Chapter K
FUEL SYSTEM AND CARBURETTERS

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Chapter K

FUEL SYSTEM AND CARBURETTERS

Section K1

FUEL SYSTEM

1. Ensure that the rubber hose is connected to the filler pipe after the fuel tank has been fitted into position.
2. Lubricate the fuel tank drain plug with Rocol Marlube Moly 51 or its equivalent, then fit and tighten the plug.
3. Fit the underlay to the luggage compartment floor as originally fitted using Aquaseal 1665 or similar sealing compound.

Fuel tank—Early cars—To remove

(see Fig. K1)
The following procedures apply to cars prior to Car Serial Numbers SRH 7694, CRH 7812, DRH 7770 and LRX 7482.
1. Disconnect the battery leads.
2. Remove the carpet and underlay from the luggage compartment.
3. Remove the fuel gauge unit cover from the fuel tank, then disconnect the leads from the unit.
4. Remove all dirt from around the drain plug, then, using the special adaptor and spanner from the tool kit, remove the plug and drain the fuel into a storage container.
5. Disconnect the fuel pipe line at the tank outlet union.
6. Disconnect the fuel tank breather pipe at the filler tube connection.
7. Remove the rubber hose connected to the filler pipe.
8. Unscrew and remove the nineteen setscrews and washers which secure the fuel tank to the floor of the luggage compartment.
9. Lift and remove the fuel tank from its location in the luggage compartment floor.

Fuel tank—Late cars—To remove

The following procedures apply to cars from Car Serial Numbers SRH 7694, CRH 7812, DRH 7770, LRX 7482 and onwards.
1. Carry out Operations 1 to 7 inclusive described under Fuel tank—Early cars—To remove.
2. Disconnect the spring clips and remove the rubber vent tube hoses from the two connections positioned on top of the fuel tank (see Fig. K2).
3. Unscrew the two worm drive clips and remove the convoluted rubber hose connected to the filler tube adaptor.
4. Lift and remove the fuel tank from its location in the luggage compartment floor.

Fuel tank—Late cars—To fit
To fit the fuel tank, reverse the procedure given for its removal noting the points described in Fuel tank—Early cars—To fit.

Replacement fuel tank
The following procedures apply to cars prior to Car Serial Numbers SRH 7694, CRH 7812, DRH 7770 and LRX 7482.
FIG. K1  CUT-AWAY VIEW OF FUEL TANK (Early cars)

1 Anti-surge baffles
2 Cover—electric fuel gauge
3 Electric fuel gauge unit with float in half-full position
4 Fuel feed pipe outlet union
5 Fuel tank breather pipe
6 Air-lock bleed pipe
7 Filler cap
8 Electrical lead—fuel level gauge
9 Anti-surge tower
10 Fuel tank drain plug
11 Fuel feed pipe
12 Securing setscrew location hole
If an early type fuel tank is to be changed, the latest type will be supplied as a replacement.

The latest type of fuel tank has a modified internal breather arrangement and the following operations describe the procedure necessary for modification of the filler neck assembly to enable the tank to be fitted.

1. Carry out Operations 1 to 9 inclusive described under Fuel tank—Early cars—To remove.

2. Using a new gasket fit the electric fuel gauge unit to the new tank. Six 3 B.A. screws will be required to secure the unit to the new tank and not four 3 B.A. screws and two 2 B.A. screws as on the previous tank.

3. Fit the new tank into the luggage compartment and secure with the 19 existing setscrews and washers.

4. Place a worm drive clip over each end of the convoluted hose and fit the hose to the filler neck of the fuel tank (see Fig. K2). Do not tighten the clips at this stage.

5. Fit the new filler tube adaptor to the convoluted hose ensuring that the adaptor connection for the existing vent pipe is facing towards the front of the car (see Fig. K2).

6. Place a worm drive clip over each end of the new fuel resistance rubber hose; fit the rubber hose between the new filler tube adaptor and the neck of the filler tube.

7. Position the upper and lower hoses and the filler tube adaptor as shown in Figure K2; tighten the four worm drive clips.
8. Connect the two new vent hoses from the fuel tank vent tubes to the vent connections on the filler tube adaptor as shown in Figure K2. Secure the hoses with spring clips.

9. Connect the existing \( \frac{3}{4} \) in. (3,17 mm.) diameter vent pipe to the filler tube adaptor and the fuel outlet pipe to the fuel tank.

10. Connect the electrical leads to the fuel gauge unit; fit and secure the cover over the unit.

11. Lubricate the fuel tank drain plug with Rocol Marlube Moly 51 or its equivalent; fit and tighten the plug.

In order to provide clearance for the fuel tank vent tubes it will be necessary to modify the filler tube cover as follows.

Carefully turn back, but do not cut, the bottom \( \frac{3}{4} \) in. (3,81 cm.) of carpeting to allow two cut-aways to be made in the cover as shown in Figure K3.

The following points should be noted when modifying and fitting the cover.

1. The dimensions shown in Figure K3 are only given as a guide and additional relieving may be necessary to ensure a satisfactory fit when the cover is secured in position.

2. The vertical edge of the cut-away (see arrow in Fig. K3) should clear the metal portion of the tank vent tubes when the cover is in position.

3. To prevent chafing of the flexible vent hoses, the vertical edge of each cut-away should be re-shaped slightly as shown in Figure K3 inset.

4. After finally securing the cover in position stick down the carpeted trim on the cover using upholstery solution.

5. Fit the underlay to the luggage compartment floor as originally fitted using Aquaseal 1665 or similar sealing compound.

6. Fit the carpet to the luggage compartment floor.

7. Connect the battery leads.
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Rear fuel filter element—To renew (see Fig. K5)

1. Disconnect the battery leads.
2. Loosen the worm drive clips on each side of the top cover and remove the inlet and outlet pipes. Blank off the pipes to prevent loss of fuel.
3. Remove the two setscrews securing the filter mounting bracket and lower the filter from the car. Take care not to spill any fuel.
4. Unscrew the three setscrews and remove the filter bowl from the top cover taking care not to spill any fuel.
5. Remove and discard the filter element after first noting the position in which the new element is to be fitted (see Fig. K5).
6. If water is present in the fuel filter, the fuel tank should be drained. On early cars, four S.B.N. inhibitors should be placed in the tank.
7. Carefully clean all fuel filter components in paraffin.
8. Fit the new element, then fit the filter bowl to the top cover tightening the three setscrews evenly.
9. Fit the fuel filter to the floor stiffener and secure with the two setscrews.
10. Remove the blanks from the ends of the inlet and outlet pipes. Fit and secure the pipes to the top cover.
11. Connect the battery leads.
12. After fitting the rear fuel filter, switch on the ignition to operate the fuel pumps and remove air from the fuel pipes.
13. Switch off the ignition and inspect the external surface of the filter bowl for any signs of fuel leakage.
Fuel pump failure

In the United Kingdom all faulty pumps are reconditioned by the manufacturer only; it is therefore necessary to replace a faulty unit with a new or reconditioned unit.

In all other countries, a new or reconditioned pump should be fitted; if this is not possible, parts can be obtained and the fault rectified as described in Section K6—Fault Diagnosis.

All reconditioned pump units and parts are obtainable through the Parts Department at Crewe.

Reconditioned fuel pump units

S.U. reconditioned fuel pump units are of the short barrel type and incorporate all the latest design features. The pump mounting studs are either of B.S.F. or U.N.F. thread form, but the correct nuts will be supplied with each pump. Nuts from other pumps should not be fitted unless the thread form is known to be the same as the stud thread on the reconditioned pump.

Neither inlet or outlet unions are supplied with reconditioned pumps. These parts should be removed from the faulty pump unit before its return to Rolls-Royce Limited.

Fuel pump—To remove (see Fig. K6)

1. Disconnect the battery leads.
2. Remove the inlet pipe from the top cover of the rear fuel filter. Blank off the pipe. This will prevent siphoning of the fuel from the tank.
3. Disconnect the delivery and feed pipes from the fuel pump.
4. Remove the stone guards surrounding the pump.
5. Remove the rubber covers from each end of the pump to reveal the electrical terminals.
6. Disconnect the following electrical leads.
   (a) the supply lead from the inner pump terminal
   (b) the earth lead and the lead to the radio interference suppressor.
   (c) the connecting lead to the outer pump terminal.
   (d) the earth lead and the suppressor lead from the outer pump.
7. Disconnect the two breather pipes from the nipples on either side of the pump body.
8. Remove the four nuts and washers securing the pump unit to the mounting bracket on the body member.

Solenoid housing and diaphragm—To remove (see Fig. K7)

The fuel pumps on present production cars are fitted with a moulded nylon armature guide plate in preference to the eleven brass rollers.

The nylon guide plate can be fitted in place of the brass rollers and will therefore be supplied for all spares.

If it is necessary to replace or reset a diaphragm on a fuel pump fitted with a nylon guide plate, it is important that the guide plate is removed first. Ensure that the guide plate is not distorted when assembling the pump.

1. Remove the six setscrews which secure the solenoid housing, using a thick bladed screwdriver to avoid damaging the screw heads.
2. Remove the earthing screw from the solenoid housing.
3. Withdraw the solenoid housing, together with the diaphragm and spindle assembly, from the pump body.
4. Fuel pumps fitted with brass rollers. Remove the diaphragm and spindle assembly by holding the...
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**FIG. K7 EXPLODED VIEW OF FUEL PUMPS**

1. Air bottle cover
2. Pump body
3. Clamping plate
4. Joint washer
5. Diaphragm
6. Condenser
7. End cover sealing ring
8. Ventilator valve
9. Valve ball
10. Ventilator cap
11. Lucar connection
12. End cover
13. Condenser clip
14. Rocker and blade assembly
15. Solenoid housing
16. Armature spring
17. Roller (eleven off)
18. Nylon armature guide plate
19. Valve cover
20. Valve assembly
21. Sealing washer
22. Filter
23. Inlet connection
24. Plug
25. Outlet connection

**FIG. K8 REMOVING THE NYLON ARMATURE GUIDE PLATE**

1. Diaphragm
2. Nylon guide plate

Fuel pumps fitted with nylon armature guide plates. Turn back the edge of the diaphragm to expose the two end lobes of the nylon guide plate. Gently probe the two end lobes of the guide plate free from the recess into which they fit (see Fig. K8); remove the guide plate.

Remove the diaphragm and spindle assembly by holding the diaphragm and unscrewing it anti-clockwise until the armature spring pushes the diaphragm away from the solenoid housing.

5. The diaphragm and spindle are serviced as a unit and should not be separated.

6. Repeat operations 1 to 5 inclusive on the remaining pump.

7. Fuel pumps fitted with brass rollers. Wash all parts in clean paraffin and dry thoroughly. Inspect the diaphragm and brass rollers. A new diaphragm assembly should be fitted if damage or deterioration is apparent.

The spherical ends of the rollers should be examined for damage. If the rollers are damaged and considered unsatisfactory, a nylon armature guide plate will be supplied as a replacement.

Fuel pumps fitted with nylon armature guide plates. Wash all components in clean paraffin and dry...
thoroughly. Inspect the diaphragm assembly and nylon armature guide plate for damage or deterioration; renew if necessary.

8. Before assembling the pump release the spring blade retaining screw in the contact breaker sufficiently to ensure that pressure is not applied to the tungsten points and outer rocker. If pressure is applied at this point during assembly, the correct setting of the diaphragm cannot be obtained.

Solenoid housing and diaphragm—To fit

1. When assembling the pump all cork and fibre washers, gaskets and rubber ‘O’ rings should be renewed.
2. Place the armature spring in the solenoid housing with the large diameter toward the solenoid.
3. Before fitting the diaphragm, ensure that the impact washer is fitted to the armature. This is a small neoprene washer which fits into the armature recess.
4. Fit the diaphragm by inserting the spindle into the hole in the solenoid and screwing it into the threaded trunnion in the centre of the rocker assembly.
5. Screw in the diaphragm until the rocker will not ‘toggle over’. This must not be confused with ‘jamming’ the armature on the solenoid housing internal steps.
6. On fuel pumps fitted with brass centralising rollers, fit the eleven rollers by turning back the edge of the diaphragm and dropping the rollers into the solenoid recess. The pump should be held rocker end downwards to prevent the rollers from falling out.
7. Fit the contact blade and adjust the finger settings by inserting a feeler gauge between the rocker finger and solenoid housing. If necessary, bend the stop finger to obtain a gap of between 0.065 in. and 0.075 in. (1.65 mm. and 1.90 mm.). Carefully remove the contact blade.
8. Hold the solenoid housing assembly in an approximately horizontal position and firmly, but steadily push in the diaphragm spindle. Unscrew the diaphragm, alternatively pressing and releasing, until the rocker just ‘toggles over’.
9. To set the diaphragm, unscrew to the nearest hole and then unscrew a further four holes (two-thirds of a complete turn). The diaphragm is now correctly set.
10. On fuel pumps fitted with brass centralising rollers, press the centre of the armature and fit the retaining fork at the back of the rocker assembly. This is necessary to prevent the rollers from falling out when the solenoid housing is placed on the bench prior to fitting the body. It is not intended to stretch the diaphragm before tightening the body screws.
11. Turn back the edge of the diaphragm and insert one of the armature guide plate end lobes into the recess beneath the diaphragm as shown in Figure K9; ensure that the flat face of the guide plate is adjacent to the diaphragm.
12. Carefully ease the guide plate into position beneath the diaphragm.
13. Press each lobe of the guide plate into the recess. In order to avoid distorting the guide plate it is most important that the two end lobes are not pressed into position until all other operations have been carried out.
14. Repeat these operations for the remaining diaphragm assembly.
15. Fit the new joint washer to the body, ensuring that the screw holes are correctly aligned.
16. Offer the solenoid housing to the body, making sure that the seating between them is correct.
17. Line up the six securing screw holes ensuring that the cast lugs on the solenoid housing are to the bottom. Screw in the six setscrews until they are finger-tight and then fit the earthing screw with its Lucar connector.
18. Fuel pumps fitted with brass rollers. Remove the roller retaining fork, tighten the body securing screws, ensuring the rollers retain their positions; a displaced roller will damage the diaphragm.
19. Fuel pumps fitted with nylon armature guide plates. Tighten the body securing screws.
20. Progressively tighten the securing screws on opposite diameters.
21. Adjust the blade so that its contact points are a little above the contact points on the rocker when the
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points are closed. Check that when the contact points 'make' or 'break' one pair of points wipes over the centre line of the other in a symmetrical manner. The contact blade is slotted to provide some degree of adjustment.

22. To set up the contact gap proceed as follows.
   Ensure that when the outer rocker is pressed onto the solenoid housing, the contact blade rests on the narrow ridge which projects slightly above the main face of the pedestal. This is achieved by slackening the contact blade attachment screw, swinging the blade clear of the pedestal, and bending it downward a sufficient amount so that when repositioned it rests lightly against the ridge. Over-tensioning of the blade will restrict the travel of the rocker mechanism.

23. Check the lift of the contact blade top above the top of the pedestal with a feeler gauge. If necessary, bend the stop finger beneath the pedestal to obtain a gap of between 0.030 in. and 0.040 in. (0.76 mm. and 1.02 mm.).

24. Tighten the contact blade attachment screw when the correct setting has been obtained.

25. Ensure that the end cover seal washer is in position on the terminal stud. Fit the bakelite end cover and secure it in position with the lock washer and brass nut.

Fuel pump—To fit

To fit the fuel pump, reverse the procedure given for its removal noting the following points.

1. In order to prevent excessive transmission of noise from the pumps, it is essential to ensure that when fitting the fuel pump, the delivery and feed pipes of the fuel system are kept clear of the body frame between the insulated mounting clips. Also ensure that the two breather pipes are firmly attached to their nipples.

Test data

1. When both fuel pumps are operating they should deliver 1.333 pints (0.758 litres) of paraffin in 28 seconds at a delivery head of 4 ft. (1.22 m.) and a suction lift of 10 in. (25.4 cm.).

2. Mount the pump unit on a test rig 10 in. (25.4 cm.) above a paraffin bath. Fit \( \frac{3}{4} \) in. (7.94 mm.) diameter bore pipes to both the inlet and outlet unions of the pump; immerse the pipe connected to the inlet union in the paraffin bath and suspend the pipe connected to the outlet union 4 ft. (1.22 m.) above the pump unit. A measuring jar or receptacle of known capacity should be placed beneath the outlet union, and the delivery of the pump checked against a stopwatch.

3. Operate each pump independently at 13.5 volts; each pump should deliver 1.333 pints (0.758 litres) of paraffin in 56 seconds. Partly block the outlets of the pumps, reducing the flow to 1 pint (0.568 litres) of paraffin in 8 minutes when both pumps are operating; check the operation of the pumps and should buzzing occur, they should be rejected.

4. Buzzing occurs when the pumps are operating quickly but without doing any work, resulting from the sponge of the diaphragm being equal to the stroke of the pump.

5. A faulty pump unit should either have a new diaphragm fitted or be exchanged for a reconditioned unit (see Reconditioned fuel pump units).
Section K3
AIR CLEANER

Introduction
All cars destined for the following countries are fitted with paper air filter elements.
Africa, (including Algeria, Egypt, Kenya, South Africa, Morocco, Sudan, Tunisia, Madeira, Tangiers, Nigeria, etc.) also Asia (including India, Turkey, Iran, Iraq, Syria, Lebanon, Israel, Jordan, Hong Kong, etc.) also Australia, New Zealand, Spain, Portugal, Greece, Yugoslavia, Gibraltar, South America, Jamaica, Bahamas and Mexico.

Paper element—To clean
1. Should it be necessary to clean the paper elements before the mileage quoted in Chapter D—Lubrication and Maintenance, is reached, a high pressure air line should be applied to the inside of each element. Do not attempt to clean the paper element in petrol, etc.

FIG. K10 EXPLODED VIEW OF THE AIR FILTER

1 Paper element
2 Sealing washer (four required for paper elements only)
3 Locating plate (four required for paper or wire elements)
4 Wire element
5 Securing nut
6 Cover
7 Securing bolt
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Wire mesh filter element—To clean
1. The oil wetted, wire mesh filter elements should be removed and washed thoroughly in petrol at the mileage quoted in Chapter D—Lubrication and Maintenance.
2. After washing, all surplus petrol should be removed by blowing through the filter from the inside with a high pressure air line.
3. The elements should then be completely immersed in clean engine oil and allowed to soak for a period of approximately five minutes and afterwards allowed to drain for a period of two hours.

Filter elements—To remove
1. Remove the knurled nut on the side of the unit (see Fig. K10) then remove the cover together with the outlet hose.
2. Remove the hexagonal nut from the centre stud, then dismantle the air filter in the following manner.
3. On cars fitted with paper elements, withdraw the outer locating plate, sealing ring, element, sealing ring, two locating plates, sealing ring and finally the second element. Note that the cone end of the locating plates fit into the element bore.
4. On cars fitted with wire mesh elements, the dismantling procedure is similar to that previously described, except that the four sealing rings are not fitted.

Air silencer/cleaner unit—To remove
1. Jack up the front of the car and support the car on suitable stands.
2. Remove the right-hand front wheel.
3. Remove the stone guard.
4. Disconnect the trunking from the air cleaner outlet.
5. The air cleaner is secured to the valance plate by six setscrews, equally spaced around the filter access hole. Remove the six setscrews from inside the engine compartment and detach the air cleaner together with the cork joint; discard the joint if it is in poor condition.

Air silencer/cleaner unit—To fit
Fit the air cleaner by reversing the procedure given for its removal.
Section K4

THE CARBURETTERS AND AUTOMATIC CHOKE SYSTEM

Carburetters—To remove (see Chapter E—Engine Compartment illustrations)

1. Disconnect the battery leads.
2. If a hot idle compensator valve is fitted disconnect the rubber pipe connected to the choke butterfly housing rubber elbow; also remove the rubber pipe connected to the carburetter 'Tee' piece.
3. Remove the air hose steady bracket noting that the small bracket retaining the kick-down micro-switch wire is retained by one screw.
4. Disconnect the hose from the air silencer and butterfly housing; remove the hose together with the bonding cable earth strip (if fitted).
5. Move the spring clip away from the choke solenoid cover then disconnect the wires noting from which terminal each wire was removed to ensure correct assembly.
   For engines fitted with a refrigeration fast-idle solenoid carry out Operations 6 and 7.
6. Disconnect the two rubber tubes connected to the refrigeration fast-idle solenoid noting their respective connections for correct assembly.
7. Disconnect the wiring to the refrigeration fast-idle solenoid noting the colour of the wiring to avoid incorrect assembly.
8. Remove the engine oil dipstick.
9. Remove the split pin, washers and swivel pin, securing the throttle linkage to the fore and after manifold shaft lever; this connection is adjacent to the 'A' bank carburetter.
10. Disconnect the distributor vacuum pipe (if fitted).
11. Disconnect the main fuel feed pipe.
12. Disconnect the fuel spill pipe.
13. Disconnect the choke stove pipe from the choke housing.
14. Remove the three small screws securing the small end cover to the bi-metal coil cover then withdraw the cover along the choke stove pipe to reveal the pipe connection. Disconnect the choke stove pipe.
15. Remove the crankcase breather pipe from the choke butterfly housing; withdraw the housing from the end of the pipe.
16. Cars from Car Serial Number SRH 8742 and onwards. Disconnect the hose from the carburetter weakening device and discard the retaining clip.
17. Remove the wires connected to the micro-switch(es) adjacent to the carburetters noting their respective position to avoid incorrect assembly.
18. Remove the air horns, the choke butterfly housing, the carburetters and the 'Tee' piece as a complete assembly. This assembly is secured to the induction manifold by a setscrew, location being provided by two dowel pins.
19. Slacken the pinch bolt and remove the 'fast-idle' lever from the 'A' bank carburetter butterfly spindle (see Fig. K11).

FIG. K11 FAST-IDLE MECHANISM

1 Lock-nut
2 Adjusting screw

20. Remove the three setscrews and bolt securing the air horns to the carburetters; remove the micro-switch(es), refrigeration 'fast-idle' solenoid (if fitted) and the hot idle compensator valve (if fitted) together with their brackets.
21. Remove the air horns.
FIG. K12 EXPLODED VIEW OF CARBURETTER (Early cars)

1 Piston  
2 Piston spring  
3 Damper  
4 Suction chamber  
5 Central nut  
6 Washer  
7 Banjo connection  
8 Fibre washer  
9 Float chamber lid  
10 Spring and filter  
11 Washer  
12 Fuel inlet union  
13 Float needle housing  
14 Float needle  
15 Hinge pin  
16 Lever  
17 Float chamber  
18 Gasket  
19 Float chamber body  
20 Anti-boiling device  
21 Jet spring  
22 Throttle valve  
23 Spindle  
24 End cap  
25 Sealing gland  
26 Bearing  
27 Jet diaphragm and jet assembly  
28 Lock-nut  
29 Jet adjusting screw  
30 Jet housing  
31 Rocker lever  
32 Jet locking nut  
33 Lock-washer  
34 Jet bearing  
35 Piston lift pin  
36 Carburetter body  
37 Circlip  
38 Seal  
39 Brass washer  
40 Spring  
41 Needle  
42 Volume screw  
43 Needle locking screw  
44 Joint  
45 Vacuum take-off plate
22. Disconnect the fuel feed pipe from the float chambers.
23. **Cars from Car Serial Number SRH 8742 and onwards.** Remove the weakening device pipes.
24. Disconnect the carburettor spill from the float chambers.
25. Remove the float chamber lids and floats keeping them identified for their respective carburetters.
26. Remove the nut securing the throttle damper (if fitted) to its bracket; remove the damper.
27. Remove the throttle spring.
28. Completely remove the two pinch bolts securing the levers to the 'A' and 'B' bank carburettor butterfly valve spindles; remove the levers.
29. Remove the nuts and washers securing both carburetters to the 'Tee' piece; remove the carburetters together with the throttle damper bracket (if fitted) adjacent to 'A' bank carburettor.

**Carburettor—To dismantle (see Fig. K12)**

1. Thoroughly clean the outside of the carburettor. **Important** Parts from the two carburetters should not be interchanged. To prevent this, the parts as they are removed from each carburettor, should be placed in two boxes, preferably marked 'A' bank and 'B' bank.
2. Unscrew and remove the damper and washer from the suction chamber lid.
3. Remove the suction chamber retaining screws and remove the chamber without tilting it.
4. Remove the piston spring.
5. Carefully lift out the piston and needle assembly; empty the damper oil from the piston rod.

For carburetters fitted with a fixed needle carry out Operation 6 (see Fig. K17).
6. Remove the needle locking screw and withdraw the needle from the piston. If it cannot easily be removed, first tap the needle inwards then pull outwards. Do not bend the needle. If excessive force is required to remove the needle it should be discarded and a new one fitted.

For carburetters fitted with a spring loaded needle and centralised jet carry out Operations 7 and 8 (see Fig. K18).
7. Remove the needle guide locking screw from the piston and withdraw the needle assembly taking care not to bend the needle.
8. Withdraw the needle guide from the needle and remove the spring.

**Note** The flange collar pressed onto the jet needle is pre-set at the factory and must not be disturbed.
9. Mark the relative position of the float chamber, jet housing and carburettor body (see Fig. K13) then unscrew the float chamber screws, holding the float chamber against the pressure of the jet spring; carefully detach the float chamber.
10. Lift off the jet housing. Withdraw the jet assembly and jet spring.
11. Using a ring spanner, remove the jet locking nut together with the jet bearing and locking washer; discard the locking washer.

**Note** Locking washers are not fitted to carburetters with a spring loaded needle.

12. **Cars prior to Car Serial Number SRH 8742.** Unscrew the fuel inlet union from the float chamber lid and remove the union and aluminium washer; extract the filter and spring assembly.

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[Fig. K13] Scribing Carburettor

[Fig. K14] Checking the Float Level

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1. Needle valve
2. Forked lever
3. Test bar
Chapter K

Cars from Car Serial Number SRH 8742 and onwards. Unscrew the two screws securing the fuel inlet union to the float chamber lid. Withdraw the union together with the spring, spring retainer and paper filter element.

13. Push out the float lever hinge pin from the end opposite the serrations. Detach the lever.

14. Extract the float needle from its seating and unscrew the seating from the lid using a box spanner.

Do not distort the seating.

15. Close the throttle and mark the relative positions of the throttle butterfly valve and the carburetter flange.

16. Slacken and remove the butterfly valve from its slot in the throttle spindle. The butterfly valve is oval and will jam if care is not taken.

17. Slide the spindle out of its bearings.

18. **Cars prior to Car Serial Number SRH 8742.** The

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**FIG. K15 CUT-AWAY VIEW OF ‘B’ BANK CARBURETTER (Late cars)**

1. Air valve piston
2. Suction chamber
3. Damper cap
4. Damper piston
5. Weakening device
6. Communication pipe
7. Filter
8. Needle
9. Diaphragm
10. Jet
11. Volume adjusting screw
12. Union—weakening device
throttle sealing glands should not be removed as servicing is not required.

Cars from Car Serial Number SRH 8742 and onwards. Remove the two rubber seals from the throttle spindle bore.

19. Uncrew and remove the slow-running valve complete with spring, seal and brass washer.
20. Remove the two screws and shakeproof washers retaining the vacuum take-off plate and union. Lift off the plate and gasket.
21. Remove the piston lifting pin by extracting the circlip from its groove with the pin pressed upwards.
22. Withdraw the pin downwards.

**Carburetters—To assemble**

1. Wash all parts with clean paraffin then dry with compressed air.
2. Check that all the passages in the carburetter body and vacuum take-off plate are not obstructed.
3. Fit the plate together with a new gasket then secure the plate to the carburetter body.
4. Examine the butterfly valve spindle for scoring or signs of wear. Fit the spindle in its bearings and check for slackness in the bearings and freedom of operation.
5. Fit the butterfly valve to the slot in the butterfly valve spindle noting the position marked during dismantling. The countersunk ends of the screw holes in the spindle must face outwards toward the flange of the carburetter body. Fit the two new retaining screws but do not tighten.
6. Adjust the butterfly valve until it closes fully. Check this visually, then tighten the screws. Spread the split ends of the screws sufficiently to prevent turning.
7. Cars from Car Serial Number SRH 8742 and onwards. Using the special tool (RH 8383) fit the rubber seals to each end of the butterfly valve spindle. Ensure that the concave end of the seals enter the bores first.
8. Examine the slow running valve seal for serviceability. Check that the concave face of the brass washer is towards the seal. Fit the valve assembly.
9. Fit the piston lifting pin, spring, rubber washer, plain washer and circlip.
10. Examine the float needle and seating for damage or wear. Screw the seating into the float chamber lid but do not overtighten. Fit the needle to the seating, coned end first. Using light finger pressure to hold the needle against its seating, test the assembly for leaks with an air pressure line. The pressure should be approximately 5 lb/sq. in. (0.35 kg/sq. cm.).
11. Fit the float chamber lid lever and fit the hinge pin.
12. Check the float level.

With the needle on its seating, insert a \( \frac{3}{8} \) in. (11.11 mm.) diameter bar between the forked lever and the lip of the float chamber lid. The prongs of the lever should just rest on the bar (see Fig. K14). If they do not, carefully bend the lever at the start of the pronged section until the correct setting is obtained.

13. Examine the piston rod and the outside surface of the piston for damage.
14. The piston assembly must be scrupulously clean. Use paraffin or methylated spirits as a cleaning agent; do not use abrasive. Clean inside the suction chamber and piston rod guide using paraffin or methylated spirits.
15. Fit the damper assembly and washer. Seal the transfer holes in the piston assembly with rubber plugs and fit the assembly to the suction chamber.
16. Invert the complete assembly and check the time it takes for the suction chamber to fall away from the piston (see Fig. K16). This should be between 5 and 7 seconds. Remove the plugs, damper assembly and washer.

**Fig. K16 Checking the Serviceability of the Suction Chamber**

1. Suction chamber
2. Rubber plug
3. Piston
For carburetters fitted with a fixed needle carry out Operations 17 to 27 inclusive.

17. Fit the needle to the piston assembly. The shoulder or lower edge of the groove must be level with the lower face of the piston rod (see Fig. K17); fit the locking screw and tighten.

18. Invert the suction chamber and spin the piston assembly inside to check for concentricity of the needle.

19. Check that the piston key is secure in the carburetter body.

20. Fit the piston assembly to the body then fit the piston spring over the piston rod. Fit the suction chamber taking care not to ‘wind up’ the piston spring; fit and tighten the suction chamber retaining screws.

21. Fit the jet bearing, a new locking washer and locking nut; do not tighten the nut.

22. With the piston resting on the bridge of the carburetter, feed the jet into the jet bearing ensuring that the two noughts on the diaphragm are towards the inlet flange.

Important It is important that the jet and diaphragm be kept in the same radial position relative to the carburetter body, as the jet orifice is not necessarily concentric with its outside diameter; turning may cause decentralisation.

23. Check that the jet is free to move inside the jet bearing and does not foul the needle, then tighten the nut. Repeat this check to ensure that the jet bearing has not moved.

24. Fit the jet housing, diaphragm, spring and float chamber complete with the anti-boiling device ensuring that the correlation marks made previously (see Fig. K13) line up with each other and that the noughts on the diaphragm are in their correct position.

25. Before tightening the four screws securing the float chamber, ensure that the chamber is pushed towards the inlet flange of the carburetter. This is very important to prevent a foul with the throttle controls (see Fig. K21 dimension Z).

26. Using a finger, lift the carburetter piston clear of the bridge piece, then set the jet flush with the bridge piece (see Fig. K19).

27. To provide an initial setting for the carburetter, turn the jet screw 2 turns clockwise (downward).

For carburetters fitted with a spring loaded needle and centralised jet carry out Operations 28 to 41 inclusive (see Fig. K18).

28. Fit the jet bearing and lock-nut; tighten the lock-nut.

29. Fit the jet housing, jet, jet spring and float chamber complete with anti-boiling device ensuring that the jet and diaphragm are kept in the correct relationship to the body and that the raised edge of the diaphragm...
is located in the housing groove.

30. Before tightening the four screws securing the float chamber, ensure that the chamber is pushed towards the inlet flange of the carburettor. This is very important to prevent a possible foul with the throttle controls (see Fig. K21 diagram Z); tighten the screws.

31. Check that the jet is not sticking in its guide. This can be carried out by moving the jet lever up and down.

32. Set the jet flush with the bridge of the carburettor (see Fig. K19) and then turn the jet screw clockwise 2½ turns.

33. Fit the spring of the spring loaded needle onto the needle collar ensuring that the spring locates in the groove.

34. Fit the guide onto the needle so that the end with the indentation is towards the flange on the collar.

35. Fit the needle assembly and guide into the piston. The lower face of the guide must be flush with the face of the piston (for guidance refer to Fig. K18), and the mark on the guide must be adjacent to the point midway between the two cut-outs in the piston (see Fig. K18). On later cars, the flat on the side of the collar should be positioned towards its locking screw.

36. Fit and tighten a new guide locking screw to the piston.

37. Check that the piston key is secure in the carburettor body.

38. Fit the piston assembly to the carburettor body carefully guiding the needle into the jet.

39. Fit the piston spring over the piston rod.

40. Fit the suction chamber taking care not to 'wind-up' the piston spring, fit and tighten the suction chamber retaining screws.

41. Fit the piston damper and washer.

**Carburetters—To fit**

Fit the carburetters by reversing the procedure given for their removal noting the following points.

1. Fit new gaskets and washers to all joints.
2. Examine the floats for damage or punctures; fit the floats to their respective float chambers.
3. Fit new gaskets to the float chamber lids then fit the lids to the chambers.
4. Secure the float chamber lids and pipes to the chambers using the appropriate connections.

5. **Cars prior to Car Serial Number SRH 8742.** Clean the fuel filter assemblies and examine for damage; renew if necessary.

6. **Cars from Car Serial Number SRH 8742 and onwards.** Examine the paper fuel filter elements for cleanliness and damage; renew if necessary.

**Fuel spill pipe—To remove**

The following procedures apply to cars from Car Serial Number SRH 8742 and onwards only.

1. Unscrew the worm drive clip situated above the float chamber drain valve.
2. Unscrew the worm drive clip from the hose adjacent to the distributor.
3. Detach the hose.
4. Unscrew the worm drive clip situated below the float chamber drain valve.
5. Detach the hose from the float chamber drain valve noting that it is attached to the induction manifold fuel drain pipe.
6. If the float chamber drain valve is to be removed, unscrew the bolt securing the valve clamping bracket and remove the bracket together with the valve. The valve clamping bracket is secured to a bracket attached to the bell housing.

**Note** If a float chamber drain valve is faulty or damaged a new valve must be fitted.

7. Fill the damper piston with an approved oil; the oil level should be approximately ¾ in. (12.7 mm.) below the top of the piston rod. Do not overfill.

**Fuel spill pipe—To fit**

Fit the pipe by reversing the procedure given for its removal.
Diagram A = Linkage in full throttle position

1. Micro-switch — transmission stator
2. Pinch bolt
3. 'B' bank throttle lever
4. Anti-toggle stop
5. 'A' bank throttle lever
6. Full throttle stop
7. Micro-switch kick-down
8. Lock-nut

Diagram B = Setting kick-down micro-switch

9. Throttle damper
10. Fixed throttle stop screw
11. Micro-switch — transmission stator
12. Throttle valve

Diagram C = Linkage in closed throttle position

13. Link (one hole elongated on refrigerated cars)
14. 0.015 in. to 0.030 in. (0.38 mm. to 0.76 mm.) feeler gauge
15. Adjusting screw — kick-down micro-switch
16. Lever — manifold to carburetter

V 0.245 in. (6.233 mm.) min.
W 0.775 in. (19.7 mm.)
X 0.025 in. (0.635 mm.)
Y 0.600 in. (15.24 mm.)
Carburetters — To set

Cars prior to Car serial Number SRH 8742

Having set the mechanical adjustments to the automatic choke set the carburetters by carrying out the following operations (where applicable) in the sequence given.

The correct method for carrying out the operations, follows the undermentioned list.

A Synchronise throttles and temporarily set the throttle stop screw.
B Set the full throttle stop.
C Check the linkage clearances.
D Tune the carburetters.
E Set the cold start ‘fast-idle’.
F Set the throttle damper plunger (if fitted).
G Set the stator micro-switches (if fitted).
H Set the kick-down micro-switch (if fitted).
I Set the refrigeration ‘fast-idle’ (if fitted).

Throttle synchronisation

1. Check that the fixed throttle stop screw is set to the correct dimension; refer to the appropriate illustration (see Figs. K20 and K21 diagram C dimension Y).
2. Unscrew the four screws securing the suction chamber of each carburetter and remove the suction chambers together with the pistons, springs and dampers.

Note It is important that each chamber and air valve piston should be fitted to the carburetter from which it was removed.
3. Slacken the two pinch bolts which clamp the operating levers to the throttle spindles (see Figs. K20 and K21).
4. Ensure that the choke is in the off position; an elastic band fitted between the choke link rod and the crankcase breather pipe fitting on the choke housing will serve to hold the choke in the off position.
5. With the ‘A’ and ‘B’ bank throttle butterfly valves held in the closed position, move the ‘A’ bank throttle lever so that it abuts its stop; tighten the two pinch bolts which clamp the operating levers to the throttle spindles.
6. Check that both throttle butterfly valves are closed.
7. Release the idle stop screw lock-nut, then turn the screw clockwise (downward) half-a-turn so that the throttle butterfly valves are just cracked open; tighten the lock-nut.
8. Final adjustment of the idle stop screw should be carried out as described in ‘Carburetter Tuning’.
9. Cars prior to Car Serial Number SRX 9001. If a refrigeration vacuum unit (see Fig. K21) is fitted, set the gap between the vacuum unit shaft and the adjustment screw to 0-100 in. (2.54 mm.).

Cars from Car Serial Number SRX 9001 and onwards fitted with the Exhaust Emission Control System. Set the gap between the throttle stop vacuum actuator shaft and the adjusting screw to 0-070 in. (1.78 mm.).

Full throttle stop

1. Adjust the full throttle stop screw so that it is set to the dimension given on the appropriate illustration (see Figs. K20 and K21 dimension W).
2. Check that the clearance (X) between the fixed stop and the lever is correct (see appropriate illustration Figs. K20 and K21). If the clearance is less than that which is given, the full throttle stop screw should be adjusted to give the correct clearance.

Linkage clearances—To check

1. Operate the carburetter linkage mechanism to ensure complete freedom of movement.
2. Particular attention should be paid to the clearance between the ‘B’ bank carburetter float chamber and the refrigeration ‘fast-idle’ adjusting screw on early cars (if fitted) or the vacuum throttle stop screw on later cars (if fitted); the clearance at this point when the linkage is moved towards its full throttle position should be at least 0-100 in. (2.54 mm.). If less than this figure, the four screws securing the float chamber to the carburetter body should be slackened and the chamber moved outward until the correct clearance is established; tighten the four screws. This dimension is applicable to both early and late linkage arrangements and is shown in Figure K21, clearance Z.

Carburetter tuning

Cars prior to Car Serial Number SRH 8742

Preliminary checks

Before tuning the carburetters the following checks should be carried out.
1. Check that the distributor contact point gaps are set correctly; if necessary clean and reset.
2. Check the sparking plug gaps.
3. Check the ignition timing, refer to Chapter M—Electrical System.
4. Check that the entire induction system is completely free from air leaks.
5. Check that the choke stove pipe is not obstructed (see Page K27).
6. Ensure that the throttle damper is not holding the throttles open.
7. Ensure that the throttle butterfly valves are...
synchronised, the full throttle stop screw is adjusted and the linkage clearance is correct as described under Carburetter—To set.

**Tuning conditions**

To ensure that the engine temperature and mixture requirements are stabilised, tuning must be carried out in accordance with the following setting cycle.

1. Set the volume screws fully in, then back off $1\frac{1}{2}$ turns.
2. With the carburettter dampers, suction chambers, springs and pistons already removed to enable the throttle synchronisation to be checked, set the main jet screw as follows.

   Using special spanner (RH 8050), slacken the carburettor jet screw lock-nuts then manipulate each jet screw until the jet in each carburettor body is level with its bridge piece.

   Screw down the jet screw 2 turns.
3. Check that the lower face of the annular groove in the needle is level with the piston base (see Fig. K17).
4. Check that the piston is free to slide in its suction chamber.
5. Fit the air valve pistons, springs and suction chambers in a clean dry condition then top-up the damper piston with the approved oil; the oil level should be approximately $\frac{1}{8}$ in. (12.7 mm.) below the top of the piston rod. **Do not overfill.**

   **It is important that each chamber and air valve piston should be fitted to the carburettor from which it was removed.**

   Do not fit the damper at this stage.
6. If a hot idle compensator valve is fitted remove the pipe from the hot idle compensator valve connection marked 'OUT'. Blank off the pipe.
7. Connect an electric impulse tachometer in accordance with the manufacturer's instructions.
8. Warm-up the engine at fast-idle speed until the normal operating temperature is attained. Preferably this should be carried out with the car standing in an ambient temperature of between 16°C. and 27°C. (60°F. and 80°F.). Run the engine for at least five minutes after the thermostat has opened; the thermostat opening point can be detected by a sudden rise in temperature of the thermostat elbow pipe or by reference to the coolant temperature gauge (if fitted).
9. If a refrigeration system is fitted, ensure that the system is switched off.
10. Check that the choke butterfly valve is fully open by feeling the tension at the operating levers and hearing it snap back on its stop when any tension which has been applied, is released.

**Tuning procedure**

11. Tuning operations may now be commenced and must be carried out in the shortest time possible. If the time to setting exceeds a three minute period, open the throttle and run the engine at 2000 r.p.m. for $\frac{1}{2}$ minute to purge the system then resume tuning. Repeat this clearing operation if further periods of three minutes are exceeded.

   Immediately after a clearing operation when the engine is at idle speed, the suction chamber should be tapped all the way round with a light weight, non-metallic instrument (e.g. the wooden handle of a screwdriver) to eliminate piston hysteresis (see Fig. K23).
12. Ensure that Neutral is selected on the gear range selector.
13. Set the idle speed to 600 r.p.m. by adjusting the fixed throttle stop screw.
14. Run the engine at idle speed then balance the carburetters using the volume screws, the carburetters are balanced when the hiss heard at the small drilling in the neck of each suction chamber is of equal intensity. The volume screws should only be adjusted within the range fully closed to two complete turns open, otherwise an obtrusive whistle from the carburetters may result. Fit the dampers.
15. Turn both jet adjusting screws by equal amounts in the same direction, approximately $\frac{1}{2}$ of a turn at a time until the maximum r.p.m. is recorded on the tachometer.

   **Note** Turning the screw clockwise richens the mixture, conversely, turning the screw anti-clockwise weakens the mixture.
16. Set the mixture balance on each carburettor individually using the jet adjusting screw approximately $\frac{1}{2}$ of a turn at a time in either direction until the maximum r.p.m. is obtained.
17. Turn both jet adjusting screws by equal amounts anti-clockwise (weaker mixture) until the engine speed just commences to fall, then turn both adjusting screws $\frac{1}{2}$ of a turn clockwise (richer mixture) and tighten the lock-nuts using spanner (RH 8050).
18. Check the idle speed and if necessary adjust to the original speed (see Operation 13).
19. Check that the carburetters are balanced by raising and releasing each carburettor piston lift pin in turn then comparing engine response. The carburetters are balanced if the response is the same for each carburettor. If the carburetters are not balanced repeat Operations 13 to 18 inclusive until a satisfactory balance is obtained.

   In certain countries the exhaust C.O. must be checked. If these regulations apply Operation 20 to 24 inclusive should be carried out.
20. Purge the engine at 2000 r.p.m. in Neutral for a period of $\frac{1}{2}$ minute.
21. Ensure that the engine has run a minimum period of 25 minutes since the thermostat has opened (see Operation 8) then fit the probe of a C.O. meter into the exhaust system. The C.O. meter should be set in accordance with the manufacturer's instructions.

Note: Suitable C.O. meters are:

22. Idle the engine until a steady C.O. reading is obtained (minimum time 1/2 minute) then check the exhaust emission on the C.O. meter; the correct reading should be between 4% and 4 1/2%.

If the C.O. meter reading is not within this limit it is permissible to unlock the jet adjusting screws and turn them a maximum of 1/4 of a turn, either clockwise or anti-clockwise, whichever is necessary to give the correct reading on the meter. Do not turn them in opposite directions (i.e. enrich one and weaken the other). Lock the jet adjusting screws.

If the correct C.O. meter reading is unobtainable at this setting, and the settings have been carried out to the instructions given, the carburetters should be removed from the engine and overhauled as described previously.

23. Remove the C.O. meter.

24. Check and if necessary set the engine idle speed (see Operation 13) using the fixed throttle stop screw.

25. Re-connect the hose to the hot idle compensator valve.

Cold start 'fast-idle' speed—To set
(see Figs. K11 and K21)

The cold start engine speed should be set with the engine at normal running temperature.

1. With the engine stopped depress the accelerator from beneath the bonnet (see Section K5—Throttle Control Linkage Settings); at the same time close the choke butterfly by hand. Release the accelerator, so allowing the 'fast-idle' cam to turn.

2. Release the choke butterfly, so allowing the 'fast-idle' adjusting screw to rest on the high step of the cam. This will leave the throttles in the cold start position.

3. Ensure that the gearchange selector is in Neutral position and that the handbrake is applied.

4. Start the engine.

5. Check to ensure that the 'fast-idle' adjusting screw is resting on the high step of the cam, then using the 'fast-idle' adjusting screw adjust the engine speed to 1 850 r.p.m.; lock the adjusting screw by means of the lock-nut and check to ensure that the engine speed is still 1 850 r.p.m. By slightly opening the throttles the cam will fall away; on releasing the throttles the engine will assume normal idling speed.

On cars from Car Serial Number SRH 8742 and onwards the 'fast-idle' speed should be set to 2 000 r.p.m.

6. Where the engine is required to start below —12°C. (10°F.) the 'fast-idle' speed should be set to 2 000 r.p.m.

Throttle damper plunger—To set
(see Figs. K20 or K21)

1. Move the cold start 'fast-idle' to its off position.

2. Move the 'A' bank throttle lever to its closed throttle position.

3. Slacken both nuts securing the throttle damper to its bracket then back them off until they are well clear of the bracket.

4. Set the damper with the throttle spindle compressed to 0-187 in. (4,75 mm.) and tighten the lock-nuts.

5. Ensure that the centre of the damper spindle is resting on the centre of the throttle lever pad.

Stator micro-switches—To set (if fitted)
(see Fig. K20)

The stator micro-switch (see Fig. K20 item 11) which signals the initial stator angle change is non-adjustable and it is only necessary to check that the switch is functioning correctly.

The stator micro-switch (see Fig. K20 item 1) which signals stator angle change at approximately 45 degrees of throttle opening should be adjusted as follows.

1. Move the throttle linkage to the full throttle position, then check that the gap between the heel of the cam lever and the inner face of the micro-switch bracket is set to dimension V.

2. If the gap is less than the dimension quoted, the full throttle stop (item 6) should be turned clockwise until the correct gap is attained.

Kick-down micro-switch—To set

1. Using a 0-015 in. to 0-030 in. (0,381 mm. to 0,762 mm.) feeler gauge fitted between the full throttle stop screw and its stop, adjust the kick-down micro-switch adjusting screw so that it just operates the switch; a clicking noise will be heard as the switch is operated (see appropriate illustration Figs. K20 and K21 diagram B).

Refrigeration 'fast-idle'—To set
(see Figs. K21 diagram C)

The following procedure applies to cars prior to Car Serial Numbers SRH 7834, SRX 7826, CRH 7886 and DBH 7883.

The engine should be thoroughly warm when carrying out this check. If the refrigeration 'fast-idle' is not checked at the same time as the normal idle speed
# FIG. K21 CARBURETTER SETTINGS (Late cars)

Diagram A = Linkage in full throttle position

Diagram C = Linkage in closed throttle position

Diagram B = Setting kick-down micro-switch

Diagram D = Cold start 'fast-idle' linkage

1. Full throttle stop
2. Anti-toggle stop
3. Micro-switch—kick-down
4. Adjusting screw—kick-down micro-switch
5. 0.015 in. to 0.030 in. (0.38 mm. to 0.76 mm.) feeler gauge
6. 'Fast-idle' adjusting screw
7. 'Fast-idle' lever
8. 'B' bank float chamber
9. Volume screw
10. Refrigeration 'fast-idle' screw
11. Vacuum unit
12. 'A' bank throttle lever
13. Lock-nut
14. Throttle stop screw
15. Throttle damper (if fitted)
16. Lock-nut
17. Underside of bracket
18. Volume screw
19. Lock-nut
20. Damper spindle
21. Pinch bolt
22. 'B' bank throttle lever
23. 'Fast-idle' cam
24. Lock-nut

W 0.350 in. (8.89 mm.)
Y 0.650 in. (16.5 mm.)
X 0.025 in. (0.635 mm.)
Z 0.100 in. (2.54 mm.)
adjustment, the car should be run for the equivalent of 20 miles (32 km.) followed by five minutes at idle speed.

1. With the engine running at idle speed and Neutral or Park selected, switch the air conditioning system to the full COLD position. Select maximum blower speed and open the circular facia outlets and the rectangular outlet.

2. Allow the engine to idle for a minimum period of two minutes.

3. Measure the ambient temperature outside the car and from the table given select the appropriate ‘fast-idle’ speed.

4. Using the refrigeration ‘fast-idle’ adjustment screw situated in the ‘B’ bank carburettor lever (see Fig. K21), set the engine to run at the appropriate ‘fast-idle’ speed.

<table>
<thead>
<tr>
<th>Ambient air temperature</th>
<th>‘Fast-idle’ speed (r.p.m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°C. (50°F.)</td>
<td>1 280</td>
</tr>
<tr>
<td>12.8°C. (55°F.)</td>
<td>1 250</td>
</tr>
<tr>
<td>15.6°C. (60°F.)</td>
<td>1 210</td>
</tr>
<tr>
<td>18.3°C. (65°F.)</td>
<td>1 170</td>
</tr>
<tr>
<td>21°C. (70°F.)</td>
<td>1 140</td>
</tr>
<tr>
<td>24°C. (75°F.)</td>
<td>1 100</td>
</tr>
<tr>
<td>26.7°C. (80°F.)</td>
<td>1 060</td>
</tr>
<tr>
<td>29.4°C. (85°F.)</td>
<td>1 020</td>
</tr>
<tr>
<td>32.2°C. (90°F.)</td>
<td>990</td>
</tr>
<tr>
<td>35°C. (95°F.)</td>
<td>950</td>
</tr>
<tr>
<td>37.8°C. (100°F.)</td>
<td>920</td>
</tr>
</tbody>
</table>

**Carburetters—To set**

**Cars from Car Serial Number SRH 8742 and onwards**

Having set the mechanical adjustments to the automatic choke set the carburetters by carrying out the following operations in the sequence given.

A. Synchronise throttles and temporarily set idle speed.
B. Set full throttle stop.
C. Check linkage clearances.
D. Tune carburetters.
E. Set cold start ‘fast-idle’.
F. Set the throttle damper plunger.
G. Set the kick-down micro-switch.

**Throttle synchronisation**

Refer to Page K19.

**Full throttle stop**

1. Adjust the full throttle stop screw so that it measures 0.350 in. (8.89 mm.) from the boss face (see Fig. K21 diagram W).

2. Check that the clearance (X in Fig. K21 diagram A) between the fixed stop and the lever is correct. If the clearance is less than that specified, the throttle stop screw should be adjusted to give the correct clearance.

**Linkage clearance—To check**

Refer to Page K19.

**Carburettor Tuning**

**Cars from Car Serial Number SRH 8742 and onwards**

**Preliminary checks**

Before tuning the carburetters the following checks should be carried out.

1. Check the distributor contact point gaps; clean and re-set if necessary. Renew the points if they are badly damaged.
2. Check the sparking plug gaps.
3. Adjust the fixed throttle screw to give an idle speed of 800 r.p.m. When setting the engine idle speed the operation must be carried out by reducing from a higher speed to 800 r.p.m. Using a dwell angle meter set the dwell angle to between 26° and 28° by means of the adjustment screw (see Chapter M—Electrical System).
4. Check the ignition timing (see Chapter M—Electrical System).
5. Check that the choke stove pipe is not obstructed (see Page K28).
6. Check that the entire induction system is completely free from air leaks.
7. Ensure that the throttle butterfly valves are synchronised, the full throttle stop screw is adjusted and the linkage clearance is correct as described under Carburetters—To set.

**Tuning conditions**

To ensure that the engine temperature and mixture requirements are stabilised, tuning must be carried out in accordance with the following setting cycle.

1. Screw the volume screws fully in, then back off 1½ turns.
2. With the carburettor dampers, suction chambers, springs and pistons already removed to enable throttle synchronisation to be checked, set the main jet screws as follows.

Using special spanner (RH 8050), slacken the carburettor jet screw lock-nut then manipulate each
screw until the jet in each carburettor body is level with the bridge piece (see Fig. K19).

Screw down the jet screw 2\frac{1}{2} turns.

Fit the air valve pistons, springs and suction chambers in a clean dry condition then top-up each damper piston with the approved oil; the oil level should be approximately \(\frac{1}{2}\) in. (12.7 mm.) below the top of the piston rod, do not overfill.

It is important that each suction chamber and air valve piston should be returned to the carburettor from which it was removed.

Do not fit the damper at this stage.

3. Connect an electric impulse tachometer in accordance with the manufacturer's instructions.

4. Warm the engine at 'fast-idle' speed until normal operating temperature is attained. Run the engine for at least five minutes after the thermostat has opened; the thermostat opening point can be detected by a sudden rise in temperature of the thermostat elbow pipe or by reference to the coolant temperature gauge.

Note It is important that the engine tuning is carried out only after the engine temperature has stabilised and at an ambient temperature of between 16°C. and 27°C. (60°F. and 80°F.).

During the warm-up period, Operations 5, 6 and 7 should be carried out.

5. Ensure that the refrigeration system is switched off.

6. Check that the choke butterfly valve is fully open by feeling the tension at the operating levers and hearing it snap back on its stop when any tension which has been applied is released.

7. Remove the cap from the pressure tapping on 'A' bank carburettor float chamber then connect a manometer to the tapping (see Fig. K22). The manometer must be capable of measuring 6 in. (15.25 cm.) of water level difference.

8. Run the engine in Neutral at 2000 r.p.m. for \(\frac{1}{4}\) minute to purge the system. During this period check the manometer reading; this reading should show between 2\frac{1}{2} in. and 3\frac{1}{2} in. (6.99 cm. and 8.25 cm.) difference in water level. If this reading is not readily attained the system should be checked as follows.

A low or zero reading may be caused by:

(a) An obstruction in one or more of the following:
   - The engine side of the weaken
   - Unit to weaken cut-off valve pipe.
   - Vacuum take-off plate to weaken cut-off valve pipe.
   - Vacuum take-off plate.
   - Pressure tapping on 'A' bank carburettor float chamber.
Tuning procedure

9. Tuning operations may now be commenced and must be carried out in the shortest time possible. If the time for setting exceeds a three minutes period, open the throttle and run the engine at 2,000 r.p.m. for ½ minute then resume tuning. Repeat this clearing operation if further periods of three minutes are exceeded.

Immediately after a clearing operation when the engine is at idle speed, the suction chamber should be tapped all the way round with a light weight, non-metallic instrument (e.g. the wooden handle of a screwdriver) to eliminate piston hysteresis (see Fig. K23).

10. Remove the pipe from the hot idle compensator valve connection marked ‘OUT’. Blank off the pipe.

11. Set the idle speed to 600 r.p.m. by adjusting the fixed throttle stop screw.

12. Run the engine at idle speed then balance the carburetters using the volume screws; the carburetters are balanced when the hiss heard at the small drilling in the neck of each suction chamber (see Fig. K23) is of equal intensity. A rubber or plastic tube of approximately ¼ in. (3,17 mm.) diameter bore and 2 ft. (60,96 cm.) long should be used for this purpose. Fit the dampers.

13. Turn both jet adjusting screws by equal amounts in the same direction, approximately ½ of a turn at a time until the maximum r.p.m. is recorded on the tachometer.

Note Turning the screw clockwise richens the mixture conversely turning the screw anti-clockwise weakens the mixture.

14. Set the mixture balance on each carburetter individually using the jet adjusting screws approximately ¼ of a turn at a time in either direction until maximum r.p.m. is obtained.

15. Turn the jet adjusting screws by equal amounts anti-clockwise (weaker mixture) until the engine speed just begins to fall, then turn both adjusting screws ½ of a turn clockwise and tighten the lock-nuts.

16. Check the idle speed and if necessary re-adjust to 600 r.p.m. using the fixed throttle stop screw.

17. Check that the carburetters are balanced by raising and releasing each carburetter piston lift pin in turn then comparing the engine response. The carburetters are balanced if the response is the same for each carburetter. If the carburetters are not balanced repeat Operations 9 to 16 inclusive until a satisfactory balance is obtained.

In certain countries the exhaust emission C.O. must be checked. If these regulations apply Operations 18 to 21 inclusive should be carried out.

18. Purge the engine at 2,000 r.p.m. in Neutral for a period of ¾ minute (see Operation 9).

19. Ensure that the engine has run a minimum period of 25 minutes since the thermostat has opened (see Operation 4) then fit the probe of a C.O. meter into the exhaust pipe. The C.O. meter should be set in accordance with the manufacturer’s instructions.

Note Suitable C.O. meters are:


20. Idle the engine until a steady C.O. reading is obtained (minimum time ¾ minute) then check the exhaust emission on the C.O. meter; the correct reading should be between 4% and 4½% (Europe only).

If the C.O. meter reading is not within this limit, it is permissible to unlock the jet adjusting screws and turn them a maximum of ½ of a turn, either clockwise or anti-clockwise, whichever is necessary to give the correct reading on the meter. Do not turn them in opposite directions (i.e. richen one and weaken the other). Lock the jet adjusting screws.

If the correct C.O. meter reading is unobtainable at this setting, and settings have been carried out to the instructions given, the carburetters should be removed from the engine and overhauled as described previously.

21. Remove the C.O. meter.

22. Remove the manometer from the float chamber pressure tapping. Fit the cap to the pressure tapping using a new washer.

23. Check the idle speed and using the fixed throttle stop screw, reset to 600 r.p.m. if necessary.

24. Re-connect the hose to the hot idle compensator valve.

Cold start ‘fast-idle’—To check

Refer to Page K21.

Throttle damper plunger—To set

Refer to Page K21.
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KICK-DOWN MICRO SWITCH—TO SET
Refer to Page K21.

MIXTURE WEAKENING DEVICE FITTINGS—TO REMOVE
The following procedures apply to cars from Car Serial Number SRH 8742 and onwards.
1. Disconnect and remove the pipes fitted to the carburettor float chambers, choke housing and carburettor butterfly housing connection. Also disconnect the hose fitted to the weakening device; discard the clip.
2. Using special spanner (RH 8087), remove the weakener cut-off valve assembly; do not dismantle the assembly.

Note The weakener cut-off valve assembly has a critical setting to ensure that the valve operates at very precise temperatures; therefore the assembly must not be dismantled. If the assembly is not operating correctly, or if the wax capsule is thought to be faulty a new cut-off valve assembly must be fitted.
3. Remove the two screws securing the vacuum take-off plate to the ‘B’ bank butterfly housing; remove the plate and gasket.

FIG. K24 CHECKING THE CHOKE STOVE PIPE DEPRESSION

1 Wooden board
2 Water
3 Rubber tube
4 Union—choke stove pipe connection
5 Choke stove pipe
6 Calibrated orifice
7 Polythene tube
8 Scale
9 Manometer

FIG. K25 VIEW OF TYPICAL CARBURETTER LINKAGE ARRANGEMENT (Early cars)

1 Kick-down micro-switch
2 Full throttle stop
3 Micro-switch—transmission stator
4 Adjusting screw—kick-down
5 Micro-switch—transmission stator
4. Using special pliers (RH 8090), remove the steel clips (if fitted) securing the outlet hose to the filter unit; detach the hose. Discard the clips.

To remove the filter unit, slacken the worm drive clip securing the filter unit to its mounting bracket. Withdraw the filter unit from the securing clip.

Note: The filter unit is a sealed unit and no attempt should be made to clean the element.

Mixture weakening device fittings—To fit

Fit the mixture weakening device fittings by reversing the procedure given for removal noting the following points.

1. Ensure that all pipes and hoses are in good condition.
2. Renew all sealing washers.
3. Renew all steel clips (if fitted).
4. When fitting the filter unit it is essential that the inlet pipe, which is off-set from the centre is situated in its lowest position.

FIG. K27 PICK-UP LEVER CLEARANCE

1 0.010 in. (0.254 mm. clearance)
3 Lever
2 Pin

FIG. K26 VIEW OF TYPICAL CARBURETTER LINKAGE ARRANGEMENT (Later cars)

1 Kick-down micro-switch
2 Piston lift pin
3 Throttle damper
4 Volume screw
5 Fixed throttle stop screw
6 ‘A’ bank throttle lever
7 Crankcase breather connection
8 Refrigeration solenoid
9 ‘B’ bank throttle lever
10 Refrigeration ‘fast-idle’ screw
11 Vacuum unit
12 Jet adjusting screw
13 Full throttle stop
14 Adjusting screw—kick-down
**Automatic Choke—To set**

Automatic choke stove pipe—To check

(see Fig. K24)

To check the choke stove pipe for any blockages, carry out the following operations.

1. Disconnect the choke stove pipe at its choke butterfly housing connection.
2. Connect the calibrated orifice (RH 8095) to the open end of the choke stove pipe, then connect a manometer capable of measuring 25 in. (63.50 cm.) of water level difference to the orifice.
3. Run the engine until it reaches normal operating temperature then allow the engine to idle and observe the depression shown on the manometer. The correct reading should be between 16 in. and 18 in. (40.64 cm. and 45.72 cm.).
4. If the level is less than 16 in. (40.64 cm.), examine the pipe and choke stove assembly, remove any blockage. After removing the blockage, again check the manometer reading.

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**FIG. K28 KICK GAP ADJUSTMENT**

1. 0.050 in. (1.27 mm.) diameter drill
2. Rod holding down depression lever
3. Adjusting screw with lock-nut

---

**FIG. K29 VIEW OF TYPICAL CARBURETTER LINKAGE ARRANGEMENT**

(Cars after Car Serial Number SRH 8742)

1. Piston lift pin
2. Jet adjusting screw
3. Fixed throttle stop screw
4. 'B' bank throttle lever
5. 'A' bank throttle lever
6. Adjusting screw—kick-down
7. Full throttle stop
8. Kick-down micro-switch

---

K28 *Revised November 1973*
5. Remove the manometer and connect the choke stove pipe to the choke housing.

**Adjustment of kick diaphragm**

1. Hold the choke butterfly closed and check the clearance between the depression valve operating link and the choke spindle pin. The clearance should be 0.010 in. (0.254 mm.) (see Fig. K27). The clearance can be adjusted by fitting washers on the diaphragm operating rod.

* **Adjustment of kick-gap (see Fig. K28)**

The kick-gap should be set to give a reading of 0.050 in. (1.27 mm.) at the bottom of the choke valve.

To obtain this setting, proceed as follows.

1. Slacken the choke depression diaphragm locking nut. Ensure that the choke is in the 'closed' position, then press down the depression valve operating lever, using a suitable rod, so that the depression valve link rod bears against the end of the 2 B.A. adjusting screw.
2. The screw should then be adjusted so that a 0.050 in. (1.27 mm.) diameter rod or drill can be inserted between the butterfly housing and the butterfly valve. Tighten the adjusting screw lock-nut; check the kick-gap and adjust if necessary.
3. Fit the solenoid and shims to the butterfly housing.

**Solenoid air gap (see Fig. K30)**

1. Hold the choke butterfly firmly closed. Check the air gap (between the solenoid lever and the solenoid) with a feeler gauge; this should be between 0.0015 in. and 0.004 in. (0.038 mm. and 0.102 mm.). Adjustment is effected by fitting shims between the solenoid and the body.

**Solenoid lever spring tension**

The spring tension should be set so that a weight of 8.25 oz. (233.88 gm.) acting on a 2 in. (5.08 cm.) arm will open the choke valve just sufficiently to allow a 0.062 in. (1.58 mm.) diameter drill to be inserted between the valve and body as shown in Figure K31.

Having set the kick diaphragm travel and the solenoid air gap, check the setting of the lever spring as follows.

1. Produce a lever 2 in. (5.08 cm.) between centres to fit a choke spindle as shown in Figure K31. Secure the lever in a horizontal position, using a 2 B.A. nut and washer, connect a 12 volt battery to the solenoid and hang the weight on the lever; this should open the choke valve 0.062 in. (1.58 mm.) as described above.
2. Adjustment of the spring can be effected by slackening the clamping bolt and turning the clamp.

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**FIG. K32 FAST-IDLE MECHANISM AND VACUUM RETARD TAP**

1. Vacuum retard tap adjusting screw
2. Control rod
3. Vacuum retard tap
4. Fast-idle adjusting screw
5. Cam
6. Cam link

**Fast-idle’ cam and Vacuum retard tap**

1. Fit the ‘fast-idle’ mechanism; do not tighten the ‘fast-idle’ lever clamping bolt.
2. Ensure that the ‘fast-idle’ adjustment screw is directly over the cam.
3. With the throttles closed, insert a 0.100 in. (2.54 mm.) diameter rod between the top of the ‘fast-idle’ cam and the boss under the ‘fast-idle’ adjustment screw. Tighten the clamping bolt on the ‘fast-idle’ lever.
4. Check that there is sufficient clearance between the cam link, which is mounted alongside the ‘fast-idle’ cam, and the boss on the ‘fast-idle’ lever. Insufficient clearance at this point can result in the cam link fouling the ‘fast-idle’ lever. In the event of this happening the ‘fast-idle’ lever would be prevented from returning to the closed throttle position, thus causing a ‘fast-idle’ speed.
5. Ensure that the throttles are closed; screw in the ‘fast-idle’ adjustment screw until it just makes contact with the top step of the ‘fast-idle’ cam.
6. Insert a 0.100 in. (2.54 mm.) diameter rod between the leading edge of the choke butterfly valve and the choke housing.
7. With the butterfly valve in this position, adjust the length of the butterfly rod so that the tip of the ‘fast-idle’ screw is in line with the start of the top step of the ‘fast-idle’ cam, (i.e. the position when the tip of the adjustment screw is about to fall from the top step to the bottom step of the cam).
8. Remove the 0.100 in. (2.54 mm.) diameter rod from the choke housing.
9. With the throttles closed and the choke partly open, adjust the ‘fast-idle’ adjustment screw to just contact the start or bottom step of the ‘fast-idle’ cam; tighten the lock-nut ensuring that the adjustment screw does not move.
10. **Cars from SRX 9001 and onwards fitted with the Exhaust Emission Control System.** Ensure that the throttles are in the fully closed position. With the vacuum retard tap in the fully open position (i.e. the plunger on the tap pushed in) adjust the vacuum retard tap adjusting screw until a gap of 0.025-in. (0.635 mm.) between the adjusting screw and the vacuum retard tap is obtained.

**Thermocoil**

Adjustment of the thermocoil is carried out in a temperature controlled room and under no circumstances should adjustment be attempted without specific instructions from the factory.

The factory setting is indicated by an arrow stamped on the pointer. Should any trouble be encountered this setting should be checked.
Section K5
THROTTLE CONTROL LINKAGE SETTINGS

The settings described in Section K4 should be carried out before the settings contained in this Section are attempted.

Throughout the setting procedure, reference should be made to the appropriate illustration (see Figs. K33, K34, K35 and K36).

The settings in this Section, unless otherwise stated, are given for the throttles in the closed position and the 'fast-idle' mechanism in the off position.

When working on a cold engine, the 'fast-idle' off position can be maintained by securing an elastic band between the 'fast-idle' mechanism (when it is in the off position) and the crankcase breather plug on the choke housing.

Four Speed Automatic Gearbox
(Early right-hand drive cars)
Throttle control linkage settings

Ideally the following settings should be carried out before the engine and gearbox are fitted into the car.

1. Set the levers on 'A' bank control shaft, so that the 'A' bank to control shaft rod lever is vertical and the 'A' bank control shaft lever is horizontal when the manifold to carburetter lever is connected to the carburetter control link with all slackness in the carburetter twin-links taken up; refrigerated cars have links with elongated holes in them. Tighten the lever pinch bolts.

2. Set the micro-adjuster to its mid-position and adjust the rod length to dimension D in the respective illustration.

3. Fit the micro-adjuster (long rod uppermost).

4. Lock the T.V. lever onto the gearbox and hold fully back in the no T.V. position (i.e. forward position). Then, with the carburetters still in the closed throttle condition, lock the pinch bolts on the bell housing-to-T.V. rod lever and the bell housing micro-adjuster lever to the bell housing cross-shaft.

5. Turn the micro-adjuster six 'clicks' anti-clockwise looking from the top, to take up free play in the T.V. linkage.

6. Ensure that the linkage moves freely and that the closed and full throttle positions on the carburetters are obtainable.

Assembly of the pedal linkage to the carburetter and T.V. linkage

With the engine and gearbox installed in the car, proceed to connect the pedal and compensator linkage to the engine as follows.

1. Assemble the compensator linkage to the engine as shown in Figure K33.

2. Fit control rod (3).

3. The setting given for control rod (3) is very important and should not be disturbed. If however, a new control rod is to be fitted or the original setting has inadvertently been altered, the control rod should be adjusted to the dimensions given. Ideally the setting for this rod should be measured between ball centres, but if this cannot be accomplished fairly easily then the setting given between the nut inner faces should be used.

4. Fit the pedal linkage to the body, then ensure that it operates smoothly.

5. Check that the pedal return spring (21) holds the pedal against the pedal stop (if fitted).

6. Position the accelerator pedal so that it is the correct distance below the level of the brake pedal (see dimension C), then, if a pedal stop is fitted adjust it to maintain this position. If a pedal stop is not fitted, a block of wood should be utilized to temporarily maintain the pedal in the position required.

7. Build up control rod (7) to dimension B leaving the lock-nuts slack, then fit the rod to the fulcrum lever (5).

8. With the accelerator pedal set to dimension C, adjust the position of the jaw (20) at the end of control rod (7) so that the bolt will pass easily through the jaw and lever (19); whilst fitting this rod it should be
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held downward to ensure that any slackness in the carburetters slotted link (14) is removed. Fit the nut and tighten the bolt.  
9. Remove the block of wood if one was used, from the accelerator pedal.  
10. Operate the mechanism and ensure that it functions without fouling and that the fulcrum lever (5) and control rod (3) do not tend to toggle over when the accelerator pedal is released sharply from its full throttle position. If the compensator mechanism does toggle over, control rod (7) should be disengaged from fulcrum lever (5) and control rod (3) lengthened until toggling is prevented. Control rod (7) should then be shortened to suit and re-fitted to fulcrum lever (5).  
11. Tighten the lock-nuts.  
12. Fit the kick-down button.

Kick-down button—To adjust
1. Slacken the large lock-nut, then adjust the position of the kick-down button by screwing the body up or down as required until the button is depressed approximately \( \frac{1}{8} \) in. (1.58 mm.) when the throttles are in the full throttle position. Tighten the lock-nut.  
2. If, when adjusting the kick-down button, its position is such that it is in danger of being hidden by the carpet and thereby rendered ineffective, the accelerator to compensator link control rod should be shortened. Shortening this rod will move the pedal away from the toe board thus allowing the kick-down button to be raised clear of the carpet; the accelerator lever pedal-stop (if fitted) will have to be adjusted to suit.  
3. Ensure that the whole control mechanism operates smoothly, that the closed throttle condition is still available and that operation of the kick-down button is noticeable.  
4. The kick-down setting quoted should provide sufficient 'feel' for most owners, if however, a more positive 'feel' is desired, the button may be raised a small amount beyond the setting given.

Final T.V. adjustment
If the controls have been set to the instructions already given, the final setting should only involve adjustment of the T.V. micro-adjuster and possibly the resetting of the kick-down button so that the 'feel' it provides coincides with the advent of kick-down in the gearbox.

Car—To road test
1. Drive the car on the road to allow the engine and gearbox to reach normal working temperature then proceed as follows.  
2. Place the gear selector lever into position '4' and accelerate the car using light throttle, note the quality of the gear changes on light throttle; these should take place as follows.  
   (a) First to second gear—5 m.p.h. to 8 m.p.h.  
      (8 k.p.h. to 13 k.p.h.)  
   (b) Second to third gear—12 m.p.h. to 15 m.p.h.  
      (19 k.p.h. to 24 k.p.h.)  
   (c) Third to top gear—22 m.p.h. to 25 m.p.h.  
      (35 k.p.h. to 40 k.p.h.)
3. It should be noted that the gear changes will occur at a higher road speed with a full throttle opening. The gear changes should take place at the following speeds.  
   (a) First to second gear—18 m.p.h. to 21 m.p.h.  
      (29 k.p.h. to 34 k.p.h.)  
   (b) Second to third gear—33 m.p.h. to 37 m.p.h.  
      (53 k.p.h. to 59 k.p.h.)  
   (c) Third to top gear—73 m.p.h. to 75 m.p.h.  
      (117 k.p.h. to 121 k.p.h.)

Final adjustment
If the changes are found to be 'slippy' and there is no kick-down, advance the T.V. lever by turning the micro-adjuster anti-clockwise (viewed from the top). If the changes are jerky or late, the micro-adjuster should be turned in the opposite direction.

Torque Converter  
Transmission  
(All left-hand drive cars and late right-hand drive cars)

Throttle control linkage settings
1. Loosely assemble the components onto the engine.  
2. Set the levers on 'A' bank control shaft (1) so that the lever (2) is vertical when the manifold to carburettor lever is connected to the carburettor control link with all slackness in the carburettor coupling twin-links taken up; refrigerated cars have links with elongated holes in them. Tighten the lever pinch bolts.

Assembly of the pedal linkage to the carburettor linkage
With the engine and transmission fitted into the car, proceed to connect the pedal and compensator linkage to the engine as follows.  
1. Assemble the compensator linkage to the engine as shown in the appropriate illustration. (see Figs. K34, K35 and K36).
2. Fit the control rod (3).

3. The setting given for control rod (3) is very important and should not be disturbed. If however, a new control rod is to be fitted or the original setting has inadvertently been altered, the control rod should be adjusted to the dimensions given. On early cars the ideal setting for this rod should be measured between ball centres, but if this cannot be accomplished fairly easily then the setting given between the nut inner faces should be used.

4. Fit the pedal linkage to the body, then ensure that it operates smoothly.

5. Check that the accelerator pedal return spring holds the pedal against the pedal stop.

6. Position the accelerator pedal so that it is the correct distance below the level of the brake pedal (see dimension C), then, adjust the stop to maintain this position.

7. Assemble the accelerator to compensator control rod to dimension B, leaving the lock-nut(s) slack, then fit the rod to the fulcrum lever (5). On very late cars, only the upper end of control rod is adjustable, the lower end being cranked and held in position by a split pin (see Figs. K35 and K36). On these cars the initial dimension B is 19.50 in. (50.00 cm.).

8. With the accelerator pedal set to dimension C, adjust the position of the jaw at the bottom of the control rod, so that the bolt will pass easily through the jaw and lever; whilst fitting this rod it should be held downward to ensure that any slackness in the carburettor elongated coupling link is removed. Fit the nut and tighten the bolt. On very late cars having a control rod on which only the upper end is adjustable, a similar operation should be carried out, with any adjustment to the length of the control rod being effected at the upper end.

9. Operate the mechanism and ensure that it functions without fouling and that the fulcrum lever (5) and small control rod (3) do not tend to toggle over when the accelerator pedal is released sharply from its full throttle position. If the compensator mechanism does toggle over, the accelerator to compensator control rod should be disengaged from fulcrum lever (5) and small control rod (3) should be lengthened until toggling is prevented. The accelerator to compensator control rod should then be shortened to suit and refitted to fulcrum lever (5).

10. Tighten the lock-nuts.

11. Fit the kick-down button.

**Kick-down micro-switch—To set**

**Carburettor mounted kick-down micro-switch**

Refer to Chapter K, Section K4.

**Kick-down button—To adjust**

**Carburettor mounted kick-down micro-switch**

1. The kick-down button should be adjusted as described on Page K32 bearing in mind the following points.

2. When checking the kick-down on cars fitted with transmissions having variable stator blade angles, care must be taken not to confuse part throttle down-changes and stator changes with the forced down-changes (kick-down).

3. When the kick-down button is set correctly and the accelerator pedal is depressed, the kick-down micro-switch (see Figs. K25, K26 and K29) will produce a clicking noise as it is operated by the carburettor linkage.

**Kick-down micro-switch—To set**

**Toeboard mounted kick-down micro-switch**

Refer to Chapter U, Section U5.

**Car—To road test**

Drive the car on the road to allow the engine and transmission to warm up, then test the kick-down and accelerator mechanism for efficient operation.
FIG. K33 THROTTLE AND T.V. CONTROLS—EARLY R.H. DRIVE CARS
FIG. K33 THROTTLE AND T.V. CONTROLS—EARLY R.H. DRIVE CARS

A1 = 4·125 in. (10.478 cm.)
(between ball centres)
A = 2·175 in. (5·526 cm.)
B = 22 in. (55·88 cm.)
C = 0·250 in. to 0·500 in.
(0·63 cm. to 1·27 cm.)
D = 3·812 in. (9·682 cm.)

1  'A' bank control shaft
2  Lever—'A' bank control
    shaft to control rod
3  Control rod—'A' bank
    manifold lever to fulcrum
    lever
4  Tie-rod
5  Fulcrum lever
6  Compensator link
7  Lever—manifold to
    carburettor
8  Throttle lever—'A' bank
9  Slow running throttle stop
    screw
10 Return spring
11 Throttle lever—'B' bank
12 Coupling link
13 Coupling link (one hole
    elongated when refrigeration
    is fitted)
14 Accelerator pedal
15 Kick-down button
16 Lock-nut
17 Accelerator pedal lever
18 Bracket
19 Pull-off spring
20 Lever—accelerator pedal
    cross-shaft
21 Jaw
22 Control rod—accelerator to
    compensator linkage
23 Accelerator pedal
24 Brake pedal
25 Lever—'A' bank control
    shaft to T.V. micro-adjuster
26 T.V. micro-adjuster
27 Lever—bell housing to
    micro-adjuster
28 Bell housing cross-shaft
29 Lever—bell housing to T.V.
    rod
30 Control rod—bell housing to
    T.V. lever
31 T.V. lever
FIG. K34  THROTTLE CONTROL LINKAGE—EARLY L.H. DRIVE CARS
FIG. K34 THROTTLE CONTROL LINKAGE—EARLY L.H. DRIVE CARS

A1 = 4·125 in. (10.478 cm.)
    (between ball centres)
A = 2·175 in. (5.526 cm.)
B = 22 in. (55.88 cm.)
C = 0·250 in. to 0·500 in.
    (0.63 cm. to 1.27 cm.)

1 'A' bank control shaft
2 Lever—'A' bank control
    shaft to control rod
3 Control rod—'A' bank
    manifold lever to fulcrum
    lever
4 Tie-rod
5 Fulcrum lever
6 Compensator link
7 Lever—manifold to
    carburettor
8 Throttle lever—'A' bank
9 Slow running throttle stop
    screw
10 Return spring
11 Coupling link (one hole
    elongated when refrigeration
    is fitted)
12 Coupling link
13 Throttle lever—'B' bank
14 Brake pedal
15 Accelerator pedal
16 Control rod—accelerator to
    compensator linkage
17 Jaw
18 Accelerator pedal
19 Lever—accelerator pedal
    cross-shaft
20 Accelerator pedal lever
21 Kick-down button
22 Lock-nut
23 Bracket
24 Pull-off spring
FIG. K35  THROTTLE CONTROL LINKAGE—LATE R.H. DRIVE CARS
FIG. K35 THROTTLE CONTROL LINKAGE—LATE R.H. DRIVE CARS

A = 2.265 in. to 2.300 in.
(5.75 cm. to 5.84 cm.)
B = 18.575 in. (47.18 cm.)
inset 19.50 in. (50.00 cm.)
C = 0.250 in. to 0.500 in.
(0.63 cm. to 1.27 cm.)

1 ‘A’ bank control shaft
2 Lever—‘A’ bank control shaft to control rod
3 Control rod—‘A’ bank manifold lever to fulcrum lever
4 Tie-rod
5 Fulcrum lever
6 Compensator link
7 Lever—manifold to carburetter
8 Throttle lever—‘A’ bank
9 Slow running throttle stop screw
10 Return spring
11 Throttle lever—‘B’ bank
12 Coupling link
13 Coupling link (one hole elongated when refrigeration is fitted)
14 Control rod—accelerator to compensator linkage
15 Accelerator pedal
16 Kick-down button
17 Lock-nut
18 Stop—accelerator pedal
19 Bracket
20 Pull-off spring
21 Jaw
22 Lever—accelerator pedal cross-shaft
23 Brake pedal
24 Accelerator pedal
FIG. K36  THROTTLE CONTROL LINKAGE—LATE L.H. DRIVE CARS
FIG. K36 THROTTLE CONTROL LINKAGE—LATE L.H. DRIVE CARS

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>'A' bank control shaft</td>
<td>Return spring</td>
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<tr>
<td>2</td>
<td>Lever—'A' bank control shaft to control rod</td>
<td>Coupling link (one hole elongated when refrigeration is fitted)</td>
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<tr>
<td>3</td>
<td>Control rod—'A' bank manifold lever to fulcrum lever</td>
<td>Coupling link</td>
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<tr>
<td>4</td>
<td>Tie-rod</td>
<td>Throttle lever—'B' bank</td>
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<td>5</td>
<td>Fulcrum lever</td>
<td>Brake pedal</td>
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<td>Compensator link</td>
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<td>Lever—manifold to carburetter</td>
<td>Control rod—accelerator to compensator linkage</td>
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<td>Throttle lever—'A' bank</td>
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<td>Slow running throttle stop screw</td>
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<td>Lock-nut</td>
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FIG. K37 FUEL EVAPORATION EMISSION CONTROL SYSTEM—GENERAL VIEW

1 Gulp valve pipe
2 Float chamber vent valve
3 Float chamber drain valve
4 Fuel trap assembly
5 Fuel tank including vent pipes and expansion tank
6 Fuel vapour line
7 Weaken filter
8 Purge line filter
9 Evaporation loss control canister
10 Purge line restrictor
Cars from Car Serial Number SRX 9001 onwards built to comply with American Federal Safety Standards requirements.

In order to comply with regulations governing the emission of fuel vapour, an efficient Fuel Evaporation Emission Control System has been designed and is fitted to cars from Car Serial Number SRX 9001 destined for the U.S.A. and Canada.

The Fuel Evaporation Emission Control System eliminates direct venting of the fuel tank and carburetters, thus preventing the release of unburnt hydrocarbons into the atmosphere. Fuel vapours are collected from the fuel tank and carburetters and stored in a charcoal filled canister. The canister is purged whenever the engine is running and the stored fuel vapours are extracted from the charcoal and burnt in the engine.

A diagrammatic illustration of the system can be seen in Figure K37.

The engine compartment components are clearly shown in Figure K39 and the fuel tank components in Figure K42.

**Fuel evaporation loss control canister** *(see Fig. K38)*

The large centre section of the canister contains approximately 775 grammes of dust free activated carbon type BPX 8X20 and accommodates nylon filter connectors which connect the canister to the various fuel vapour emission sources on the car (i.e. the carburettor weakener unit, float chamber vent and fuel tank vent).

The function of the activated carbon is to absorb and retain fuel vapour from the carburettor float chambers and fuel tank.

At either end of this section of the canister are thin discs of polyurethane filter.

The lower compartment of the canister is the purge chamber and is connected via the purge line filter and line restrictor, to the engine induction system. It is operative whenever the engine is running, and its func-
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The operation is to draw air through the carbon, extracting the fuel vapour as it does so for consumption in the engine. The upper section of the canister is open to the atmosphere and houses a polyurethane foam filter to ensure that the air drawn through the carbon is clean.

**Polyurethane foam filter element**—
**To renew**

It is not necessary to remove the canister from the car in order to extract the polyurethane foam filter element. A detachable cover is situated in the left-hand valance, adjacent to the blower motor resistances (see Fig. K40).

1. Unscrew the four screws retaining the access cover, lift off the cover and withdraw the filter element from the top of the canister.

When fitting a new filter element, ensure that it is correctly positioned inside the retaining rim of the canister. Fit the access cover and tighten the setscrews.

---

**FIG. K39 FUEL EVAPORATION EMISSION CONTROL SYSTEM—ENGINE COMPARTMENT FITTINGS**

1. Purge line restrictor
2. Weakener filter
3. Weakener unit
4. Float chamber vent valve
5. Vent from fuel trap
6. Purge line filter
7. Evaporation loss control canister
8. Evaporation loss control canister polyurethane foam filter
Fuel evaporation loss control canister—
To remove

The canister is mounted under the left-hand front wing and is removed as follows.
1. Remove the front left-hand road wheel as described in Chapter R—Wheel—To remove.
   Note Left-hand front is determined when viewed from the driver’s seat.
2. Suitably position stands under the raised portion of the car as a safety precaution.
3. Remove the front section of the underwing sheet by unscrewing the \( \frac{3}{8} \) in. A/F nut and bolt, and the 16 small screws situated around the sheet.
4. The canister is now clearly visible.
5. Using special pliers (RH8090), remove the steel retaining clips and detach the four rubber hoses connected to the canister.
6. Raise the bonnet.
7. Inside the engine compartment adjacent to the blower motor resistances, (see Fig. K40) locate the six \( \frac{3}{8} \) in. A/F setscrews. Unscrew the lower four setscrews and withdraw the canister from beneath the wing.

Fuel evaporation loss control canister—
To fit

Fit the canister by reversing the procedure described for removal, noting the following points.
1. Ensure that the rubber hoses are in a good condition and new hose retaining clips are used.
2. Ensure that the underwing sheet is sealed with Bostik Sealing Compound 771.

Purge line (see Fig. K39)

The purge line consists of a rubber hose, passing from the lowest connection on the canister through the valance junction piece to the gulp air pipe situated between the gulp valve and carburettor ‘Tee’ piece. Incorporated into this hose there is the purge line filter and restrictor.

When the engine is running, air drawn through the canister filter and carbon picks up the stored fuel vapours and passes them via the hose, to the induction manifold. The restrictor in the line controls the flow rate at 1 cu. ft. per min. to maintain carburettor metering accuracy and the paper element line filter is fitted to prevent blockage of the restrictor.

Purge line filter—To remove (see Fig. K41)

1. Using special pliers (RH8090) remove the two steel retaining clips (if fitted) situated on either side of the unit.
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2. Slacken the 2 B.A. setscrew which secures the nylon retaining clip.

3. Withdraw the component from the clip.

Purge line filter—To fit

Fit the purge line filter by reversing the procedure described for removal, noting the following point.

1. Ensure that the rubber hoses are in a good condition and new hose retaining clips are used (if fitted).
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Purge line restrictor—To remove
1. Hold the restrictor firmly and slide the rubber hosing from both ends.

Purge line restrictor—To fit
Fit the restrictor by reversing the procedure described for removal, noting the following point.
1. Ensure that the purge line restrictor is fitted into the line correctly. This can be determined by comparing the diameters of the restrictor ends with those of the rubber hoses.

Weakener line
The weakener line connects the weakener unit on the float chamber with the evaporation loss control canister (see Fig. K39). With the engine running under light throttle opening a depression is created in this line, so allowing air to pass from the canister to the weakener unit.
A filter incorporated in the line prevents blockage of the weakener unit.
During 'hot soak' conditions fuel vapour can pass along this pipe from the float chamber to be stored in the carbon filled canister.

Weakener filter—To remove (see Fig. K41)
1. Remove the steel clips (if fitted) from the inlet and outlet hoses using special pliers (RH8090).
2. Slacken the worm drive clip which retains the weakener filter to the bracket.
3. Withdraw the filter.

Weakener filter—To fit
Fit the weakener filter by reversing the procedure given for its removal noting the following points.
1. Ensure that the rubber hoses are in good condition.
2. If clips have been previously fitted, ensure that new clips are fitted.
3. Ensure that the inlet pipe for the unit which is off-set from the centre is facing the front of the car and is in its lowest position (see Fig. K39).

Float chamber vent line (see Fig. K39)
The carburettor float chambers are vented to the evaporation loss control canister through the float chamber vent line. Incorporated in the line is a non-return valve which maintains a depression in the float chamber during light throttle operation. The vent valve is not serviceable and if its operation is suspect a new vent valve should be fitted.

Float chamber vent valve—To remove (see Fig. K39)
1. Remove the rubber hose from both the inlet and outlet connections.
2. Slacken the worm drive clip which secures the vent valve to its mounting bracket.
3. Remove the vent valve.

Float chamber vent valve—To fit
Fit the vent valve by reversing the procedure given for its removal noting the following point.
1. Ensure that the inlet and outlet connections of the vent valve are positioned so that the rubber hoses can be connected.

Fuel tank assembly
The fuel tank assembly consists of the fuel tank, expansion tank and fuel trap assembly (see Fig. K42).
The fuel tank is vented from three positions to a fuel trap assembly which is mounted above the fuel filler. One vent is from the fuel filler neck and the other two vents from the fuel tank.
From the fuel trap, a vent line passes under the floor of the car to the evaporation loss control canister.

Fuel tank
The fuel tank (see Fig. K42) is similar to that fitted to standard cars, except that two vent pipes, 0.375 in. (9.525 mm.) diameter, are rigidly attached to the underside of the fuel tank top plate. The open ends of the vents terminate inside the tank at the front and rear. The outer ends of the two vent pipes terminate adjacent to the fuel filler neck.
A 5-5 Imp. pts. (3,125 litres, 6-7 U.S. pts.) capacity expansion tank situated within the main fuel tank inhibits complete filling and provides additional fuel expansion volume to contend with extreme temperature conditions.
When a vehicle is being filled with fuel, automatic cut-off could completely fill the tank leaving only the filler neck, vent connector pipes and fuel trap to accommodate the expansion of the fuel. The expansion tank is situated in the upper part of the fuel tank and as the fuel level rises above the lower part of the expansion tank it flows inside through the two small holes in the base. Two additional holes in the top of the expansion tank will also admit fuel if the level rises above the top of the tank.
At normal rates of filling it takes approximately 3 minutes to fill an empty tank whereas it takes approximately 9 minutes for the levels in both the main and expansion tanks to stabilise. After this time the main
tank will have transferred 5.5 Imp. pts. (3,125 litres, 6.7 U.S. pts.) to the expansion tank leaving the equivalent air space in the main tank for expansion.

**Fuel tank—To remove**

To remove the fuel tank proceed as described in Section K1—Fuel System (Early Cars) noting that Operation 6 should be omitted and Operation 6 as follows should be carried out.

1. Disconnect the battery.
2. Remove the luggage compartment carpet and underlay.
3. Remove the tool kit (see Chapter R—Wheels and Tyres, Fig. R10).
4. Remove the fuel filler door release ring.
5. Unscrew the five ‘Philips’ headed screws from the side carpet; four secure the brackets retaining the tool kit and the fifth is positioned at the front of the side carpet.
6. Release the ‘Tenax’ clip situated adjacent to the rear lamps access point.
7. Remove the side carpet and the carpet covering the fuel filler neck.
8. Using special pliers (RH8090) remove the steel clips from the rubber hoses. Withdraw the hoses from their respective pipes.

For the fuel trap assembly—To remove:

1. Remove the fuel trap assembly as described in Fuel trap assembly—To remove.
2. Unscrew the retaining setscrews, taking care not to lose the washers.
3. Withdraw the relief and vacuum valve.

**Fuel tank—To fit**

Fit the fuel tank by reversing the procedure given for its removal noting the following points.

1. Ensure that the two rubber vent hoses are in a good condition.
2. New steel clips should be used to secure the rubber vent hoses to the metal pipes on either side of the filler neck base.

**Fuel trap assembly**

The fuel trap (see Fig. K42) has a capacity of 3.25 Imp. pts. (1,87 litres, 4.00 U.S. pts.).

It acts as a liquid separator and prevents liquid fuel from being transferred to the control canister under severe driving manoeuvres when the fuel tank is full or during expansion of the fuel at elevated ambient temperatures.

The tank vent pipes are fed to the lower ends of the banana-shaped fuel trap. These pipes also serve as drain pipes for any fuel in the trap.

The filler tube is vented into the forward end of the fuel trap.

An outlet pipe is attached to the interior of the fuel trap and the other end is connected via metal and rubber pipes to the evaporation loss control canister.

A combined relief and vacuum valve in the fuel trap prevents any excessive pressure build-up due to vaporisation, or depression as the fuel is consumed, should the vent line to the evaporation loss control canister become blocked.

**Fuel trap assembly—To fit**

Fit the fuel trap assembly by reversing the procedure given for its removal noting the following points.

1. Ensure that the rubber hose connections are in a good condition.
2. Ensure that new steel retaining clips are used.

**Fuel trap relief and vacuum valve—To remove**

1. Remove the fuel trap assembly as described in Fuel trap assembly—To remove.
2. Unscrew the retaining setscrews, taking care not to lose the washers.
3. Withdraw the relief and vacuum valve.

**Fuel trap relief and vacuum valve—To fit**

Fit the relief and vacuum valve by reversing the procedure given for its removal, noting the following points.

1. Ensure that the joint faces of the relief and vacuum valve and fuel trap assembly are clean and in a good condition.
2. Fit a new gasket.
# Section K7

## FAULT DIAGNOSIS

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<tr>
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<th>ACTION</th>
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<tr>
<td>Fuel Pumps</td>
<td>1. Faulty fuel pumps.</td>
<td>1 (a) Disconnect the fuel line at the carburetters, switch on the ignition and check for fuel flow. If there is a good flow of fuel, carry out checks 1 (c) and 9 (a). If there is no fuel flow, connect the carburettor feed pipe and disconnect the flexible pipe from the pressure side of the pump. If there is still no fuel flow, carry out check 1 (d).</td>
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<td></td>
<td>(b) Faulty or obstructed float chamber needle valves.</td>
<td>(b) Refer to Symptom 9—Action 9 (a).</td>
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<tr>
<td></td>
<td>(c) Blocked carburettor filters.</td>
<td>(c) Disconnect the carburettor fuel feed pipes, then unscrew the float chamber lid unions; if necessary, remove and clean the filters. Reconnect the pipes.</td>
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<td></td>
<td>(d) Faulty electrical circuit.</td>
<td>(d) Connect a 12 volt bulb between the electrical supply and the pump body. If the bulb fails to light, examine the earthing of the pump and the supply lead from the main ignition fuse.</td>
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<td>(e) Dirty or incorrectly set contact points.</td>
<td>(e) Ensure that the electrical supply is satisfactory (see 1 (d)). Remove the bakelite cover and ensure that the tungsten points are in contact. Clean the points by drawing a piece of fine glass paper across them whilst they are held together. Check their operation by placing the supply lead onto the terminal and a short piece of bared wire put across the contacts. If the pump operates for one stroke the fault is due to dirt, corrosion or mal-adjustment of the contact points.</td>
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<td><strong>Fuel Pumps—continued</strong></td>
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<td>(f) Obstruction in the pipe line between the fuel tank and the pump. This fault usually causes overheating of the pump.</td>
<td>(f) If the fuel pump operates correctly with the pump inlet pipe disconnected, the trouble is due to an obstruction in the pipe line between the fuel tank and the pump. Remove the fuel tank filler cap, then blow compressed air through the inlet pipe. Note Compressed air should not be passed through the pump, as this will cause serious damage to the valves. Refer to Action 2 (b).</td>
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<td>2. Fuel flow initially correct, then diminishing rapidly resulting in slow pump operation. Inadequate ventilation of the fuel tank causes a slow power stroke with resultant excessive burning of the contact points.</td>
<td>2. (a) Insufficient fuel tank ventilation. (b) Restriction on the suction side of the pump.</td>
<td>2. (a) Remove the filler cap. If this cures the fault remove any blockage or obstruction from the fuel tank vent pipe. (b) Check that the rear fuel filter is not choked; if necessary renew the filter element. Ensure that the pump supply pipe from the fuel tank is unobstructed.</td>
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<tr>
<td>3. Reduced fuel flow with rapid operation of the fuel pump.</td>
<td>3. (a) Air leak on the suction side of the pump or faulty sealing washers.</td>
<td>3. (a) Check for air leaks and the condition of the pump sealing washers. Remove the inlet and outlet valve assemblies from the pump (see Fig. K7). Check that the assemblies are clean and that they operate freely.</td>
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<td>4. As Symptom 1.</td>
<td>4. (a) If all the preceding operations fail to locate the fault, stiffening of the diaphragm or abnormal friction in the rocker 'toggle over' mechanism should be suspected.</td>
<td>4. (a) Remove the solenoid housing, then flex the diaphragm several times. Care should be taken not to lose any of the eleven brass rollers (if fitted) from beneath the diaphragm. Prior to assembly, it is advisable to apply several drops of thin oil to the 'toggle over' spring spindles at the point where they pivot in the brass rockers. Assemble and set the diaphragm armature assembly (see Section K2—Solenoid housing and diaphragm—To fit).</td>
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<td>5. Fuel pump operates without fuel delivery.</td>
<td>5. (a) Serious air leak on the suction side of the pump. (b) Dirt lodged under one of the valves particularly the inlet valve.</td>
<td>5. (a) Check that the inlet flexible pipe and union are tight. (b) Remove the valves for cleaning.</td>
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<td>6. Noisy pump operation.</td>
<td>6. (a) Air leak in suction line.</td>
<td>6. (a) Disconnect the fuel pipe at the carburetter and allow the pump to discharge into a fuel filled container with the end of the pipe submerged. The emission of continuous bubbles at this point will confirm the existence of an air leak.</td>
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To rectify the fault, ensure that all connections from the fuel tank to the pump are in good condition, also check that the inlet union is tight. Check that the solenoid housing securing screws are firmly and evenly tightened. Air leaks on the suction side of the pump cause rapid operation and are the most frequent cause of premature failure.

(b) Renew mounting rubbers.
(c) Alter position of pipe as necessary to obviate foul.

7. (a) Remove the air cleaner hosing from the butterfly housing. A spring-loaded pin, located on the right-hand side of the suction chamber, is provided for lifting the piston (see Fig. K12 item 35). Normally, when the engine is not running, the piston rests on the buffer pin in the base of the piston just above the bridge of the main carburettor body. Raise the piston to its highest position, against the resistance of the damper piston, then release it and check that it drops freely. If the downward movement of the piston is sluggish or if the piston does not readily leave the bridge of the carburettor, lower the main jet by pushing the mixture adjusting screw lever upwards and repeat the check on the piston. The elimination of sticking by lowering the jet indicates that the needle is fouling the jet. First check for a bent needle; if the needle is satisfactory, it will be necessary to centralise the jet (Carburetters with fixed needles only).

After lowering the jet, if the piston continues to stick it is probable that the piston is fouling the side of the suction chamber or that the piston rod is not free to move within its bush (refer to Action 7 (b)). On completion of these checks re-set the carburetters (see Section K4—The Carburetters and Automatic Choke System—Carburettor Tuning).
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<td><strong>Carburetters—continued</strong></td>
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<td>(b) Sticking carburetter piston caused by a bent damper rod.</td>
<td>(b) Remove the oil cap and damper piston assembly and repeat the check for a sticking piston (see 7 (a)). If it is determined that the damper rod is bent a new damper rod should be fitted.</td>
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<tr>
<td>(c) Sticking carburetter piston caused by dirt between the suction chamber and piston rod sticking in its bush.</td>
<td>(c) Remove the suction chamber and damper piston assembly, then remove the air valve piston assembly. Clean the parts with clean petrol or methylated spirits and wipe dry with a clean lint-free cloth. Apply a few drops of clean light oil to the piston rod. Fit the damper assembly and washer to the suction chamber. Seal the transfer holes in the piston assembly with rubber plugs and fit the assembly to the suction chamber. Invert the complete assembly and allow the suction chamber to fall away from the piston. Check the time it takes, which should be between 5 and 7 seconds, remove the plugs and damper assembly. On no account should any attempt be made to increase the bore of the suction chamber, or to reduce the diameter of the enlarged part of the piston, as the maintenance of a limited clearance between these two parts is essential for the correct operation of the carburetter. If the needle is disturbed or renewed the carburetters must be tuned (see Section K4 The Carburetters and Automatic Choke System — Carburetter Tuning).</td>
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8. **Stalling.**

| 8. (a) Flooding of the float chamber or the jet. | 8. (a) Examine the float to determine if it is punctured; renew if necessary. Examine the needle valve seating to ensure that it is clean and serviceable. Check that the float level is correct (see Section K4—The Carburetters and Automatic Choke System—Carburetter—To assemble). Ensure that the cork gasket between the float chamber body and the lid is in good condition. |

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### Rolls-Royce Silver Shadow & Bentley T Series

#### Workshop Manual

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<td>Carburetters—continued</td>
<td>(b) Water or foreign matter in the float chamber.</td>
<td>(b) Remove the float chamber lid, then withdraw the float. Thoroughly clean the float chamber and the wire mesh filter in the lid (if paper filter is fitted it should be renewed). If dirt is present in the float chamber, it is possible that the main jet may be choked. The following method should successfully clear a choked jet. (i) Remove the suction chamber and withdraw the piston assembly. (ii) Fit the suction chamber and seal the air intake. (iii) Disconnect the L.T. lead on the distributor then remove the protective cap from the starter solenoid. (iv) Lower the jet to its bottom position by pushing the mixture adjusting screw lever upward, hold it in this position. (v) Operate the starter motor. This should cause any foreign matter to be drawn out of the jet into the carburettor body. (vi) Should this fail to clear the blockage, remove and clean the jet, bearing in mind that all carburettor parts should be assembled in the same relative position from which they are removed (see Section K4). If globules of water are found in the carburettor, the fuel system should be cleaned thoroughly and the fuel tank drained in order to inspect the fuel for water content. On completion of this operation, tune the carburetters (see Section K4).</td>
</tr>
<tr>
<td>9. Engine stalls when idling or under light running conditions.</td>
<td>9. (a) Providing that there is a good supply of fuel available at the float chamber inlet unions, it is possible that the float needle valve has stuck to its seating. This results from a gum deposit which forms in the fuel system after prolonged storage of the fuel in the tank.</td>
<td>9. (a) Remove the float chamber lid and withdraw the needle valve, then clean the valve and its seating with a clean cloth soaked in alcohol. Cleaning of the seat will be facilitated by wrapping the cloth around a thin wooden stick. Repeated trouble of this nature can only be rectified by completely dismantling and thoroughly cleaning the fuel system and tank.</td>
</tr>
<tr>
<td>10. Engine shows serious power loss evident at high speeds and loading.</td>
<td>10. (a) Insufficient delivery of fuel.</td>
<td>10. (a) Check the fuel pumps for adequate delivery and the filters in the system for cleanliness.</td>
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<td>Malfunctioning mixture weakening system</td>
<td>11. (a) Weakening device filter blocked or blockage in rubber hose or bleed orifice. (b) Dislodged venturi in weakening device. Items (c), (d), (e) and (f) are applicable only when a Fuel evaporation emission control system is fitted. (c) Evaporation loss control canister filter blocked. (d) Incorrect connection of weakener hose to valance adaptor or evaporation loss control canister. (e) Incorrect purge flow rate (greater than 1 cu. ft./minute). (f) Evaporation loss control canister obstructed.</td>
<td>11. (a) Renew filter or remove the blockage. (b) Renew the weakening device. (c) Renew filter or remove blockage. (d) Ensure connections are fitted correctly; rectify if necessary. (e) Renew purge line restrictor. (f) Remove obstruction or fit new canister.</td>
</tr>
<tr>
<td>High float chamber depression also spitting back in the carburetters.</td>
<td>12. (a) Blockage in engine side of weakening device. (b) Float chamber and weakening device air leaks. (c) Float chamber connection air leaks as far as and including the one way valves in the fuel drain and vent pipes. (d) Engine intake air temperature below 18°C (64°F). (e) Inoperative weakener cut-off valve. (f) Leaks in weakening device, carburetter tapping or weakener cut-off valve. (g) Faulty cut-off valve. (h) A dirty or faulty float chamber drain valve. Items (i) and (j) are applicable only when a Fuel evaporation emission control system is fitted. (i) A dirty or faulty float chamber vent valve. (j) Incorrect purge flow rate (correct flow rate 1 cu. ft./minute).</td>
<td>12. (a) Remove blockage. (b) Renew gaskets and washers. Ensure that both float chamber lids are tight also that all connections are tight. (c) Check that all pipe connections are tight and seating correctly and rubber hoses are in a good condition. Check that the one way valve assemblies are clean and correctly seated also that it is tightly assembled. (d) Allow engine to warm up. (e) Renew valve. (f) Check and tighten any loose connections also check the condition of sealing washers and renew if necessary. (g) Disconnect the two pipes fitted to the cut-off valve then connect the pipes by fitting a small piece of thick walled rubber tube over the two end nipples; a piece of tube similar to the type fitted to the refrigeration fast-idle solenoid would suffice. Run the engine and check the float chamber depression, if the depression is correct, the cut-off valve is faulty and should be renewed. (h) Remove foreign matter or renew valve. (i) Remove foreign matter or renew valve. (j) Remove any blockage in the purge line restrictor or renew the restrictor. Also remove any blockage in the purge line filter or the pipes situated between the gulp valve to carburetter 'Tee' piece pipe and evaporation loss control canister.</td>
</tr>
<tr>
<td>Low float chamber depression also small increase in fuel consumption.</td>
<td>11. (a) Renew filter or remove the blockage. (b) Renew the weakening device. (c) Renew filter or remove blockage. (d) Ensure connections are fitted correctly; rectify if necessary. (e) Renew purge line restrictor. (f) Remove obstruction or fit new canister.</td>
<td>12. (a) Remove blockage. (b) Renew gaskets and washers. Ensure that both float chamber lids are tight also that all connections are tight. (c) Check that all pipe connections are tight and seating correctly and rubber hoses are in a good condition. Check that the one way valve assemblies are clean and correctly seated also that it is tightly assembled. (d) Allow engine to warm up. (e) Renew valve. (f) Check and tighten any loose connections also check the condition of sealing washers and renew if necessary. (g) Disconnect the two pipes fitted to the cut-off valve then connect the pipes by fitting a small piece of thick walled rubber tube over the two end nipples; a piece of tube similar to the type fitted to the refrigeration fast-idle solenoid would suffice. Run the engine and check the float chamber depression, if the depression is correct, the cut-off valve is faulty and should be renewed. (h) Remove foreign matter or renew valve. (i) Remove foreign matter or renew valve. (j) Remove any blockage in the purge line restrictor or renew the restrictor. Also remove any blockage in the purge line filter or the pipes situated between the gulp valve to carburetter 'Tee' piece pipe and evaporation loss control canister.</td>
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## WORKSHOP TOOLS

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<tr>
<td>RH8050</td>
<td>Spanner—Carburetter Jet Screw.</td>
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<tr>
<td>RH8087</td>
<td>Spanner—Weakener Cut-off Valve.</td>
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<tr>
<td>RH8090</td>
<td>Pliers—Wire Hose Clips.</td>
</tr>
<tr>
<td>RH8095</td>
<td>Restrictor—Manometer Check—Choke Stove Pipe.</td>
</tr>
<tr>
<td>RH8383</td>
<td>Positioning Tool—Throttle Spindle Seal.</td>
</tr>
</tbody>
</table>