SECTION 'E' - PART I

THE FUEL SYSTEM

SECTION 'E' - PART II

THE IGNITION SYSTEM

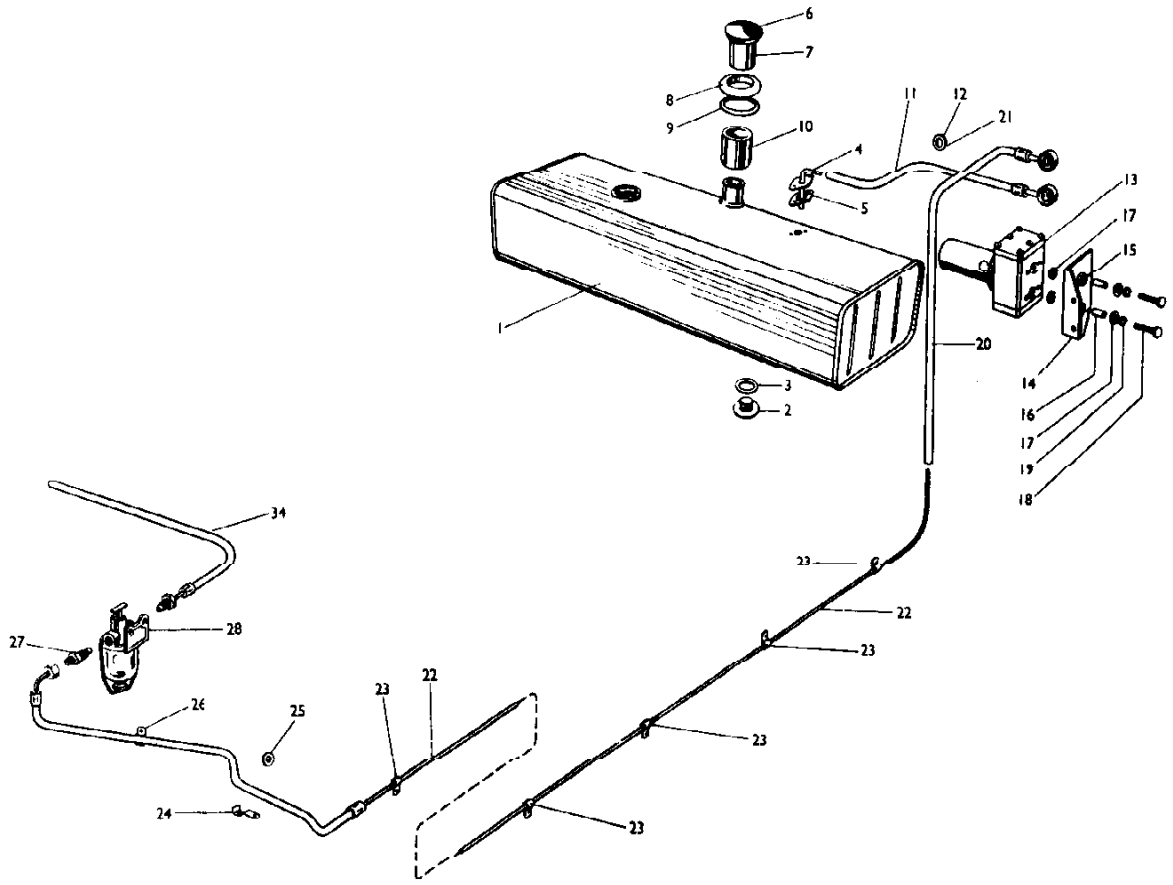

Figure E1
Exploded View of the Fuel System.

1. Petrol tank.
2. Petrol tank drain plug.
3. Sealing washer.
4. Petrol suction pipe.
5. Joint washer.
6. Filler cap.
7. Filler cap neck.
8. Body grommet.
9. Body grommet rubber ring.
10. Petrol tank hose.
11. Petrol feed pipe to pump.
12. Rubber grommet.
13. Electric petrol pump.
14. Petrol pump mounting bracket.
15. Petrol pump mounting rubber grommets.
16. Distance piece.
17. Washers.
18. Mounting bolt.
19. Spring washers.
20. Flexible petrol pipe from pump.
21. Rubber grommet.
22. Rigid petrol pipe.
23. Pipe clip.
24. Clip for flexible petrol pipe.
25. Rubber grommet.
26. Pipe clip.
27. Petrol filter union.
34. Flexible pipe to L.H. carburettor.

SECTION 'E' - PART 1
THE FUEL SYSTEM

DESCRIPTION Fig. E1.

The petrol tank is situated transversely behind the cockpit of the car and the S.U. electric petrol pump is attached to a bracket situated in the front L.H. corner of the luggage boot. The petrol is drawn by the pump through a flexible pipe and passes it downward through the luggage boot floor to the rigid pipe running along the outer face of the L.H. chassis frame side member. The rigid pipe line is attached by seven clips and self tapping screws. From the front end of the rigid pipe the petrol passes upward through a flexible pipe into the L.H. side of the engine compartment to the sediment bowl type petrol filter which incorporates an on and off tap and then through further flexible pipes to the inter-connected carburettor float chambers. The front end of the pipe assembly is protected from stones thrown up by the front wheel by the fitting of a stone guard.

MAINTENANCE

FIRST 500 miles (805 kms)
Tighten inlet manifold bolts.
Clean petrol filter sediment bowl.
Check synchronisation of carburettors.
Lubricate accelerator pedal and carburettor linkage.

EVERY 5,000 miles (8,050 kms)
Check oil level in carburettor dash pots.
Clean carburettor air cleaners.
Clean petrol filter sediment bowl.
Lubricate accelerator pedal and carburettor linkage.

EVERY 10,000 miles (16,100 kms)
Check synchronisation of carburettors.
Clean the petrol pump contact breakers.

EVERY 20,000 miles (32,200 kms)
Replace carburettor float chamber needle valve assembly.
Clean petrol pump filter and disc valves.
Replace the petrol pump contact breakers.
Drain the petrol tank of any sediment.

THE PETROL FILLER CAP

DESCRIPTION Fig. E2.

The petrol filler cap, which incorporates a spring type anti-airlock valve, is situated on the body centre line between the rear of the cockpit and the front of the luggage boot lid; it is hinged for safe keeping toward the cockpit. A restraint mechanism is incorporated between the fixed and free moving parts of the petrol filler cap to ensure that the filler cap does not become mis-aligned with the filler neck and make closing of the filler cap difficult.

The petrol filler cap is mounted in the body through a rubber grommet and is attached to the neck of the petrol tank below by a short length of hose. It is essential that a clearance is evident between the rubber grommet and the underside of the filler cap; failure to observe this instruction may cause an airlock in the petrol tank resulting in petrol starvation.

OPENING AND CLOSING PETROL FILLER CAP

1. TO OPEN

Grip the rim of the petrol filler cap and turn anti-clockwise to its fullest extent and hinge the petrol cap upwards, toward the cockpit.

2. TO CLOSE

The closing of the petrol filler cap is the reversal of the removal sequence but particular attention must be given to the following points:-

(i) That slight downward pressure is applied at the beginning of the operation.

(ii) That when difficulty is experienced in closing the cap ensure that the lugs incorporated inside the petrol cap are not mis-aligned to the slots in the petrol tank filler neck; the cap may need turning a short distance while open to correct this inconvenience.

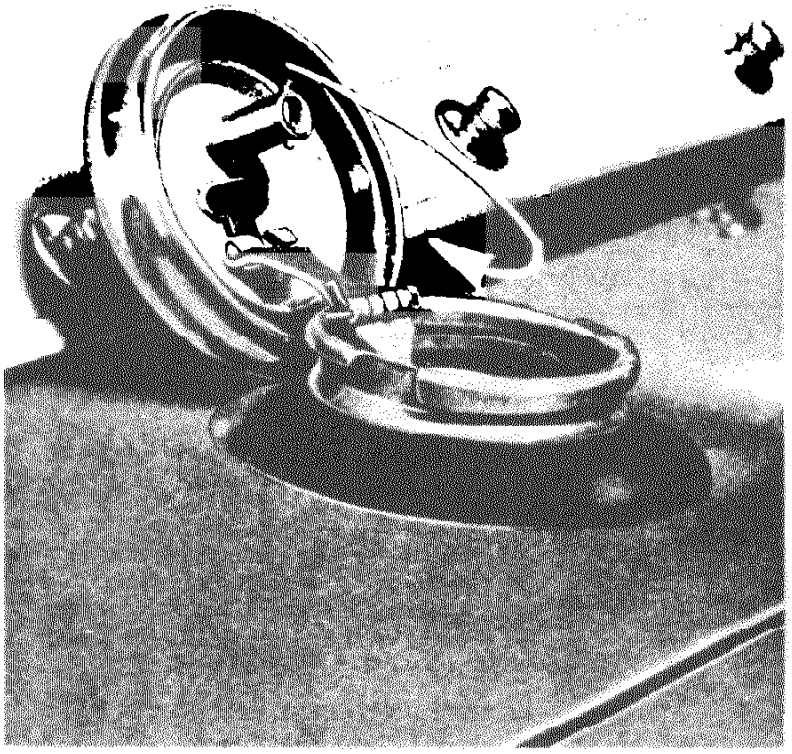

Figure E2.
Petrol Filler Cap.

REMOVAL AND REPLACEMENT

1. REMOVAL

Remove the petrol tank trim panel from the front end of the luggage boot as detailed in THE BODY, SECTION Q. Withdraw the petrol filler cap and rubber grommet from the top of the body by slackening the top inside hose clip, remove the short length of hose from the top of the petrol tank by slackening the second hose clip.

2. REPLACEMENT

The replacement of the petrol filler cap is the reversal of the removal sequence but particular attention must be given to the following points:-

(i) That the petrol filler cap is positioned in the body so that the hinge is towards the front of the car.

(ii) That there is a clearance between the top of the rubber grommet and underside of the filler cap rim to allow the passage of air into the petrol tank.

THE PETROL TANK

DESCRIPTION

The petrol tank is secured to the body so that the filler neck is on the rear top edge, the tank unit of the fuel contents gauge is on the R.H. top side, the suction pipe to the petrol pump is on the L.H. side and provided in the L.H. underside face is a drain plug. The securing details consist of two pairs of metal straps with rubberized felt interposed between them and the tank and secured with two pinch bolts.

The petrol tank is sub-divided into three sections by two baffle plates to reduce washing of the petrol as the car corners at high speed.

MAINTENANCE

EVERY 20,000 miles (32,200 kms)

The petrol tank will require little maintenance apart from periodical draining off any sediment and foreign matter. It should be noted that less condensation will form in the tank by keeping it as full as possible with petrol.

Figure E3.

Location of petrol tank drain plug

DRAINING THE PETROL TANK Fig. E3.

Ascertain the quantity of petrol in the petrol tank and have a suitable container in which to drain it. Raise the car to gain access to the petrol tank drain plug and to allow room for the container. When the petrol tank has not been drained for some considerable time, it may be considered necessary to allow the first one or two pints to run free as it may be contaminated with water and other impurities.

Remove the drain plug in the L.H. underside of the petrol tank and allow the fluid to run into a suitable receptacle. After draining has been completed ensure the good condition of the sealing washer and replace the drain plug.

REMOVAL AND REPLACEMENT, PETROL TANK Fig. E4.

While the draining of the petrol tank facilitates its removal, due to the lessening of its weight, it is not really necessary.

1. PETROL TANK TRIM PANEL

Remove the petrol tank trim panel from the front of the luggage boot as detailed in THE BODY, SECTION Q.

2. PETROL FILLER CAP

Remove the petrol filler cap from the top of the tank as detailed on page E2

3 PETROL TANK CONTENTS GAUGE

Detach the battery earthing lead and remove the electric cable from the petrol tank unit of the petrol gauge.

4. PETROL TANK

Detach the flexible pipe from the petrol outlet pipe as detailed on page E13. Remove the petrol tank from the front of the luggage boot by withdrawing the two pinch nuts and bolts and swinging the vertical straps flat by slackening the two bottom bolts.

5. REPLACEMENT

The replacement of the petrol tank is the reversal of the removal sequence.

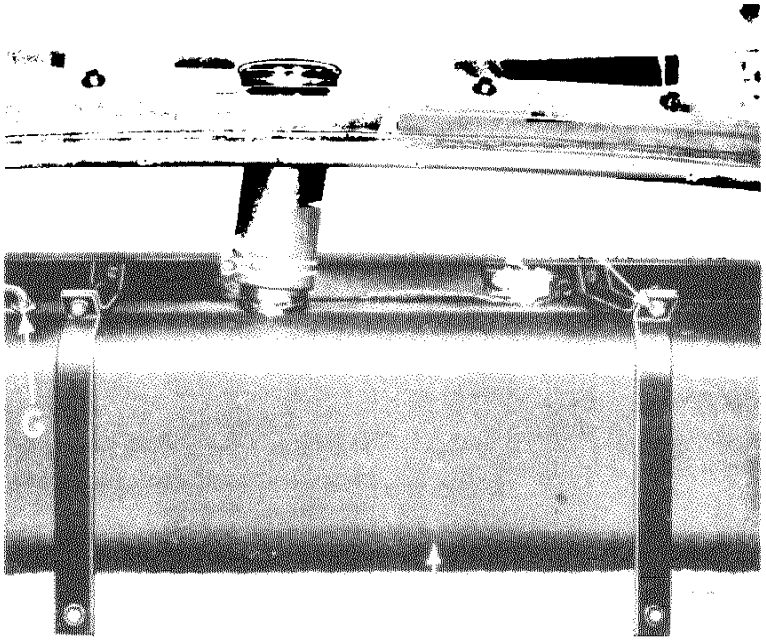

Figure E4.
Petrol Tank in Car.

A. Petrol cap.
B. Petrol flexible connection.
C. Petrol gauge tank unit.
D. Petrol tank securing straps.
E. Petrol tank.
F. Rubberized felt pad.
G. Petrol outlet.
H. Hose clip.

THE PETROL TANK CONTENTS GAUGE

DESCRIPTION Fig. E5

The petrol tank contents gauge consists of two components one in the petrol tank and the second in the centre instrument panel in the cockpit of the car, this is fully detailed in the "ELECTRICAL EQUIPMENT AND INSTRUMENT SECTION 'O'.

The gauge indicates the level of the petrol in the tank in accordance with the position of the float in the petrol tank. A limited quantity of petrol still remains in the petrol tank when the gauge unit first reads "E".

The tank unit consists of a float mounted on an arm pivotted in a die cast body. The second end of the float arm carries the contact which travels over a resistance wound on an insulated former which is provided with stops to prevent the contact over-riding the resistance. The contact takes up a position along the resistance according to the quantity of petrol in the tank and so varies the current flow to the gauge in the centre instrument panel.

The float arm must never be set to any other shape than that when it was supplied and under no circumstance must the battery supply be connected directly to the terminal of the tank unit.

REMOVAL AND REPLACEMENT, PETROL TANK GAUGE UNIT Fig. E5.

While it is possible to remove and replace the petrol tank gauge unit from the top face of the petrol tank, the operation is greatly facilitated by removing the petrol tank from the car.

1. REMOVAL

Remove the petrol tank from the car as detailed on page E2. Withdraw the tank unit from the top face of the petrol tank by removing the six screws, exercising care not to destroy

the original set of the float arm.

2. REPLACEMENT

The replacement of the petrol tank gauge unit is the reversal of the removal procedure but particular attention must be given to the following points:

(i) That the joint washer between the petrol tank and tank unit is in good condition.

(ii) That the tank unit is checked for satisfactory operation before the petrol tank is replaced in the car.

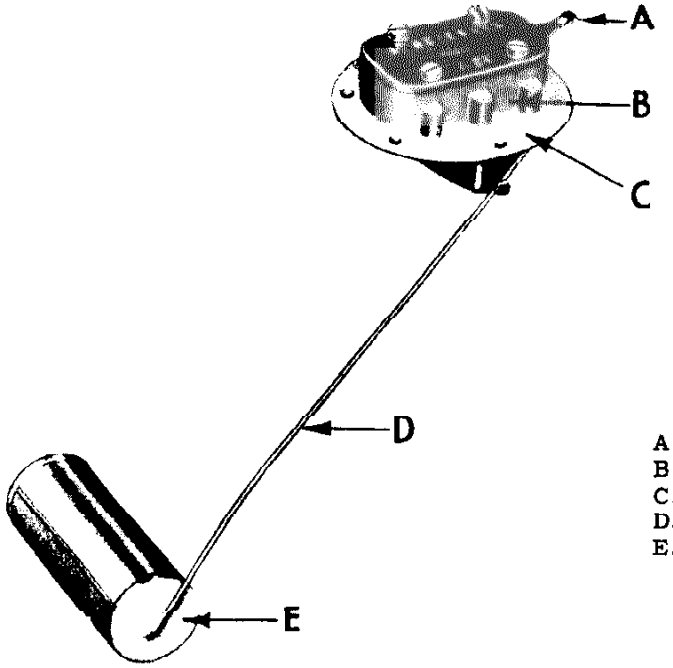

Figure E5.
The Petrol Tank Gauge Unit.

A. Lucar connection to gauge unit.
B. Resistance housing.
C. Petrol tank mounting flange.
D. Float arm.
E. Float.

TESTING THE PETROL TANK GAUGE UNIT

Remove the petrol tank gauge as detailed on page E5 and ensure that the float arm moves freely. Having tested the gauge unit in the centre instrument panel as detailed in THE INSTRUMENTS, SECTION 'O' and found it serviceable, connect the tank unit terminal 'T' to the gauge unit terminal 'T' with an independent cable and earth the tank unit body with a second cable. Switch on the ignition and move the contact arm through its complete range of travel while observing the gauge unit.

When a varied reading, according to the position of the float arm, is observed it indicates that the tank unit is serviceable. Check that the cable is not broken or is making a bad connection. Check for a lack of continuity between the tank unit and petrol tank.

When the gauge unit persistantly reads "F" irrespective of the float arm position, the tank unit is faulty and must be replaced. Switch off the ignition.

NOTE

These tests are best performed in the cockpit of the car so that any sparking will not ignite the petroleum vapour that may be escaping from the petrol tank.

Avoid keeping the ignition circuit on for long periods as this tends to overheat the ignition coil.

IDENTIFICATION NUMBERS

Tank Unit No. FT.3501/05

Gauge Unit No. FG.2331/06

The tank unit identification number will be found stamped on the cover plate on top of the tank unit.

The gauge unit identification number will be found printed on the dial card of the gauge unit in the centre instrument panel.

THE S.U. ELECTRIC PETROL PUMP

DESCRIPTION Fig. E6.

The S.U. electric petrol pump consists of four main assemblies.

(i) The valve and filter body.

(ii) The magnet and coil assembly.

(iii) The armature and diaphragm assembly.

(iv) The rocking mechanism and contact breaker.

The valve and filter body is closed top and bottom by two cover plates and the removal of the top cover effects access to the valve chamber while removal of the bottom gives access to the gauze filter. Incorporated in one side face of the body are the inlet and outlet valve ports and in the back face are the two mounting lugs. The ports and body top and bottom faces are identified during manufacture.

The magnet and coil assembly, contained in a flanged cylinderical iron housing is attached to the front face of the valve and filter body by six screws. It consists of an iron core, wound with copper wire, one end of which is in circuit with the battery through the terminal post and screw while the second end is in circuit with the contact breaker.

Gripped between the flange of the magnet and coil assembly and the valve and filter body is the diaphragm of the armature and diaphragm assembly, the armature being centrally located within the cylindrical housing by spherical edged armature rollers permitting complete freedom of movement for the armature and diaphragm assembly and the rod attached to its centre in a longitudinal attitude. This centre rod passes freely through the iron core of the magnet to the rocking mechanism at its second or outer end.

The contact breakers and rocking mechanism are mounted on a pillared plate fabricated from a non-conductive material and carried on its outside face is the terminal post and screw with one set of contact breakers. These are mounted on the free end of a vee shaped blade which is connected to the second end of the magnetic coil winding. Between the pillars of the insulating plate and operated by the centre rod from the armature is the inner and outer rockers of the rocking mechanism. The outer rocker is equipped with a second set of contact breakers and the rocking movement makes and breaks this set with the previous mentioned contact breakers on the vee shaped blade. The outer rocker arm and hence the contact breakers are connected to earth by a small flexible cable to one of the mounting plate fixing screws.

To obviate the possibility of arcing while the petrol pump is working a condenser is fitted across the two sets of contact breakers.

OPERATION

When the petrol pump is inoperative the two sets of contact breakers are in the closed position and the electric current, switched on by turning the ignition key, will pass from the terminal post through the coil winding and contact breakers to earth, thus energising the coil and attracting the armature and diaphragm assembly.

This action causes the diaphragm to draw petrol from the tank through the gauze filter and inlet valve into the pumping chamber and also causes the outlet valve to be drawn onto its seat thus ensuring there is no drawback from the outlet. The centre rod of the armature and diaphragm assembly will also move and reaching the limit of its travel operates the rocking mechanism at its second end and separates the contact breakers. This breaks the electrical circuit so collapsing the magnetic field, thus allowing the spring to return the armature and diaphragm assembly toward its rest position. This in turn closes the inlet valve, pressurizes the pumping chamber which opens the outlet valve and pumps petrol to the carburettors. The flow of petrol being determined by the requirements of the engine through the operation of the needle valve assembly in the

carburettor float chamber covers.

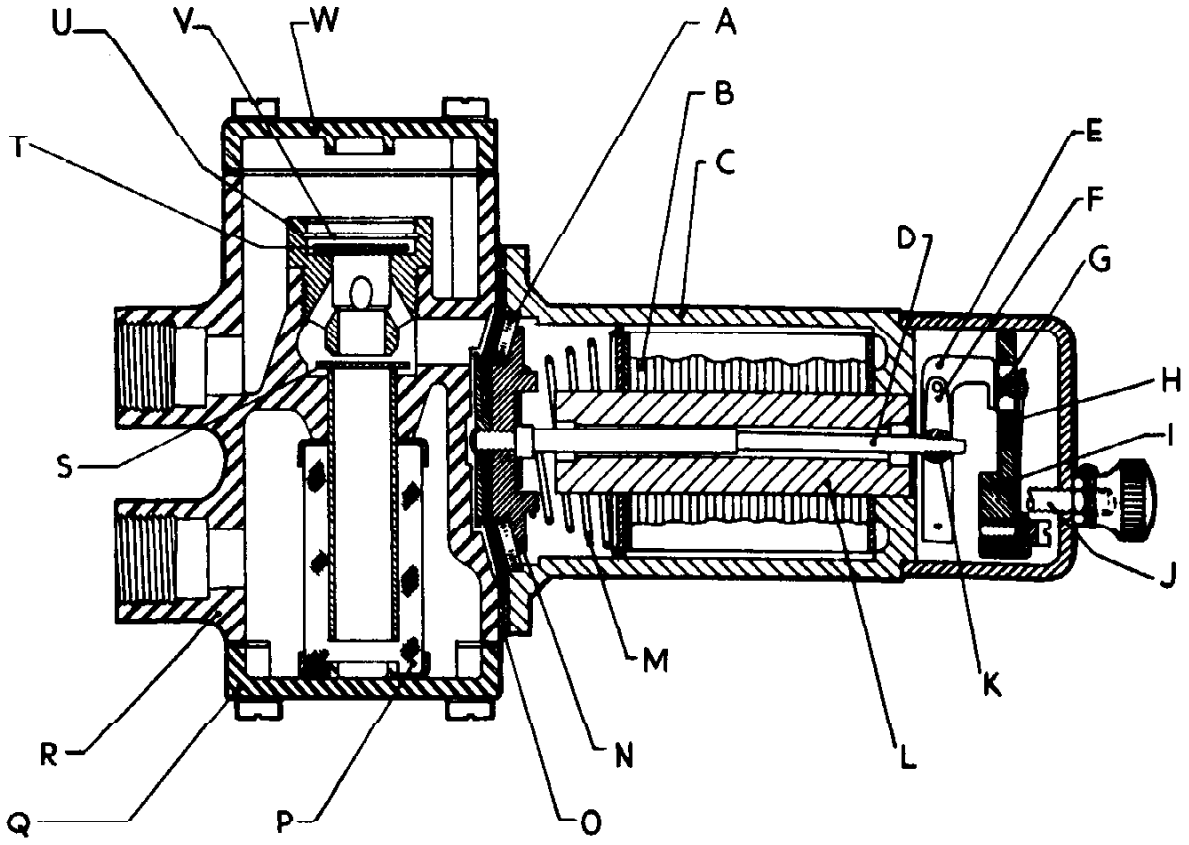

Figure E6.

Cross Section through S.U. Electric Fuel Pump

A. Spherical rollers.
B. Magnet coil.
C. Coil housing.
D. Centre rod.
E. Outer rocker and contact assembly.
F. Inner rocker.
G. Contact breakers.
H. Vee shaped contact blade.
I. Insulated mounting plate.
J. Terminal post.
K. Trunnion.
L. Magnet coil.
M. Armature return spring.
N. Armature.
O. Diaphragm.
P. Inlet petrol filter.
Q. Bottom cover.
R. Valve and filter body.
S. Inlet valve disc.
T. Outlet valve disc.
U. Outlet valve cage.
V. Circlip.
W. Top cover.

When the armature and diaphragm has reached its rest position, the centre rod and rocking mechanism causes the contact breakers to close energising the magnetic field for a second time and the pumping cycle is repeated. When the pump supply exceeds that required by the engine, the pump chamber and petrol line to the carburettor remain pressurized thus preventing the armature and diaphragm from reaching its rest position and delay further pumping action.

It is quite normal for the petrol pump to emit a fast beating note when the ignition is first switched on, thus replacing the petrol that has been lost from the carburettor float chambers due to evaporation and no useful purpose is served by attempting to start the engine during this period. While the engine is running or the car is in motion the "beating noise" will become inaudible, partly due to its slow operation and partly due to the insulation of the body.

MAINTENANCE

EVERY 20,000 MILES (32,300 kms)

Withdraw and clean the petrol pump filter and disc valves.
Replace the petrol pump contact breakers.

CLEANING THE PETROL PUMP CONTACT BREAKERS Fig. E7.

Disconnect the battery earthing lead, remove the cover trim from the L.H. corner of the luggage boot as detailed in the BODY SECTION Q. Detach the electric cable from the terminal post by removing the screw. Remove the bakelite cover from the cylinderical body of the petrol pump by detaching a nut. Withdraw the condenser body from the spring clip and allow it to hang temporarily on its cable. Lift the spring leaf carrying two of the four contacts and insert a thin piece of cardboard between this pair and the pair beneath, attached to the outer rockers. Apply slight pressure to the spring leaf while agitating the cardboard to and fro. Withdraw the cardboard and replace the components by reversing the removal sequence.

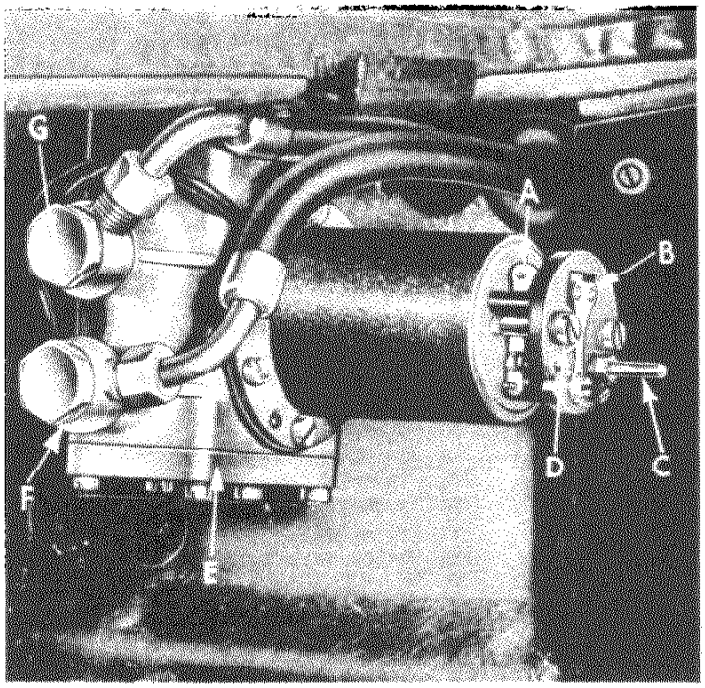

Figure E7.

Petrol pump in situ with cap removed (condenser and clip has been removed for clarity).

A. Outer rocker.
B. Vee contact breaker
C. Terminal post.
D. Mounting plate and condenser securing screw.
E. Petrol pump bottom plate.
F. Petrol inlet union.
G. Petrol outlet union.

CLEANING THE PETROL PUMP FILTER

This operation must only be effected when the petrol tank is almost empty, as petrol may syphon off when the bottom cover is removed.

Disconnect the battery earthing lead and remove the petrol pump cover trim from the front L.H. corner of the luggage boot as detailed in the BODY SECTION O. Place a suitable receptacle under the pump body to trap any petrol that is contained in the petrol pump, detach the bottom cover and filter by withdrawing six screws. Clean the gauze filter in petrol and dry off in clean dry air.

The replacement of the petrol pump filter is the reversal of the removal sequence but particular attention must be given to the following point.

That before the petrol pump cover trim is fitted, the engine is started and run for a short time so the bottom of the petrol pump can be observed for leaking.

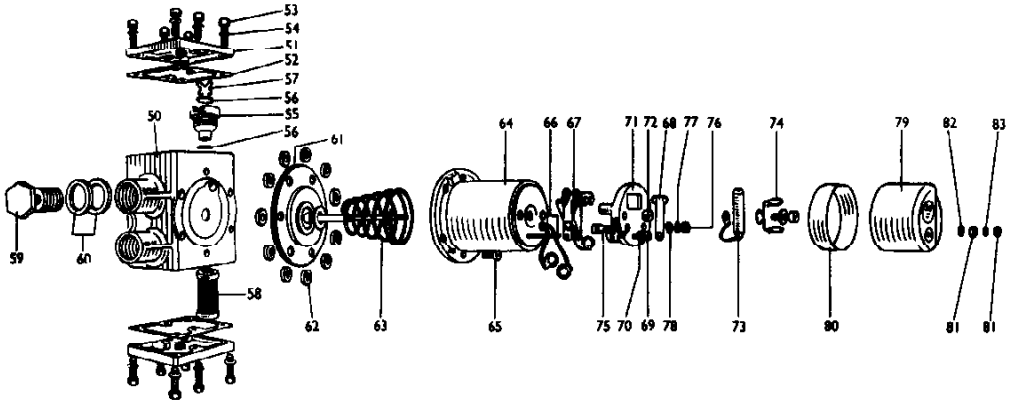

Figure E8.

Exploded view of S. U. electric petrol pump.

50. Valve and filter body.
51. Top and bottom cover plates.
52. Joint washer.
53. Lever plate screws.
54. Shakeproof washers.
55. Outlet valve cage.
56. Inlet (bottom) and outlet (top) valve discs.
57. Outlet valve circlip.
58. Gauge filter.
59. Banjo bolt.
60. Fibre washers.
61. Armature and diaphragm with centre rod detached.
62. Spherical rollers.
63. Armature return spring.
64. Coil housing.
65. Housing screws.
66. Contact breaker spindle.
67. Outer rocker and contact assembly.
68. Vee shaped contact blade.
69. Contact blade screw.
70. Spring washer.
71. Insulated mounting plate.
72. Screw.
73. Condenser.
74. Condenser spring clip.
75. Terminal post.
76. Terminal post nut.
77. Terminal post lead washer.
78. Spring washer.
79. Bakelite cover.
80. Dust excluder sleeve.
81. Terminal post nut.
82. Fibre washer.
83. Shake proof washer.

CLEANING THE INLET AND OUTLET VALVE DISCS

1. REMOVAL

Detach the battery earthing lead and remove the petrol pump from the car as detailed under "PETROL PUMP REMOVAL, but in this instance it is unnecessary to detach the mounting bracket. Remove the top cover from the body of the petrol pump by withdrawing six screws. Unscrew the outlet valve cage from inside the pump body and withdraw the inlet valve disc. Remove and identify the outlet valve disc from the outlet valve cage by

removing the circlip.

2. CLEANING

The two valve discs must be thoroughly degreased and so must their seats in the outlet valve cage and valve and filter body.

3. REPLACEMENT

The replacement of the valve discs is the reversal of the removal sequence but particular attention must be given to the following point:-

That the valve discs are fitted into the petrol pump body so that the smooth side is toward the bottom of the petrol pump.

PETROL PUMP - REMOVAL AND REPLACEMENT

This operation must only be effected when the petrol tank is almost empty, as the petrol may syphon off when the inlet union is disconnected.

1. REMOVAL

Disconnect the battery earthing lead and remove the petrol pump cover trim as detailed in THE BODY SECTION Q. Detach the electric cable from the terminal post by removing the nut. Place a suitable receptacle under the petrol pump body to trap any petrol that is contained in the petrol pump and detach the inlet and outlet pipe assemblies by withdrawing the two banjo bolts. Remove the petrol pump and its bracket from the body of the car by withdrawing two bolts. Detach the petrol pump from the bracket by removing two bolts and withdrawing the rubber grommets with the metal bushes from inside the pump mounting bracket.

2. REPLACEMENT

The replacement of the petrol pump is the reversal of the removal sequence but particular attention must be given to the following points:-

(i) That the rubber grommets are fitted to the petrol pump mounting bracket and the metal bushes inserted in their centres.

(ii) That the petrol pump is fitted to the mounting bracket, grommets and metal bushes with two bolts and four washers, one each side of each grommet and the bolts tighten until the washers contact the metal bushes.

(iii) That before the petrol pump cover trim is fitted, the engine is started and run for a short time so that the petrol pump can be observed for leaking.

FITTING NEW ARMATURE AND DIAPHRAGM ASSEMBLY AND RESETTING ROCKING MECHANISM Fig. E9.

This operation will only be necessary when a replacement armature and diaphragm assembly is being fitted and the magnet and coil assembly will be detached from the valve and filter body.

Move the contacts mounted on the vee shaped blade to one side of the mounting plate by slackening the clamp screw. The armature and diaphragm assembly with the spherical rollers in position is screwed inwards until the rocking mechanism ceases to function and then it should be screwed back gradually 1/6th. of a turn at a time, i.e. one diaphragm hole and by pressing the armature and diaphragm assembly centre firmly in and out until it is found that the rocking mechanism commences to function. The armature and diaphragm assembly is then turned a further two thirds of a turn (four of the six diaphragm holes) and attached to the valve and filtered body with six screws but these are left loose at this juncture.

Replace the vee shaped contact blade and insert a matchstick between the two white fibre washers and the casing of the magnet and coil assembly, this will set the rocking mechanism in such a position that it will not "rock over" but hold the armature and diaphragm forward to slacken the diaphragm when a 12 volt current is passed through the pump. Switch on the current

and while the armature and disphragm is in this forward position, slacken off and then fully tighten the six screws, then switch off the current; the armature and diaphragm assembly will return to its rest position with the diaphragm in its fully stretched position.

Remove the matchstick, switch on the current and observe the action of the two pairs of contact breakers. Ensure that the pair on the outer rocker "wipe" across the centre of the pair on the vee shaped blade by repositioning the latter.

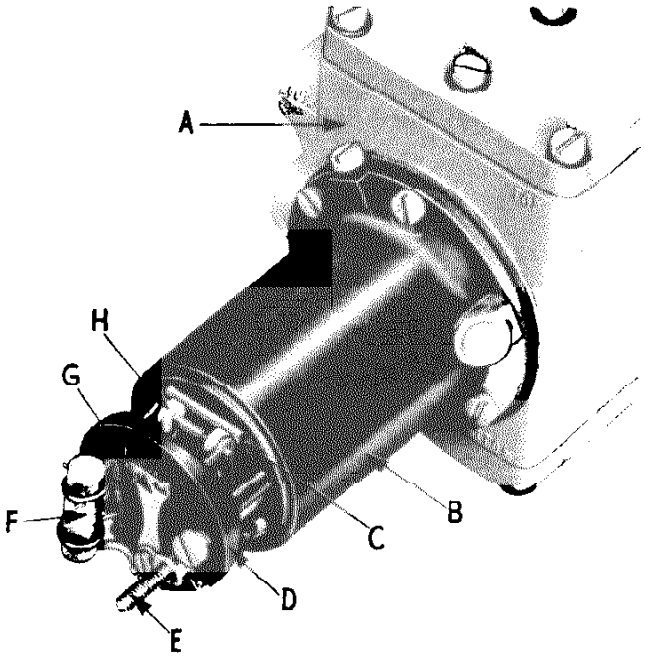

Figure E9
Petrol pump with cap removed.

A. Petrol pump body.
B. Coil and magnet assembly.
C. Matchstick (temporary fitting)
D. Insulated mounting plate.
E. Terminal post.
F. Condenser.
G. Vee contact breaker blade.
H. Roller of outer rockers.

THE CONTACT BREAKERS Fig. E9.

The vee shaped spring blade should rest against a small projection in the face of the insulated mounting plate and it should be deflected away from the plate face.

The clearance between the two sets of contact breakers is approximately 0.030" (0.762 m/m) when the outer rocker arm is held against the magnet and coil assembly.

THE PETROL PIPE LINES

DESCRIPTION

Two types of petrol pipe lines, rigid and flexible, are used to convey petrol from the rear positioned petrol tank to the engine compartment.

The rigid pipe line consists of one length of pipe and runs from a point below the front L.H. bottom corner of the luggage boot being clipped at seven points to the outside face of the L.H. chassis side member to a point adjacent to the L.H. front suspension pillar stay.

The flexible pipes connect the petrol tank to the S.U. electric pump and the pump to the rear end of the rigid pipe, a rubber grommet protecting the pipe from chafing as it passes through the luggage boot floor. Further flexible pipes connect the front end of the rigid pipe to the A.C. petrol filter and the two S.U. carburettors. The front length of flexible piping passes through a rubber grommet in the wing valance to the engine compartment to which it is secured by a metal clip.

Small hose clips or ferrules secure the flexible pipes to the ends of the rigid pipe or the unions of the various components. A metal guard is fitted to protect the external flexible pipe from flying mud and stones thrown up by the L.H. front road wheel.

When making a disconnection below the petrol level it is best to detach the flexible pipe of the petrol suction pipe and when disconnecting any of the pipes after the filter ensure that the petrol is turned off by utilizing the on and off tap situated in the top of the petrol filter in the engine compartment.

REMOVAL AND REPLACEMENT
RIGID PIPE LINE

This operation must only be effected when the petrol tank is almost half empty, as petrol may syphon off when the outlet connection is detached from the petrol pump.

1. PETROL TANK TRIM

Disconnect the battery earthing lead and remove the petrol tank trim from the front L. H. corner of the luggage boot as detailed in THE BODY, SECTION Q.

2. ROAD WHEELS

Detach the rear L.H. road wheel as detailed in ROAD WHEELS AND TYRES, SECTION K. It may be found beneficial to also remove the front road wheel.

3. STONE GUARD

Remove the stone guard from the rear of the front road wheel arch as detailed in THE BODY, SECTION Q.

4. FLEXIBLE PIPES

Detach the flexible pipe from the rear end of the rigid pipe as detailed below. Remove the inlet union from the petrol filter in the engine compartment by slackening the union nut, detach the pipe from the wing valance and the underside face of the L. H. toe board by withdrawing a clip and screw, and a nut and bolt respectively. Eject the rubber grommet in the wing valance into the front wheel arch.

5. RIGID PIPE

Detach the rigid pipe from the outside face of the L. H. chassis frame side member by removing seven clips and screws. Turn the rear end of the rigid pipe outward and withdraw the pipe assembly backward, feeding the petrol filter union through the aperture in the wing valance and the clearance holes in the two outrigger body mounting brackets.

6. REPLACEMENT

The replacement of the rigid petrol pipe assembly is the reversal of the removal sequence but particular attention must be given to the following points:-

(i) That when fitting a new rigid pipe assembly it will be necessary to crimp on the union for the petrol filter.

(ii) That before the petrol pump cover and the road wheel(s) are replaced the engine is started and run for a short time so that the pipe connections can be observed for leaks.

REMOVAL AND REPLACEMENT
FLEXIBLE PIPES

1. REMOVAL

Slacken the hose clip securing the end of the flexible pipe to the component and remove the flexible pipe.

2. REPLACEMENT

Fit the pipe end to the component and tighten the hose clip.

THE PETROL FILTER AND TAP

DESCRIPTION Fig. E10

The petrol filter is of the sediment bowl type and is situated in the petrol pipe line at the L.H. side of the engine compartment. A screw type on and off tap is incorporated in the top body of the filter and is turned anti-clockwise to turn the petrol on and clockwise to turn the petrol off.

The petrol is pumped into one side of the body and passes downward through the on and off tap into the glass sediment bowl. As the outlet is above the filter gauze all petrol must pass through this before reaching the carburettor leaving the impurities below.

Any dirt that collects in the bottom of the sediment bowl can be easily viewed when the glass bowl should be cleaned out.

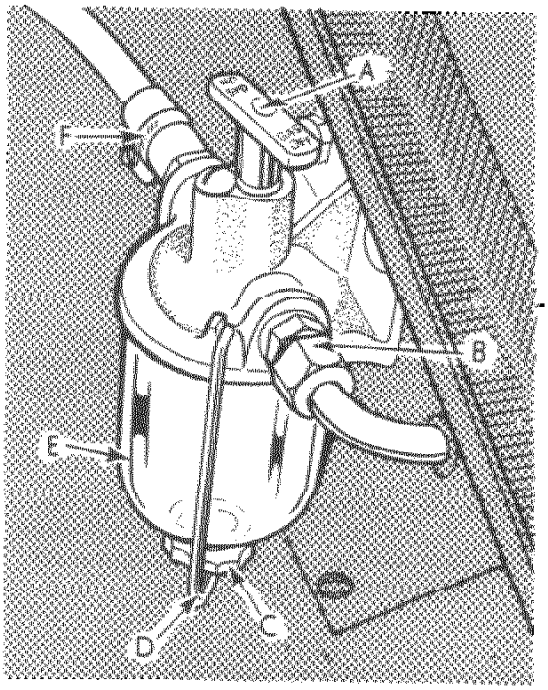

Figure E10
Petrol filter and tap.

A. On and Off tap.
"Off" turn clockwise.
"On" turn anti-clockwise.
B. Inlet union.
C. Thumb screw.
D. Wire cage.
E. Glass sediment bowl.
F. Outlet pipe hose clip.

MAINTENANCE

FIRST 500 MILES (805 kms) AND EVERY 5,000 MILES (8050 kms)

The only maintenance that the petrol filter requires is the cleaning of the glass sediment bowl when it is observed that water and dirt have accumulated at the bottom.

CLEANING THE SEDIMENT BOWL Fig. E11

Turn off the petrol at the "on" and "off" tap, remove the glass sediment bowl from the underside of the top body by slackening the thumb nut and swing the wire cage clear. Empty and dry out the sediment bowl. Remove the rubber seal and gauze filter from the top body, clean the latter and ensure the good condition of both components.

The gauze, seal and bowl are replaced by the reversal of their removal sequence but particular attention must be given to the following point.

That the petrol is turned on and the sediment bowl is filled with petrol by switching on the ignition before the engine is started. After a short running period the ignition is switched off and the filter seal examined for leakage.

REMOVAL AND REPLACEMENT
PETROL FILTER AND TAP

1. REMOVAL.

Disconnect the earthing lead of the battery and remove the inlet and outlet unions from the top body of the petrol tap and filter by slackening the union nuts. Remove the petrol tap and filter from the side of the engine compartment by withdrawing two bolts.

2. REPLACEMENT

The replacement of the petrol tap and filter is the reversal of the removal sequence. The engine should be started and run for a short period so that the pipe connections can be observed for leaks.

DISMANTLING AND ASSEMBLING
PETROL FILTER AND TAP

1. DISMANTLING

Slacken the thumb screw and detach the glass sediment bowl from the underside of the body by swinging the wire clip clear, detach the wire cage from the top of the body. Withdraw the rubber seal and gauze from the underside of the body. Unscrew the on and off tap from the top of the body by withdrawing the round headed stop screw.

2. ASSEMBLING

The assembling sequence of the petrol tap and body is the reversal of the removal sequence.

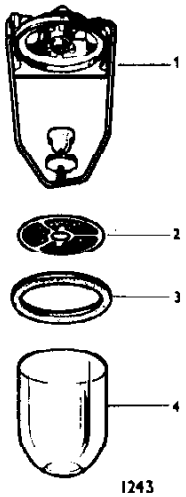

Figure E11

Petrol filter and tap.

1. Tap body and tap.
2. Wire gauze.
3. Sealing ring.
4. Glass sediment bowl.

THE CARBURETTOR AIR CLEANERS

DESCRIPTION

The carburettor air cleaner is of the oil damped wire gauze type. They are fitted on to each carburettor and so any air drawn in by the carburettor, first passes through the oil damped gauze and is cleaned. Short flexible pipes from the top of each rocker cover connects with a short pipe incorporated in the air cleaner thus effecting the crankcase ventilation of the engine unit.

MAINTENANCE

EVERY 5,000 MILES (8,050 kms)

Wash and dampen with engine oil.

REMOVAL AND REPLACEMENT
CARBURETTOR AIR CLEANER

1. REMOVAL

Remove the air cleaner from the carburettor air intake by withdrawing two bolts and detaching it from the rocker cover breather pipe, after slackening the hose clip.

2. REPLACEMENT

The replacement of the air cleaner is the reversal of the removal sequence.

SERVICING THE CARBURETTOR AIR CLEANER

Too much emphasis cannot be placed on the regular cleaning and oiling of the carburettor air cleaners. Not only do these air cleaners filter the supply of air to the engine but some of the air is vented to the underside of the piston in the carburettor section chamber. Failure to service the air cleaner regular will mar the efficiency of the S. U. carburettors increasing fuel consumption and lessening engine efficiency.

The carburettor air cleaner must be washed thoroughly in petrol and left to dry in clean dry air. Soak with engine oil and allow the excess to dry off in clean dry air.

NOTE It is important that the carburettor air cleaner is damped with engine oil, little or no air cleaning will be effected if this instruction is ignored.

THE ACCELERATOR PEDAL AND CARBURETTOR LINKAGE

DESCRIPTION Fig. E12.

The accelerator and carburettor linkage consists of the accelerated pedal situated in the R. H. corner of the drivers foot well and the inter-carburettor linkage and return spring mounted on top of the inlet manifold between the two carburettors.

The accelerator pedal is attached to a shaft which protrudes into the engine compartment and a lever at its second end is connected to the throttle control lever of the carburettor linkage by a rigid rod.

The carburettor throttle control lever is included in the bottom of the double lever and spindle assemblies mounted in the carburettor linkage and is connected to the throttle butterfly levers of each carburettor by short rods and ball end joints.

The second lever and spindle assembly mounted in the top portion of the carburettor linkage is connected to the drivers mixture control in the centre instrument panel by a piano wire cable and connected in a similar manner to the carburettor diaphragm levers of each carburettor but by longer rods.

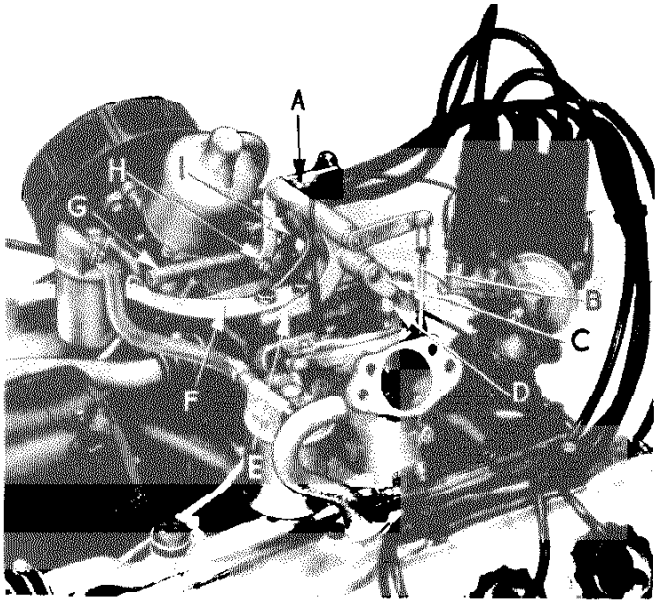

Figure E12.
Carburettor linkage between carburettors.

A. Mixture control lever.
B. Mixture control rod.
C. Throttle control lever.
D. Throttle control rod.
E. Carburettor linkage mounting bracket.
F. Spring abutment bracket.
G. Return spring.
H. Mixture control lever for inner cable of hand operated control.
I. Throttle control lever for rod of accelerator pedal linkage.

The ball ends, one at each end of the rigid control rods, consist of two components:-

(1) A ball end attached to the end of the control lever by a nut.

(ii) A ball end socket screwed on the end of the control rod and secured by a lock nut.

Incorporated in the ball end socket is a metal band with moving end pieces and it is by lifting these ends that the control rod can be detached from the ball end on the lever.

NOTE: No attempt must be made to effect any carburettor tuning or any other apparent carburettor improvement by resetting the length of the carburettor control rods. The length of these control rods is set during initial assembly of the car and must not be altered.

REMOVAL AND REPLACEMENT
CONTROL ROD Figs. E12 and E18.

1. REMOVAL

First ensure that the locknut is tight thus preventing any inadvertant change in the length of the rod. Lift the two metal clips one each side of the ball socket body and remove rod assembly from ball end. The two metal clips can now be closed in order to avoid straining the metal band.

2. REPLACEMENT

The replacement of the control rod is the reversal of the removal sequence but ensure that the ball joint is first lubricated and that the metal clips are fully closed.

REMOVAL AND REPLACEMENT
CARBURETTOR LINKAGE

1. REMOVAL

Remove the front end of the throttle return spring from the spring bracket. Detach the top of the two carburettor mixture control rods, the top of the two throttle control rods and the accelerator control rod from the five levers of the carburettor linkage by withdrawing the ball sockets as detailed above. Withdraw the drivers mixture control inner cable from the lever by slackening the nut and the outer cable from the clamp by slackening the nut and bolt. Remove the carburettor linkage bracket and spring anchorage from the top of the inlet manifold by withdrawing two bolts.

Any of the control rods can be removed by detaching the ball sockets as detailed above.

2. REPLACEMENT

The replacement of the carburettor linkage is the reversal of the removal sequence.

DISMANTLING AND ASSEMBLING
CARBURETTOR LINKAGE AND CONTROL ROD Fig. E12.

1. CARBURETTOR LINKAGE

Identify the single levers to their rod ends, their angular positions and their respective bores. Detach the levers from the rods by ejecting the mills pins and withdraw the double lever and rod assembly from the bracket.

2. CONTROL ROD ASSEMBLY

Measure and note the length of the control rod assembly and the direction of the open ends in the ball end sockets. Slacken the locknuts and remove the ball end sockets followed by the locknuts.

3. ASSEMBLING

The assembly of the carburettor linkage and the control rod is the reversal of the dismantling sequence but particular attention must be given to the following points:

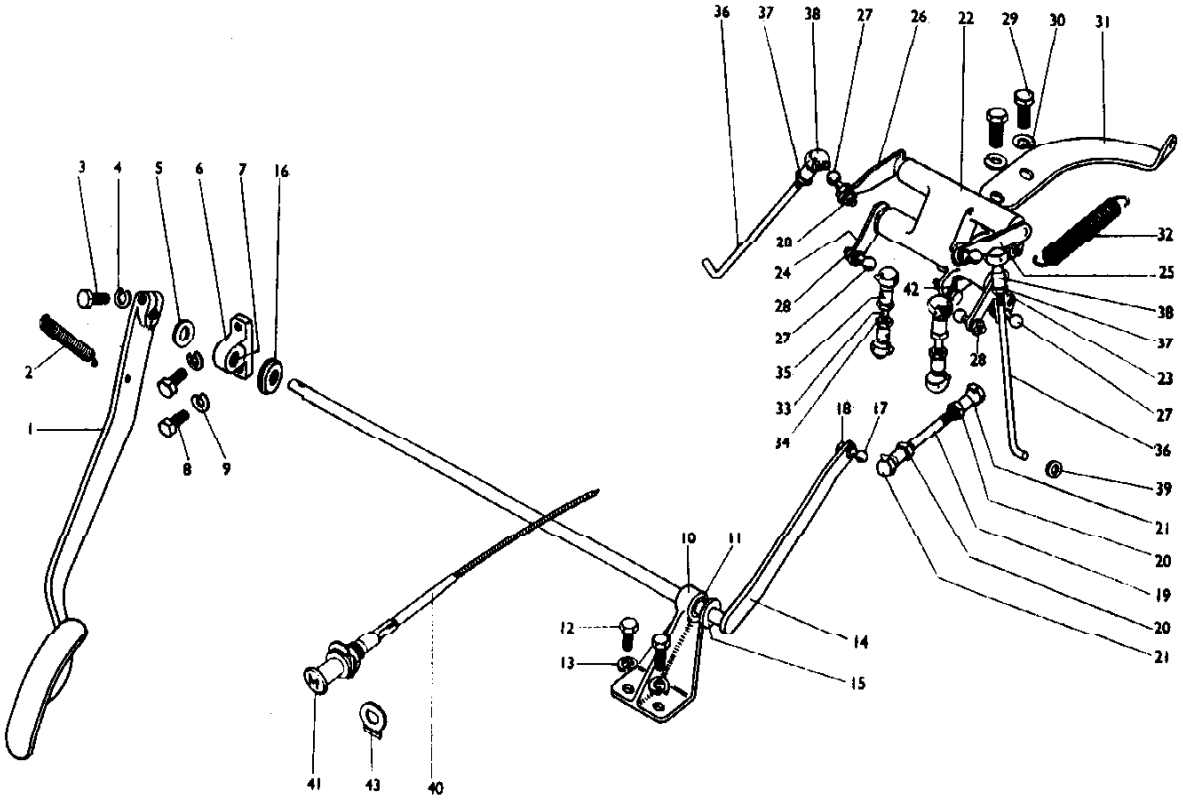

Figure E13

Exploded view of carburettor linkage (L.H.D. car)

1. Accelerator pedal.
2. Pedal return spring.
3. Accelerator pedal pinch bolt.
4. Spring washer.
5. Plain washer.
6. Pedal spindle bracket inside cockpit.
7. Spindle bracket bush bearing.
8. Long bracket bolts.
9. Spring washer.
10. Pedal spindle bracket inside engine compartment.
11. Spindle bracket bush bearing.
12. Short bracket bolts.
13. Spring washers.
14. Accelerator spindle and lever.
15. Plain washer.
16. Rubber grommet.
17. Lever ball pin.
18. Nut.
19. Accelerator control rod.
20. Ball socket locknuts.
21. Control rod ball sockets.
22. Carburettor linkage bracket.
23. R.H. throttle lever and spindle.
24. L.H. throttle lever.
25. R.H. throttle lever and spindle.
26. L.H. mixture lever.
27. Ball pin.
28. Nut.
29. Spring anchorage, and bracket bolt.
30. Spring washers.
31. Spring anchorage.
32. Accelerator return spring.
33. Butterfly valve control rod.
34. Ball socket locknut.
35. Control rod ball socket.
36. Mixture control rod.
37. Ball socket locknut.
38. Control rod ball socket.
39. Control rod washer.
40. Mixture control cable assembly.
41. "M" control rod.
42. Mixture control outer cable clip.
43. Mixture designation plate.

(i) That the lever and rod assembly having smaller levers are fitted to the bottom bore so that when the bracket bolt holes point forward the double lever assembly is to the R.H. side.

(ii) That the shorter single lever is pinned in position so that it subtends an angle of 50^{o} with the centre line of the rear hole in the front lever on the opposite side and that the long lever is similarly replaced but subtending an angle of 124^{o} and both levers have an end float of 0.025" - 0.015" (0.635 - 0.381 mm).

(iii) That the open end of the ball end sockets are facing the same way and the same distance apart as noted during the dismantling sequence.

REMOVAL AND REPLACEMENT
ACCELERATOR PEDAL R OR L.H.D.

1. INSIDE THE CAR

Detach the return spring from the pedal and remove the accelerator pedal from the end of the shaft inside the car by withdrawing the pinch bolt. Detach the spindle bracket from the accelerator shaft bearing by withdrawing two bolts. Eject the accelerator shaft grommet in the wall of the foot well into the engine compartment.

2. INSIDE THE ENGINE COMPARTMENT

Detach the accelerator pedal return spring from the lever or the bracket on the rear engine bulkhead. Remove the rear end of the carburettor control rod from the ball pin on the bulkhead lever as detailed on page E17. Detach the accelerator shaft bracket and bearing assembly from the rear engine bulkhead. Withdraw the accelerator shaft assembly into the engine compartment and withdraw the bearings. Eject the bearings when they are well worn.

3. REPLACEMENT

The replacement of the accelerator pedal is the reversal of the removal sequence but the accelerator stop must be checked to ensure that the linkage is not strained.

THE ACCELERATOR PEDAL STOP

The accelerator pedal stop consists of a bracket bolted to the bulkhead at the right hand side of the foot well.

It is important to see that the control rod lengths are correctly set so that when the throttle pedal is fully depressed against its stop full throttle is obtained at the carburettors, without there being any strain on the butterfly spindles against their own stops.

CARBURETTOR LINKAGE

DIMENSIONS

	English	Metric
Length of control rod from accelerator bulkhead lever to carburettor linkage lever.	4.000"	101.600 mm.
Length of carburettor throttle operating control rods.	2.000"	50.800 mm.
Length of carburettor mixture operating control rods.	6.550"	165.100 mm.

THE CARBURETTOR MIXTURE CONTROL

DESCRIPTION

The carburettor mixture control is situated in the centre instrument panel and is of the locking flexible cable type, the cable passing through the bulkhead to the carburettor linkage mounted on top of the inlet manifold. The flexible outer cable is secured to the bracket of the carburettor

linkage by a clamp, nut and bolt while the piano wire inner cable is attached to the forward lever of the mixture control linkage by a second nut and bolt.

OPERATION

The control knob is pulled out of the centre instrument panel and has three intermediate positions in order to provide various and progressive enrichment of the petrol/air mixture and the control is self locking. The control is cancelled by rotating the knob 45° clockwise and pushing it into the centre instrument panel.

In the engine compartment the outer cable is fixed and so remains stationary but the rearward movement of the inner cable raises the two top rear levers of the carburettor linkage. Rods attached to these two levers actuate the mixture enrichment levers (or jet levers) at the base of the two carburettors

When the mixture control is used to its fullest extent, the carburettor butterfly valves are partially opened by a connecting cam and a short lever on the carburettor butterfly valve spindle, to effect a faster idling speed during very difficult starting conditions.

REMOVAL AND REPLACEMENT
CARBURETTOR MIXTURE CONTROL

1. ENGINE COMPARTMENT

Withdraw the inner and outer cables from the lever and bracket clamp respectively by slackening the securing nuts and bolts.

2. CENTRE INSTRUMENT PANEL

Remove the nut from the body of the mixture control on the underside of the centre instrument panel and withdraw the mixture control assemble through the instrument panel and bulkhead. Immediately the inner cable is withdrawn from the bulkhead collect the nut and washers before withdrawing it through the centre instrument panel.

3. REPLACEMENT

The replacement of the mixture control is the reversal of the removal sequence but particular attention must be given to the following points:

(i) That the cable of the control is fed through the centre instrument panel and the washers and securing nut fed on in that order and then the cable fed through into the engine compartment.

(ii) That the cable ends are secured to their respective anchorage so that there is a little slackness in the inner cable.

DISMANTLING AND ASSEMBLING

1. DISMANTLING

Detach the knob from the inner rod by depressing the spring plunger in the shank of the knob, remove the split spring sleeve from the body of the control and withdraw the flat pawl. Withdraw the inner cable through the body.

2. ASSEMBLING

The assembly of the mixture control is the reversal of the dismantling sequence but the inner cable must be well greased before fitting.

THE S.U. CARBURETTORS

DESCRIPTION Fig. E14.

The S.U. carburettors are of the automatically expanding choke type, in which the cross sectional area of the main air passage above the petrol jet and the effective orifice of the petrol jet

itself is infinitely variable being effected by a rising piston with a tapered jet needle attached positioned in the air passage and petrol jet respectively.

This variation occurs in accordance with the demands of the engine as determined by the degree of throttle opening employed, the engine speed and the load placed upon it. The distinguishing feature of this type of carburettor is that an almost constant air velocity and hence, an approximately constant degree of depression, is maintained in the region of the jet orifice at all times. This velocity is such, that the airflow demanded by the engine in order to develop its maximum power is not impeded and ensures good atomisation of the petrol under all speed and load conditions.

The maintenance of a constant high air velocity across the jet orifice, even during idling speeds, obviates the necessity of an idling jet and so, only a single petrol jet is employed. The petrol jet is mounted on a flexible diaphragm in a leakproof housing at the bottom of the carburettor air passage body.

The carburettors are of the semi-downdraught type mounted in the centre of the inlet manifold and are operated simultaneously by an inter-connection linkage controlled by the accelerator pedal and mixture control. The simultaneous operation or synchronisation, as it is known hereafter, is set by running the engine at a fast idling speed and listening to and equalising the airflow passing into the carburettor intake and once set the synchronising of the carburettors will require little attention.

The carburettor consists of four main components:

(i) The air passage body, having flanges at both ends for attachment to the inlet manifold and for the mounting of the air cleaner. Adjacent to the inlet manifold flange is a throttle butterfly valve, the ignition distributor vacuum connection in the instance of a L.H. carburettor and a slow running mixture passage toward the air cleaner end and on top of the air passage is a bore to the bottom and small end of the sliding piston, while beneath the air passage body is a boss for the petrol jet and diaphragm unit and this is closed by the arm of the carburettor float chamber.

(ii) The suction chamber, housing the sliding piston is mounted on top of the air passage body. The centre position of the suction chamber being so constructed as to form a bearing for the axial movement of the sliding piston, the upward travel of which is damped by a device inserted through the top of the suction chamber. When the piston is in its lowest position it will rest on the bridge in the bottom of the air passage. Inserted in the bottom of the sliding piston is a tapered jet needle so positioned that it will pierce the petrol jet below.

(iii) The petrol jet and diaphragm assembly mounted in a flanged bush bearing in the boss at the bottom of the air passage body, is so positioned that it will accommodate the tapered jet needle in its bore without touching it. A mechanical linkage is attached to the bottom extremities of the petrol jet permits it to be lowered to provide enrichment of the mixture.

(iv) The float chamber, attached to the external face of the boss in the underside of the air passage body below the jet and diaphragm assembly, contains the petrol float and incorporated in the top cover are the petrol inlet and overflow ports and the needle valve assembly. The arm of the float chamber is drilled and conveys petrol from the bottom of the float chamber to the petrol jet and diaphragm assembly.

The bottom and smaller diameter portion of the sliding piston, protrudes into the air passage forming a shutter which enlarges and diminishes the cross sectional area of the air passage above the petrol jet and bridge when the sliding piston rises and falls. As the tapered jet needle is attached to the bottom of the sliding piston, in addition to varying the size of the air passage, the discharge from the petrol jet will be varied in accordance with the tapered form of the jet needle.

The top and larger portion of the sliding piston does not actually touch the bore of the suction chamber due to machining limits and neither does the tapered jet needle, secured in its underside, touch the petrol jet due to the lateral positioning of the petrol jet itself.

The return of the sliding piston to its rest position on the bridge in the bottom of the air passage is assisted by a coil spring mounted inside and on top of the sliding piston beneath the

suction chamber. Any impact with the bridge is cushioned by a small bore spring loaded plunger in the underside face of the sliding piston adjacent to the tapered jet needle.

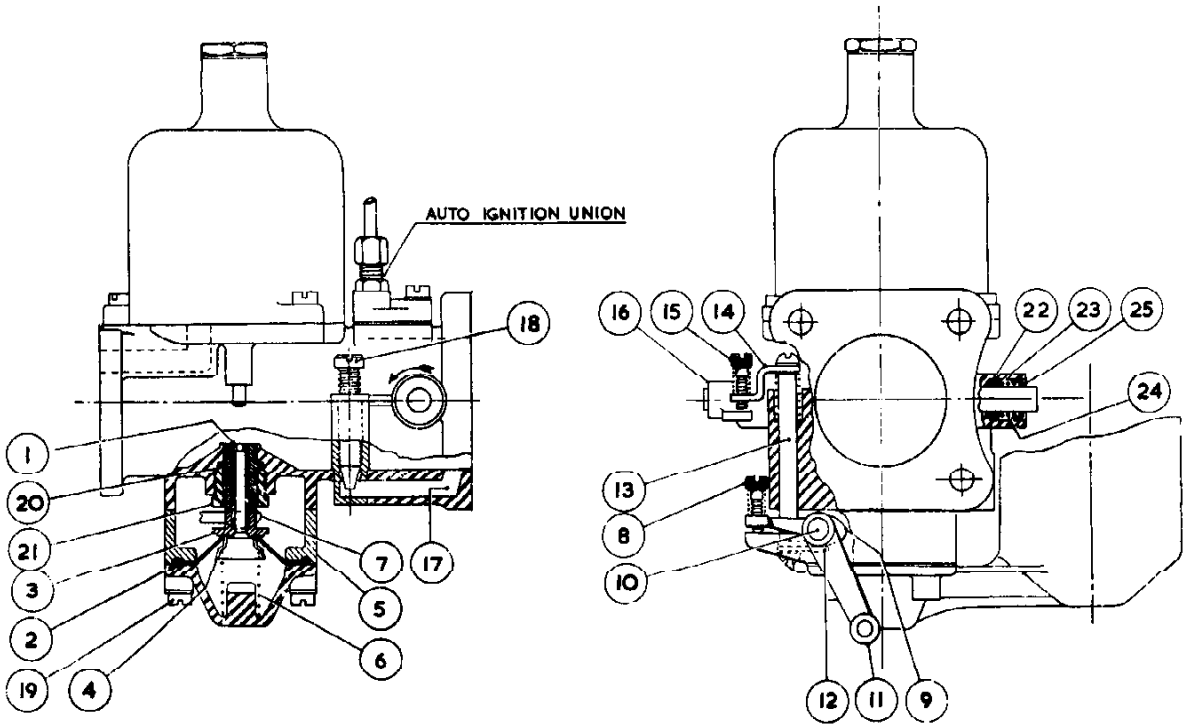

Figure E14

Partial cross section through S. U. HD. 6 carburettor

1. Jet.
2. Rubber diaphragm.
3. Jet cup.
4. Jet return spring cup.
5. Diaphragm housing.
6. Jet return spring.
7. Jet actuating lever.
8. Mixture of jet adjusting screw.
9. Cam of cold starting throttle mechanism.
10. Jet lever spindle.
11. Jet control lever.
12. Cam shoe of cold starting throttle mechanism.
13. Push rod.
14. Cold starting throttle top plate.
15. Cold starting throttle screw.
16. Throttle top.
17. Slow running passage.
18. Slow running screw.
19. Float chamber securing screw.
20. Jet bearing.
21. Jet bearing lock nut.
22. Throttle spindle cork gland.
23. Dished retaining washer.
24. Spring.
25. Shroud.

THE IGNITION DISTRIBUTOR VACUUM CONNECTION

The ignition distributor vacuum connection union is situated at the top of the main body and its bore is on the air intake side when the carburettor butterfly valve is closed. The carburettor having this connection is attached to the L. H. side of the inlet manifold and is connected to the vacuum unit of the ignition distributor by a small bore pipe.

THE THROTTLE SPINDLE GLANDS

The throttle spindle glands are fitted at each end of the throttle spindle and consist of a cork gland, a dished washer, a retaining spring and shroud.

This assembly rarely needs servicing but when it does it will be necessary to withdraw the throttle butterfly valve disc from the throttle spindle.

THE JET AND THROTTLE INTER-CONNECTION LINKAGE Fig. E14

The jet and throttle inter-connection linkage is operated by a cam mounted on the jet actuating lever spindle and the whole linkage is situated between the diaphragm and throttle butterfly valve spindles. The cam rotates with the movement of the jet actuating lever spindle and contacts the cam shoe at the bottom end of the vertical push rod while a plate attached to its top end makes contact with the second end of the throttle stop lever.

It will then be realised that any movement of the jet or mixture lever will not only be transferred to the petrol jet inside the carburettor but also the cam, and convey the movement to the throttle butterfly valve. The amount of jet movement and the instant of the throttle butterfly valve opening can be varied by adjusting the jet or mixture adjusting and slow running throttle adjusting screws respectively.

Figure E15.
Petrol connections to carburettor float chamber covers.

A. Petrol inlet pipe to L.H. carburettor.
B. Petrol overflow pipe.

THE CARBURETTOR FLOAT CHAMBER OVERFLOW PIPE Fig. E15.

An overflow port is incorporated in the top of the float chamber cover and this is connected to a rigid pipe attached to the front face of the cylinder block by a short length of flexible pipe. A small coil of wire is positioned inside this pipe to prevent any collapse.

OPERATION OF CARBURETTOR

The sliding piston rises under the influence of the induction depression, which is controlled by the degree of throttle opening, being conveyed to the top of the large diameter portion of the sliding piston through two drillings in the piston body, while the underside face of this large diameter portion is vented to atmosphere through ducts in the body and the air cleaner.

As the piston rises it withdraws the smaller portion of the sliding piston from the air passage body and also the tapered jet needle from the petrol jet thus permitting the greater volume of air demanded by the engine to pass over the new enlarged petrol jet opening. It will be realised that there is no speeding up of the airflow as the increased volume of air demanded by the engine passes through an orifice of increased size.

To enrichen the mixture during rapid throttle openings, as when accelerating, the rising of the sliding piston is delayed by the restricting action of the oil damped plunger. This is fitted in the centre of the sliding piston through the suction chamber and offers no resistance to the piston when it returns. The delay in the upward travel of the sliding piston causes the airflow to momentarily speed up while passing between the bridge and the underside of the piston and so take up an increased amount of petrol from the petrol jet.

Mixture enrichment, to facilitate cold starting, is effected by withdrawing the mixture control situated in the instrument panel. This action lowers the petrol jet down the tapered form of the jet needle and so presents a larger jet orifice to the airflow demanded by the engine while it is running due to the influence of the electric starter motor.

THE EFFECT OF ALTITUDE AND CLIMATIC EXTREMES ON STANDARD TUNING

The tuning as the car leaves the Daimler works employs a jet needle which is broadly suitable for temperate climates at sea level upwards to approximately 3,000 ft. Above that altitude it may be

necessary depending on the additional factors of extreme climatic heat and humidity, to use a needle which will give a weaker tuning than the standard.

The factors of altitude, extreme climate heat and humidity all tend to demand a weaker tuning and a combination of any of these factors would naturally emphasise this demand. The situation cannot be met by a hard and fast rule owing to the wide variations in the existing conditions and in such cases the owner must contact his Daimler Dealer who will have carried out experiments and obtained a satisfactory solution.

Improvement is often experienced by fitting a lighter spring above the suction chamber piston or even by removing the spring.

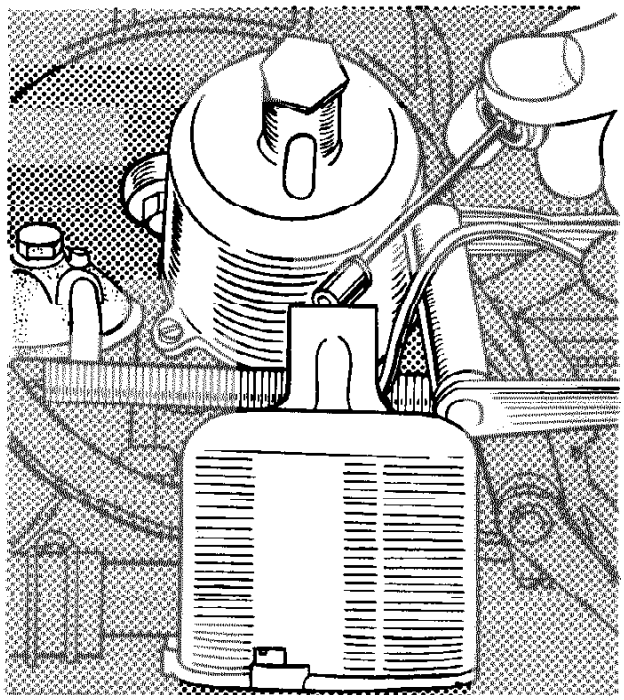

Figure E16
Carburettor piston damper assembly.

FILLING THE CARBURETTOR DASH POTS
Fig. E16

Withdraw the oil cap/damper assembly from the top of the carburettor suction chamber and feed in sufficient engine oil to raise the oil level to the shoulder observed through the open top.

After ensuring the sound condition of the sealing washer, fit the oil cap/damper assembly to the carburettor suction chamber.

REMOVAL AND REPLACEMENT
CARBURETTOR FLOAT CHAMBER COVER
NEEDLE VALVE ASSEMBLY

1. CARBURETTOR FLOAT CHAMBER COVER

Turn off the petrol at the petrol filter, detach the flexible petrol feed and overflow pipes from the carburettor float chamber cover as detailed on page E13. Remove the cover from the top of the carburettor float chamber by withdrawing the cap nut.

2. NEEDLE VALVE ASSEMBLY

Remove the forked lever from the underside of the carburettor float chamber cover by ejecting its fulcrum pin toward the serrated end. Unscrew the needle valve assembly from the underside of the float chamber cover.

3. REPLACEMENT

The replacement of the needle valve and carburettor float chamber cover is the reversal of the removal sequence but particular attention must be given to the following points:

(i) That the carburettor float chamber level is adjusted by setting the forked lever on the underside of the carburettor float chamber cover as detailed on page E13.

(ii) That the flexible petrol feed and overflow pipes are attached as detailed on page E13.

SETTING THE PETROL LEVEL IN CARBURETTOR FLOAT CHAMBER AND JET Fig. E17.

The petrol level in the float chamber and jet is controlled by the height at which the carburettor float will rise and close the needle valve. It is set by adjusting the forked lever situated in the underside of the float chamber cover.

Remove the float chamber cover from the carburettor as detailed on page E24. Invert the carburettor float chamber cover and pass a 0.4375" (11.1125 m/m) diameter rod between the inside radius of the forked lever and allow it to rest on both sides of the flange underside of the cover.

The petrol level is correct when the shank of the forked lever is in contact with the base of the needle valve in the needle valve assembly and the forked lever must be set to attain this condition.

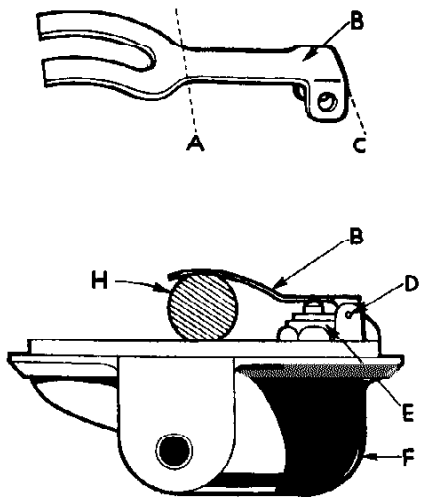

Figure E17.
Setting petrol level in float chamber

A. Bend here.
B. Forked lever.
A-C. Keep flat.
D. Fulcrum pin.
E. Needle valve assembly.
F. Float chamber top cover.
G. Fuel inlet pipe.
H. Test bar.

When there is clearance between the forked lever and the rod the petrol level will be too low, conversely when there is clearance between the shank of the forked lever and the base of the needle valve the petrol level will be too high.

Replace the carburettor float chamber cover by reversing the removal sequence.

ADJUSTING COLD STARTING
THROTTLE SETTING Fig. E18

Normally, adjustment to this linkage is unnecessary but a change of oil viscosity or sustained usage in a different climate may warrant a small adjustment to maintain a satisfactory engine speed during cold starting conditions.

The cold starting throttle setting can be set when the carburettors are being synchronised and the most opportune time is while the engine is reaching its normal working temperature and is effected by manipulating the screw (C) situated in the plate at the top end of the vertical push rod. (Fig. E18.

When the engine is "stone" cold, fully engage the drivers mixture control, slacken off the two cold starting throttle adjustment screws until they just contact the lever below, then rotate each two turns clockwise and start the engine.

Before the engine gets warm set the two screws to give the desired engine speed. It is a wise plan to listen to the "air hiss" and set the two screws so that the volume of each "air hiss" is equal.

CARBURETTOR SYNCHRONISATION

The two carburettors are accurately synchronised during the initial assembly and testing of the engine and should require little attention in normal service.

The symptoms of the necessity for synchronising are readily detected by the observation of the exhaust beat when the engine is idling at its full working temperature with the mixture control fully inoperative and are as follows:-

(i) An irregular beat with a splashy type of misfire, indicates a weak mixture.

(ii) A regular or rhythmic misfiring exhaust beat with a blackish exhaust discharge indicates a rich mixture.

Before making any carburettor adjustments with a view to improve engine performance, it is best to ascertain that the deterioration is not due to any one or a combination of two or more of the following faults:-

(i) The use of a petroleum spirit having an unsuitable octane value.

(ii) Incorrect petrol pump pressure or petrol level in carburettor float chamber(s).

(iii) Incorrect spark plug setting, faulty or unsuitable spark plugs.

(iv) The deterioration of the ignition distributor contact breakers or their gap settings.

(v) Unsuitable ignition timing.

(vi) Incorrect engine valve rocker clearances or leaky valves.

(vii) Alteration of carburettor linkage mounted on top of inlet manifold.

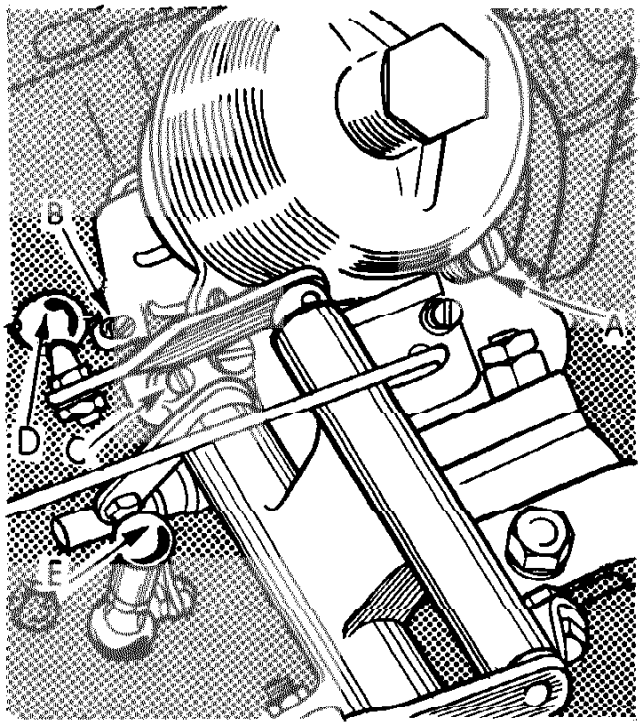

Figure E18
Carburettor mixture screws.

A. Slow running screw.
B. Mixture control screw.
C. Cold starting throttle adjustment screw.
D. Ball joint socket open ready for removal.
E. Ball joint socket closed and secured to ball end on lever.

TO SYNCHRONISE THE CARBURETTORS Fig. E18

It is essential that the operation of carburettor synchronisation is carried out in the open air and to ensure perfection the operation must be effected in an efficient and unhurried manner.

1. PREPARATION

Remove the carburettor air cleaners as detailed on page E15 remove the oil cap/damper assemblies as detailed on page E24 test for sticking jet needles as detailed on page E30 check the petrol level in the float chambers as detailed on page E24. Ensure that the drivers mixture control is fully inoperative, that the two butterfly valves close simultaneously and they are in the closed position. Rotate the two slow running screws "A" fully clockwise and then slacken off one and a half turns anti-clockwise. Rotate the two mixture adjusting screws "B" anti-clockwise until they are just in contact with the mixture levers and then turn two turns clockwise.

2. ENGINE TEMPERATURE

Start the engine and allow it to warm to its normal working temperature. While the engine is warming up the cold starting throttle adjustment can be set. When the engine has reached its temperature set the engine speed to 800 r.p.m. by rotating the two slow running screws "A" an equal amount.

3. SYNCHRONISING Fig. E19

Utilizing a suitable length of rubber tubing as a stethoscope, hold one end to the ear and position the second end in the carburettor intake, listen to the "air hiss" of both carburettors individually by placing the second end of the rubber tubing in the same relative position in each carburettor intake. Rotate the slow running screws "A" so that the intensity of each "air hiss" is identical for both carburettors, this may increase the engine speed which must be reduced to 800 r.p.m. by slackening off both slow running screws "A" an equal amount. Check and adjust the "air hiss" and engine speed until perfection is attained.

Elevate the piston and needle assembly of one carburettor 0.031" - 0.062" (0.793 - 1.587 m/m) by pressing the piston lift pin "B", Fig. E19. When the engine speed reduces, it indicates that the mixture of that carburettor is too weak but when the engine speed increases, it indicates that the mixture of that carburettor is too rich. Repeat this operation with the second carburettor and determine whether its mixture is too weak or too high.

Correct the determined mixture strengths by rotating the mixture adjusting screw "B" situated at the extreme end of the diaphragm dog lever as follows:-

Clockwise to enrichen the mixture.

Anti-clockwise to weaken it.

The piston and needle assemblies are again elevated as previously detailed to determine the mixture strength and further adjustment made to the mixture adjustment screws "B" as may be necessary to attain perfection.

The engine speed is reduced to 500 r.p.m. by rotating the slow running screws "A" an equal amount and the "air hiss" checked as previously described. The engine is then switched off and the carburettor air cleaners fitted as detailed on page E15.

THE JET NEEDLE

T.S. jet needles are fitted as standard and no useful purpose is served by fitting any other. When the car is being used for sporting events of a very high speed nature, the advice of the carburettor manufacturer may be sought with a view of obtaining a needle recommendation that is designed specifically for high speeds only.

NOTE:

When the piston and needle assembly has been removed from the carburettor it must NEVER be laid down so it rests on the point of the needle. Failure to observe this

instruction may result in carburation defects due to a bent needle.

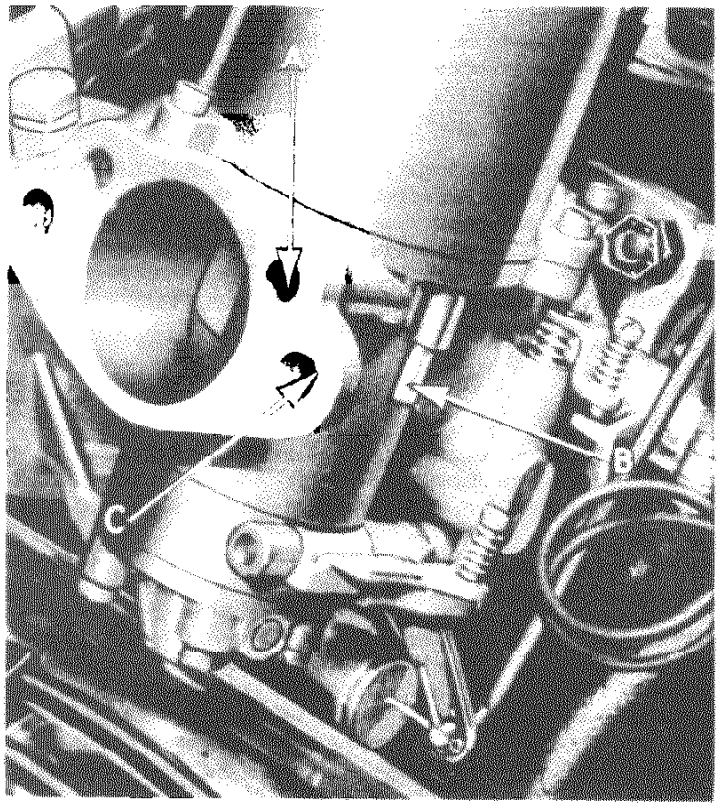

Figure E19
Left hand carburettor.

A. Air bleed to underside of piston.
B. Piston lift pin.
C. Air filter fitting face.

REMOVAL AND REPLACEMENT
JET NEEDLES Fig. E20

1. REMOVAL

Withdraw the oil cap/damper assembly from the top of the suction chamber. Remove the suction chamber and spring from the top of the air passage body by withdrawing three screws. Withdraw the piston and needle assembly from the top of the air passage body and empty the oil away. Remove the jet needle from the bottom of the piston by slackening the sunken jet screw.

2. REPLACEMENT

The replacement of the jet needle is the reversal of the removal sequence but particular attention must be given to the following points.

(i) That the jet needle is fitted to the piston so that the shoulder or the bottom edge of the groove is level with the bottom face of the piston.

(ii) That after it has been fitted it is checked for sticking.

(iii) That the dash pot is replenished with thin engine oil.

THE PETROL JET

The petrol jet is attached to a synthetic rubber diaphragm between a jet cup and the jet return spring cup while the outside edge is gripped between the diaphragm housing and the arm of the float chamber. The movement of the petrol jet is controlled by an actuating lever contacting the top face of the jet cup and the jet return spring beneath. The external portion of the jet actuating lever has a spring loaded adjusting screw which limits the upward travel of the petrol jet and thus constitutes a mixture adjusting device.

(i) By rotating the screw clockwise the mixture is enrichened.

(ii) By rotating the screw anti-clockwise the mixture is weakened.

The petrol jet and diaphragm assembly is mounted in a flanged bush bearing held in the underside of the air passage body by a locknut. A particular amount of clearance is provided during manufacture, between the flange of the bush bearing and the air passage body to permit a certain degree of lateral movement. This lateral movement facilitates the centralisation of the petrol jet around the tapered jet needle in the sliding piston above. The bush bearing is held in this position by tightening the locknut while the tapered jet is positioned inside the petrol jet.

The petrol jet is centralised during initial assembly of the carburettor and due to design features, the petrol jet is unlikely to become accidentally misplaced. Before any attempt is made to recentre the jet, first, ensure that the sliding piston is not sticking in the suction chamber or that the tapered needle has become mis-shaped. Re-centring of the petrol jet will not normally be necessary during periodical maintenance unless it has become misplaced by inadequate tightening of the locknut. It may, however, become necessary after a replacement jet needle has been fitted to the sliding piston.

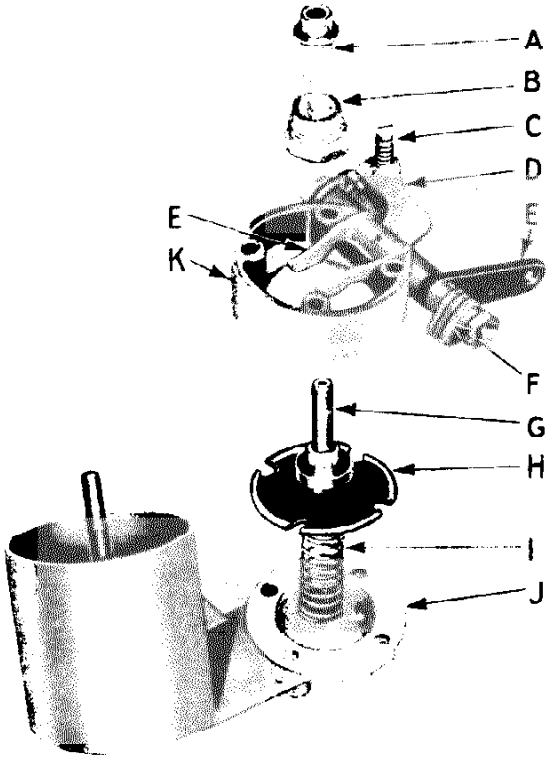

Figure E20
The carburettor diaphragm and jet assembly.

A. Jet bearing.
B. Jet bearing locknut.
C. Mixture adjusting screw.
D. Mixture adjusting dog lever.
E. Mixture operating lever.
F. Cold starting throttle operating cam.
G. Jet) One assembly.
H. Diaphragm)
I. Jet and diaphragm assembly return spring.
J. Foot of carburettor float chamber.

CHECKING AND CENTRALIZING THE PETROL JET Fig. E19

1. CHECKING

Utilizing the lift pin at the side of the carburettor, at the rear on the L.H. carburettor or in front of the R.H. carburettor, lift the sliding piston from the bridge in the air passage and then release the lift pin. When the petrol jet and tapered jet needle are concentric, the sliding piston will fall emitting a sharp "click" as the sliding piston contacts the bridge in the air passage, but when the sliding piston fails to return in this manner it may be due to one of three faults or a combination of two or more.

(i) The sliding piston sticking in the suction chamber.

(ii) A damaged taper jet needle.

(iii) A misplaced petrol jet.

2. STICKING PISTON

Remove the oil cap/damper assembly from the top of the suction chamber and the suction chamber from the top of the air passage body by withdrawing three screws. It is worthwhile noting the torque required to slacken off these screws, for if one is slacker than the other two, this might well be the cause of the sticking piston. Remove the spring and withdraw the sliding piston and needle assembly from the bore in the air passage body, empty away the damper oil, clean and examine the large circumferential piston face for high spots by returning it to the suction chamber to determine its freedom of movement.

When any obstruction is perceived the sliding piston and suction chamber can be treated with the judicious use of a fine swiss file or a scraper and on replacement the sluggish operation may have disappeared.

3. DAMAGED NEEDLE

When the sliding piston moves freely in the suction chamber, remove the tapered jet needle from the bottom of the sliding piston by slackening the sunken jet screw, examine it for damage and misalignment; when any doubt exists as to its condition a replacement jet needle of the same type must be fitted. The piston and suction chamber are thoroughly cleaned and with the new jet needle fitted returned to the air passage body omitting the oil in the dash pot and rechecked for petrol jet concentricity.

4. CARBURETTOR REMOVAL

It may now be found that the sluggish operation has disappeared but if still persistant the carburettor must be removed from the inlet manifold and the petrol jet recentred.

5. CENTRING THE PETROL JET Fig. E20

Scribe a line across the arm of the float chamber, the jet diaphragm housing and the boss at the bottom of the air passage body, these indentification marks will facilitate replacement of the components. Detach the float chamber from the air passage body by withdrawing the four screws, exercising care not to displace the jet diaphragm between the float chamber arm and the underside of the diaphragm housing and to control the jet return spring. Utilizing a soft pencil transfer the scribed identification marking onto the diaphragm. Withdraw the petrol jet and diaphragm assembly followed by the diaphragm housing and slacken the jet bush bearing lock nut.

Insert the petrol jet and diaphragm assembly into the jet bush bearing so that the identification mark on the diaphragm aligns with that on the body, this is important. Press the petrol jet into the bush bearing with thumb pressure exercising care not to displace the radial position of the diaphragm. Raise the piston and needle assembly and allow it to fall sharply when the thicker portion of the tapered jet needle will move the petrol jet and its bush bearing to a more central position.

Carefully withdraw the petrol jet and diaphragm assembly, so as not to disturb the lateral position of its bush bearing and "nip up" the bush bearing locknut. Replace the petrol jet and diaphragm assembly and repeat the sequence detailed in the previous paragraph. Withdraw the petrol jet and diaphragm assembly and fully tighten the jet bearing locknut.

Fit the diaphragm housing followed by the jet and diaphragm assembly in such a manner that the jet engages its actuating lever and the pencil identification mark aligns with that on the diaphragm housing and air passage body. Fit the float chamber according to its identification mark and secure with four screws. A final check is made to ensure that the petrol jet is concentric to the tapered jet needle.

When there is any indication of contact between the petrol jet and tapered jet needle still persisting, which sometimes occurs due to displacement of the jet bush bearing during the final tightening of its locknut, the petrol jet centring operation must be repeated until perfection is achieved.

DISMANTLING AND ASSEMBLING
CARBURETTOR Fig. E21

1. PETROL JET, BEARING AND MIXTURE CONTROL LEVERS

Scribe a line across the arm of the float chamber, the jet diaphragm housing, and the boss at the bottom of the air passage body, these identification marks will facilitate the replacement of these components. Detach the float chamber from the air passage body by withdrawing four screws, exercising care not to displace the jet diaphragm between the float chamber arm and the underside of the diaphragm housing and to control the jet return spring. Utilizing a soft pencil transfer the scribed identification marking onto the underside of the diaphragm. Withdraw the petrol jet and diaphragm assembly followed by the diaphragm housing and mixture control levers. Remove the jet actuating lever spindle by detaching the end nut, cam assembly, distance pieces, mixture control lever, lever stop, jet actuating lever, mixture adjusting lever and spring by ejecting the pin in the jet actuating lever. Withdraw the petrol jet bush bearing from inside the boss of the air passage boss by removing the jet bearing locknut.

2. FLOAT CHAMBER

Remove the float chamber cover from the top of the float chamber detaching the cap nut. Remove the forked lever from the underside of the float chamber cover by ejecting its fulcrum pin toward its serrated end. Withdraw the needle valve assembly from the underside of the float chamber cover by unscrewing. Remove the float from the centre pillar in the float chamber.

3. SUCTION CHAMBER, PISTON AND JET NEEDLE

Remove the oil cap/damper assembly from the top of the suction chamber and the suction chamber from the top of the air passage body by withdrawing three screws. Remove the sliding piston return spring and needle assembly from the bore in the air passage body. Detach the taper jet needle from the bottom of the sliding piston by slackening the sunken jet screw.

4. THROTTLE BUTTERFLY VALVE AND INTER CONNECTION MIXTURE LINKAGE

Identify the short end of the throttle spindle to that side of the body. Remove the throttle butterfly valve and stop levers from the throttle spindle by slackening the pinch bolt and ejecting the pin respectively. Close the split shanks of the two throttle disc screws together and withdraw the throttle disc by removing the two screws. Withdraw the throttle spindle and prise out the spindle gland shrouds, springs, dished washers and cork glands. Withdraw the push rod with cam shoe attached by removing the cheese headed screw, top plate, adjusting screw and spring, exercising care to control the return spring fitted at the top end of the push rod. Detach the cam shoe at the bottom of the push rod by withdrawing a second cheese headed screw.

5. AIR PASSAGE BODY

Remove the piston lift pin and spring from the air passage body by withdrawing a split pin. Withdraw the spring loaded slow running screw.

6. ASSEMBLING

The assembling of the carburettor is the reversal of the dismantling sequence but particular attention must be given to the following points.

(i) That the throttle spindle is inserted in the air passage body in accordance with the identification mark.

(ii) That when fitting the throttle valve disc the two securing screws are first left loose. Then fully open the throttle and then close smartly with some force, in order to centre the throttle disc in the air passage, tighten the two screws and observe if any light can be seen around the edge of the disc, when light is observed the disc must be re-centred then open the shanks of the two screws slightly with a screwdriver blade.

(iii) That the tapered jet needle is fitted to the sliding piston so that its shoulder or the bottom edge of the groove is level with the bottom of the piston.

(iv) That the petrol jet and diaphragm is fitted according to its identification mark or when a replacement is fitted its diaphragm is marked so that it can always be returned to that particular position and then centred.

(v) That the jet actuating lever is fitted, in the diaphragm housing, between the forked end of the mixture adjusting lever in such a manner that the spring loaded screw of the latter is upward and then rivetted in position.

(vi) That the mixture stop lever is fed on the mixture spindle projection side first, followed by a distance piece, the mixture control lever, a second distance piece, the cam assembly so that the lobes point toward the diaphragm housing, a third distance piece and secured with the nut.

(vii) That the diaphragm housing is fitted so that the jet actuating lever contacts the petrol jet and together with the arm of the float chamber and the boss of the air passage body the identification marks align.

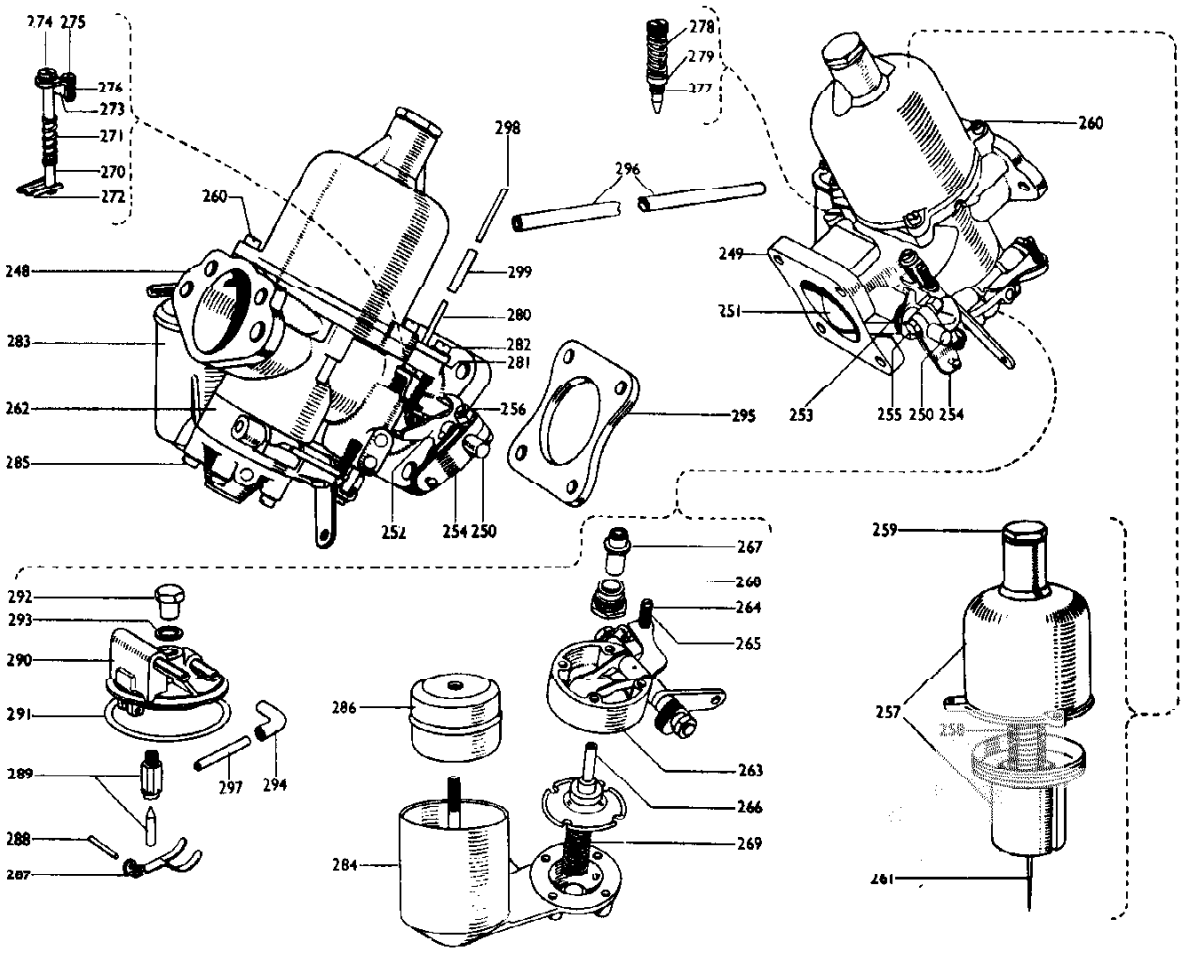

Figure E21

Exploded view of the S. U. HD. 6 semi down-draught carburettors.

248. L.H. carburettor air passage body.
249. R.H. carburettor air passage body.
250. Throttle butterfly spindle.
251. Butterfly valve disc.
252. L.H. throttle stop.
253. R.H. throttle stop.
254. Throttle lever and ball pin assembly.
255. Throttle lever pinch bolt.
256. Pinch bolt nut.
257. Suction chamber and piston assembly
258. Piston return spring.
259. Oil cap/damper assembly.
260. Suction chamber screw.
261. Tapered jet needle.
262. L.H. diaphragm housing assembly.
263. R.H. diaphragm housing assembly.
264. Mixture adjusting screw.
265. Mixture adjusting screw spring.
266. Jet and diaphragm assembly.
267. Jet bearing.
268. Jet bearing locknut.
269 Jet return spring.
270. Cold starting push rod.
271. Push rod return spring.
272. Cam shoe.
273. Cold starting throttle top plate.
274. Top plate screw.
275. Cold starting throttle adjusting screw.
276. Cold starting throttle adjusting screw spring.
277. Slow running screw.
278. Slow running screw spring.
279. Neoprene gland washer.
280. Auto-ignition adaptor plate and tube.
281. Joint washer.
282. Adaptor plate screw.
283. L.H. float chamber.
284. R.H. float chamber.
285. Float chamber screw.
286. Petrol float.
287. Float hinged lever.
288. Hinged lever pin.
289. Needle valve assembly.
290. R.H. float chamber cover.
291. Float chamber joint washer.
292. Float chamber cap nut.
293. Aluminium washer.
294. Overflow bend pipe assembly.
295. Carburettor distance piece.
296. Petrol inter-connection pipe.
297. Float chamber overflow pipe.
298. Auto-ignition suction pipe.
299. Rubber connector.

THE INLET MANIFOLD

DESCRIPTION Fig. E22.

The inlet manifold is an aluminium casting which incorporates the contact faces for both cylinder heads being secured to the latter by bolts with a gasket to effect a gas tight seal. Cast in the top of each cylinder porting is the cylinder identification number, these numbers are handed as viewed from the drivers seat with the lesser numbers at the front of the engine.

Also incorporated in the design of the inlet manifold is a jacketed mounting for the two carburettors and heat from the engine side of the thermostat will maintain the ingoing petrol/air mixture at a constant temperature. The fluid inlet of the jacket is situated low on the L.H. side of the combined carburettor mounting while the outlet is high on the front face and is connected to the impellor pump of the cooling system by a rigid pipe.

The carburettor mounted on the L.H. side of the air manifold feeds the:

No. 2L and No. 1R cylinders in front of the carburettor.

No. 4L and No. 3R cylinders at the rear of the carburettor.

While the carburettor mounted on the R.H. side of the air manifold feeds the:

No. 1L and No. 2R cylinders in front of the carburettor.

No. 3L and No. 4R cylinders at the rear of the carburettor.

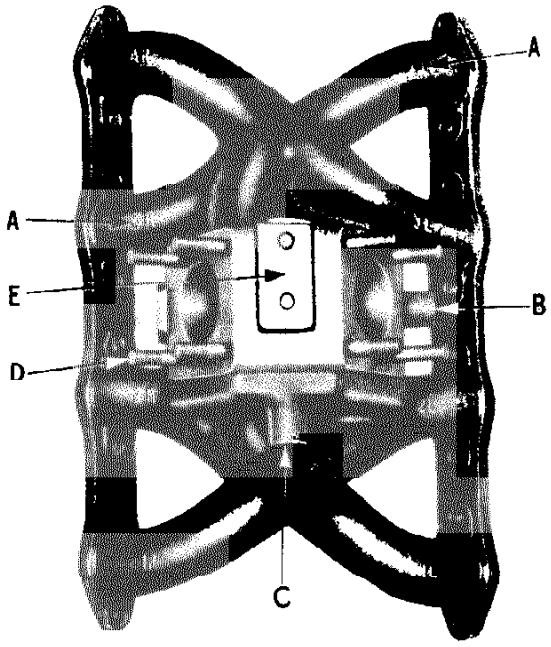

Figure E22.
Inlet manifold as viewed from front of car.

A. Cylinder identification letters.
B. Coolant inlet to carburettor mounting.
C. Coolant outlet to coolant pump.
D. Carburettor mounting studs.
E. Carburettor linkage, mounting spot face.

THE INLET MANIFOLD BOLTS

FIRST 500 MILES (805 kms)

The inlet manifold bolts must be tightened after the first 500 miles (805 kms) of running whenever replacement gaskets have been fitted.

THE COOLING SYSTEM CONNECTION PIPES

The carburettor mounting on top of the inlet manifold is connected to the cooling system. It will be necessary, therefore, to partially drain the cooling system before removing the inlet manifold.

REMOVAL AND REPLACEMENT
INLET MANIFOLD

While it is not impossible to remove the inlet manifold with the two carburettors in situ, their removal is detailed hereafter as it is assumed that a replacement inlet manifold is required.

1. COOLING SYSTEM

Drain the cooling system and detach the necessary pipes as detailed in the COOLING SYSTEM, SECTION 'C'.

2. CARBURETTOR AIR CLEANERS

Remove the air cleaners from the carburettors and rocker covers as detailed on page E15.

3. CARBURETTORS AND LINKAGE

Remove the carburettors and linkage from the inlet manifold.

4. INLET MANIFOLD

Detach the inlet manifold from the two cylinder heads by withdrawing sixteen bolts, eight from each side.

5. REPLACEMENT

The replacement of the inlet manifold is the reversal of the removal sequence but particular attention must be given to the following points:-

(i) That whenever the carburettors have been removed their synchronisation must be checked.

(ii) That after 500 miles(805 kms) have been completed the inlet and carburettor securing details are tightened.