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SU CARBS

22 Carburetto SU type HD 6 and HS 6 - general description

1 The 3.4 and 3.8 liter and the 34-0 models are fitted with twin SU type HD 6 carburettors whilst the 240 model has twin SU HS 6 carburettors. these are illustrated in Figs,3.13 and 3.14. They are generally similar in appearance and operation the main difference in construction being that in the case of the HD 6 rhe jet is fixed and the mixture is controlled by an external screw and lever (item B in Fig.3.281 whilst in the HS 6 type the position of the jet in relation to the needle can be adjusted by means of an adjusting nut at the base of the carburettor and this movement of the jet controls the mixture.

2 These variable choke carburettors differ from most other makes in that, instead of having a number of various sized fixed jets for different conditions, only one variable jet is fitted to deal with all possible conditions.

3 Air passing rapidly through the carburettor draws petrol from the jet so forming the petrol/air mixture. The amount of petrol drawn from the jet depends on the position of the tapered carburettor needle, which moves up and down the jet orifice according to the engine load and throttle opening, thus effectively altering the size of the jet so that exactly the right amount of petrol is metered for the prevailing conditions.

4 The position of the tapered needle in the jet is determined by engine vacuum. The shank of the needle is held at its top end in a piston which slides up and down the dashpot in response to the degree of manifold vacuum.

5 With the throttle fully open, the full effect of inlet manifold vacuum is felt by the piston which has an air bleed into the choke tube on the outside of the throttle. This causes the needle to rise fully bringing the needle with It. With the accelerator partly closed only slight inlet manifold vacuum is felt by the piston (although of course, on the engine side of the throttle the vacuum is greater), and the piston only rises a little, blocking most of the jet orifice with the metering needle.

6 To prevent the piston fluttering and giving a richer mixture when the accelerator pedal is suddenly depressed, an oil damper and a light spring are fitted inside the dashpot.

7 The only part of the piston assembly to come into contact with the piston chamber or dashpot is the actual piston rod. All other parts of the piston assembly, including the lower choke portion, have sufficient clearance to prevent metal to metal contact which is essential if the carburettor is to function correctly.

8 The correct level of the petrol in the carburettor is determined by the level of the float in the float chamber. When the level is correct, the float, by means of a lever resting on top of it, closes a needle valve in the cover of the float chamber and this cuts off the supply of fuel from the tank. As fuel is used in the carburettor, the float drops and in so doing the float needle is unseated and allows more fuel to enter the float chamber.

9 The HD 6 carburettors employ a separate starting car-burettor. But with the HS 6 model the rich mixture for starting is obtained by manually pulling down the jet to a smaller diameter of the needle.

23 Carburettor (SU) - removal and replacement

Disconnect the battery (for HD 6 carburettors) as a safety measure.

2 Undo the butterfly nut to the center bolt of the air cleaner and lift out the air cleaner.

3 Undo the two bolts securing the air intake pipe to the carburettors and remove the pipe.

4 Disconnect the lead from the auxiliary starting carburettor to the thermostatic switch on the inlet manifold (HD 6 carburettors only).

5 Disconnect the auxiliary starting carburettor to manifold connection (HD 6 carburettors only).

6 Remove the split pin, plain and spring washers from the connecting link pivot located on the manifold between the front and rear carburettors and disconnect the throttle link rod joint from the ball pin on the bell crank lever.

7 disconnect the choke cable and the throttle linkage from the pivot pin between the carburettors IHS 6 carburettors only).

8 If automatic transmission is fitted, remove the spring clip which secures the kick down rod to the front carburettor.

9 Disconnect the distributor vacuum pipe from the front carburettor.

10 Disconnect the accelerator return spring if fitted to the particular model.

11 Remove the clip which attaches the float chamber overflow pipes to the oil filter.

12 Remove the nuts and washers securing each carburettor to the inlet manifold.

13 Remove the carburettors together with the insulating distance pieces.

14 Refitting is the reverse of the removal procedure, but particular attention must be paid to the throttle linkage setting of the carburettors.

15 The following paragraphs 16 - 20 inclusive refer to the HD 6 carburettor.

16 With the front carburettor coupling and the rear carburettor throttle lever released, check that both butterflies are fully closed and that the rear carburettor coupling is clearing the manifold nut.

17 With both carburettors fully dosed, re-tighten the front coupling.

18 Refer to Fig.3. 15. Unscrew the intermediate throttle stop and push down on the belt crank lever until center "A" is 1/16" (1.6 mm) below a line from center "B" to the pivot center. When in this position, screw down the stop on to the Inter-mediate throttle and lock in this position.

19 Lock the lever to carburettor spindle.

20 Ensure that when the throttle is closed, the intermediate lever does not foul the petrol connection.

21 Open the throttle fully and check that both carburet1on ere in the fully open position.

22 The following paragraphs 23 - 26 inclusive, refer to the HS 6 carburettor.

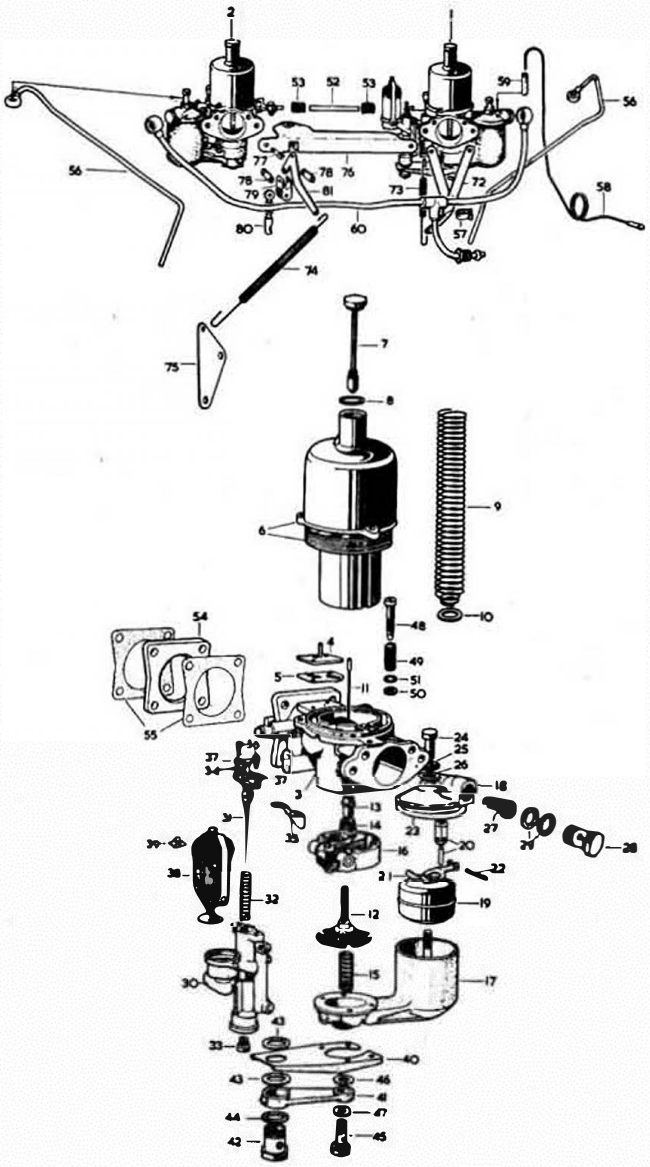

FIG.3.13. THE S.U. HD.6 CARBURETTOR (FRONT)

1 *Front carburettor*
2 *Rear carburettor*
3 *Carburettor body*
4 *Ignition union adaptor*
5 *Gasket*
6 *Suction chamber and piston*
7 *Damper*
8 *Washer*
9 *Spring*
10 *Skid washer*
11 *Jet needle*
12 *Jet*
13 *Jet bearing*
14 *Nut - jet bearing*
15 *Spring*
16 *Jet unit housing*
17 *Float chamber*
18 *Float chamber cover*
19 *Float*
20 *Float needle and seat*
21 *Float needle lever*
22 *Knurled pin*
23 *Gasket*
24 *Cap nut*
25 *Fibre serrated washer*
26 *Aluminium washer*
27 *Filter*
28 *Banjo bolt*
29 *Fibre washer*
30 *Auxiliary starting carburettor body*
31 *Auxiliary starting carburettor needle*
32 *Spring*
33 *Jet*
34 *Spring clip*
35 *Dust shield*
36 *Screw*
37 *Double coil spring washer*
38 *Solenoid*
39 *Spring clip*
40 *Bracket*
41 *Connecting arm*
42 *Banjo bolt*
43 *Fibre washer*
44 *Fibre washer*
45 *Banjo bolt*
46 *Fibre washer*
47 *Aluminium washer*
48 *Slow running control valve*
49 *Spring*
50 *Neoprene washer*
51 *Brass washer*
52 *Connecting rod*
53 *Connecting rod coupling*
54 *Manifold insulator*
55 *Gasket*
56 *Overflow pipe*
57 *Overflow pipe clip*
58 *Distributor vacuum suction pipe*
59 *Neoprene coupling tube*
60 *Petrol feed pipe*
72 *Front carburettor spring bracket*
73 *Front carburettor throttle spring*
74 *Throttle return spring*
75 *Return spring bracket*
76 *Throttle stop bracket*
77 *Dowel bolt*
78 *Link*
79 *Trunnion*
80 *Link rod*
81 *Throttle lever*

23 Set the throttle interconnecting clamping levers (item 7 in Fig.3.16) so that the link pin is 0.006" (0.15 mm) away from the lower edge of the fork as shown in the inset. Tighten the clamp bolts.
24 With the jet levers at their lowest position, set the jet interconnecting lever clamp bolts (item 8 in Fig.3.16) so that both jets commence to move simultaneously.
25 Reconnect the mixture control wire, with about 1/16" (1.6 mm) free movement, when the control lever in the car is set at "RUN", before it starts to move the jet levers.
26 Operate the mixture control lever in the car until the linkage is about to move the carburettor jets and then adjust the fast idle screws to give an engine speed of about 1000 rpm when hot.

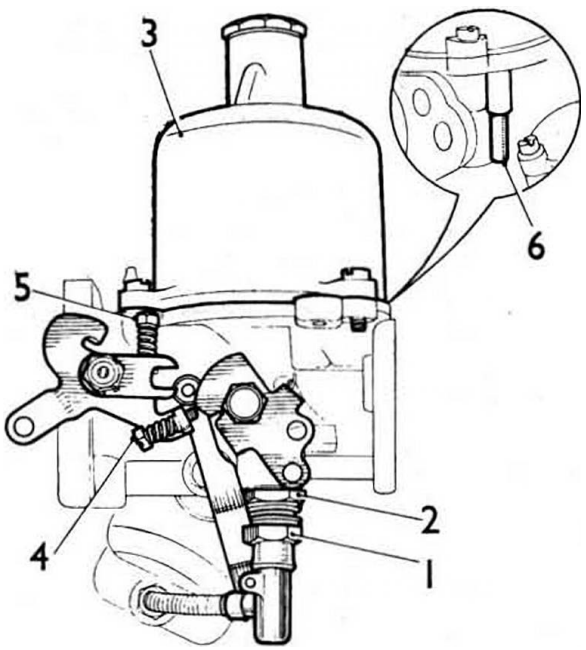

FIG.3.14. THE S.U. HS CARBURETTOR

1 Jet adjusting nut
2 Jet locking nut
3 Piston/suction chamber
4 Fast idle adjusting screw
5 Throttle adjusting screw
6 Piston lifting pin

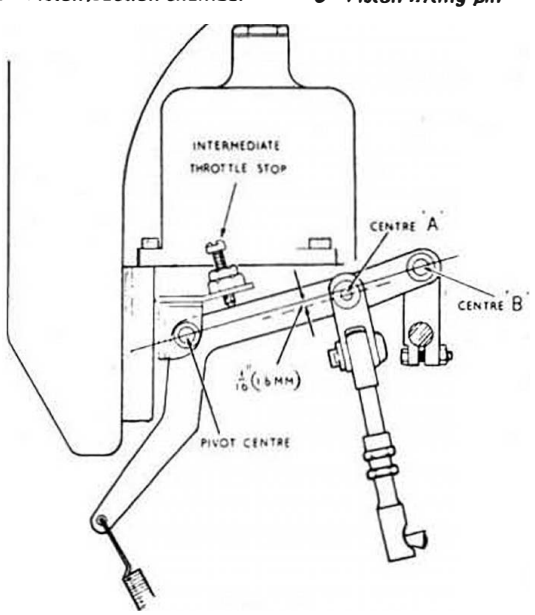

Fig.3.15. Throttle control linkage setting HD6 carburettor

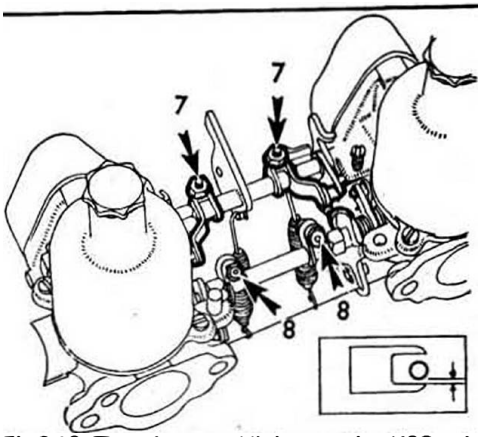

Fig.3.16. Throttle control linkage setting HS6 carburettor

24 Carburettor HD 6 - dismantling and reassembly

1 Remove the starting carburettor from the carburettor by undoing the banjo bolt (item 42 in Fig.3.13). From this point onwards both front and rear carburettors can be treated in a similar manner.
2 Unscrew the damper and remove it together with its washer.
3 Using a small file or scriber, scratch identification marks on the suction chambers so that they may be fitted together again in their original position.
4 Remove the three suction chamber retaining screws and remove the suction chamber from the body leaving the piston in position. Be careful when lifting off the suction chamber not to apply side loads to the piston otherwise the piston needle may be bent.
5 Lift the piston spring from the piston noting which way round it is fitted.
6 Remove the piston and invert it to allow the oil in the damper bore to drain out. Place the piston in a safe place so that the needle will not be damaged or that the piston roll onto the floor. It is suggested that the piston be placed on the neck of suitable sized jar with the needle inside, so acting as a stand.
7 It is recommended that, unless absolutely necessary, the needle is not separated from the piston. However, if the needle must be removed, slacken the retaining screw in the side of the piston body and remove the needle.
8 Mark the position of the float chamber lid in relation to the body. Undo the cap nut and remove together with the washer. Lift off the float chamber lid.
9 Withdraw the pin from the float chamber lever and remove the lever. The pin is serrated and can be removed in one direction only.
10 Remove the float needle by unscrewing on the brass valve body, use the correct size spanner.
11 The float may be lifted out of the float chamber. Place it in a position where it will not be damaged.
12 Remove the banjo bolt from the base of the front carburettor, this will release the connecting arm for the starting carburettor. Note the fibre and aluminium washers.
13 Remove the four setscrews securing the float chamber to the body. On the front carburettor, these screws also secure the starting carburettor bracket.
14 Separate the float chamber from the body and this will free the jet spring, the jet and diaphragm and the jet housing which may now be lifted away from the body.
15 Unscrew the jet bearing nut and lift out the jet bearing.
16 Unscrew the slow running control valve from the body and collect its neaprene and brass washers, note their positions for reassembly.
17 No further dismantling of the carburettor is necessary, indeed, it is rarely that dismantling beyond paragraph 11 will ever be required.
18 Reassembly is the reverse of the above. Fit new washers throughout. The jet needle must be reassembled in the piston in the manner described in Section 33. The jet must be centred as

described in Section.
19 Finally, and before fitting the suction chamber fill the piston damper bore to within ½" of its top with SAE 20 engine oil. Wipe any spillage off the outside of the piston. After fitting the suction chamber, raise the piston by means of the lifting pin and check that it falls back smartly on to the upper face of the body. Any sluggishness, assuming all other factors to be correct, will probably be due to oil on the outside of the piston.

25 Carburettor HS 6 - dismantling and reassembly

1 Refer to Fig.3.17.
2 Remove the baffle plate from the inlet nozzle on those carburettors fitted with "push-on" type petrol feed pipe.
3 Thoroughly clean the outside of the carburettor.
4 Mark the relative positions of the suction chamber and the carburettor body.
5 Remove the damper and its washer.
6 Unscrew the three suction chamber retaining screws and lift off the chamber vertically so as not to put any side loads on the piston as may bend the needle.
7 Refer to Fig.3.18.
8 Remove the piston spring and washer (if fitted). Note which way round the spring is fitted.
9 Carefully remove the piston and invert it to allow the oil in the damper bore to drain out. Place the piston in a safe place so that the needle will not be damaged or that the piston will roll onto the floor. It is suggested that the piston be placed on the neck of a suitably sized jar with the needle inside, so acting as a stand.
10 It is recommended that, unless absolutely necessary, the needle is not removed from the piston. However, if the needle must be removed, slacken the retaining screw on the side of the piston and remove the needle. If the needle cannot easily be removed, tap the needle inwards first and then pull outwards. Do not bend the needle.
11 If a piston lifting pin with an external spring is fitted, remove the spring retaining circlip and spring, then push the lifting pin upwards to remove it from its guide. With the concealed spring type, press the pin upwards, detach the circlip from its upper end, and withdraw the pin and spring downwards.
12 Refer to Fig.3.19.
13 Support the moulded base of the jet and slacken the screw retaining the jet pick-up link.
14 Relieve the tension of the pick-up lever spring from the screw and remove the screw and brass bush (when fitted).
15 Unscrew the brass sleeve nut retaining the flexible jet tube to the float chamber and withdraw the jet assembly from the carburettor body. Note the gland, washer and ferrule at the end of the jet tube.
16 Remove the jet adjusting nut and screw. Unscrew the jet locking nut and detach the nut and jet bearing. Withdraw the bearing from the nut, noting the brass washer under the shoulder of the bearing.
17 Refer to Fig.3.20.
18 Note the location points of the two ends of the pick-up lever return spring. Unscrew the lever pivot bolt together with its double coil spring washer, or spacer. Detach the lever assembly and return spring.
19 Note the location of the two ends of the cam lever spring and push out the pivot bolt tubes, taking care not to lose the spring. Lift off the cam lever noting the skid washer between the two levers.
20 Refer to Fig.3.21.
21 Slacken and remove the bolt retaining the float chamber to the carburettor body. Note the component sequence with flexibly mounted chambers.
22 Mark the location of the float chamber lid. Remove the lid retaining screws and detach the lid and its gasket complete with the float assembly.
23 Push out the float hinge pin from the end opposite to its serrations and detach the float.
24 Extract the float needle from its seating and unscrew the seating from the lid using the correct sized spanner (a box spanner will be found to be the most suitable tool). Do not distort the seating.
25 Refer to Fig.3.32.
26 Close the throttle and mark the relative position of the throttle disc and the carburettor flange.
27 Unscrew the two disc retaining screws. Open the throttle and ease out the disc from its slot in the throttle spindle. The disc is oval and will jam if care is not taken.
28 Tap back the tabs of the tab washer securing the spindle nut. Note the location of the lever arm in relation to the spindle and carburettor body, remove the nut and detach the arm.
29 Reassembly is the reverse of the above. Fit new washers throughout. The jet needle must be assembled in the position in the manner described in Section 33. The jet must be centred as described in Section 32.
30 Finally, and before fitting the piston damper, top up the piston damper tube with SAE 20 oil until the level is ½" (12.7 mm) above the top of the piston rod.

26 Carburettor SU - examination and repair

The SU carburettor, generally speaking is most reliable and it is very rarely that you would have to completely dismantle it in the manner described in Section 24 and 25. However, after a long period of use some deterioration must be expected, therefore, when the time arrives for a major overhaul of the engine, serious consideration should be given to replacing the carburettors with factory reconditioned items. The carburettor may develop one or more of several faults which may not be readily apparent without careful examination. The common faults to which the carburettor is prone are:-

1 Piston sticking.
2 Float needle sticking.
3 Float chamber flooding.
4 Water and dirt in the carburettor.

In addition the following parts are susceptible to wear after high mileage and as they will affect fuel consumption they should be checked and rectified at, say every other 10,000 mile servicing.
a) The carburettor needle: if the carburettor has not been correctly assembled at some time so that the needle has not been truly central in the jet orifice it will be found that the needle will have a tiny ridge on it. If this is noted, the needle must be replaced with one of a similar type (identification letters are stamped on the flat of the needle). As the needles are made to very fine tolerances, no attempt should be made to clean out the ridge or to rub down the needle with emery cloth. If the needle requires cleaning this can be done by rubbing very lightly with metal polish.
b) The carburettor jet: If the needle is worn it is likely that the rim of the jet will be damaged where the needle has been striking it. It should be renewed as wear in the jet will result in high fuel consumption. The jet may also become worn or ridged on the outside where it has been sliding up and down between the jet bearing every time the choke is pulled out. Renewal is the only remedy.
c) The edges of the throttle and the choke tube may become worn. Renew as necessary.
d) The washers fitted to the base of the jet and under the float chamber lid may deteriorate and leak after long use and result in fuel leakage.
e) After high mileage the float chamber needle and seat may become ridged and if this occurs, flooding of the float chamber becomes a distinct possibility. Renew both the needle and the brass seating.

27 Carburettor SU - piston sticking

1 The hardened piston rod which slides in the centre guide tube of the suction chamber is the only part which should make

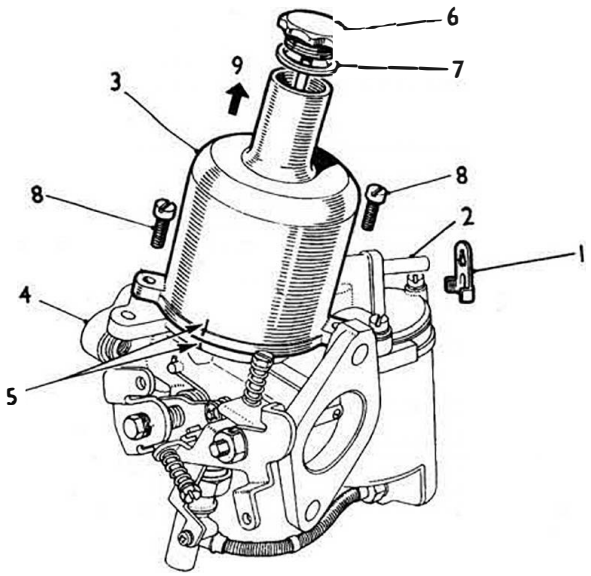

FIG. 3.17. DISMANTLING THE HS6 CARBURETTOR - STAGE 1

1 *Baffle plate*
2 *Inlet nozzle*
3 *Suction chamber*
4 *Carburettor body*
5 *Marks for replacement*
6 *Damper*
7 *Damper washer*
8 *Chamber retaining screws*
9 *Direction of removal*

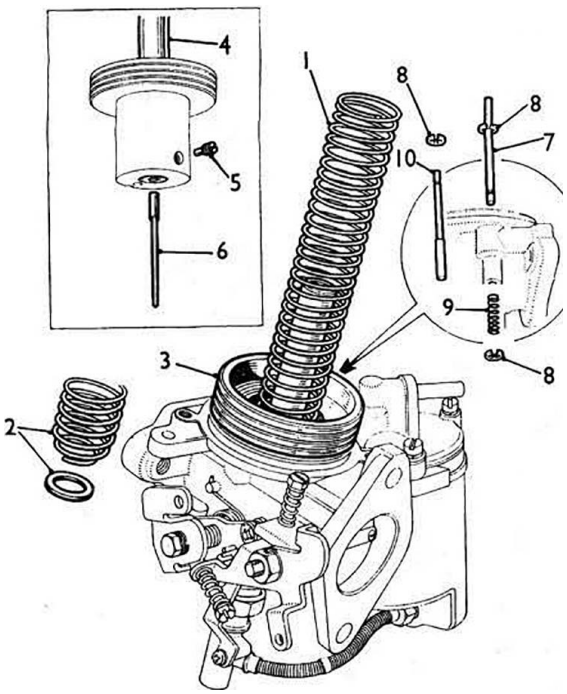

FIG. 3.18. DISMANTLING THE HS6 CARBURETTOR - STAGE 2

1 *Piston spring*
2 *Alternative spring with washer*
3 *Piston assembly*
4 *Piston rod*
5 *Needle locking screw*
6 *Needle*
7 *Piston lifting pin*
8 *Circlip for pin*
9 *Spring for pin*
10 *Alternative lifting pin*

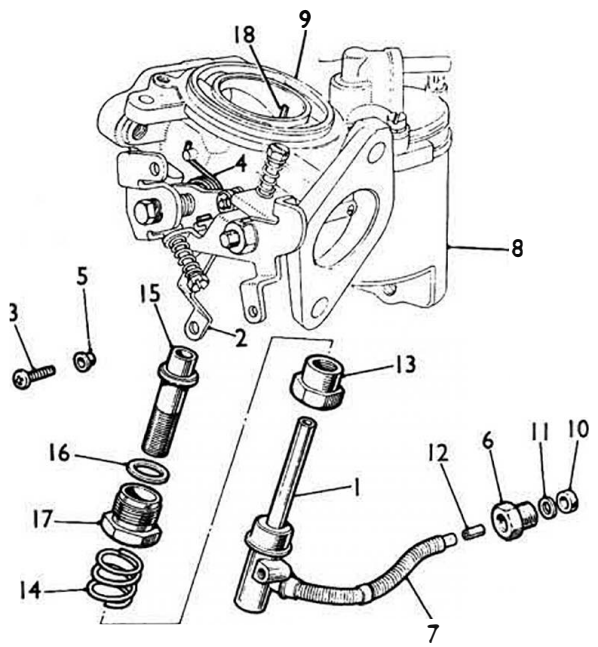

FIG. 3.19. DISMANTLING THE HS6 CARBURETTOR - STAGE 3

1 *Jet assembly*
2 *Pick-up link*
3 *Link retaining screw*
4 *Pick-up lever return spring*
5 *Brass bush*
6 *Sleeve nut*
7 *Flexible jet tube*
8 *Float chamber*
9 *Carburettor body*
10 *Gland*
11 *Washer*
12 *Ferrule*
13 *Jet adjusting nut*
14 *Spring for nut*
15 *Jet bearing*
16 *Brass washer*
17 *Jet locking nut*
18 *Piston key*

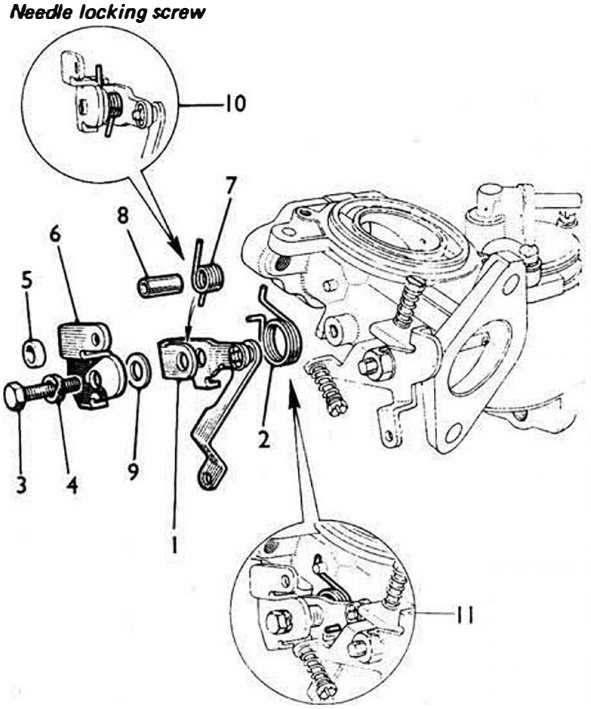

FIG. 3.20. DISMANTLING THE HS6 CARBURETTOR - STAGE 4

1 *Pick-up lever*
2 *Lever return spring*
3 *Lever pivot bolt*
4 *Double coil spring washer*
5 *Spacer (alternative)*
6 *Cam lever*
7 *Lever spring*
8 *Pivot bolt tube*
9 *Skid washer*
10 *Cam lever spring location*
11 *Pick-up lever spring location*

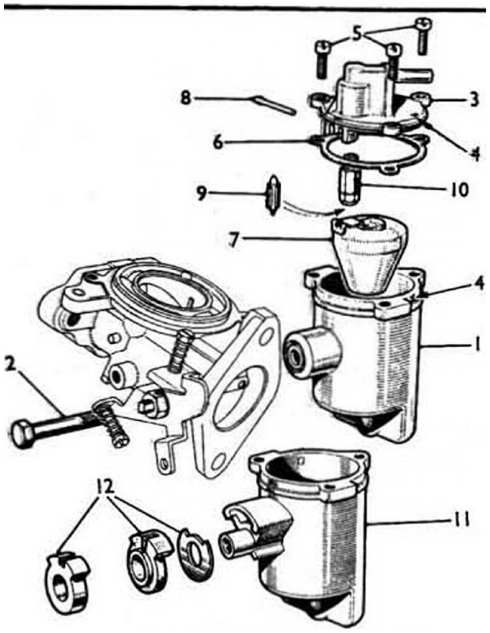

FIG. 3.21. DISMANTLING THE HS6 CARBURETTOR - STAGE 5

1 Float chamber
2 Retaining bolt
3 Float chamber lid
4 Marks for replacement
5 Lid retaining screws
6 Lid gasket
7 Float
8 Float hinge pin
9 Float needle
10 Needle seating
11 Alternative float chamber
12 Alternative spacers

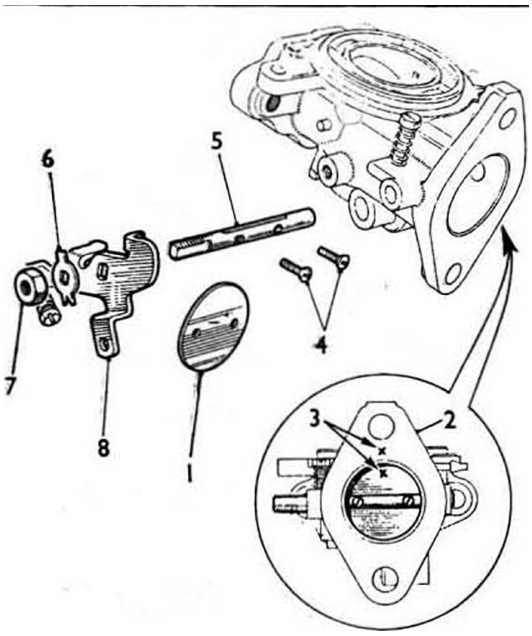

FIG. 3.22. DISMANTLING THE HS6 CARBURETTOR - STAGE 6

1 Throttle disc
2 Carburettor flange
3 Marks for replacement
4 Disc retaining screws
5 Throttle spindle
6 Tab washer
7 Spindle nut
8 Lever arm

contact with the suction chamber.

2 Corrosion of the piston rod is not uncommon and this will prevent free movement of the piston. Tha corrosion can be cleared by careful rubbing with metal polish or, in extreme cases, by very light rubbing with 00 crocus paper.

3 Check thet the rim of the piston is not burred as the result of a knock or having been dropped. Burrs can be removed by rubbing with fine emery cloth.

4 After high mileage wear in the centre guide tube may allow the piston to touch the wall of the suction chamber and this will cause obstruction to free movement of the piston.

5 Great care should be taken to remove only the minimum amount of metal when freeing the piston as the parts are made to very fine tolerances and too large a gap will cause air leakage and ill upset the function of the carburettor. Clean down the walls of the suction chamber and the piston rim and ensure there is no oil on them. A trace of light oil may be applied to the piston rod.

6 If the piston is sticking, under no circumstances try to clean it by stretching the return spring.

28 Carburettor SU - float needle sticking

1 If the float needle sticks, the carburettor will soon run dry and the engine will stop.

The easiest way to check for a sticking needle is to disconnect the fuel inlet pipe to the carburettor, check that the gear lever is in "neutral" or, for automatic transmission that it is in "N" or "P", guide the fuel pipe into a wad of rag or into a container, and press the starter solenoid button. If fuel is passed, the fault is almost certainly a sticking needle.

2 Remove the float chamber lid, dismantle the needle valve and clean the housing and float chamber thoroughly.

29 Carburettor SU - float chamber flooding

If fuel emerges from the small breather hole in the cover of the float chamber this is known as flooding. It can be caused by the float chamber needle not seating properly in its housing and this is usually due to a piece of dirt or foreign matter which has passed the filters and has become jammed between the needle and its seating in the housing. Alternatively the float may have developed a leak so that it is not rising to operate the float needle lever, this fault can be determined by removing the float and shaking it, any sound of liquid inside the float indicates that it is faulty.

It may be that the setting of the float needle lever in relation to the float chamber cover, is incorrect. Refer to Fig 3.23 in the case of the HD 6 carburettor. The lever clearance should be as shown (use the shank of a 7/16" drill as the test ber) when the lever is lightly pressed on to the needle. If adjustment is required, hold the flat portion with a pair of pliers and bend only at the positionshown. In the case of HS 6 carburettors refer to Fig.3.24. The clearance indicated by the arrow should be 1/8" to 3/16" (3.2 to 4.8 mm) when the needle valve is held in the shut-off position by the weight of the float only. The clearance is adjusted by bending at the crank.

30 Carburettor SU - water or dirt in the carburettor

1 Because of the size of the jet orifice,water or dirt in the carburettor is usually self clearing with only a momentary noticeable affect on the engine performance. However, if dirt in the carburettor is suspected, lift the piston and flood the float chamber. The normal level of the fuel should be about 1/16" below the top of the jet so that on flooding the carburettor the fuel should flow out of the jet hole.

2 If little or no petrol appears, start the engine (because of the needle, the jet will never be completely blocked) and with the throttle fully open place your hand over the air intake, leave in position momentarily and then remove it. The vacuum caused by this action will help suck out any foreign matter, repeat this procedure two or three times and then check for flow of fuel as described in the first paragraph of this Section.

3 In the event of the above action failing to clear the jet (and this is unlikely) you will have to remove and blow out the jet.

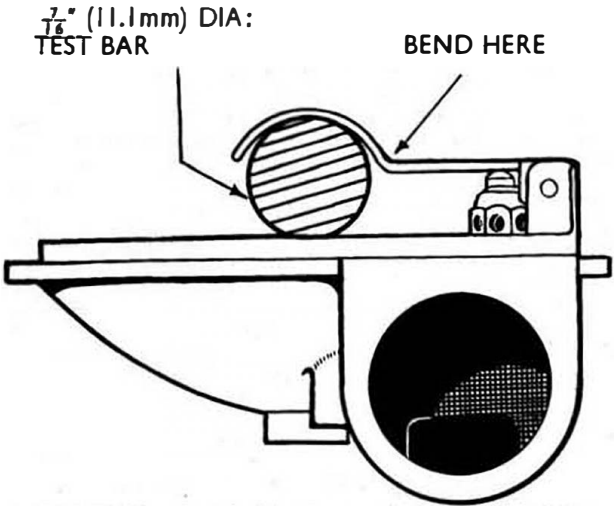

Fig.3.23. Checking the float lever setting HD6 carburettor

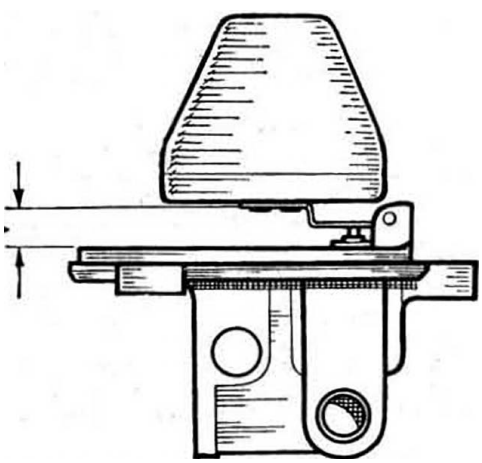

Fig.3.24. Checking the float lever setting HS6 carburettor

31 Carburettor HD 6 - jet centring

Warning: Take care not to bend the needle when carrying out this operation.

1 Remove the carburettor from the engine as described in Section 23.
2 Remove the piston damper.
3 Remove the four setscrews securing the float chamber to the carburettor body, detach the float chamber and remove the jet housing and the jet.
4 Using a ring spanner, slacken the jet locking nut approximately half a turn.
5 Refer to Fig.3.15. Replace the jet and diaphragm assembly. Push the jet and diaphragm assembly as high as possible with hand pressure and at the same time press the piston down onto the jet bridge, using a pencil or a piece of rod for this. Centralisation will be helped by lightly tapping on the side of the carburettor body.
6 Tighten the jet locking nut.
7 The actual centring must be carried out with the setscrew holes in the jet diaphragm and carburettor in alignment. After tightening the jet locking nut the jet diaphragm must be kept in the same position relative to the carburettor body and to do this it is advisable to mark one of the corresponding jet diaphragm and carburettor setscrew holes with a soft pencil. Centring will be upset if the diaphragm is moved radially after tightening the jet nut.
8 The jet is correctly centred when the piston falls freely and hits the jet "bridge" with a metallic click. Check if there is any difference in the sound of the piston hitting the bridge with the jet in its highest and lowest positions. If there is any difference in the sound, the procedure for centralising the jet will have to be repeated.
9 If difficulty in centring the jet is encountered after carrying out above procedure, it is permissable to lower the jet needle slightly in the position to make centralising more positive. The needle must, however, be restored to its normal position when checking the centralisation.
10 Top up the damper with SAE 20 engine oil.

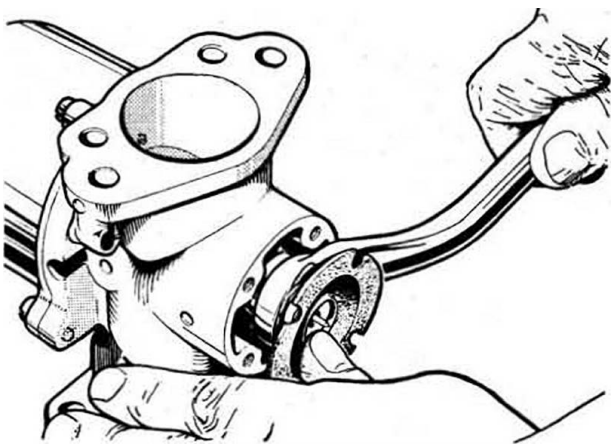

Fig.3.25. Centring the jet HD6 carburettor

32 Carburettor HS 6 - jet centring

Warning: Take care not to bend the needle when carrying out this operation.

1 Remove the carburettor from the engine as described in Section 23.
2 Remove the piston damper.
3 Remove the jet head screw to release the control linkage.
4 Refer to Fig.3.26. Withdraw the jet, disconnecting the fuel feed pipe union in the float chamber and removing the rubber sealing washer.
5 Remove the jet locking spring and adjusting nut.
6 Replace the jet and insert the fuel feed pipe connections into the float chamber.
7 Slacken the jet locking nut until the assembly is free to rotate.
8 Apply pressure to the top of the piston rod using a pencil or a piece of rod.
9 Tighten the jet locking nut at the same time keeping the jet hard up against the jet bearing.
10 The jet is correctly centred when the piston falls freely and hits the jet bridge with a metallic click. Check if there is any difference in the sound of the piston hitting the bridge with the jet in its highest and lowest position. If there is any difference in the sound the procedure for centralising the jet will have to be repeated.
11 If difficulty in centring the jet is encountered, it is permissible to lower the needle slightly in the piston to centralisation. The needle must be restored to its normal position for checking the centralisation.
12 Refit the jet locking spring when centralisation is correct. Before replacing the fuel feed pipe line into the float chamber fit the rubber sealing washer over the end of the plastic pipe so that at least 3/16" (4.8 mm) of pipe protrudes (see inset, Fig.3.26).
13 Top up the damper with SAE 20 engine oil.

33 Carburettor SU - needle replacement

The needle size is determined during engine development and

will provide the correct mixture strength unless extremes of temperature, humidity or altitude are encountered. A different needle to that specified may be required if any alteration to the standard specification of the exhaust system, air cleaner, camshaft or compression ratio is made.

1 Remove the suction chamber and piston assembly.

2 Slacken the needle clamping screw in the side of the body of the piston and pull out the old needle. If the needle is tight it can probably be loosened by moving it inwards and then pulling out.

3 The needle type letter is stamped on the shank of the needle, check that this corresponds with the item being fitted.

4 Fit the needle to the piston assembly so that it is positioned as shown in Fig.3.27. Another type of needle, not illustrated, has a groove instead of the shoulder depicted, the correct position for this type of needle is for the bottom edge of the groove to be level with the bottom edge of the piston rod.

5 Correct positioning of the needle in relation to the piston is essential otherwise the fuel/air mixture to the engine will be upset.

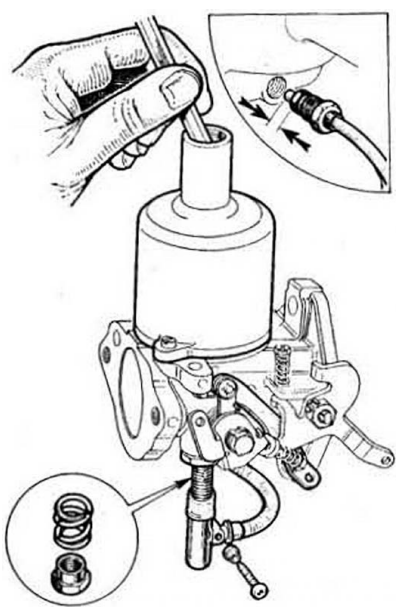

Fig.3.26. Centring the jet HS6 carburettor

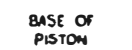

Fig.3.27. Location of the jet needle in the piston

34 Carburettors SU - adjustment and tuning - general

It is useless to attempt carburettor tuning until the cylinder compressions, valve clearances, spark plug gaps and contact breaker gaps have been tested, checked and adjusted as necessary. The distributor centrifugal advance mechanism and vacuum advance operation should be checked and ignition timing set to the correct figure. The ignition timing is important since if retarded or advanced too far the setting of the carburettors will be affected. Ensure that the needles are correctly located in the pistons (see Section 33). Check over the carburettors and ensure that the pistons are free in the suction chambers and that the piston dampers are topped up with engine oil SAE 20. Lubricate the throttle controls and check for free operation and travel. Check that petrol filters are clean.

35 Carburettors SU HD 6 - adjustment and tuning

Only two adjustments are provided at the carburettor as illustrated in Fig.3.28. These are (a) the slow running volume screw "A" and (b) the mixture adjusting screws "B" governing the idling speed and the mixture strength respectively. The design of the SU carburettor is such that correct mixture strength at idling speed ensures that the carburettors are correctly adjusted throughout their entire range.

1 Remove the air cleaner and air intake pipe .

2 Remove the suction chambers from the carburettors and screw out both mixture screws (B) until the tops of the jets are flush with the jet bridge in each carburettor body.

3 Screw in the mixture screws until the jets start to move and then screw in a further 3½ turns. Replace the pistons and suction chambers.

4 Slacken one clamp bolt on the coupling between the throttle spindles. Check that both butterfly valves are closed by rotating both throttle spindles clockwise when viewed from the front. Tighten the coupling clamp bolt.

5 Screw in the slot running volume screws (A) until they meet their seatings and then unscrew each of the screws 2½ turns.

6 Start the engine and run until it reaches its normal operating temperature.

7 Now the carburettors must be balanced (synchronised) by adjusting on the slow running volume screws (A) until they are sucking equally. This can best be judged by applying a balance meter to the carburettor air inlet and adjusting on the screws until the readings are the same. Alternatively, listen to the "hiss" of each carburettor (use a piece of tube as illustrated in Fig.3.29, a piece of old bicycle tube is ideal and adjust on each of the screws (A) until it is judged that the hiss from each carburettor is the same.

8 Keep checking as above and continue adjusting on the slow running volume screws until, with the carburettors balanced (same hiss), the engine is idling at 500 rpm on cars fitted with the 3-speed synchromesh gearbox or automatic transmission and at 700 rpm on cars fitted with the all synchromesh gearbox.

9 Re-check that both butterfly valves are fully closed by rotating the throttle spindles in a clockwise direction looking from the front, and noting if any change in engine speed results, there should be no change in engine speed if the butterflies are indeed closed.

10 Now refer to Fig.3.30 and check the mixture strength by lifting the piston of the front carburettor approximately 1/32" (0.8 mm) by means of the lifting pin (arrowed), if:-

a) the engine speed increases appreciably this indicates that the mixture strength of the front carburettor is too rich.

b) the engine speed immediately decreases, this indicates that the mixture strength of the front carburettor is too weak.

c) the engine speed increases slightly and continues to run without change of speed, then the mixture strength of the front carburettor is correct.

11 Repeat the above operation for the rear carburettor to test its mixture strength and after adjustment recheck the front carburettor as the two carburettors are interdependant.

12 A check on the correctness of the mixture adjustment is to listen to the exhaust note:-
a) an irregular note, splashy misfire and colourless emission indicates that the mixture is too weak.
b) a regular or rhythmical misfire and the emission of black smoke indicates that the mixture is too rich.
c) a regular and even note indicates that the mixture is correct.
13 To enrich the mixture, screw in the adjustment screw (B) clockwise and to weaken the mixture, unscrew it anti-clockwise.
14 Some adjustment of the slow running to maintain the desired 500 or 700 rpm may now be required following adjustment of the mixture strength. To do this, rotate each screw (A) exactly the same amount and listen at the air intake (or apply the meter) to maintain balance.
15 Replace the air cleaner and air intake pipe.
16 Re-check the mixture strength as described in paragraph 10.

36 Carburettors SU HS 6 - adjustment and tuning

1 Remove the air cleaner and the air intake elbow.
2 Remove the suction chamber and piston from each carburettor.
3 Disconnect the mixture control wire.
4 Screw the jet adjusting nut upwards until the jet is flush with the bridge of the carburettor or fully up if this position cannot be obtained but the position of both jets must be the same.
5 Replace the piston and suction chamber. Check that the piston falls freely onto the bridge when the lifting pin is released.
6 Turn down the jet adjusting nut two complete turns.
7 Unscrew the throttle adjusting screws ("A" in Fig.3.31) until they are just clear of their stops and then screw down 1¼ turns open.

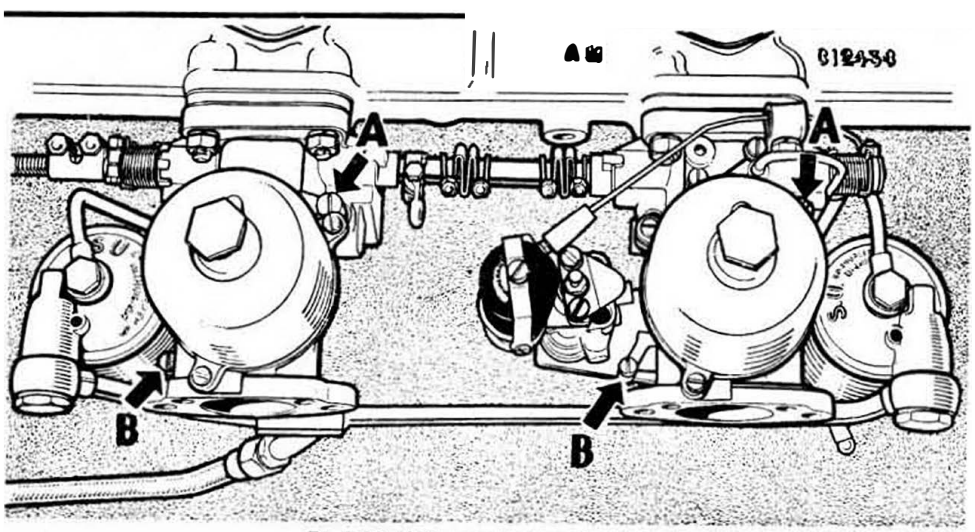

Fig.3.28. HD6 carburettor adjustment

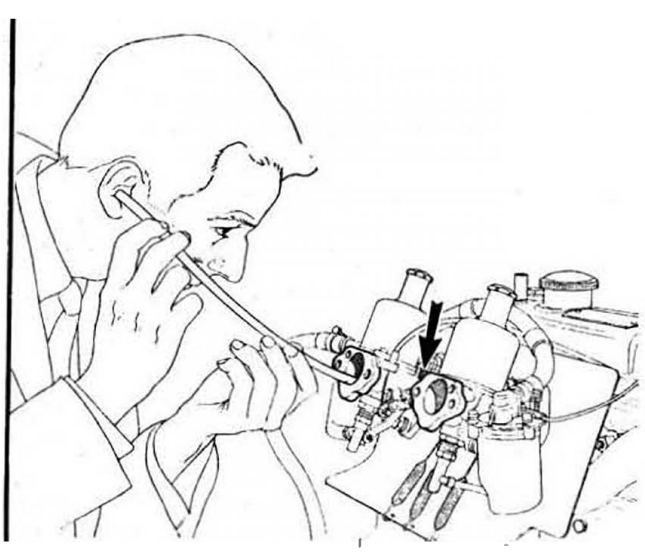
Fig.3.29. Balancing the S.U. carburettor

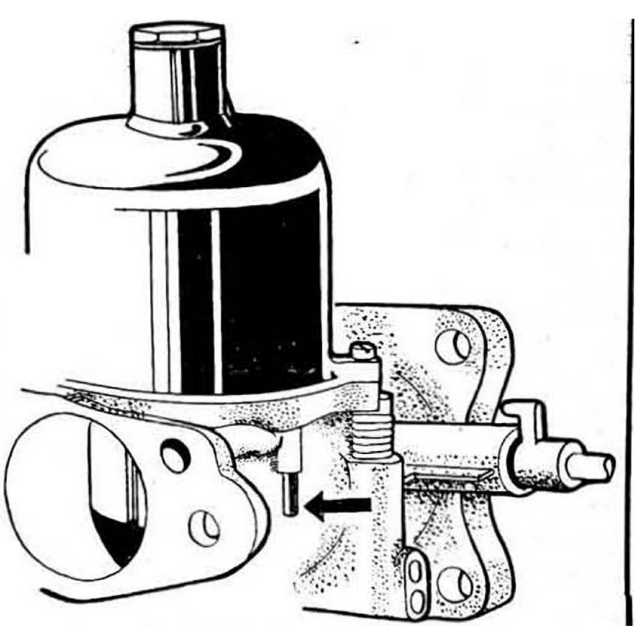
Fig.3.30. The piston lifting pin

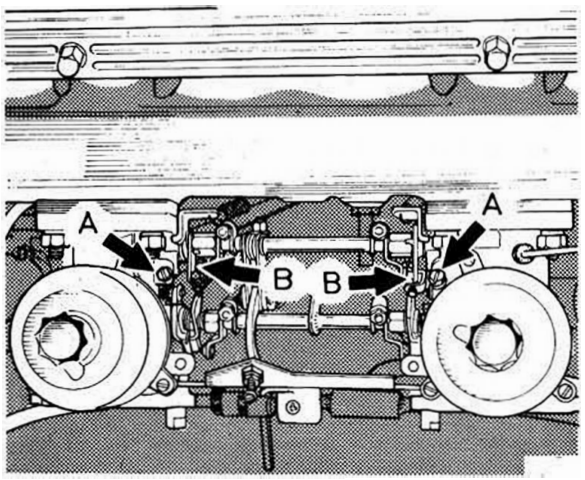

Fig.3.31. Adjustment of the HS6 carburettor

8 Slacken both of the clamping bolts on the throttle spindle interconnections.
9 Disconnect the jet control interconnection by slackening the clamping bolts.
10 Unscrew the fast idle adjusting screws until they are clear of their stops.
11 Start the engine and run until it attains its normal operating temperature.
12 Adjust on each throttle adjusting screw by the same amount each to give the desired idling speed.
13 Now the carburettors must be balanced (synchronised) by adjusting the throttle adjusting screws until they are sucking equally. This can best be judged by applying a balance meter to the carburettor air inlet and adjusting the screws until the readings are the same. Alternatively, listen to the "hiss" of each carburettor (use a piece of tube as illustrated in Fig.3.29, a piece of old bicycle tube is ideal) and adjust on each of the screws until it is judged that the hiss from each carburettor is the same.
14 Check the mixture strength of the front carburettor (see Fig.3.30) by raising the piston about 1/32" by means of the lifting pin, if:-
a) the engine speed increases appreciably, this indicates that the mixture of the front carburettor is too rich.
b) the engine speed immediately decreases, this indicates that the mixture strength of the front carburettor is too weak.
c) the engine speed increases slightly and continues to run without change of speed, then the mixture strength is correct.
15 Repeat the above operation for the rear carburettor and after adjustment recheck the front carburettor as the two carburettors are interdependant.
16 A check on the correctness of the mixture adjustment is to listen to the exhaust note:-
a) An irregular note, splashy misfire and colourless emission indicates that the mixture is too weak.
b) a regular or rhythmical misfire and the emission of black smoke indicates that the mixture is too rich.
c) a regular and even note indicates that the mixture is correct.
17 To enrich the mixture, screw down on the jet adjusting nut (anti-clockwise) and to weaken the mixture screw up on the nut (clockwise).
18 Some adjustment of the slow running may now be required following adjustment of the mixture strength. To do this, adjust each throttle adjusting screw the same amount at the same time checking by hiss or by the meter that they remain in balance.
19 Set the throttle interconnecting clamping levers (item 7 in Fig.3.16) so that the link pin is 0.006" (0.15 mm) away from the lower edge of the fork as shown in the inset to Fig.3.16. Tighten the clamp bolts.
20 With the jet levers at their lowest position set the jet interconnection lever clamp bolts, 8 in Fig.3.16, so that both jets commence to move simultaneously.
21 Reconnect the mixture control wire with about 1/16" (1.6 mm) free movement before it starts to move the jet levers.
22 Operate the mixture control lever in the car until the linkage is about to move the carburettor jets and then adjust the fast idle screws, comparing the intensity of the air intake "hiss", to give an engine speed of about 1000 rpm when hot.
23 Refit the air cleaner and the air intake elbow to the carburettors and recheck for correct mixture as described in paragraph 14.

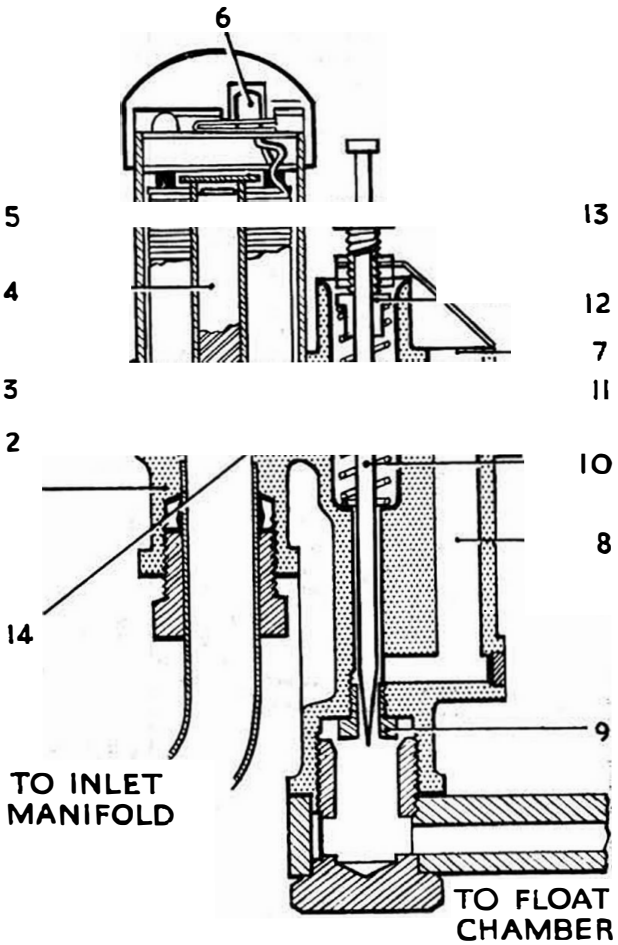

Fig.3.32. The auxiliary starting carburettor

37 The auxiliary starting carburettor - description

The auxiliary starting carburettor, is attached to the float chamber of the front HD 6 carburettor of the 3.4, 3.8 litre and 340 models, the parts forming the assembly to the carburettor are shown in Fig.3.32. It is a device for automatically enriching the mixture when starting from cold and is brought into action by a solenoid energised by a thermostatic switch located in the inlet manifold water jacket.

Fuel from the float chamber is supplied to the base of the jet (9) the size of which is governed by the position of the sliding needle (10) which is moved against the spring (11) by inlet manifold depression acting on the disc (12) attached to the shank of the needle. After passing the jet, the fuel is mixed with air drawn in from the intake (7) through the passage (8), the mixture is drawn past the needle into the passage (14) and thence, if the valve (3) is clear of its seating (2), into the inlet manifold. The thermostatic switch is connected to the solenoid through the terminal (6) and when the winding of the solenoid (5) is energised, the iron core (4), to which the valve is connected, is lifted thus allowing free passage of the mixture. When

the engine attains its normal running temperature the switch operates and de-energises the magnet to allow the valve to close.

38 The auxiliary starting carburettor - adjustment

1 Tuning of this device is confined to adjustment of the stop screw (13) which limits the downward travel of the needle (10).
2 Run the engine until it attains its normal running temperature.
3 Energise the solenoid by shorting the terminal of the thermostatic switch directly to earth with a screwdriver and at the same time flick open the throttles when the carburettor will be heard to come into operation with a pronounced hissing noise.
4 Adjust the stop screw (13) until the mixture is distinctly, but not excessively, rich ie until the exhaust gases are seen to be discernably black in colour, but just short of the point where the engine commences to run noticeable irregularity.
5 Anti-clockwise rotation of the stop screw will raise the needle and enrichen the mixture and screwing down on the screw will weaken the mixture.

39 The thermostatic switch - removal and refitting

The thermostatic switch which controls the operation of the auxiliary starting carburettor is situated at the front end of the inlet manifold water jacket, it operates the solenoid of the starting carburettor at temperatures below 30 – 35°C. It cannot be dismantled so if any fault arises there is no alternative but to fit a new item.
1 Disconnect the battery as a safety measure.
2 Drain sufficient water from the radiator to clear the inlet manifold water jacket.
3 Disconnect the electrical lead from the switch by undoing the chrome dome nut.
4 Remove the three securing setscrews and washers and withdraw the switch and the cork gasket.
5 Refitting is the reverse of the removal procedure but a new cork gasket must be fitted.
6 Top up the radiator to the correct level.

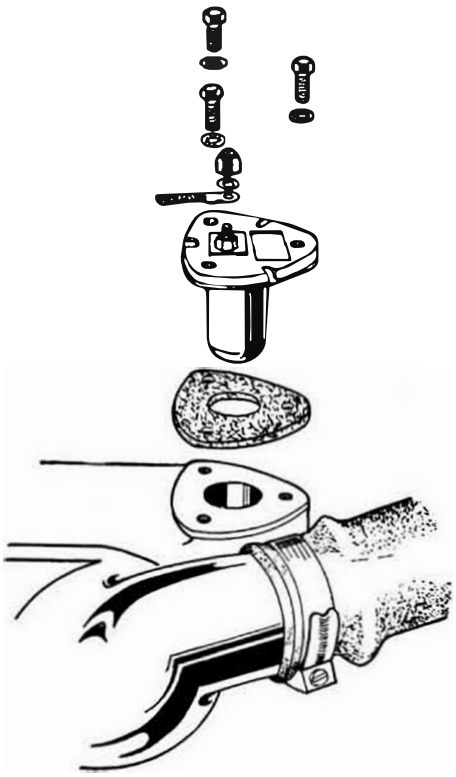

Fig.3.33. The auxiliary starting carburettor thermostatic switch

40 Fault diagnosis

Unsatisfactory engine performance is not necessarily the fault of the fuel system or the carburettors. Indeed, sluggishness, excessive fuel consumption etc: more commonly occur as the result of ignition faults so, before spending time in trying to trace a suspected fuel or carburation fault, it is advisable to first refer to Chapter 4 and check over the ignition system. The table below, therefore, assumes that the ignition system has been checked and is in order; the table should also be read in conjunction with Sections 7,15 to 21 and 26 to 30 of this Chapter.

Symptom	Reason/s	Remedy
Smell of petrol when engine is stopped	Leaking fuel lines or unions Leaking fuel tank	Repair or renew as necessary. Fill fuel tank to capacity and examine carefully at seams, unions and filler pipe. Repair as necessary.
Smell of petrol when engine is idling	Leaking fuel line unions between pump and carburettor Overflow of fuel from float chamber due to wrong level setting or ineffective needle valve or punctured float	Check line and unions, tighten and repair. Check fuel level setting and condition of float and needle valve, renew as necessary.
Excessive fuel	Worn needle	Renew needles.
Consumption for reasons not covered by leaks or float chamber faults	Sticking needle	Check correct movement of needle body.
Difficult starting, uneven running, lack of power, cutting out	One or more blockages Float chamber fuel level too low or needle sticking	Check fuel lines and clear. Dismantle and check.