



# Part 4 SU carburetors

## Chapter 18 Type HD

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### 1 Introduction

The Type HD (Diaphragm-jet) carburettor was introduced after the Type H. It was manufactured in larger sizes only – 1½ in, 1¾ in and 2 in, being models HD4, HD6 and HD8 respectively, and was therefore generally fitted to larger and heavier cars.

The characteristic features of the Type HD are the methods of metering fuel for idling, and of sealing the jet base.

### 2 Construction

The piston and suction chamber assembly is of the same general design as that of the Type H. The dashpot bore may be either dustproofed or non-dustproofed, and may therefore have un-drilled or drilled piston damper caps respectively.

The jet slides within a bearing, secured to the underside of the body, by the same method as in the Type H, and is surrounded by an open-ended cylindrical housing, cast integrally with the body. The housing is closed by a jet housing, incorporating the jet actuating lever assembly hinged in integrally-cast lugs, and an extension of the float-chamber, the parts being secured to the body by four screws. A flexible diaphragm (fixed to the base of the jet assembly) is clamped between the float chamber extension and the underside of the jet housing, and divides the housing cavity into two chambers. The upper chamber contains the jet actuating (lowering) mechanism and the lower chamber is linked to the float chamber via a drilling in the

extension, and is therefore flooded with fuel. The fuel flows up through the hollow jet to the orifice at the top.

A helical compression spring, fitted between a cup at the base of the jet assembly and a locating spigot in the float chamber extension, loads the jet upwards.

All HD4 and HD6 units are fitted with throttle spindle sealing glands, which minimise inwards air leakage when the spindle bearings become worn. Some HD8 units are also so equipped, while others have no sealing glands and are fitted with replaceable PTFE bushes.

The glands have tapered faces, and are fitted into conical-ended counterbores in the unit body. A helical compression spring, retained by a steel sleeve pressed into the end of the counterbore, compresses the gland so that the bore closes onto the throttle spindle and forms a seal. The glands do not require servicing, and no provision is made for their easy removal.

PTFE bushes are inserted into counterbores in the unit body from inside the bore of the unit. They are retained in position by circular spring clips fitted to the throttle spindle.

The underside of the body has cast ribs, and there is a cast projection at each side of the main bore. The ribs are internally-drilled to form a passage which bypasses the throttle plate when it is closed. One of the side projections houses a screwed needle valve, the end of which intercepts the drilled passage, and functions as a slow running volume screw. The other side projection has a vertical bore in which slides a cam rod, forming part of the cold start enrichment/throttle opening interconnection mechanism. The top end of the cam rod is fitted with a plate, carrying an adjusting screw which bears on the throttle spindle

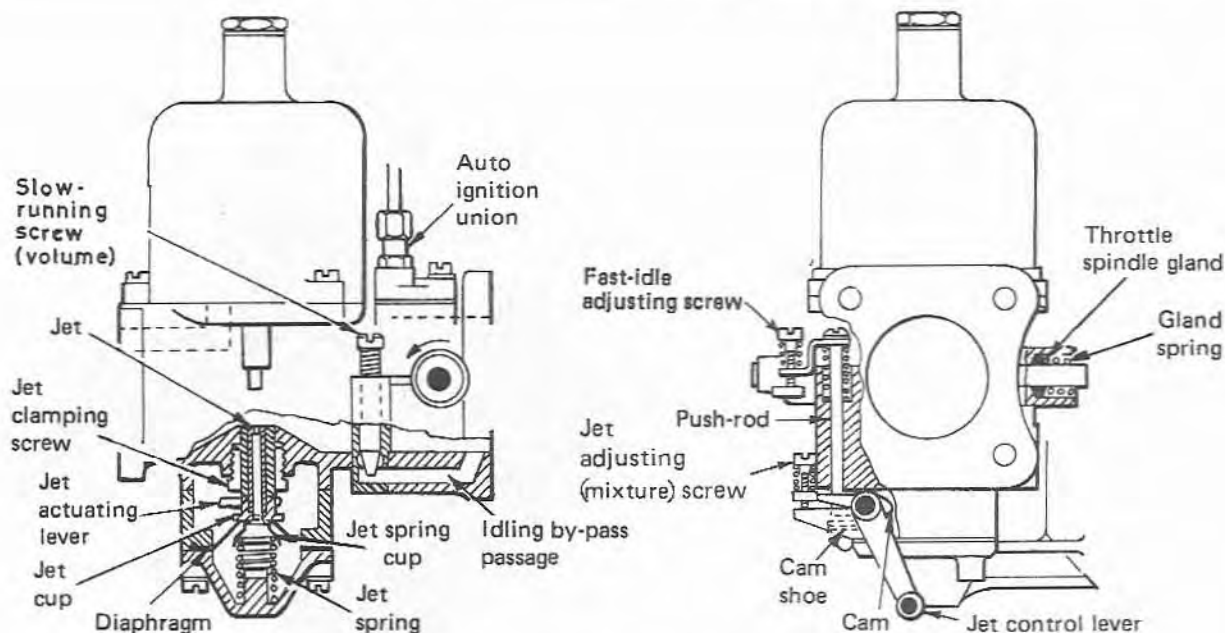


Fig. 6.1 Cutaway view of the Type HD carburettor (Sec 2)

arm. The bottom end is rivetted to an arm, at the end of which is a roller. The roller bears on a cam at the end of the jet actuating lever spindle.

The float chamber assembly is of similar design to Type H, in that it houses a brass float sliding on a central spindle, and the inlet valve is closed by a hinged lever mounted in the detachable float chamber top.

An ignition timing vacuum tapping is provided in the roof of the bore, the fine hole emerging at the edge of the throttle plate when in the closed position. The hole is bored through from a flat projection behind the suction chamber. Connection is made by an adapter plate with a stub pipe, secured to the body with two screws. A gasket is fitted between the body and the plate.

### 3 Jet assembly

The jet assembly consists of a brass jet tube, a flanged collar on which the jet actuating lever bears, a spring cup and a synthetic rubber diaphragm. The component parts are assembled by clamping and pressing and cannot be separated.

The diaphragm has a moulded circumferential rib on its upper surface, which locates in a similar annular groove in the underside of the jet housing and forms the sealing face. Four holes or cut-outs on the periphery accommodate the jet housing securing screws.

The jet size is identified by a code number stamped on the upper surface of the flanged collar.

### 4 Operation

The operation of the unit for acceleration, full throttle and cruise conditions is similar to that of the Type H. The idling condition is different, as the throttle disc is not used for idling mixture volume regulation.

When idling (engine hot), the throttle plate is fully closed in the carburettor bore. Mixture flows from the jet (upstream of the throttle) through the bypass passage, past the slow running volume screw and returns to the bore through a drilling downstream of the throttle plate. This gives more precise control of metering small quantities of mixture, and eliminates the effects of irregular flow around worn throttle plates, bores and spindles.

Note that the idling mixture *strength* is still determined by the position of the jet, and that the slow running volume screw only regulates the *volume* of mixture.

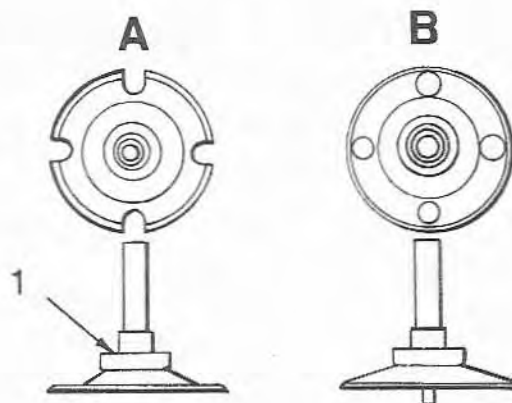


Fig. 6.2 Standard (A) and Rolls Royce (B) jets for the HD carburettor (Sec 3)

1 Jet size code location

Jet sizes: 9 = 0.09 in, 1 = 0.1 in, 125 = 0.125 in

At cold-start condition, the jet is lowered (by operation of the jet control lever) and the throttle interconnection mechanism opens the throttle slightly to a preset amount (determined by adjustment of the fast idle screw). A rich mixture of increased volume is therefore supplied to the engine through both the main throttle valve and the bypass passage.

As the engine warms through, the jet is raised and the throttle is automatically closed by the interaction of the throttle interconnection mechanism, when the 'choke' control is pushed home.

Due to the construction of the linkage in the jet housing, it is possible to obtain a fast-idle condition by pulling out the 'choke' control slightly from its fully closed position. This has the effect of opening the throttle before the jet actuating lever starts to lower the jet.

### 5 Special overhaul procedures

1 Refer to Chapter 4.

2 The SU part numbers for gasket and overhaul packs are as follows:

Carburettor model	Throttle diameter	Gasket pack	Overhaul pack
HD4	1 1/2"	AUE 805S	AUE 855
HD6	1 3/4"	AUE 805S	AUE 855
HDB	2"	AUE 806S	AUE 857

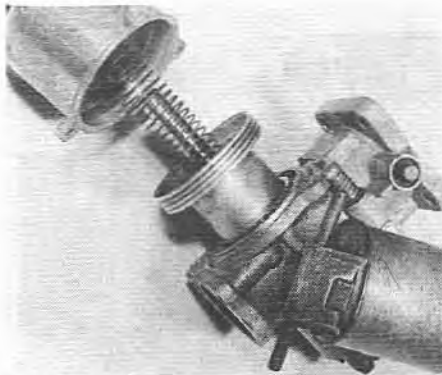
**Note:** Overhaul packs may be difficult to obtain. The 'S' suffix on the gasket pack part numbers indicates that throttle plate screws are included

## 6 Disassembly

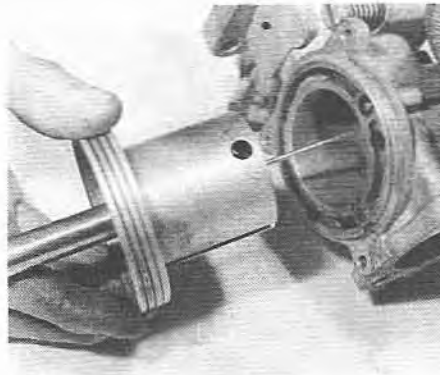
- 1 Clean the outside of the carburettor thoroughly.
- 2 Undo and remove the damper and washer.
- 3 Remove the suction chamber retaining screws and remove the chamber straight up (photo).
- 4 Lift off the piston spring. Carefully lift out the piston and needle assembly (photo). Empty out the damper oil from the piston rod.
- 5 Remove the needle locking screw and withdraw the needle (photos). If it sticks in place, tap the needle inwards first and then pull outwards. Do not bend it.
- 6 Record the positions of the float chamber, jet housing, and carburettor body. Unscrew the float chamber screws, holding the float chamber against the pressure of the jet spring. Carefully detach the float chamber (photos). If a thermostat starting carburettor is fitted, refer to Chapter 10.
- 7 Lift out the jet spring, mark the jet diaphragm opposite one of the screw holes in the jet housing and withdraw the jet assembly (photo).
- 8 Remove the screw from the top of the fast idle pushrod, and lift off the plate (with fast idle adjustment screw) and the return spring (photo).
- 9 Withdraw the fast idle pushrod, then remove the jet housing,

complete with the jet actuating levers (photos).

- 10 Slacken and remove the jet locking nut together with the jet bearing (photo).
  - 11 Record the positions of the float chamber and lid. Remove the central nut retaining the float chamber lid together with the vent tube banjo and fibre washer, or cover cap, as applicable.
  - 12 Where a banjo inlet is fitted, unscrew the banjo bolt from the float chamber and remove the bolt, banjo and fibre washers. Pull out the filter and spring assembly from the float chamber lid inlet (photo).
  - 13 Remove the lid and gasket (photo). Pull out the float lever hinge pin from the serrated end. Detach the lever.
  - 14 Extract the float needle from its seating, and unscrew the seating from the lid using a spanner 0.338 in (8.58 mm) across flats (photo). Do not distort the seating.
  - 15 Remove the float from the chamber (photo).
  - 16 Shut the throttle and record the positions of the throttle disc and the carburettor flange.
  - 17 Loosen and remove the disc retaining screws. The ends of the screws will be split to retain them securely – close the split before attempting to remove the screws. Withdraw the disc from its slot in the throttle spindle (photos). The disc is oval, and can jam. Take care to make sure it does not.
  - 18 Slide out the spindle from its bearings (photo).
  - 19 Do not remove the throttle spindle sealing glands.
- Note:** Some Type HDB carburetors are fitted with plastic spindle bushes and have no spindle sealing glands.
- 20 Loosen and remove the slow running volume screw, complete with spring, seal, and brass washer (photo).
  - 21 Remove the two screws and washers holding the vacuum ignition take-off plate and union. Lift off the plate and gasket.
  - 22 Remove the piston lifting pin by extracting the circlip from its groove with the pin pressed upwards. Withdraw the pin and spring downwards.
  - 23 For instructions on cleaning, inspection and repair, refer to Chapter 4.



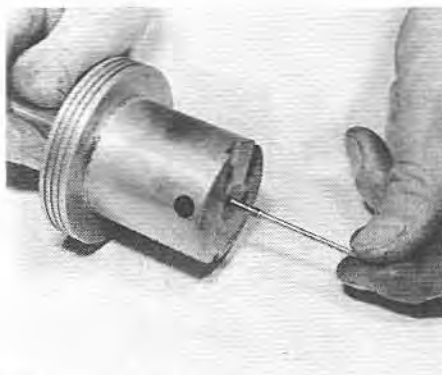
6.3 Removing the suction chamber



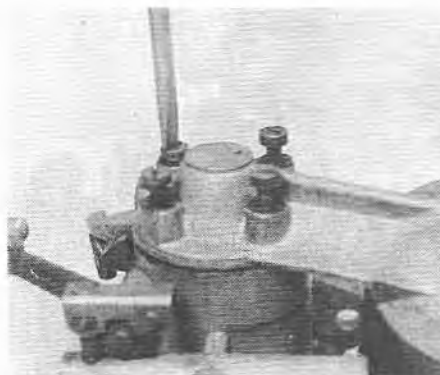
6.4 Removing the piston



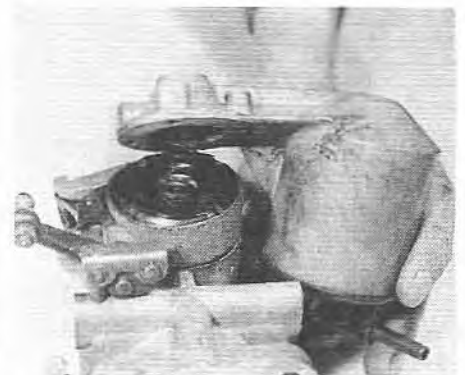
6.5A Extract the locking screw ...



6.5B ... and withdraw the needle



6.6A Remove the screws ...



6.6B ... and lift off the float chamber

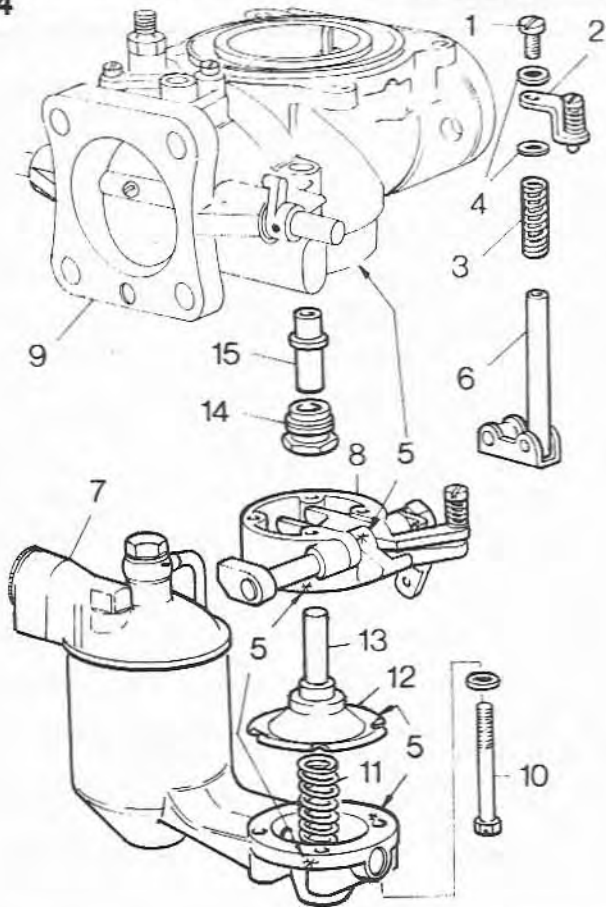


Fig. 6.3 Type HD jet housing components (Sec 6)

- |                         |                        |
|-------------------------|------------------------|
| 1 Plate retaining screw | 9 Carburettor body     |
| 2 Plate                 | 10 Float chamber screw |
| 3 Spring                | 11 Jet spring          |
| 4 Shakeproof washer     | 12 Jet diaphragm       |
| 5 Marks for replacement | 13 Jet assembly        |
| 6 Fast idle pushrod     | 14 Jet locking nut     |
| 7 Float chamber lid     | 15 Jet bearing         |
| 8 Jet housing           |                        |

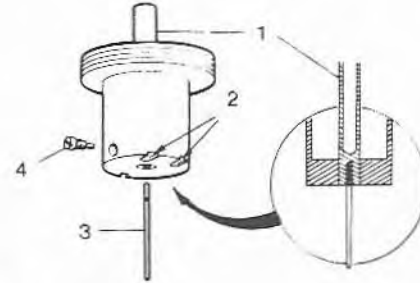
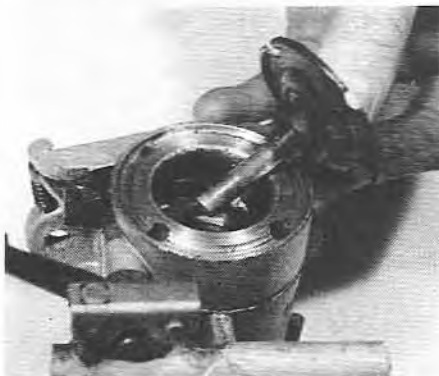
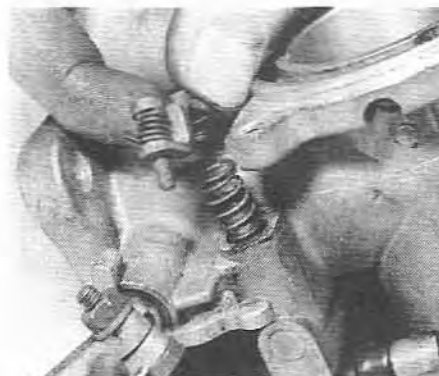


Fig. 6.4 Piston and needle components (Sec 6)

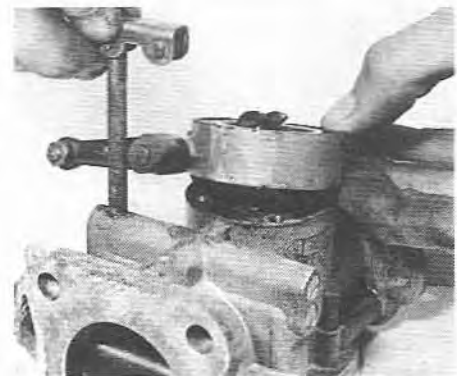
- |                         |                 |
|-------------------------|-----------------|
| 1 Piston rod            | 3 Needle        |
| 2 Vacuum transfer holes | 4 Locking screw |



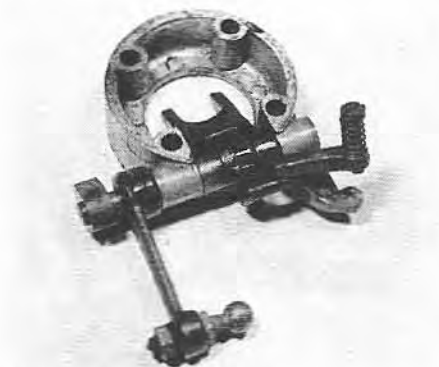
6.7 Withdrawing the jet assembly



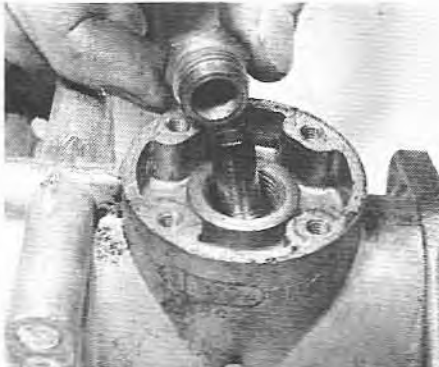
6.8 Removing the fast idle adjustment screw plate



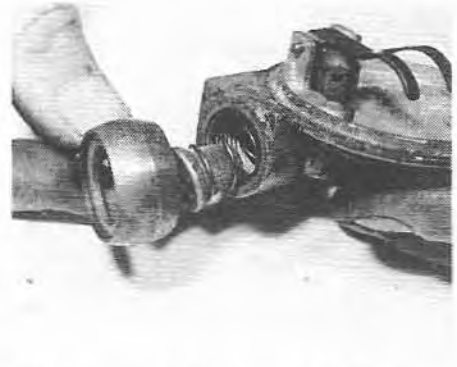
6.9A Fast idle pushrod and jet housing removal



6.9B Jet housing and levers



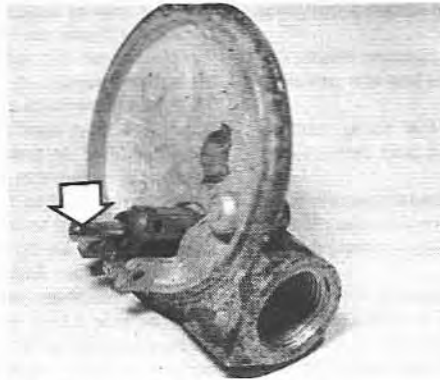
6.10 Jet locking nut and bearing removal



6.12 Removing the banjo inlet and filter from the float chamber lid



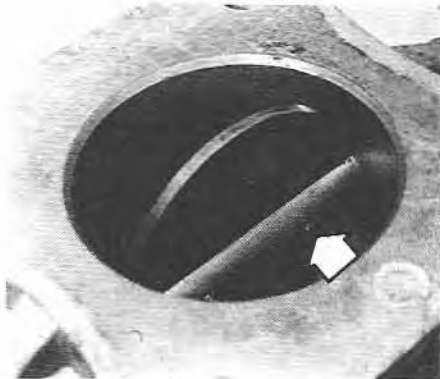
6.13 Removing the hose connection type float chamber lid



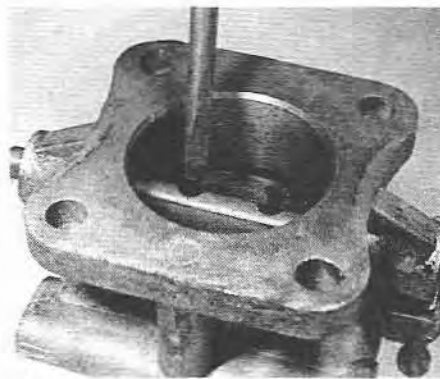
6.14 Float needle (arrowed)



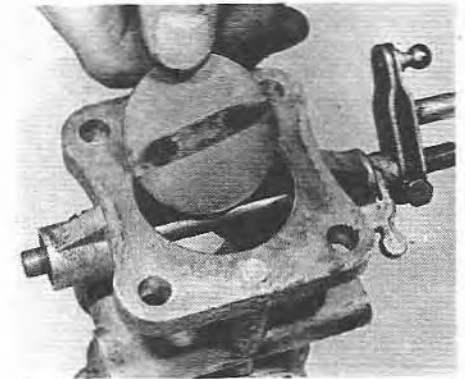
6.15 Lifting the float from the float chamber



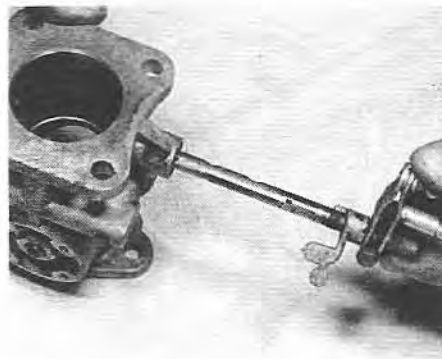
6.17A Showing the split ends of the throttle disc retaining screws (arrowed)



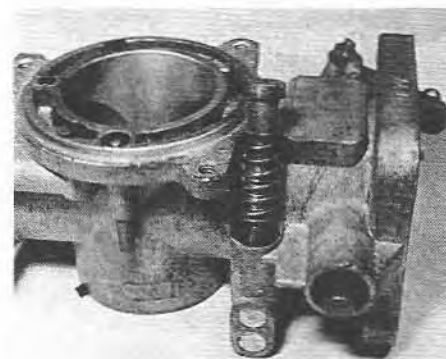
6.17B Extract the screws ...



6.17C ... and withdraw the throttle disc



6.18 Throttle spindle removal



6.20 Removing the slow running volume screw

## 7 Assembly

- 1 Fit the spindle in its bearings.
- 2 Fit the throttle disc to the slot in the throttle spindle in the position marked previously (on disassembly). Note that the countersunk ends of the screw holes in the spindle must face outwards, ie towards the intake flange of the carburettor body. Insert two new retaining screws, but do not tighten. Adjust the disc in the slot until it closes fully in the bore of the carburettor, and tighten the screws. Spread the split ends of the screws just enough to prevent them turning.
- 3 Fit the slow running volume screw, taking care that the brass washer is fitted with its concave face toward the seal.
- 4 Fit the gasket and vacuum ignition take-off plate, with screws and new shakeproof washers. Do not use jointing compound on the gasket.
- 5 Fit the piston lifting pin, spring, new rubber washer, plain washer and circlip.
- 6 Fit the needle to the piston assembly. The lower edge of the groove must be level with the lower face of the piston rod. Fit a new needle locking screw and tighten. Invert the suction chamber and turn the piston assembly inside it to check for concentricity of the needle.
- 7 Check the piston key for security in the carburettor body (photo).
- 8 Fit the jet bearing and jet locking nut. Leave the nut with just enough slack to allow the bearing to be moved from side to side.
- 9 Temporarily fit the jet assembly in the jet bearing in the previously-noted position, and push it fully upwards. Carefully locate the piston and needle in the upper end of the body, and push

downwards. This will centralise the jet, and the jet locking nut may then be tightened. Remove both the piston and jet.

10 Locate the jet housing, complete with the jet actuating levers, on the body in its previously-noted position, then fit the fast idle pushrod and lower it onto the cam (photo).

11 Fit the jet, jet spring and float chamber in the same relative positions as recorded on dismantling (photos). Fit and tighten the securing screws evenly.

12 Fit the fast idle pushrod spring, plate and plate retaining screw with a shakeproof washer on either side of the plate. Make sure the plate is positioned so that the fast idle adjustment screw strikes squarely on the lug of the throttle spindle operating arm.

13 Smear a little oil on the piston rod, then fit the piston to the suction chamber without the spring. With the piston fully inserted, seal the transfer holes (with plasticine or similar product), then invert the assembly and allow the suction chamber to fall from the piston. Check the time this takes. It should be between 5 and 7 seconds. If the time taken exceeds that, the cause will be thick oil on the piston rod, or an oil film on the piston or inside the suction chamber. Remove the oil

from the points suggested and re-test.

14 Fit the piston assembly to the body, and locate the piston spring on the piston rod. Fit the suction chamber and retaining screws. Tighten the screws evenly.

15 Fit the needle seating and needle to the float chamber lid.

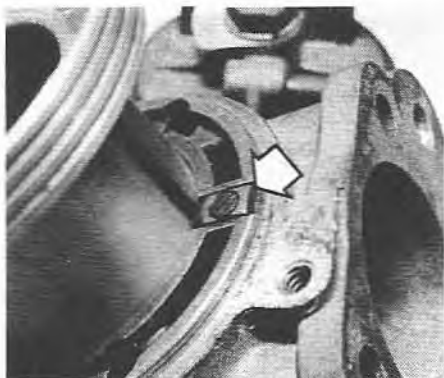
16 Fit the float lever and press in the lever hinge pin to secure. Check the float level as described for the Type H carburettor in Chapter 5, Section 8, paragraph 6 (photo).

17 Refit the float to the float chamber.

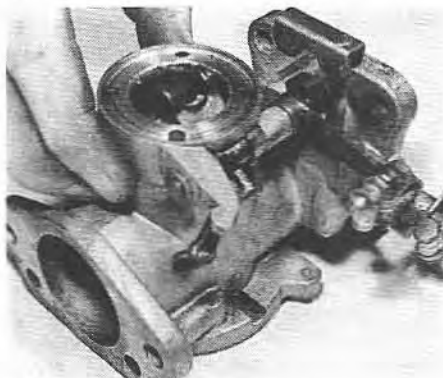
18 Fit the gasket to the lid, and refit the lid on the float chamber in the same position as recorded on dismantling. Fit the fibre washer, vent tube banjo, plain washer, and nut or cover cap and nut, as applicable. Do not overtighten the nut.

19 Where a banjo inlet is fitted, insert the filter, spring end first, followed by the banjo, fibre washers, and bolt. The recessed side of the banjo must face outwards (ie abutting the bolt head).

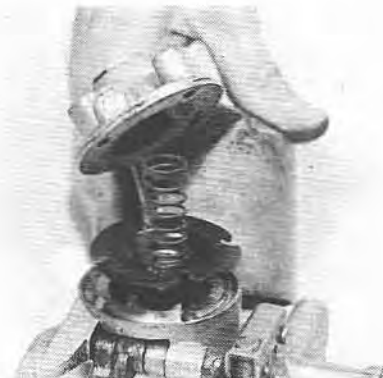
20 Top up the piston rod with oil as described in Section 8, then fit and tighten the damper rod.



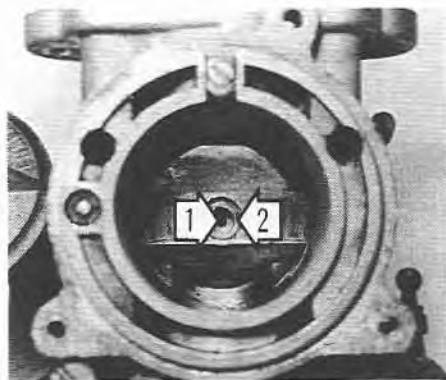
7.7 Piston key location (arrowed)



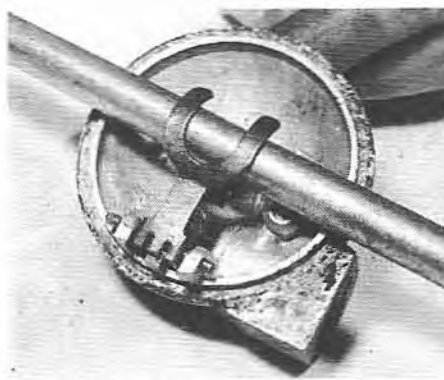
7.10 Refitting the jet housing



7.11A Refitting the float chamber



7.11B Top view of the jet (1) and jet bearing (2)



7.16 Checking the float level

## 8 Tuning

**Note:** Refer to Chapter 3 for notes on tuning, with particular reference to preliminary procedures. If a thermostatic starting carburettor is fitted, refer also to Chapter 21.

### Single carburettor installations

1 Set the initial fast idle and slow running volume screws. Run the engine up to a normal running temperature. Switch off the engine. Unscrew the fast idle adjusting screw where fitted to clear the throttle spindle arm with the throttle closed. Screw down the slow running volume screw onto its seating, then unscrew it  $3\frac{1}{2}$  turns.

2 Set the jet height. Remove the piston and suction chamber unit. Turn the jet adjusting (mixture) screw until the jet is flush with the bridge of the carburettor.

3 Set the jet adjusting (mixture) screw. Refit the piston and suction chamber unit. Check that the piston falls freely onto the bridge when the lifting pin is released. Lower the jet by turning the jet adjusting screw clockwise  $2\frac{1}{2}$  turns.

4 Set the idle speed. Start the engine and adjust the slow running volume screw to give the desired idle speed. Turn the jet adjusting screw anti-clockwise to weaken, or clockwise to richen, until the fastest idle speed, consistent with even running, is obtained. Re-adjust the slow running volume screw to give the correct idle speed, if necessary.

5 Check the mixture strength (CO content) as described in Chapter 5, Section 9.

6 Connect and set the mixture control wire (except on thermo-type carburettor). Connect the mixture control wire with about 0.0625 in (1.6 mm) free movement before it starts to pull on the jet lever. Pull the choke knob at the fascia until the linkage is about to move the

carburettor jet operating arm, and adjust the fast idle screw to give an engine speed of about 1000 rpm when the engine is hot. Return the choke knob, and check that there is some clearance between the fast idle screw and the throttle stop.

7 Fill the damper. Finally top up the piston damper with engine oil, until the level is 0.5 in (13 mm) below the top of the hollow piston rod. On non-dustproofed carburetors, (identified by a vent hole in the piston damper top) the oil level should be 0.5 in (13 mm) above the top of the hollow piston rod.

#### Multiple carburettor installations

8 Run the engine to normal operating temperature then switch off.

9 Slacken one of the pinch-bolts on the throttle spindle coupling, then hold both throttle butterfly plates fully closed and re-tighten the pinch-bolt. Where throttle adjusting screws are fitted, these must be adjusted so that both throttle plates are fully closed before tightening the pinch-bolt.

10 Screw in each of the slow running volume screws until they are fully seated, then unscrew each screw exactly two turns.

11 Remove the pistons and suction chambers, and unscrew each of the jet adjusting (mixture) screws until each jet is flush with the bridge of its carburettor.

12 Refit the pistons and suction chambers, and then check that each piston falls freely by pressing the small lifting pin upwards and letting the pistons fall onto their bridges. A distinct 'click' should be heard.

13 Turn each of the jet adjusting (mixture) screws clockwise  $2\frac{1}{2}$  turns, then top up the piston dampers with engine oil.

14 Restart the engine and adjust each of the slow running volume screws by equal amounts to give the desired idle speed. To make sure that both carburetors are synchronized, use a length of tubing placed between the carburettor intake and the ear, and adjust the slow running volume screws fractionally until the hiss from both units is the same. Alternatively, use a balancing device (flowmeter) in accordance with its manufacturer's instructions.

15 With the carburetors correctly synchronized, screw the jet adjusting (mixture) screws up or down by equal amounts until the fastest idle speed is obtained, consistent with even running. If necessary, re-adjust the slow running volume screws by equal amounts until the correct idle speed is re-obtained.

16 Now check the mixture strength on each carburettor separately using the procedure described in Chapter 17, Section 9. Stop the engine.

17 Where cold start control (choke) cables are fitted, adjust them with reference to paragraph 6.

Piston lifting pin

Slow-running volume screw

Throttle adjusting screw (not on all units)

Fast-idle adjusting screw

Jet adjusting (mixture) screw

Fig. 6.5 Type HD carburettor adjustment points (Sec 8)

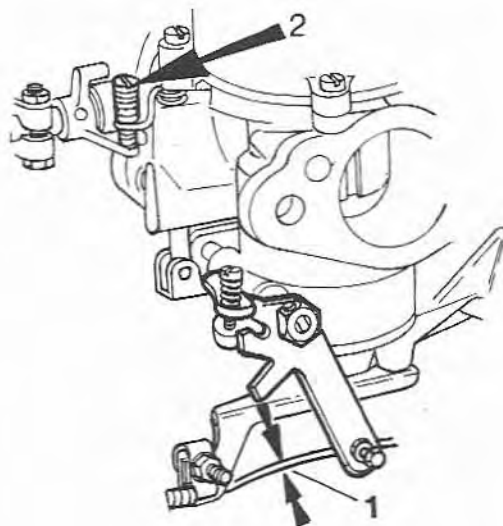
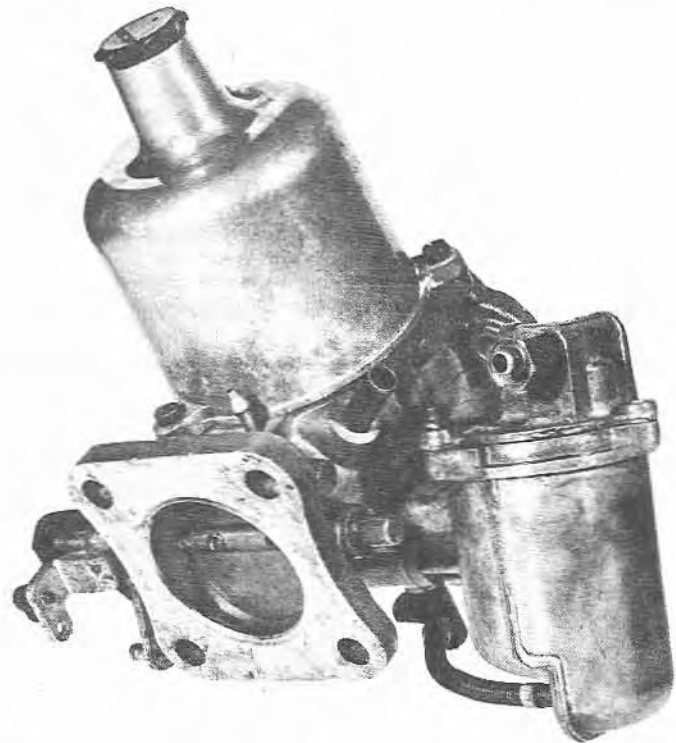


Fig. 6.6 The cold start control (choke) cable free movement (1) and fast idle adjusting screw (2) (Sec 8)



## Part 4 SU carburetors

### Chapter 19 Type HS

#### Contents

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Jet assembly .....	2		

#### 1 Introduction

The Type HS carburettor was introduced in the late 1950s and came into widespread use in the early 1960s. It does not supersede Types H or HD, but was produced together with these units. It was probably the most popular type of SU carburettor in service at the time.

The Type HS is basically a development of the Type H unit. The main improvement is in the jet assembly, which was designed to eliminate the troublesome gland seals of the previous carburettor, and it is this feature by which it is easily identified. The float chamber is also of a different design, and incorporates a float moulded from a plastic material instead of the previous brass type. On some models, the throttle valve incorporates an overrun valve to improve combustion during overrun conditions (Fig.7.1).

#### 2 Jet assembly

Petrol from the float chamber flows direct to the base of the jet through a plastic tube. The tube is flexible, which allows the jet to

move down in its holder to give the necessary degree of enrichment for starting. This dispenses with the necessity of a petrol-filled annulus surrounding a drilled jet tube (as in Type H), and the attendant seals or glands at the base of the annulus to allow an extension of the tube to project through for external operation.

The jet assembly consists of an accurately-machined brass tube (the jet), a flexible feed pipe, and a plastic moulding into which both items are inserted. They are secured by contraction of the moulding by means of conical metal collars pressed on. Short brass reinforcing sleeves are fitted inside each end of the flexible pipe to prevent it being crushed. The flexible feed pipe is secured to the base of the float chamber by a union nut and rubber sealing washer. Where the carburettor is fitted to automatic transmission models, the jet assembly may incorporate a fuel temperature compensation device, which raises the fuel jet slightly with increasing fuel temperatures, and lowers it slightly with decreasing fuel temperatures. The device is called a *capstat*, and consists of a wax pellet contained inside a capsule, with the jet assembly mounted above. It essentially responds to the varying ambient air temperature within the engine compartment.

The jet holder is a brass tube, in which the jet is a sliding fit, externally flanged at the top and threaded at the bottom. It is held to the underside of the carburettor body by a large, steel nut which



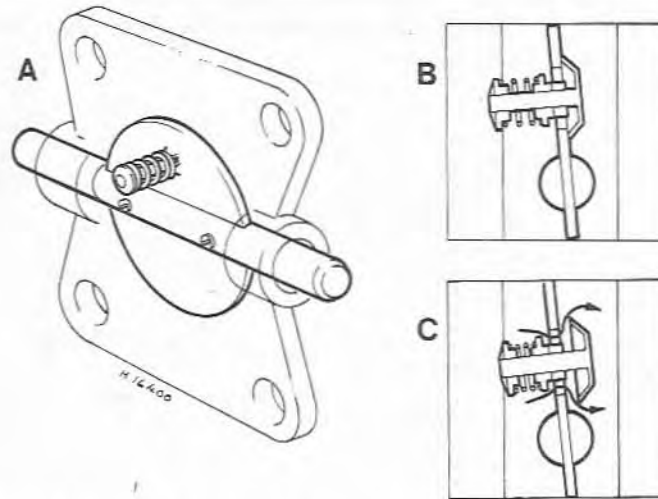


Fig. 7.1 Diagram of overrun valve fitted to throttle valve (Sec 1)

A Overrun valve location

B Overrun valve closed (engine idling)

C Overrun valve open (engine on overrun)

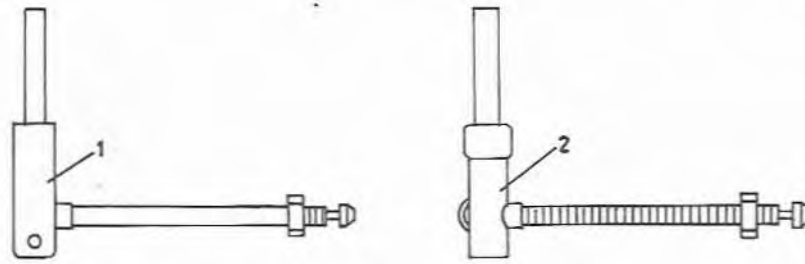


Fig. 7.2 Early HS jet assemblies (Sec 2)

1 Brass

2 Plastic

HS 2, 4 & 6 JET

HS4C & HS8 JET

HS CAPSTAT JET

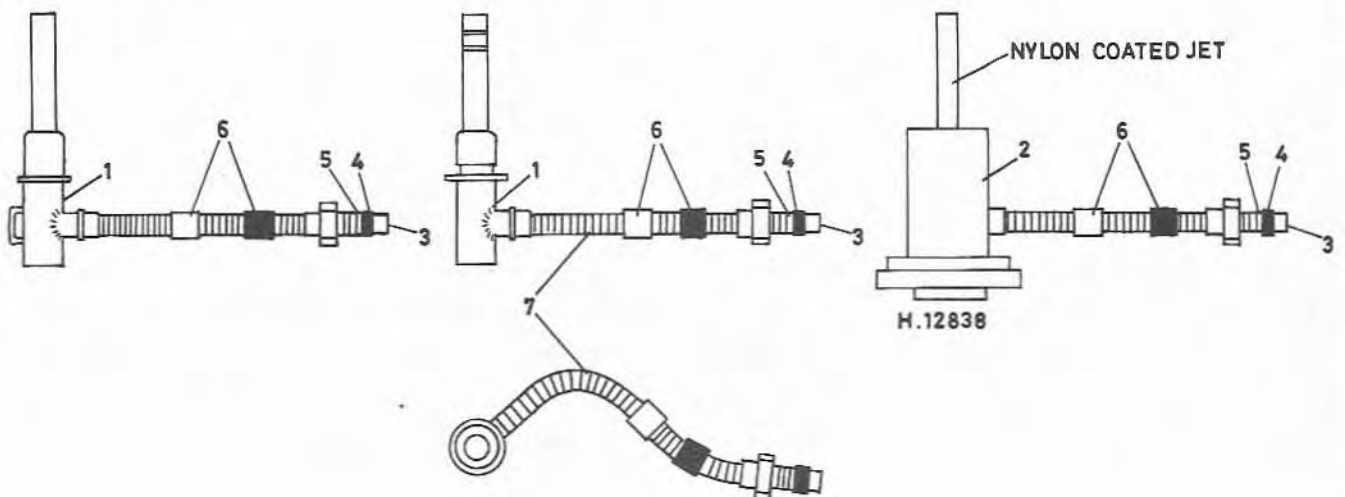


Fig. 7.3 Later HS jet assemblies (Sec 2)

1 Plastic  
2 Die cast

3 Brass sleeve  
4 Rubber washer

5 Brass washer  
6 Plastic identification sleeves

7 Moulded swan neck for type HS8

clamps the flange against the end of a counterbored hole in the body. the hole in the nut is considerably larger than the external diameter of the jet holder, thus permitting sideways adjustment of the jet assembly to centre it relative to the needle.

A helical compression spring and long nut are fitted to the threaded portion at the bottom of the jet holder. The underside of the nut is in contact with the metal collar on the jet assembly moulding, thus the vertical position of the jet is controlled by screwing the nut up or down. The jet is held in contact with the nut by spring loading on the external (choke) linkage. On type HS4C and HS8 carburetors, the jet holder is retained with a bracket and two screws, and the jet position is adjusted by a linkage and adjustment screw.

The jet may be any of three sizes, according to the size and application of the carburettor. The size denotes the diameter of the bore and is 0.09 in, 0.10 in or 0.125 in. This is identified by the number of machined grooves at the top of the jet, being none, one, and two, respectively.

If replacing a jet, ensure that the replacement has the same number of grooves, the same colour of jet head (the plastic moulding), and the same number (one, two or three) and colour of plastic sleeves on the flexible feed pipe as the original one. Each jet has a separate part number, and its application is dictated by the following features:

- (a) Angle of float chamber
- (b) Carburettor size
- (c) Interconnection (right- or left-hand)
- (d) Jet size

On more recent models the jet adjusting nut may be tamperproofed, to discourage unauthorized adjustment, by fitting a plastic clamp over both the adjusting nut and the jet locking nut. The clamp is designed to break when it is removed, so that a new one must be fitted after making an adjustment. The throttle adjusting screw may be tamperproofed by fitting a metal cap over it. The cap may be levered out using a pointed instrument, and should also be renewed after making an adjustment.

### 3 Float chamber assembly

The float chamber is of different design from the previous Types H and HD, due to the different design of jet assembly, and a simplification and improvement in construction and operation.

The chamber is attached to the carburettor body by a single bolt screwed into a tapped boss cast on the side of the chamber. This enables the chamber to be rotated, within limits, to suit either horizontal or semi-down draught installation, thereby eliminating the need for different castings. An adapter bush with locating tongues, interposed between the chamber and the body, ensures correct orientation for any particular installation. The fuel outlet from the chamber is arranged so that there is a sediment-well surrounding it. Where the outlet emerges from the chamber, the boss is tapped to accept the union nut of the jet connection pipe.

The detachable float chamber lid incorporates lugs which carry the float lever hinge pin. The fuel inlet is a stub (brass pipe) for connection to a push-on flexible pipe, and the vent is a horizontal drilling immediately below it, the outlet being shielded by a baffle plate to prevent the entry of dirt, and to prevent fuel being ejected forcibly from it, should the inlet valve stick open.

The inlet valve may be either the brass type with a steel needle, as on Types H and HD, or may be a plastic-bodied, spring-loaded type. This latter type was introduced on the Type HS to overcome the effects of engine vibration, which tends to affect the seating of the inlet valve.

To further assist in reducing the effects of vibration, the float chamber may be flexibly mounted by the inclusion of rubber bushes between it and the carburettor body. The float is formed by two plastic mouldings – on some types a steel arm is fitted to the float for adjustment purposes.

### 4 Piston and needle

On some applications, the needle is spring-loaded in the piston, and biased toward the engine side of the jet. This provides more accurate metering of the fuel. A spring seat is fitted inside the piston rod, and a flanged collar is fitted to the top of the needle. The spring

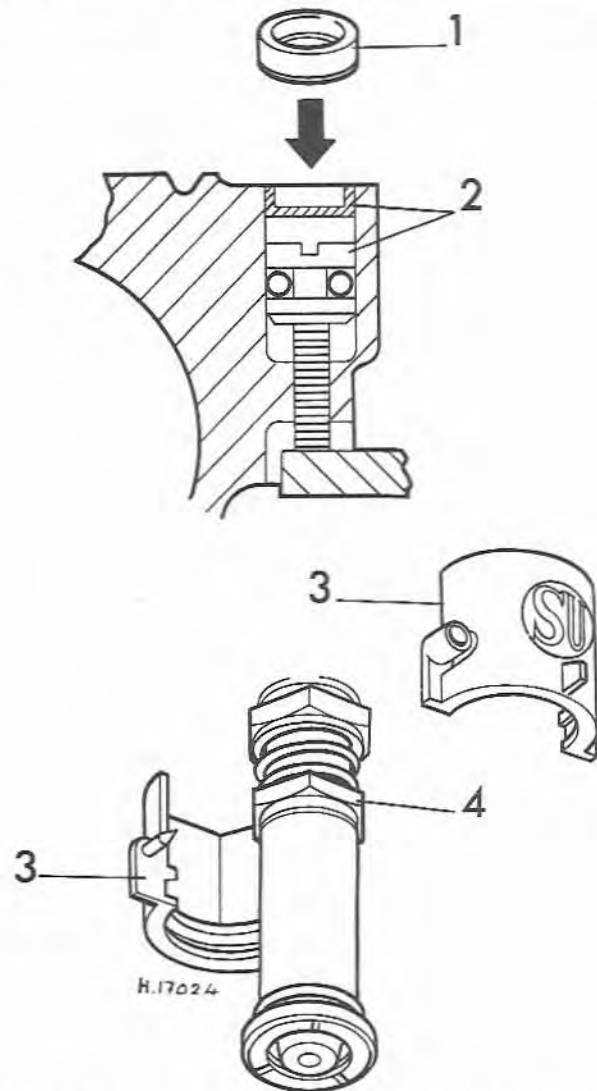


Fig. 7.4 Tamperproof cap and clamp fitted to later models (Sec 2)

- 1 Throttle adjusting screw cap
- 2 Throttle adjusting screw showing cap in position
- 3 Plastic clamp
- 4 Jet adjusting nut

presses the needle collar onto a guide, which is clamped in the piston by a locking screw. the upper surface of the guide is machined at an angle to provide the bias to the needle.

### 5 Operation

The operation of the carburettor for cold start, idling, acceleration and cruise conditions is the same as for the Type H.

### 6 Special overhaul procedures

- 1 Refer to Chapter 4.
- 2 Service and repair kits are available under SU part numbers according to *vehicle* model. Gasket packs are available under the following part numbers:

Carburettor model	Throttle diameter	Gasket pack
HS2	1 1/4"	AUE 810S
HS4	1 1/2"	AUE 811S

HS6  
HS8

1 3/4"  
2"

AUE 812S  
AUE 813S

**Note:** The 'S' suffix on gasket pack part numbers indicates that throttle plate screws are included

### 7 Disassembly

- 1 Take off the baffle plate from the vent pipe and thoroughly clean the outside of the carburettor.
- 2 Record the relative positions of the suction chamber and the carburettor body.
- 3 Unscrew and remove the damper and its washer. Where a retaining clip is fitted, give the damper a sharp tug to release the clip from the piston rod (photos).

- 4 Unscrew the suction chamber retaining screws and lift off the chamber without tilting it (photo). Take off the piston spring and washer (if fitted).
- 5 Lift out the piston assembly carefully, and empty the oil from the piston rod.
- 6 Undo the needle locking screw and withdraw the needle (photos). If it sticks, tap the needle inwards first, and then pull outwards. Do not bend the needle. Where fitted, recover the guide and spring.
- 7 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. For the concealed-spring type, press the pin upwards, detach the circlip, and withdraw the pin and spring downwards.
- 8 Support the moulded base of the jet, and loosen the screw retaining the jet pick-up link.
- 9 Relieve the tension of the pick-up lever return spring, and remove the screw and brass bush (if fitted).
- 10 Undo the brass union nut retaining the flexible jet feed pipe to the

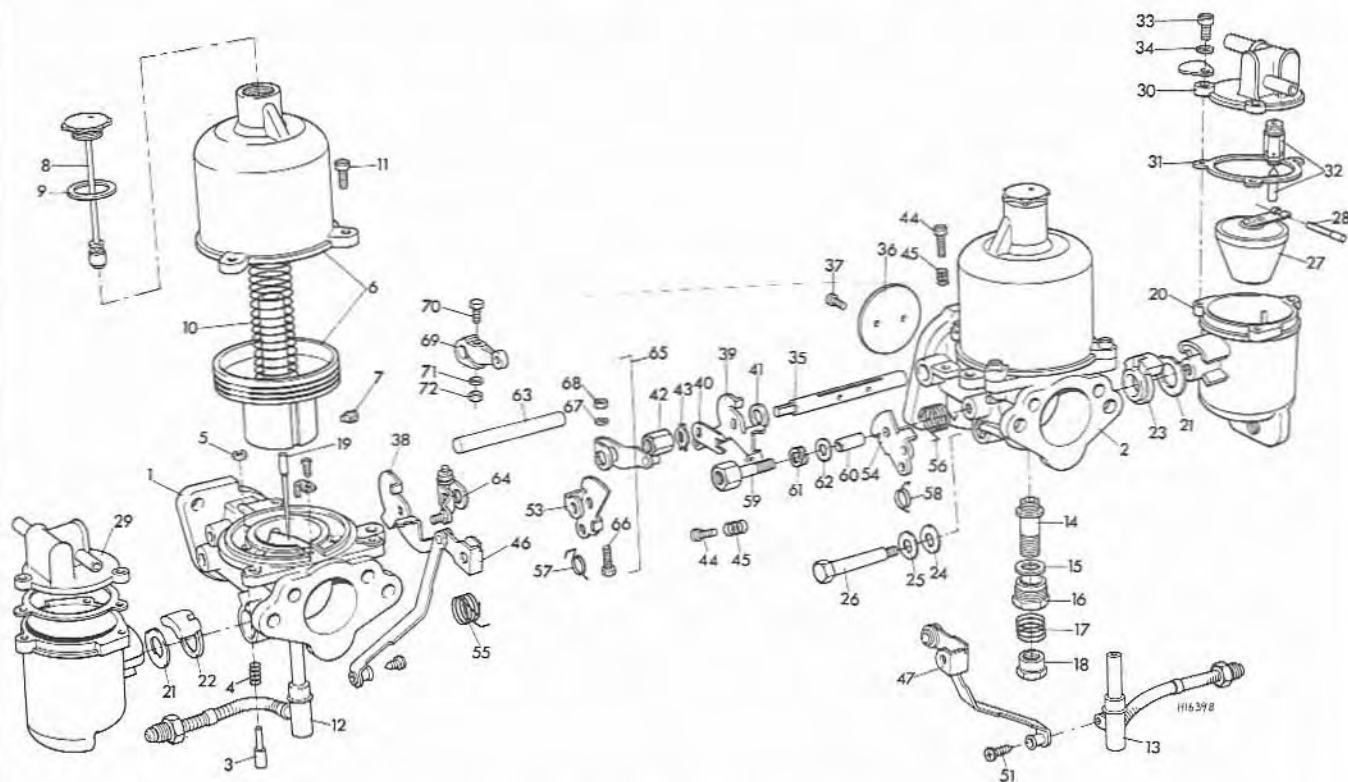


Fig. 7.5 Exploded view of twin HS4 carburettor installation (Sec 7)

- |                                     |                                |  |   |
|-------------------------------------|--------------------------------|--|---|
| 1 Body - front carburettor          | 17 Spring                      | 36 Throttle disc                               | 57 Spring - front carburettor                 |
| 2 Body - rear carburettor           | 18 Screw                       | 37 Screw                                       | 58 Spring - rear carburettor                  |
| 3 Pin                               | 19 Needle                      | 38 Lever - front carburettor                   | 59 Bolt                                       |
| 4 Spring                            | 20 Float chamber               | 39 Lever - rear carburettor                    | 60 Tube                                       |
| 5 Circlip                           | 21 Washer                      | 40 Lever                                       | 61 Washer                                     |
| 6 Chamber and piston assembly       | 22 Grommet - front carburettor | 41 Washer                                      | 62 Washer                                     |
| 7 Screw                             | 23 Grommet - rear carburettor  | 42 Nut   | 63 Rod  |
| 8 Cap and dampers assembly          | 24 Washer                      | 43 Washer                                      | 64 Lever and pin assembly - front carburettor |
| 9 Washer                            | 25 Plain washer                | 44 Screw                                       | 65 Lever and pin assembly - rear carburettor  |
| 10 Spring                           | 26 Bolt                        | 45 Spring                                      | 66 Bolt                                       |
| 11 Screw                            | 27 Float assembly              | 46 Lever and link assembly - front carburettor | 67 Washer                                     |
| 12 Jet assembly - front carburettor | 28 Pin                         | 47 Lever and link assembly - rear carburettor  | 68 Nut  |
| 13 Jet assembly - rear carburettor  | 29 Lid - front carburettor     | 51 Screw                                       | 69 Lever                                      |
| 14 Jet bearing                      | 30 Lid - rear carburettor      | 53 Lever - front carburettor                   | 70 Bolt                                       |
| 15 Washer                           | 31 Washer                      | 54 Lever - rear carburettor                    | 71 Spring washer                              |
| 16 Screw                            | 32 Needle and seat assembly    | 55 Spring - front carburettor                  | 72 Nut  |
|                                     | 33 Screw                       | 56 Spring - rear carburettor                   |   |
|                                     | 34 Washer                      |  |   |
|                                     | 35 Throttle spindle            |  |   |

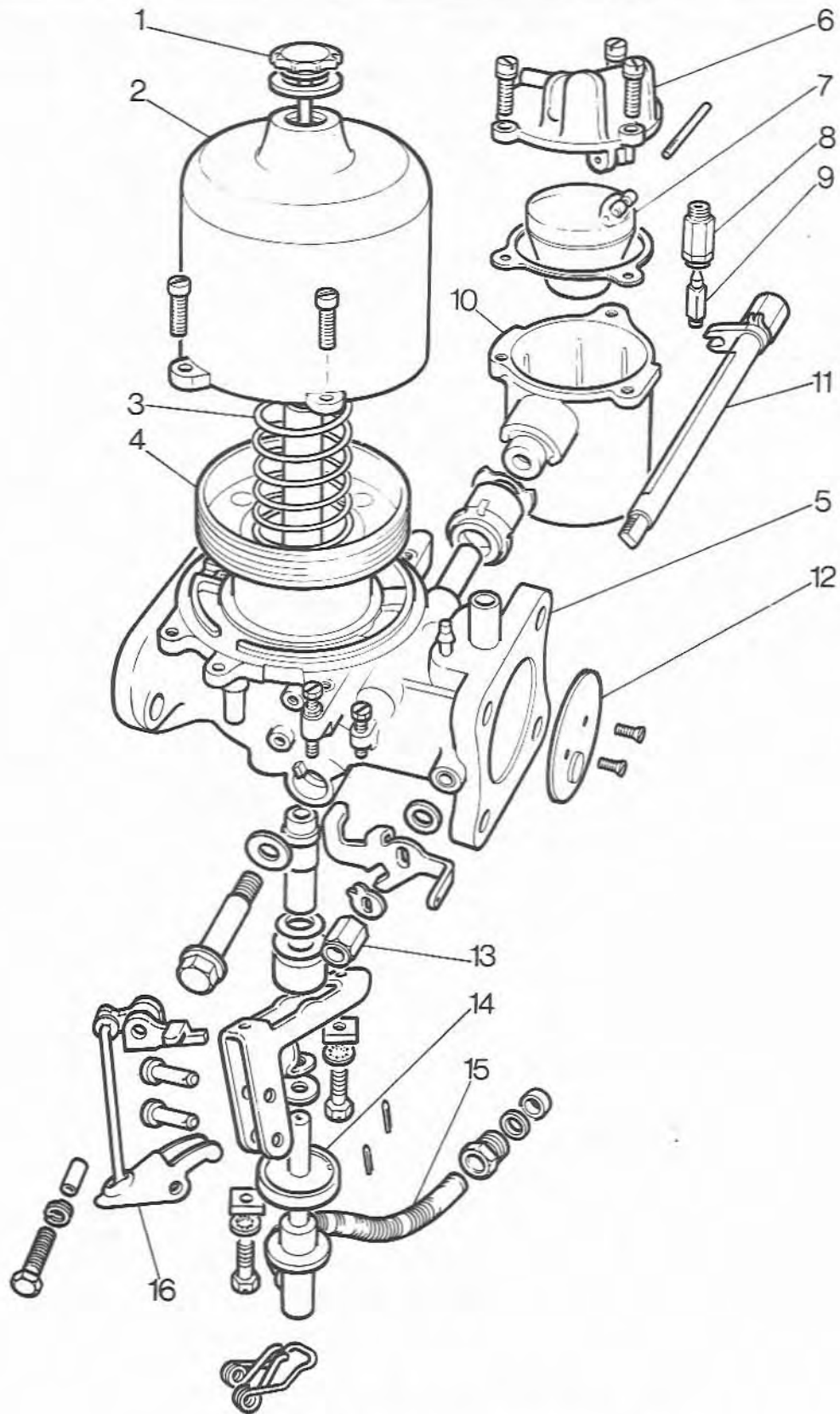
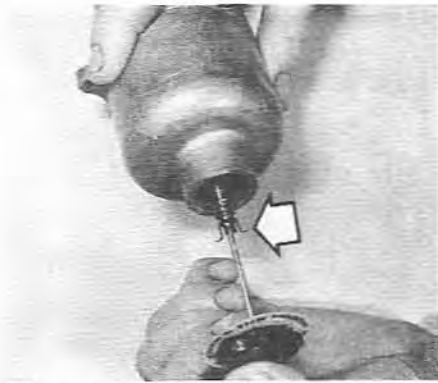
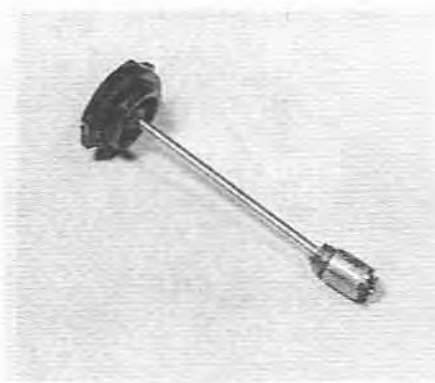


Fig. 7.6 Exploded view of HS8 carburettor (Sec 7)

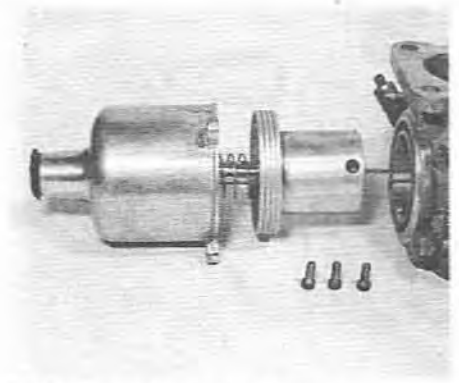
- |                   |                        |                           |                       |
|-------------------|------------------------|---------------------------|-----------------------|
| 1 Damper          | 5 Body                 | 9 Needle                  | 13 Spindle nut        |
| 2 Suction chamber | 6 Float chamber lid    | 10 Float chamber          | 14 Jet assembly       |
| 3 Spring          | 7 Float                | 11 Throttle valve spindle | 15 Flexible feed pipe |
| 4 Piston          | 8 Needle valve seating | 12 Throttle valve         | 16 Jet fork           |



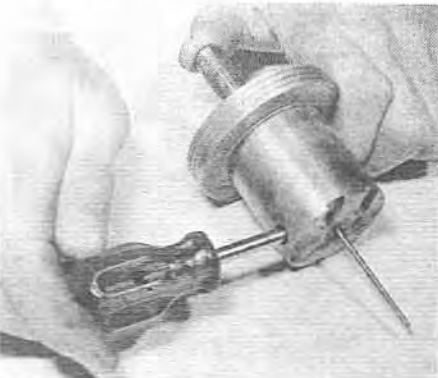
7.3A Removing a damper fitted with a retaining clip (arrowed)



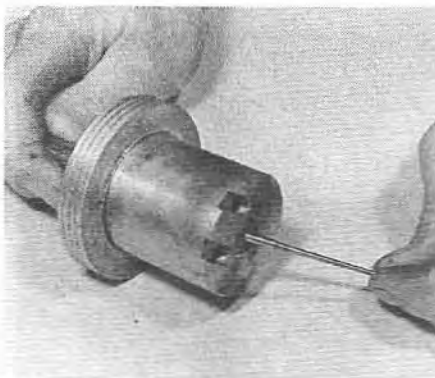
7.3B Standard damper



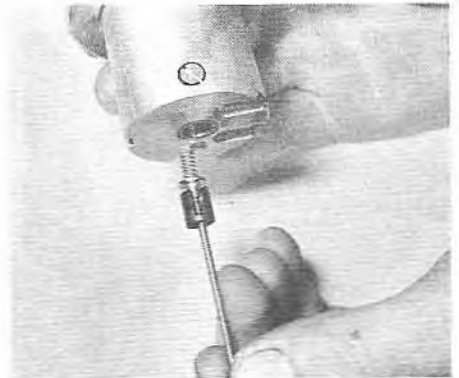
7.4 Removing the suction chamber



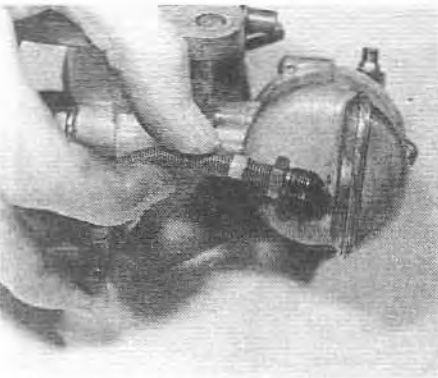
7.6A Undo the locking screw ...



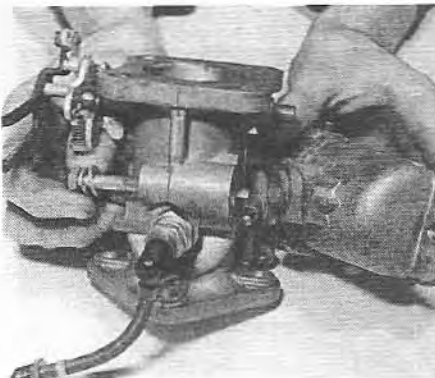
7.6B ... and withdraw the needle



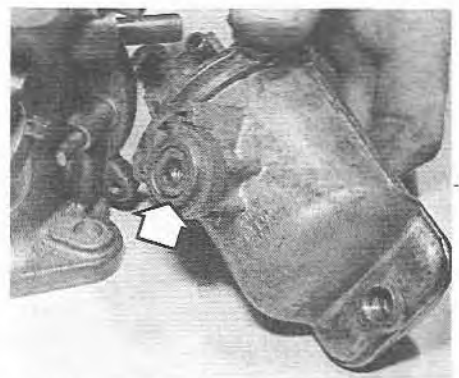
7.6C Removing the spring-loaded type needle



7.10 Jet feed pipe removal from the float chamber



7.11A Float chamber removal



7.11B Float chamber adapter bush location (arrowed)

float chamber (photo).

11 Unscrew the bolt retaining the float chamber to the carburettor body, and withdraw the float chamber. Note the location of the adapter bush and (where fitted) the flexible rubber mountings (photos).

12 Slide the jet from its bearing (photo).

13 Unscrew and remove the jet locking nut, together with the adjusting nut (photo). Unscrew the adjusting nut and separate the spring and jet bearing. On HS4C and HS8 carburetors, unscrew the clamp screws.

14 Record the seating 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. Take off the lever assembly and return spring (photo).

15 Record the seating of the two ends of the cam lever spring, and push out the pivot bolt tube or tubes. Take care not to lose the spring. Lift off the cam lever, noting the washer between the two levers.

16 Record the location of the float chamber lid. Undo the lid retaining

screws and take off the lid and its gasket, complete with float assembly (photo).

17 Pull out the float hinge pin from the serrated end, and detach the float (photo).

18 Extract the float needle from its seating and unscrew the seating from the lid, using a spanner 0.338 in (8.58 mm) across flats.

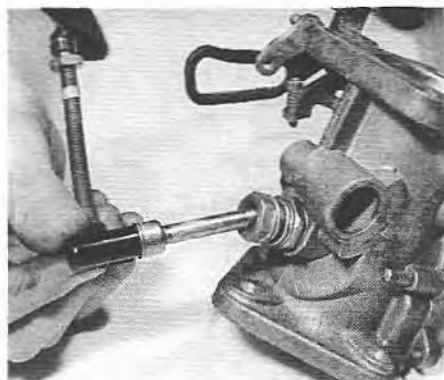
19 Shut the throttle and record the relative positions of the throttle disc and the carburettor flange.

20 Unscrew the two disc retaining screws. Open and ease out the disc from its slot in the throttle spindle (photos). The disc is not round but oval, and will jam if care is not taken.

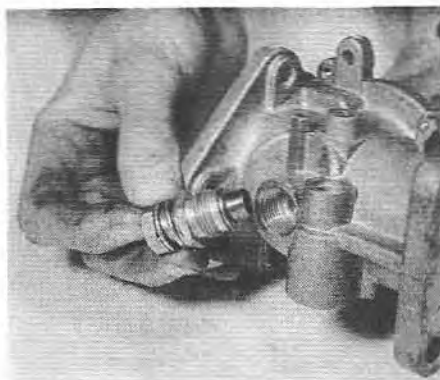
21 Bend back the tabs of the washer securing the spindle nut. Note the location of the lever arm in relation to the spindle and carburettor body; remove the nut and arm (photo).

22 Withdraw the spindle (photo).

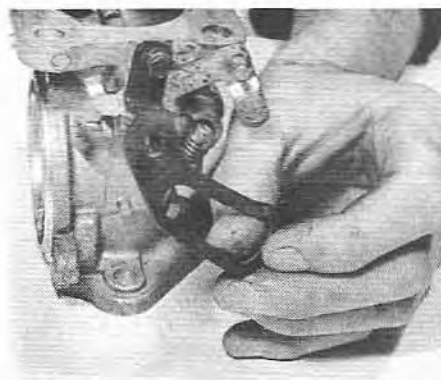
23 For instructions on cleaning, inspection and repair, refer to Chapter 4.



7.12 Removing the jet assembly



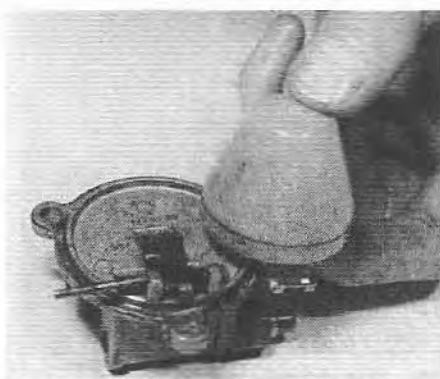
7.13 Removing the jet locking and adjusting nuts



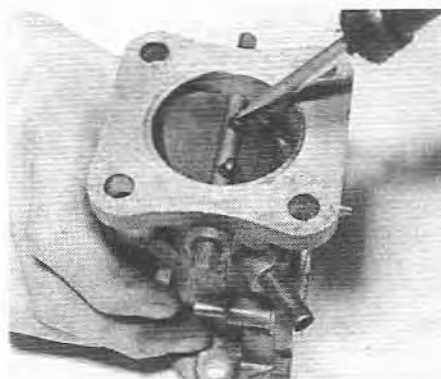
7.14 Pick-up lever removal (except HS8)



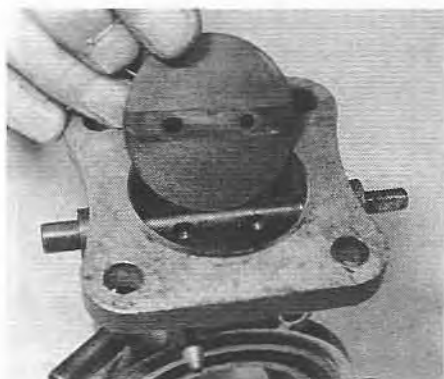
7.16 Removing the float chamber lid



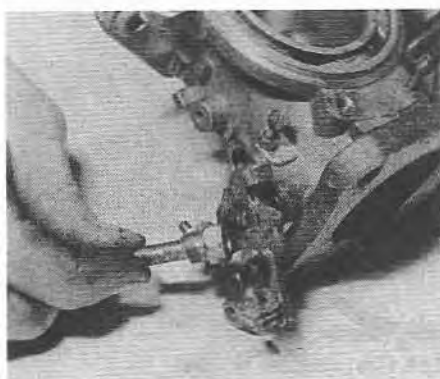
7.17 Float removal



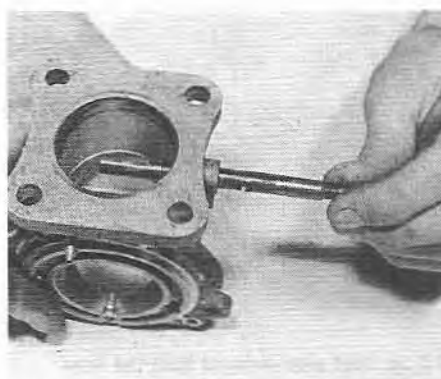
7.20A Remove the screws ...



7.20B ... and lift out the throttle disc



7.21 Spindle nut removal



7.22 Removing the throttle spindle

## 8 Assembly

1 Oil the spindle, then fit it to the body. Fit the lever arm, new tab washer and spindle nut. Check that when the stop on the lever arm is against the abutment on the body, the countersunk ends of the holes in the spindle face towards the intake end of the carburettor. Tighten the spindle nut, and lock with one of the two pointed tabs. This enables the tab washer to be re-used. Bend the square tab over the lever arm.

2 Slide the throttle disc into the slot in the spindle in the same relative position marked on disassembly, and fit two new throttle screws. Do not tighten at this stage. Close the throttle, when the disc will centre itself in the bore. Check visually that contact is made between the disc and the bore throughout its circumference. Check with the throttle closed that there is clearance between the throttle and the carburettor

body. Without moving the disc in the slot, tighten the screws and spread the split ends sufficiently to prevent the screws coming undone (photo).

3 Screw the needle valve seating into the float chamber lid. Do not overtighten. Insert the needle into the seating, and check that the spring-loaded plunger in the needle operates freely. Fit the float assembly and retain with the hinge pin. Check that the float hinges freely. With the float assembly resting on the needle valve, check that the gap between the float lever, or float itself, and the rim of the float chamber lid is between 0.126 and 0.189 in (3.2 and 4.8 mm). Use a twist drill or length of metal bar to make the check (photo). Where a steel arm is fitted, adjustment is possible by carefully bending the arm. However, where an all-plastic float is fitted, it will be necessary to increase or decrease the washer thickness under the needle seat (photos).

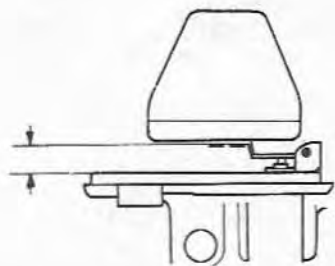


Fig. 7.7 Float level setting – steel arm type (Sec 8)

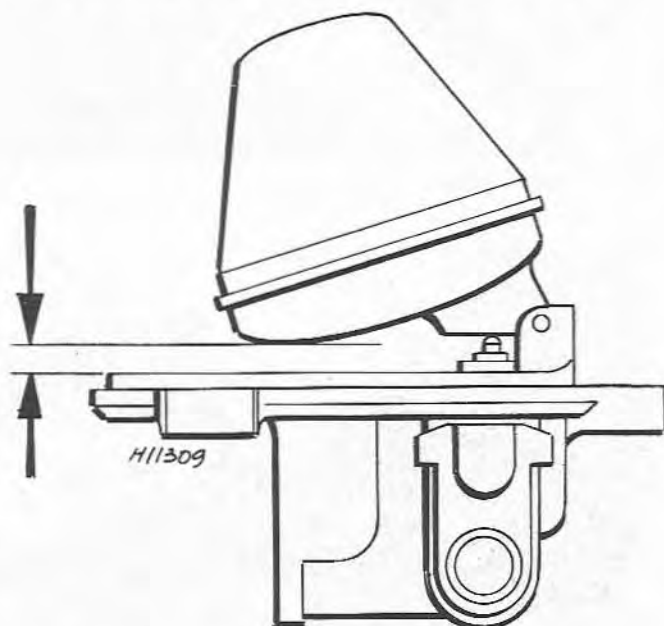


Fig. 7.8 Float level setting – all-plastic type (Sec 8)

4 Fit a new float chamber lid gasket (do not use jointing compound) and fit the lid to the float chamber in the same relative position marked on disassembly. Fit and evenly tighten the securing screws. Fit the identity tag under one of these screws.

5 Fit the float chamber assembly to the carburettor body, with spacers between the two as necessary. Ensure that the registers on the body and the chamber engage correctly. If the chamber is flexibly mounted, ie with rubber spacer(s), use new items. Fit and tighten the retaining bolt, but take care not to overtighten.

6 Fit the piston lifting pin, spring, new rubber sealing washer (if applicable) and circlip to the body.

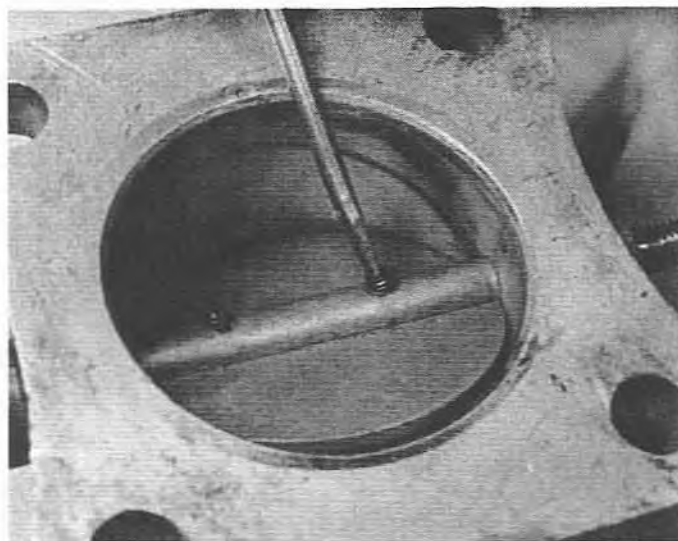
7 Fit the needle to the piston. Refer to Chapter 5, Fig 5.5, (where a rigid needle is fitted) and tighten the screw to secure. Where a spring-loaded needle is fitted, locate the spring on the needle collar and insert them in the piston. Insert the guide so that it is flush with the lower surface of the piston, and with the slot aligned with the locking screw hole. The small etch-mark must also be located between the two vacuum transfer holes. Insert and tighten the locking screw.

8 Check the piston key for security in the carburettor body (photo).

9 Fit the jet bearing, washer and locking nut. Do not tighten the nut.

10 Temporarily fit the jet assembly in the jet bearing, with the flexible feed pipe located in the float chamber outlet. Push the jet fully upwards (photo), then carefully locate the piston and needle in the upper end of the body, and push downwards. This will centralise the jet, and the jet locking nut may then be tightened. Remove both the piston and jet.

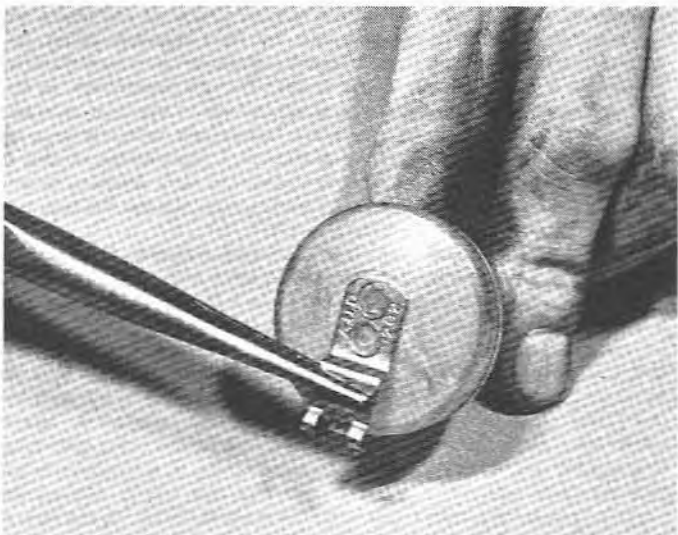
11 Fit the spring and jet adjusting nut to the jet bearing. Fit the gland, washer and ferrule to the flexible pipe (if removed). Check that the end of the tube projects at least 0.188 in (4.8 mm) beyond the gland.



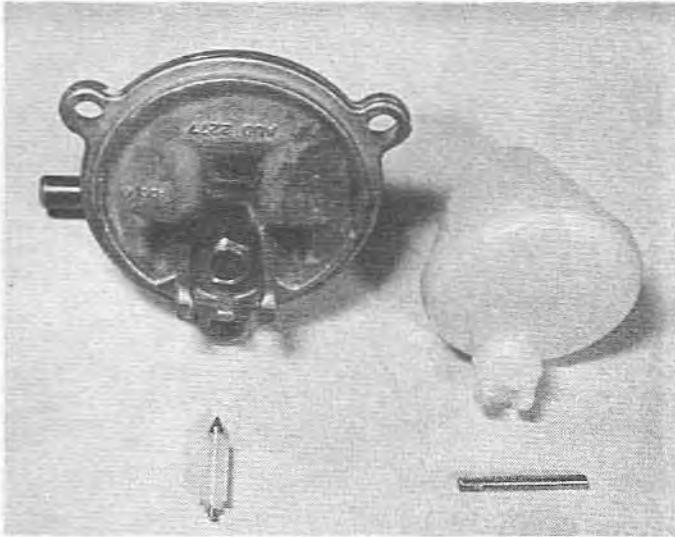
8.2 Spreading the throttle disc screw split ends



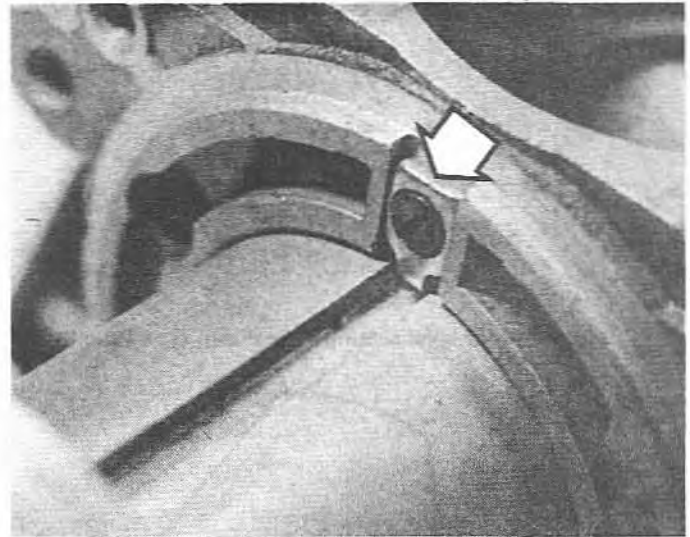
8.3A Checking the float level



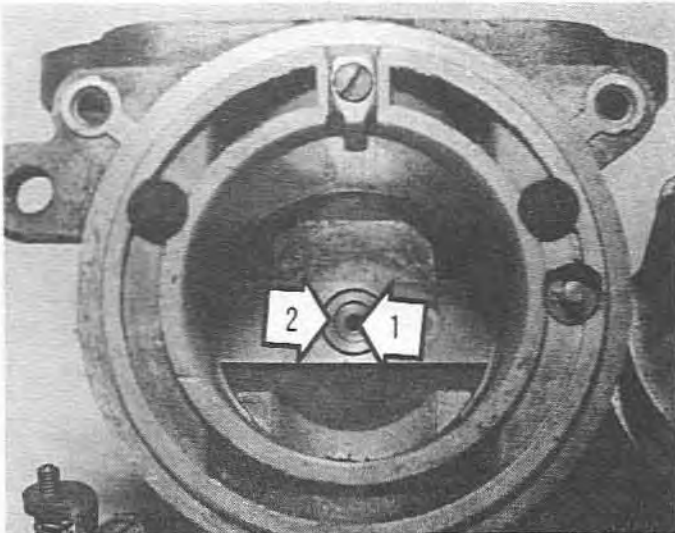
8.3B Bending the steel float arm



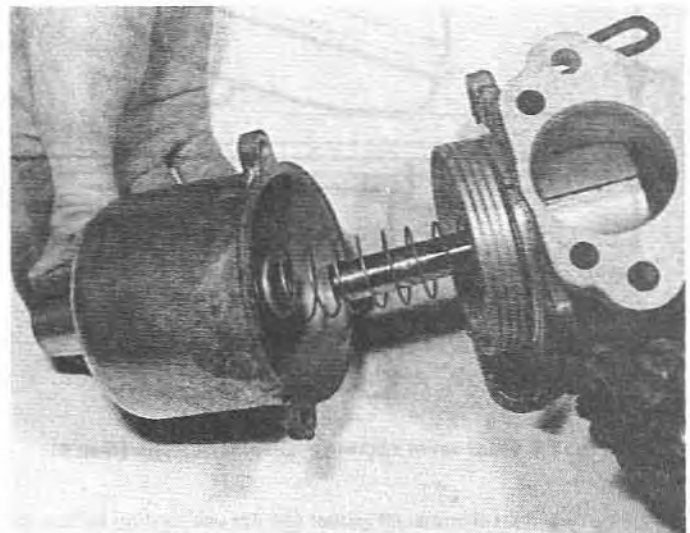
8.3C All-plastic float, needle and float chamber lid



8.8 Piston key (arrowed)



8.10 Top view of the jet (1) and jet bearing (2)



8.12 Fitting the suction chamber

Lightly smear petroleum jelly on the outside of the jet and insert into the bearing. Insert the feed pipe into the float chamber outlet, and tighten the union nut until the neoprene gland is compressed (when the pipe will be held firmly in the outlet). Do not overtighten, as this can cause leakage and possibly stripped threads in the float chamber.

12 Fit the piston assembly to the body, taking care not to damage the needle. Fit the piston spring to the piston rod. Lightly oil the outside of the piston rod, and fit the suction chamber in the same relative position as marked on disassembly (photo). Fit and evenly tighten the retaining screws.

13 Top up the piston rod with oil as described in Section 9, paragraph 7, then fit and tighten the damper rod. Where a retaining clip is fitted, hold the piston in its raised position while inserting the damper rod, and press the clip firmly into the top of the piston rod.

14 Assemble the pick-up lever, cam lever, cam lever spring, washer and pivot bolt tube(s). Place the lever return spring in position over the boss, and fit the linkage assembly to the carburettor body with the pivot bolt. Ensure that the double-coil spring washer or spacer (alternative part) fits over the projecting end of the pivot bolt tube. Register the angled end of the lever return spring in the groove in the pick-up lever, and hook the other end of the spring around the moulded peg on the carburettor body. Fit the brass ferrule to the hole in the end of the pick-up lever. Relieve the torsion of the return spring, and fit the link to the jet with its retaining screw. Fit the baffle plate to the float chamber vent pipe.

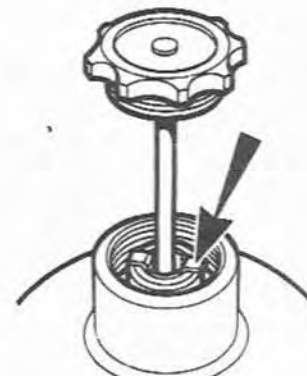


Fig. 7.9 Damper retaining clip fitted in the piston rod (Sec 8)



## 9 Tuning

**Note:** Refer to Chapter 3 for notes on tuning, with particular reference to preliminary procedures

*Single carburettor installations*

- 1 Set the throttle adjusting screw. Warm the engine up to normal operating temperature, then switch off. Unscrew the throttle adjusting screw until it is just touching its stop, and the throttle is shut. Set the throttle adjusting screw  $1\frac{1}{2}$  turns open. Ensure that the fast idle screw is clear of the fast idle cam.
- 2 Set the jet height. Mark the components for correct reassembly, and remove the suction chamber and piston. Disconnect the mixture control wire. Screw up the jet adjusting nut (or screw on HS4C carburetors) until the jet is flush with the bridge of the carburettor (or fully up if this position cannot be attained). Refit the piston and suction chamber. Check that the piston falls freely onto the bridge when the lifting pin is released.
- 3 Set the jet adjusting nut/screw. Screw down the jet adjusting nut/screw two turns on non-tamperproof type carburetors, or three turns on tamperproofed carburetors.
- 4 Set the idle speed. Start the engine, and adjust the throttle

adjusting screw to give the desired idle speed. Turn the jet adjusting nut/screw up to weaken, or down to richen, until the fastest idle speed, consistent with even running, is obtained. Re-adjust the throttle adjusting screw to give the correct idle speed if necessary.

5 Check the mixture strength (CO content), as described in Chapter 17, Section 9.

6 Connect and set the mixture control wire. Connect the mixture control wire with about 0.0625 in (1.6 mm) free movement before it starts to pull on the jet lever. Pull the choke knob at the fascia until the linkage is about to move the carburettor jet operating arm, and adjust the fast idle screw to give an idle speed of about 1000 rpm when the engine is hot. Return the choke knob, and check that there is some clearance between the fast idle screw and the throttle stop.

7 Fill the damper. Finally top up the piston damper with the engine oil, until the level is 0.5 in (13mm) below the top of the hollow piston rod. On non-dustproofed carburetors (identified by a vent hole in the piston damper top), the oil level should be 0.5 in (13mm) above the top of the hollow piston rod.

*Multiple carburettor installations*

8 Refer to Chapter 17, Section 9, but ignore references to thermostatic carburetors. On HS8 carburetors, a jet adjusting screw is provided instead of an adjustment nut.

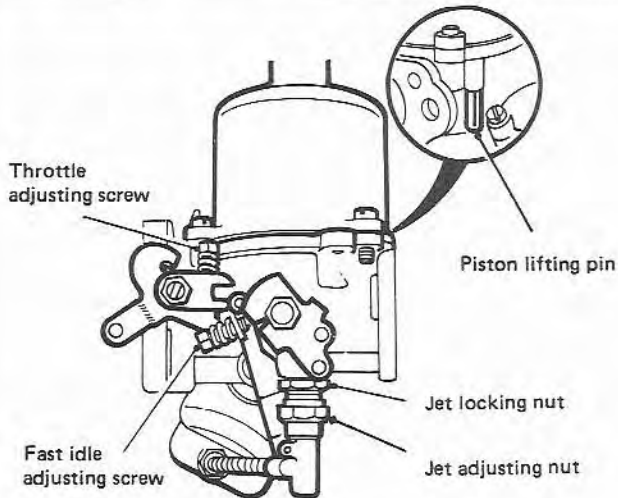


Fig. 7.10 HS carburettor adjustment points (Sec 9)

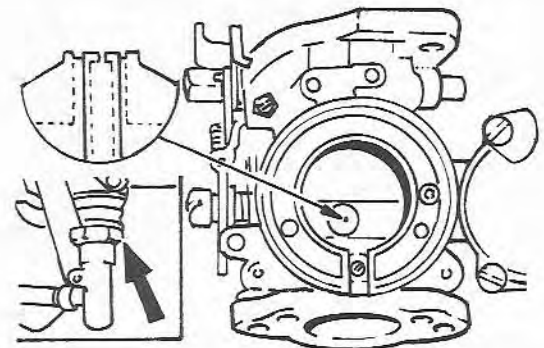


Fig. 7.11 Jet height adjustment (Sec 9)  
 Insets show cross-section of upper part of jet, and jet adjusting nut

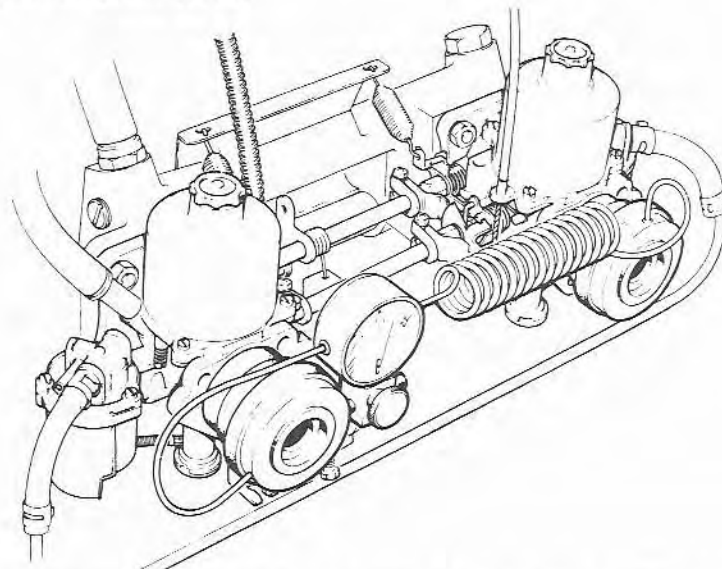


Fig. 7.12 Using an airflow balancing meter on a twin HS carburettor installation (Sec 9)