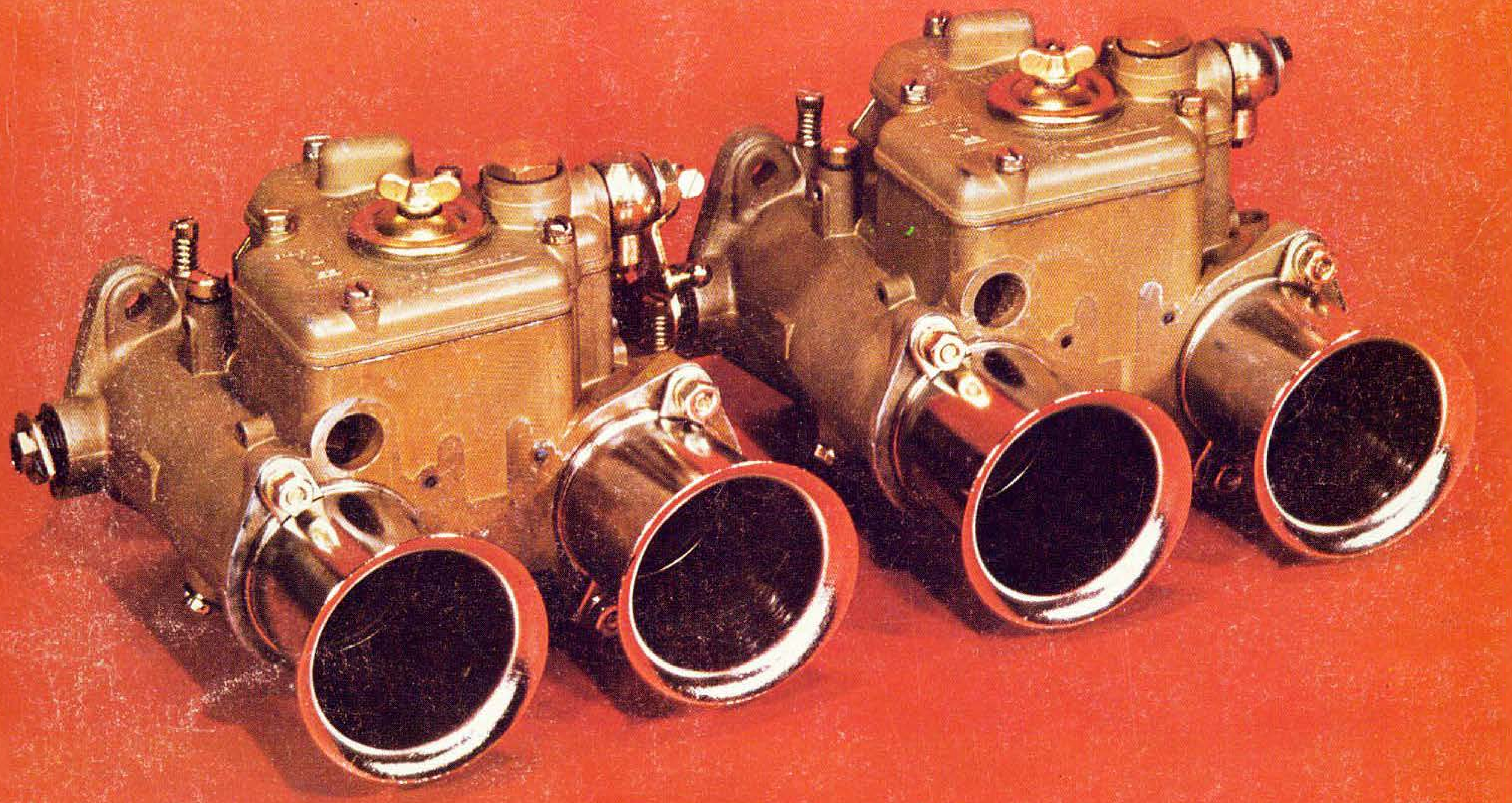
WEBER CARBURETTORS

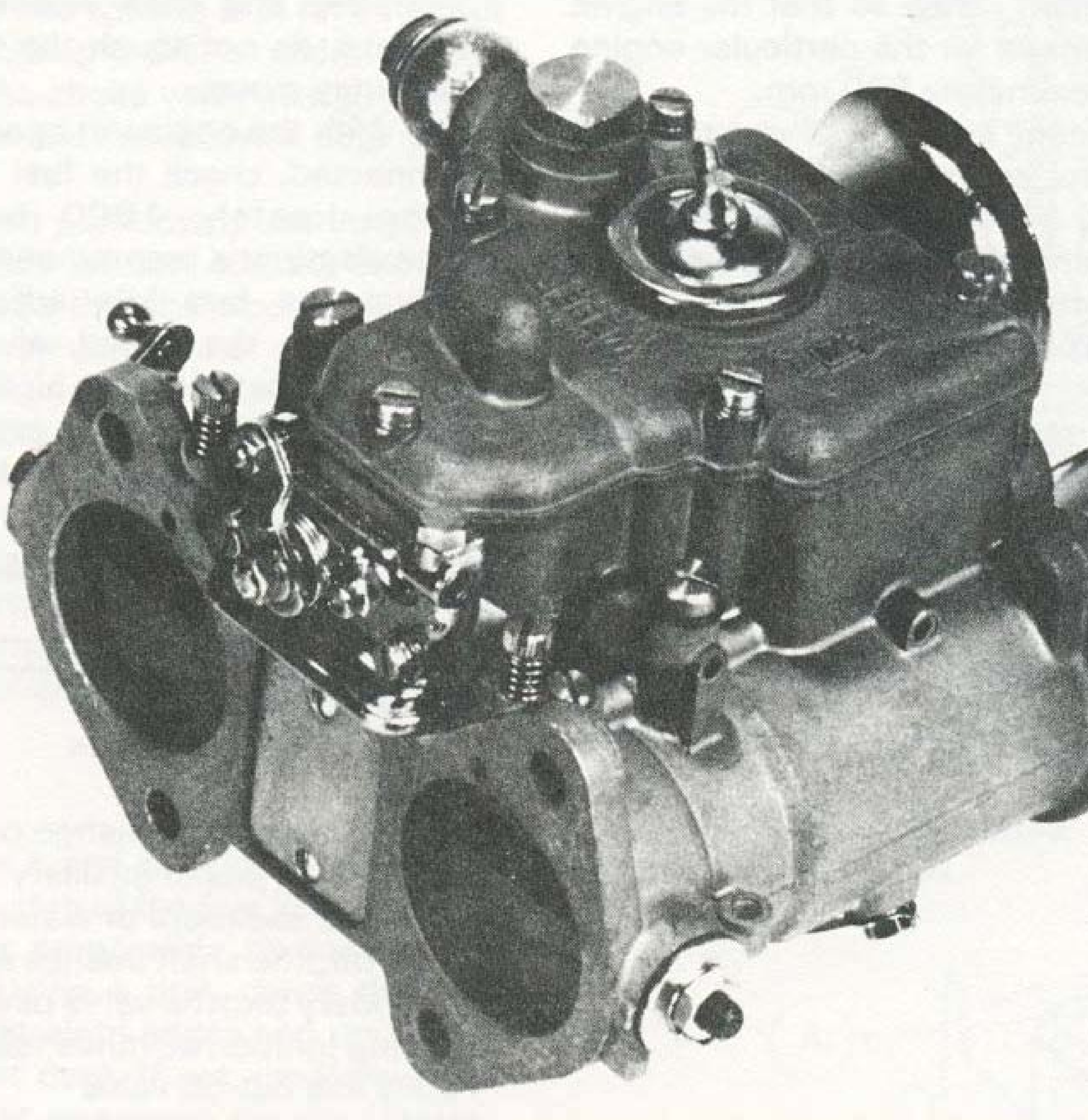
Haynes

THE BOOK

Tuning ▫ Overhaul ▫ Specification tables
Popular carburettor types ▫ to 1979

Owners Workshop Manual





Part2
Chapter 11 Type 38 to 48 DCOE carburettors

Contents

Adjuatment data

Nota: The followlng information app//es to standard Weber fittings only and is not necessarily correct for non-standard fittings.

Accelerator pump stroke	in (mm)
40 DCOE Series 2, 4, 24, 27, 28, 32, 33	0,551 (14-0)
46 DCOE Series 15/16	0•551 (14•0)
40 DCOE Series 18, 22/23, 29/30	0-394 (10-0)
42 DCOE Series 8	0-394 (10-0)
45 OCOE Series 9, 14, 14/18, 17	0,394 (1O,O)
40 DCOE Series 31, 34/35, 44/46, 76/77	0,630 (16,0)
45 DCOE Series 38/39, 62/63, 68/69	0,630 (16,0)
40 DCOE Series 72/73, 80/81	0•709 (18,0)

Float level setting dimension	Cloaed poaitlon	Open position	Stroke
40 DCOE Series 2, 4, 18, 22/23, 24, 27, 28, 31, 32, 33 34/35	0.335 in (8,5 mm)	0•591 in (15-0mm)	0,256 in (6,5 mm)
45 DCOE Series 14, 14/18, 17	0.335 in (8-5 mm)	0-591 in (15,0 mm)	0,256 in (6•5 mm)
40 DCOE Series 29/30	0-197 in (5•0 mm)	0-453 in (11-5 mm)	0•256 in (6•5 mm)
40 DCOE Series 44/46	0-276 in (7•0 mm)	0-551in (14•0 mm)	0-276 in (7•0 mm)
40 DCOE Series 72/73, 76/77, 80/81	0,295 in (7•5 mm)	0•551 in (14-0mm)	0•256 In (6•5 mm)
45 OCOE Series 16/16	0,295 In (7-5 mm)	0•551 in (14•0mm)	0,256 In (6•5 mm)
42 DCOE Series 8	0,197 in (6,0 mm)	0,632 In (13•5mm)	0,335 in (8•5 mm)
46 DCOE Series 9:			
Aston Martin 0B4 Vantage GT and Maseratl 3500 GT Speciale	0,197in (5•0 mm)	0,532 in (13•5 mm)	0,335 in (8,5 mm)
Alfa Romeo and Aston Martin 0B5	0•276 In (7,0 mm)	0•532 in (13•5mm)	0,256 in (6•5 mm)
45 OCOE Series 38/39, 62/63, 68/69	0-197 in (5•0 mm)	0•551 in (14,0 mm)	0•354 in (9,0 mm)

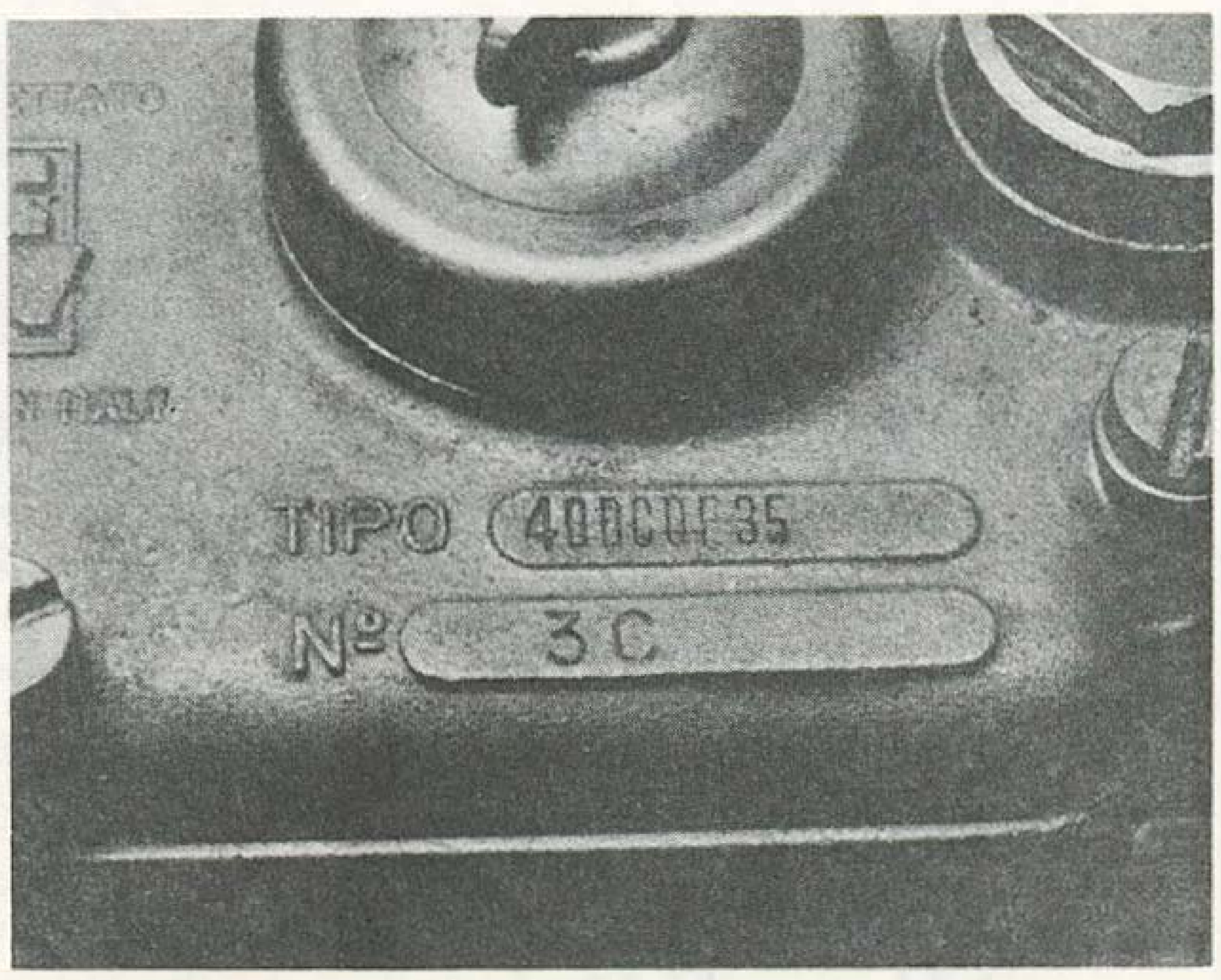
1 Introduction

The Weber DCOE carburettor is of the horizontal, side-draught type and has two identical barrels fed by a common centrally located float chamber. The throttle valves are mounted on a common spindle and are of the synchronised, simultaneous operation type.

The carburettor may be fitted on the engine ln several different arrangements, the most common being listed as follows:

1 One unit on a four-cylinder In-line engine, ie each barrel feeds two cylinders
2 Two units on a four-cylinder in-line engine, ie each barrel feeds one cylinder via short in/et manifolds
3 Two units on a four-cylinder V-configuratlon engine, ie each barrel feeds one cylinder
4 Three units on a six-cylinder in-line engine, ie each barrel feeds one cyllnder
5 Two units on a six-cylinder In-line engine with one in/et manifold for each carburettor, ie each carburettor feeds three cylinders

The carburettor identification mark is located on the upper cover (photo).



1.3 Identiflcation mark location

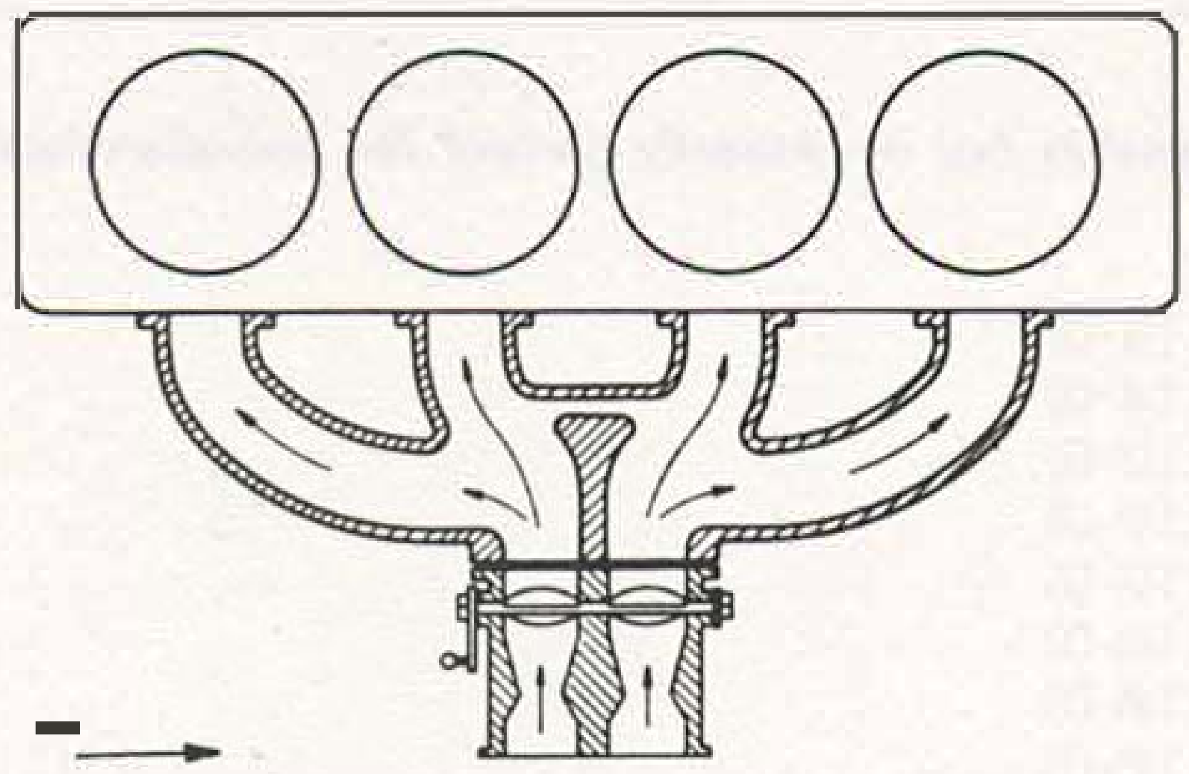


Fig. 11.1 One carburettor fitted to a four-cylinder in-line engine (Sec 1)

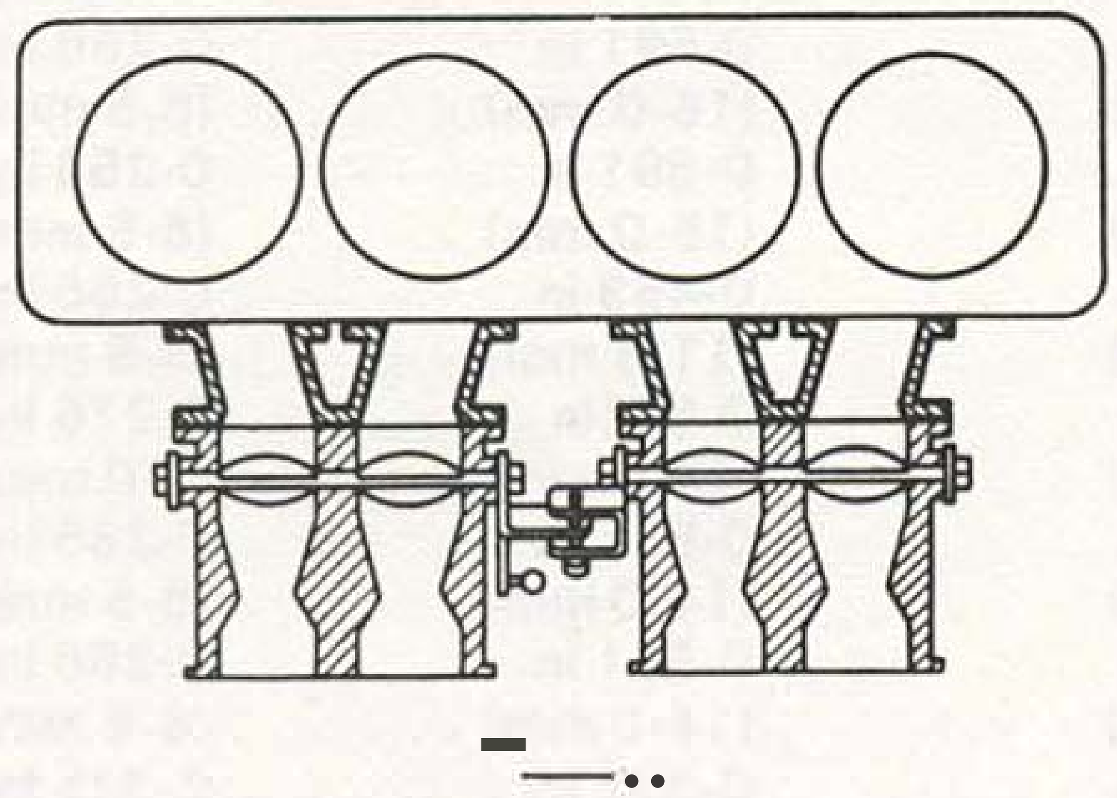


Fig. 11.2 Two carburettors fitted to a four-cylinder in-line engine (Sec 1)

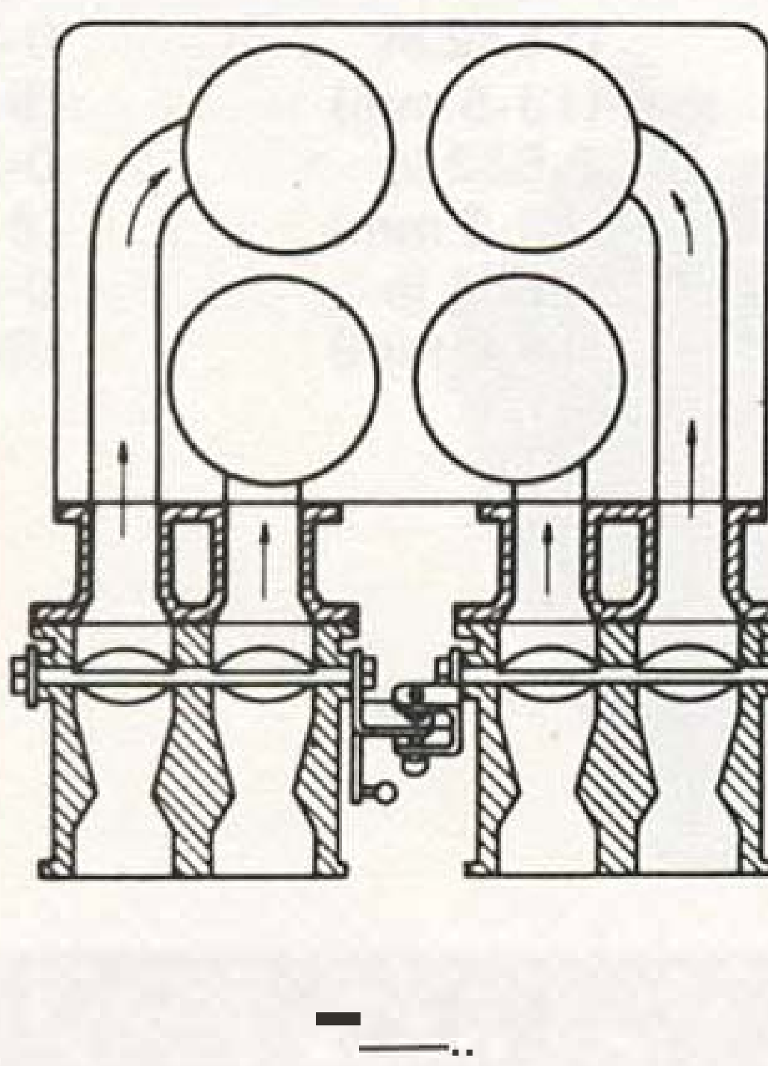


Fig. 11.3 Two carburettors fitted to a four-cylinder V-engine (Sec 1)

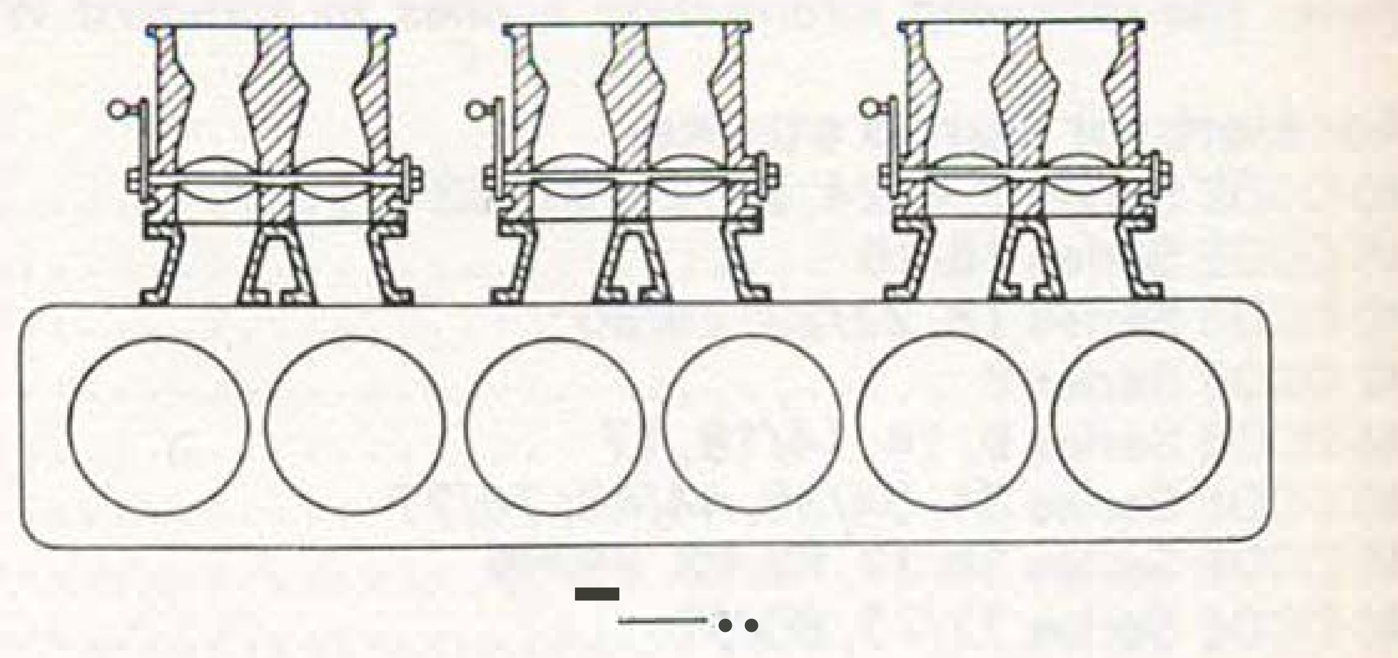


Fig. 11.4 Three carburettors fitted to a six-cylinder in-line engine (Sec 1)

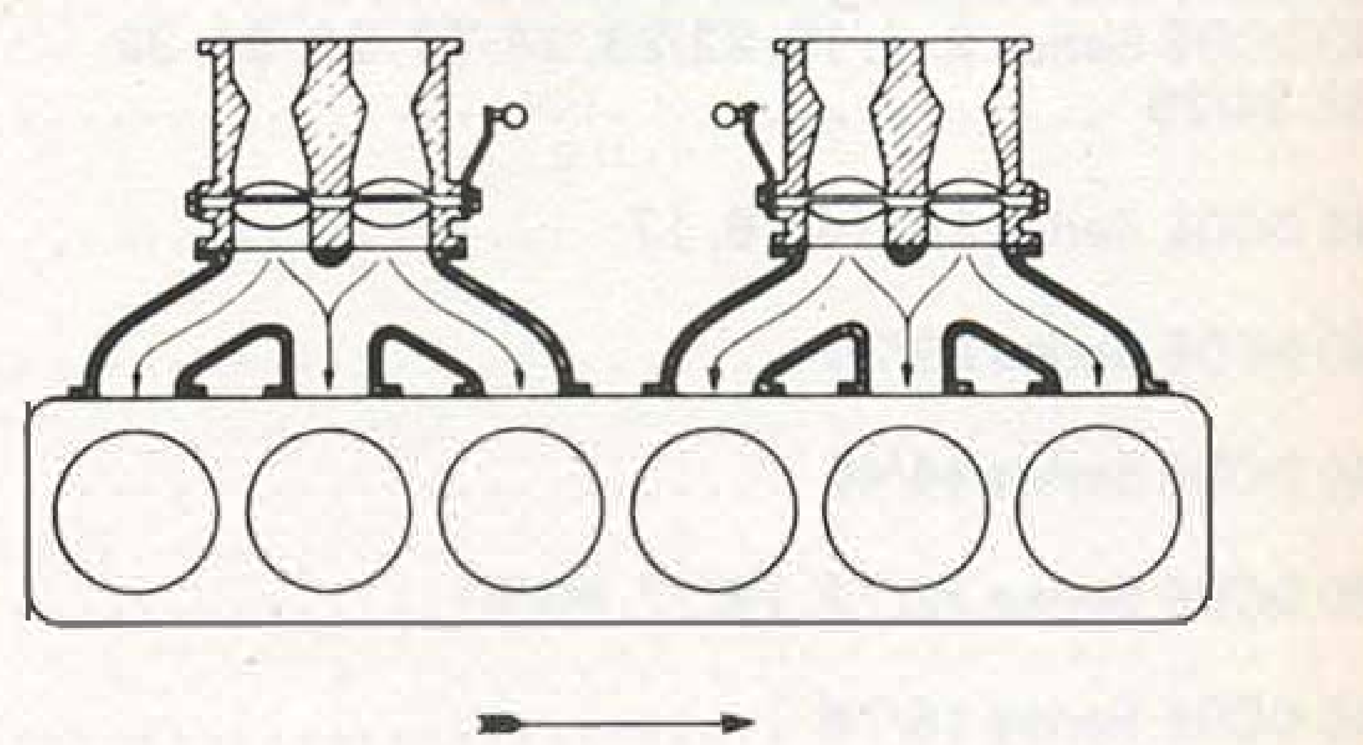


Fig. 11.5 Two carburettors fitted to a six-cylinder in-line engine (Sec 1)

2 Construction

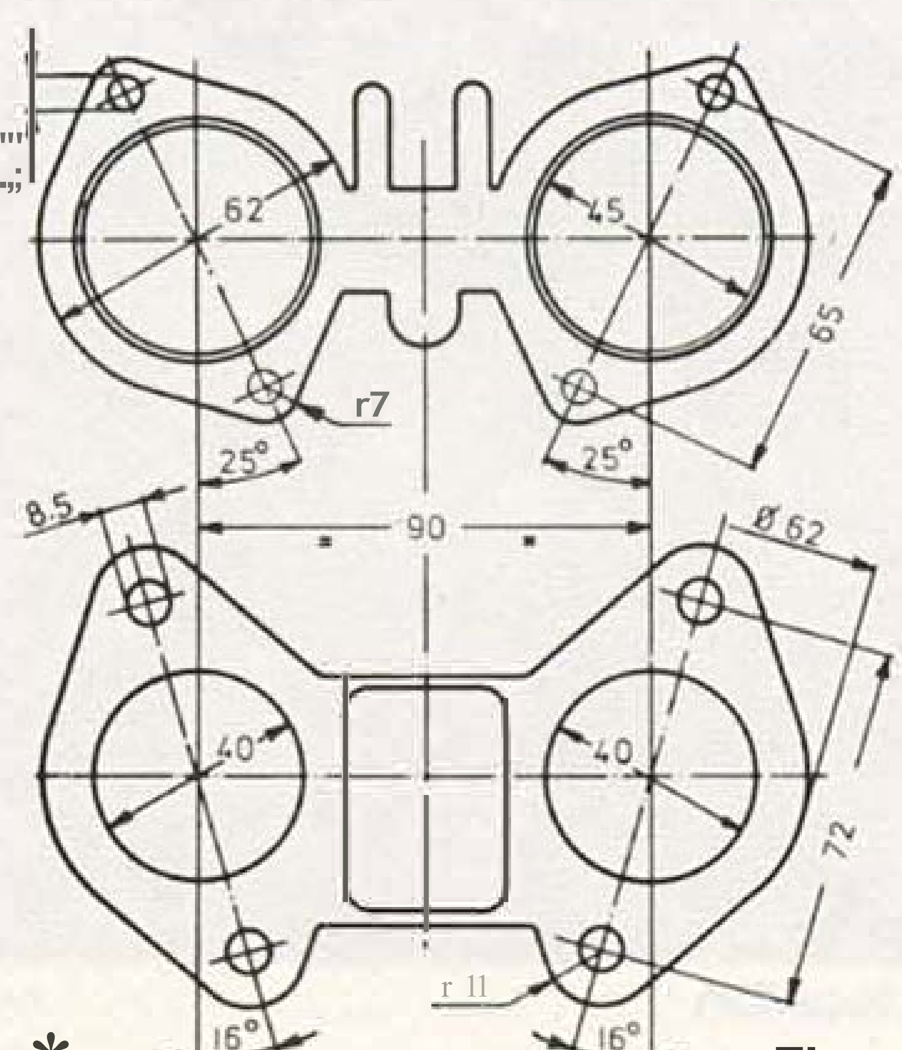
The main body and covers of the Weber DCOE carburettor are of die-cast aluminium construction. The two mounting flanges are machined flat for fitting on the inlet manifold.

Early types are fitted with a brass throttle spindle. Later types have a steel spindle which incorporates two slots to accommodate the two brass throttle valves.

The air horns are of steel construction and are attached to the carburettor body by studs and nuts.

All fuel and air jets and emulsion tubes are of brass construction and are screw fittings into the main body. The internal channels of the main body are mostly drilled and where necessary, sealed with lead plugs.

The throttle spindle is supported by two ball-bearings in most types and spring tensioned seals are incorporated at each end of the spindle to prevent air being drawn through the bearings.



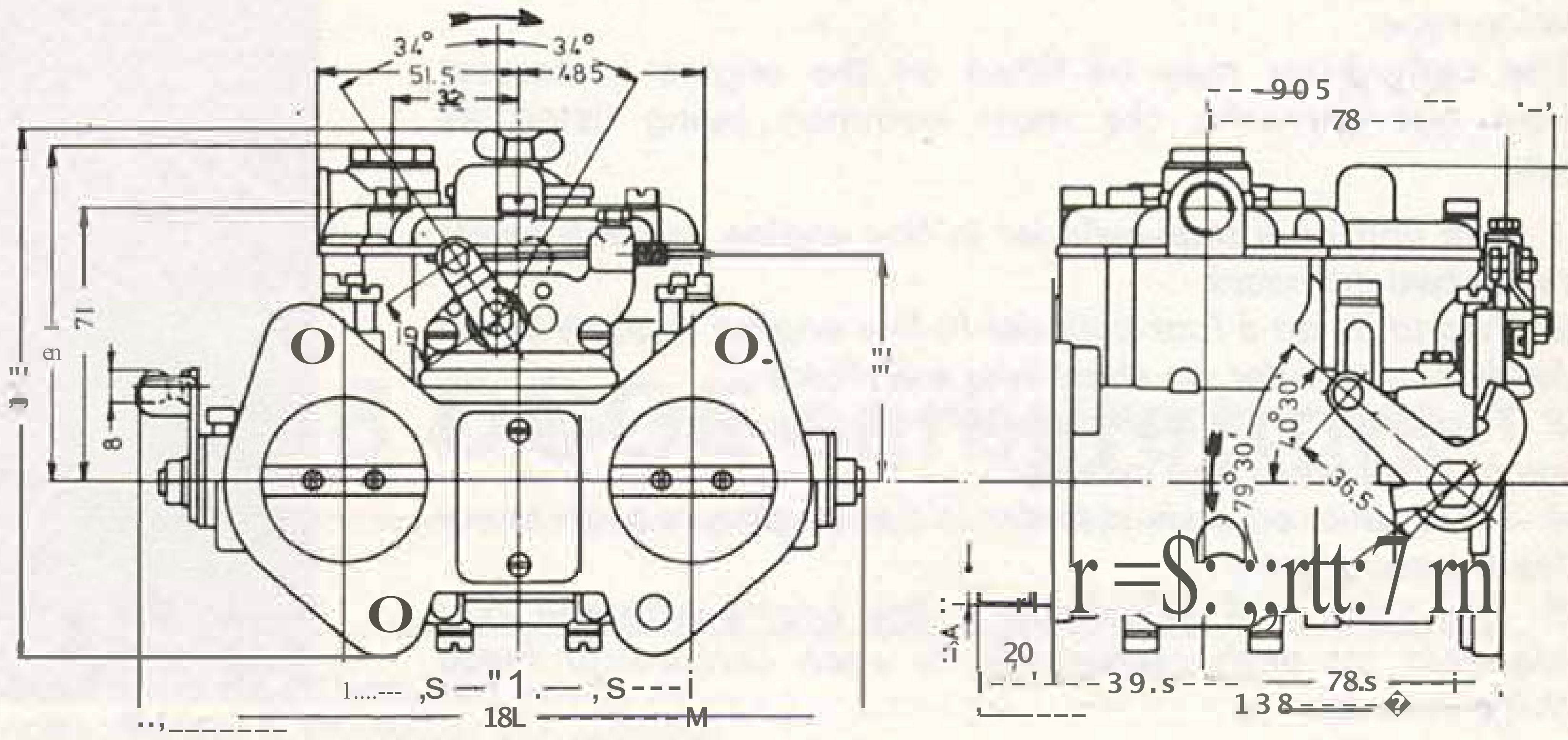


Fig. 11.6 Overall dimensions of the DCOE carburettor (Sec 2)

The fuel float assembly comprises two semi-floats constructed of thin brass sheet. Each float consists of two halves soldered together.

3 Operation

Cold starting

Not all of the DCOE range of carburettors are fitted with starting devices, the 40 DCOE 20 to 22 and 45 DCOE 12 types being the exception. Where fitted, the starter circuits operate independent of the main circuits and may be considered as separate carburettors within the main carburettor. The system functions as follows:

Operation of the choke (or to be precise cold start) cable moves the starter device lever which, through two intermeshed sector gears, lifts the two starter valves off their seats. Reference to Fig. 11.7 will show that fuel trom the float chamber (4) is drawn through the channels (32) to arrive at the starter fuel jets. Air entering the carburettor through hole (29) passes through the top and bottom of the starter jets (30) and emulsifies the fuel which is then drawn through the channels (31), past the starter valves (35), through the channels (33) and into the carburettor throats at the engine side of the throttle valves. It will be observed that additional air is introduced to the emulsified fuel through the starter valve spring retainer guide and through the starter device air filter and channels (34).

Partial operation of the starter device (ie when the engine is warming up) will reduce the amount of fuel admitted to the engine by lowering the starter valves (35) onto their seats and, when completely shut, the supply will cease.

Idling and progression

Refer to Fig. 11.8 and note that when the engine is idling with the throttle valves (17) closed, fuel is drawn trom the float chamber (4), through the channels (15) to the bottom of the idling jets (14). On passing through the idling jets, air is introduced through the channels (13) and the holes in the sides of the idling jets and the fuel then becomes emulsified.

The mixture then passes through the channels (20), past the idling adjusting screws (19), through the idling feed holes {18) and into the carburettor throats at the engine side of the throttle valves. The idling adjusting screws (19) have tapered ends and can therefore be adjusted to admit more or less mixture as necessary.

When the throttle valves are opened slightly to increase the engine speed, the progression holes (16) are brought into action to provide additional fuel. This is necessary in order to prevent a flat spot occuring before the main fuel supply system comes into operation.

Normal running

Under full throttle and high speed cruise conditions, the throttle plates will be sufficiently far from the idling and progression holes to prevent them from admitting fuel and the main supply circuit will be brought into action. Refer to Fig. 11.9 and note that fuel from the float chamber (4) passes through the apertures (6) to the main jets (5) which are located in the bottom of the emulsion tubes (12). Air is drawn through the air corrector jets (11). through the emulsion tube holes and emulsifies the fuel which then passes through the channels (10) to the auxiliary venturis (8). The fuel mixture then passes through the nozzles (7) and mixes with the main air supply as it is drawn through the chokes (9) and into the engine.

It will be observed that under statie engine conditions, the fuel levels in the emulsion tubes will be identical to that in the float chambers. As the engine speed increases and the fuel flow is faster, the fuel levels in the emulsion tubes drop. By providing additional holes in the lower part of the emulsion tubes, the necessary air correction is made possible at the higher engine speeds.

Acceleration

To provide the engine with a rich mixture when accelerating, the carburettor is equipped with an accelerator pump. Reference to Fig. 11.10 will show that when the throttle valves are closed, the lever (25) will lift the operating rod (27) against the pressure of the spring (28) and the piston (26) will draw fuel through the intake valve (23), along the channel and into the piston chamber. When the throttle valves are opened, the lever (25) allows the operating rad (27), together with the piston (26), to move down the pi:.ton bore under the action of the spring (28). Fuel is therefore forced along the internal channels (22), past the delivery valves (21) and through the pump jets (24) into the carburettor throats. During the pump delivery, the intake valve (23) is closed by the action of the internal ball but a certain amount of fuel is discharged back into the float chamber

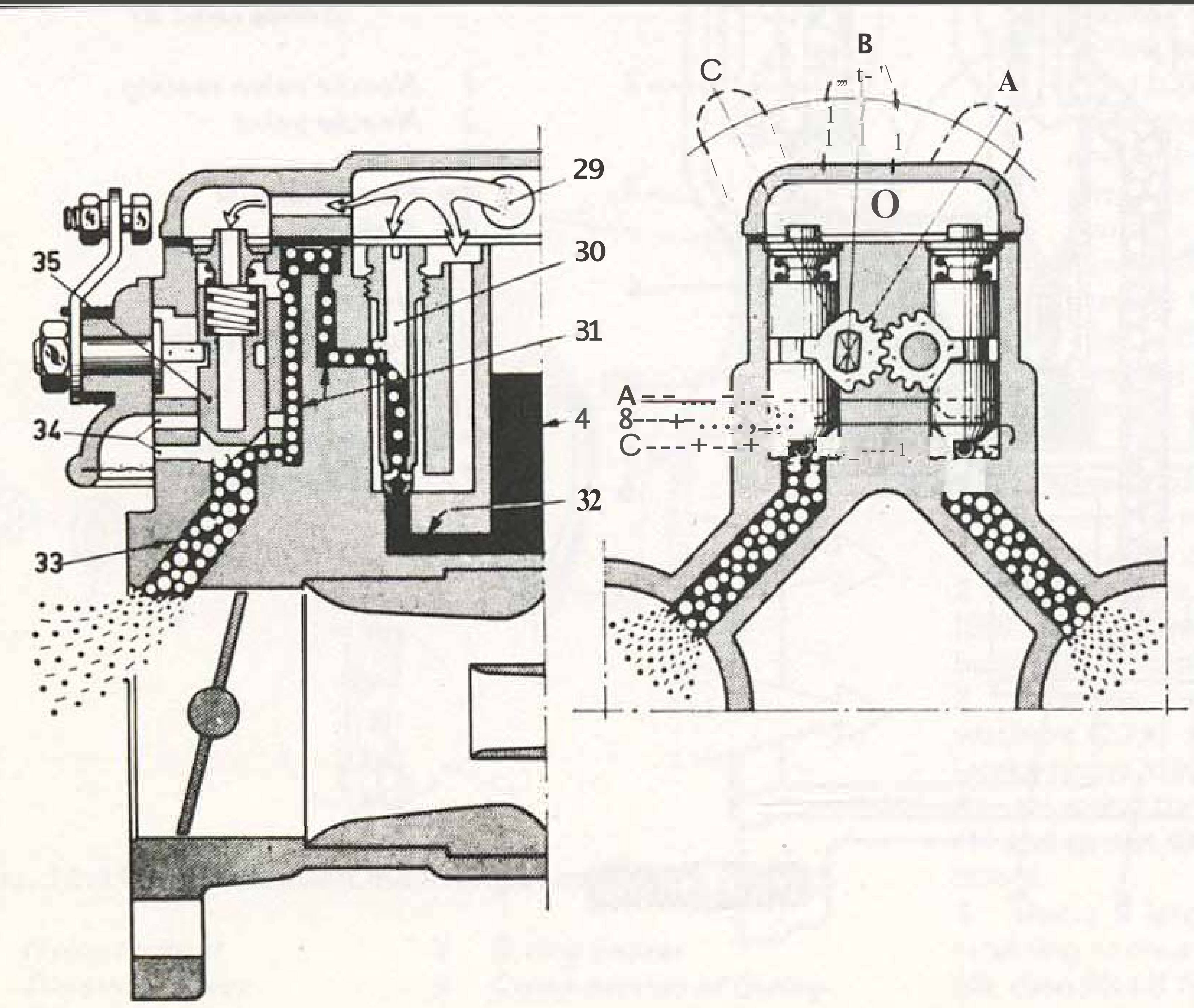
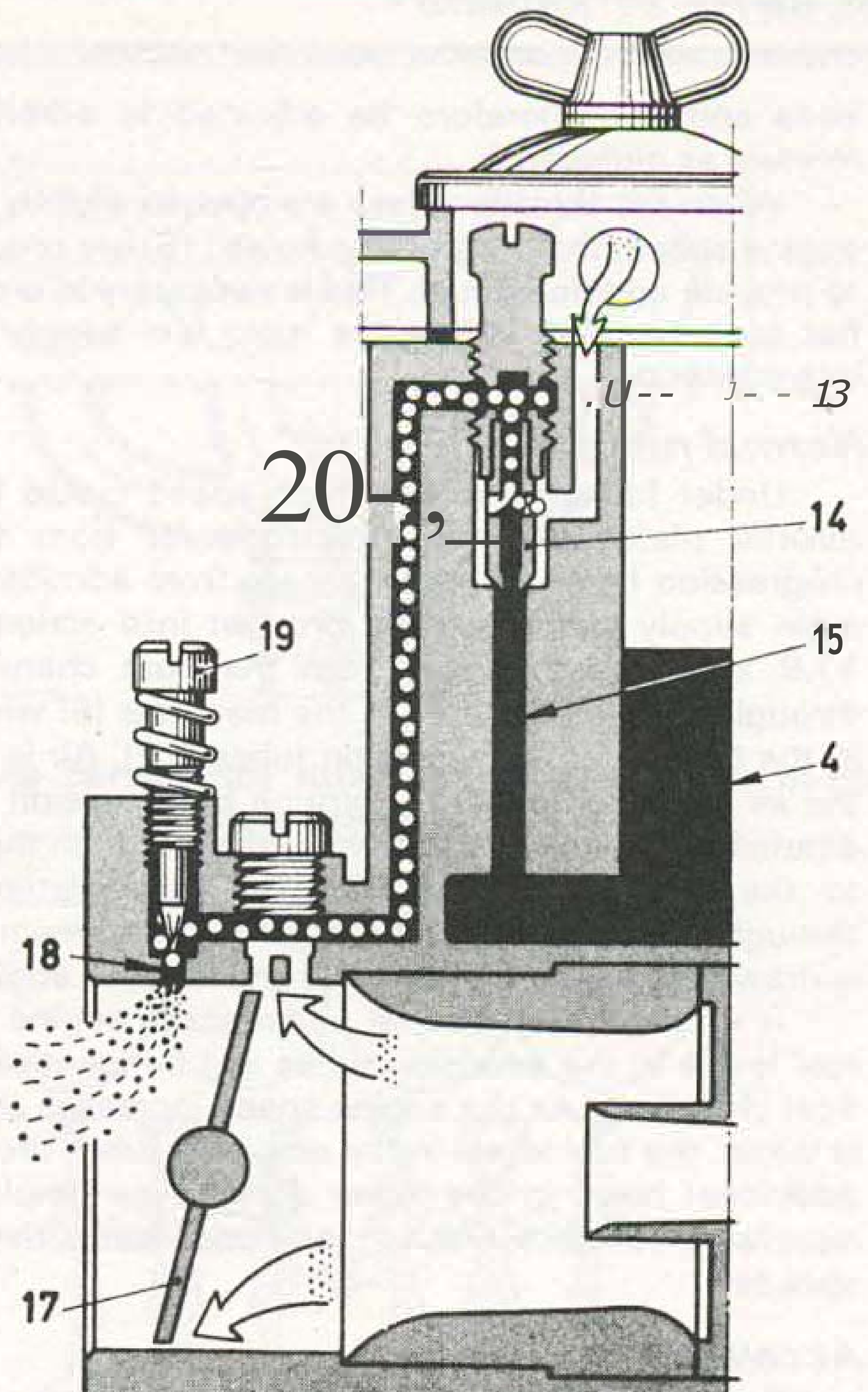


Fig. 11.7 Cold starting device operation (Sec 3)

4 Float chamber
29 Airentry
30 Startingjets
31, 32, 33 and 34 Internal channels
35 Starter valves
A Cold starting position
8 Warming up position
C Closed position



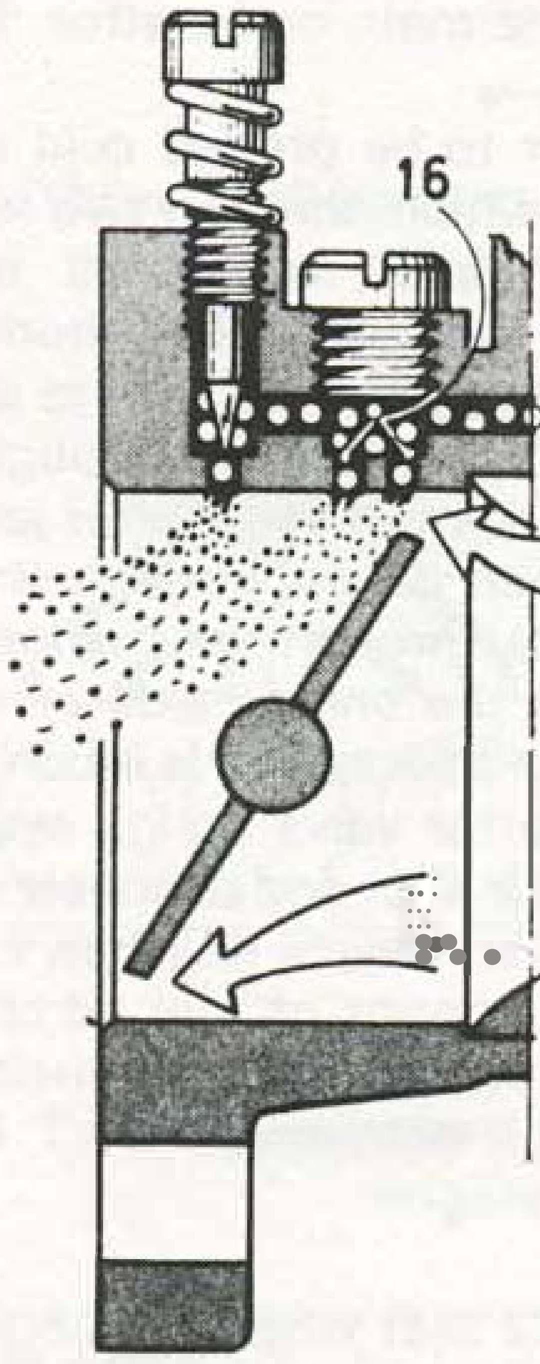


Fig8 Carburettor idling and progression phase (Sec 3)

4 Float chamber
13, 15 and 20 Internal channels
14 Idlingjets
16 Progr1ssion holes
17 Throttle plates
18 Idling feed holes
19 /die mixture adjustment screw

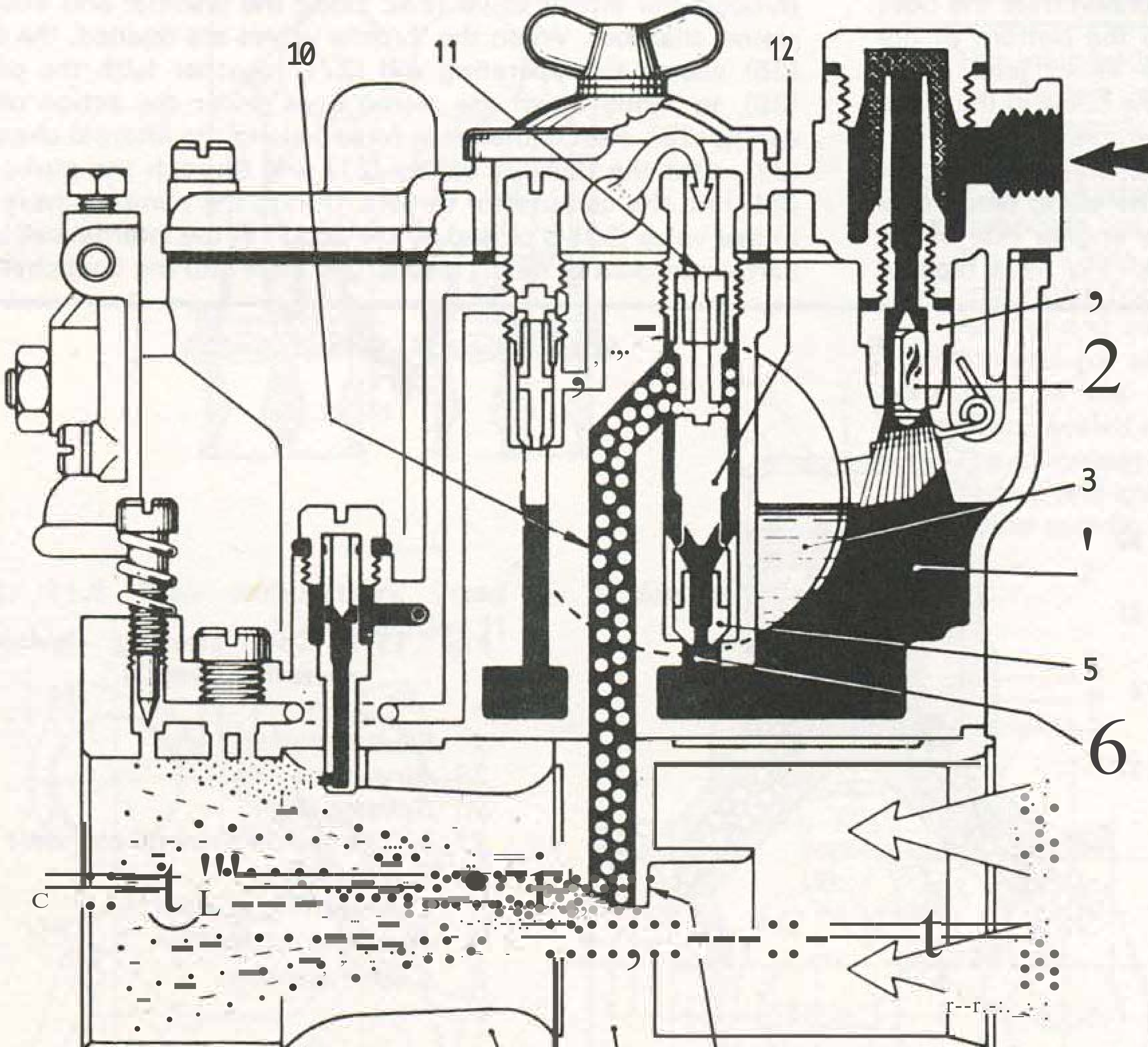


Fig. 11.9 **Carburettor normal phase (Sec 3)**

1 Needle valve seating
2 Needle valve
3 Float
4 Float chamber
5 Main jets
6 Channels
7 Nozzles
8 A uxi/iary venturis
9 Chokes
10 Channels
11 Air corrector jets
12 Emulsion tubes

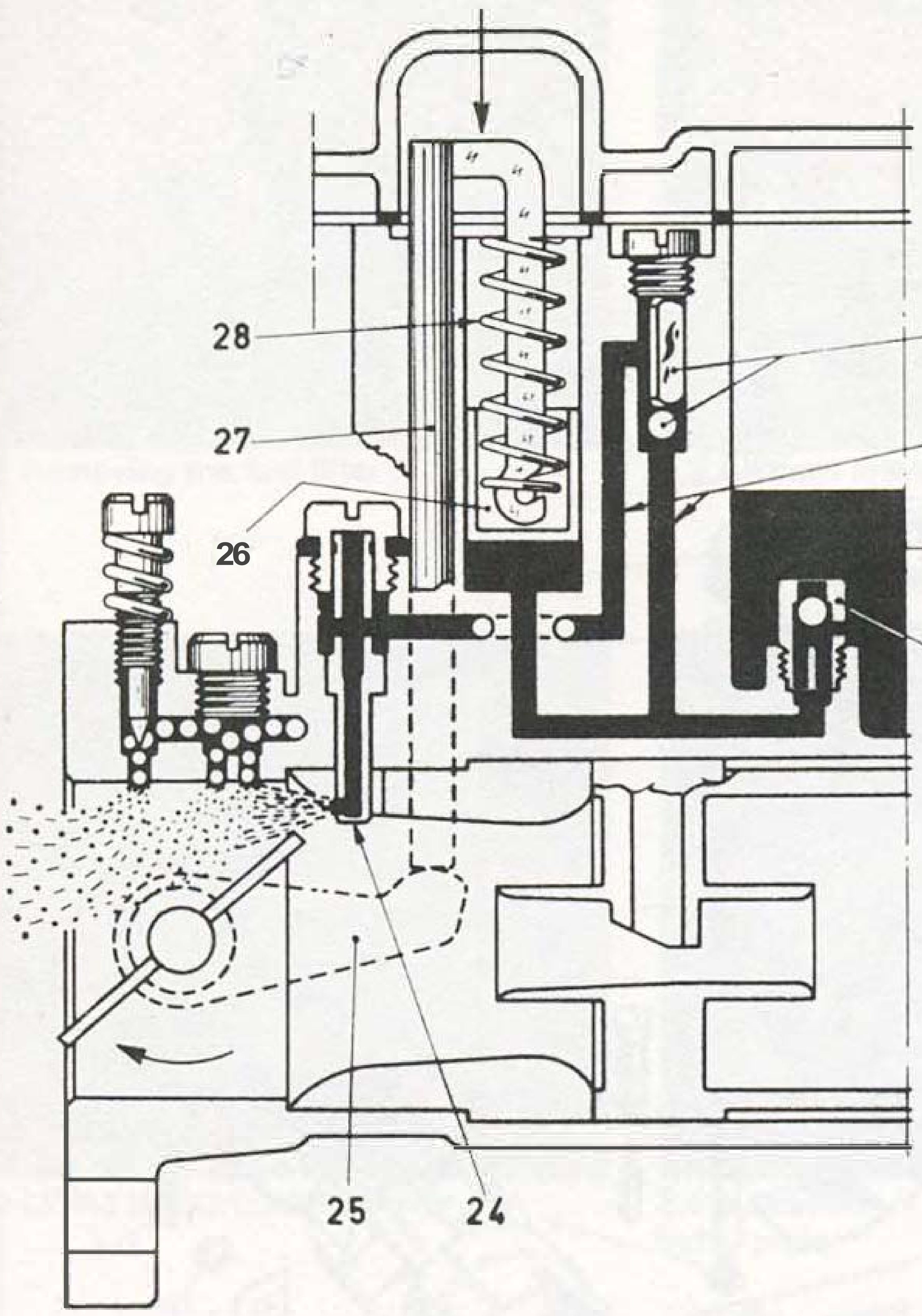


Fig. 11.10 Carburettor acceleration phase (Sec 3)

4 Float chamber
21 Delivery valves
22 Channels
23 Intake and discharge valve
24 Pump jets
25 Pump control lever
26 Piston
27 Control rod
28 Pump operating spring

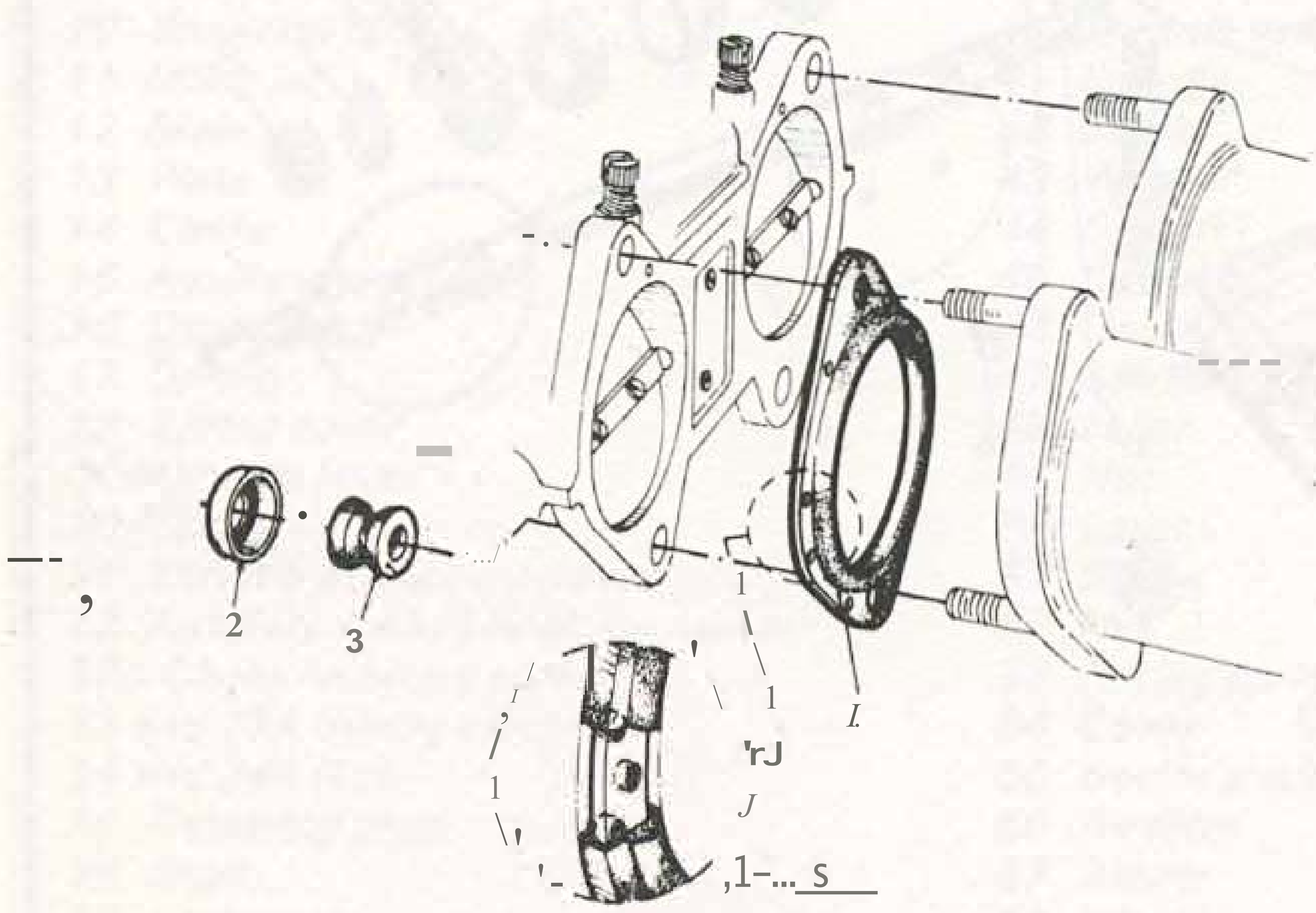


Fig. 11.11 Anti-vibration mounting components (Sec 4)

1 Nylon locknut
2 Grommet cover
3 Grommer
4 0-ring gasket
5 Cross-section of 0-ring gasket

through the discharge hole. By fine calibration of this hole it is possible to determine the exact quantity of fuel injected by the accelerator pump.

4 Removal and refitting

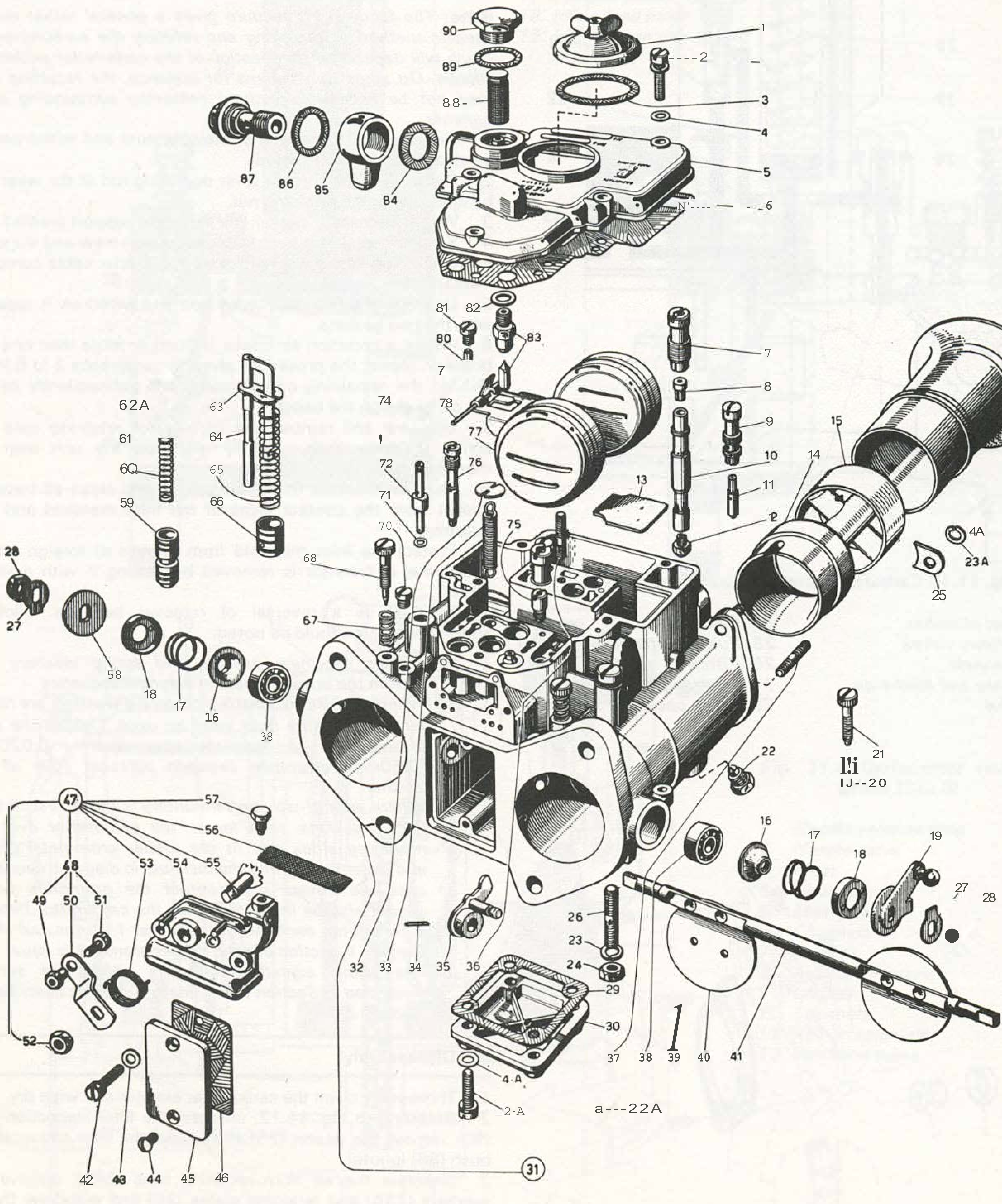
Note: *The following procedure gives a general rather than a specific method of removing and refitting the carburettor, as much will depend on the location of the carburettor within the vehicle. On some applications for instance, the retaining nuts may not be accessible without removing surrounding components.*

1 Unscrew and remove the retaining nuts and withdraw the air cleaner assembly (if fitted).
2 Disconnect the throttle lever operating rod at the lever end by unscrewing the retaining nut.
3 Where necessary, detach the air intake support bracket.
4 Slacken the starter inner cable securing screw and the outer cable securing screw and withdraw the starter cable complete from the carburettor.
5 Unscrew the fuel inlet union bolt and withdraw it together with the two gaskets.
6 Where a common air intake is fitted to more than one carburettor, repeat the procedure given in paragraphs 2 to 5 inclusive on the remaining carburettor(s) and subsequently detach the air intake on the bench.
7 Unscrew and remove the carburettor retaining nuts and spring washers, then carefully withdraw the unit over the mounting studs.
8 Remove the inlet manifold gaskets and clean all traces of gasket from the contact faces of the inlet manifold and carburettor.
9 Protect the inlet manifold from ingress of foreign matter whilst the carburettor is removed by sealing it with masking tape.
10 Refitting is a reversal of removal but the following additional points should be noted:

- (a) *Always use new gaskets and spring washers and tighten the retaining nuts in diagonal sequence*
- (b) *Where Thackeray double-coil spring washers are fitted, new self-locking nuts must be used. Tighten the self-locking nut to maintain approximately 0.020 in (0.50mm) clearance between adjacent coils of the washer*
- (c) *Where an anti-vibration mounting is fitted, first fit both 0-ring gaskets, then locate the carburettor over the mounting studs and fit the rubber grommers, covers and locknuts. Tighten the locknuts in diagonal sequence until the covers just contact the grommets which should also be in contact with the carburettor flanges. Now tighten each locknut a further 1½ turns and check that the V-section of each rubber grommer is equal*
- (d) *The idling adjustment screws should be set as described in Section 7 and finally turned as described in Section 8*

5 Disassembly

1 Thoroughly clean the carburettor exterior and wipe dry.
2 Referring to Fig. 11.12, unscrew the filter inspection plug (90), remove the gasket (89) and extract the filter and retaining bush (88) (photo).
2 Unscrew the air horn retaining nuts (24A), remove the washers (23A) and retaining plates (25) and withdraw the air intake horns (69) (photo).
4 Unscrew the wing nut and remove the jet inspection cover (1) and gasket (3) (photo) together with the serrated ring (where fitted).
5 Using a large screwdriver, unscrew the carburettor cover retaining screws (2) together with the spring and plain washers (4), then lift off the cover (5) (photo).
6 Remove the plate (13) from the carburettor bowl, then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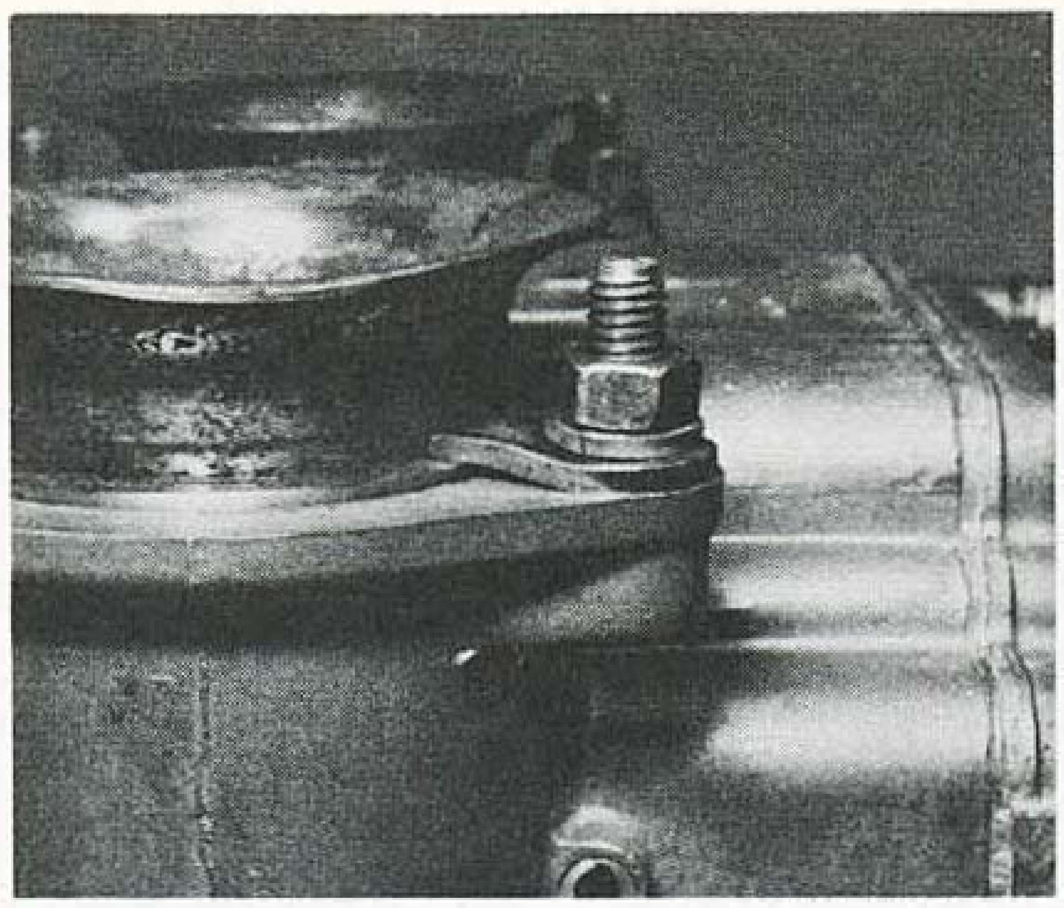
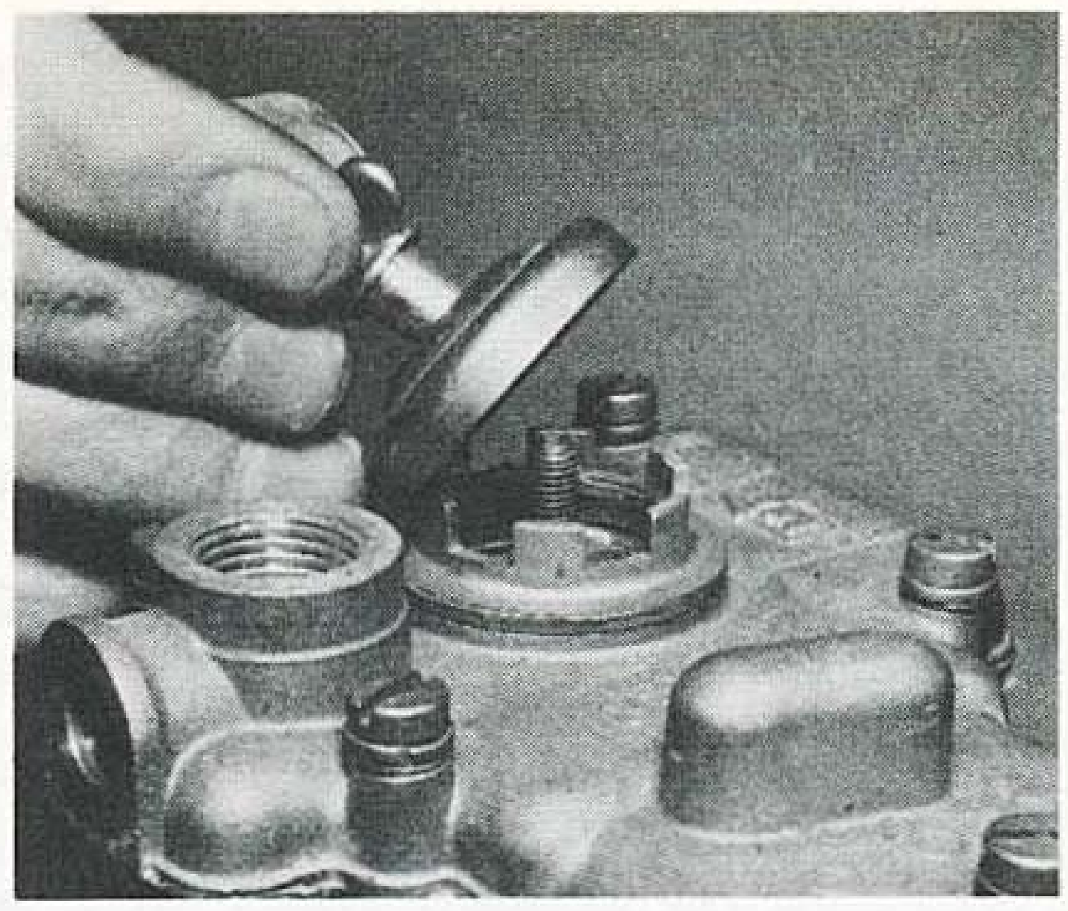
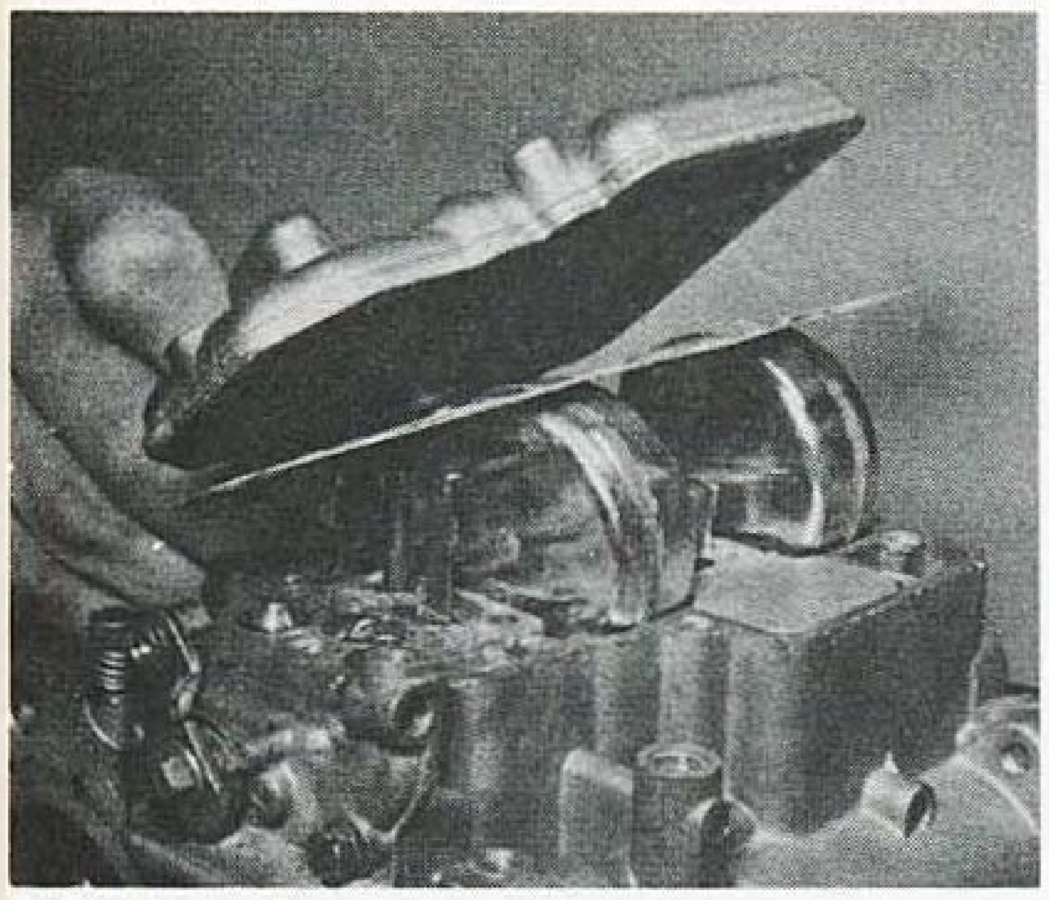
5.2 Aemoving the fuel filter



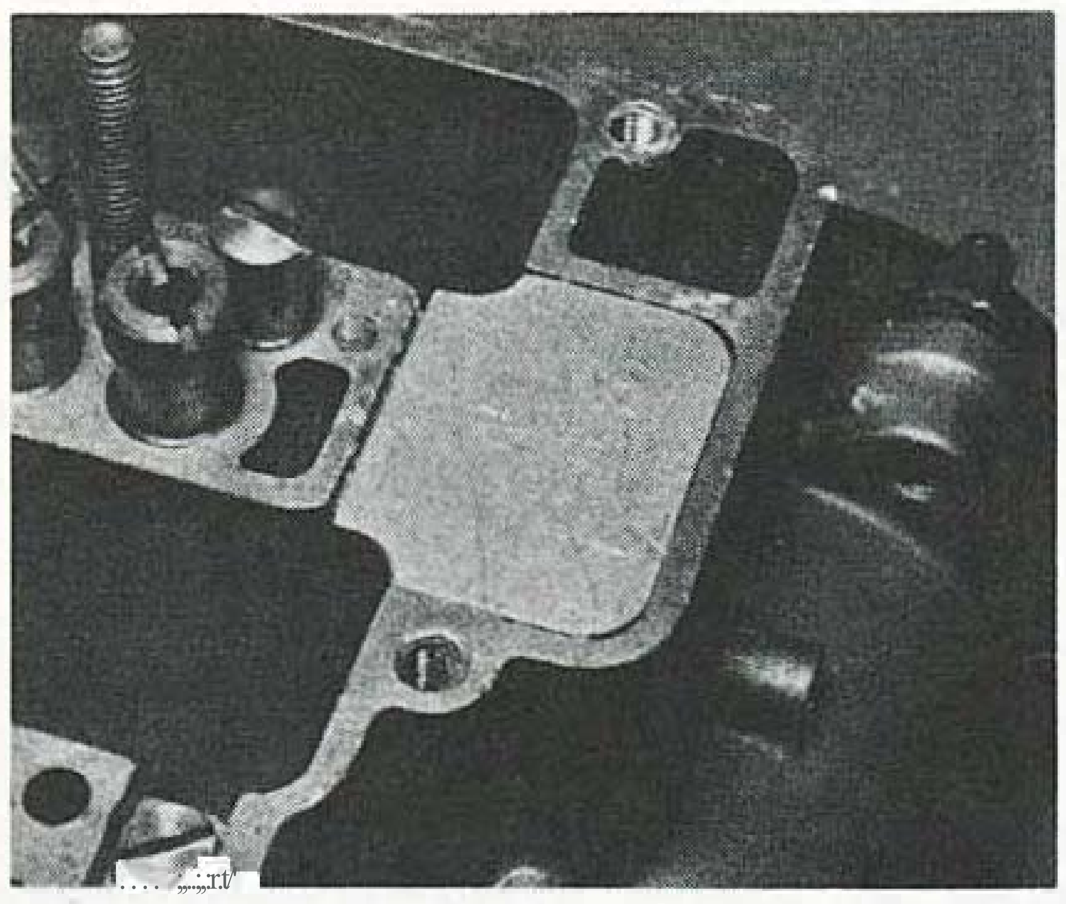
5.3 Air hom retaining nuts



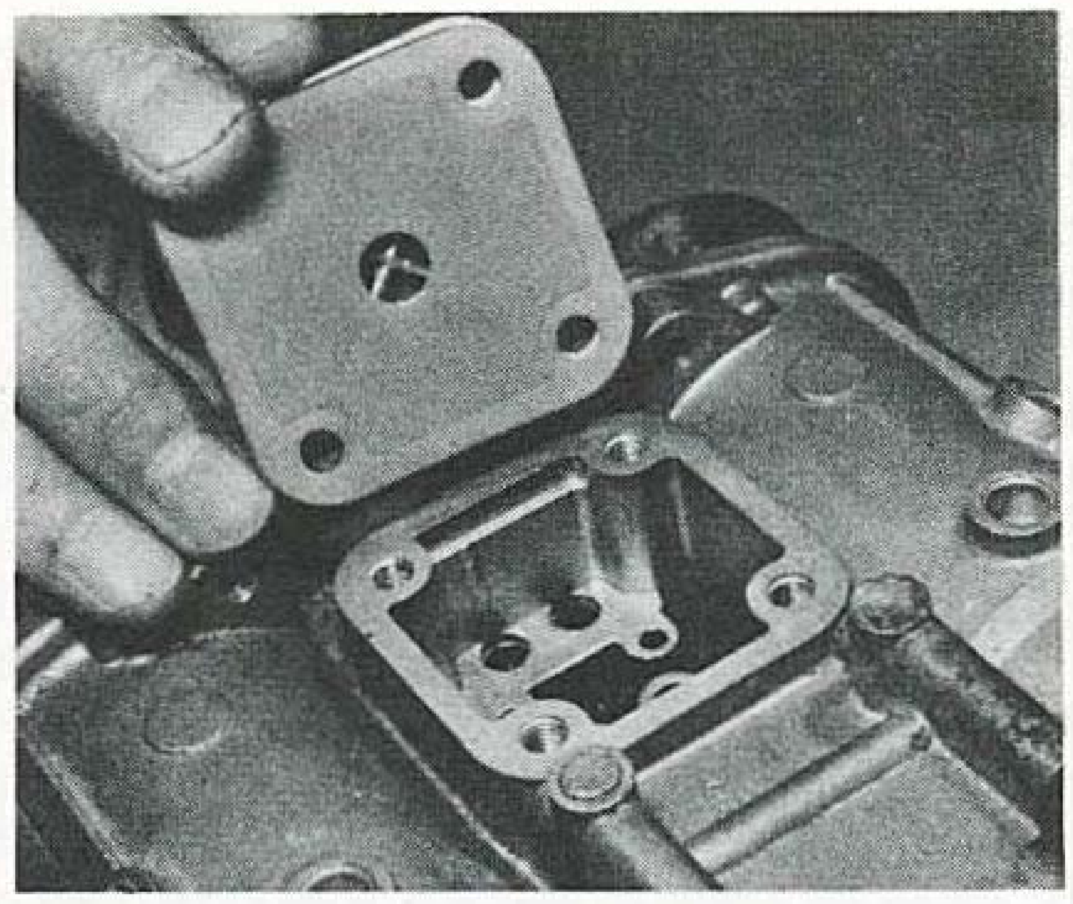
5.4 Aemoving the jet inspection cover



5.5 lifting the carburettor cover



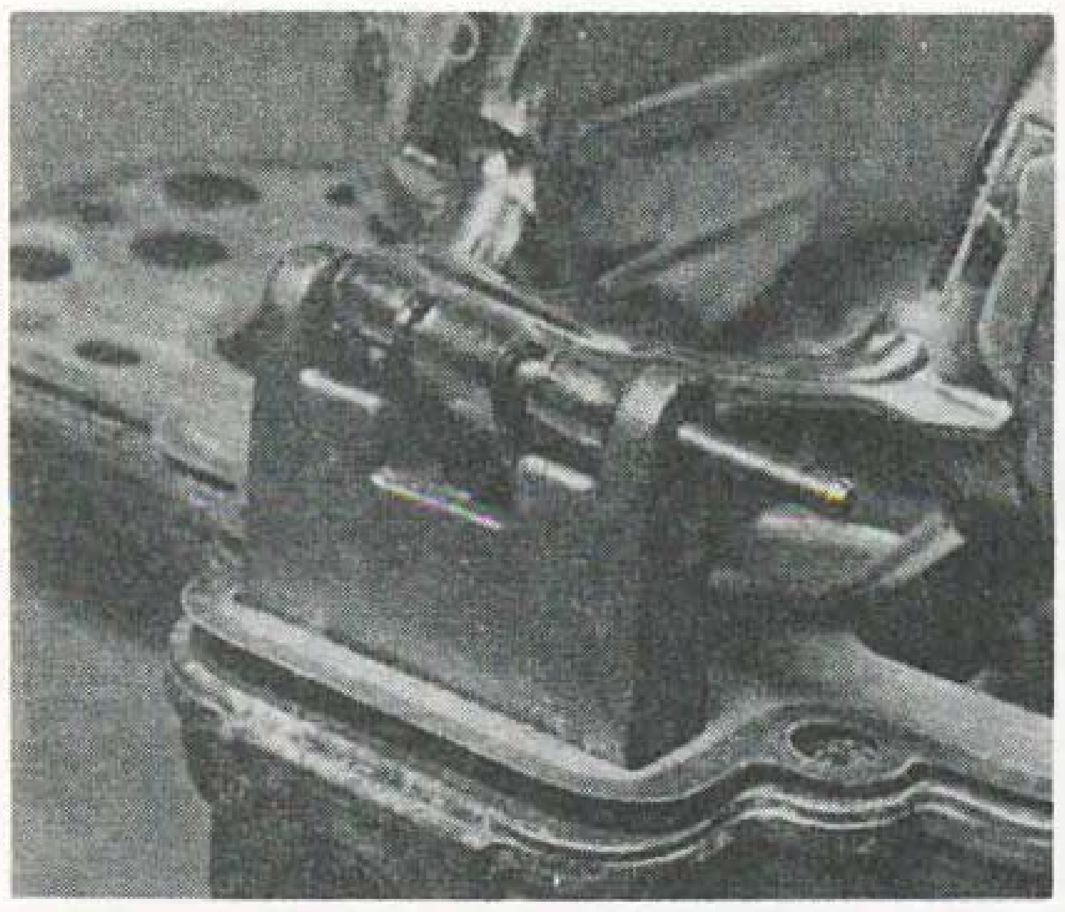
5.6 Location of the carburettor bowl battle plate

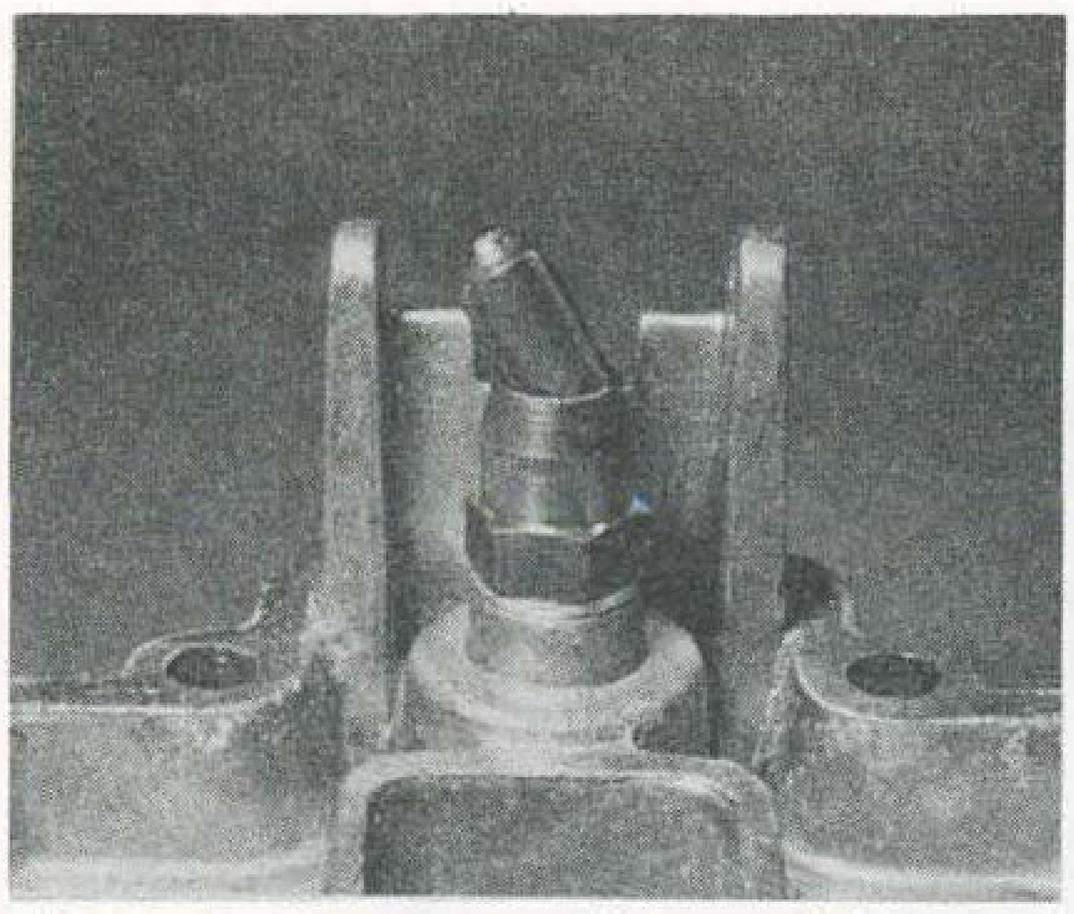


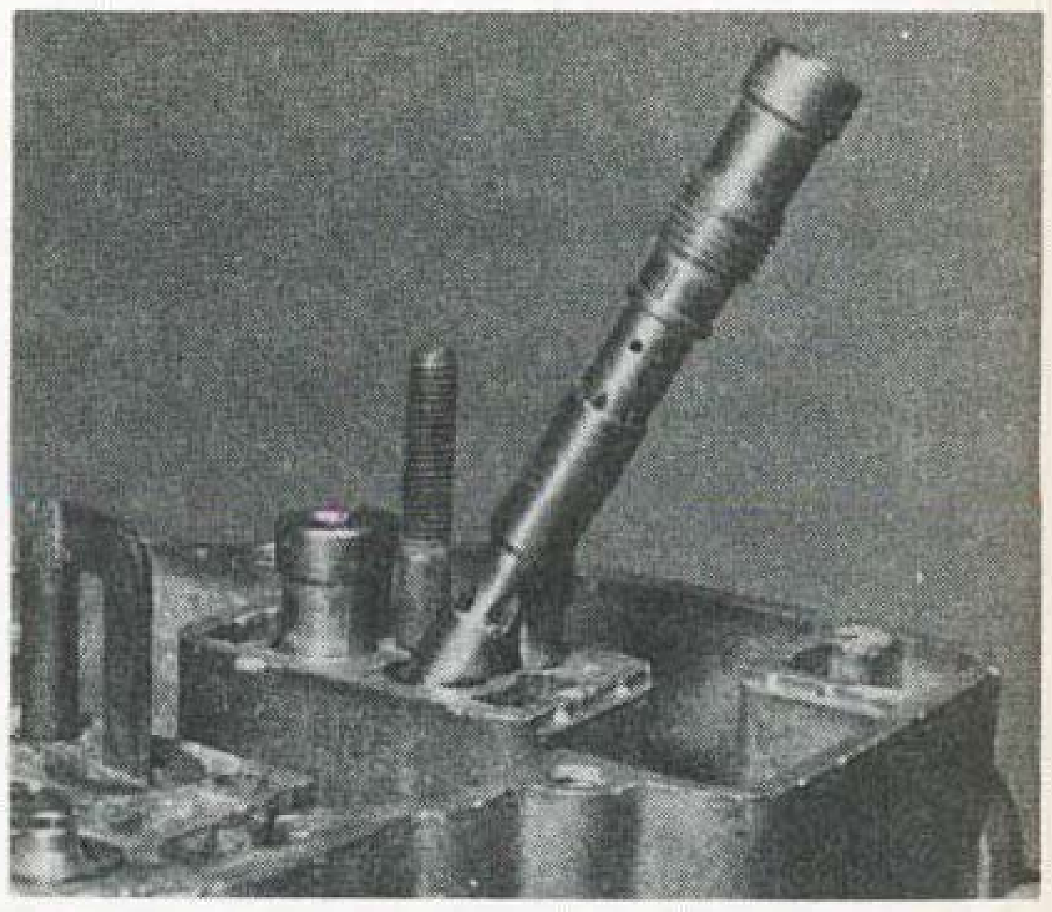
5.7 Removing the welf bottom cover

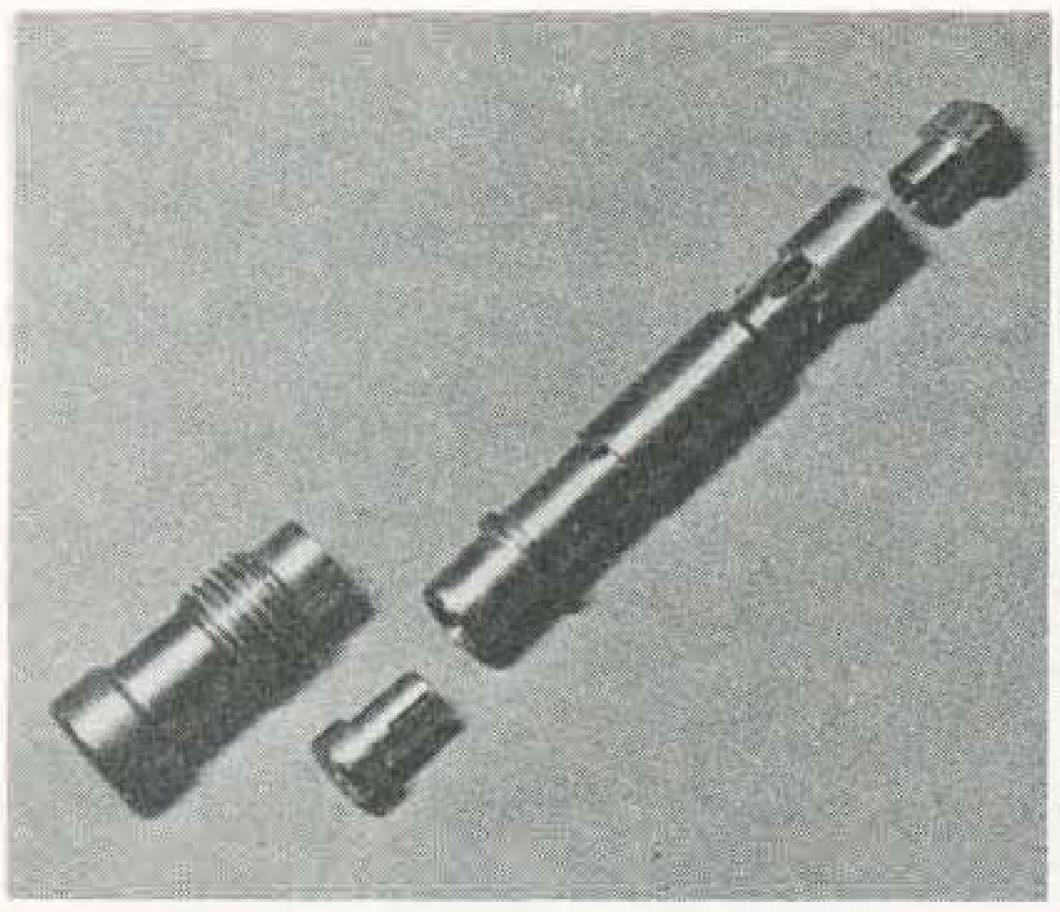
Fig. 11 .12 Exploded view of the DCOE carburettor (typical) (Sec 5)

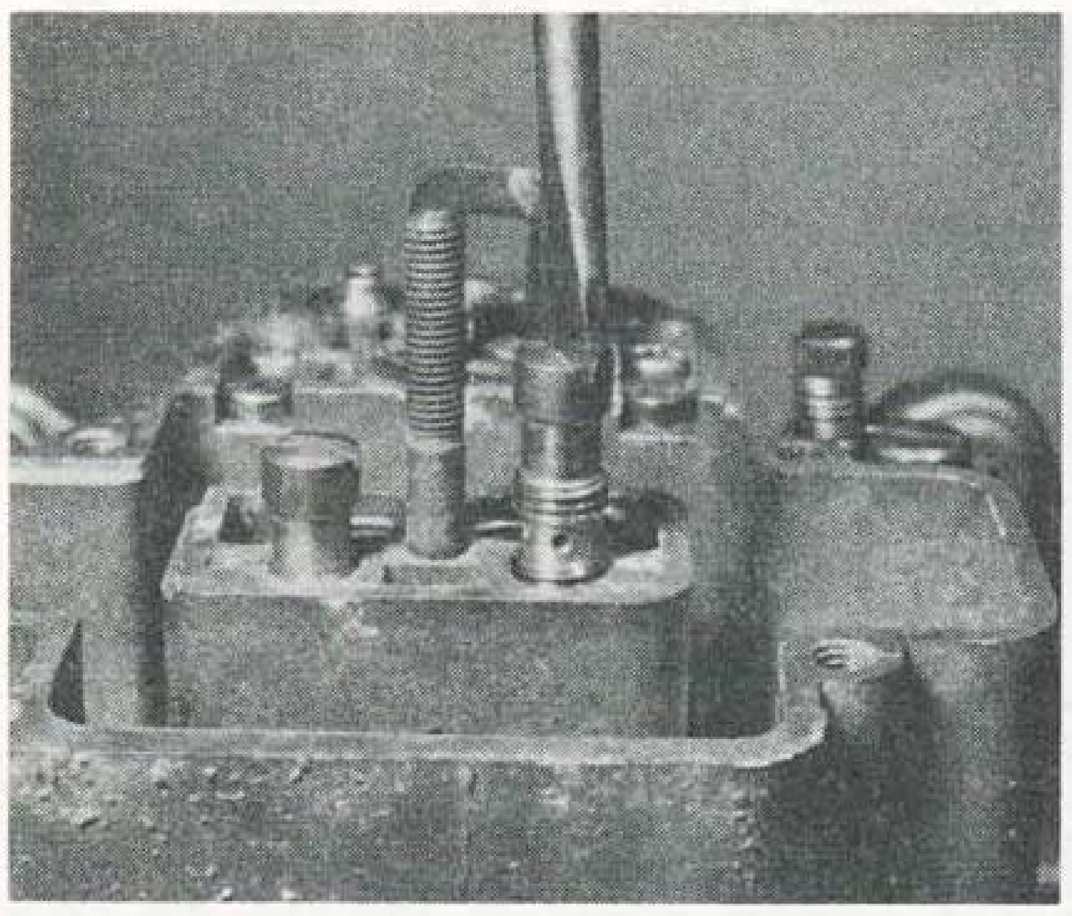
1 Jet inspection cover
2 and 2A Screw
3 Gasket
***4** and **4A** Washer*
5 Carburettor cover
6 Gasket
7 Emulsion tube ho/der
8 Air correctorjet
9 /die jet ho/der
10 Emulsion tube
11 Idlingjet
12 Mainjet
13 Plate
***14** Choke*
15 A uxiliary venturi
16 Dust cover
17 Spring
18 Spring cover
19 Throttle lever
20 Spring
21 Throttle adjusting screw
22 Auxi/iary venturi retaining screw
22A Choke retaining screw
23 and 23A Spring washer
24 and 24A Nut
25 Retaining plate
26 Stud
27 Lockwasher
28 Nut
29 Gasket
30 Well bottom cover
31 Carburettor body
32 Anchoring plate
33 Spindle return spring
34 Lever fixing pin
35 Pump control lever
36 and 37 Stud
38 8 a/1-bearing
39 Screw
40 Throttle va/ve
41 Spindle
42 Screw
43 Washer
***44** Screw*
45 Cover
46 Gasket
47 Starter device
48 Lever
49 Nut
50 Lever
51 Screw
52 Nut
53 Return spring
54 Cover
55 Sector shaft
56 Air filter
57 Screw
58 Washer
59 Starter va/ve
60 Spring
61 Spring retainer and guide
62 Spring washer
63 Retaining p/ate
64 Accelerator pump control rod
65 Spring
66 Pump piston
67 Spring
68 Idling adjustment screw
69 Air intake hom
70 Progression hole inspection screw
71 Gasket
72 Pumpjet
73 Seal
74 Screwplug
75 Intake and discharge valve
76 Starterjet
77 Float
78 Fulcrum pin
79 Valve bal/
80 Stuffing bal/
81 Screwplug
82 Washer
83 Needle valve
84 and 86 Washer
85 Union
87 Union bolt
88 Fuel filter
89 Washer
90 Filter inspection plug

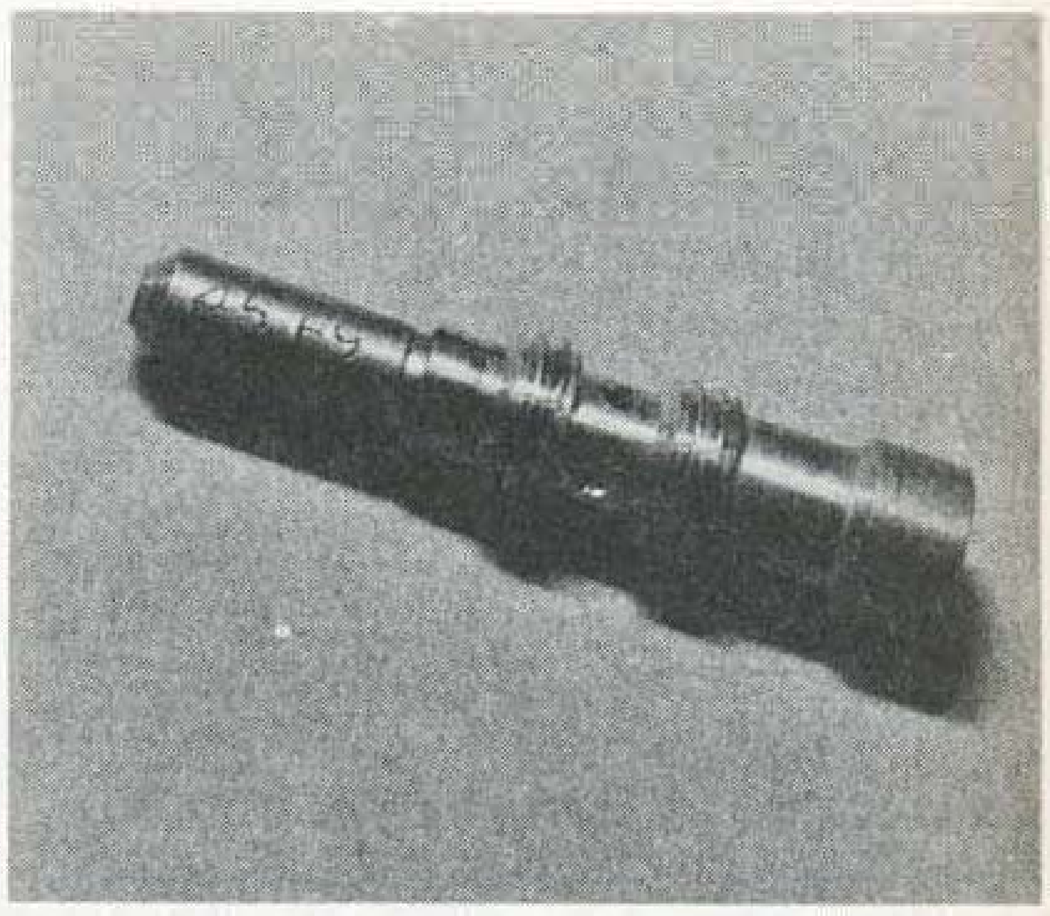

5.8 Extracting the float fulcrum pin

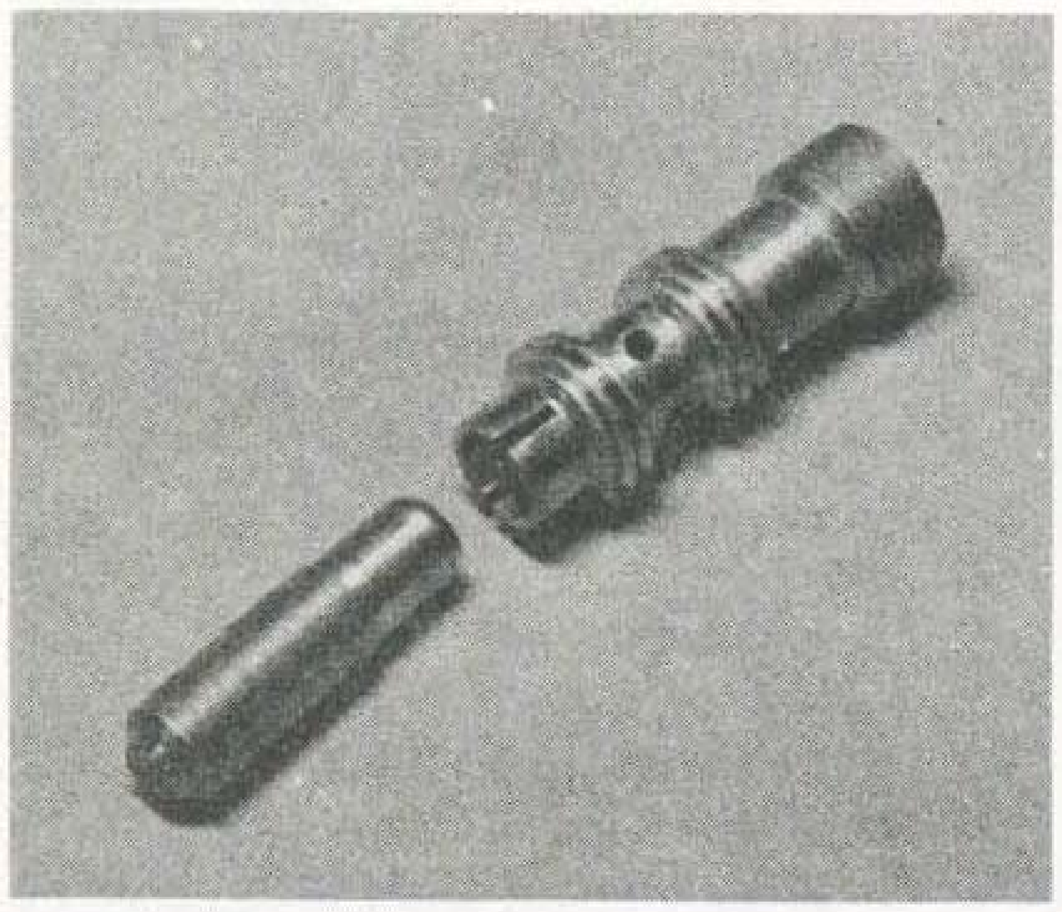

5.9 Removing the needle and ball from the needle valve seating (40 DCOE 35 type)

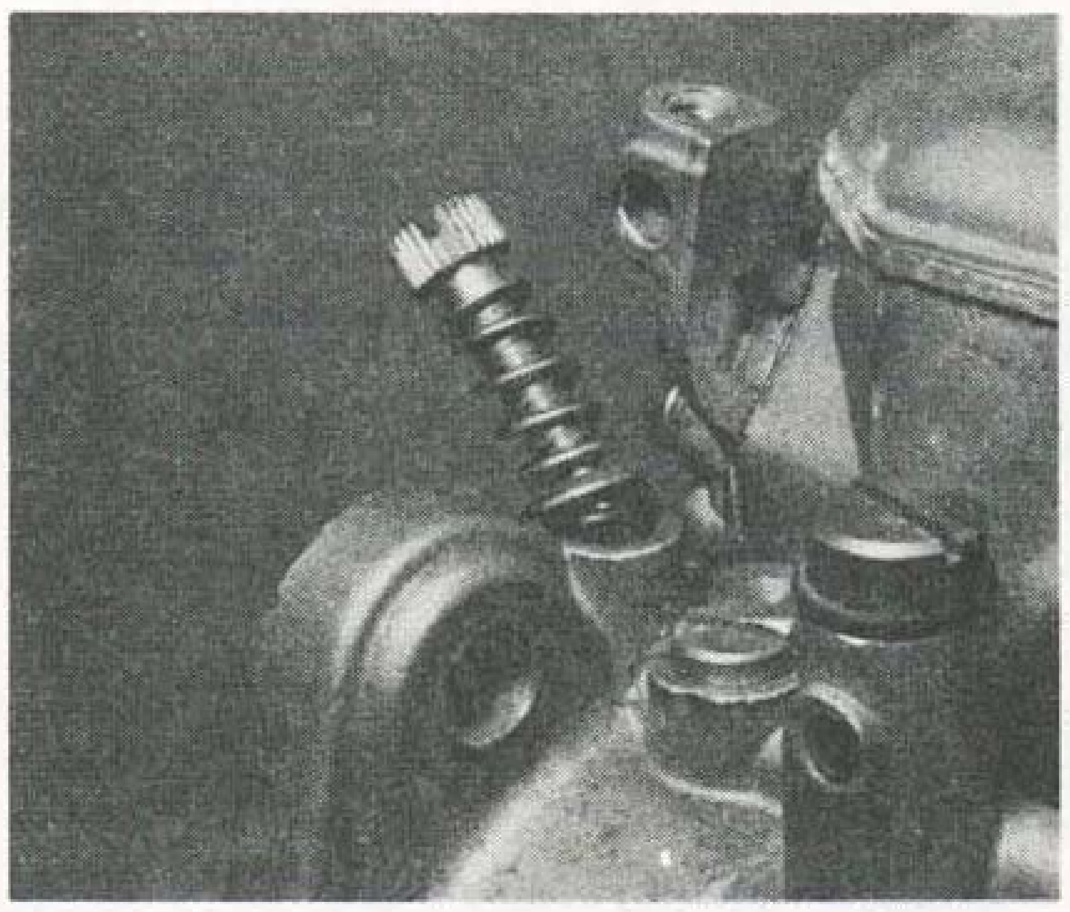

5. 11 a Removing an emulsion tube

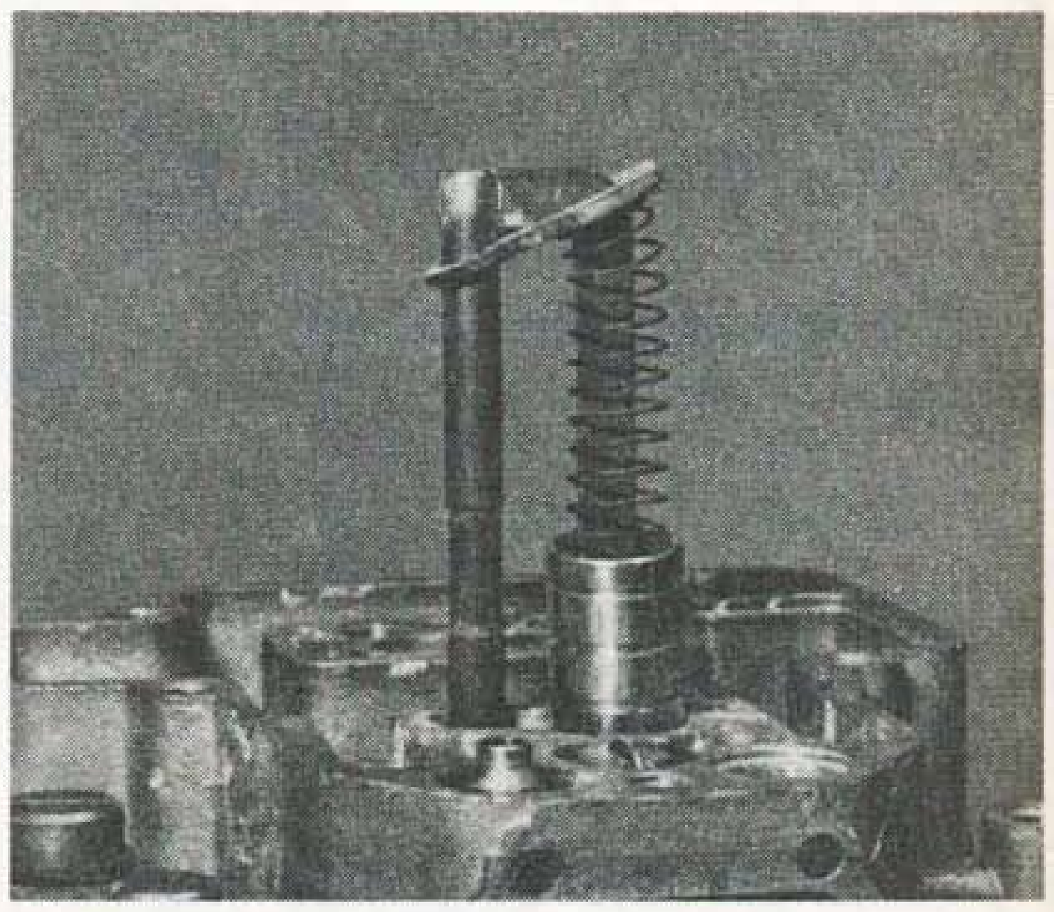

5.11 b Emulsion tube components

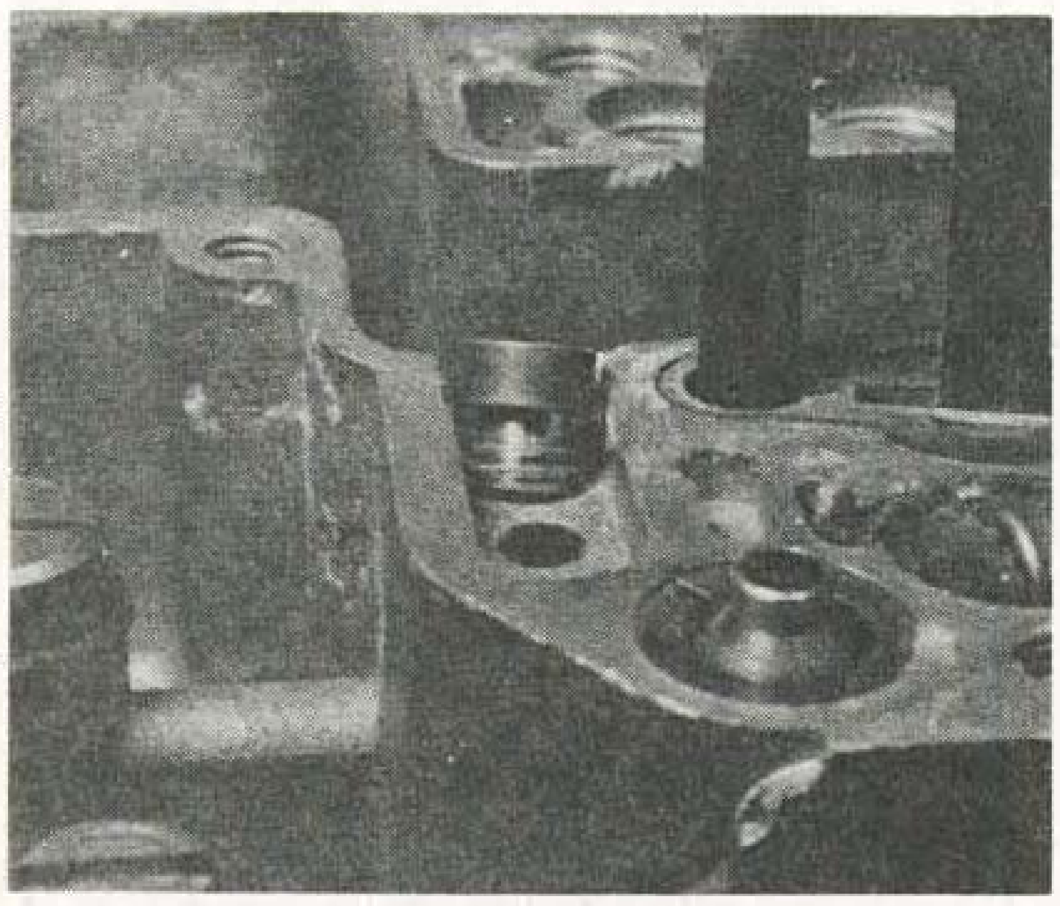

5.12a Removing an idling jet

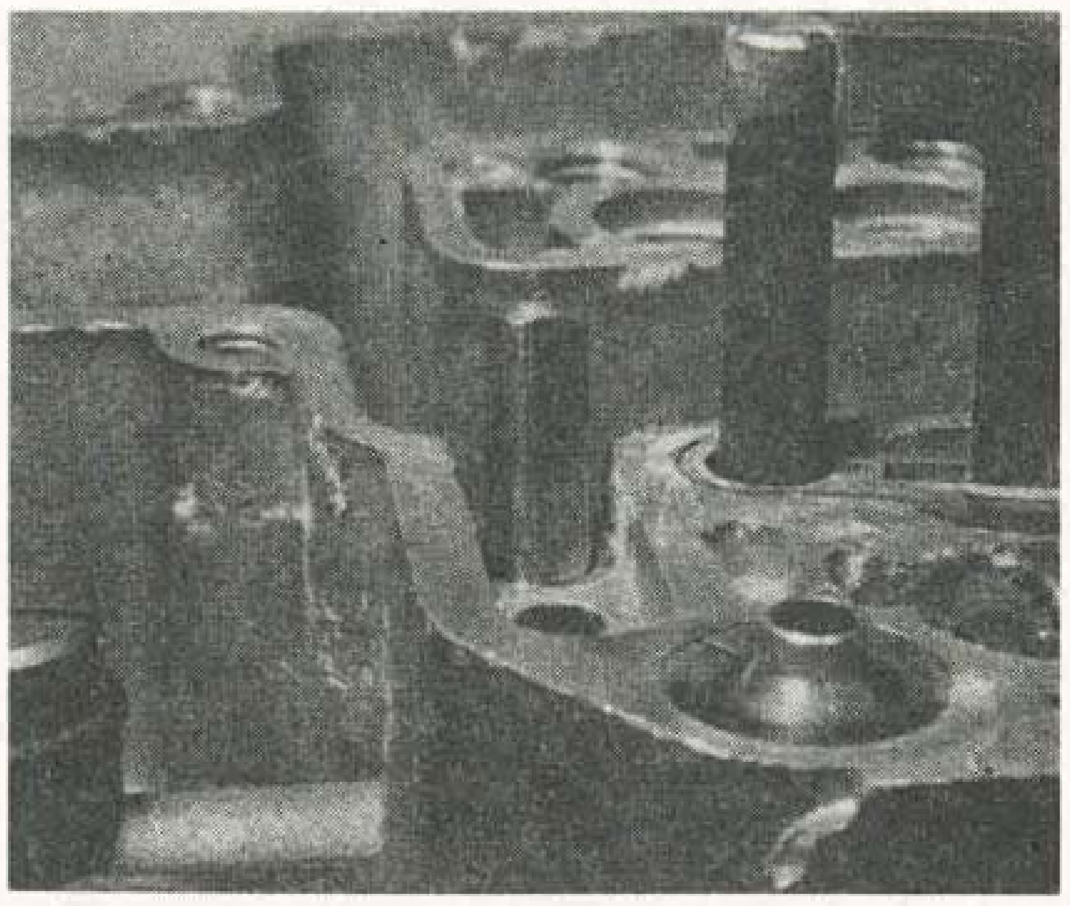

5.12b Idling jet sections assembled

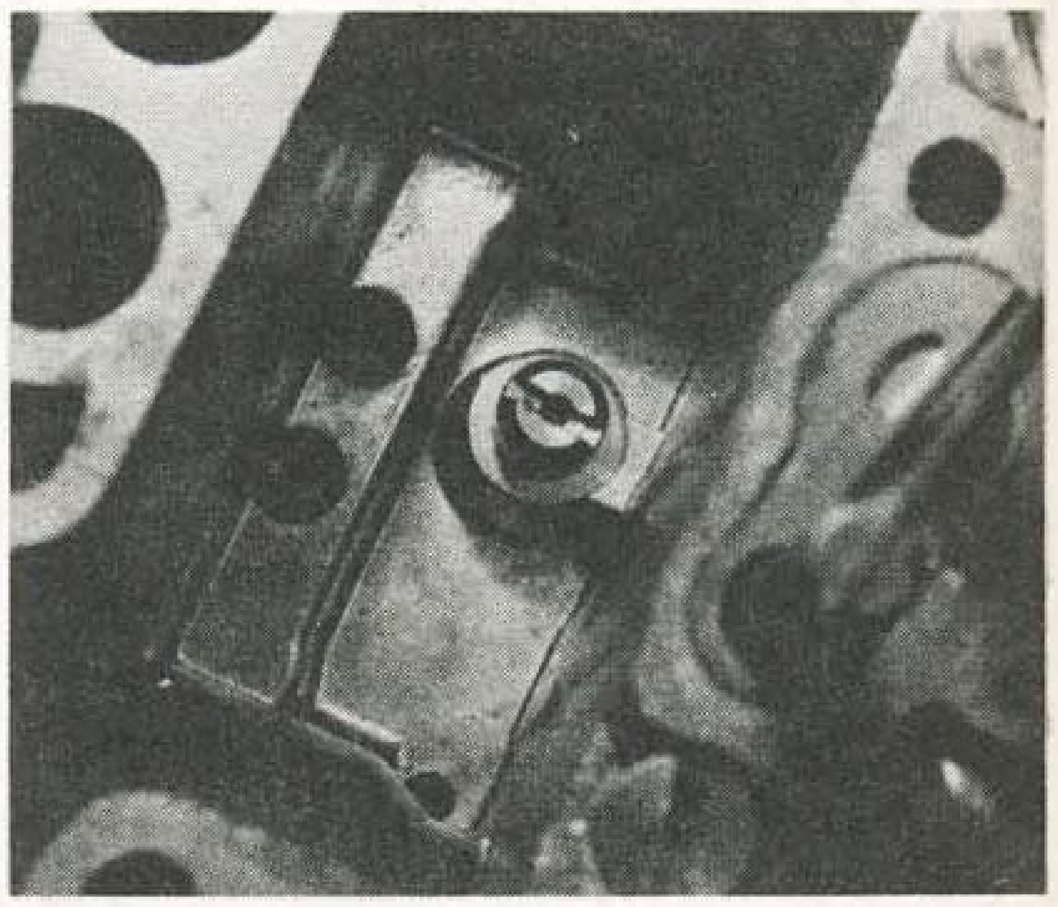

5.12c Idling jet components


5.14 Removing an idling mixture adjusting screw

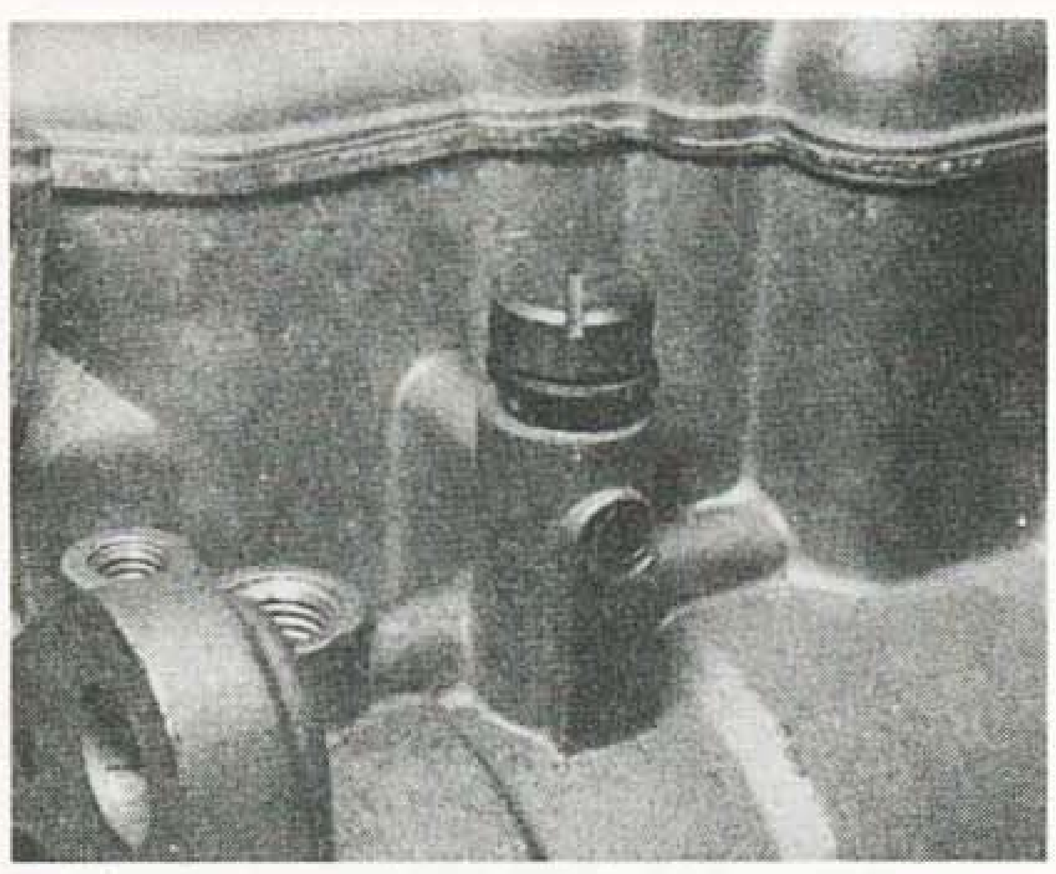

5.15 Removing the accelerator pump

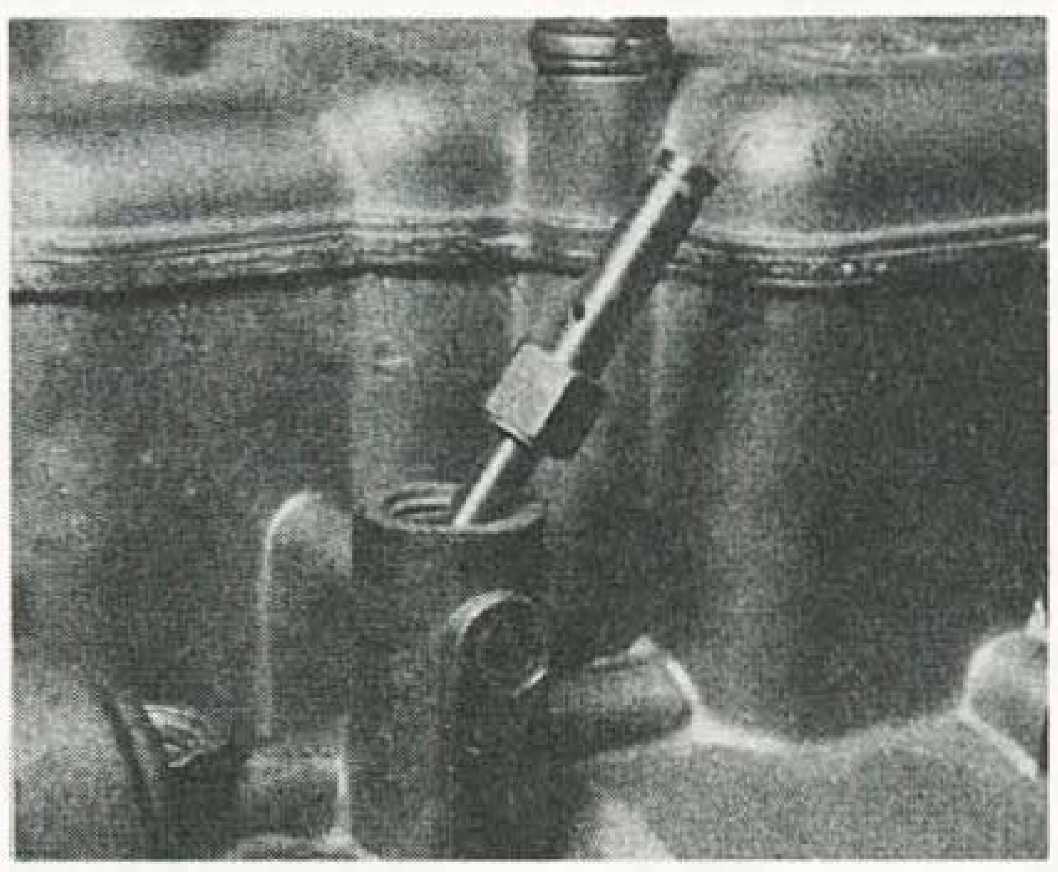

5.17 a Removing a stuffing ball retaining screw

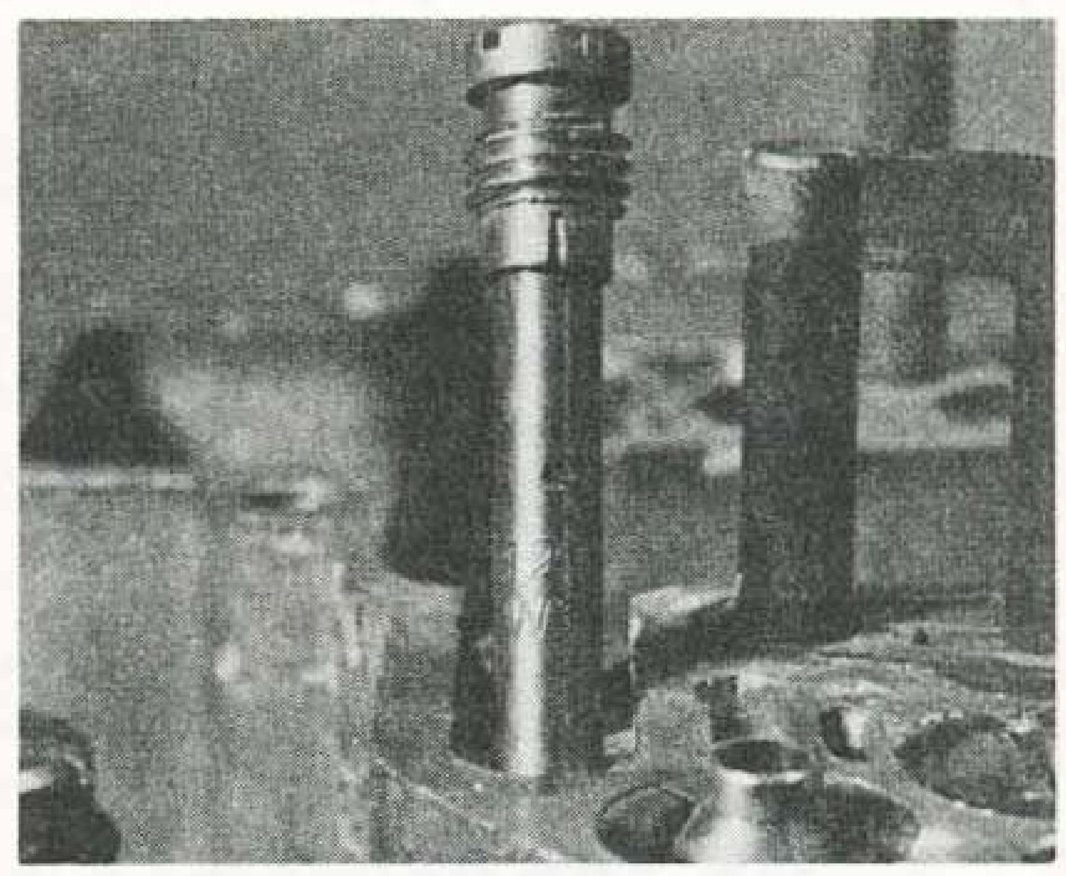

5.17b Removlng a stuffing ball

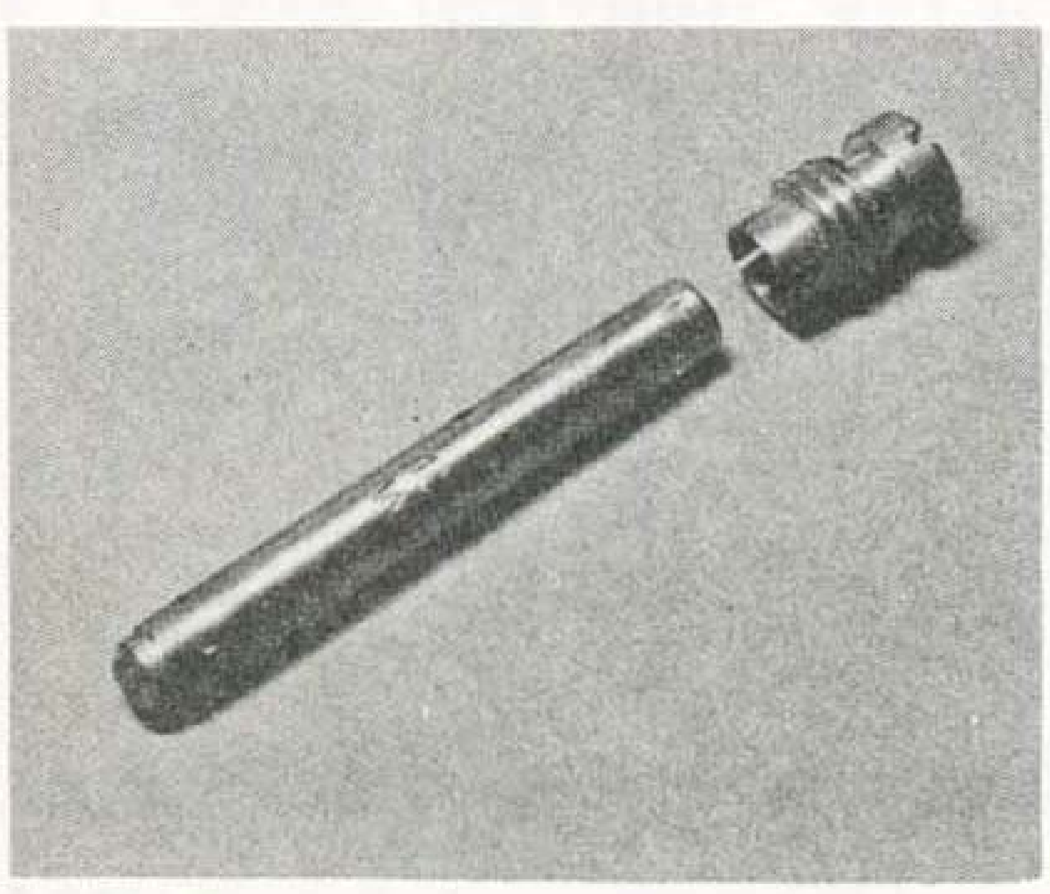

5.1 8 Location of the intake and discharge valve

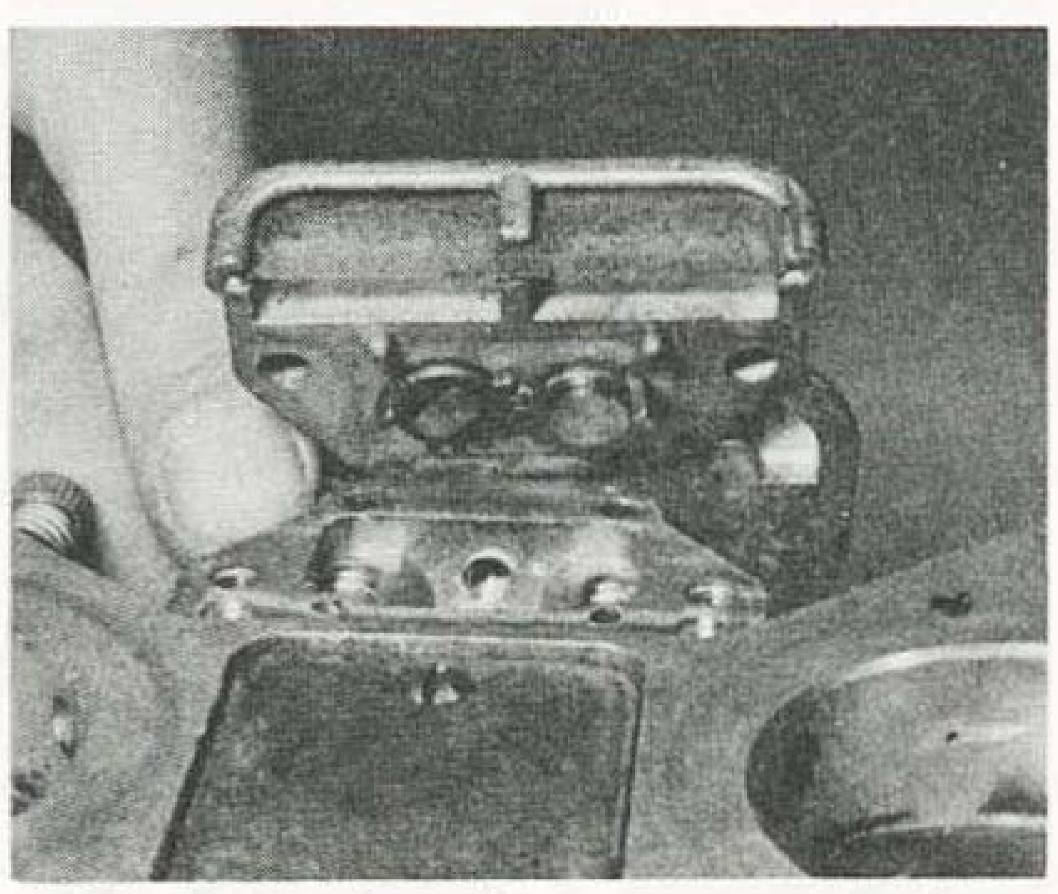
invert the carburettor and unscrew the well bottom cover retaining screws (2A), together with the spring washers and plain washers (4A) (photo).
7 Withdraw the welt bottom cover (30) and gasket (29) (photo).
8 Invert the carburettor cover (5) so that the float assembly is uppermost, then extract the float fulcrum pin (78) and withdraw the float assembly (77). If necessary, use a suitable diameter pin punch to tap the pin from the two posts (photo).
9 Remove the needle valve needle and the cover gasket (6) (photo).
10 Using a 10 mm socket, unscrew the needle valve seating (83) and remove the gasket (82).
11 Using a suitable screwdriver, unscrew the emulsion tube assemblies, then separate the tube holders (7), air corrector jets (8), emulsion tubes (10) and main jets (12). Although these parts are a tight fit they must preferably be removed by hand only (photos).
12 Unscrew the idling jet holders (9) and separate the idling jets (11) (photos).
13 Unscrew and remove the throttle idling adjustment screw (21) and spring (20).
14 Unscrew and remove the idling mixture adjusting screws (68) and springs (67) together with the conical washers and 0-rings (photo).
15 Carefully prise the accelerator pump retaining plate (63) from the carburettor body and lift out the pump assembly (photo).
16 Disengage the accelerator pump piston (66) from the operating rod (64) and remove the spring (65) and plate (63).
17 Unscrew the stutting ball retaining screws (81), invert the carburettor body and extract the stutting balls (80) and the balls for the valves (79) (photos).
18 Unscrew and remove the intake and discharge valve (75) from the bottom of the float chamber (photo).
19 Unscrew the screw plugs (74) and remove the seals (73), pump jets (72) and gaskets (71) (photos).
20 Where a starter device is not fitted, unscrew the retaining screws and remove the blanking plate.
21 Where a starter device is fitted, unscrew and remove the starter jets (76), separate the two sections and follow paragraphs 22 to 25 (photos).
22 Unscrew the starter device retaining screws together with the spring and plain washer and withdraw the starter device assembly (47) from the carburettor (photo).
23 Dismantle the starter device by unscrewing the nut (52) from the shaft (55), then carefully remove the lever (48) and spring (53). Unscrew the cable clamp nut (49) and screw (51). then remove the shaft (55) and filter gauze (56) (photo).
24 Unscrew and remove the progression hole inspection screw plugs (70) (photo).
25 Whilst depressing the starter valve spring retaining guides (61) in turn, prise the spring washers (62) from the carburettor body, then release the guides (61) and extract the return springs (60) and starter valves (59). Note trom which bore each valve was taken so that they can be refitted in their original locations (photo).
26 Unscrew and remove the pump opening cover plate retaining screws (44) and withdraw the plate (45) and gasket (46) (photo).
27 Note the location of each throttle plate and mark them if necessary, with a pencil.
28 Unscrew and remove the throttle plate retaining screws (39) with the throttle closed, then open the throttle and withdraw the plates (40) trom the spindle (41). If a brass spindle is titted, be careful not to exert excessive presure with the screwdriver otherwise the spindle will be distorted (photo).
29 Using a pair of pliers, grip the top of the spindle return spring (33), lift it and remove the spring anchoring plate (32).
30 Drive out the lever roll pin (34) with a suitable pin punch; if

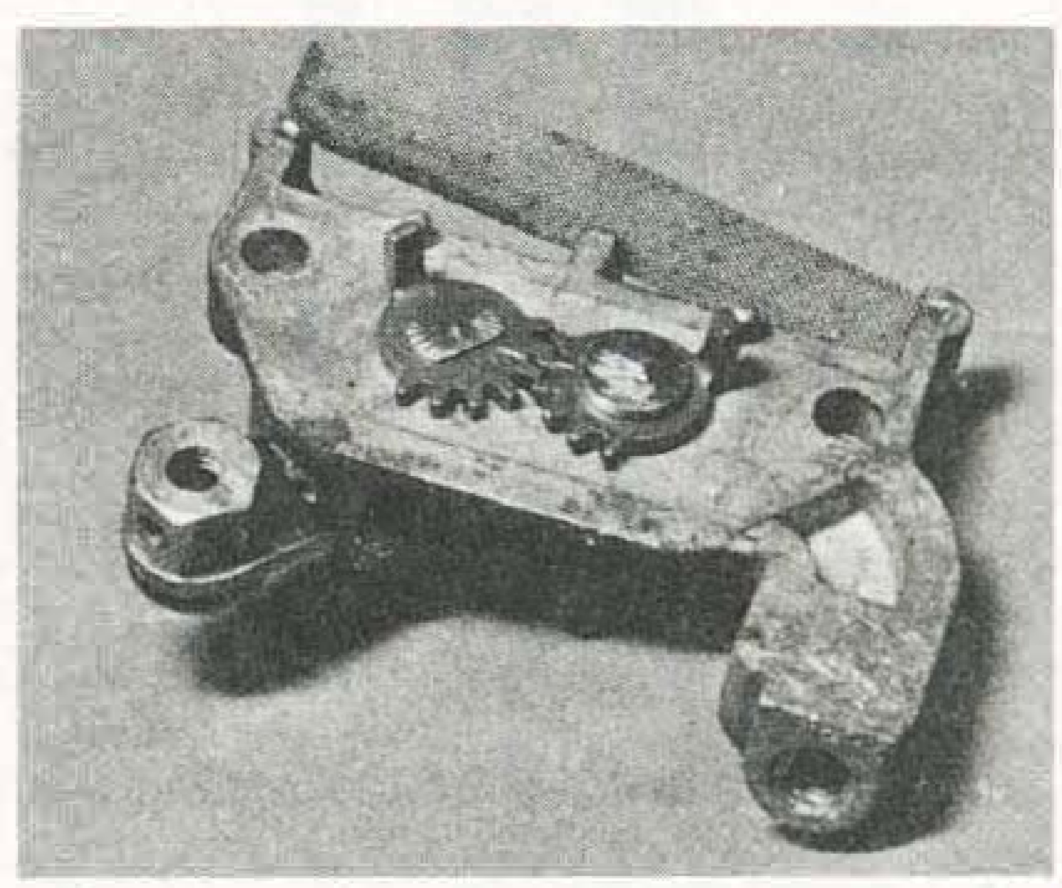

5.19a A pump jet retaining screw

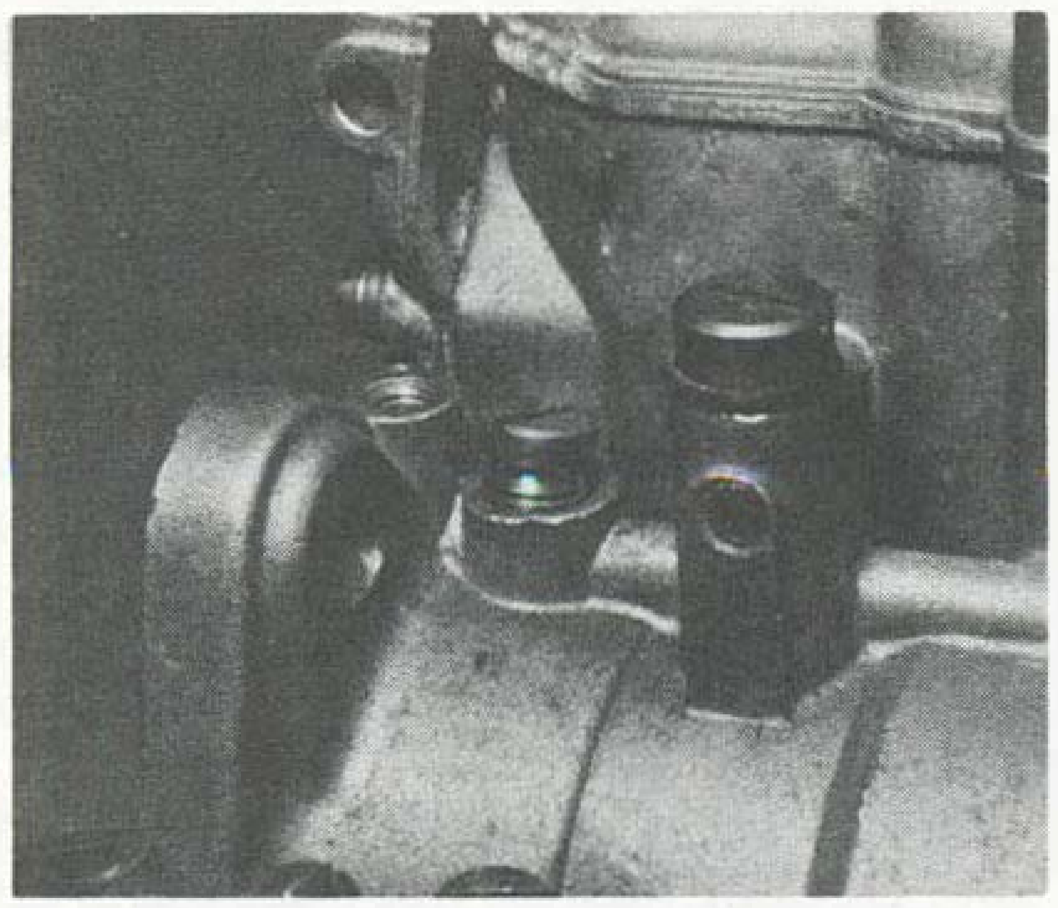

5.19b Removlng a pump jet

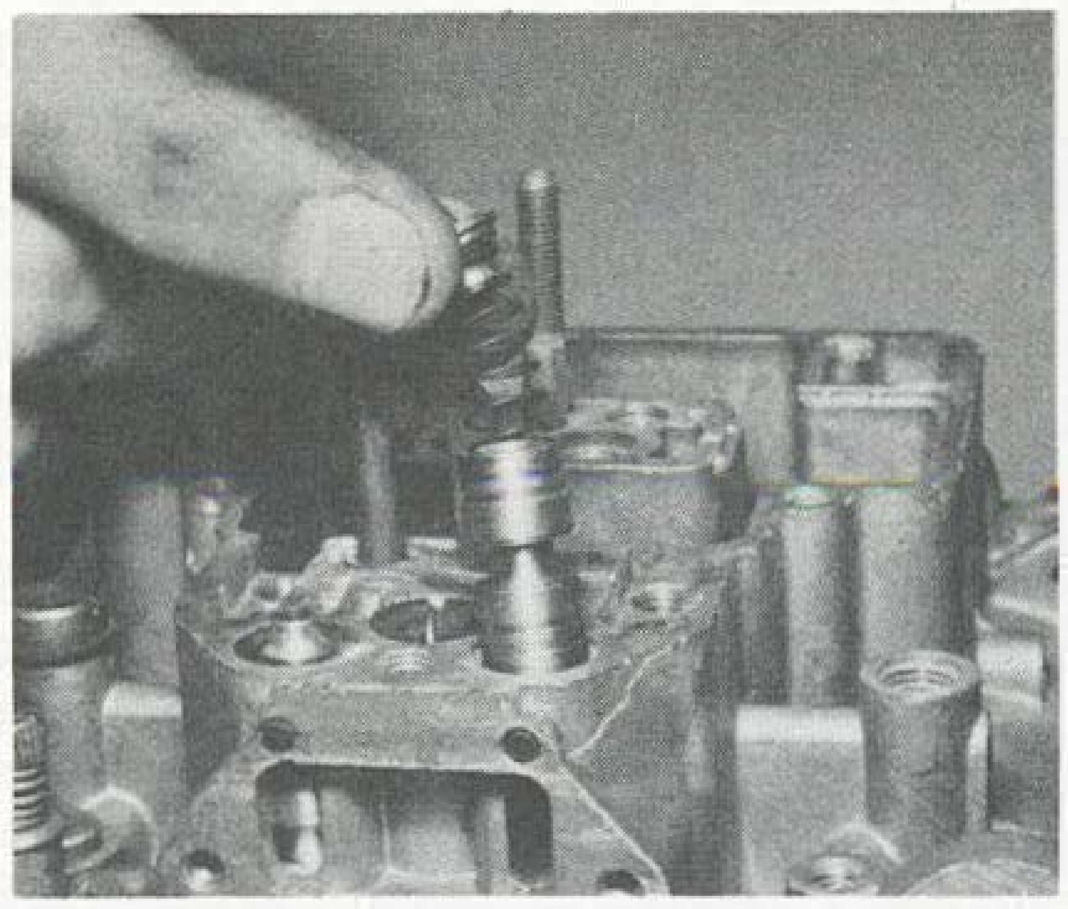

5.21 a Removing a starter jet

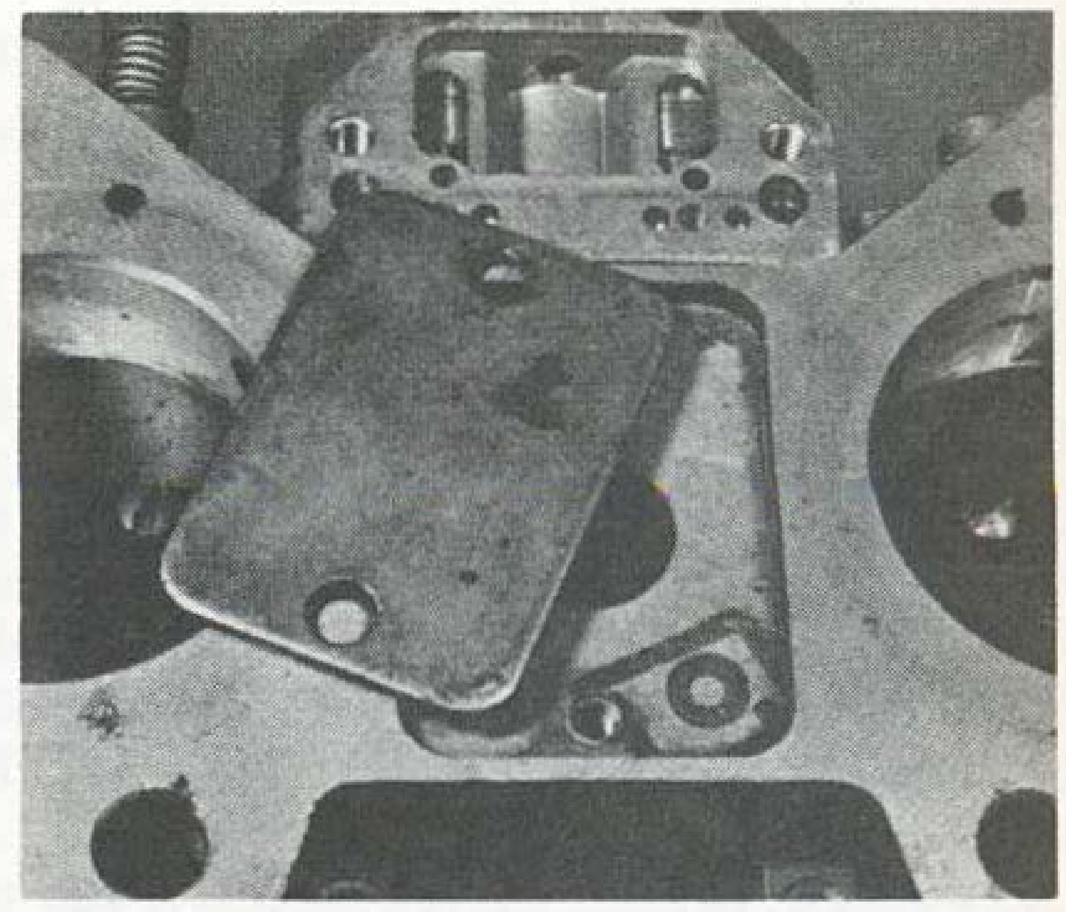

5.21 b The starter jet components

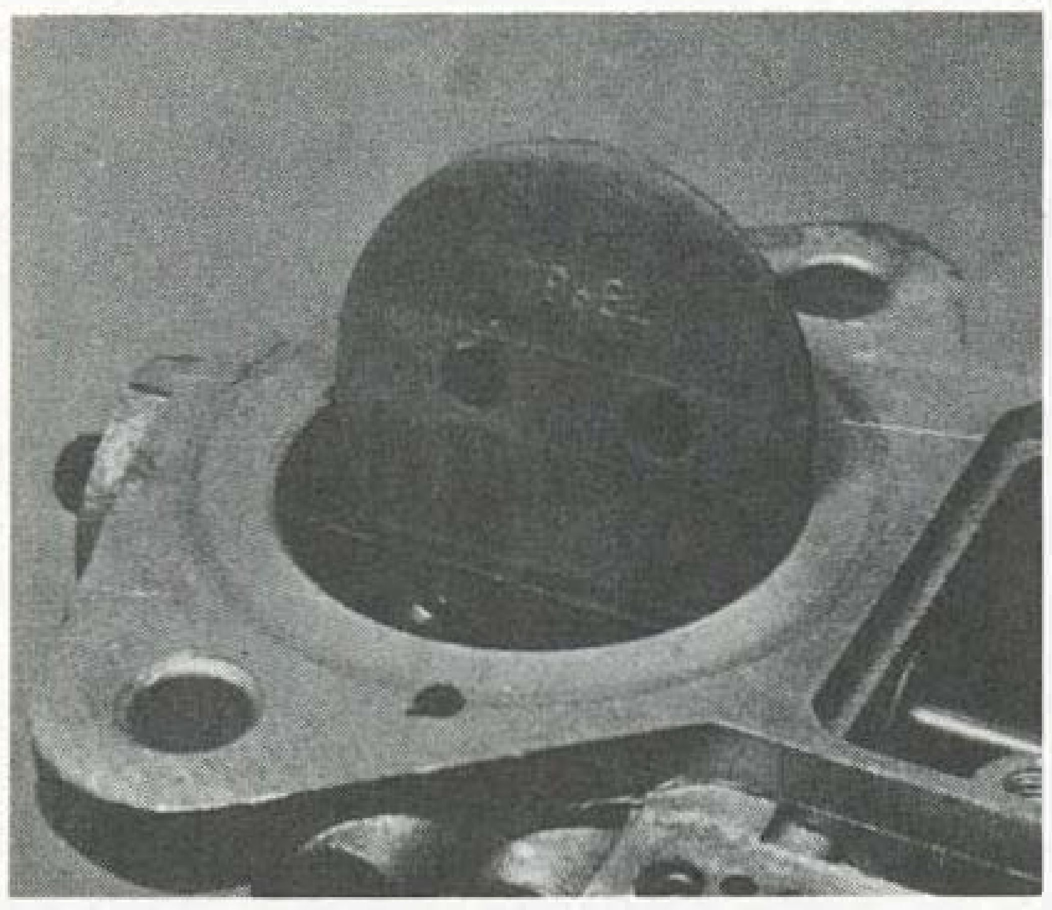

5.22 Removing the starter device, showing the locating lugs

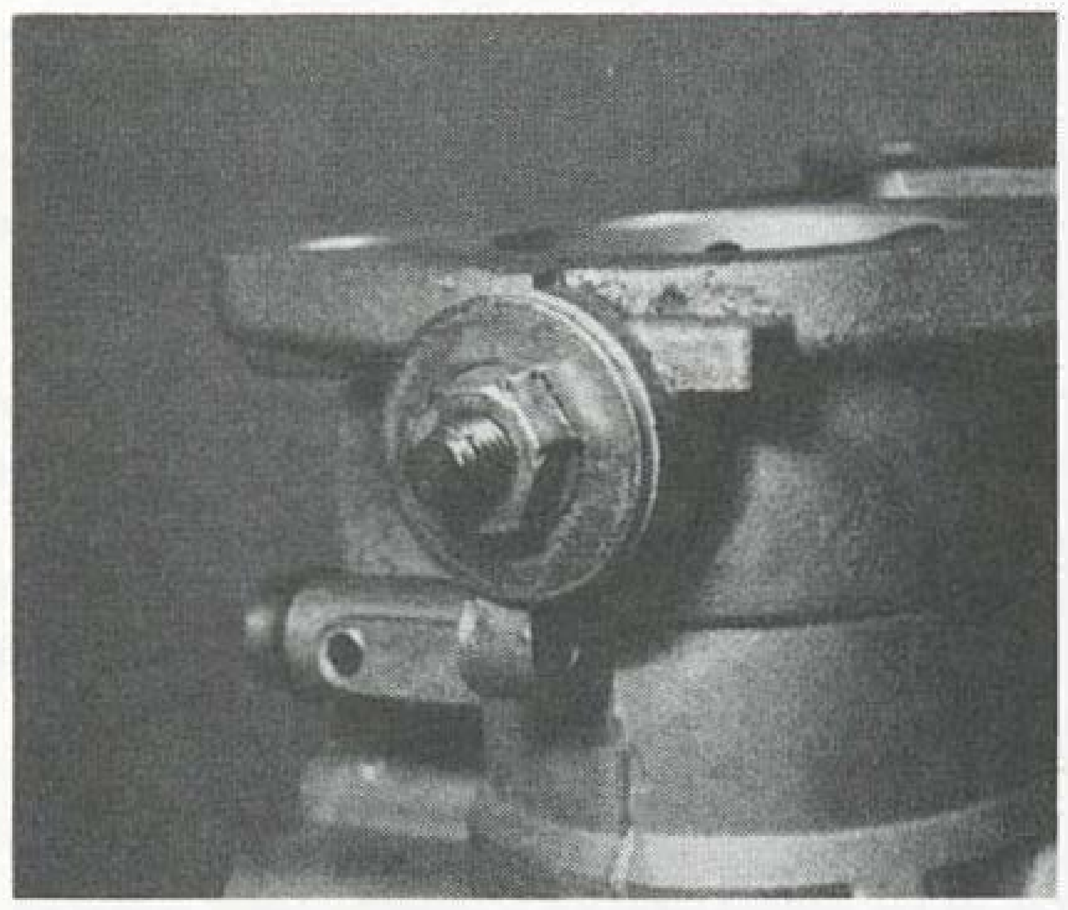

5.23 Removing the starter device air filter gauge, also showing sector alignment marks

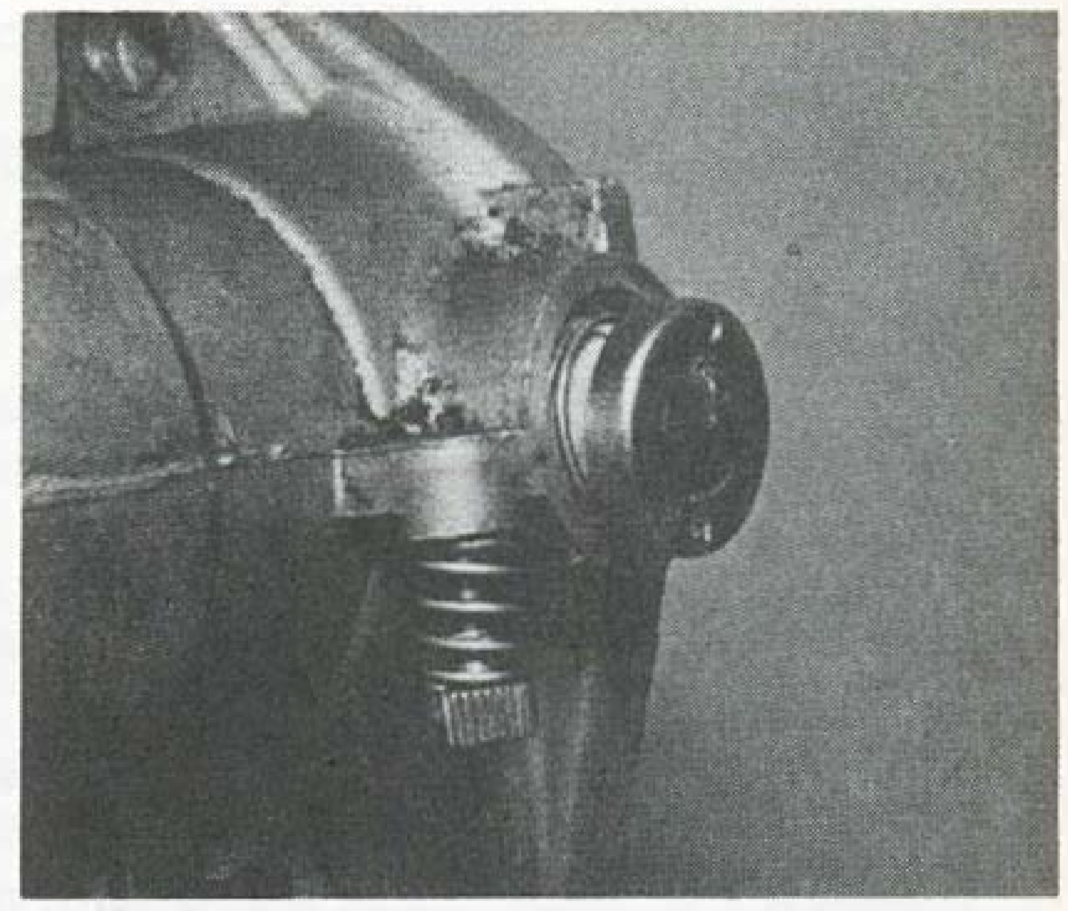

5.24 Removing a progression hole inspection screw plug


5.25 Extracting a starter valve, spring and guide


5.26 Removing the accelerator pump opening cover plate and gasket


5.28 Withdrawing a throttle valve trom the spindle


5.31 Throttle spindle outer retaining nut and locktab


5.32 Removing a spring cover trom the throttle spindle

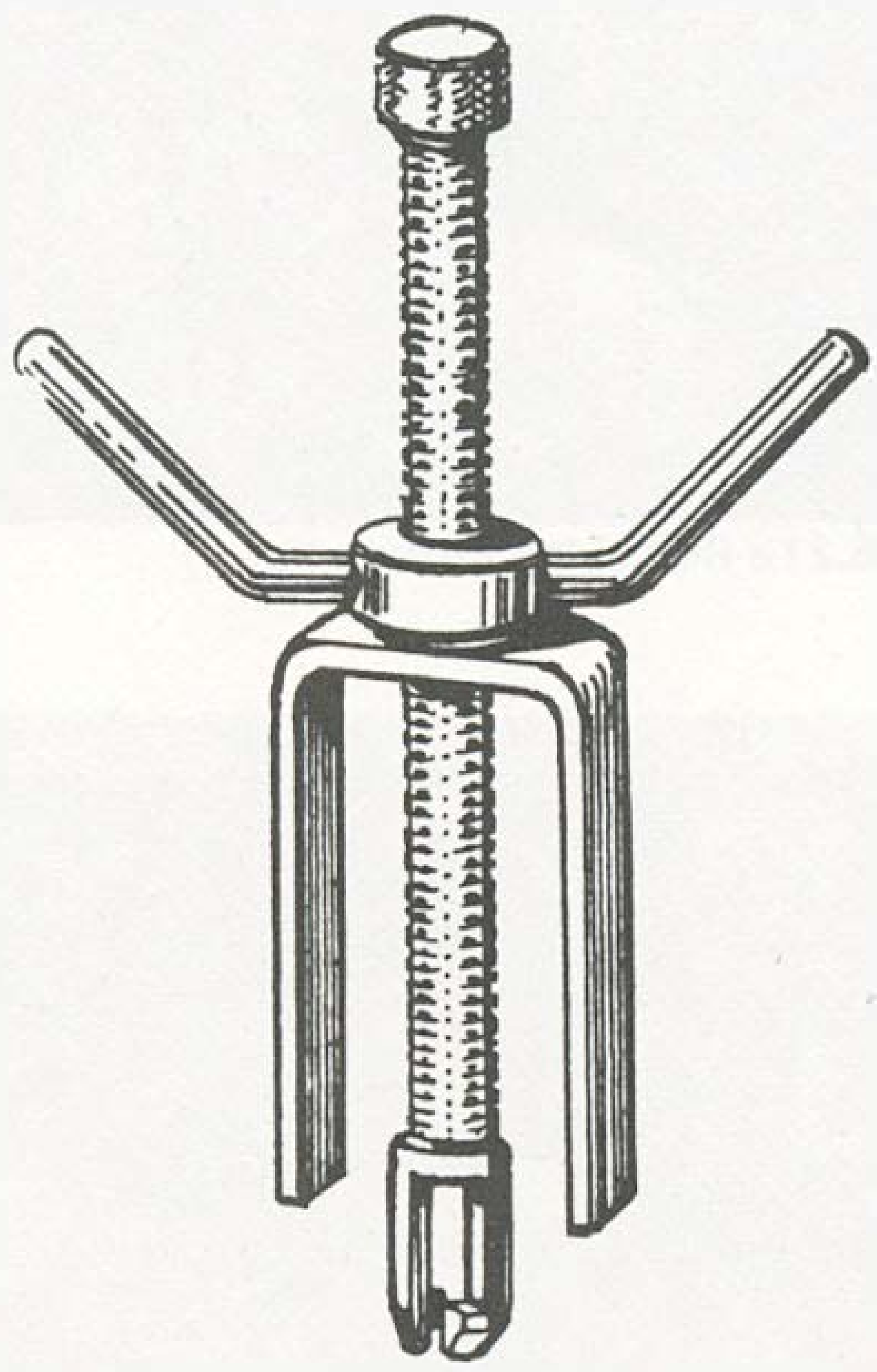
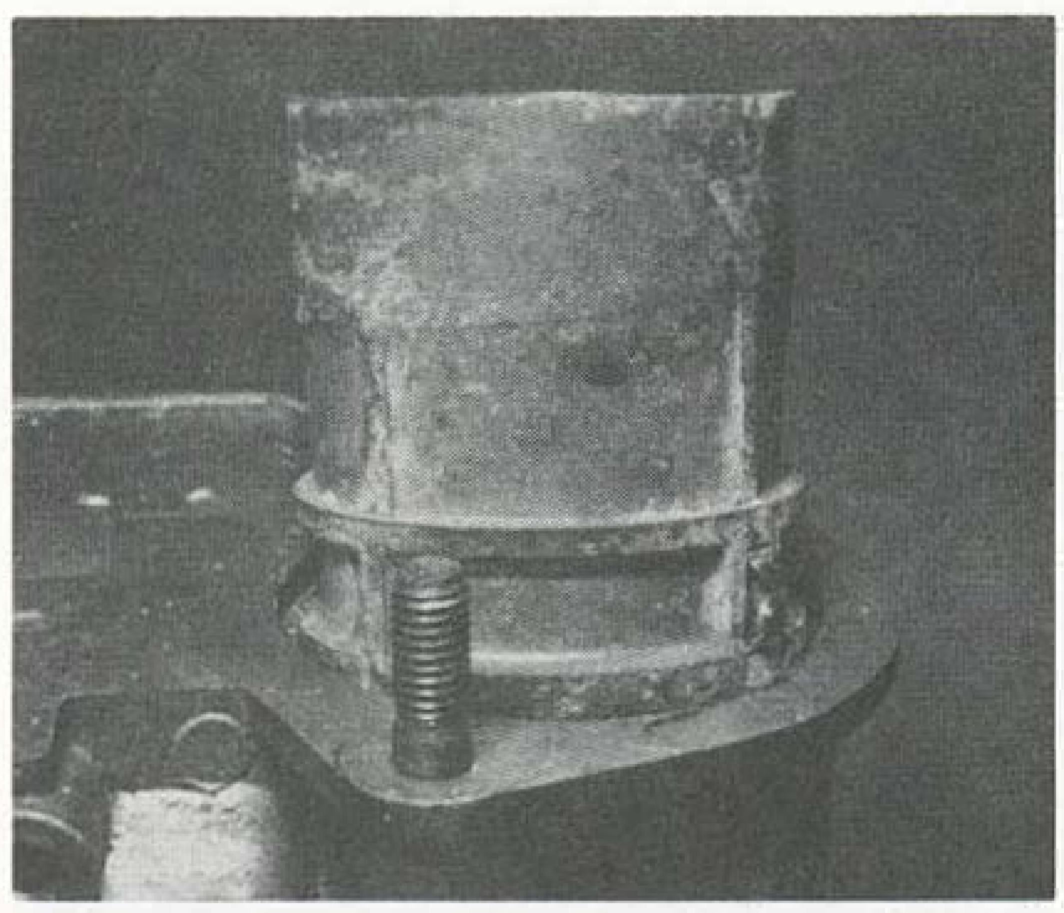


Fig. 11.13 Auxiliary venturi extracting tool (Sec 5)


5.37 Removing an auxiliary venturi, showing the locating spring


5.38 Removing a choke trom the carbu rettor barrel

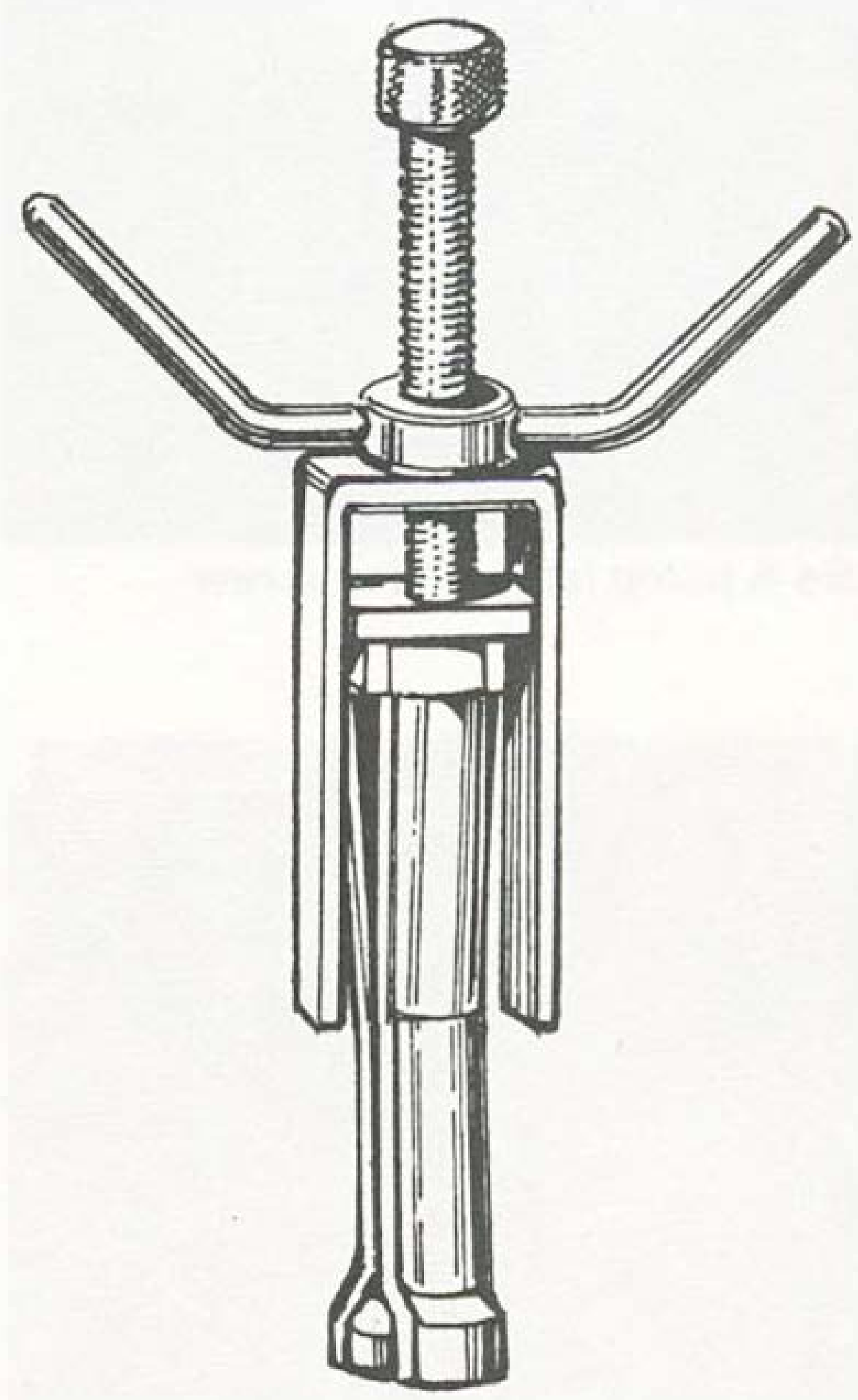


Fig. 11.14 Choke extracting tool (Sec 5)

one is not available obtain the special Weber tool no 98011 400.
31 Bend back the tab washers (27) and unscrew the nuts (28) trom each end of the spindle (41). If the nuts are tight use Weber tool no 98023 700 to hold the spindle while the nut is loosened. If this precaution is not taken it is quite possible to distort the spindle, especially if it is a brass one. Should the special tool be unavailable, it is possible to strengthen the spindle by cutting the throttle plates and clamping the middle sections on the spindles while the nuts are loosened. Although the throttle plates will be ruined, they will not cost as much as a new spindle (photo).
32 Remove the nuts (28), tab washers (27). washer (58). lever (19). spring covers (18), springs (17) and dust covers (16) (photo).
33 Using a plastic or hide hammer, tap the spindle (41) out of the carburettor body together with one ball-bearing (38). At the same time withdraw the pump control lever (35) from the carburettor.
34 Place the spindle (41) and bearing (38) loosely in a vice and tap the spindle trom the bearing, then reassemble the spindle to the carburettor and tap out the remaining bearing.
35 If the bearings are excessively worn, it is possible for the inner race to separate from the outer race leaving the latter in the carburettor body. If this happens, gently heat the body with a gas blow lamp until the race can be removed. On no account use excessive heat, otherwise the main body may be distorted and this is the only part which is not available as a spare.
36 On series 45 DCOE carburettors, unscrew and remove the auxiliary venturi retaining screws (22).
37 Extract the auxiliary venturis (15) from the carburettor barrels. In most cases these can be pulled out with the fingers, or alternatively Weber tool no 98009 200 can be used {photo).
38 Using Weber tool no 98009 100, extract the chokes (14) trom the carburettor barrels. Note from which barrel the auxiliary venturis and chokes are removed in order to ensure correct refitting, also mark them in relation to the top of the carburettor sa that they can be correctly refitted to the locating grooves (photo).

6 Special overhaul procedures

After carrying out the genera! overhaul procedures given in Chapter 4, the following special procedures should be made:
1 Using a hand chuck and Weber tool no 98006 100, reform the main jet seatings at the bottom of the emulsion tube housing wells by carefully rotating the tool in alternate directions. Finish the seatings by inserting Weber tool no 98010 400 and gently tapping the top of the tool whilst rotating it.
2 Using the same procedure as described in paragraph 1, reform the idling jet seats with Weber tool nos. 98005 800 and 98010 600.
3 Using the same procedure as described in paragraph 1, reform the starter valve seats with Weber tool nos 98004 000 and 98010 400.
4 Using the same procedure as described in paragraph 1, reform the starter jet seats with Weber tool nos 98006 300 and 98010 600.
5 If the internal channels are suspected of being blocked, it will be necessary to drill out the lead plugs as shown in Fig. 11.16, remembering that on 40 DCOE 20 to 22 and 45 DCOE 12 carburettors, the starter device and relativa channels are missing. The channels can be checked for obstructions before removing the lead plugs by injecting fuel with a syringe and observing that it emerges freely from the particular channel being tested.
6 The channels are of three diameters, viz 1•O mm, 1.5 mm and 2,0 mm. The Weber tool nos 98014 300, 98014 400 and 98014 500 should be used to check that the channels are clear tor their full lengths.
7 The carburettor body should be thoroughly cleaned after

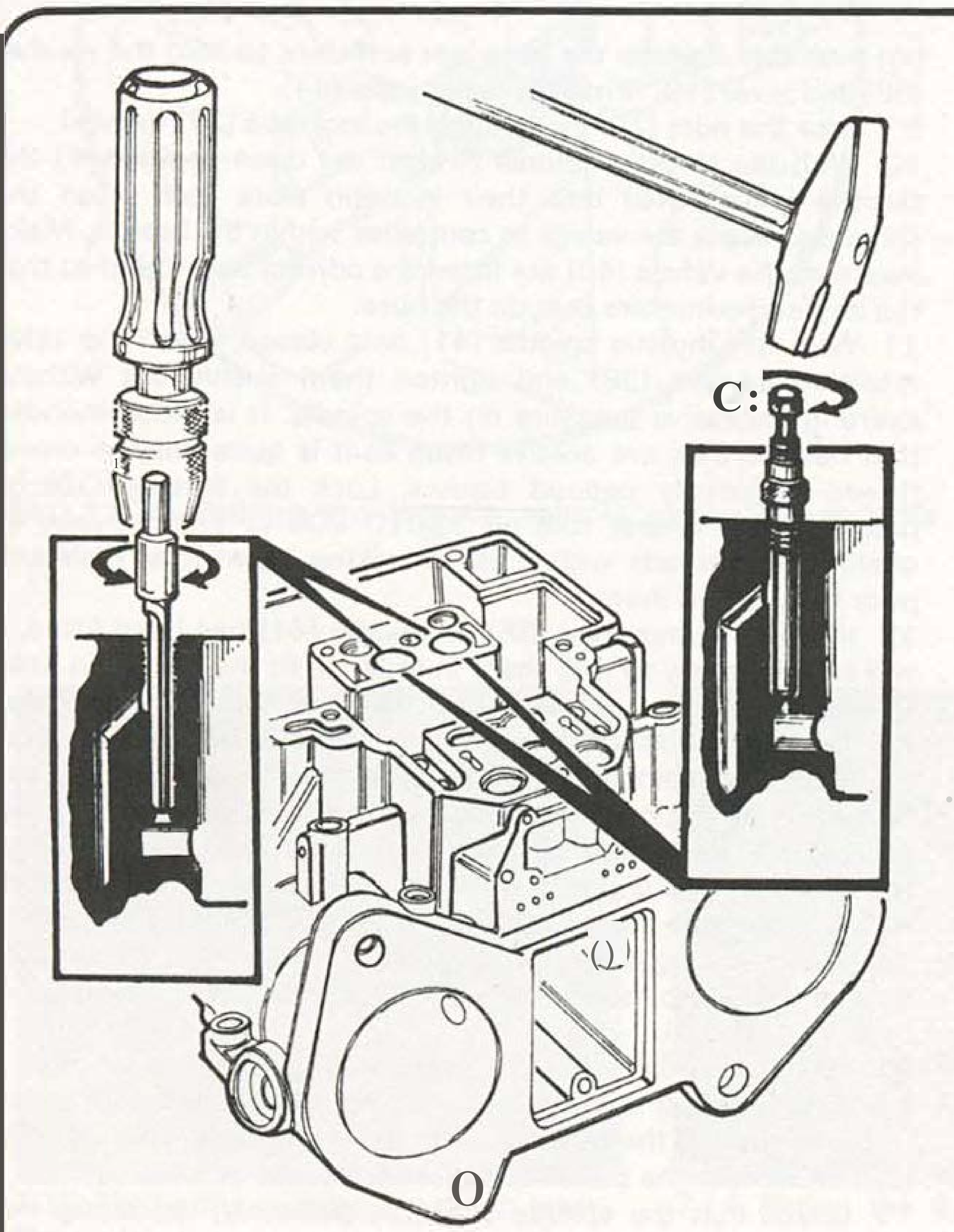


Fig. 11.15 Main jet seats overhaul procedure (Sec 6)

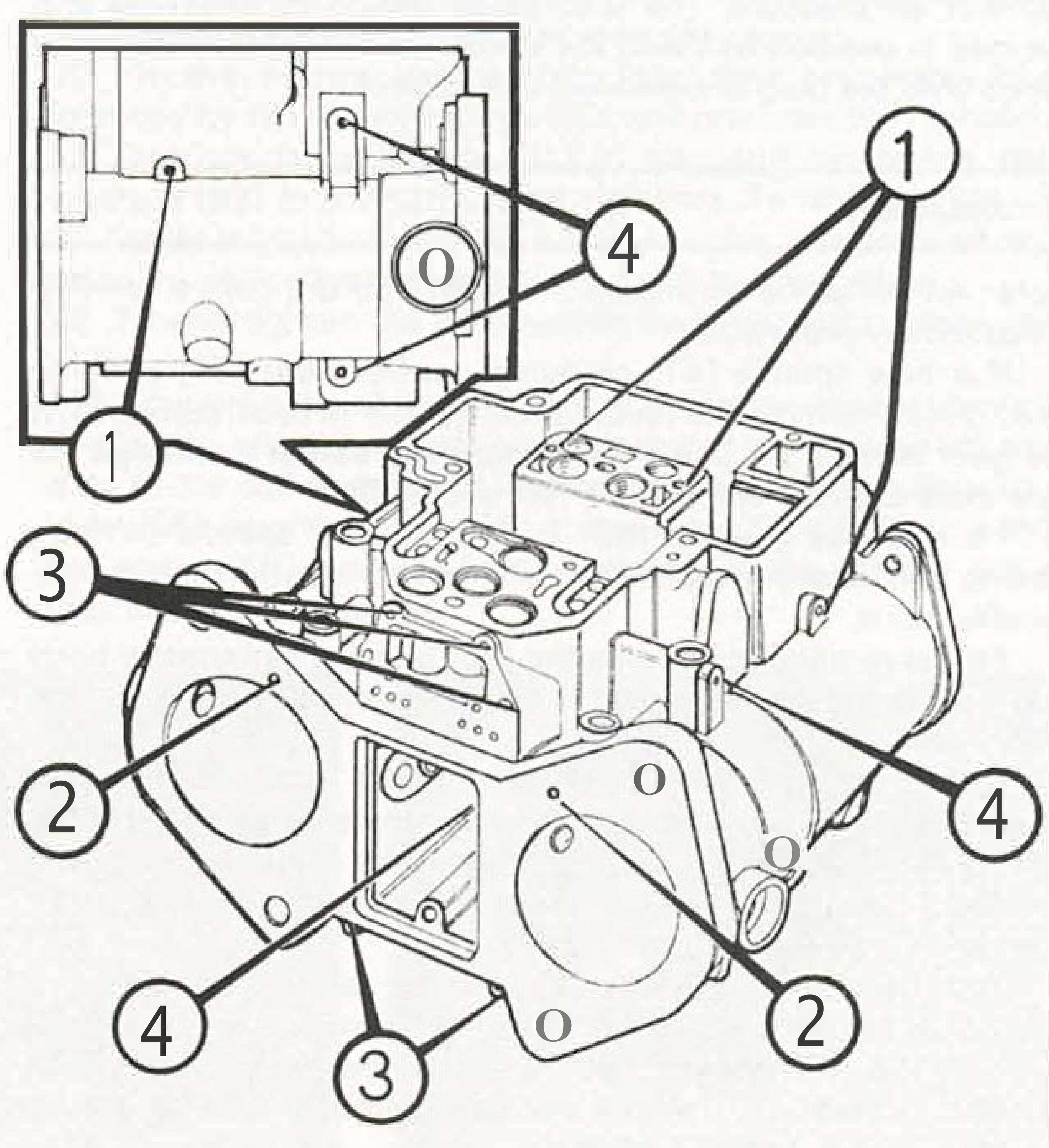


Fig. 11 .16 Location of the lead sealing plugs (Sec 6)

1 Idling channels
2 Idling/progression channe/s
3 Starting channels
4 Accelerator pump channels

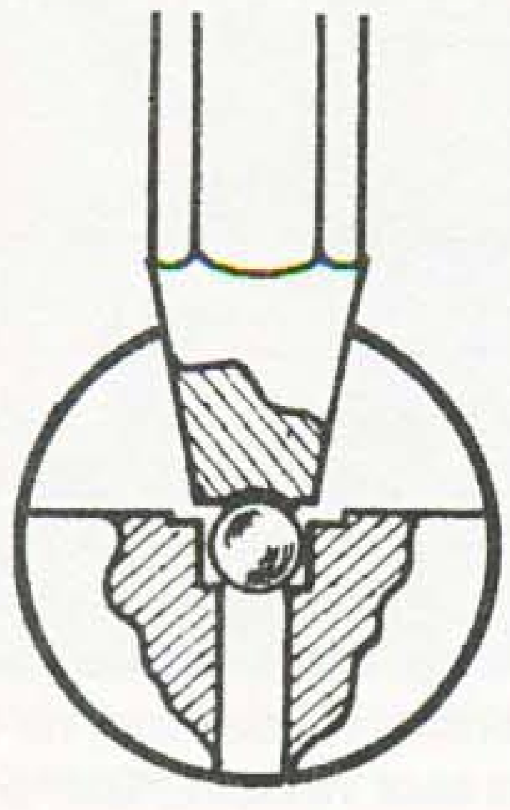
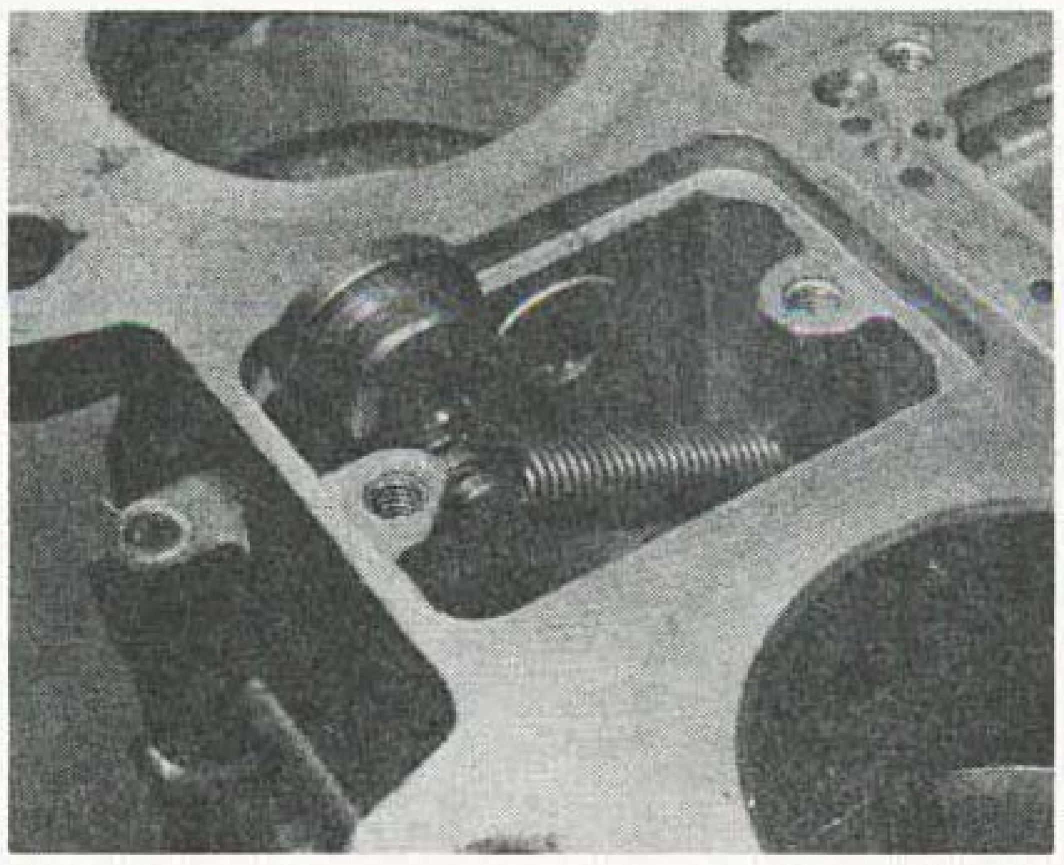
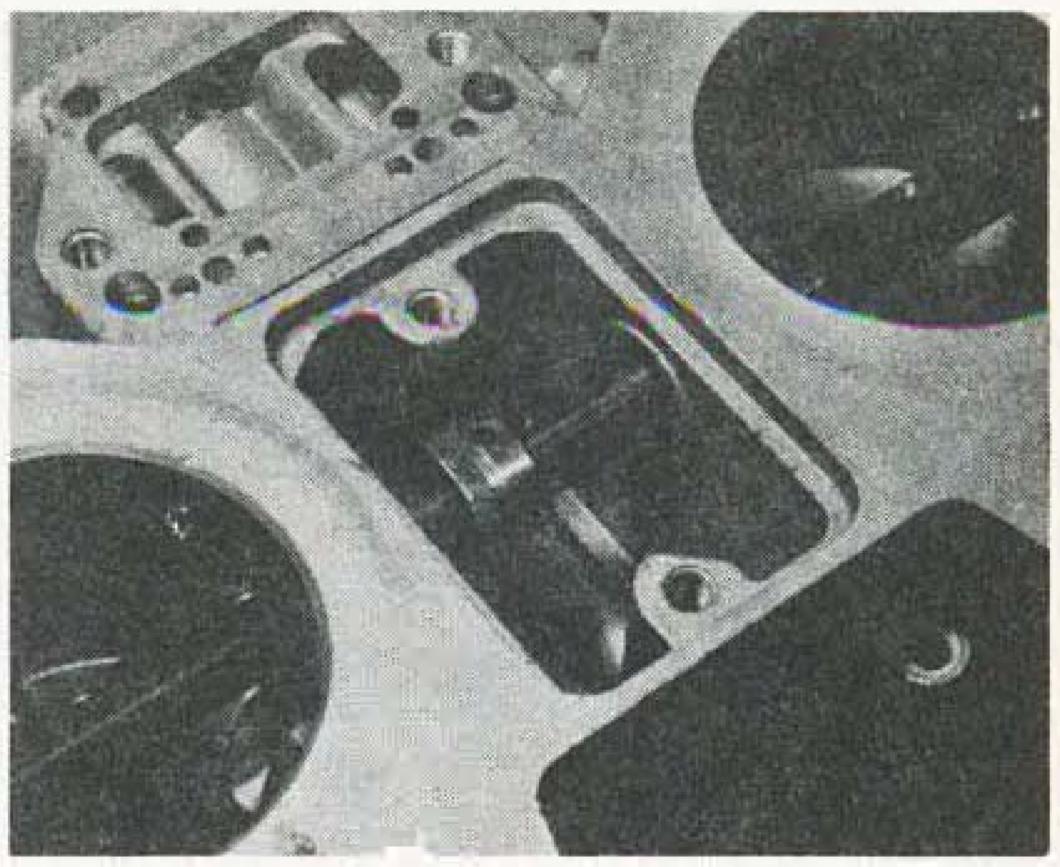
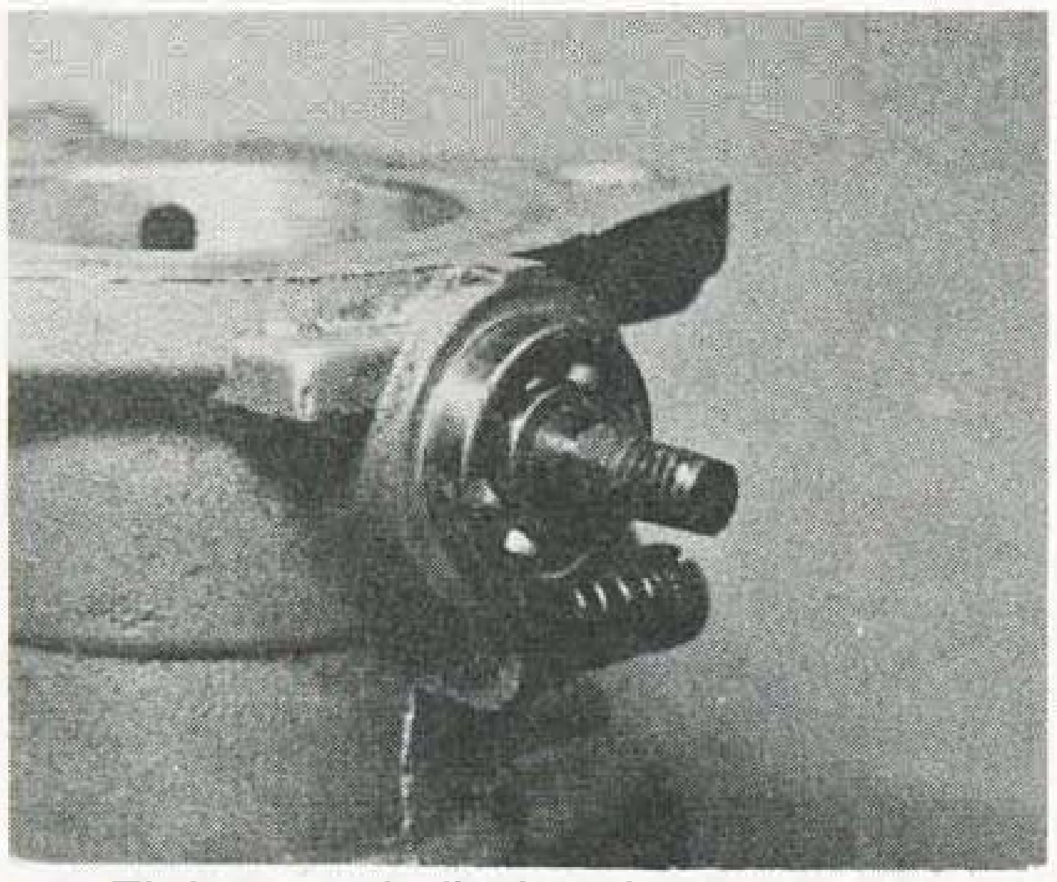
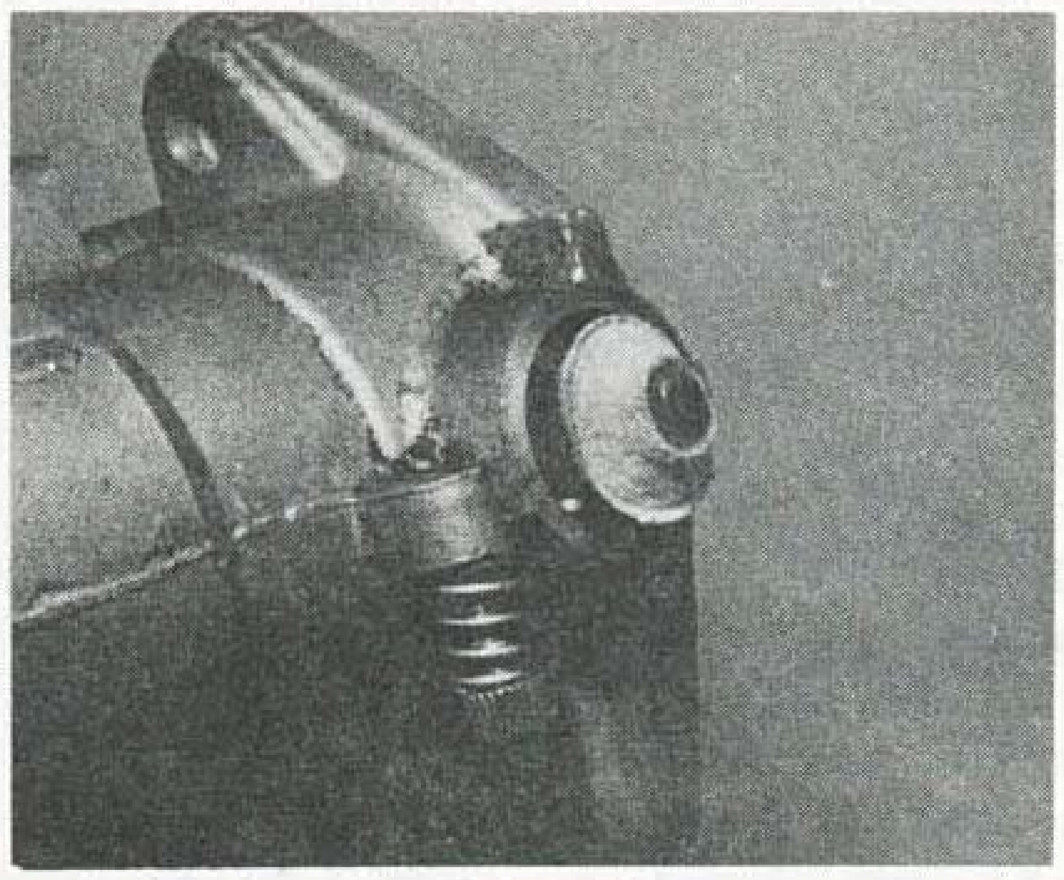


Fig. 11.17 **Method** of **inserting the lead** plugs **(Sec 6)**


7.4a Inserting the throttle spindle return spring and accelerator pump lever


7.4b Fitting the throttle spindle


7.5 Fitting a spindle bearing


7.6 Fitting a throttle spindle dust cover

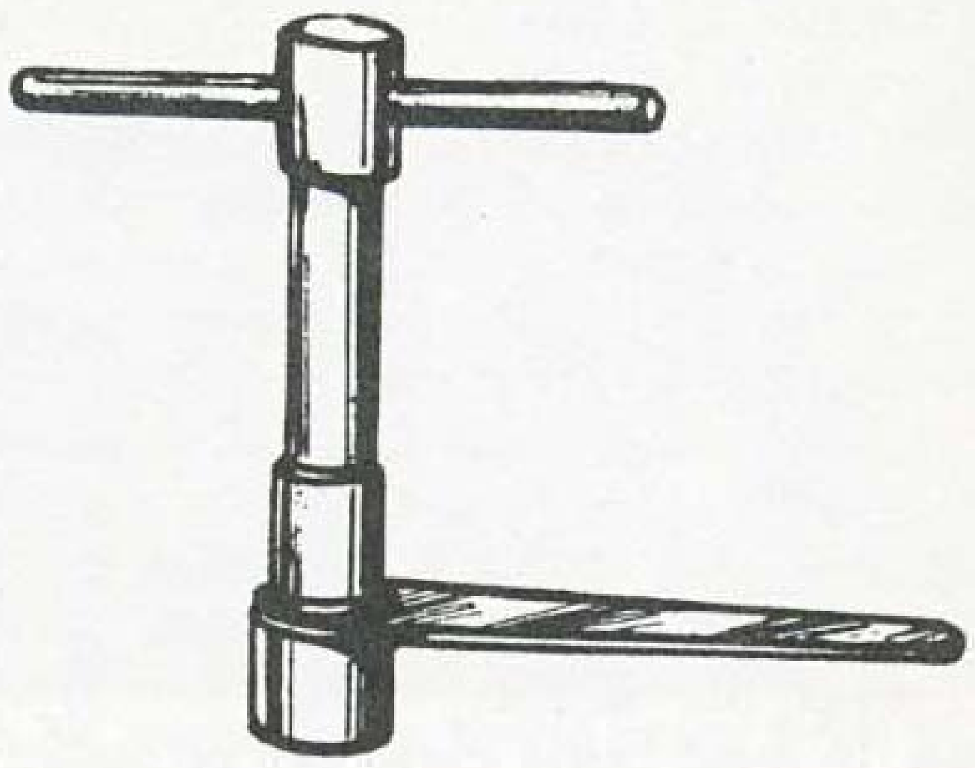


Fig. 11.18 Throttle spindle nut tightening toot (Sec 7)

overhaul to remove any swarf and dirt, preferably using clean fuel and air pressure. The lead plugs should be renewed and retained in position by using the Weber tool no 98010 800 as a punch until the plug is expanded into its bore.

7 Assembly

Note: *All components shou/d be clean and dry before starting the assembly procedure.*

1 If a new spindle (41) or pump control lever (35) is being fitted, first assemble the lever to the spindle to ascertain its fit. If the lever is too tight, use a 1 in expanding reamer to en large the lever bore until the spindle is a firm sliding fit.

2 Fit one ball-bearing (38) to the throttle spindle (41) by placing the bearing on an open vice and gently tapping the spindle into it.

3 Fit the remaining ball-bearing (38) into the carburettor body using a plastic hammer and suitable diameter tubing on the outer race.

4 Insert the pump control lever (35) with spring (33) assembled, Into the carburettor body, then press the throttle spindle (41) through the locating bore at the same time entering it through the pump control lever (35), making sure that the lever is facing inwards (photos).

5 Tap the spindle bearing (38) into the carburettor body and check that the opposite bearing has not been displaced (photo).

6 Smear a little grease over the spindle bearings (38), then fit the dust covers (16) using a suitable diameter tube to ensure they are correctly seated (photo).

7 Assemble the springs (17), spring covers (18), lever (19). washer (58) and tab washers (27) to their respective ends of the spindle (41), then screw on the nuts (28) finger tight.

8 Screw the throttle adjusting screw (21) and spring (20) into the carburettor body, then tighten the nuts (28) onto the spindle (41). Use the special Weber tool no 98023 700 to do this, but if not available, tighten the nuts just sufficient to hold the washer (58) and lever (19) firmly on the spindle (41).

9 Loek the nuts (28) by bending the locktabs (27) (photo).

10 With the throttle spindle (41) in the open position, fit the throttle valves (40) into their location slots then close the spindle to allow the valves to centralise within the barrels. Make sure that the valves (40) are fitted the correct way round so that the angled perimeters seat on the bore.

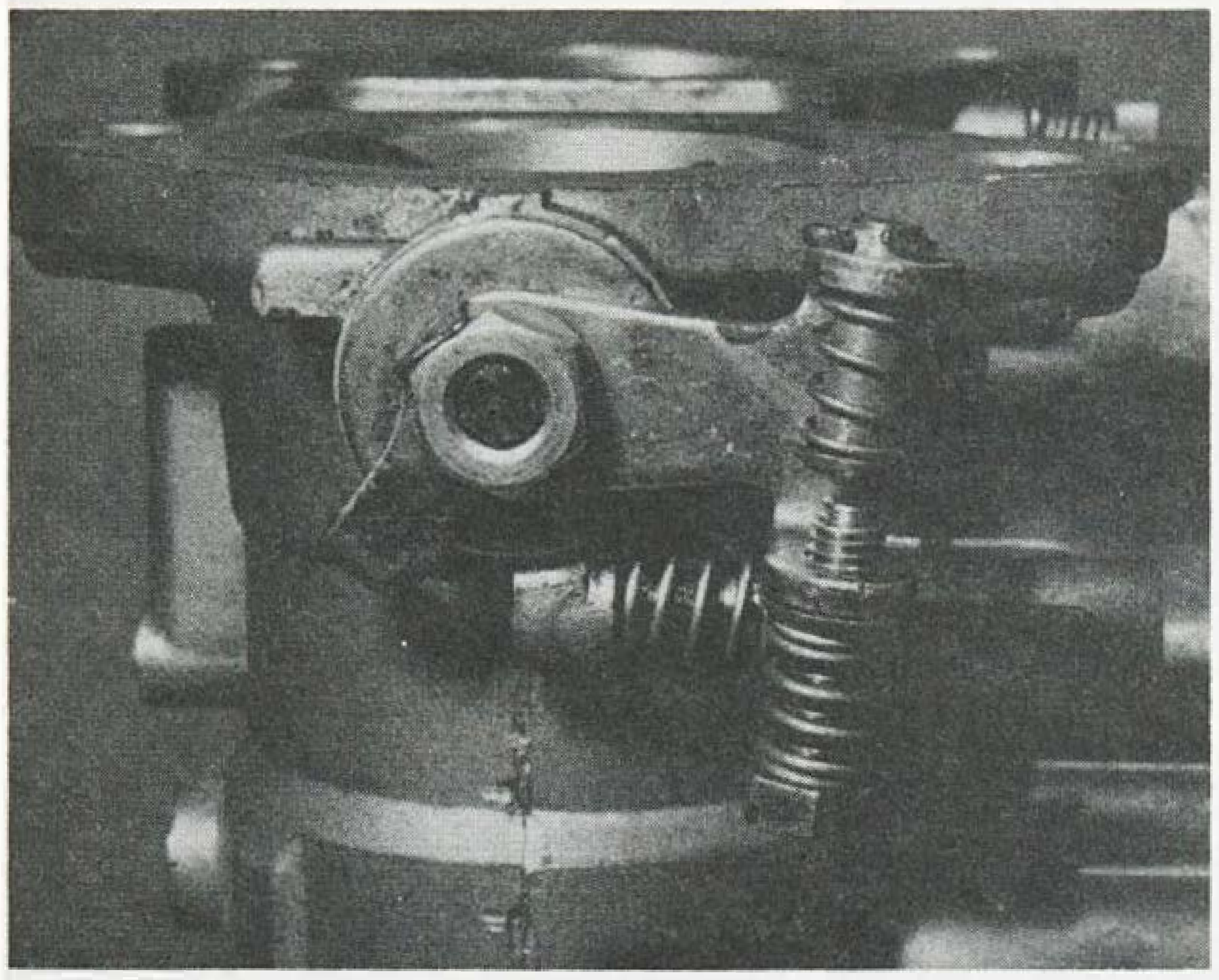
11 With th-1 throttle spindle (41) held closed, insert the valve retaining screws (39) and tighten them evenly but without exerting excessive pressure on the spindle. It is recommended that new screws are always fitted as it is quite easy to cross-thread previously peened screws. Loek the screws (39) by peening with Weber tool no 98010 900 or alternatively, by coating the threads with a liquid locking agent (fuel resistant) prior to inserting them.

12 If a new pump lever (35) or spindle (41) has been fitted, it will be necessary to drill them in order to fit the fixing pin (34). This can be carried out by one of two methods. First by using the gauge no 98015 600 and spacer no 98007 800 and drilling the lever and spindle whilst holding the throttle valves shut. Secondly by fitting the pump rod and piston assembly as described in paragraph 32, then retaining the rod with a bulldog clamp so that the distance from the face of the carburettor body to the underside of the pump rod arch is equal to the pump stroke. By closing the throttle valves and holding the lever (35) against the pump rod (64) the spindle can be drilled using a 2-0 mm or no 46 drill.

13 Drive in the fixing pin (34) using a suitable punch (photo).

14 With a pair of long nose pliers, grip the spindle return spring (33). lift it out of the carburettor body, insert the anchoring plate (32) and locate the plate in its location recess (photo).

15 Check that the spindle operates smoothly, indicating that the bearings are not binding. If there is any tendency to bind, the bearings may not be properly aligned. This may be rectified by gently tapping the carburettor body in their vicinity.



7.9 Throttle lever fitted to the spindle

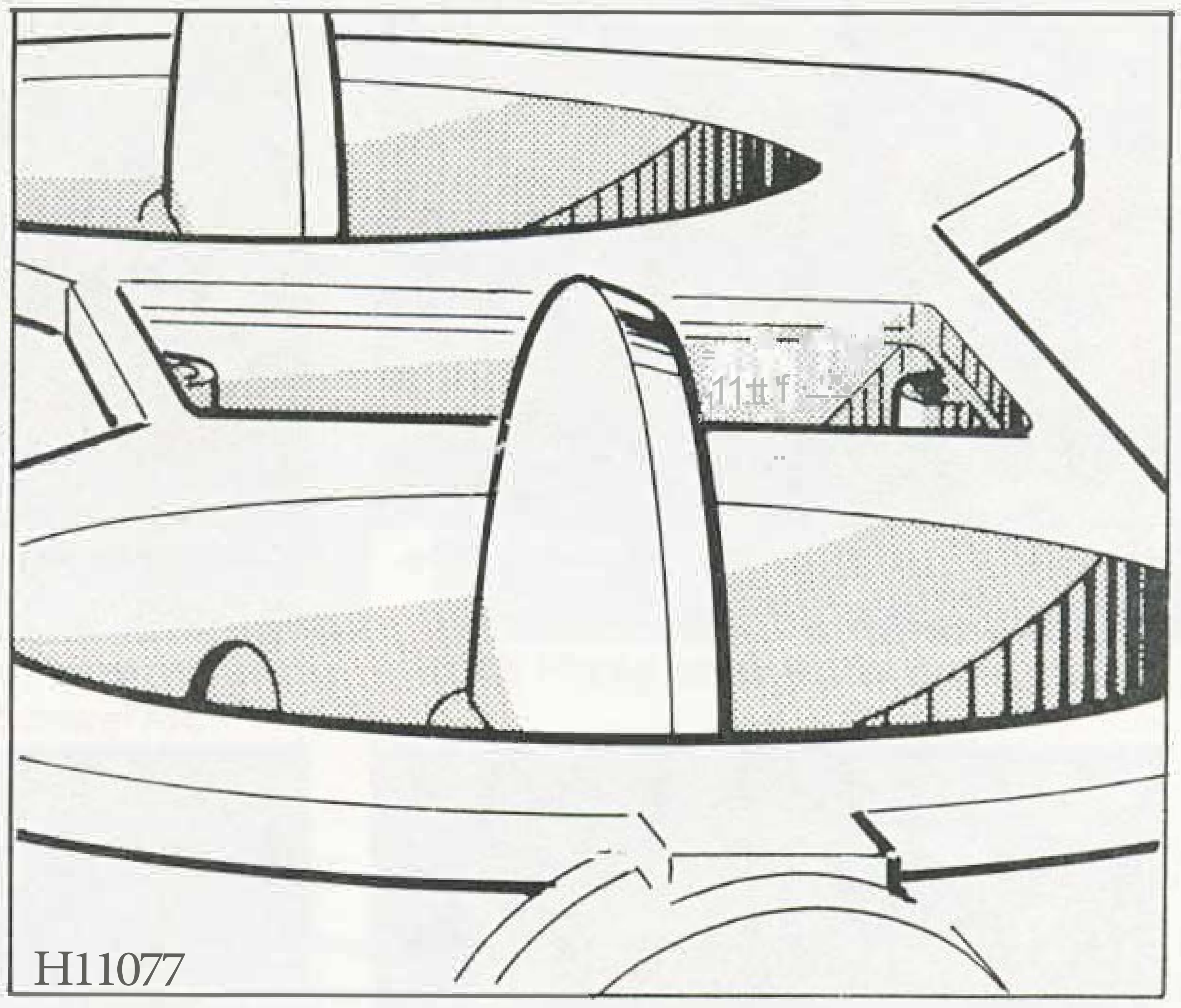


Fig. 11.19 Angled perimeter of the throttle valves (Sec 7)

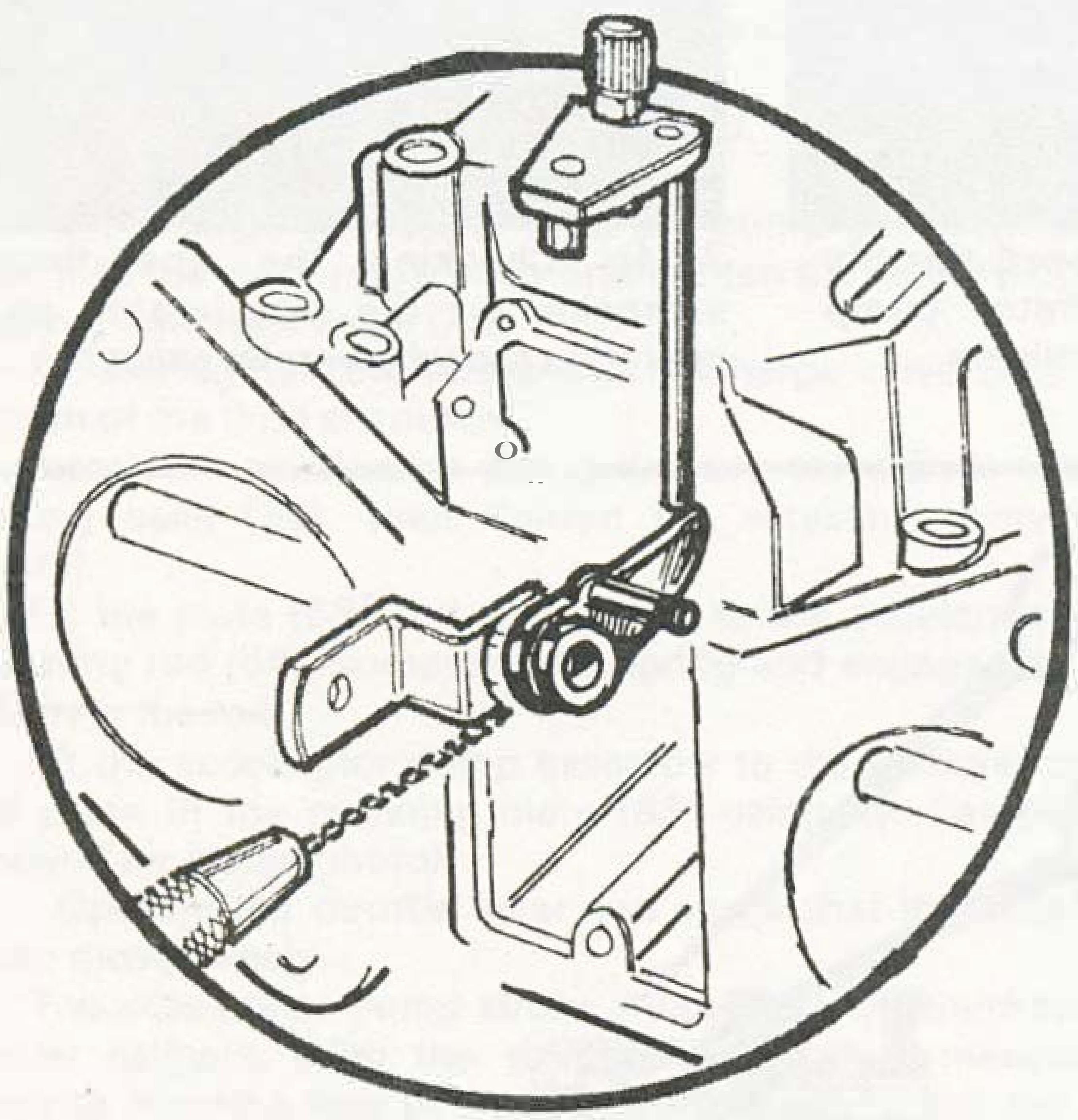
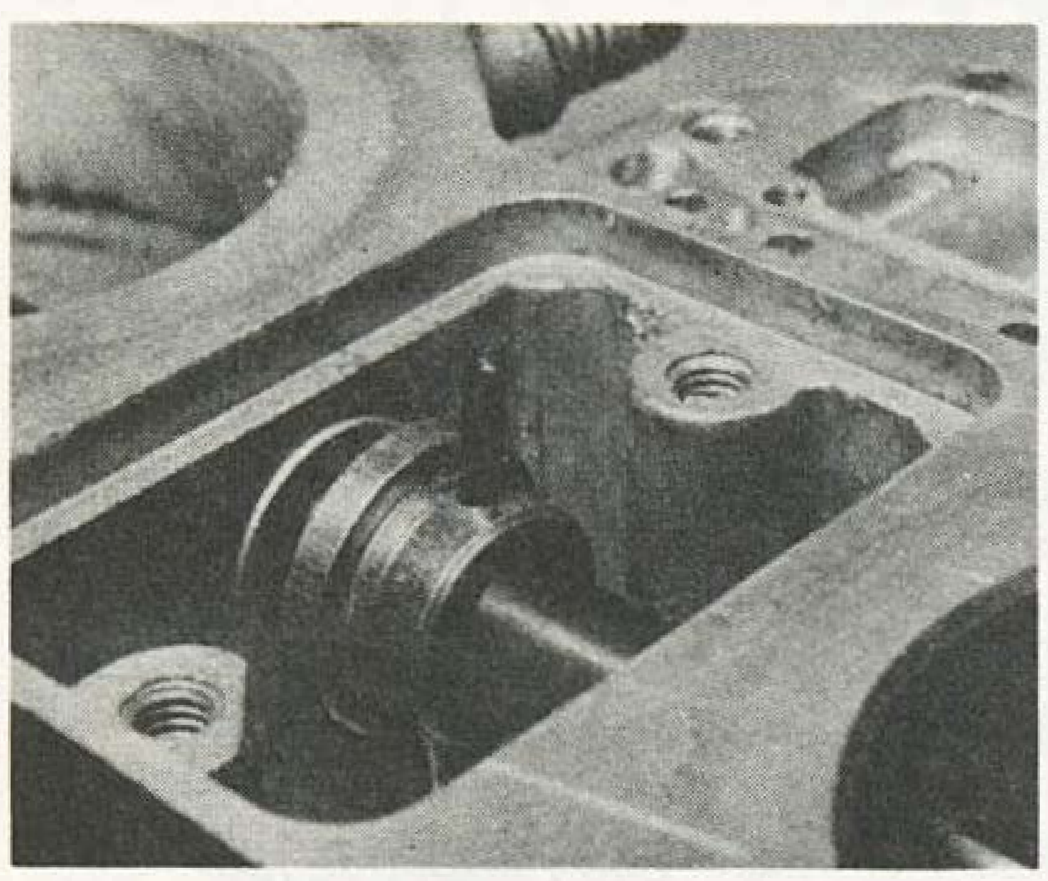
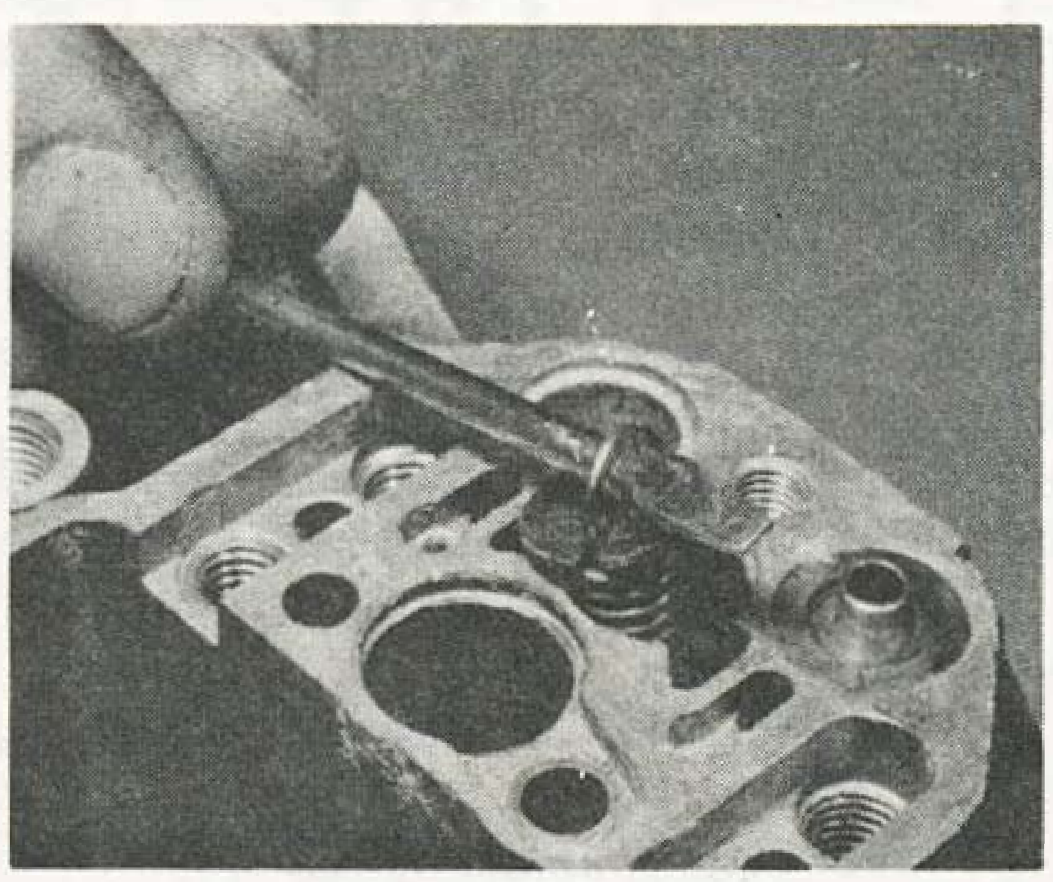


Fig. 11.20 Drilling the throttle spindle **using Weber tools** (Sec 7)

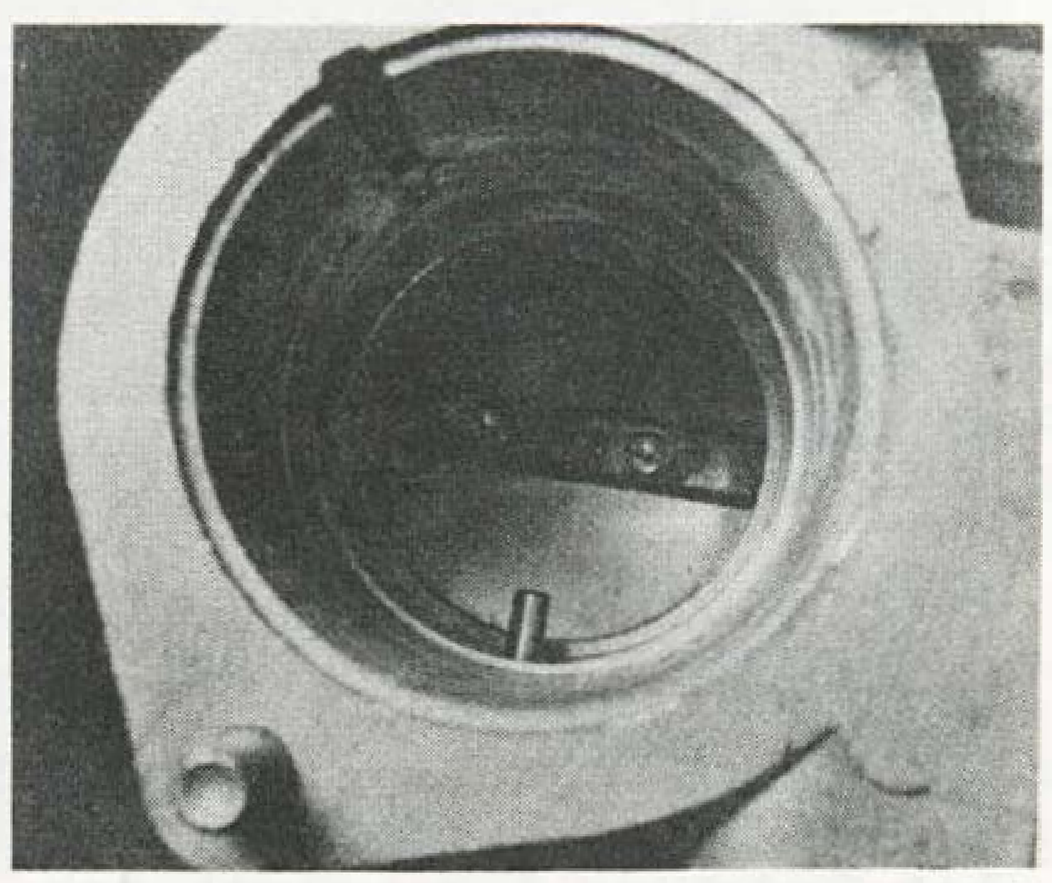
16 Fit the chokes (14) into the carburettor barrels, making sure that they are located in their original positions and do not obstruct the pump jet (72) apertures (photos).
17 Fit the auxiliary venturis (15) into the carburettor barrels, making sure that the jet cutaway sections are facing the throttle valves.
18 On series 45 DCOE carburettors, fit and tighten the auxiliary venturi retaining screws (22).
19 Fit the pump opening cover plate (45) with a new gasket (46) and tighten the retaining screws **(44)** evenly.
20 Fit the starter valves (59) into their respective bores, followed by the return springs (60) and retainers (61) (photo).
21 Depress the retainers (61) in turn and locate the spring washers (62) in the carburettor recesses. To do this, first enter the lower leading edge then, whilst keeping this pressed down, close the spring washer and enter the remaining edge.
22 Fit and tighten the progression hole inspection screw plugs (70).
23 Assemble the shaft (55) to the starter device (where fitted) so that the alignment lines on each sector are facing each other, then fit the coil spring (53) locating it in the location hole. Fit the lever (50) over the shaft (55) at the same time hook the end of the spring (53) over the lever, then locate the washer and nut (52) and tighten the nut.



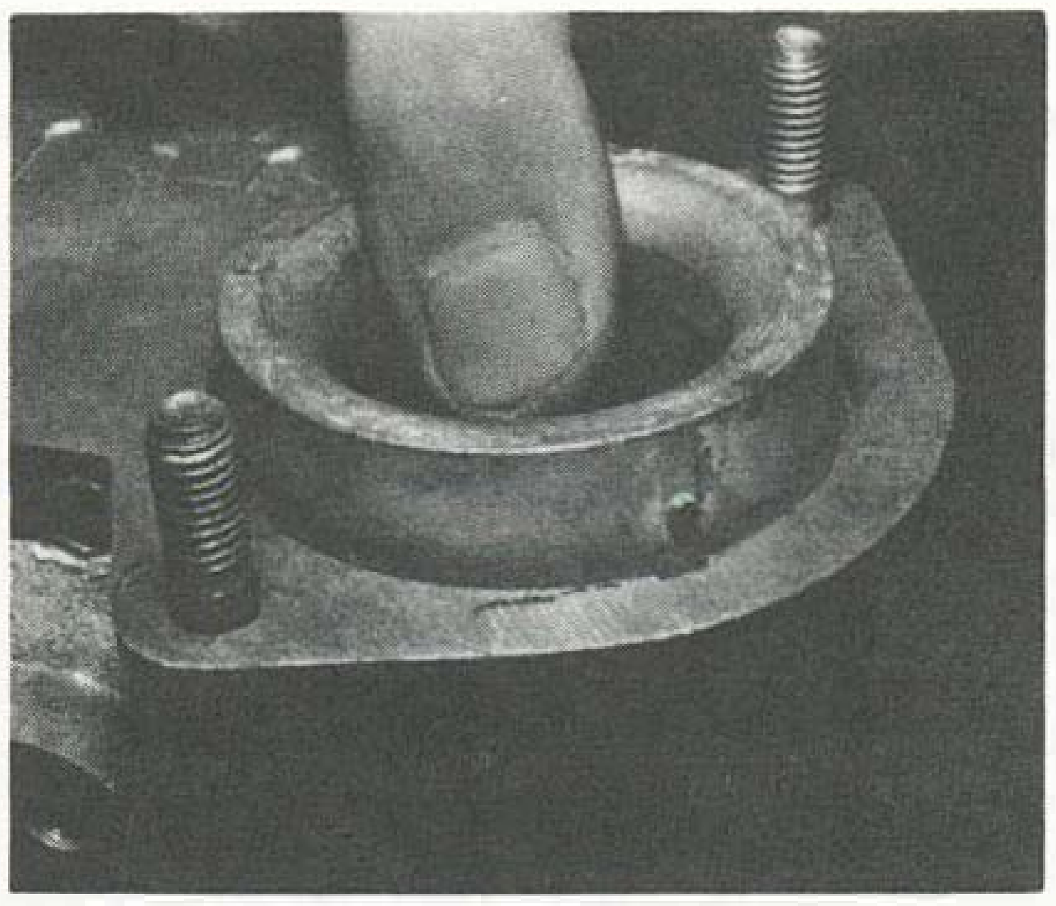
7.13 Fitting the accelerator pump lever fixing pin



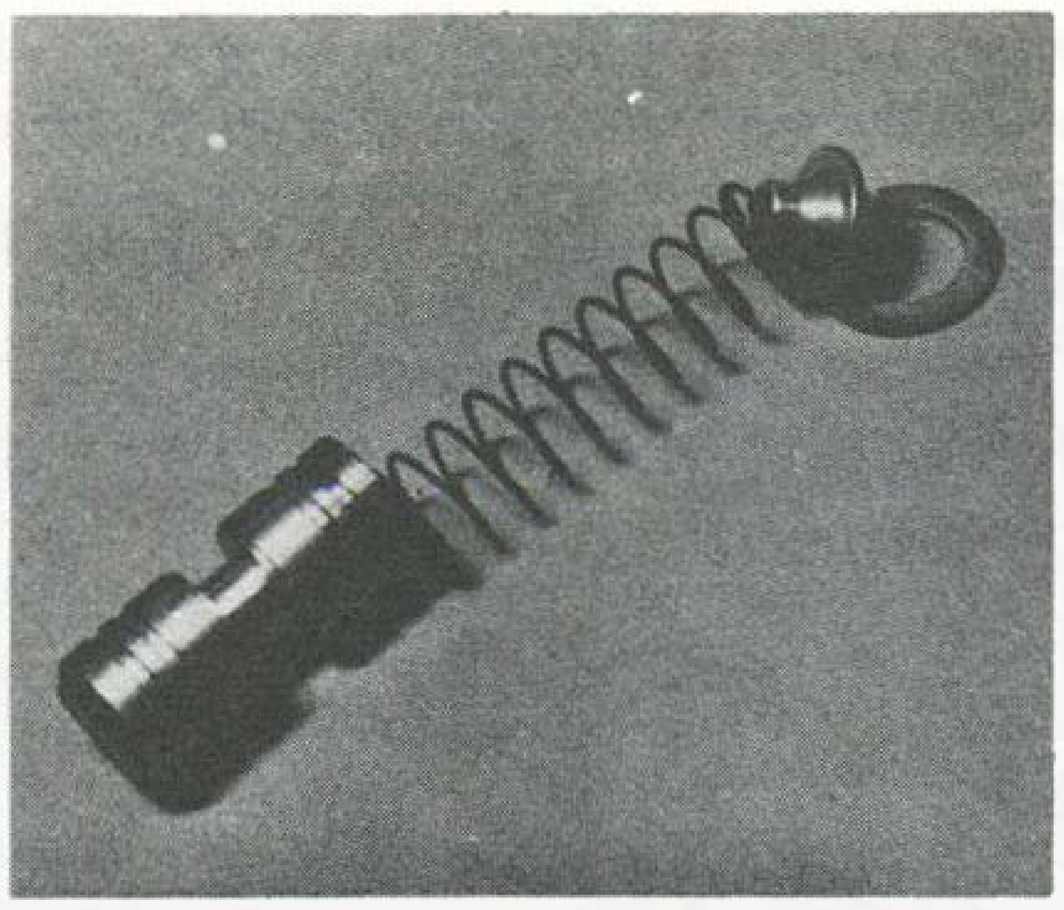
7.14 Fitting the throttle spindle return spring anchoring plate



7.16a A carburettor barrel with auxiliary venturi and choke removed showing location groove and accelerator pump jet

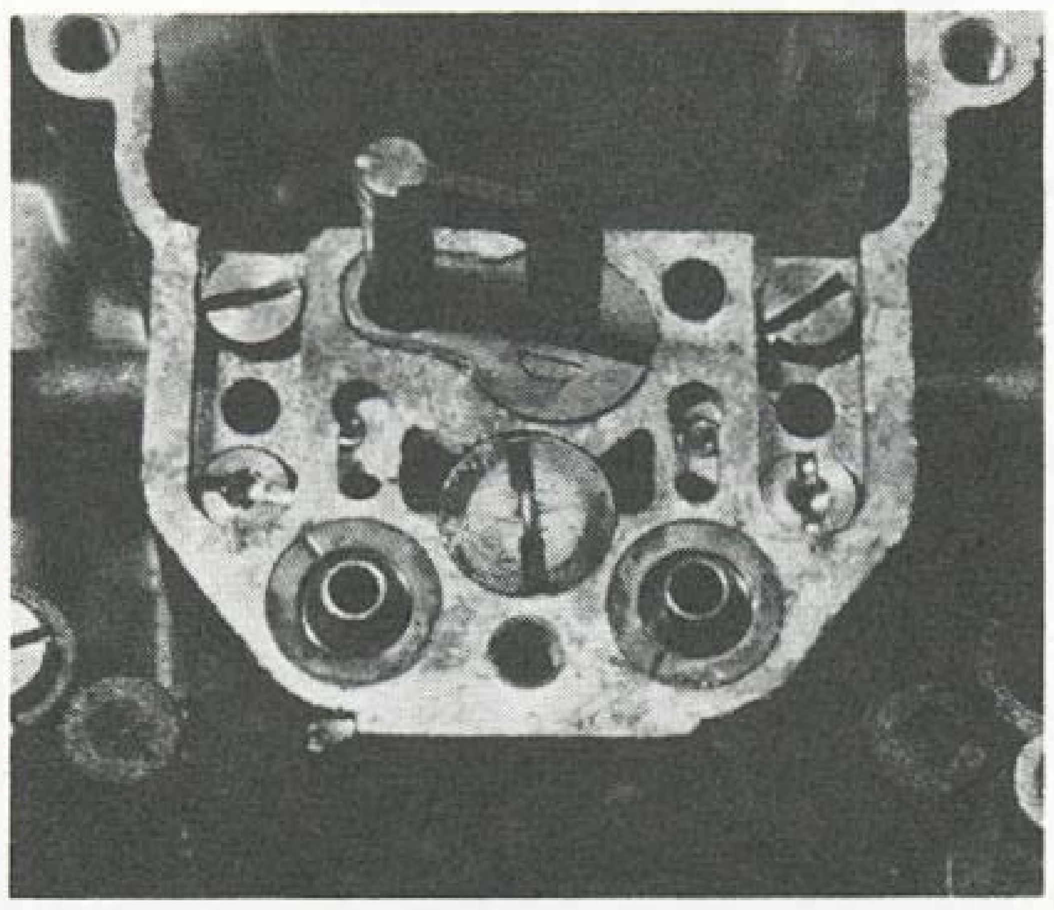


7.16b Fitting a choke, showing the location lug

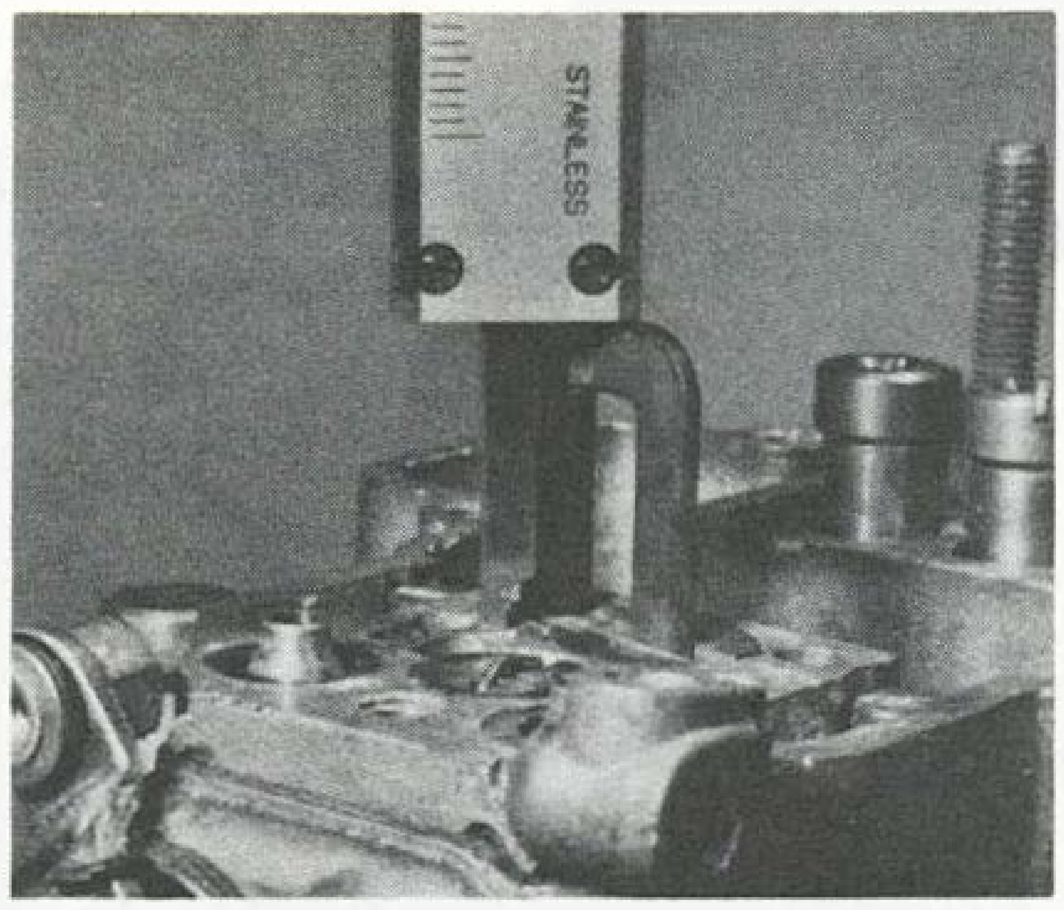


7.20 Starter valve components

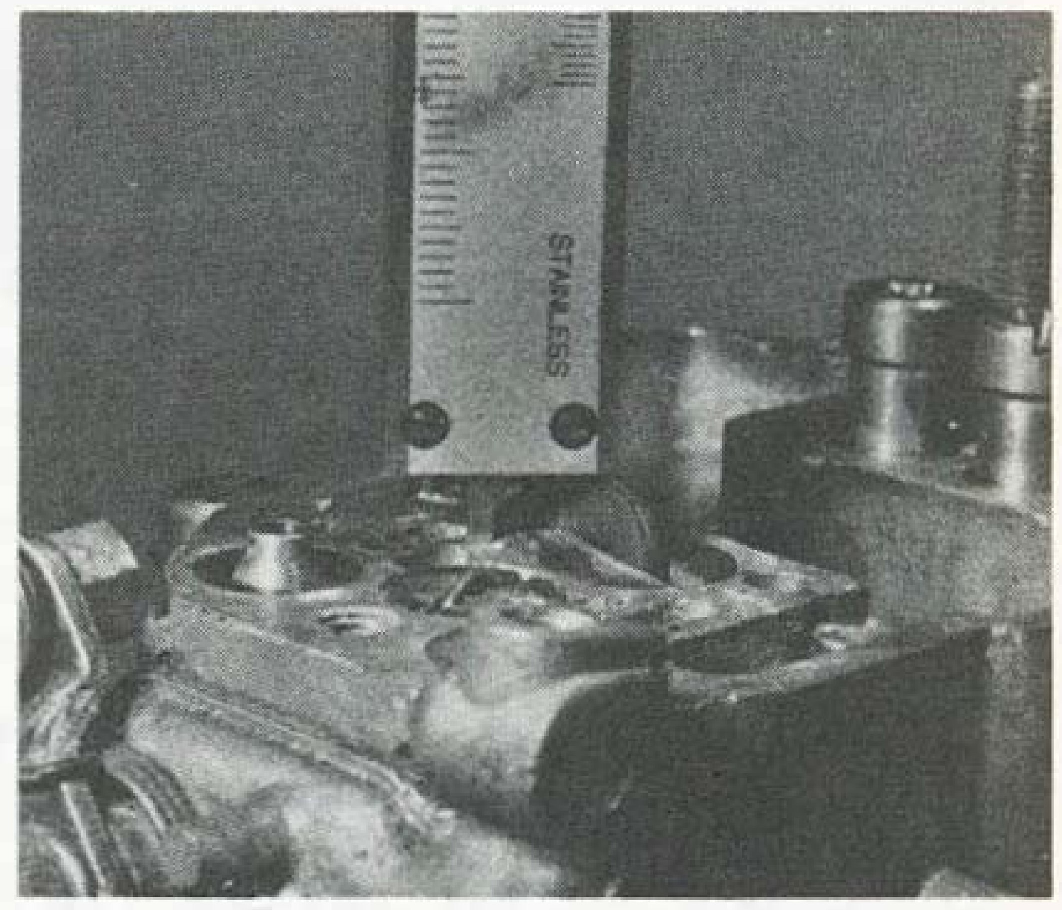
7.30 Fitting an accelerator pump delivery valve ball



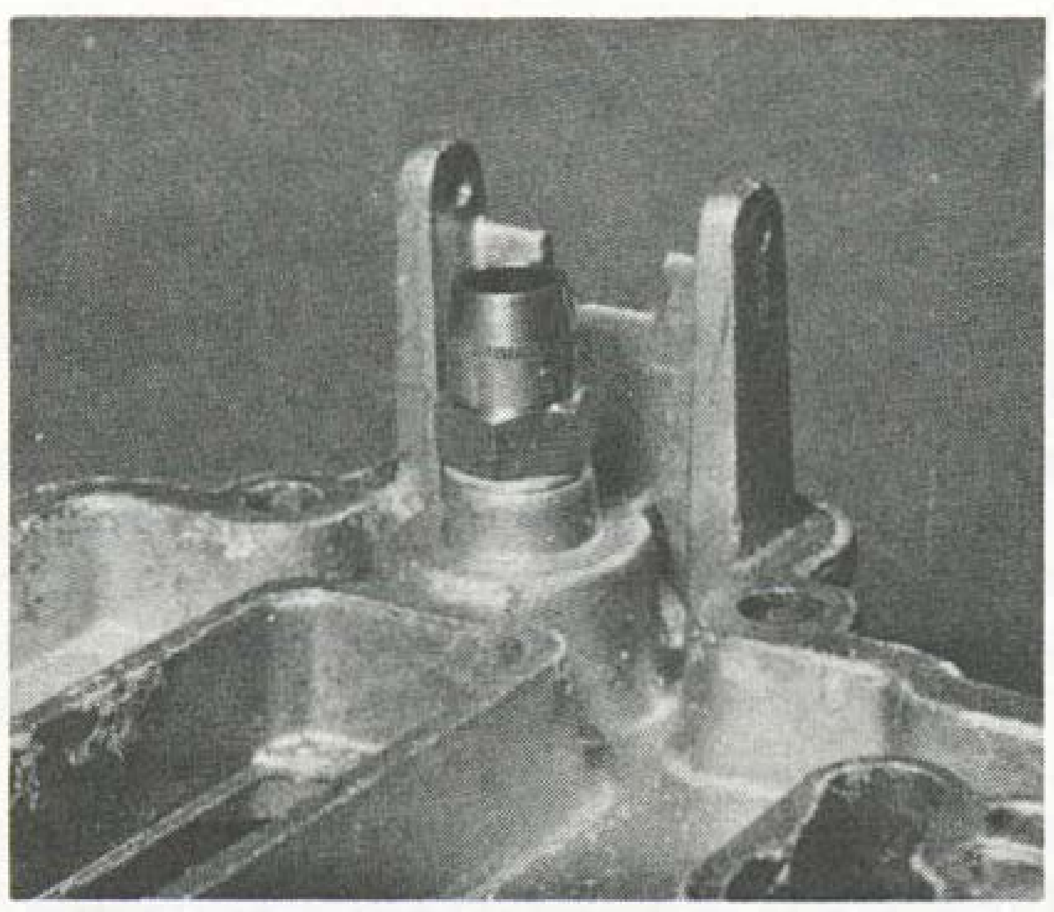
7.32 Fitted position of the accelerator pump



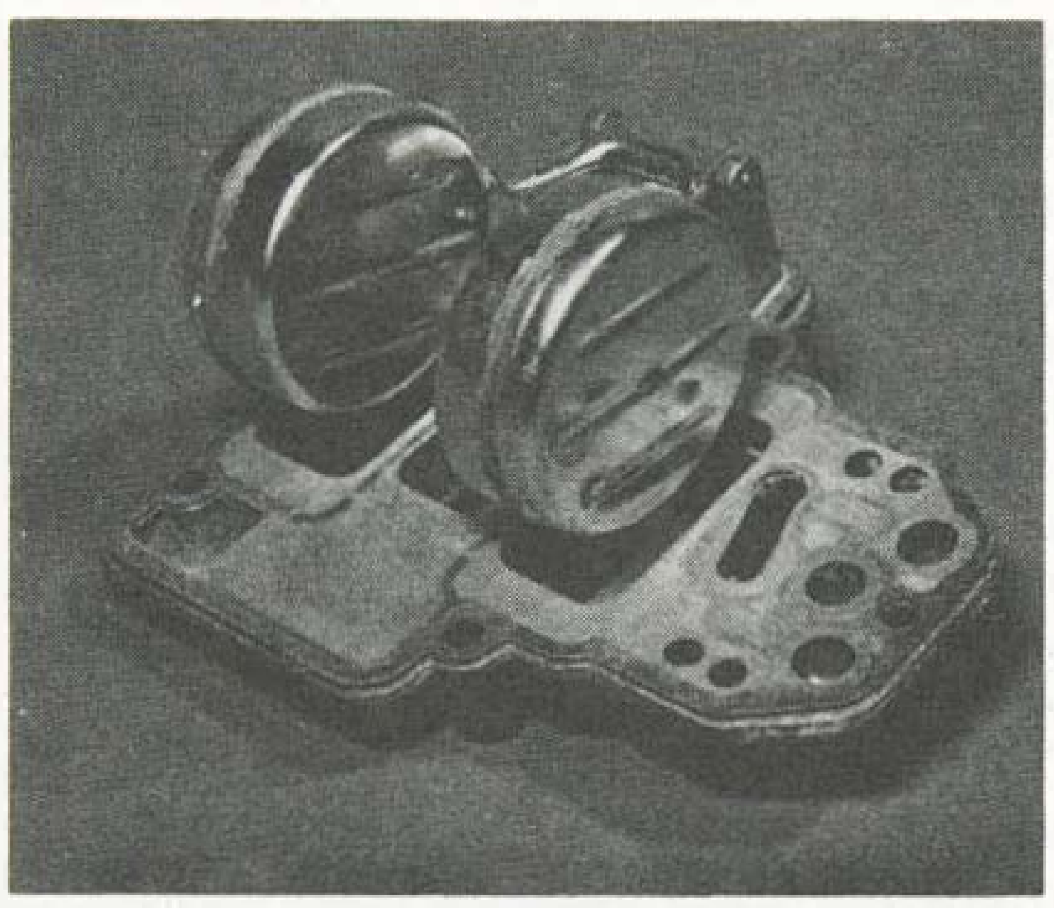
7.34a Checking the closed-throttle extension of the accelerator pump operating rod with vernier calipers



7.34b Checking the open-throttle extension of the accelerator pump operating rod with vernier calipers



7.38 Needle valve seatlng location in the carburettor cover



7.40 Gasket and float assembly fitted on the carburettor cover

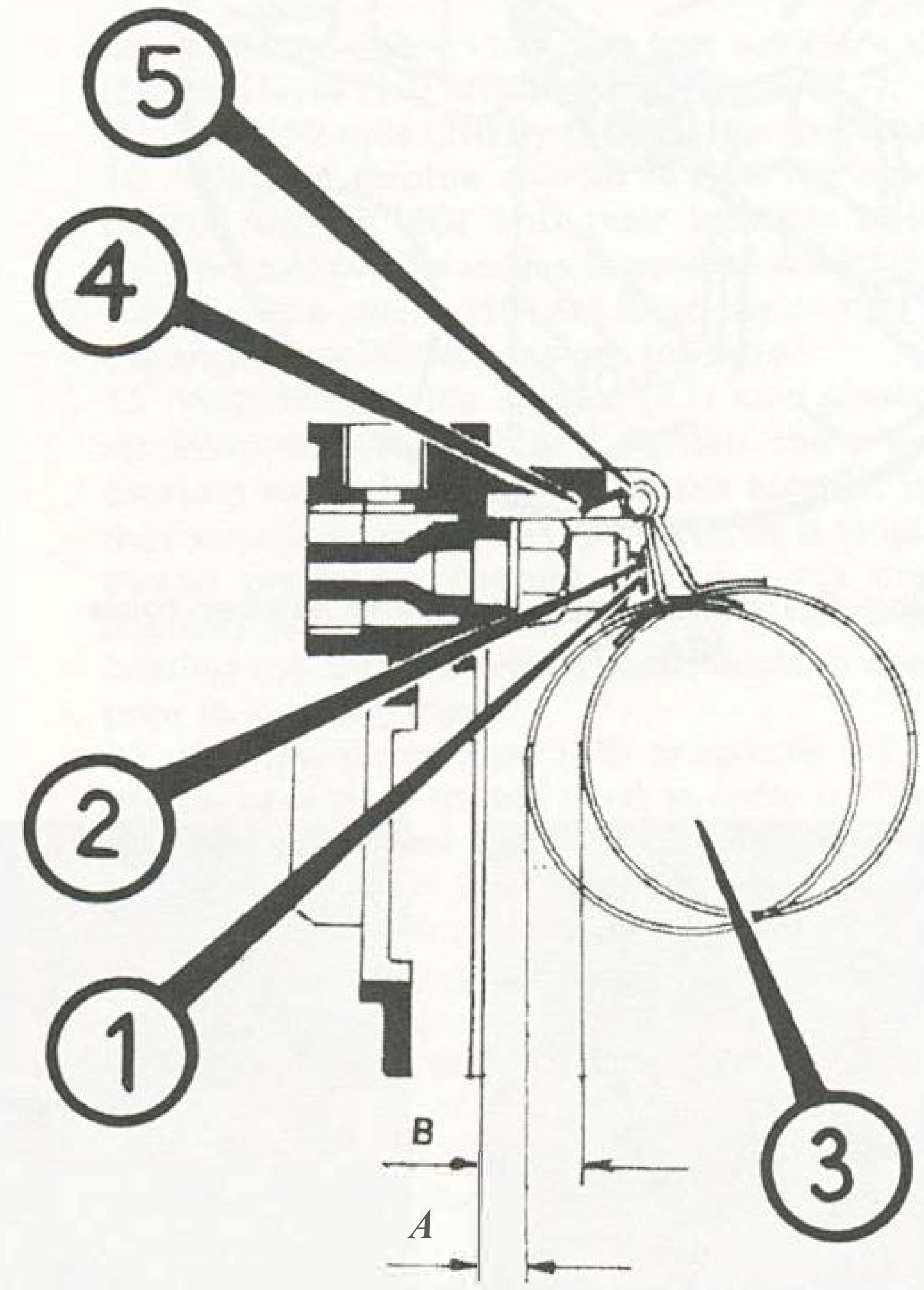
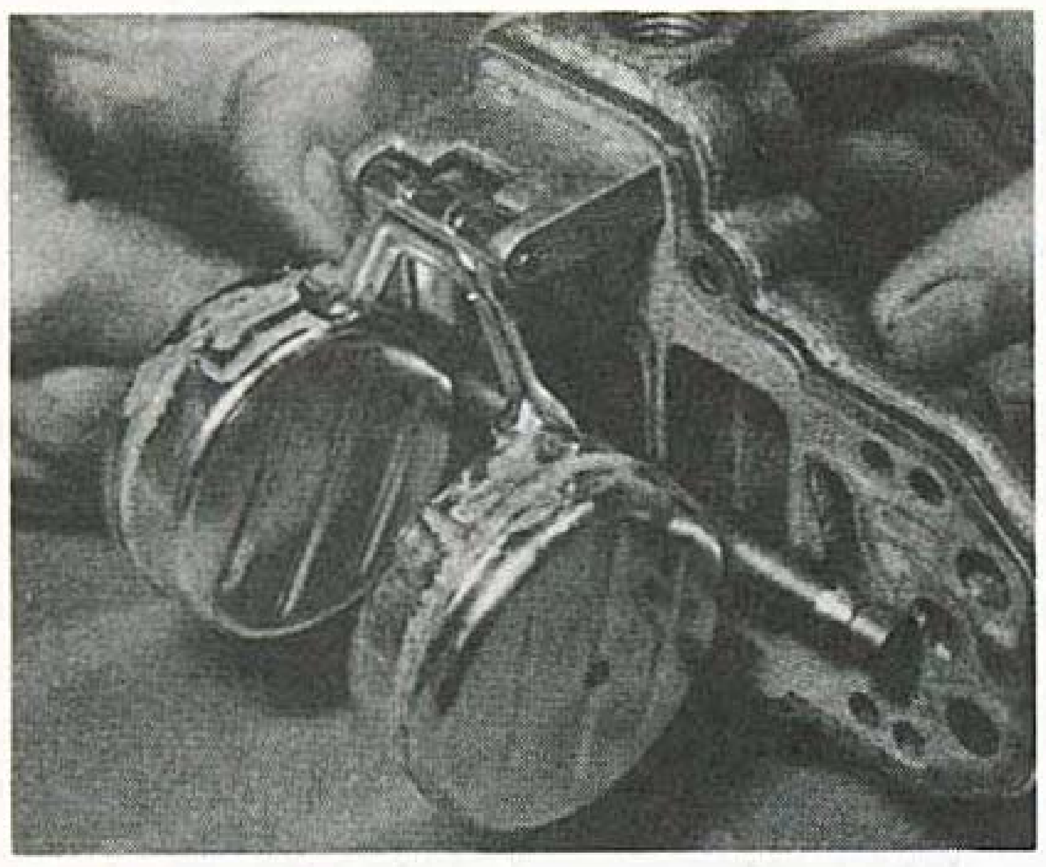
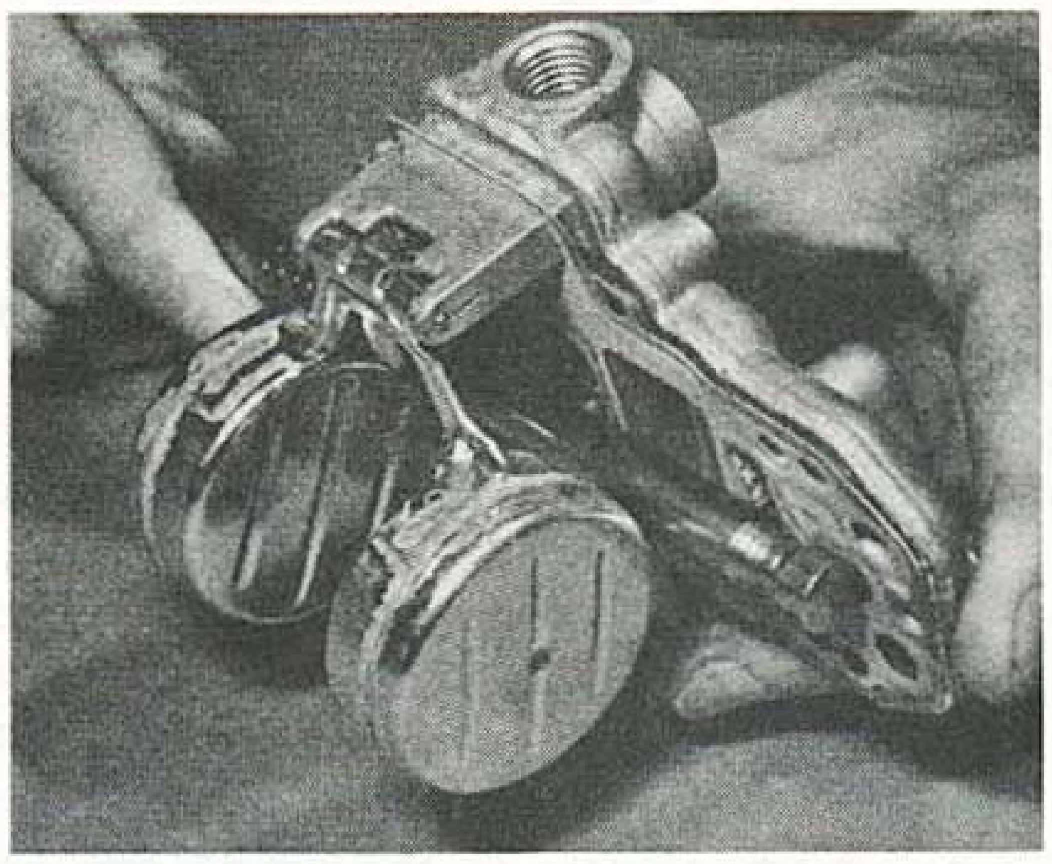


Fig. 11 .21 Float level adjustment (Sec 7)

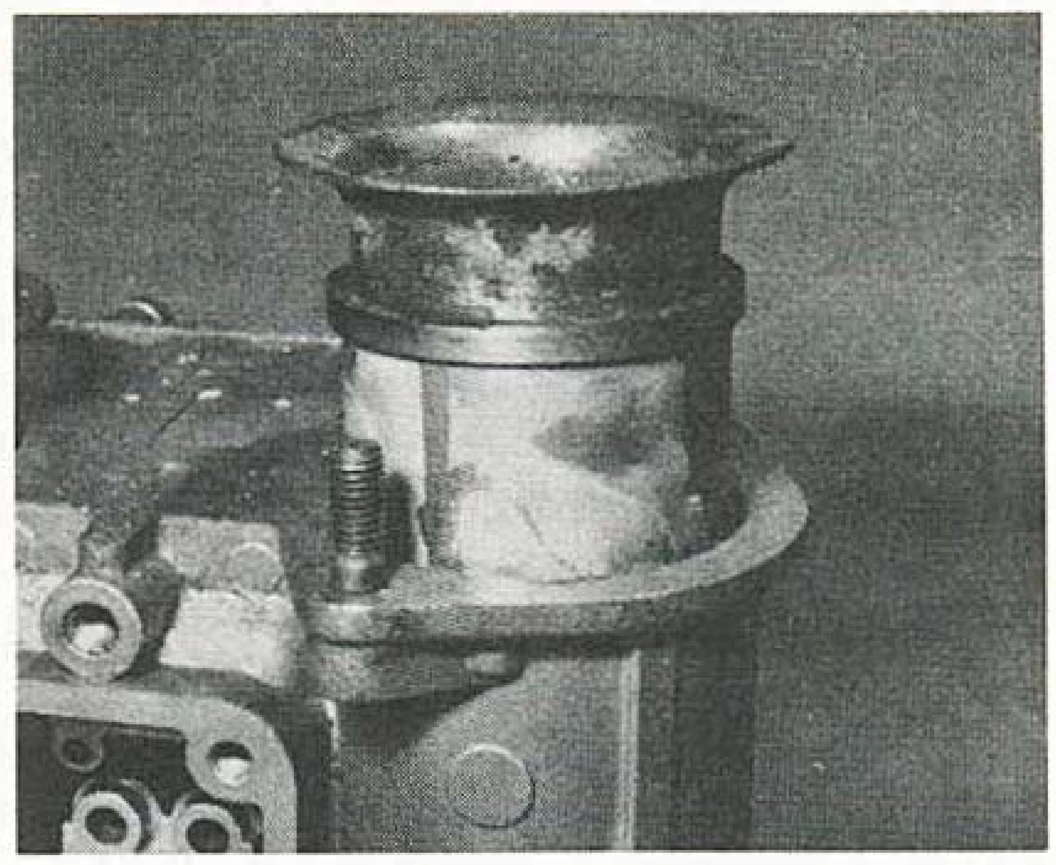
1	*Short adjusting tab*	4	*Long adjusting tab*
2	*Spring tensioned bal/ (not fitted to all types)*	5	*Fulcrum pin*
3	*Semi-floats*	A	*Closed dimension*
		8	*Open dimension*



7.41 Checking the closed position of the floats using a length of dowel rod



7.43 Checking the open position of the floats using a length of dowel rod



7.49 Fitting an air intake horn

24 Check the operation of the starter device, then fit the cable securing screw (51) and filter gauze (56).
25 Offer the starter device up to the carburettor body and make sure that the sector lugs locate in the starter valve (59) grooves; then insert the retaining screws together with spring and plain washers and tighten them.
26 Check the operation of the starter device and valves then fit and tighten the starter jets (76).
27 Where a starter device is not fitted, fit the blanking plate and tighten the retaining screws.
28 Fit the small gaskets (71) to the pump jets (72), then fit them into the carburettor body and tighten the screw plugs (74) together with new seals (73).
29 Fit and tighten the intake and discharge valve (75) to the bottom of the float chamber.
30 Insert the accelerator pump delivery valve balls (79) and stuffing balls (80). then tighten the retaining screws (81) (photo).
31 Fit the plate (63) and spring (65) to the accelerator pump operating rod (64), compress the spring and engage the piston (66) over the rod.
32 Fit the accelerator pump assembly to the carburettor body and press in the retaining plate (63) using the flat side of a screwdriver blade (photo).
33 Operate the throttle lever and check that the accelerator pump moves freely.
34 The accelerator pump stroke should now be checked using vernier calipers. With the throttle valves shut, measure the distance from the face of the carburettor body to the top of the pump operating rod. Now fully open the throttle and again measure the distance; the difference is the pump stroke which should be as stated in the adjustment data. If the correct stroke is known but the actual reading obtained is incorrect, the length of the operating rod must not be shortened to decrease the stroke by filing, otherwise the hardening will be removed and rapid wear will result; instead a shorter or langer operating rod must be obtained (photos).
35 Fit the conical washers and 0-rings together with the springs (67) to the idling mixture adjusting screws (68), then screw them into the carburettor body.
36 Press the idling jets (11) into the holders (9) and tighten them into the carburettor body.
37 Press the air corrector jets (8) into the tops of the emulsion tubes (10) and the main jets (12) into the bottoms of the emulsion tubes, then press the holders (7) to the emulsion tubes and tighten bath assemblies into the carburettor body.
38 Tighten the needle valve seating (83) together with a new gasket (82) into the carburettor cover (5) (photo).
39 With the cover (5) inverted, fit the needle then place a new gasket (6) in position.
40 Locate the float assembly (77) and insert the fulcrum pin (78) fully into the two posts. Very carefully pinch the split post to secure the pin using a pair of pliers {photo).
41 The float level adjustment must now be checked in the following manner: Hold the carburettor cover vertical so that the floats are hanging trom the fulcrum and the float level arm is in light contact with the needle ball (ie without the batl being depressed). Obtain a drill or dowel rod of diameter equal to the needle valve closed checking dimension and check that the distance from the cover gasket to the nearest part of the floats is correct. The annular seam of the floats should not be taken into consideration for the check and for this reason two small grooves must be filed on the checking rod (photo).
42 If the dimension is not correct, carefully bend the small tab on the float arm accordingly.
43 Tilt the cover so that the floats move away from the cover and the long tab makes contact with the needle valve seating. Now, using the same method as described in paragraph 41, check the needle valve fully open dimension and if necessary bend the long tab to correct (photo).
44 The difference between the dimensions checked in paragraphs 41 and 43 is the needle valve stroke which should be as given in the adjustment data.
45 Fit the well bottom cover (30) with a new gasket (29) to the carburettor body and tighten the retaining screws, {2A) together with the spring washers and plain washers (4A), in diagonal sequence.
46 Press the plate (13) into the top of the carburettor bowl.
47 Lower the cover assembly (5) onto the carburettor body and tighten the retaining screws (2), together with the spring and plain washers (4), in diagonal sequence.
48 Fit the gasket (3) or serrated ring to the cover (5) and tighten the cover (1) with the wing nut.
49 Fit both air intake horns (69), retaining plates (25) and washers (23A). then tighten the retaining nuts {24A) (photo).
50 Insert the fuel filter and retaining bush (88) Into the cover (5) and tighten the filter Inspection plug (90) fitted with a new gasket (89).
51 With the carburettor completely assembled, the idling adjustment screws should be turned to their preliminary settings. To do this, first screw in the throttle idling adjustment scre,w until it just touches the throttle lever lug, then continue turning for a further t turn. Working on the idling mixture volume screws in turn, fully screw them in until they are in light contact with their seats, then back them offĞ turn. Final adjustments will be necessary when the carburettor is fitted on the engine (refer to Section 8).

8 Tuning

Note: Reter to Chapter 3 tor genera/ notes on tuning.
1 The idling adjustment screws should be set to their preiiminary positions as described in Section 7 paragraph 51.
2 Connect a tachometer to the engine in accordance with the manufactu rer's instructions.

Single carburettor unit fittings

3 Start the engine and run until normal operating temperature has been reached (ie the thermostat has opened).

4 Turn the throttle valve adjusting screw so that the engine runs at the recommended idling· speed *tor* the particular engine being worked on; this will be between 600 and 800 rpm *tor* touring mode ls and 1000 rpm plus *tor* sports car models.

5 Turn one idle mixture adjustment screw in or out until the engine runs at the highest rpm, then repeat the process on the remaining adjustment screw.

6 Re-adjust the throttle valve adjusting screw if nec.essary, to bring the engine speed within limits.

7 Repeat the procedure given in paragraphs 5 and 6, switch off the engine and remove the tachometer.

Multiple carburettor fittings (without idle air compensation)

8 The carburettors must be synchronised in order to deliver equal amounts of air/fuel mixture to each individual cylinder. To check the adjustment it will be necessary to obtain a length of tubing (approximately 1 metre long) of about 5 mm to 10 mm (0·25 in to Q.5 in) internal diameter. Alternatively, a synchroniser as shown in Chapter 8 may be used.

9 Remove the air cleaner(s) if fitted, then start the engine and run until normal operating temperature has been reached (ie the tf-,drmostat has opened).

10 Switch off the engine and disconnect the accelerator rad connections trom the carburettors.

11 Start the engine and place one end of the tube in one air intake of one carburettor, then listen to the amount of hiss present which will indicate the volume of air being passed. Alternatively, press the synchroniser over one of the ai intakes and adjust the ring until the air flow indicator is midway up the calibrated tube.

12 Move the tube to the next carburettor and turn the throttle adjustment screw or intermediate synchronising screw until the hiss of the air intakes is identical to that of the original carburettor. If using the synchroniser, turn the screw until the flow indicator is mldway up the tube without alterlng the instrument ring.

13 The procedure given in paragraph 12 must be repeated on all carburettors until all throttle valves are synchronised.

14 Check the engine speed on the tachometer and if necessary, adjust each carburettor adjusting screw by equal amounts to give the correct rpm. Note that where an intermediate synchronizing screw is fitted, it will only be necessary to adjust the carburettor with the fixed adjusting screw; the remaining carburettor will be automatically adjusted.

15 The mixture adjusting screws (2 per carburettor) must all deliver identical amounts of mixture. If necessary, due to uneven engine idling, the screws should be turned half a turn clockwise and the engine rpm noted. This action will weaken the mixture and may cause the engine to stalt; if it does. turn each screw anti-clockwise by half a turn. When an adjustment has been reached which gives the highest engine speed, the setting is correct, although it may be necessary to readjust the engine speed on the throttle adjusting screws as previously described.

16 To check that each barrel is delivering equal amounts of idling mixture, temporarily remove each spark plug lead in turn and note the drop in rpm which should be ie:lentical on each cylinder.

17 After completing the adjustment procedure, switch off the engine, remove the tachometer and if fitted, fit the air cleaner(s). Finally connect the accelerator rod(s) to the carburettor(s).

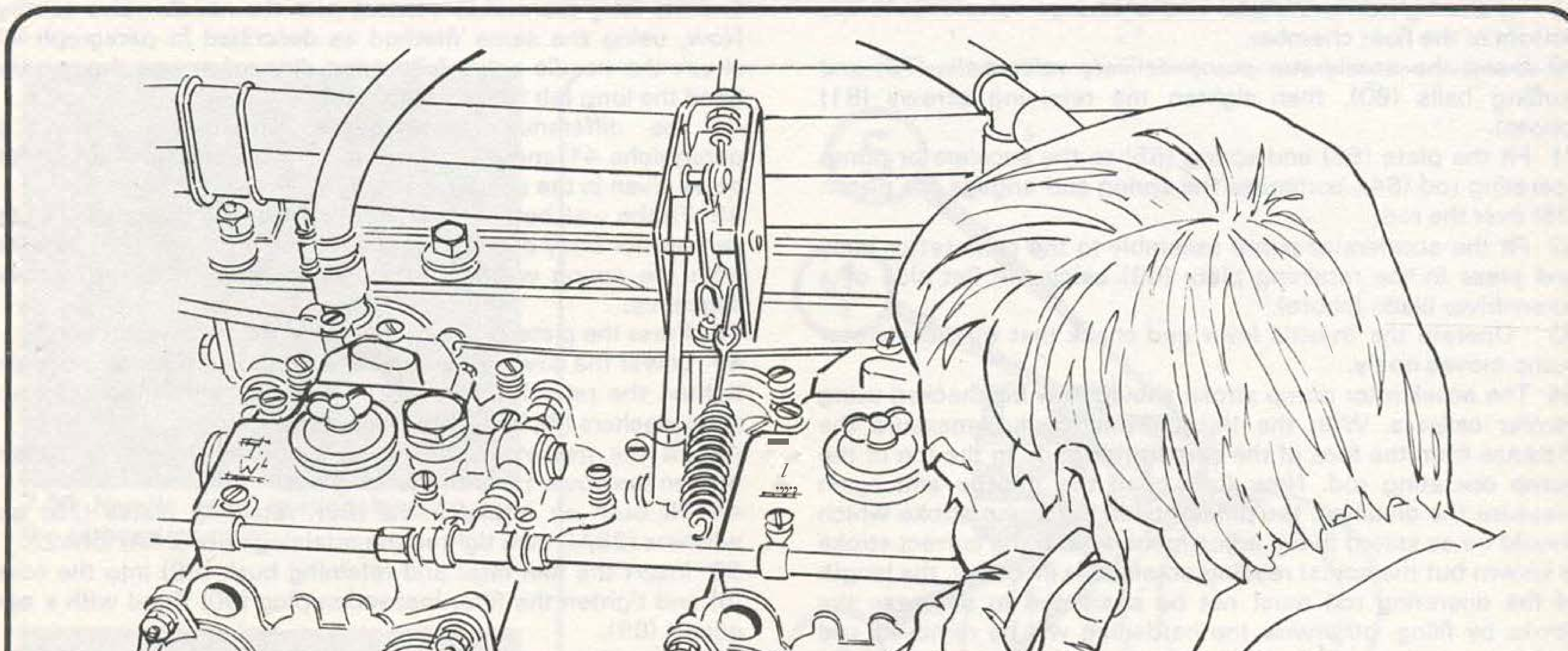


Fig. 11.22 Using a length of tube to adjust the carburettor throttle settings (Sec 8)

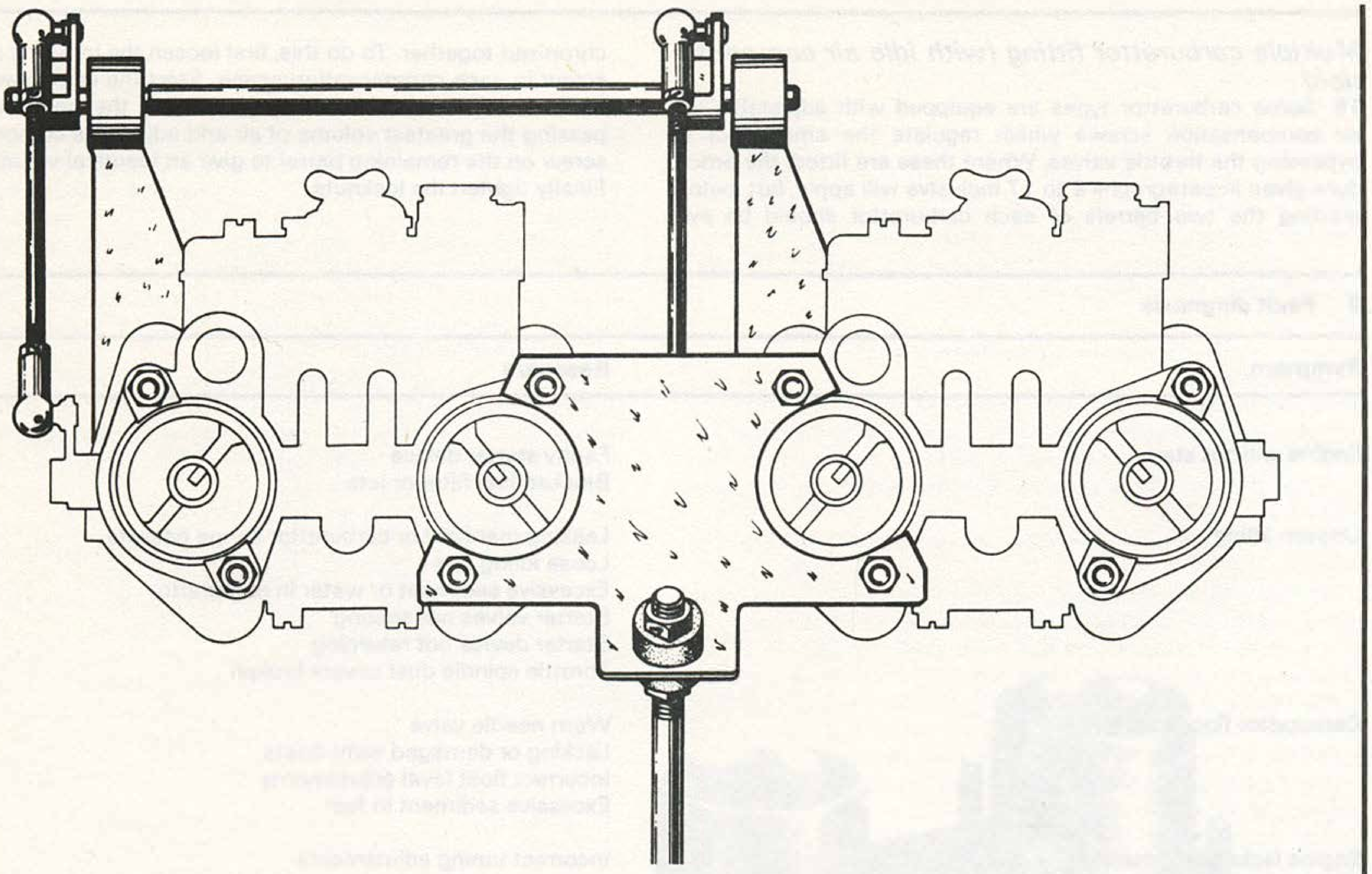


Fig. 11.23 Individual accelerator rod arrangement on a duel carburettor fitting (Sec 8)

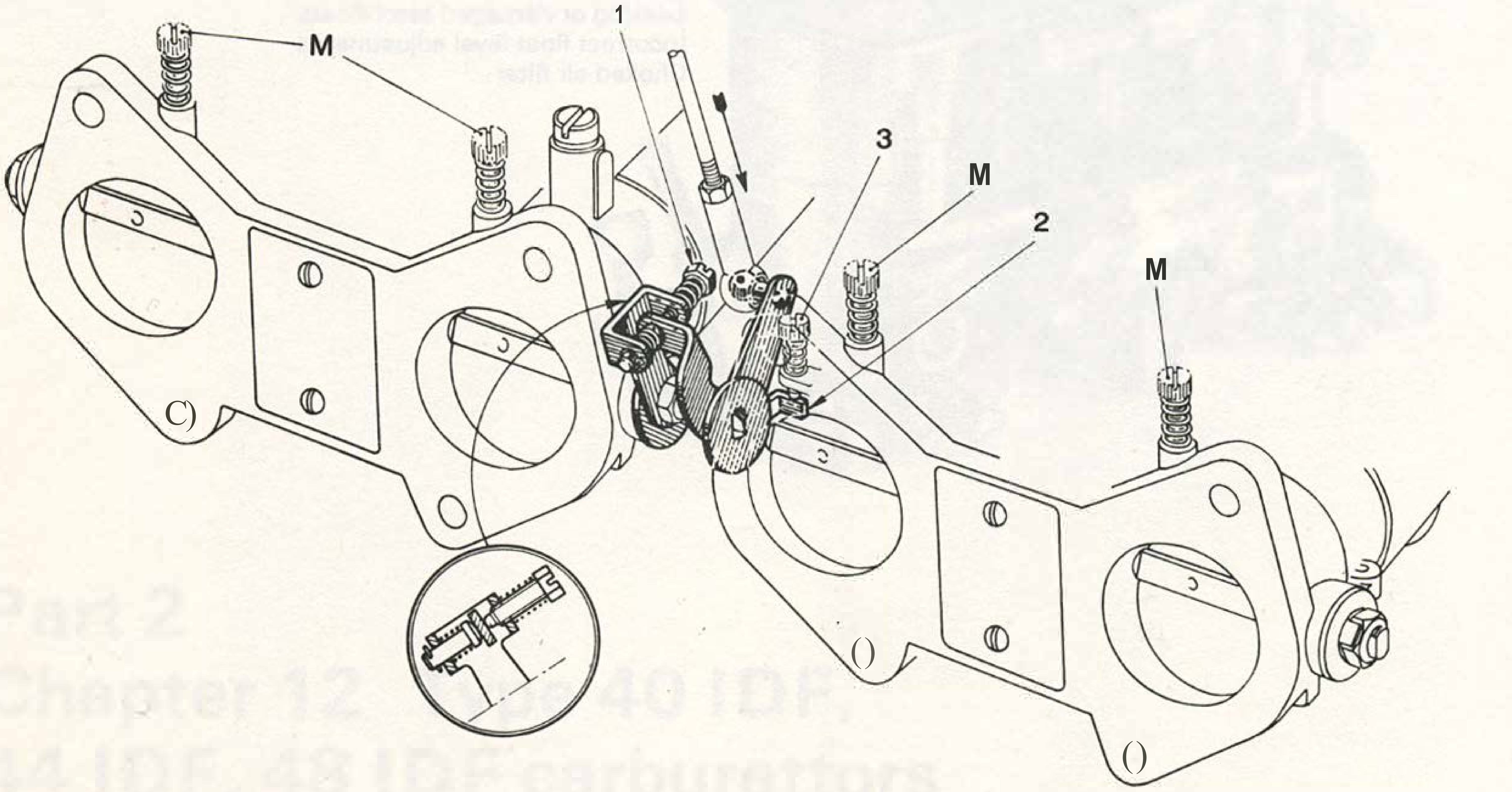


Fig. 11.24 Linked throttle accelerator rod arrangement on a duel carburettor fitting (Sec 8)

1 Synchroniser screw
2 Throttle lever
3 Adjusting screw
M /die mixture adjusting screws

Multiple carburettor fitting (with idle air compensation)

18 Some carburettor types are equipped with adjustable idle air compensation screws which regulate the amount of air bypassing the throttle valves. Where these are fitted, the procedure given in paragraphs 8 to 17 inclusive will apply, but, before starting the two barrels of each carburettor should be synchronised together. To do this, first loosen the locknuts and fully screw in each compensation screw. Start the engine and listen to the hiss from each barrel. Determine the barrel which is passing the greatest volume of air and adjust the compensating screw on the remaining barrel to give an identical volume of air. Finally tighten the locknuts.

9 Fault diagnosis

Symptom	Reason/s
Engine will not start	Faulty starter device Blocked fuel filter or jets
Uneven idling	Leaking manifold or carburettor flange gaskets Loose idling jets Excessive sediment or water in carburettor Starter valves not seating Starter device not returning Throttle spindle dust covers broken
Carburettor floods	Worn needle valve Lacking or damaged semi-floats Incorrect float level adjustments Excessive sediment in fuel
Engine lacks performance	Incorrect tuning adjustments Incorrect float level adjustments Excessive sediment in fuel Throttle valves do not fully open Accelerator pump jamming or stroke incorrect
Excessive fuel consumption	Faulty starter device Needle valve not seating Leaking or darnaged serni-floats Incorrect float level adjustments Choked air filter