

Part 2

Chapter 6 Type 28/36 DCD carburettor

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Adjustment data

Float level setting dimensions	in (mm)
Closed position	0.197 (5.0)
Open position	0.531 (13.5)
Stroke	0.335 (8.5)

1 Introduction

The Weber 28/36 carburettor is of the downdraught type and has two barrels to supply the primary and secondary functions; the primary barrel is of 28.0 mm diameter at the throttle valve location and the secondary barrel is of 3.60 mm diameter. Each throttle valve is mounted on separate shafts and the valves are of the differential or progressive choke type. The linkage between the two throttle valves is arranged so that the secondary throttle valve does not commence to open until the primary throttle valve is $\frac{2}{3}$ open.

The carburettor is normally fitted to the engine as a single unit with both barrels feeding a common inlet manifold, the most common arrangements being as follows:

- 1 One unit on a four-cylinder in-line engine
- 2 One unit on a six-cylinder in-line engine

The carburettor identification mark is located on the lower flange outer surface.

2 Construction

The main body and cover of the Weber 28/36 DCD carburettor are made of die-cast aluminium or zinc alloy (Mazak), the mounting flange being machined flat for fitting on the inlet manifold. The upper face of the cover is also machined flat and incorporates four threaded holes for the fitting of an air cleaner (photo).

The throttle valves and shafts are of brass and the shafts run directly in the carburettor body. All fuel and air jets and emulsion tubes are of brass construction and are screw fittings into the main body.

Internal channels of the main body and cover are mostly drilled and are sealed with lead plugs where necessary.

The fuel float assembly comprises two semi-floats which are each of two halves soldered together; they are made of thin brass sheet.

3 Operation

Cold starting

The starting device fitted to type DCD carburettors operates independently of the main circuit and may be considered as a separate carburettor within the main carburettor.

When the choke cable is pulled, the starting device operating lever turns the control shaft which lifts the starting valve off of its seat. Reference to Fig. 6.3 will show that fuel from the float chamber (7) is driven through the channel (53) to arrive at the starter fuel jet (52). Air entering through the air correction jet (51) and the bypass channel emulsifies the fuel as it is drawn through the starting jet emulsion holes and the bypass channel. The mixture is then drawn through the channel (48) and past the starter valve (50) where additional air from the channel (49) weakens the mixture. The final mixture is drawn through the channel (54) and into both the primary and secondary carburettor barrels at the engine side of the throttle valves.

Once the engine starts, the vacuum in the channels (54) and (57) increases to such an extent that the starter plunger (56) is pulled against spring pressure from the seat (55). Additional air is thus admitted to the mixture to allow the engine to continue running.

The starting device has a progressive action made possible by the tapered shape of the valve head. Lowering the valve will reduce the amount of mixture admitted to the engine. The supply will cease when the valve is completely shut.

Idling and progression

Refer to Fig. 6.4 and note that when the engine is idling the secondary throttle valve (37) is completely shut, but the primary

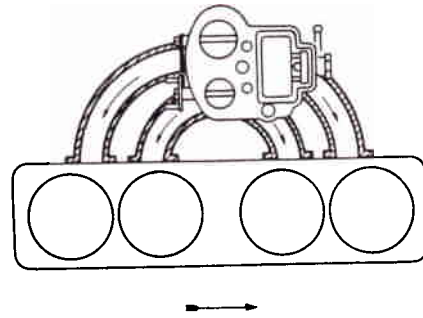


Fig. 6.1 Single carburettor fitted to a four-cylinder in-line engine (Sec 1)

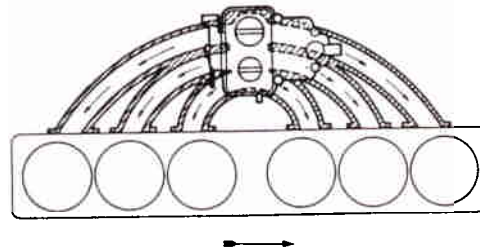


Fig. 6.2 Single carburettor fitted to a six-cylinder in-line engine (Sec 1)

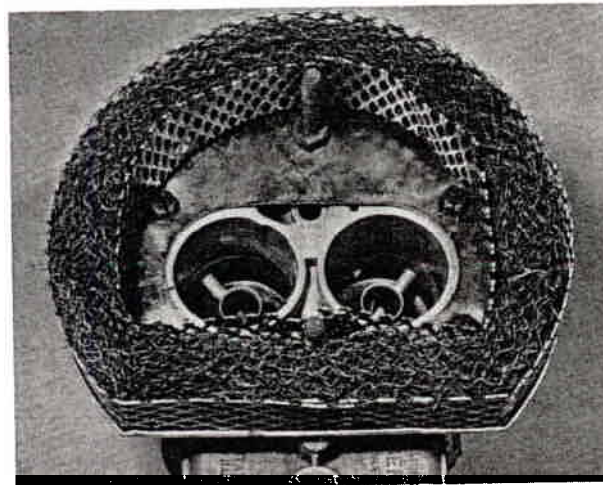


Fig. 6.0 Typical air cleaner with the cover removed

throttle (13) is slightly open, according to the throttle idling adjustment screw setting. Fuel is drawn from the float chamber through an internal channel to the fuel jet in the idling jet (34). On passing through the fuel jet, air is introduced to the fuel from the calibrated bush (35) and the holes in the idling jet tube. The fuel then becomes emulsified.

The mixture then passes through the channel (32), past the idling mixture adjustment screw (20), through the idling feed hole (31) and into the primary carburettor throat at the engine side of the throttle valve. The idling adjustment screw (20) has a tapered end and can therefore be adjusted to admit more or less fuel/air mixture as necessary.

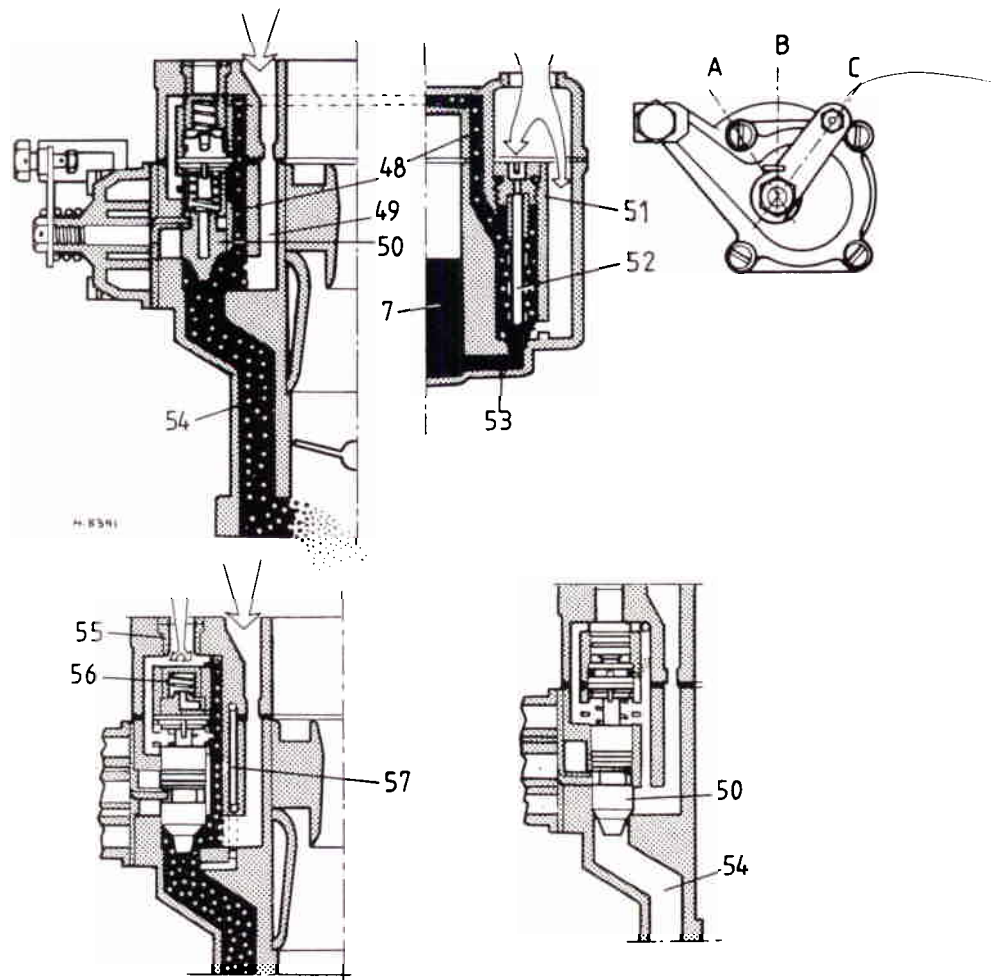


Fig. 6.3 Cold starting device operation (Sec 3)

- | | | | |
|------------------|-----------------------|---------------------------|--------------------------|
| 7 Float chamber | 51 Air correction jet | 55 Starter air valve seat | A Cold starting position |
| 48 Channel | 52 Starting jet | 56 Starter air valve | B Warming up position |
| 49 Air channel | 53 Fuel channel | 57 Transfer channel | C Closed position |
| 50 Starter valve | 54 Emulsion channel | | |

When the primary throttle valve (13) is opened slightly to increase the engine speed, the progression hole (36) is brought into action to provide additional fuel. This is necessary to prevent a flat spot occurring before the main primary fuel supply system comes into operation.

When the primary throttle valve (13) is approximately $\frac{3}{4}$ open, the secondary throttle valve (37) will commence to open. This action causes the secondary progression hole (38) to be brought under engine vacuum. Fuel is then drawn from the float chamber to the secondary idling jet (27), where air is introduced from the calibrated bush (26). The mixture passes through the channel (29) and thus emerges from the progression hole (38).

With either throttle valve fully open, the progression system for the particular carburettor barrel ceases.

Normal running

Under full throttle and high speed cruising conditions, the throttle plates will be sufficiently far from the idling and progression holes to prevent them from admitting fuel and the main fuel supply circuits will be brought into action.

Refer to Fig. 6.5 and note that fuel from the float chamber (7) passes through the main jets (8) and channels (9) to the

emulsion tube wells (11). At the same time, air is drawn through the air corrector jets (1), through the centre of the emulsion tubes (12) and via the emulsion tube holes to the fuel. The fuel then becomes emulsified and is drawn through the nozzles (17) and auxiliary venturis (16) and thus mixes with the main air supply as it is drawn through the chokes (15) and into the engine.

Under static conditions the level of fuel in the float chamber and emulsion tube will be identical; however, as the engine speed increases and the fuel flow is faster, the fuel level in the emulsion tube drops. By providing additional holes in the lower part of the emulsion tube, the necessary air correction is made possible at the higher engine speeds.

The main fuel supply circuits of the primary and secondary carburettor barrels operate progressively and there is a certain amount of overlapping as each circuit is brought into action.

Acceleration

To provide the engine with a rich mixture when accelerating, the carburettor is equipped with an acceleration pump which is operated by the primary throttle of the carburettor and injects only into the primary venturi. Reference to Fig. 6.6 will

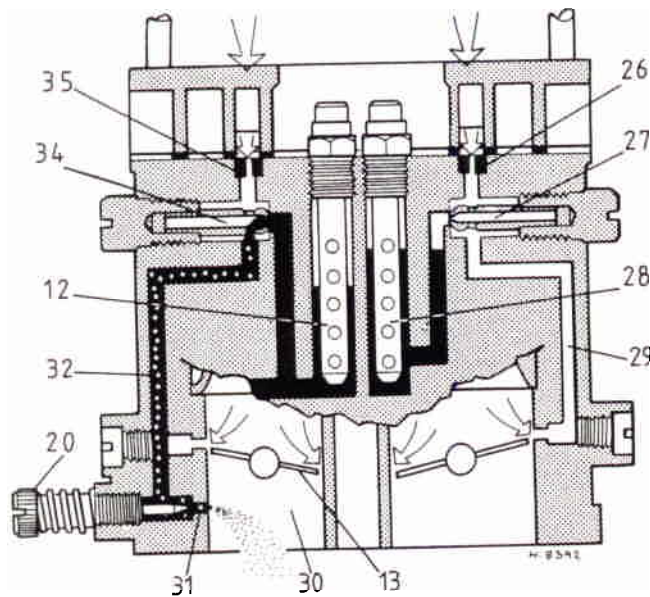
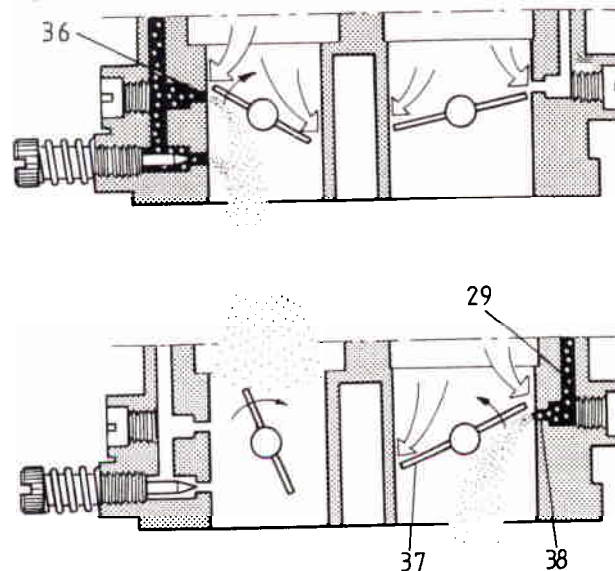


Fig. 6.4 Carburettor idling and progression phase (Sec 3)

- 12 Primary emulsion tube
- 13 Primary throttle valve
- 20 Idling mixture control screw
- 26 Secondary air jet
- 27 Secondary idling jet
- 28 Secondary emulsion tube
- 29 Secondary progression channel
- 30 Primary barrel
- 31 Idle feed orifice
- 32 Primary idling and progression channel
- 34 Primary idling jet
- 35 Primary air jet
- 36 Primary progression hole
- 37 Secondary throttle valve
- 38 Secondary progression hole



show that when the primary throttle valve is closed, the lever (45) lifts the operating rod (44) under the action of the coil spring. The piston (42) is pulled up the piston bore against the pressure of the spring (41) and fuel is drawn from the float chamber (7) through the intake valve (47).

When the primary throttle valve is opened, the lever (45) moves away from the operating rod (44) and allows the piston (42) to move down the bore under the action of the spring (41). The ball in the intake valve (47) prevents fuel returning to the float chamber (7) and the fuel is forced along the internal channel (43), past the delivery valve (4), through the pump jet (39) and into the primary venturi. The inlet valve (47) may or may not incorporate a discharge orifice according to the application, but where there is one, a certain amount of fuel is discharged back into the float chamber during the acceleration pump piston stroke. By fine calibration of the discharge orifice, it is possible to determine the exact quantity of fuel injected by the acceleration 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 within the vehicle.

- 1 Unscrew and remove the retaining nuts and withdraw the air cleaner cover and filter gauze. Unscrew the air cleaner retaining screws, being very careful not to drop them into the carburettor barrels.
- 2 Loosen the fuel supply hose clip and pull the hose from the inlet pipe.
- 3 Slacken the choke cable retaining screws on the starting device and pull the cable clear.
- 4 Disconnect the throttle control rod from the throttle lever.
- 5 Pull the ignition advance tube from the vacuum pipe on the side of the carburettor.

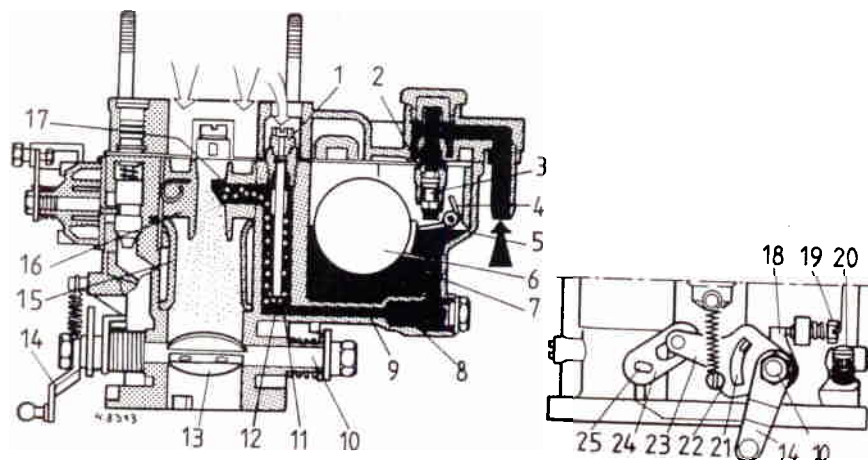


Fig. 6.5 Carburettor normal phase (Sec 3)

- | | | | |
|---------------------|-----------------------|------------------------------------|-----------------------------|
| 1 Air corrector jet | 8 Main jet | 15 Choke | 21 Slot |
| 2 Needle valve seat | 9 Channel | 16 Auxiliary venturi | 22 Sector lug |
| 3 Needle valve | 10 Throttle shaft | 17 Discharge nozzle | 23 Link sector |
| 4 Spring hook | 11 Emulsion tube well | 18 Throttle sector | 24 Secondary lever |
| 5 Fulcrum pin | 12 Emulsion tube | 19 Idling adjustment screw | 25 Secondary throttle shaft |
| 6 Float | 13 Throttle valve | 20 Idling mixture adjustment screw | |
| 7 Float chamber | 14 Throttle lever | | |

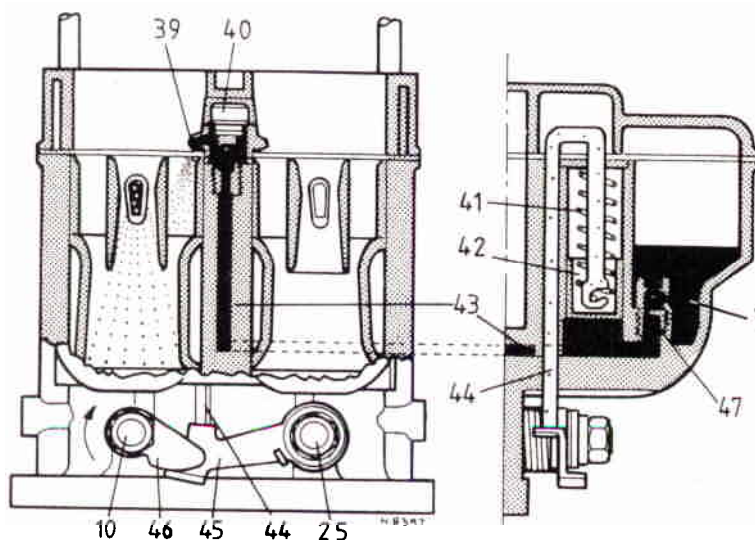


Fig. 6.6 Carburettor acceleration phase (Sec 3)

- | | | | |
|-----------------------------|----------------------------|------------------|-------------------------------|
| 7 Float chamber | 40 Delivery valve | 43 Fuel channel | 46 Operating cam |
| 10 Primary throttle shaft | 41 Accelerator pump spring | 44 Operating rod | 47 Intake and discharge valve |
| 25 Secondary throttle shaft | 42 Pump piston | 45 Lever | |
| 39 Pump jet | | | |

6 Where fitted, disconnect the automatic transmission controls from the carburettor.

7 Unscrew and remove the carburettor mounting nuts then withdraw the unit over the mounting studs.

8 Remove the inlet manifold gasket and clean all traces 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 fit a new gasket and tighten the four retaining nuts in diagonal sequence.

(b) When refitting the choke (starting device) cable, first fit the outer cable to the starting device cover, then insert the inner cable into the operating lever nut and push the instrument panel control knob fully in. Tighten the inner cable retaining screw with the operating lever fully released.

(c) The idling adjustment screws should be set as described in Section 7 and finally tuned as described in Section 8.

5 Disassembly

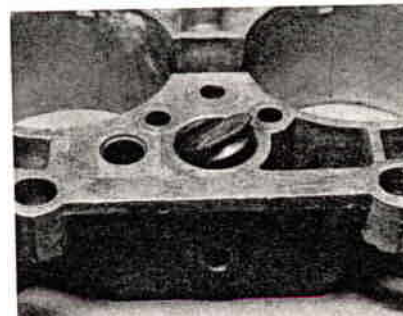
- 1 Thoroughly clean the carburettor exterior and wipe dry.
- 2 Referring to Fig. 6.7, unscrew the filter inspection plug (11), remove the gasket (10) and extract the fuel filter (8) (photos).
- 3 Using a suitable screwdriver, unscrew the carburettor cover retaining screws (3) together with the spring washers, then carefully withdraw the cover (1) from the carburettor body (77). With a new carburettor this is straightforward, but where the seat of the starter plunger spring (7) is a loose fit in the cover (1), it may easily fall out together with the spring (7) and plunger (6) (photo).
- 4 Remove the gasket (12) from the carburettor cover (1).
- 5 Invert the carburettor cover (1) so that the float assembly is uppermost, then use a suitable diameter pin punch to release the float fulcrum pin (15) from the two posts.
- 6 Using a pair of flat pliers, extract the fulcrum pin (15), then carefully withdraw the float (16), at the same time disconnecting the long tab on the float arm from the spring hook on the end of the needle valve needle (photo).
- 7 Lift the needle from the needle valve (14) seating (photo).
- 8 Using a 10 mm socket, unscrew the needle valve seating and remove the gasket (13).
- 9 If the starter plunger spring seat is still retained in the cover (1), use a plastic rod entered through the lockwasher (4) and tap out the seating, spring (7), and plunger (6).
- 10 The lockwasher (4) is retained in the carburettor cover (1) by local peening and unless the starter plunger seat (5) requires renewal (see overhaul Section 6) neither item should be removed. If removal is necessary, extract the lockwasher (4) and use a small file to remove the peening; the plunger seat (5) can then be driven out from below by using a suitable diameter drift.
- 11 Unscrew and remove the main jet holders (39) together with the gaskets (37) and place them in separate containers marked 'primary' and 'secondary' as necessary (photo).
- 12 Unscrew the main jets (38 and 38A) from their respective holders (photo).
- 13 Unscrew and remove the idling jet holders (36) together with the sealing rings (35) and place them in separate containers marked 'primary' and 'secondary' as necessary (photo).
- 14 Separate the idling jets (34 and 34A) from their respective holders by pulling apart (photo).
- 15 Using an 8 mm ring or box spanner, unscrew and remove the emulsion tube assemblies (74 and 74A), keeping them identified for correct refitting (photos).
- 16 Unscrew the air corrector jets (73 and 73A) from the emulsion tubes (74 and 74A), again keeping them identified for correct refitting (photo).
- 17 Unscrew and remove the throttle idling adjustment screw (44) and spring (43).
- 18 Unscrew and remove the idling mixture adjusting screw (41) and spring (42) (photo).
- 19 Unscrew the accelerator pump delivery valve (70) and withdraw it together with the gaskets (71) and pump jet (72), then separate the jet (72) and gaskets (71) from the valve (70) (photos).
- 20 Prise the accelerator pump retaining plate (17) from the carburettor body, or alternatively lift the operating rod (18) until the retaining plate (17) comes away (photo). Lift the accelerator pump operating rod (18) from the carburettor body (77) together with the spring (19) and piston (22).
- 21 Pull the spring (19) away from the piston (22) then unhook the piston by turning it through 90°. Remove the piston (22), spring (19) and retaining plate (17) from the operating rod (18).
- 22 Unscrew and remove the intake and discharge valve (23) from the bottom of the float chamber (photo).
- 23 Unscrew and remove the starting air jet (20) and fuel jet (21) assembly, then separate the two components by pulling them apart (photos).



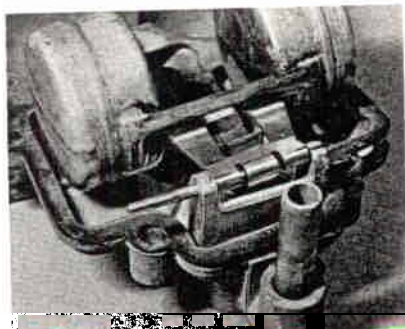
5.2a Removing the filter inspection plug



5.2b Removing the fuel filter



5.3 Example of a loose starter plunger spring seat



5.6 Removing the float fulcrum pin



5.7 Removing the needle from the needle valve



5.11 Removing a main jet holder

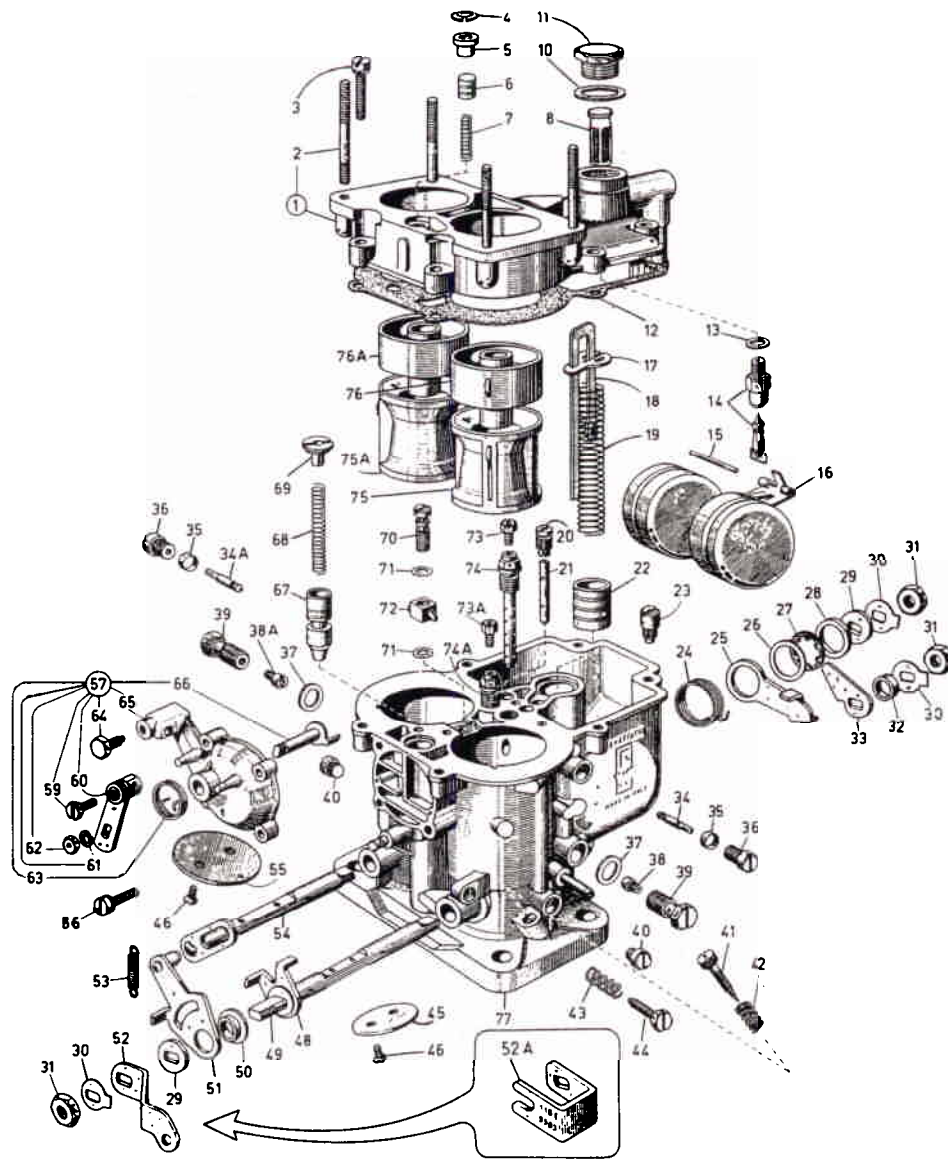
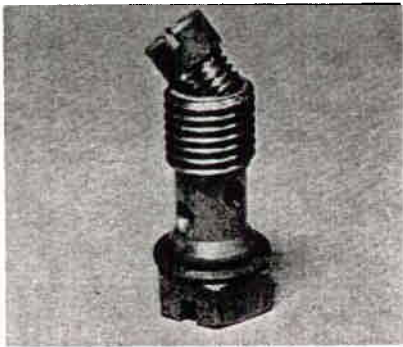
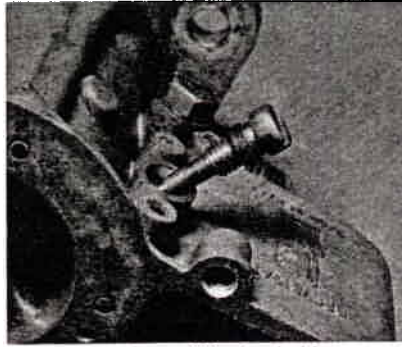


Fig. 6.7 Exploded view of the DCD carburettor (typical) (Sec 5)

- | | | | |
|---------------------------|-------------------------------|--|---------------------------------|
| 1 Carburettor cover | 23 Intake and discharge valve | 41 Idle mixture adjusting screw | 61 Spring washer |
| 2 Stud | 24 Return spring | 42 Spring | 62 Nut |
| 3 Cover retaining screw | 25 Pump control lever | 43 Spring | 63 Return spring |
| 4 Lockwasher | 26 Washer | 44 Throttle adjusting screw | 64 Screw |
| 5 Starter plunger seat | 27 Toothed ring | 45 Primary throttle | 65 Starting device cover |
| 6 Starter plunger | 28 Washer | 46 Throttle retaining screw | 66 Shaft |
| 7 Spring | 29 Spacer | 48 Stop sector | 67 Starting valve |
| 8 Filter | 30 Lockwasher | 49 Primary shaft | 68 Spring |
| 10 Gasket | 31 Retaining nut | 50 Bush | 69 Spring guide and retainer |
| 11 Filter plug | 32 Spacer bush | 51 Primary sector | 70 Pump delivery valve |
| 12 Cover gasket | 33 Pump control cam | 52 and 52A Alternate throttle control levers | 71 Gasket |
| 13 Needle valve gasket | 34 Primary idling jet | 53 Return spring | 72 Pump jet |
| 14 Needle valve | 34A Secondary idling jet | 54 Secondary shaft | 73 Primary air corrector jet |
| 15 Fulcrum pin | 35 Sealing ring | 55 Secondary throttle | 73A Secondary air corrector jet |
| 16 Float | 36 Idle jet holder | 56 Retaining screw | 74 Primary emulsion tube |
| 17 Spring retaining plate | 37 Gasket | 57 Starting device | 74A Secondary emulsion tube |
| 18 Operating rod | 38 Primary main jet | 59 Screw | 75 Primary choke |
| 19 Spring | 38A Secondary main jet | 60 Control lever | 75A Secondary auxiliary venturi |
| 20 Starting air jet | 39 Main jet holder | | 77 Carburettor body |
| 21 Starting fuel jet | 40 Progression hole | | |
| 22 Pump piston | | | |



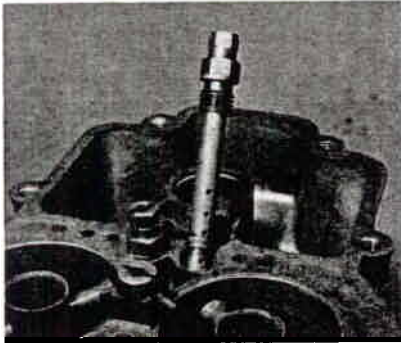
5.12 Location of a main jet in its holder



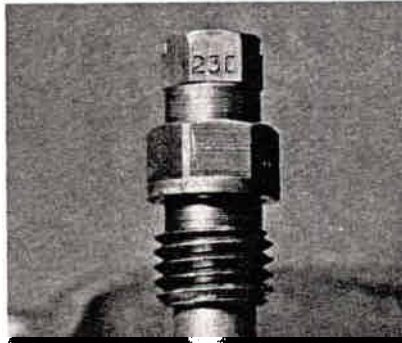
5.13 Removing an idling jet holder



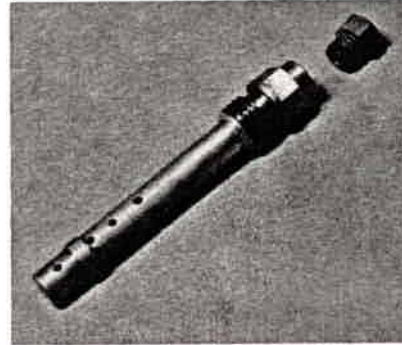
5.14 Location of an idling jet in its holder



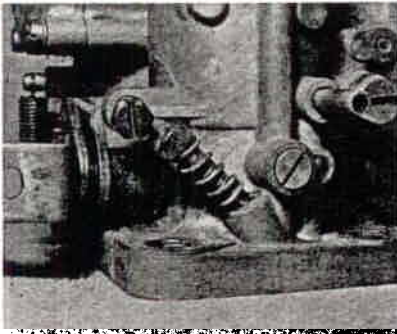
5.15a Removing an emulsion tube assembly



5.15b An emulsion tube air corrector jet identification number



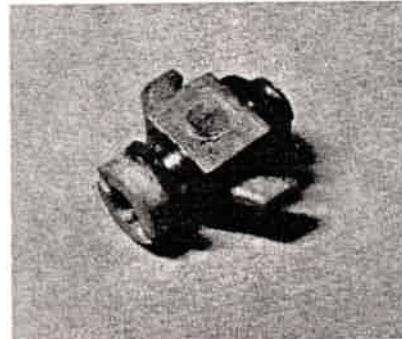
5.16 Location of an air corrector jet in an emulsion tube



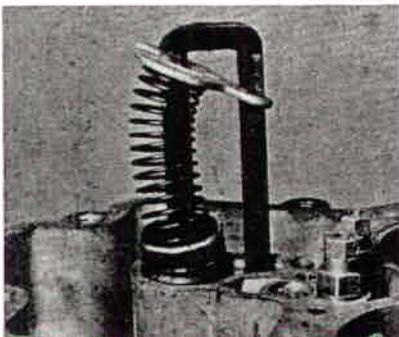
5.18 Removing the idling mixture adjusting screw



5.19a Withdrawing the accelerator pump valve and jet



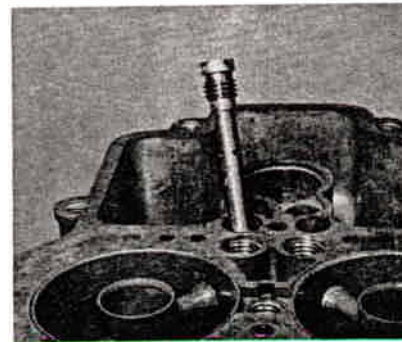
5.19b The accelerator pump valve and jet



5.20 Removing the accelerator pump assembly



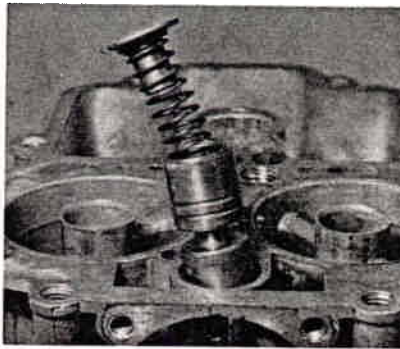
5.22 Location of the accelerator pump intake and discharge valve



5.23a Removing the starting jet assembly



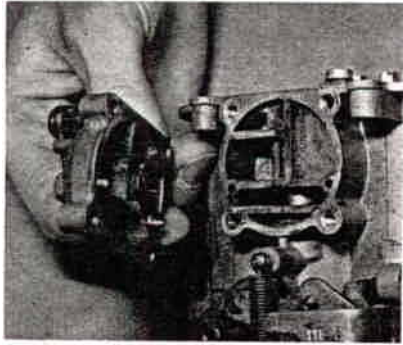
5.23b The starting air and fuel jets



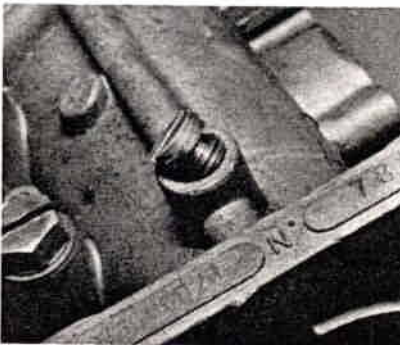
5.24a Removing the starting valve components



5.24b Showing the tapered starting valve head, spring and retainer



5.26 Removing the starting device



5.31 Progression hole inspection screw plug location



Fig. 6.8 Choke removing tool (Sec 5)

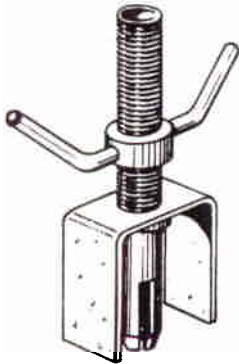
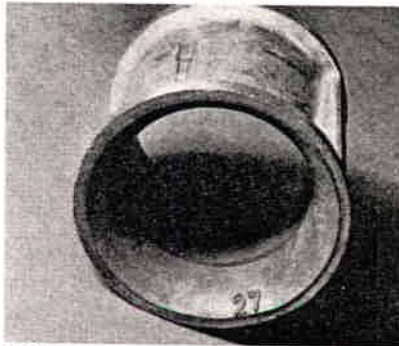
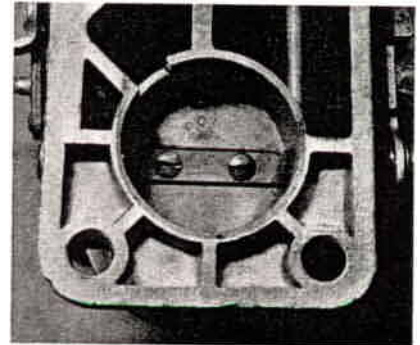


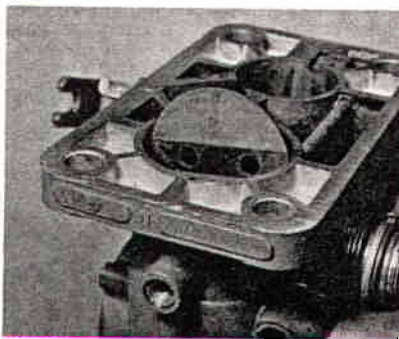
Fig. 6.9 Auxiliary venturi removing tool (Sec 5)



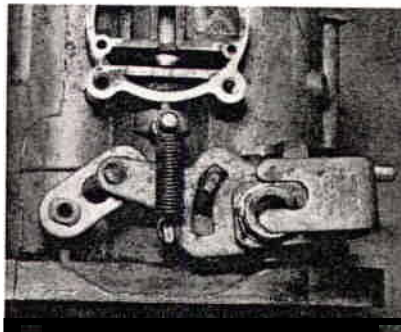
5.33 Typical choke, showing diameter identification mark



5.35 Location of the secondary throttle valve retaining screws



5.36 Removing the secondary throttle valve



5.37 Primary sector return spring location

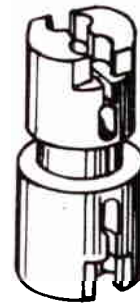


Fig. 6.10 Throttle shaft retaining tool (Sec 5)

24 Using a hooked length of welding rod or similar object, pull the starting valve spring guide and retainer (69) from the carburettor body (77) (photos).

25 Extract the retainer (69) and spring (68) from the starting valve.

26 Unscrew and remove the starting device retaining screws (56) and withdraw the starting control (57) (photo); note the spring washers fitted to the retaining screws (56).

27 Dismantle the starting device by unscrewing the nut (62) and removing the spring washer (61). Lift the control lever (60) over the stop lug, release the spring tension and withdraw it from the shaft (66).

28 Remove the coil spring (63), then withdraw the shaft (66) from the cover (65), noting the relative position of the starting valve operating lug.

29 Unscrew the cable retaining screws (59 and 64).

30 Invert the carburettor body (77) and remove the starting valve (67); if for any reason the valve is difficult to remove, a plastic drift may be inserted from underneath the carburettor and the valve tapped upwards with a light hammer.

31 Unscrew and remove the progression hole inspection screw plugs (40) (photo).

32 Remove the auxiliary venturi (76) and choke (75) from the primary barrel and place them in a suitably marked container. If they will not come out with hand pressure, it will be necessary to obtain Weber tools nos 98009 200 and 98009 100.

33 Remove the auxiliary venturi (76A) and choke (75A) (photo) from the secondary barrel, using the procedure given in paragraph 32. Place them in a suitably marked container.

34 Invert the carburettor and note the location of each throttle plate, marking them with a pencil if necessary.

35 Unscrew and remove the throttle plate retaining screws (46) with the throttle closed, making sure that unnecessary pressure is not exerted on the throttle spindles (49 and 54) as this could distort them (photo).

36 Fully open the throttle and extract the two throttle valves (45 and 55) from their respective spindles using a pair of flat pliers (photo).

37 Unhook the primary sector return spring (53) from the anchoring post and the sector (51) (photo).

38 Bend back the tab washers (30) at both ends of the primary shaft (49) and unscrew the retaining nuts (31). Provided the nuts are not too tight the boss shaft (49) will not be buckled, but if there is any doubt on this matter, it will be necessary to obtain Weber tool no 98011 700 to hold the centre section of the spindle stationary whilst loosening the nuts (photo).

39 Remove the nut (31), tab washer (30), spacer (32) and accelerator pump control cam (33) from the primary shaft (49), then pull the shaft (49) from the carburettor body (77), together with the throttle lever and components and spring (if fitted).

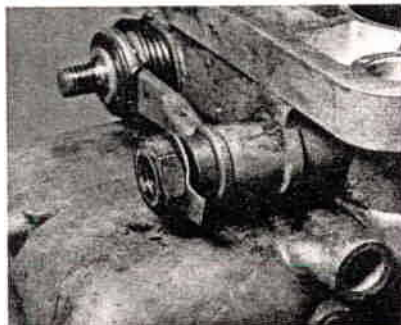
40 Remove the nut (31), tab washer (30), throttle control lever (52 or 52A), spacer (29), primary sector (51), bush (50) and stop sector (48) from the primary shaft (49).

41 Bend back the tab washer (30) at the float chamber end of the secondary shaft (54) and unscrew the retaining nut (31) whilst holding the other end of the shaft stationary (photo). Take care not to buckle the brass shaft (54). If the nut appears to be excessively tight, obtain Weber tool no 98011 700 to hold the centre section of the spindle stationary whilst loosening the nut.

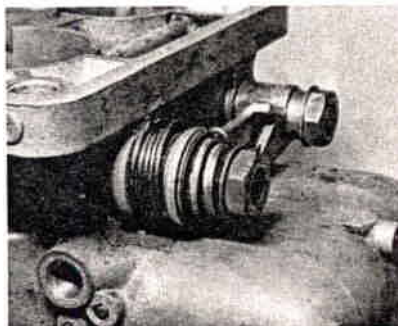
42 Remove the nut (31), tab washer (30) and spacer (29) from the end of the secondary shaft (54). Withdraw the shaft (54) from the carburettor body (77) (photo).

43 If the accelerator pump control lever (25) moves freely on its bearing and the coil spring (24) is not broken, it is recommended that these components are not removed as it is not an easy task to refit them. However, if either component requires renewal, first obtain a new toothed ring (27), otherwise the repair will be in vain, then remove the washer (28) (photo).

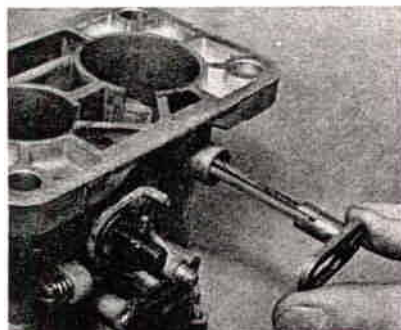
44 Using a narrow screwdriver, prise the toothed ring (27) from the bearing lug, edging around the ring a little at a time.



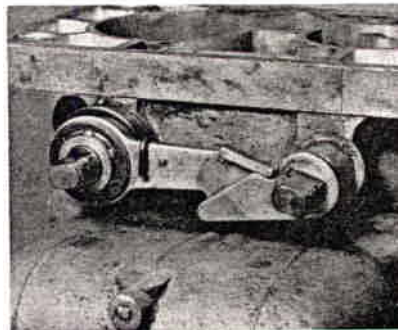
5.38 Removing a primary shaft retaining nut



5.41 Removing the secondary shaft retaining nut



5.42 Withdrawing the secondary shaft from the carburettor body

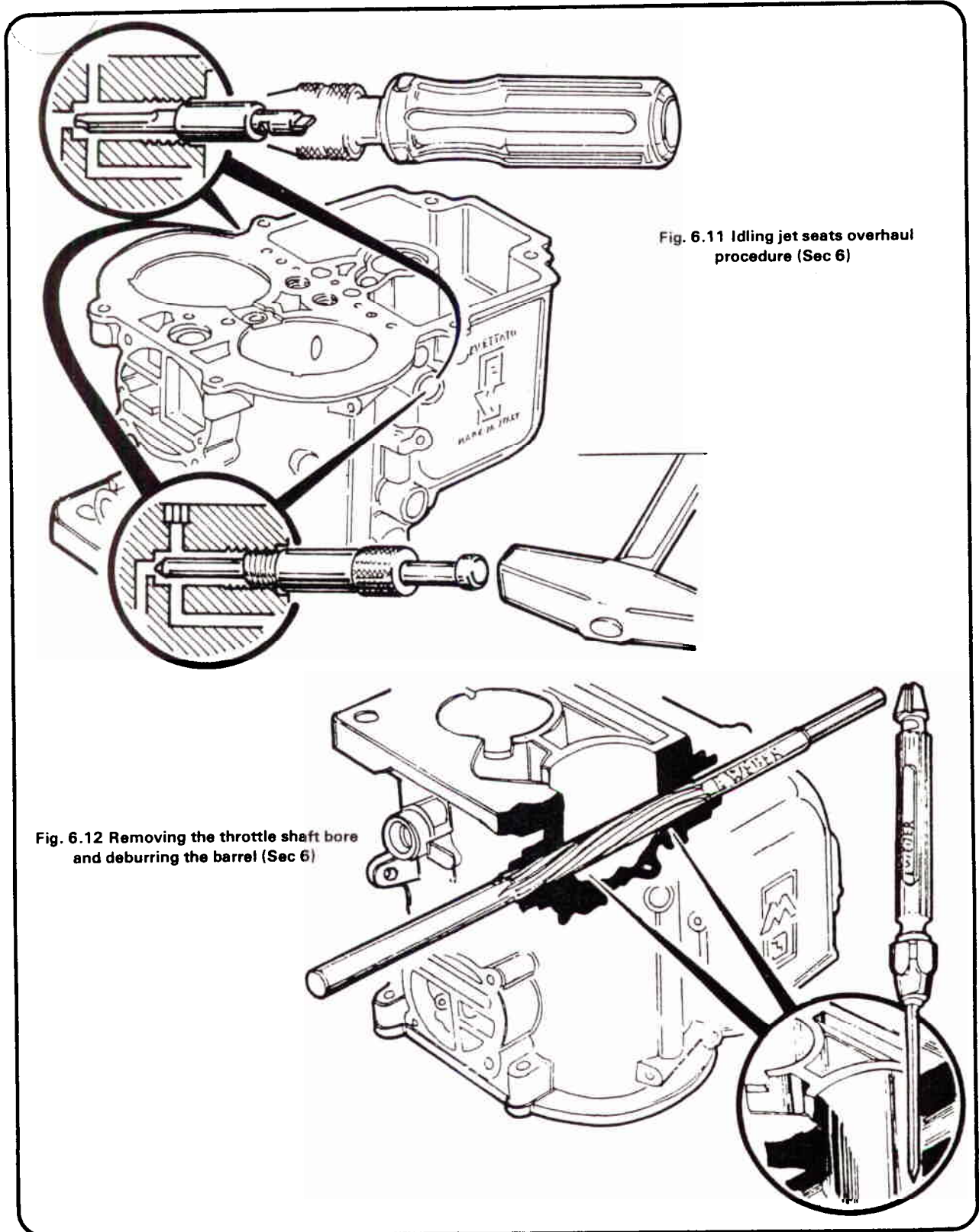


5.43 Location of the accelerator pump control lever, spring, and toothed ring

45 Prise the spring end from the carburettor body (77) to release all tension, then withdraw the washer (26), control lever (25), and spring (24); it is advisable to place a cloth over the components when prising out the spring, to stop them springing

onto the floor.

46 The brass bearing supporting the control lever (25) may be prised from the carburettor body (77), although it cannot be obtained as a spare part.



6 Special overhaul procedures

After carrying out the general overhaul procedures given in Chapter 4, the following special procedures should be made:

- 1 Using a hand chuck and Weber tool no 98005 900, reform the idling jet seatings in the carburettor body by carefully rotating the tool in alternate directions. Finish the seatings by inserting Weber tool 98010 500 and gently tapping the centre pin whilst rotating it.
- 2 Using the same procedure as described in paragraph 1, reform the starter valve seat and bush, using Weber tools nos 98004 100 and 98002 650.
- 3 Using the same procedure as described in paragraph 1, reform the starting jet seat, using Weber tool nos 98006 300 and 98010 600.
- 4 If the emulsion tube bores are discoloured and show signs of sediment build up, ream them clear again using Weber tool no 98005 300. Rotate the tool slowly with a hand chuck until it moves quite freely, then remove it whilst still rotating it.
- 5 If, on disassembly, the throttle shafts (49 and 54) are a tight fit in the carburettor body (77) and they are of original diameter (8.0 mm), use Weber tool no 98003 600 to ream the shaft bores clear with the aid of a hand chuck. Should the shaft bores be excessively worn, oversize shafts of 8.5 mm diameter must be fitted and the bores should be reamed using Weber tool no 98003 500. Note that normally the shaft itself will wear

quicker than its bore, in which case it will only be necessary to renew the shaft.

- 6 Using a small file, remove any burrs that have formed at the end of the shaft bores as a result of reaming.
- 7 Check the internal channels of the carburettor body (77) and cover (1), for blockage by injecting fuel with a syringe and observing that it emerges freely from the particular channel being tested. If any are blocked, the lead plugs as shown in Fig. 6.13 must be drilled out and the channels cleared and checked with the special Weber tool.
- 8 The channels are of three diameters, viz 1.0 mm, 1.5 mm and 2.0 mm. The corresponding tools are Weber tool nos 98014 300, 98014 400, and 98014 500.
- 9 The carburettor body and cover should be thoroughly cleaned after overhaul to remove 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.
- 10 Check the semi-floats of the float unit for damage and leakage. The seams around each float should be at 90° to the fulcrum pin axis. Check for leakage by shaking the floats and listening for any fuel which may have entered them. If fuel is present, the float assembly must be renewed.
- 11 Check the contact faces of the starter air valve and seat in the carburettor cover; if either of these components is excessively worn both must be renewed.

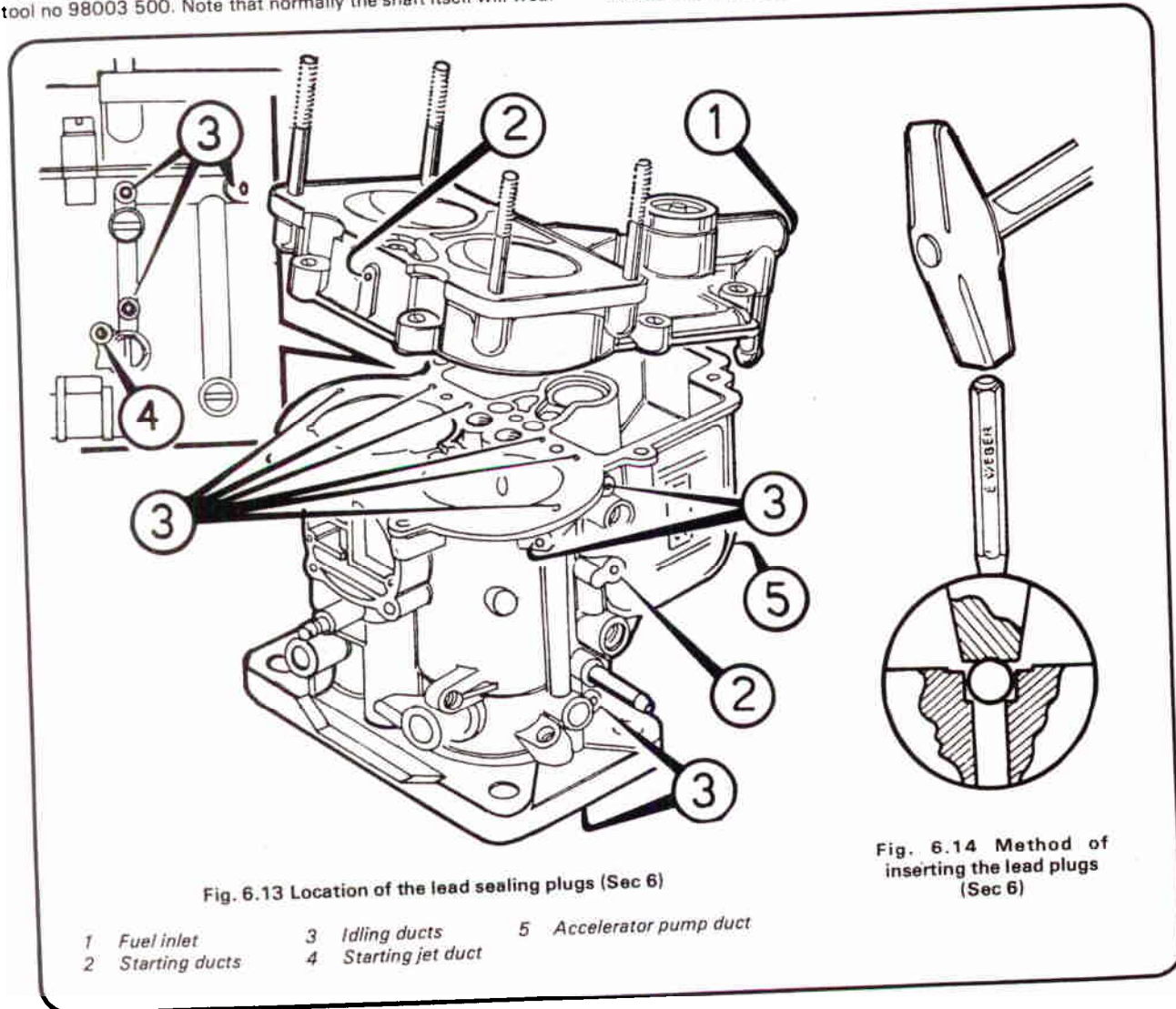


Fig. 6.13 Location of the lead sealing plugs (Sec 6)

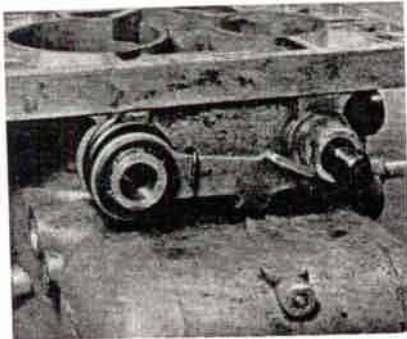
Fig. 6.14 Method of inserting the lead plugs (Sec 6)

- | | | |
|------------------|---------------------|-------------------------|
| 1 Fuel inlet | 3 Idling ducts | 5 Accelerator pump duct |
| 2 Starting ducts | 4 Starting jet duct | |

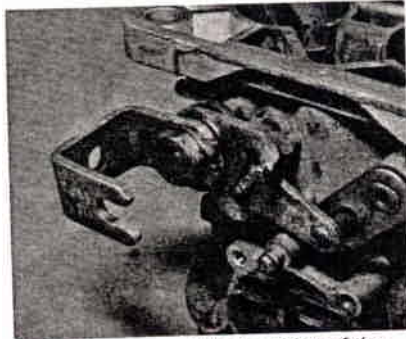
7 Assembly

Note: All components should be clean and dry before starting the assembly procedure.

- 1 Press the brass bearing which supports the control lever (25) onto the carburettor body (77), largest diameter first.
- 2 Place the coil return spring (24) over the bearing and insert its straight end into the retaining hole provided in the body (77).
- 3 The coil spring (24) must now be tensioned so that the control lever (25) can be inserted under the hooked end. One of two methods may be used to do this. Much will depend on the tension of the spring fitted as to how easy its fittings will be. The first method involves one large and one small screwdriver. With the large screwdriver, pass the hooked end of the spring onto the bore of the float chamber, then insert the small screwdriver from the primary shaft end and pass the hook onto the small screwdriver. Lever the small screwdriver around until the hooked end faces the primary shaft; it will be necessary to reposition the spring coils onto the carburettor body using the large screwdriver during the procedure. The second method involves using a length of thin wire firmly secured to the hooked end of the coil spring; the wire is wrapped once around the carburettor body lug and simply pulled to tension the spring.
- 4 With the coil spring (24) suitably tensioned, fit the control lever (25) onto its bearing, making sure that the square section tab is below the accelerator pump rod (18) aperture, then ease the coil spring hook onto the lever (25).
- 5 Fit the washer (26), then fit the new toothed ring (27); the teeth of the ring must initially face the carburettor body (77) and the ring should be driven into position using a suitable internal diameter tube (photo).
- 6 Lightly lubricate the secondary throttle shaft (54) with engine oil then insert it into the bore from the starting device end.
- 7 Locate the spacer (29), tab washer (30) and nut (31) onto the shaft (54). Tighten the nut (31) whilst holding the other end of the shaft stationary. There is no need to overtighten the nut, but if Weber tool no 98011 700 is available, use this to restrain movement of the shaft (54).
- 8 Lock the nut (31) by bending the locktab (30).
- 9 Fit the stop sector (48) to the primary shaft (49) in the position shown in Fig. 6.7, followed by the bush (50), primary sector (51), spacer (29), throttle control lever (52 or 52A), tab washer (30) and retaining nut (31).
- 10 Where a primary throttle shaft return spring is fitted, locate it on the shaft (49) and hook it over the stop sector (48).
- 11 Lightly lubricate the primary throttle shaft (49) with engine oil, then insert it into the bore from the starting device end.
- 12 Pull the spring, if fitted, and tension it before pushing the shaft (49) fully home.
- 13 Engage the primary sector (51) with the slot in the end of the secondary throttle shaft (54) (photo).
- 14 Fit the accelerator pump control cam (33) to the primary shaft (49), lift the control lever (25) and push the cam (33) fully onto the shaft, making sure that its angled section abuts the control lever (25).
- 15 Fit the spacer (32), tab washer (30) and nut (31) to the shaft (49), then tighten both nuts (31). If necessary use the special tool as described in paragraph 7.
- 16 Lock the nuts (31) by bending the locktabs (30).
- 17 Hook the primary sector return spring (53) to the anchoring post and the sector (51).
- 18 With both throttle shafts in the open position, fit the throttle valves (45 and 55) into their respective locations, then close the throttle shafts to allow the valves to centralise within the barrels. Make sure that the valves (45 and 55) are fitted the correct way round so that the angled perimeters seat correctly; the hole in the secondary valve (55) should face the primary barrel, ie opposite the progression orifices (photo).
- 19 Insert the throttle plate retaining screws (46) and tighten them finger tight, then move each throttle shaft in turn until both shafts and valves are centralised. Tighten the screws (46) evenly without exerting excessive pressure on the shafts. It is recommended that new screws are always fitted as it is quite easy to cross-thread previously peened screws. Lock the screws (46) by peening with Weber tool no 98010 900 whilst supporting the shafts with a length of wood. Alternatively, coat the screw threads with a liquid locking agent (fuel resistant) prior to inserting them.
- 20 Check that both throttle valves operate smoothly and fully without any trace of binding or sticking.
- 21 Fit the choke (75A) and auxiliary venturi (76A) into the secondary barrel, locating the springs into the location groove; make sure that the choke identification number faces away from the throttle valve and the long centre section of the auxiliary venturi faces the throttle valve (photos).
- 22 Fit the choke (75) and auxiliary venturi (76) into the primary barrel using the same method as described in paragraph 21.
- 23 Fit and tighten the progression hole inspection screw plugs (40).
- 24 With the carburettor upright, insert the starting valve (67) into its bore.
- 25 Assemble the shaft (66) to the starting device cover (65) with the operating lug facing away from the cover extension (photo).
- 26 Fit the coil spring (63) to the cover (65) and insert the straight end in the location hole.
- 27 Tension the coil spring (63), then fit the control lever (60) with the cable securing nut facing the cover.
- 28 Fit the spring washer (61) and tighten the nut (62).
- 29 Fit the cable retaining screws (59 and 64).
- 30 Offer the starting device (57) up to the carburettor body (77) and locate the operating lug in the starting valve groove; check for correct engagement by operating the lever and checking that the valve moves up and down (photo).
- 31 Insert the retaining screws (56) together with the spring washers and tighten them in diagonal sequence; check the operation of the device again.
- 32 Fit the spring (68) to the starting valve (67), then fit the retainer (69) and press it into the carburettor body using the flat blade of a screwdriver.
- 33 Press the starting fuel jet (21) into the air jet (20), then screw it into the carburettor body (77) and tighten.
- 34 Screw the intake and discharge valve (23) into the bottom of the float chamber.
- 35 Fit the retaining plate (17) to the accelerator pump operating rod (18) with the spring location facing downwards, then fit the spring (19).
- 36 Compress the spring (19), then fit the piston (22) to the operating rod (18) by turning it through 90°; release the spring (19) into the piston (22).
- 37 Fit the accelerator pump to the carburettor body (77), then press the retaining plate (17) into the body, using the flat blade of a screwdriver. Check the operation of the pump by operating the throttle lever; there must be no signs of sticking.
- 38 Fit a gasket (71) to the accelerator pump delivery valve (70), followed by the pump jet (72) with the hole facing downwards and a further gasket (71). Locate the assembly into the carburettor body (77) with the locating lug in the corresponding cut-out, then tighten the valve (70). Note that the ball in the valve must move freely.
- 39 There is no accelerator pump stroke checking procedure for the 28/36 DCD carburettor as it is identical on all versions and cannot be adjusted.
- 40 Fit the spring (42) to the idling mixture adjusting screw (41) and screw it into the carburettor body (77).
- 41 Fit the spring (43) to the throttle idling adjustment screw (44) and screw it into the carburettor body (77).
- 42 Tighten the air corrector jets (73 and 73A) into the tops of the emulsion tubes (74 and 74A) keeping them identified as when removed.
- 43 Using an 8 mm ring or box spanner, tighten the emulsion tube assemblies (74 and 74A) into their respective locations in the carburettor body (77).
- 44 Press the idling jets (34 and 34A) into their respective



7.5 Correct assembled position of the accelerator pump control lever



7.13 Correct assembled position of the primary sector

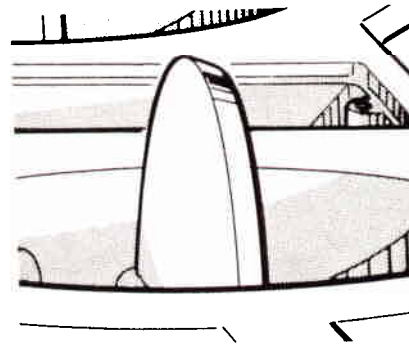
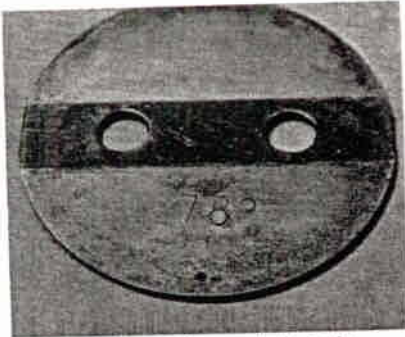
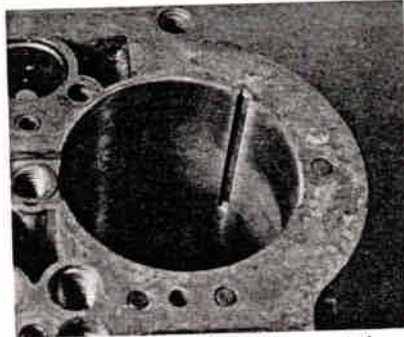


Fig. 6.15 Angled perimeter of the throttle valves (Sec 7)



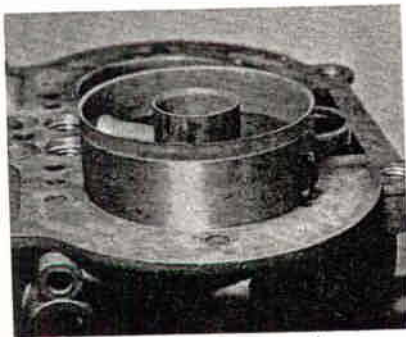
7.18 Showing the bypass hole in the secondary throttle valve



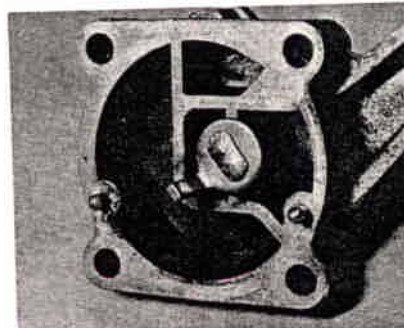
7.21a The choke and auxiliary venturi locating groove



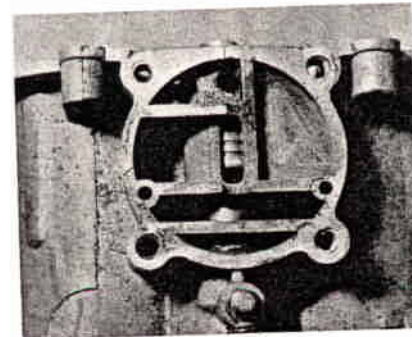
7.21b Fitting a choke



7.21c Fitting an auxiliary venturi



7.25 The correct location of the starter device operating lug



7.30 Starter valve control grooves (upper) and operating lug groove (lower dark area)

holders (36), then tighten each holder into the carburettor body (77) making sure that the nylon seals (35) are positioned correctly and that the correct jet is fitted to both the primary and secondary locations.

45 Tighten the main jets (38 and 38A) into the main jet holders (39), keeping them identified as when removed.

46 Locate a new gasket (37) to each main jet holder (39), then tighten them into their respective locations in the carburettor body (77).

47 If the starter plunger seat (5) has been removed, fit the new seat and insert the lockwasher (4). Retain the lockwasher (4) by local peening in two or three places.

48 Invert the carburettor cover (1) and insert the starter plunger (6) followed by the spring (7). The spring seat is a press fitting and should be fitted by pressing with a flat blade screwdriver. If the seat is a loose fit as a result of continual removal, extra care must be exercised to locate it when fitting the cover (1) to the body (77).

49 Fit a new gasket (13) to the needle valve (14) seating, then tighten it into the carburettor cover (1) using a 10 mm socket or ring spanner.

50 Insert the needle into the needle valve (14) seating with the spring hook aligned across the cover (1).

51 Carefully locate the float (16) into position, at the same time inserting the long tab under the needle spring hook.

52 Fit the fulcrum pin (15) through the float arm and two posts and very carefully pinch the split post to secure the pin using a pair of pliers.

53 The float level adjustment must now be checked in the following manner. Hold the carburettor cover (1) vertically so that the floats are hanging from the fulcrum and the float level arm is in light contact with the needle ball (ie without the ball being depressed). Obtain a drill or dowel rod of 5.0 mm diameter and check that the distance from the cover surface to the nearest part of the floats is correct (Fig. 6.16). The annular seams of the semi-floats should not be taken into consideration,

and for this reason two small grooves must be filed on the checking rod (photo).

54 If the dimension is not correct, bend the long tab on the float arm accordingly.

55 Tilt the cover (1) so that the floats move away from the cover and the short tab makes contact with the needle valve seating. Now, using the same method as described in paragraph 53, check the needle valve fully open dimension which should be 13.5 mm and if necessary, bend the short tab to correct (photo).

56 The difference between the dimensions checked in paragraphs 53 and 55 is the needle valve stroke which must be 8.5 mm.

57 Fit a new gasket (12) to the carburettor cover (1), then lower the cover (1) onto the carburettor body (77). Make sure that the gasket is located correctly and aligns with the various drillings in the cover. Where the starter plunger spring seating is loose, it is better to fit the gasket to the top of the carburettor body, then to place the seating on the gasket before lowering the cover (1) (photo).

58 Insert the cover retaining screws (3) together with spring washers and tighten them evenly in diagonal sequence.

59 Fit the fuel filter (8) into the cover (1), fit a new gasket (10) to the filter inspection plug (11) and tighten the plug into the cover (1).

60 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 screw (44) until it just touches the throttle lever lug, then continue turning for a further $\frac{1}{2}$ turn. Working on the idling mixture volume screw (41), fully screw it in until it is in light contact with its seat, then back it off 2 full turns. Final adjustments will be necessary when the carburettor is fitted on the engine (refer to Section 8).

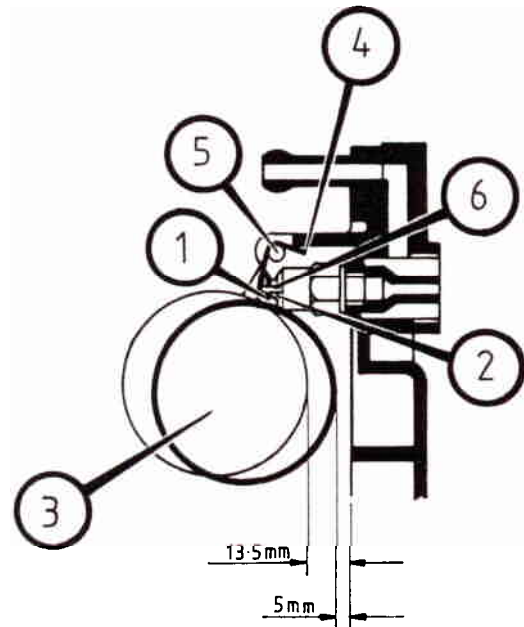
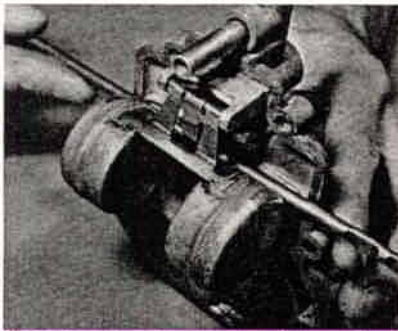
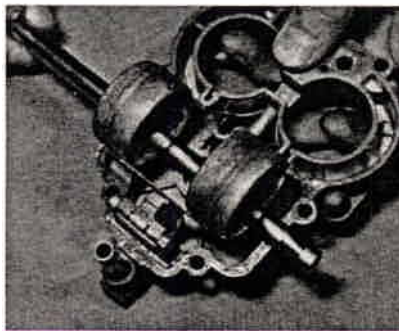


Fig. 6.16 Float level adjustment (Sec 7)

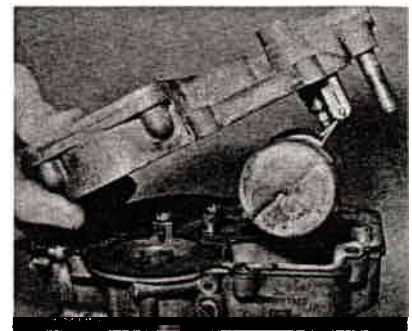
- | | |
|-------------------------|-----------------------|
| 1 Long adjusting tab | 4 Short adjusting tab |
| 2 Spring tensioned ball | 5 Fulcrum pin |
| 3 Float | 6 Spring hook |



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



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



7.57 Lowering the carburettor cover assembly onto the carburettor body

8 Tuning

Note: Refer to Chapter 3 for general notes on tuning.

- 1 The idling adjustment screws should be set to their preliminary positions as described in Section 7 paragraph 60.
- 2 Connect a tachometer to the engine in accordance with the manufacturer's instructions.
- 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 for the particular engine being worked on; this will be between 600 and 800 rpm for touring models and approximately 1000 rpm for sports car models.

5 Turn the idle mixture adjustment screw in or out until the engine runs at the highest rpm.

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

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

9 Fault diagnosis

Symptom	Reason/s
Engine will not start	Faulty starter device Blocked fuel filter or jets Starter air valve sticking
Uneven idling	Leaking manifold or carburettor flange gasket Loose idling jets Excessive sediment or water in carburettor Starter valve not seating Starter device not returning Throttle spindle or carburettor body excessively worn Secondary throttle valve partially sticking open Leaking ignition advance vacuum tube
Carburettor floods	Worn needle valve Leaking 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
Excessive fuel consumption	Faulty starter device Needle valve not seating Leaking or damaged semi-floats Incorrect float level adjustments Choked air filter