

Part 2

Chapter 13 Type 36 DCNF, 40 DCNF, 42 DCNF, 44 DCNF carburettors

Contents

Assembly	7	Operation	3
Construction	2	Removal and refitting	4
Disassembly	5	Special overhaul procedures	6
Fault diagnosis	9	Tuning	8
Introduction	1		

1 Introduction

The carburettors covered by this Chapter are of vertical downdraught type and each barrel of the carburettor is of identical diameter.

The throttle valves are of the synchronised, simultaneous operation type and are located on a single shaft.

The identification mark is located on the main body on the outer face of the float chamber wall.

2 Construction

The main body and cover of the Weber DCFN carburettor are of die-cast aluminium or zinc alloy (Mazak) construction. The mounting flange is machined flat for fitting on the inlet manifold.

The throttle spindle is made of steel and the throttle valve plates of brass.

All fuel and air jets and emulsion tubes are of brass construction and are secured to the main body by screw fittings.

The internal channels of the main body are mainly drilled and where necessary, sealed with lead plugs.

The throttle spindle is supported by two ball-bearings mounted in the main body. Washers are located at each end of the spindle to prevent air being drawn through the bearings.

The fuel float assembly is constructed of thin brass sheet and comprises two halves soldered together.

The accelerator pump is of the diaphragm type and the operating lever is actuated by a cam plate attached to the end of the throttle shaft.

3 Operation

Cold starting

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

Refer to Fig. 13.1 and note that when the choke cable is pulled, the starting device operating lever turns the control shafts which lift the starting valves off their seats. Fuel from the float chamber (8) is drawn through channels (34) into the starting jets (32) where it is emulsified with air entering through the top of the starting jets (32). The mixture is then drawn through channels (33) where it is further emulsified with air from the hole (31). After passing the starter valves (37) where additional air from holes (36) weakens the mixture, the final mixture is drawn through channels (35) into the engine below the throttle valves (14).

The starting device has a progressive action made possible by the tapered end of the valve heads and lowering the valves will reduce the amount of mixture admitted to the engine until, when completely shut, the supply will cease.

Idling and progression

Refer to Fig. 13.2 and note that when the engine is idling with the throttle valves (14) closed, fuel is drawn through the main jets and emulsion tube wells (6), along channels (18) to the idling jets (19) where it becomes emulsified with air entering through the calibrated bushes (20). The mixture then travels through the channels (17), past the adjustable mixture screws (16), through the idling feed holes (15) and into the carburettor throats at the engine side of the throttle valves (14). The idling mixture screws (16) 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 (13) are brought into action to provide additional fuel and to enable the engine to reach the speed when the main system starts to function.

In order to ensure that each carburettor barrel passes

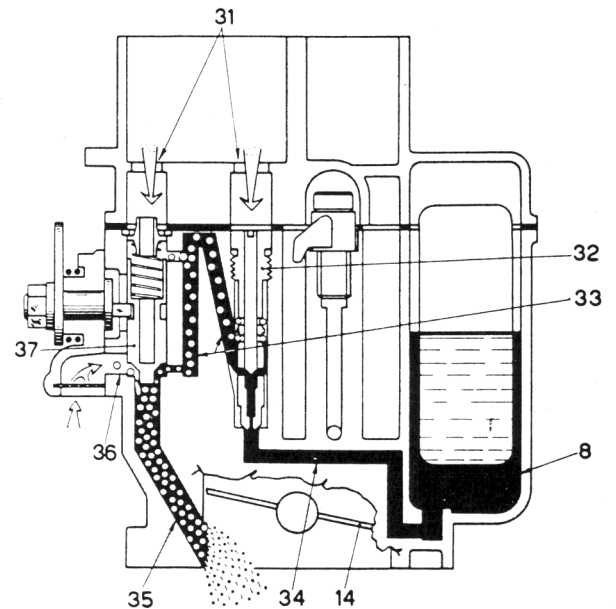


Fig. 13.1 Cold starting phase (Sec 3)

- | | | | |
|----|-----------------|----|-----------------|
| 8 | Float chamber | 34 | Channel |
| 14 | Throttle valves | 35 | Channel |
| 31 | Air holes | 36 | Channel |
| 32 | Starting jets | 37 | Starting valves |
| 33 | Channel | | |

identical amounts of air, in particular when the engine is idling, the majority of DCFN carburettors incorporate air compensation screws in each barrel, whereby air can bypass the throttle valves (14) via the starting device ducts (35). This system ensures identical vacuum below each throttle valve and therefore ensures identical mixtures during idling and progression.

Normal running

Refer to Fig. 13.3 and note that under full throttle and high speed cruise conditions, fuel is drawn from the float chamber (8), through the main jets (7) to the emulsion tubes (6). The fuel becomes emulsified with air drawn through the air corrector jets (1) and is then drawn through the nozzles (2), auxiliary venturis (3) and chokes (4) into the engine.

Acceleration

Refer to Fig. 13.4 and note that when the throttle valves are closed, the spring (24) pushes the diaphragm (28) outwards and fuel is drawn from the float chamber (8), through the ball valve (30) into the pump chamber. When the throttle valves are opened, the cam (25) operates the lever (26) and the diaphragm (28) is depressed against the tension of the spring (24). Fuel is forced along the channel (23) to the delivery valve (22) and is injected through the pump jets (21) into the carburettor barrels in the vicinity of the auxiliary venturis. The spring (27) dampens any sudden opening of the throttle valves and prolongs the full delivery. The calibrated discharge hole (29) allows excess fuel and any accumulated air and vapour to escape into the float chamber.

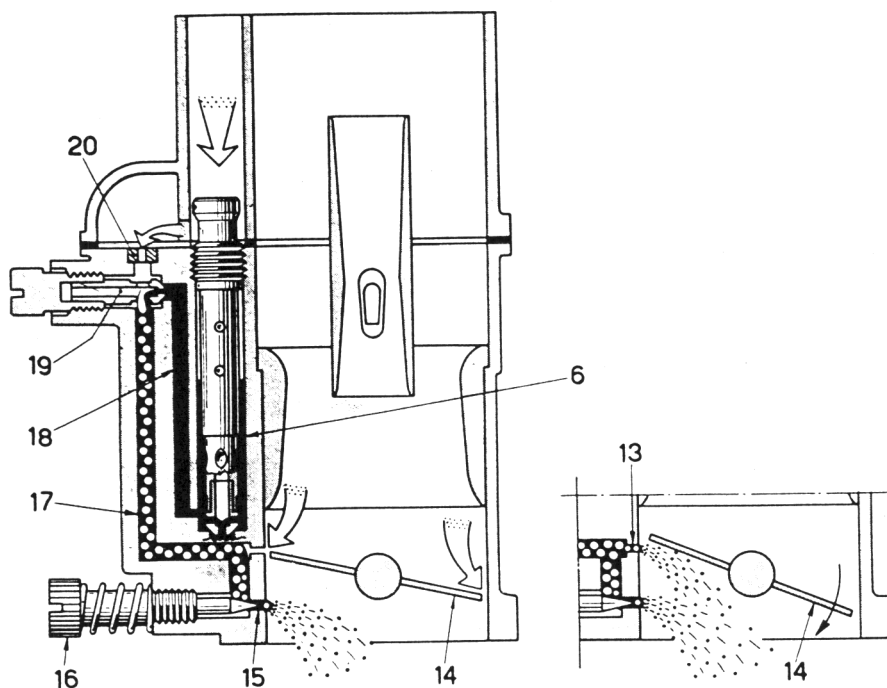


Fig. 13.2 Idling and progression phase (Sec 3)

- | | | |
|-----------------------|-----------------------|----------------------|
| 6 Emulsion tube wells | 15 Idle feed holes | 18 Channel |
| 13 Progression holes | 16 Idle mixture screw | 19 Idle jets |
| 14 Throttle valves | 17 Channel | 20 Calibrated bushes |

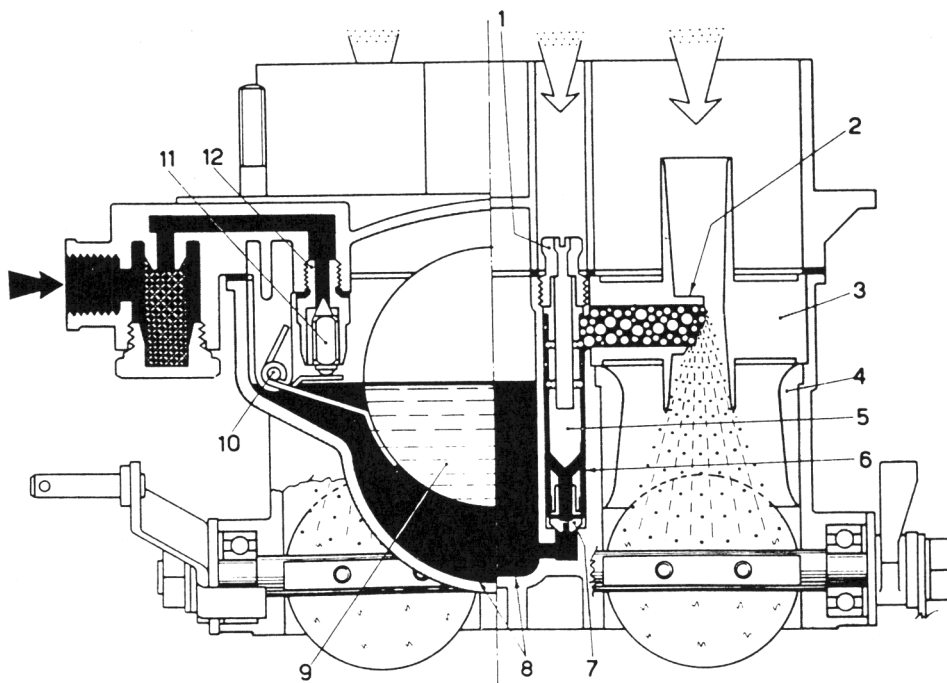


Fig. 13.3 Normal phase (Sec 3)

- | | | |
|----------------------|-----------------------|-------------------------|
| 1 Air corrector jets | 5 Emulsion tubes | 9 Float |
| 2 Nozzles | 6 Emulsion tube wells | 10 Fulcrum pin |
| 3 Auxiliary venturis | 7 Main jets | 11 Needle |
| 4 Chokes | 8 Float chamber | 12 Needle valve seating |

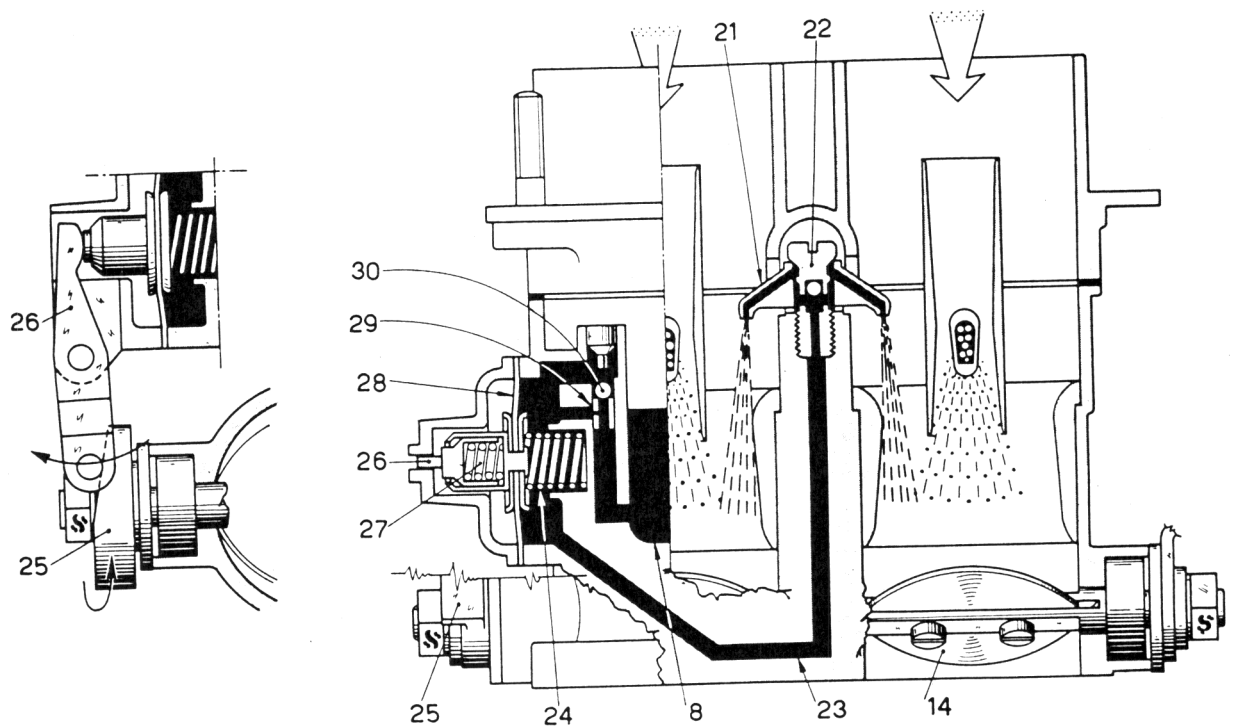


Fig. 13.4 Acceleration phase (Sec 3)

8 Float chamber
14 Throttle valves
21 Pump jets
22 Delivery valve

23 Channel
24 Return spring
25 Cam
26 Operating lever

27 Reaction spring
28 Diaphragm
29 Calibrated discharge hole
30 Ball valve

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.

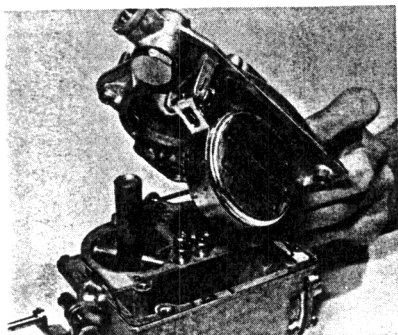
- 1 Where fitted, remove the air cleaner assembly from the carburettor.
- 2 Disconnect the throttle linkage and choke cable.
- 3 Unscrew the fuel inlet union and recover the two gaskets.
- 4 Unscrew and remove the carburettor retaining nuts and spring washers and withdraw the carburettor complete over the mounting studs.
- 5 Remove the gasket from the inlet manifold and clean all traces of gasket from the contact faces of the manifold and carburettor.
- 6 Protect the inlet manifold from ingress of foreign matter whilst the carburettor is removed by sealing it with masking tape.

7 Refitting is a reversal of removal but the following additional points should be noted:

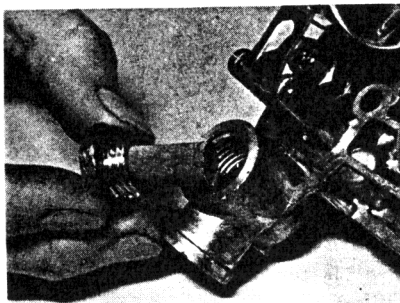
- (a) Always fit a new gasket and tighten the retaining nuts evenly in diagonal sequence
- (b) The idling adjustment screws should be set as described in Section 7 and finally tuned as described in Section 8
- (c) When refitting the choke (starting device) cable, first secure the outer cable to the support, 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.

5 Disassembly

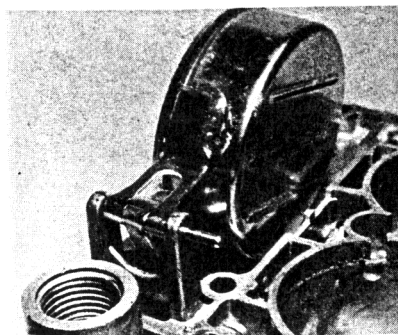
- 1 Thoroughly clean the carburettor exterior and wipe dry.
- 2 Where air horns are fitted, remove the retaining screws and washers and withdraw the air horn assembly.
- 3 Referring to Fig. 13.5, unscrew and remove the retaining screws (86) and washers (85) in diagonal sequence and lift the carburettor top cover (1) from the carburettor body (51), making sure that the gasket (3) is not broken (photo).
- 4 Lift the gasket (3) from the carburettor body (51).
- 5 Invert the carburettor cover (1) and unscrew the filter cover plug (78), using a 19 mm ring spanner or socket (photo). Remove the washer (79).
- 6 Remove the filter gauze (81) and extract the base (80).
- 7 Using a suitable diameter metal drift, tap the fulcrum pin (9) from the support posts (photo). Do not attempt to prise the split post apart.
- 8 Lift the float assembly (18) from the cover and extract the needle from the needle valve seating (11) (photo).
- 9 Unscrew and remove the needle valve seating (11) and washer (10).
- 10 Unscrew and remove the retaining screw (7) and remove the washer and bush (8) (photo).
- 11 Lift the operating arm (13) and disengage the rod (4 or 6) from the starter device.
- 12 Extract the split pin (5) and remove the rod from the operating arm (14) (photo). Remove the clamp screw (15) if necessary.
- 13 Unscrew and remove the retaining screws (69) and washers (70) and remove the starter device (61) from the carburettor (photo).
- 14 Dismantle the starter device by unscrewing the nut (68) from the shaft (62) together with the washer (67), then carefully



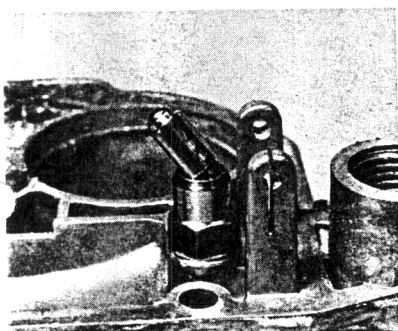
5.3 Removing the carburettor top cover



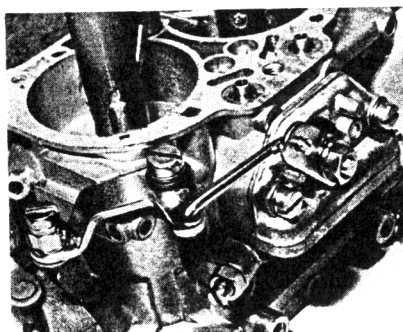
5.5 Removing the fuel filter and plug



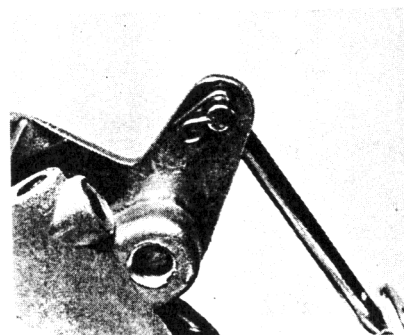
5.7 Removing the float fulcrum pin



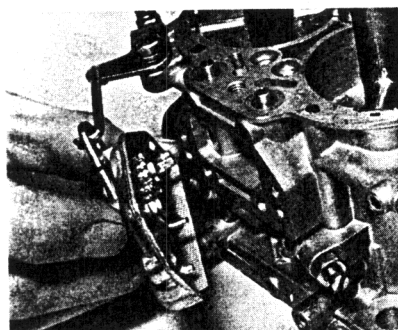
5.8 Removing the needle from the needle valve seating



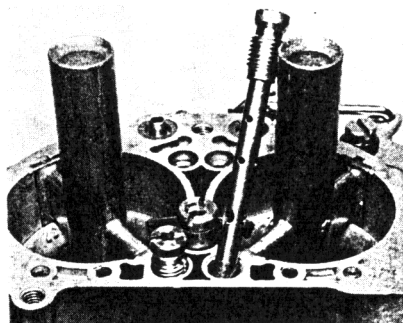
5.10 Starter device operating rod and lever location



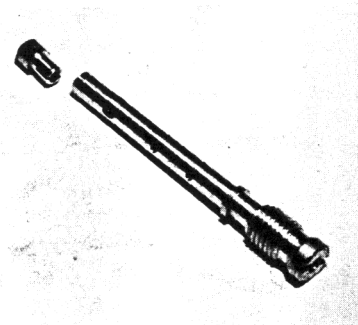
5.12 Starter device operating rod split pin location



5.13 Removing the starter device



5.15 Removing an emulsion tube



5.16 Separating the main jet and air corrector jet from the emulsion tube

remove the lever (66) and spring (65). Withdraw the shaft (62) and filter gauze (64).

15 Unscrew and remove the air corrector jets (12) from the carburettor body (51) and lift out the emulsion tube assemblies (photo).

16 Separate the emulsion tubes (17) from the air corrector jets (12) and main jets (25) (photo). Take care not to damage the jets when removing them and, if pliers are used, interpose a piece of paper or card to prevent the brass being scratched. Alternatively, insert a small drill through the emulsion tube holes to retain it whilst the jets are turned off each end.

17 Unscrew the idling jet holders (28) from the sides of the carburettor body (51), remove the rubber O-rings (27), then separate the idling jets (26) (photos).

18 Whilst depressing the starter valve spring retaining guides (75) in turn, prise the spring washers (74) from the carburettor body, then release the guides (75) and extract the return springs (76) and starter valves (77) (photos). Note from which bore

each valve is taken so that they can be refitted in their original locations. Do not force the valves if they will not come out freely; if a burr exists at the top of the bore, remove it with a fine file.

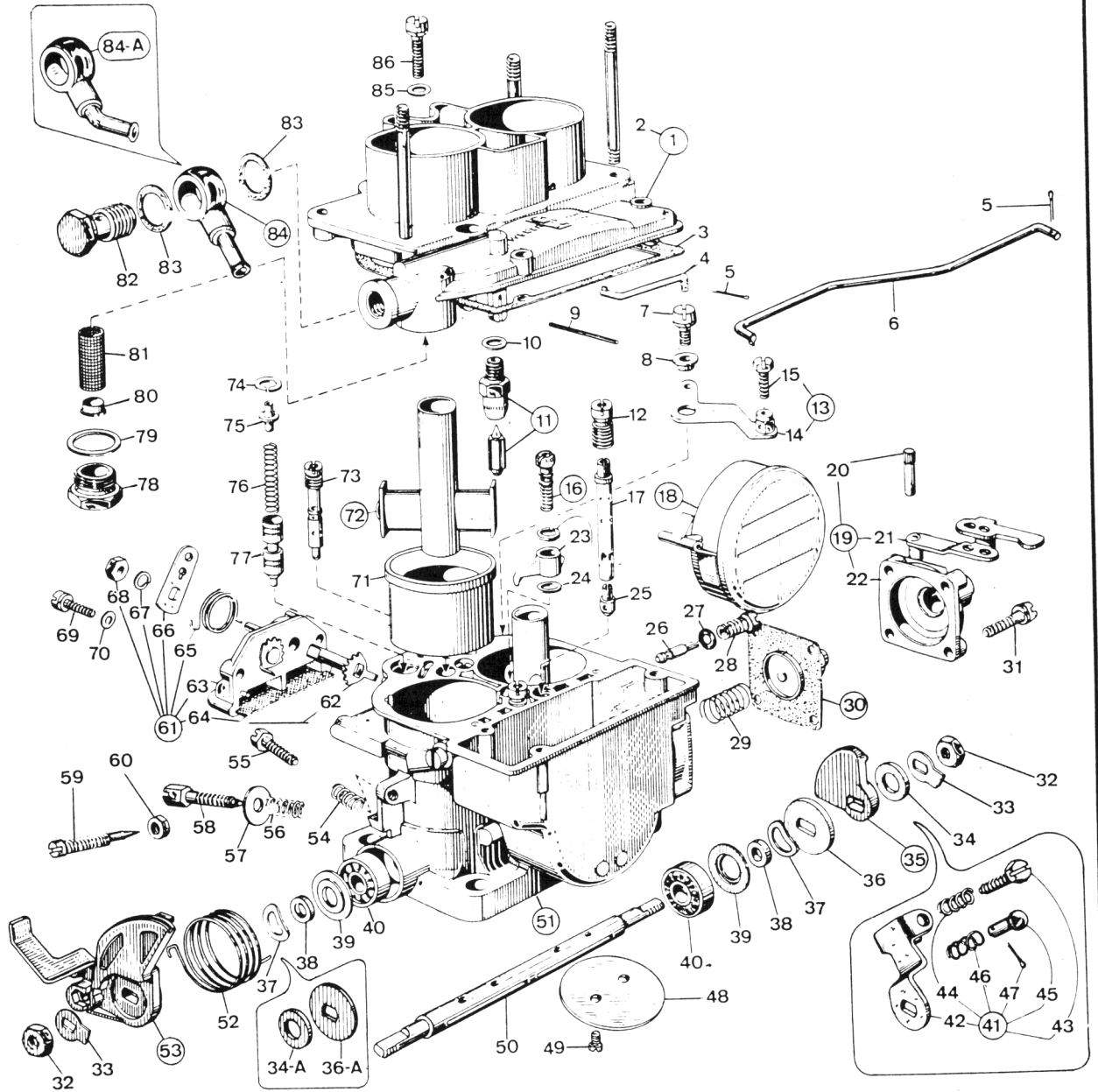
19 Unscrew and remove the starter jets (73) (photo).

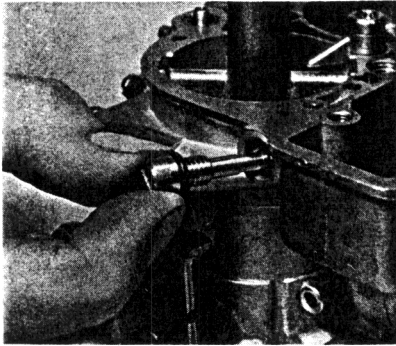
20 Unscrew and remove the accelerator pump delivery valve (16) together with the pump jet (23) and copper washers (24) (photo), then separate the washers and jet from the valve.

21 Unscrew the retaining screws and washers (31) and withdraw the pump cover (22) from the carburettor body (photo). Take care not to damage the diaphragm and if necessary, use a blunt knife to release it from the body.

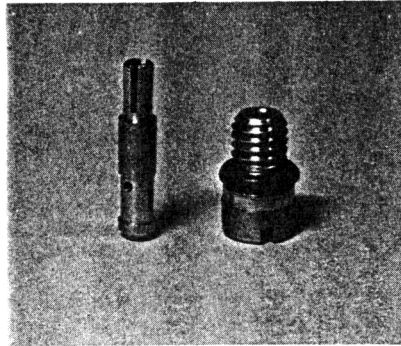
22 Remove the diaphragm (30) and spring (29) (photo). Note that the gasket must not be separated from the diaphragm.

23 Mark the accelerator pump lever (21) in relation to the cover (22) to ensure correct refitting, then, using a suitable diameter metal drift, drive the pin (20) up out of the cover (22). On some models it will be necessary to remove a split pin,

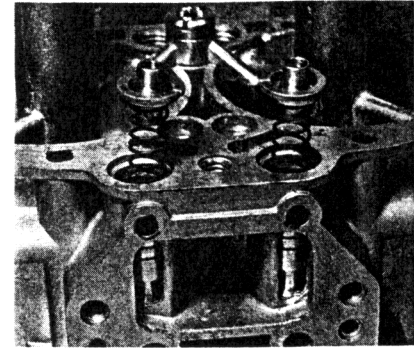




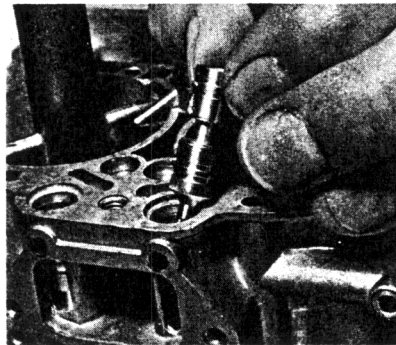
5.17a Removing the idling jets



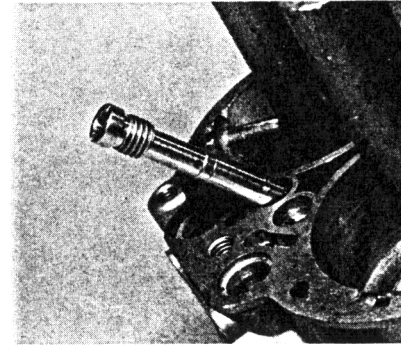
5.17b An idling jet and holder



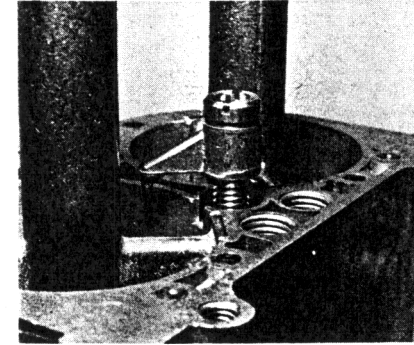
5.18a Removing the starter spring components ...



5.18b ... and starter valves



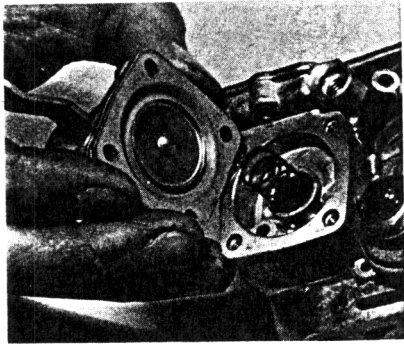
5.19 Removing a starter jet



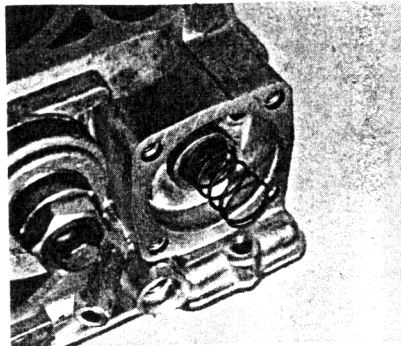
5.20 Removing the accelerator pump delivery valve and jet

Fig. 13.5 Exploded view of the 36 DCNF carburettor (typical) (Sec 5)

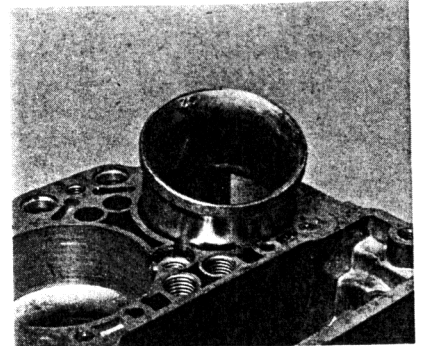
- | | | |
|------------------------------------|----------------------------|-----------------------------|
| 1 Top cover | 30 Diaphragm | 59 Air bypass screw |
| 2 Stud | 31 Screw | 60 Locknut |
| 3 Gasket | 32 Nut | 61 Starting device assembly |
| 4 Operating rod | 33 Tab washer | 62 Shaft and sector |
| 5 Split pin | 34 Spacers | 63 Housing |
| 6 Operating rod link | 35 Cam | 64 Filter gauze |
| 7 Screw | 36 Spacers | 65 Return spring |
| 8 Bush | 37 Wave washer | 66 Lever |
| 9 Fulcrum pin | 38 Spacer | 67 Washer |
| 10 Gasket | 39 End washer | 68 Nut |
| 11 Needle valve assembly | 40 Ball-bearing | 69 Screw |
| 12 Air corrector jet | 41 Throttle lever assembly | 70 Washer |
| 13 Starting device lever assembly | 42 Lever | 71 Choke |
| 14 Starting device lever | 43 Adjustment screw | 72 Auxiliary venturi |
| 15 Clamp screw | 44 Spring | 73 Starter jet |
| 16 Delivery valve | 45 Pressure pin | 74 Retaining clip |
| 17 Emulsion tube | 46 Spring | 75 Retaining guide |
| 18 Float | 47 Split pin | 76 Spring |
| 19 Accelerator pump cover assembly | 48 Throttle valve | 77 Starter valve |
| 20 Pivot pin | 49 Retaining screw | 78 Plug |
| 21 Lever | 50 Throttle spindle | 79 Gasket |
| 22 Cover | 51 Carburettor body | 80 Base |
| 23 Pump jets | 52 Return spring | 81 Filter |
| 24 Washers | 53 Throttle lever | 82 Fuel inlet bolt |
| 25 Main jet | 54 Spring | 83 Gasket |
| 26 Idle jet | 55 Idle speed screw | 84 and 84A Inlet union |
| 27 Rubber O-ring | 56 Spring | 85 Washer |
| 28 Idle jet holder | 57 Washer | 86 Screw |
| 29 Return spring | 58 Idle mixture screw | |



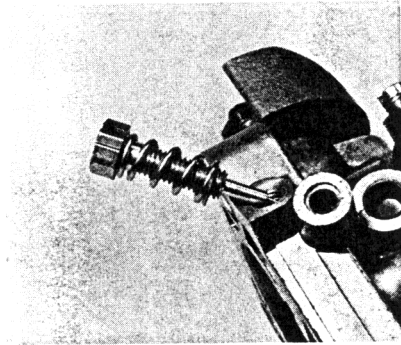
5.21 Withdrawing the accelerator pump cover



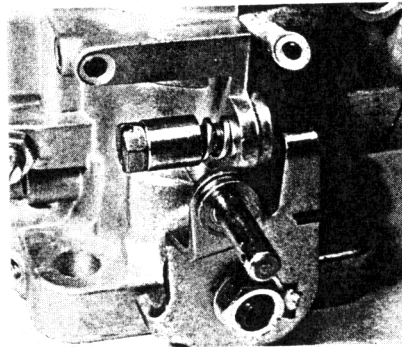
5.22 Accelerator pump diaphragm return spring location



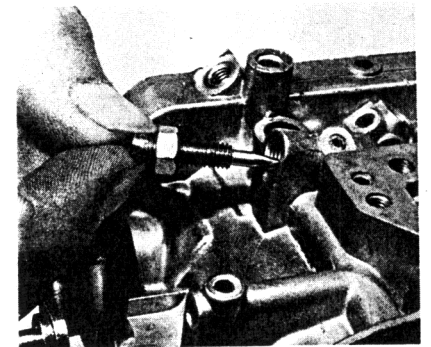
5.25 Removing a choke



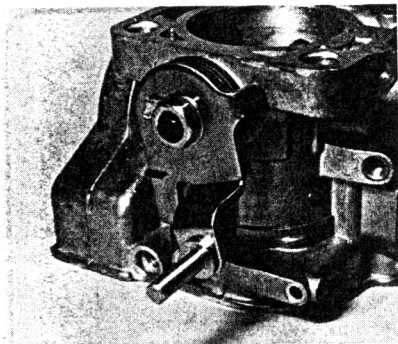
5.26 Removing an idling mixture adjusting screw



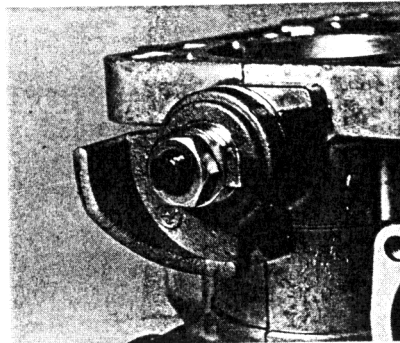
5.27 Idle speed screw location



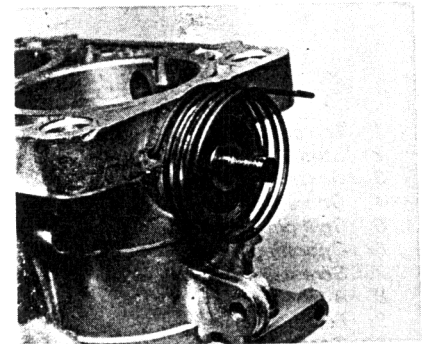
5.28 Removing an air bypass adjusting screw



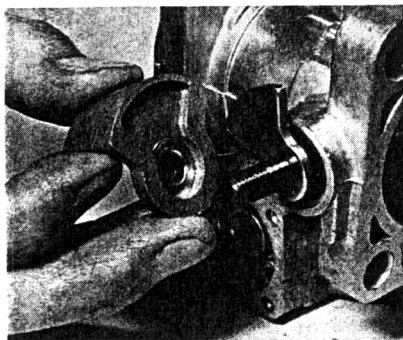
5.30a Throttle lever and end nut with locktab



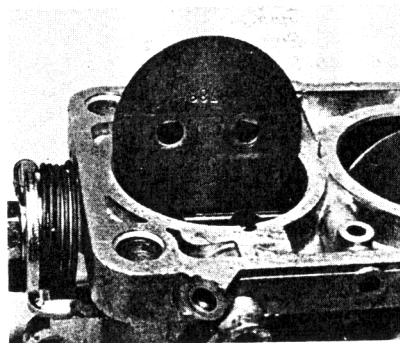
5.30b Accelerator pump cam and end nut with locktab



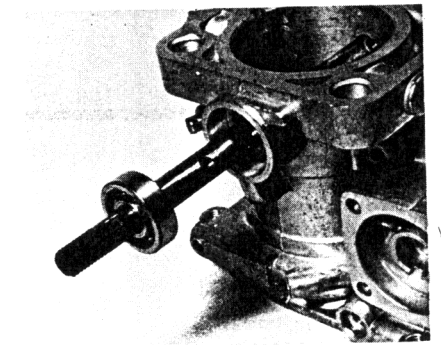
5.32 Throttle return spring location



5.33 Accelerator pump cam and sector



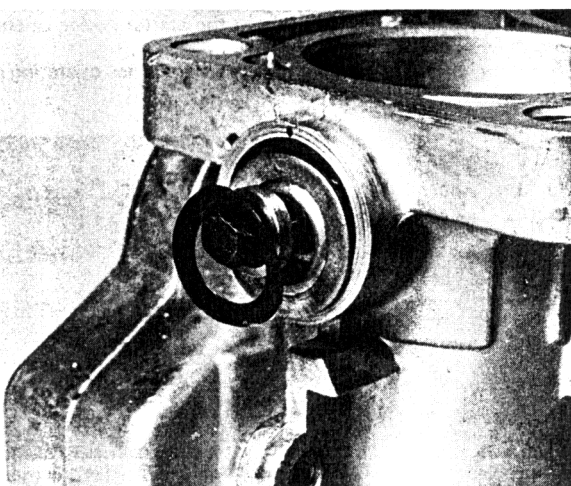
5.36 Removing a throttle valve



5.39 Removing the throttle spindle

washer and clevis pin.

- 24 Note the location of the auxiliary venturis (72) and mark them if necessary, with a pencil to ensure correct refitting. The auxiliary venturis (72) are lightly staked into the carburettor body and to remove them, it will be necessary to insert a wooden or plastic dowel rod through the throttle valve end of the barrels to tap them free. If they are excessively tight it will be necessary to obtain the special Weber tool no 98009 200.
- 25 Using a fine file, remove the staking from the two barrels, then note the locations of each choke (71) and slide them out of the barrels. Note that the choke ends with the smaller internal diameters are uppermost (photo).
- 26 Unscrew and remove the idling mixture adjusting screws (58) together with the springs (56) and washers (57) where fitted (photo).
- 27 Unscrew and remove the idle speed screw (55), spring (54) and sleeve, where fitted (photo).
- 28 Loosen the locknuts (60) with an 8 mm ring spanner, then unscrew and remove the air bypass screws (59) (photo).
- 29 Where fitted, unhook the throttle return spring from the accelerator pump end of the throttle spindle (50).
- 30 Bend back the locktabs (33) on each end of the throttle spindle (50), then unscrew and remove the nuts (32) (photos). If these are very tight, use Weber tool no 98023 700 to hold the spindle whilst they are loosened; this will prevent the spindle from being buckled. Do not loosen a tight nut with the throttle valves being forced against the barrel walls; instead, use a screwdriver to hold the throttle lever (53) in the open position.
- 31 Remove the nuts (32), tab washers (33) and spacer (34) from the throttle spindle (50), together with the throttle return spring lever where fitted.
- 32 Turn the throttle lever (53) against the tension of the coil spring (52) then ease it from the throttle spindle (50) and remove the coil spring (photo). Remove the wave washer (37) together with washers (34A and 36A) where fitted.
- 33 Using a screwdriver, prise the accelerator pump cam and sector (35) from the throttle spindle (50), together with the spacer (36) when fitted (photo). Remove the wave washer (37).
- 34 Unscrew and remove the throttle valve retaining screws (49), being careful not to exert excessive pressure on the spindle (50).
- 35 Note the position of the throttle spindle and valves in relation to the barrels and if necessary, mark the valves with a pencil.
- 36 Turn the spindle to the fully open position and withdraw the two throttle valves (48) from their location slots (photo).
- 37 Mark one end of the throttle spindle (50) in relation to the carburettor body (51) to ensure correct refitting.



5.40 Throttle spindle wave washer, spacer and bearing washer

- 38 Check that the spindle (50) is free of any burrs in the vicinity of the valve retaining screw holes and if necessary, remove them with a fine file.
- 39 Using a plastic mallet, drive the spindle (50) from the carburettor (photo).
- 40 Remove the spacers (38) and end washers (39) from the spindle and carburettor body (photo).
- 41 Tap the spindle (50) through the bearing (40) with the bearing placed on a vice.
- 42 Re-insert the spindle (50) and drive the remaining bearing (40) from the carburettor body (51). Remove the bearing from the spindle.
- 43 Where fitted, unscrew the idle speed screw (43) and spring (44) from the throttle lever (42), then remove the split pin (47), pressure pin (45) and spring (46).

6 Special overhaul procedures

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

- 1 Using a hand chuck and the special tool available from Weber or a tool hire agent, 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 with the special drift by tapping it gently whilst rotating it at the same time.
- 2 Using the same procedure as described in paragraph 1, reform the idling jet seats.
- 3 Using the same procedure as described in paragraph 1, reform the starter valve seats.
- 4 Using the same procedure as described in paragraph 1, reform the starter jet seats.
- 5 If the emulsion tube wells are discoloured and considerable sediment has accumulated, the bores must be reamed using the special Weber tool and a hand chuck. Turn the tool carefully until it moves freely, then continue turning it whilst removing it.
- 6 Check the internal channels of the carburettor body cover by injecting fuel from a syringe and observing whether it emerges freely. If any channels are blocked, it will be necessary to drill out the lead plugs and use Weber tool nos 98014 300, 98014 400 and 98014 500 to clear them. These tool numbers refer to the three channel diameters of 1.0 mm, 1.5 mm and 2.0 mm.
- 7 Check that the accelerator pump ball valve is free by shaking the carburettor body and listening to the ball movement.
- 8 After overhaul, the carburettor body should be thoroughly cleaned, preferably using clean fuel and air pressure. The lead plugs should be renewed and retained in position by using the Weber tool no 98010 700 or 98010 800 as a punch until the plugs are expanded into their bores.
- 9 Check the float assembly for damage and leakage; shake the float to determine whether fuel has entered. If the float is damaged or fuel is present, it must be renewed.
- 10 Check and renew if necessary, the accelerator pump lever and diaphragm.

7 Assembly

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

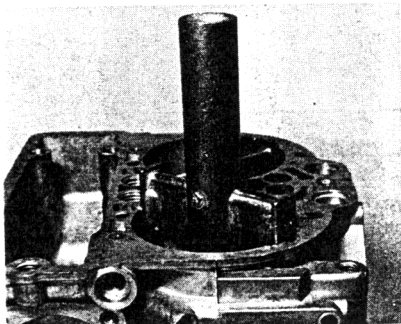
- 1 Where fitted, fit the spring (46) and pressure pin (45) to the throttle lever (42) and secure with the split pin (47).
- 2 Fit the idle speed screw (43) and spring (44) to the throttle lever (42), when fitted.
- 3 Using a suitable diameter length of tubing, drive one bearing (40) fully into the carburettor body (51) at the accelerator pump end.
- 4 Place the remaining ball-bearing (40) on an open vice and gently tap the spindle (50) into it, entering the end with the

shorter recess first.

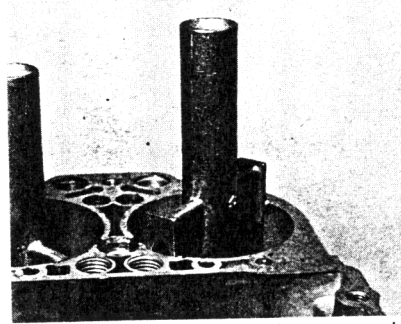
- 5 Insert the throttle spindle (50) into the carburettor body (51), then make sure that the bearings (40) are fully seated on the spindle by supporting one in a suitable diameter length of tubing and using a further length of tubing to tap the opposite bearing.
- 6 Fit the end washers (39) and spacers (38) over the ends of the spindle (50) after lubricating the bearings with a little grease.
- 7 Turn the throttle spindle (50) so that the throttle valve retaining screw head recesses are facing the carburettor mounting flange. Place the carburettor body (51) on the accelerator pump end then locate the wave washer (37) over the spindle, together with the washers (34A and 36A) where fitted.
- 8 Locate the return spring (52) in the hole on the body and hook the remaining end over the flat edge of the throttle lever (53). Tension the spring and press the throttle lever (53) fully onto the spindle (50).
- 9 Fit the tab washer (33) and nut (32), then tighten the nut and lock it by bending the tab onto a flat; do not overtighten the nut.
- 10 Turn the throttle lever (53) fully open so that the throttle valve slots can be seen from the flange end of the carburettor, then insert one throttle valve (48) in the location previously noted and close the valve. Make sure that the throttle valve is fitted the correct way round so that the angled perimeter seats in the barrel.
- 11 Snap the valve shut several times in order to centralise it, then insert and tighten the valve retaining screws (49) 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. Lock the screws by peening with Weber tool no 98010 900 whilst supporting the spindle with a length of wood. Alternatively, coat the threads with a liquid locking agent (fuel resistant) prior to inserting them.
- 12 Repeat the procedure described in paragraphs 10 and 11 for the remaining throttle valve.
- 13 Locate the wave washer (37) over the spindle (50) and fit the spacer (36) when fitted.
- 14 Press the sector into the nylon accelerator pump cam (35), then fit the cam over the spindle with the lowest cam contour uppermost.
- 15 Fit the spacer (34) throttle return spring lever where fitted, tab washer (33) and nut (32). Tighten the nut (32) whilst holding the throttle lever (53) open with a screwdriver, then lock it by bending the locktab; do not overtighten the nut.
- 16 Where fitted, hook the throttle return spring onto the lever on the end of the spindle (50).
- 17 Insert the air bypass screws (59) and screw them in until they are fully seated, then tighten the locknuts (60).
- 18 Fit the idle speed screw (55), spring (54) and sleeve where fitted.
- 19 Fit the idling mixture adjusting screws (58) together with the springs (56) and washers (57), where fitted.

20 Insert the chokes (71) into the barrels with the smaller internal diameter ends uppermost.

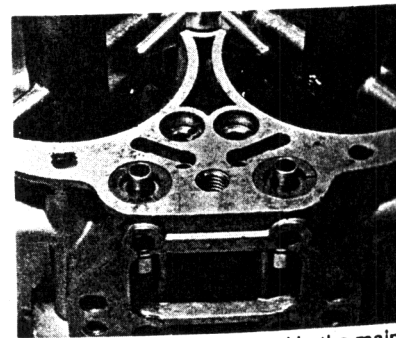
- 21 Fit the auxiliary venturis (72) in their original locations, making sure that the location springs engage with the grooves in the barrels and that the supply channels are in alignment with those in the carburettor body. The extended venturis must also be uppermost (photos).
- 22 With the auxiliary venturis (72) fully seated, lightly stake the carburettor upper face to retain them. Use a blade pinch and not a centre punch to do this.
- 23 Assemble the lever (21) to the accelerator pump cover (22) in its previously noted position, then drive the pin (20) through the cover and lever until fully entered. Where a clevis pin is fitted, insert it through the cover and lever and retain it with the washer and split pin.
- 24 Support the carburettor body (51) with the pump diaphragm face uppermost, then locate the spring (29) on the face in the central position.
- 25 Place the diaphragm (30) over the spring (29), then locate the pump cover (22) over the diaphragm (30).
- 26 Insert the retaining screws and washers (31) and tighten them evenly in diagonal sequence. Operate the throttle lever and make sure that the pump lever runs smoothly and is in contact with the cam.
- 27 Assemble the accelerator pump (23) to the delivery valve (16) with a copper washer (24) either side, then tighten the assembly into the carburettor body.
- 28 Insert and tighten the starter jets (73).
- 29 Fit the starter valves (77) into their respective bore; followed by the return springs (76) and retainers (75).
- 30 Depress the retainers (75) in turn and locate the spring washers (74) in the carburettor recesses, pressing them fully in with the flat blade of a screwdriver (photo).
- 31 Press the idling jets (26) into the holders (28), fit the rubber O-rings (27), then tighten the holders into the carburettor body.
- 32 Press the emulsion tubes (17) onto the main jets (25) an into the air corrector jets (12). Insert and tighten the air corrector jets (12) into the carburettor body together with the emulsion tubes.
- 33 Assemble the shaft (62) to the starter device body so that the alignment lines on each sector are facing each other, then fit the coil spring (65) with its end in the location hole. Fit the lever (66) over the shaft (62) and at the same time hook the end of the spring (65) over the lever, then locate the washer (67) and nut (68), and tighten the nut.
- 34 Fit the filter gauze (64) and check that the starter device operates smoothly.
- 35 Offer the starter device (61) up to the carburettor body and make sure that the sector lugs locate in the starter valve grooves, then insert the retaining screws (69) and washers (70) and tighten the screws. Check that the starter device operates smoothly.
- 36 Fit the clamp screw (15) to the starter device operating arm (14).



7.21a Fitting an auxiliary venturi, showing the location spring



7.21b Showing the auxiliary venturi channel which must face the emulsion tube well



7.30 The starter valves fitted in the main body

- 37 Insert the operating rod (4 or 6) into the arm (14) and screw with the split pin (5).
- 38 Insert the rod into the starter device arm (66), then assemble the bush (8) and washer and tighten the retaining screw (7) into the carburettor body.
- 39 Tighten the needle valve seating (11) together with a new gasket (10) into the carburettor cover (1).
- 40 Lower the needle into the needle valve seating (11), tapered end first.
- 41 Lower the float assembly (18) onto the cover (1) and insert the fulcrum pin (9) through the support posts and float arm. If necessary, gently pinch the split post to secure the pin using a pair of pliers.
- 42 The float level adjustment must now be checked in the following manner: Hold the carburettor screw vertical so that the float is hanging from the fulcrum pin with the float level arm in light contact with the needle ball (ie without the ball being depressed). Using a vernier caliper, check that the distance from the cover face (without gasket) to the top of the float as shown in Fig. 13.6 is 1.890 in (48 mm) for 42 DCNF models and 1.969 in (50 mm) for other DCNF models (photo). If not, bend the needle operating tab as necessary.
- 43 Tilt the cover so that the float moves away from the cover and the tab makes contact with the needle valve seating. Now, using the same method as described in paragraph 42, check that the needle valve fully open dimension is 2.224 in (56.5 mm) for 42 DCNF models and 2.303 (58.5 mm) for other DCNF models (photo). If not, bend the tab which contacts the needle valve seating as necessary.
- 44 The difference between the dimensions checked in paragraphs 42 and 43 is the needle valve stroke which should be 0.335 in (8.5 mm).
- 45 Fit the base (80) to the filter gauze (81). With the carburettor cover (1) inverted, press the filter gauze into the inlet cavity.
- 46 Fit the washer (79) to the filter cover plug (78), then tighten the plug into the cover (1).
- 47 Place the gasket (3) onto the top face of the carburettor body (51).
- 48 Lower the carburettor cover (1) onto the main body (51), then insert the retaining screws (86) and washers (85) and

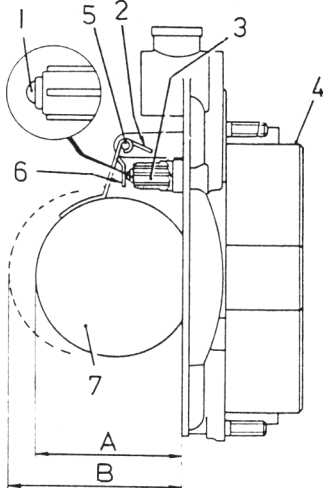


Fig. 13.6 Float level adjustment dimensions (Sec 7)

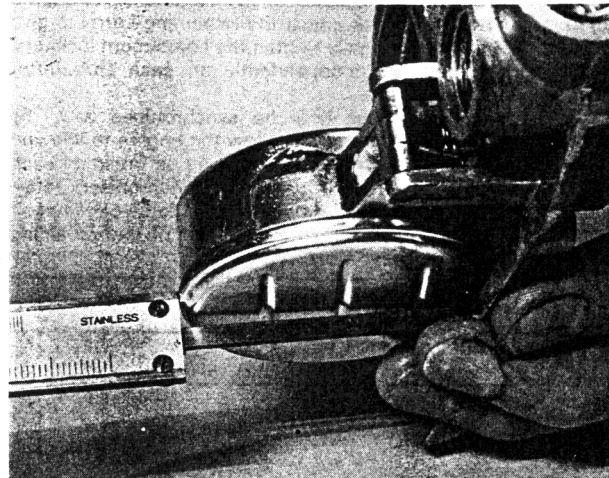
- 1 Spring loaded ball
- 2 Stroke adjusting tab
- 3 Needle valve assembly
- 4 Carburettor cover
- 5 Fulcrum pin
- 6 Height adjusting tab
- 7 Float
- A Needle valve fully closed dimension
- B Needle valve fully open dimension

- tighten them a little at a time in diagonal sequence.
- 49 Fit the air horn assembly, where fitted. Insert the retaining screws and washers and tighten them evenly in diagonal sequence.
- 50 With the carburettor completely assembled, the idling adjustment screws should be turned to their preliminary settings. To do this, first screw in the idling speed adjustment screw until it just touches the throttle lever, then continue turning for a further $\frac{1}{2}$ turn. Working on the idling mixture volume screws in turn, fully screw them in until they are in contact with their seats, then back them off 2 complete turns. Final adjustments will be necessary with the carburettor fitted on the engine (refer to Section 8).

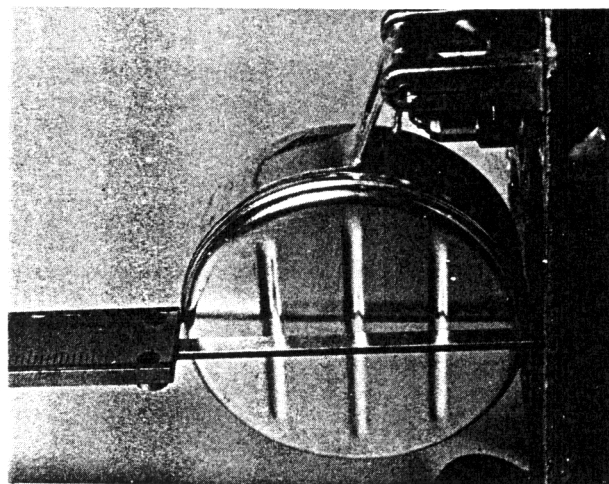
8 Tuning

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

- 1 Set the idling adjustment screws to their preliminary positions as described in Section 7.
- 2 Connect a tachometer to the engine in accordance with the manufacturer's instructions.
- 3 It is now important to understand that each barrel of each carburettor must be synchronised in order to deliver equal



7.42 Checking the float closed position with vernier calipers



7.43 Checking the float open position with vernier calipers

amounts of air/fuel mixture to each individual cylinder. To check this, it will be necessary to obtain a length of tubing (approximately 1 metre) of about 5 mm to 10 mm (0.25 in to 0.5 in) internal diameter. Alternatively, a synchroniser as illustrated in Chapter 8 may be used.

4 Remove the air cleaner(s) if fitted, then run the engine until normal operating temperature is reached. To ensure that the engine is really hot enough, drive it hard over a 5 mile distance.

5 Switch off the engine and disconnect the accelerator rod connections from each carburettor.

6 Where two carburettor throttle spindles are linked, turn the adjustment screw on the link $\frac{1}{2}$ a turn in from the fully shut position.

7 Start the engine and adjust each idling speed adjusting screw (except link adjustments) by equal amounts until the engine is idling at the approximate recommended speed. This will vary according to the application and state of tune of the engine but on average will be around 800 rpm.

8 The barrels of each individual carburettor must now be synchronised to pass identical quantities of air during idling. To do this, loosen the locknuts and check that the bypass screws are both in light contact with their seats. Place one end of the synchronising tube in one air intake and listen at the other end to the amount of hiss present. Alternatively, use the synchroniser to record the air flow through the air intake. Check both air intakes of the carburettor to determine which one is passing the greatest amount of air, then adjust the remaining barrel to give an identical volume and finally tighten the adjustment locknuts. Carry out the procedure independently on each carburettor fitted to the engine.

9 Each carburettor must now be synchronised with the remaining carburettors. To do this, allow the engine to idle and check the volume of air flowing through one air intake of each carburettor, using the length of tube or the synchroniser. Determine the carburettor which is passing the medium volume of air and adjust the idle speed adjustment screws of the remaining

carburettors until they also pass identical volumes of air.

10 If the engine idling speed is not now within the recommended limits, turn each idling speed adjustment screw by equal amounts as necessary.

11 The mixture screw adjustments on each carburettor must now be set and synchronised. Since each screw was turned to its preliminary setting, it can be assumed that they are reasonably synchronised to start with. With the engine idling, turn all the screws by equal amounts ($\frac{1}{2}$ a turn initially) first in one direction, then in the reverse direction. Observe whether the engine speed falls or increases and make several adjustments until the engine runs at the highest speed commensurate with even firing.

12 If necessary, again turn each idling speed adjustment screw by equal amounts to bring the engine speed within the recommended limits.

13 To check whether the final mixture screw synchronisation is correct, allow the engine to idle, then remove each spark plug lead in turn and observe the reduction in engine rpm on the tachometer. The reduction should be identical for each cylinder, thus proving that the mixture strength is also identical for each cylinder. A further check can be made by removing the spark plugs after the engine has been idling for approximately 15 minutes. Any with black sooty deposits indicate that the particular cylinder is running rich. Normally, if the mixture screw has been set correctly, weakening it by half a turn during idling will cut the relevant cylinder.

14 Note that on some applications it may be advisable to fit 'hotter' spark plugs whilst adjusting the carburettors to prevent misfiring. However, the original plugs must always be refitted after completing the adjustment.

15 Switch off the engine and reconnect the throttle linkages making any adjustments as necessary to prevent the carburettor idling settings from being affected.

16 Remove the tachometer from the engine and refit the air cleaner(s), if fitted.

9 Fault diagnosis

Symptom	Reason
Engine will not start	Blocked fuel filter or jets Flooded engine as a result of faulty needle valve or depressing accelerator pedal
Uneven idling	Leaking manifold or carburettor flange gaskets Loose idling jets or auxiliary venturis Excessive sediment or water in carburettor Incorrect tuning adjustments
Carburettor floods	Worn needle valve Leaking or damaged float Incorrect float level adjustments Excessive sediment in fuel
Engine lacks performance	Incorrect tuning adjustments Incorrect float level adjustments Excessive sediment in fuel Throttle valves not fully opening Accelerator pump faulty or leaking
Excessive fuel consumption	Needle valve not seating Leaking or damaged float Incorrect float level adjustments Choked air filter (if fitted)