

Part 2 Weber carburetors

Chapter 9 Type 40 DFA, 40 DFAV, 34 DGAS, 38 DGAS

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Adjustment data

Fast idle throttle valve opening

High cam position:

40 DFA and 40 DFAV types	0.029 to 0.031 (0.75 to 0.80)
34 DGAS and 38 DGAS types:	
38 DGAS 1A	0.026 to 0.028 (0.65 to 0.70)
38 DGAS 7A	0.025 to 0.027 (0.65 to 0.70)
38 DGAS 3A and 34 DGAS	0.027 to 0.029 (0.70 to 0.75)
38 DGAS 4A	0.029 to 0.031 (0.75 to 0.80)

Low cam position:

38 DGAS 4A	0.080 to 0.100 (2.05 to 2.55)
38 DGAS 7A	0.080 to 0.100 (2.05 to 2.55)
38 DGAS 1A	0.100 to 0.120 (2.55 to 3.05)
38 DGAS 3A	0.100 to 0.120 (2.55 to 3.05)

Choke valve pull down clearance

38 DGAS types:

Minimum:

All types	0.112 to 0.124 (2.85 to 3.15)
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Maximum:

38 DGAS 4A and 7A	0.177 to 0.216 (4.5 to 5.5)
38 DGAS 1A and 3A	0.196 to 0.236 (5.0 to 6.0)

Float level setting dimension

40 DFA and 40 DFAV types	0.236 in (6.0 mm)	0.551 in (14.0 mm)	0.315 in (8.0 mm)
34 DGAS and 38 DGAS types (brass float)	1.57 in (40.0 mm)	1.968 in (50.0 mm)	0.393 in (10.0 mm)
34 DGAS and 38 DGAS types (plastic float)	1.35 in (34.3 mm)	1.744 in (44.3 mm)	0.393 in (10.0 mm)

1 Introduction

The carburettor types covered in this Chapter are of dual downdraught design. Each throttle valve is mounted on a separate shaft, but the shafts are linked by toothed sectors and their action is synchronised.

Semi-automatic choke controls are fitted to all carburettor types included in this Chapter.

The carburettor is normally fitted to the engine as a single unit, the most common arrangements being as follows:

- 1 One unit on a six-cylinder in-line engine, ie each barrel feeds three cylinders separately
- 2 One unit on a six-cylinder V-engine, ie each barrel feeds one bank of three cylinders

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

2 Construction

The main body and cover of the carburettor types covered in this Chapter are of die cast aluminium construction and the mounting flange is machined flat for fitting purposes. The cover incorporates a mounting flange for the air cleaner assembly and is equipped with four mounting studs.

The throttle valves are of brass and the throttle shafts are of steel. The throttle shafts run on Teflon (PTFE) bearings mounted in the main body. The choke valves are cadmium plated steel and the choke shaft is of steel on DGAS types and brass on DFA and DFAV types.

All fuel and air jets are of brass construction and are screwed into the main body. The emulsion tubes are also constructed of brass.

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

The fuel float assemblies are of brass construction; DFA and DFAV types have a single float and DGAS types have two semi-floats.

in (mm)

0.029 to 0.031 (0.75 to 0.80)

0.026 to 0.028 (0.65 to 0.70)

0.025 to 0.027 (0.65 to 0.70)

0.027 to 0.029 (0.70 to 0.75)

0.029 to 0.031 (0.75 to 0.80)

0.080 to 0.100 (2.05 to 2.55)

0.080 to 0.100 (2.05 to 2.55)

0.100 to 0.120 (2.55 to 3.05)

0.100 to 0.120 (2.55 to 3.05)

in (mm)

0.112 to 0.124 (2.85 to 3.15)

0.177 to 0.216 (4.5 to 5.5)

0.196 to 0.236 (5.0 to 6.0)

Closed position	Open position	Stroke
0.236 in (6.0 mm)	0.551 in (14.0 mm)	0.315 in (8.0 mm)
1.57 in (40.0 mm)	1.968 in (50.0 mm)	0.393 in (10.0 mm)
1.35 in (34.3 mm)	1.744 in (44.3 mm)	0.393 in (10.0 mm)

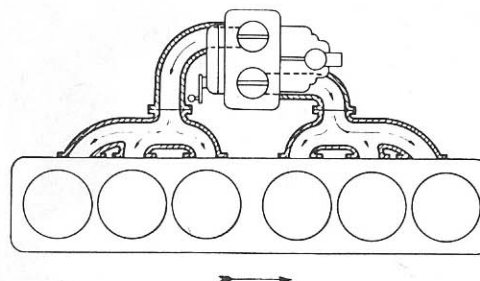


Fig. 9.1 Single carburettor fitted to a six-cylinder in-line engine (Sec 1)

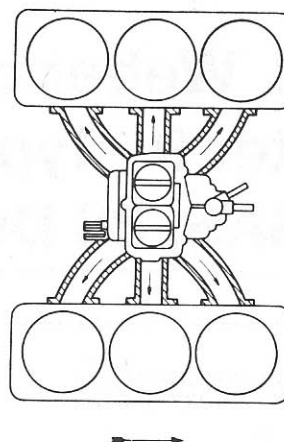


Fig. 9.2 Single carburettor fitted to a six-cylinder V-engine (Sec 1)

3 Operation

Cold starting

Refer to Fig. 9.3 and note that when the engine is cold and the throttle pedal has been depressed once, the bi-metallic spring (51) rotates the spindle (52) and closes the choke valves (55). At the same time the fast idle cam (59) prevents the throttle valves (12) from completely closing.

When the engine is cranked, a rich mixture is drawn from the nozzle (9) to facilitate starting. As soon as the engine fires, vacuum from below the throttle valve is relayed through the channel (53) to the diaphragm (47). The shaft (50) then moves and partially opens the choke valves (55) against the action of the bi-metallic spring (51). If the throttle is opened at this stage,

the vacuum will cease and the choke valves (55) will close, however the passage of air will open the choke valves against the action of the bi-metallic spring (51) due to the offset construction of the choke valves (55). On DGAS types, the action of the shaft (50) is modulated by an internal spring (49).

As the engine warms up, the bi-metallic spring (51) progressively opens and the choke valves (55), until at normal operating temperature they are held fully open. The fast idling screw (62) does not now rest on the fast idling cam (59) since the latter has been rotated by the bi-metallic spring and therefore the throttle valves (12) are free to return to the normal idling position.

Idling and progression

Refer to Fig. 9.4 and note that when the engine is idling, the

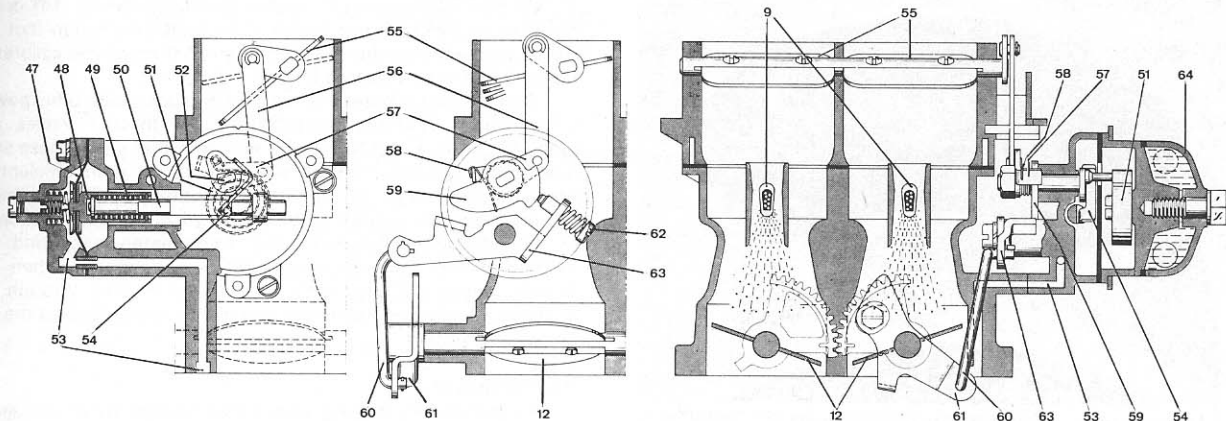


Fig. 9.3 Automatic choke operation (DGAS type shown) (Sec 3)

- 9 Nozzles
- 12 Throttle valves
- 47 Diaphragm
- 48 Bush
- 49 Modulating

- 50 Rod
- 51 Bi-metallic spring
- 52 Shaft
- 53 Channel
- 54 Lever

- 55 Choke valves
- 56 Lever
- 57 Lever
- 58 Spring
- 59 Cam

- 60 Linkage
- 61 Lever
- 62 Adjusting screw
- 63 Lever
- 64 Housing

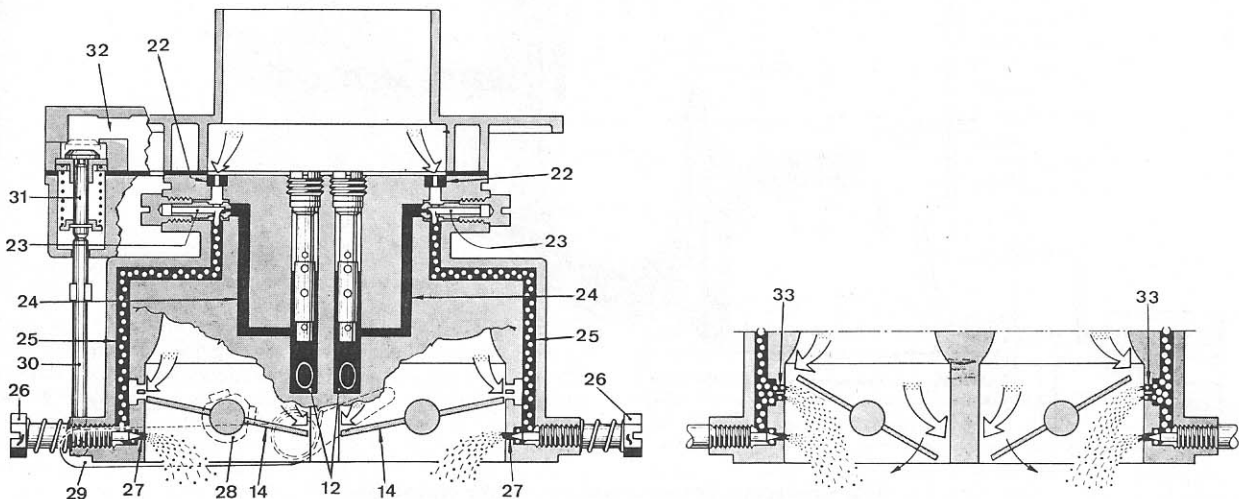


Fig. 9.4 Carburettor idling and progression phase (Sec 3)

- 12 Wells
- 14 Throttle valves
- 22 Calibrated hole
- 23 Idling jet

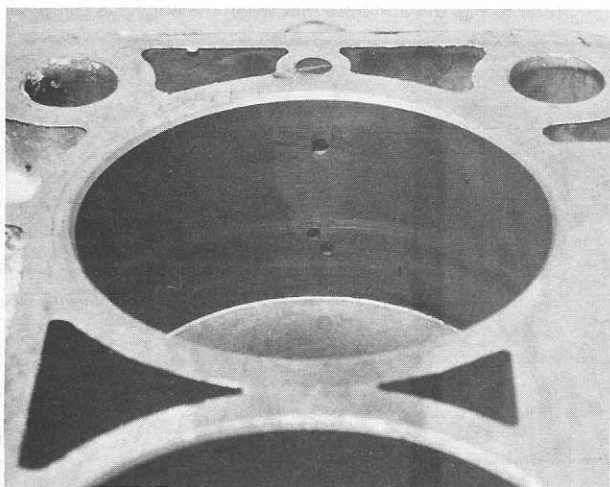
- 24 Channel
- 25 Channel
- 26 Mixture screw
- 27 Idling feed holes

- 28 Cam
- 29 Lever
- 30 Rod
- 31 Vent and air bleed control

- valve
- 32 Channel
- 33 Progression feed holes

throttle valves (14) are shut. Fuel is drawn from the float chamber through internal channels to the emulsion tube wells (12) and then passes along the channels (24) to the idling jets (23) where air is introduced through the calibrated bushes (22). The fuel and air is now an emulsion and continues through the channels (25), past the idling mixture control screws (26), through their idling feed holes (27) and into the carburettor throats at the engine side of the throttle valves (14) (photo). When the throttle valves (14) are opened slightly to increase the engine speed, the progression holes (33) are brought into action to provide extra fuel. Note that on DGAS types, three progression holes are provided in each barrel.

When the throttle valves (14) are sufficiently open, the



3.2 Location of the idling and progression holes (40 DFAV type)

idling and progression system ceases and the main fuel supply system operates.

DFAV types are provided with a float chamber vapour discharge valve (31) which prevents the build up of vapour within the float chamber. The valve is open when the throttle valves are fully shut or fully open and additionally controls the overfeed enrichment air bleed.

Normal running

Under full throttle and high speed cruise conditions, the main fuel supply circuit is brought into action. Refer to Fig. 9.5 and note that fuel from the float chamber (9) passes through the main jets (10) to the emulsion tube wells (12). Air is drawn through the air corrector jets (2), through the holes in the emulsion tubes (13) and emulsifies the fuel which is then drawn through the nozzles (18) and auxiliary venturis (17). The mixture then combines with the main air supply as it is drawn through the chokes (16) and into the engine.

At high engine speeds with the throttle valves (14) open, the overfeed enrichment circuit is brought into action (not 40 DFA types) and additional fuel is supplied through the calibrated tubes (1) via the calibrated bushes (4).

DGAS type carburetors are also equipped with a full power valve which operates immediately the throttle valves are opened quickly. Refer to Fig. 9.6 and note that under these conditions the vacuum through the channel (7) is insufficient to draw the diaphragm (4) against the spring (6). The operating rod (5) therefore opens the full power valve (17). The fuel level in the emulsion tube wells (14) immediately rises and the mixture drawn from the nozzle (9) is enriched. When the throttle valves (12) are partially open, the vacuum through the channel (7) overcomes the tension of the spring (6) and the full power valve shuts.

Acceleration

To provide the engine with a rich mixture when accelerating, the carburettor is provided with a diaphragm type acceleration pump which is operated by the primary throttle shaft but

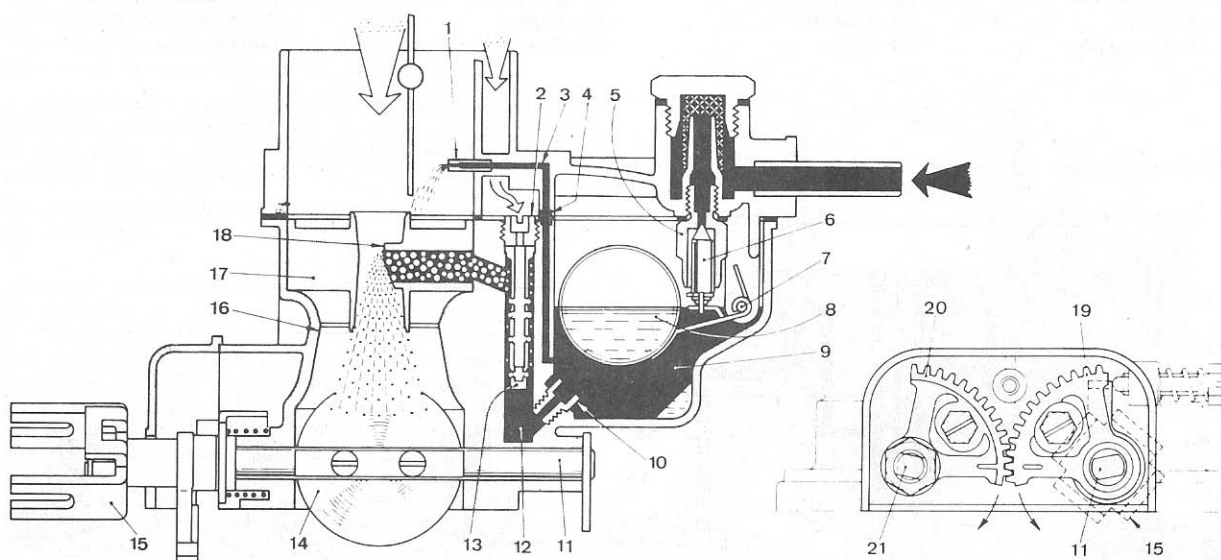


Fig. 9.5 Carburettor normal phase (DFAV types) (Sec 3)

- | | | | |
|------------------------|-------------------|-------------------|----------------------|
| 1 Enrichment tube | 7 Fulcrum pin | 12 Well | 17 Auxiliary venturi |
| 2 Air corrector jet | 8 Float | 13 Emulsion tube | 18 Nozzle |
| 3 Channel | 9 Float chamber | 14 Throttle valve | 19 Primary sector |
| 4 Calibrated bush | 10 Main jet | 15 Lever | 20 Secondary sector |
| 5 Needle valve seating | 11 Throttle shaft | 16 Choke | 21 Throttle shaft |
| 6 Needle | | | |

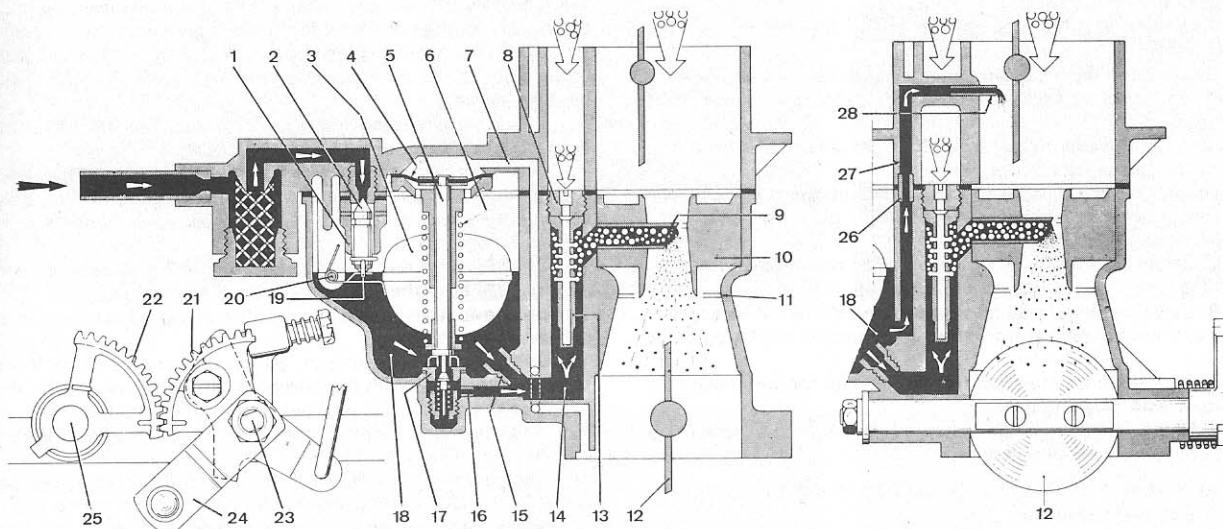


Fig. 9.6 Carburettor normal phase (DGAS types) (Sec 3)

- | | | | |
|------------------------|----------------------|---------------------|---------------------|
| 1 Needle valve seating | 8 Air corrector jet | 15 Main jet | 22 Secondary sector |
| 2 Needle | 9 Nozzle | 16 Calibrated bush | 23 Throttle shaft |
| 3 Float | 10 Auxiliary venturi | 17 Full power valve | 24 Lever |
| 4 Diaphragm | 11 Choke | 18 Float chamber | 25 Throttle shaft |
| 5 Rod | 12 Throttle valve | 19 Hook | 26 Calibrated bush |
| 6 Spring | 13 Emulsion tube | 20 Fulcrum pin | 27 Channel |
| 7 Channel | 14 Well | 21 Primary sector | 28 Enrichment tube |

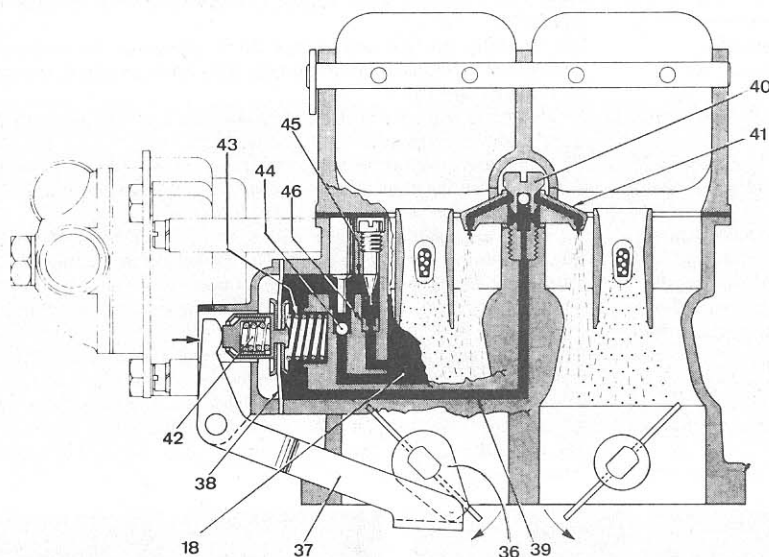


Fig. 9.7 Carburettor acceleration phase (Sec 3)

- | |
|--------------------|
| 18 Float chamber |
| 36 Cam |
| 37 Lever |
| 38 Diaphragm |
| 39 Channel |
| 40 Delivery valve |
| 41 Pump jet |
| 42 Spring |
| 43 Return spring |
| 44 Ball |
| 45 Blanking needle |
| 46 Discharge jet |

injects into both venturis. Reference to Fig. 9.7 will show that when the throttle valves are closed, the accelerator pump diaphragm (38) draws fuel from the float chamber (18), through the ball valve (44) into the pump chamber. When the throttle valves are opened, the cam (36) moves the lever (37) and fuel is forced along the channel (39), through the delivery valve (40) and out of the pump jet (41). The spring (42) absorbs the initial movement of the lever (37) and prolongs the fuel delivery period. Excess fuel and any accumulated air is discharged into the float chamber (18) through the channel (45) and calibrated bush (46).

DGAS types are fitted with a discharge blanking needle which determines the amount of fuel returned to the float chamber (18).

DFAV types are equipped with an accelerator pump lever

incorporating two pivot holes whereby the pump stroke can be varied.

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 (screws are fitted to some models).
- 2 Lift out the air filter element.
- 3 Bend back the locktabs and unscrew the air cleaner body retaining nuts.
- 4 Unscrew and remove the mounting bracket bolts and

remove the air cleaner together with the reinforcement plate and gasket.

5 Partially drain the cooling system and disconnect the two water hoses.

6 Disconnect the fuel supply pipe and return pipe (where fitted) and release the vent tube from the top of the float chamber.

7 Release the distributor automatic advance pipe from the side of the carburettor.

8 Disconnect the throttle control shaft from the throttle lever.

9 Disconnect the crankcase ventilation pipe from the heat insulator spacer, if fitted.

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

11 Remove the inlet manifold gasket and spacer (if fitted) and clean all traces of gasket from the inlet manifold and carburettor flange.

12 Protect the inlet manifold from ingress of foreign matter by sealing it with masking tape.

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

(a) Always fit new gaskets and tighten the mounting nuts in diagonal sequence

(b) Note that on some fittings the lower gasket has two metal V-notches which must locate within the inlet manifold

(c) Refill the cooling system in accordance with the manufacturer's instructions

(d) The idling adjustment screws should be set as described in Sections 8 and 9 and finally tuned as described in Section 10

5 Disassembly (40 DFA and 40 DFAV types)

1 Thoroughly clean the carburettor exterior and wipe dry.

2 Referring to Fig. 9.8, unscrew and remove the fuel filter inspection plug (4) and extract the filter (5) (photo).

3 Disconnect the choke plate operating rod (16) from the lever (39) by removing the split pin (15).

4 Unscrew and remove the carburettor cover retaining screws (3) together with the spring washers, then carefully lift the cover (1) from the main body (photo).

5 Invert the carburettor cover (1) so that the float assembly is uppermost, then extract the float fulcrum pin (14) and withdraw the float assembly (13) together with the needle of the needle valve (12). If necessary, use a suitable diameter pin punch to tap the pin from the two posts, but on no account prise the slotted post apart (photo).

6 Unhook the needle from the float assembly (13).

7 Lift the gasket (9) from the cover (1).

8 On 40 DFAV types only, unscrew and remove the vent and power valve (92) from the cover (1) (photo).

9 Unscrew and remove the needle valve (12) seating and

remove the gasket (11) (photo).

10 Unscrew the two main jets (17) and remove them from the bottom of the float chamber in the main body (photos).

11 Unscrew the idling jet holders (83) from each side of the carburettor body, then separate the idling jets (84) from their holders (photos).

12 Unscrew and remove the air corrector jets (88) from the carburettor body (photos).

13 Invert the body and extract the emulsion tubes (89). If these are tight due to overtightening of the air corrector jets, use a selftapping screw to remove them but take care not to damage the tubes (photos).

14 Unscrew and remove the idling adjusting screws (81) and springs (82) from the body.

15 Unscrew and remove the throttle idling adjustment screw (28) and spring (27).

16 Unscrew the accelerator pump delivery valve (87) and remove it together with the pump jet (86) and gasket (85), then separate the gasket and jet from the valve (photos).

17 Unscrew and remove the accelerator pump discharge blanking plug (18) (photo).

18 Unscrew the four screws (26) and withdraw the accelerator cover (25) together with the diaphragm (24) and spring (23). If necessary, peel the diaphragm assembly (24) from the cover (25) (photos).

19 Working on the carburettor cover (1), extract the split pin (15) and detach the operating rod (16) from the choke spindle arm.

20 Pull the rod (16) through the seal (10), then prise the plug (101) and seal (10) from the cover (1) (photo).

21 Note the location of each choke valve (7) and if necessary, mark them with a pencil.

22 Unscrew the retaining screws (6) and remove the choke valves (7) from the shaft (8), then remove the shaft (8) from the cover (1).

23 Working on the carburettor body, unscrew the automatic choke water housing retaining bolt (58) and remove it together with the gasket (57).

24 Remove the cover (56) and gasket (54); cut the gasket from the thermostat assembly (53) if it is stuck.

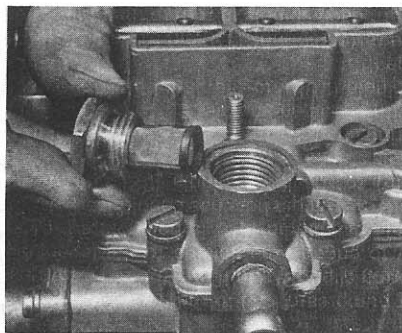
25 Unscrew and remove the retaining screws (59) and lift the automatic choke thermostat assembly (53) from the body (47), then remove the retaining ring (55) (photo).

26 Remove the disc gasket (52), then unscrew and remove the three retaining screws (51) and spring washers. Withdraw the automatic choke body (47) at the same time disengage the fast idling control rod (61) from the throttle lever (71) by extracting the split pin (60) (photos).

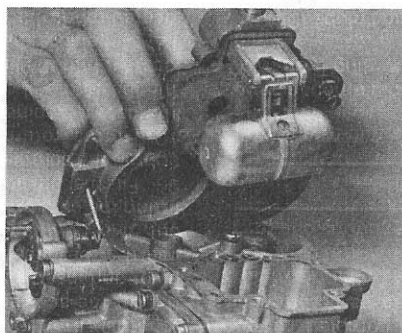
27 Disconnect the rod (61) from the fast idle lever (29) by extracting the split pin (60), if fitted.

28 Note the location of the individual components on the automatic choke body (47) before dismantling them.

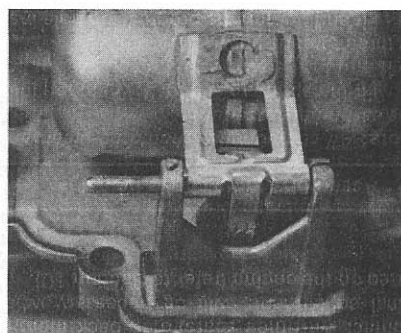
29 Prise the O-ring seal (35) from the side of the carburettor (photo).



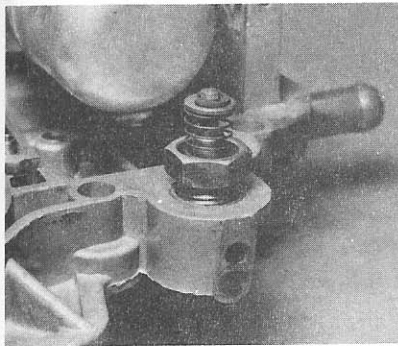
5.2 Removing the fuel filter (DFAV type)



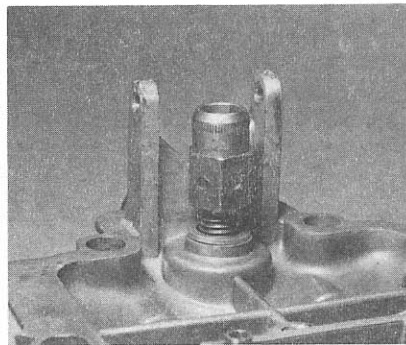
5.4 Removing the carburettor cover (DFAV type)



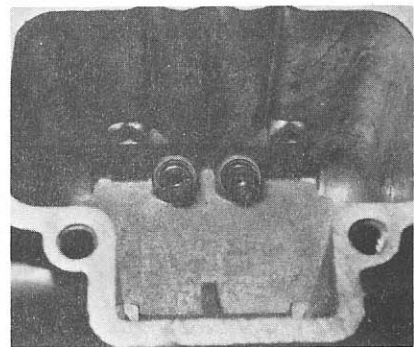
5.5 Withdrawing the float fulcrum pin (DFAV type)



5.8 Location of the vent and air bleed valve (DFAV type)



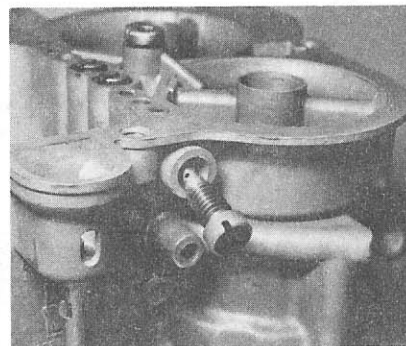
5.9 Removing the needle valve seat (DFAV type)



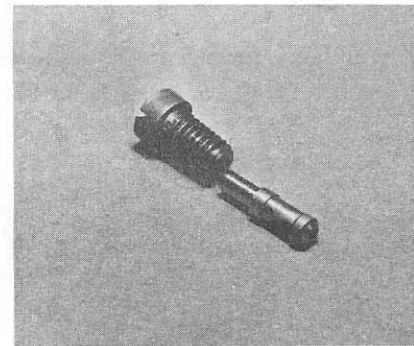
5.10a Location of the main jets (DFAV type)



5.10b Location of the main jet size (DFAV type)



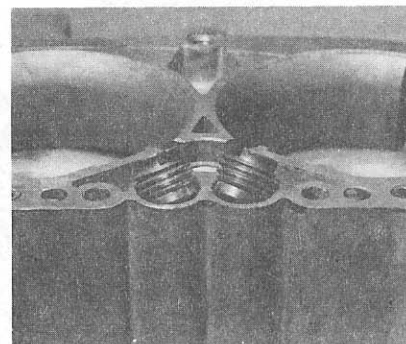
5.11a Removing the idling jets (DFAV type)



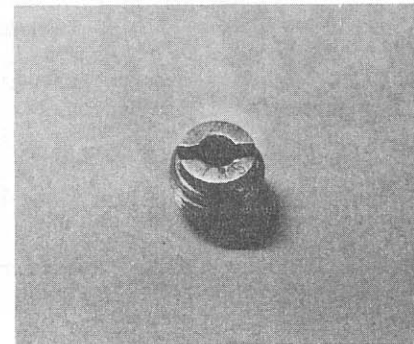
5.11b Idle jet and holder (DFAV type)



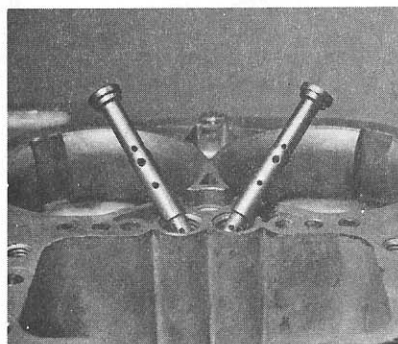
5.11c Idle jet size location (DFAV type)



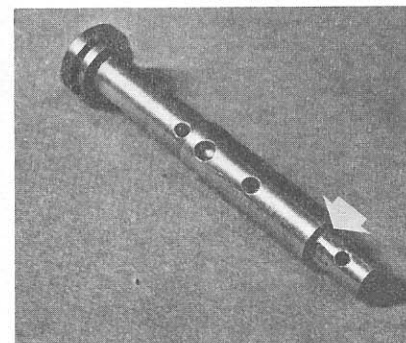
5.12a Removing the air connector jets (DFAV type)



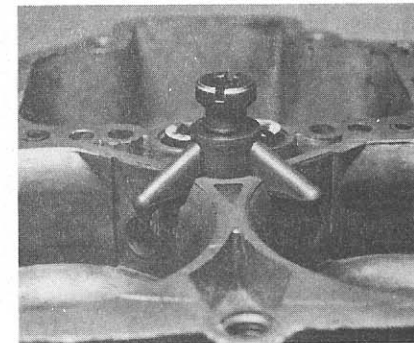
5.12b Air corrector jet size location (DFAV type)



5.13a Removing the emulsion tubes (DFAV type)



5.13b Emulsion tube size location (DFAV type)



5.16a Removing the accelerator pump delivery valve (DFAV type)

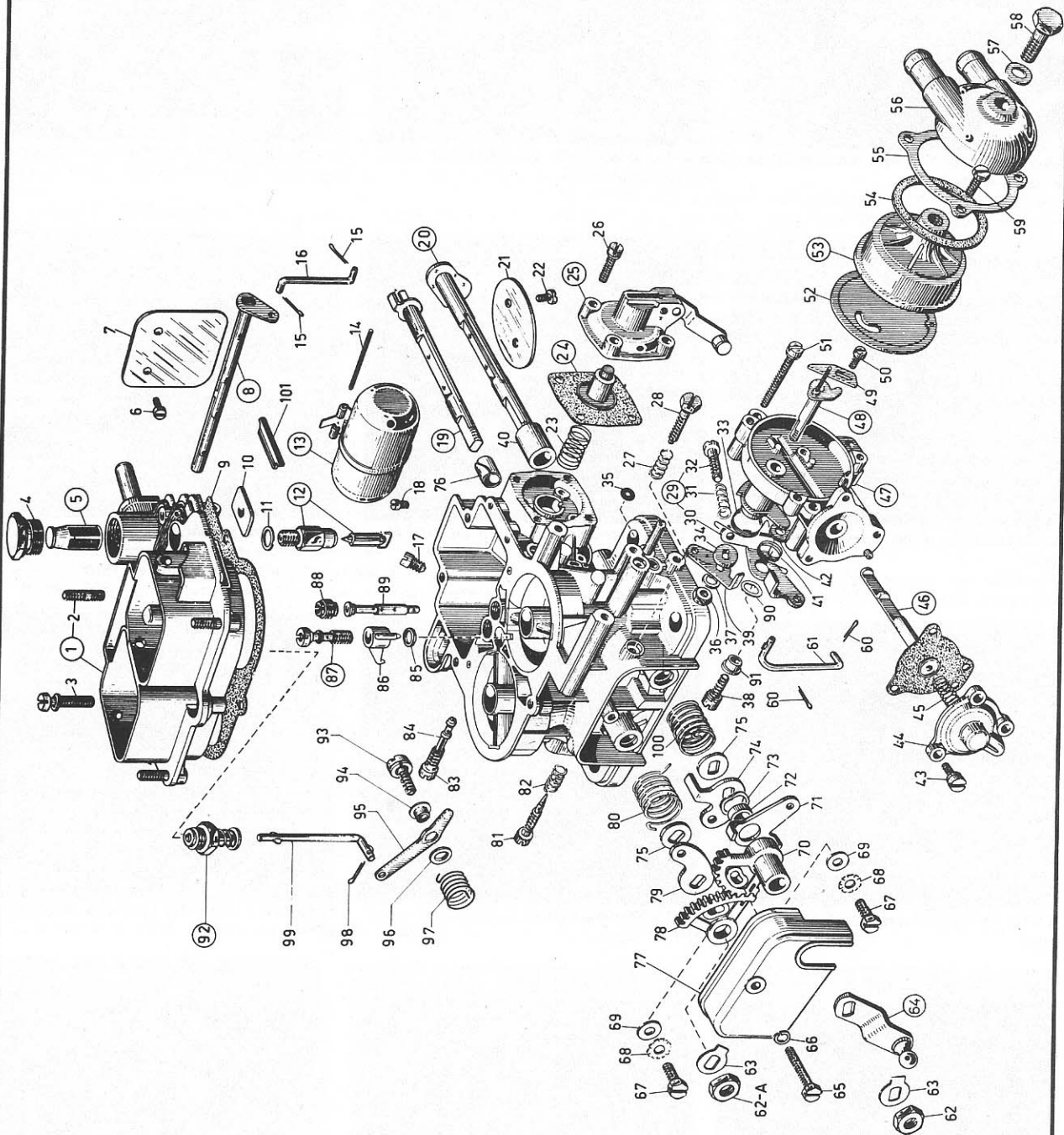
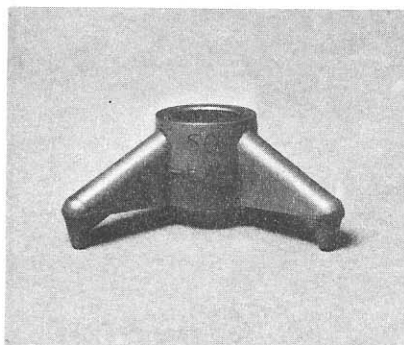
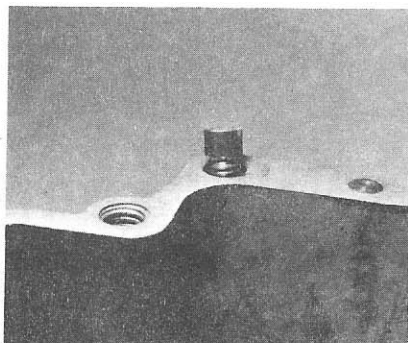


Fig. 9.8 Exploded view of the 40 DFAV carburettor (typical) (Sec 5)

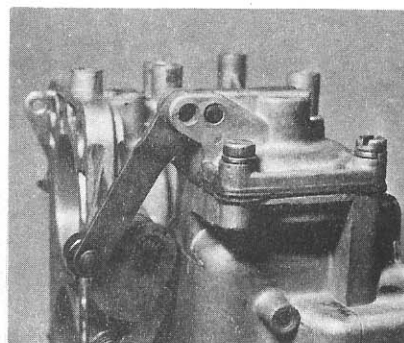
1	Carburettor cover assembly	27	Idling adjusting screw spring	51	Auto-choke body to throttle body screw and washer	76	Throttle shaft bearing
2	Carburettor to air cleaner stud	28	Idling adjustment screw	52	Auto-choke body gasket	77	Geared sectors cover
3	Cover screw and washer	29	Fast idling adjusting lever assy	53	Auto-choke thermostat assy	78	Geared sector (left-hand)
4	Strainer inspection plug	30	Lever	54	Water chamber to thermostat assy	79	Geared sector adjusting lever
5	Fuel inlet strainer assy	31	Spring	55	Locking ring	80	Throttle control return spring (left-hand)
6	Choke plate screw	32	Screw	56	Water chamber	81	Idle adjustment needle screw
7	Choke plate	33	Auto-choke shaft spring	57	Washer	82	Spring
8	Choke shaft and lever assy	34	Auto-choke shaft spacer	58	Bolt	83	Idling jet holder
9	Cover to throttle body gasket	35	Auto-choke body O-ring seal	59	Screw	84	Idle jet
10	Air cleaner dust seal	36	Auto-choke lever fixing nut	60	Fast idle rod split pin	85	Nozzle bar gasket
11	Fuel intake valve gasket	37	Spring washer	61	Fast idle rod	86	Accelerator pump jet
12	Fuel inlet needle valve assy	38	Fast idle lever pivot screw and washer	62	Throttle shaft nut	87	Accelerator pump valve assy
13	Float assy	39	Auto-choke lever	63	Lockwasher	88	Air corrector jet
14	Float lever shaft	40	Right-hand shaft spacer	64	Throttle lever	89	Emulsion tube
15	Auto-choke control rod split pin	41	Fast idle lever spring	65	Geared sector cover screw	90	Auto-choke wave washer
16	Auto-choke operating rod	42	Fast idle lever washer	66	Spring washer	91	Fast idling adjusting lever bush
17	Main jet	43	Auto-choke cover screw and washer	67	Geared sector adjusting screw	92	Power valve
18	Accelerator plug discharge plug	44	Auto-choke cover	68	External tooth washer	93	Lever fixing screw
19	Throttle left-hand shaft	45	Auto-choke vacuum diaphragm spring	69	Washer	94	Bushing
20	Throttle right-hand shaft assy	46	Auto-choke vacuum diaphragm and shaft assy	70	Geared sector (right-hand)	95	Valve control lever
21	Throttle plate	47	Auto-choke body assy	71	Fast idling lever	96	Washer
22	Throttle plate screw	48	Auto-choke shaft and lever assy	72	Throttle shaft bushing	97	Spring
23	Accelerator pump self-loading spring	49	Auto-choke shaft adjusting plate	73	Wave washer	98	Split pin
24	Accelerator pump diaphragm assy	50	Screw	74	Full throttle stop lever	99	Valve control rod
25	Accelerator pump cover assy			75	Washer	100	Return spring (right shaft)
26	Accelerator pump cover screw and washer					101	Dust seal plug



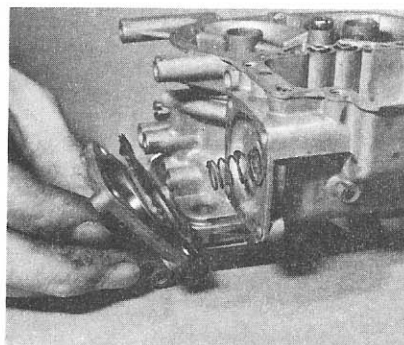
5.16b Accelerator pump jet size location (DFAV type)



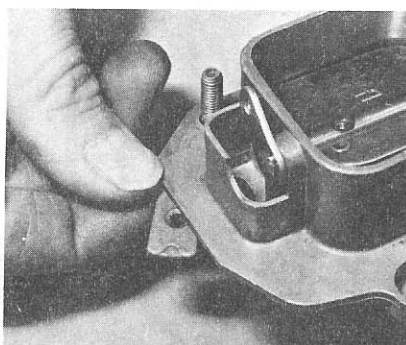
5.17 Removing the accelerator pump discharge plug (DFAV type)



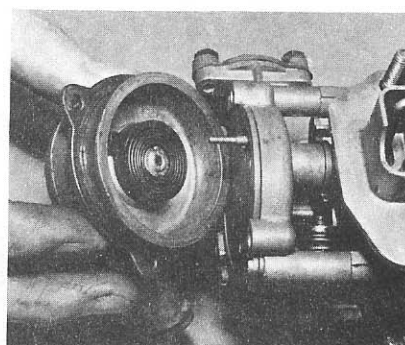
5.18a Accelerator pump location (DFAV type)



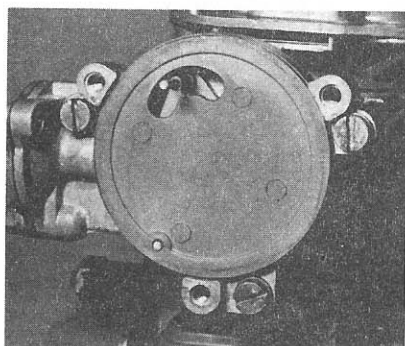
5.18b Removing the accelerator pump cover (DFAV type)



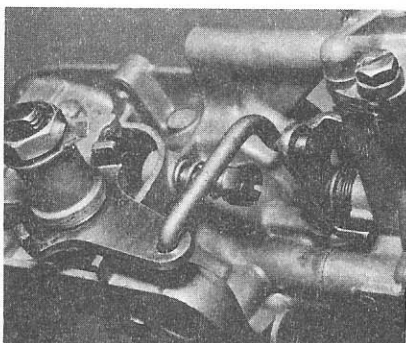
5.20 Removing the cover dust seal (DFAV type)



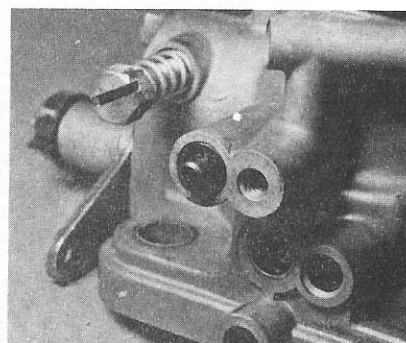
5.25 Withdrawing the thermostat housing (DFAV type)



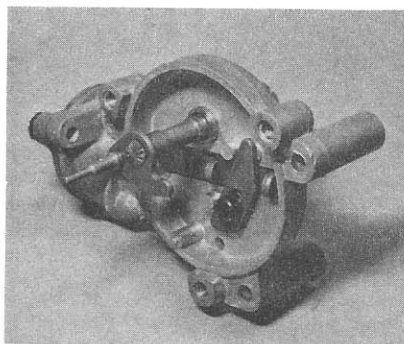
5.26a Insulation gasket location (DFAV type)



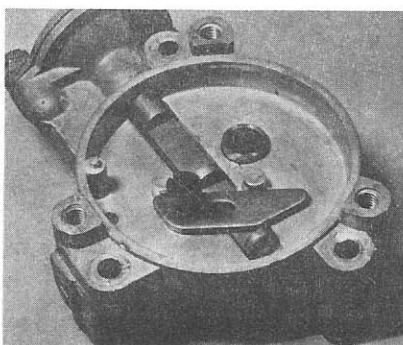
5.26b Location of the fast idling control rod (DFAV type)



5.29 Automatic choke O-ring seal location (DFAV type)



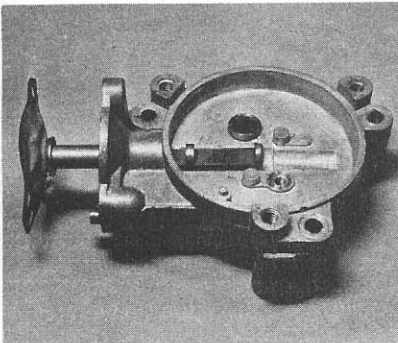
5.33 Removing the automatic choke shaft (DFAV type)



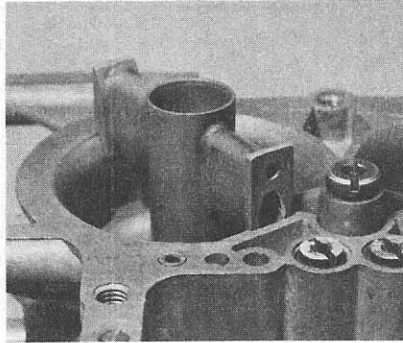
5.34 Removing the stop plate (DFAV type)



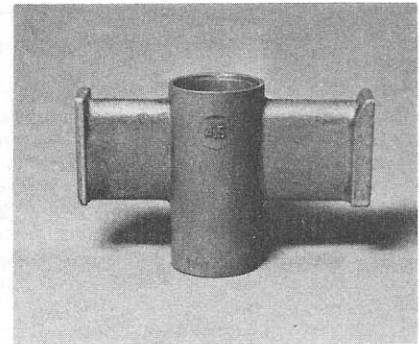
5.35 Removing the diaphragm cover (DFAV type)



5.36 Withdrawing the diaphragm rod (DFAV type)



5.39a Removing the auxiliary venturi (DFAV type)



5.39b Auxiliary venturi size location (DFAV type)

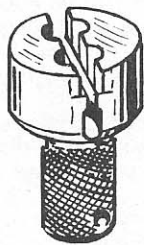
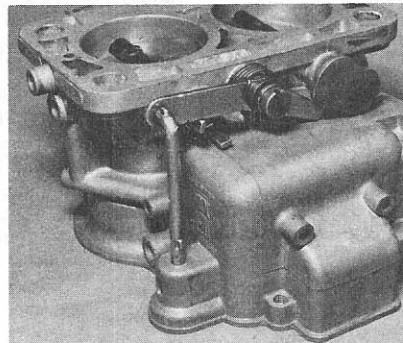
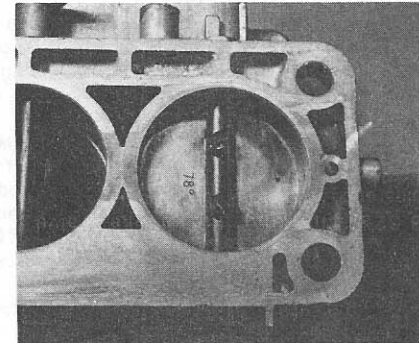


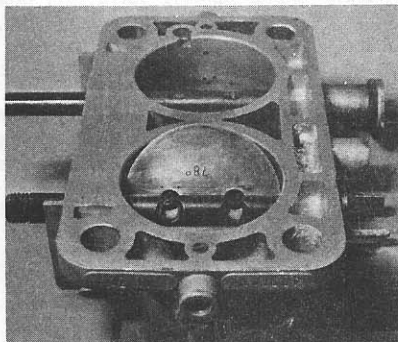
Fig. 9.9 Tool for holding throttle shaft (DFA and DFAV types) (Sec 5)



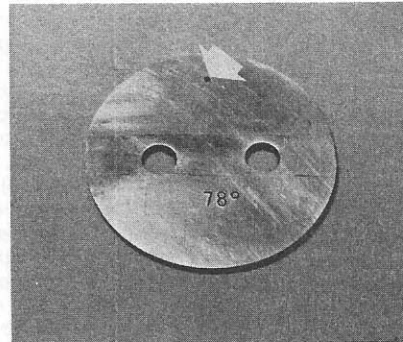
5.46 Vent valve operating arm location (DFAV type)



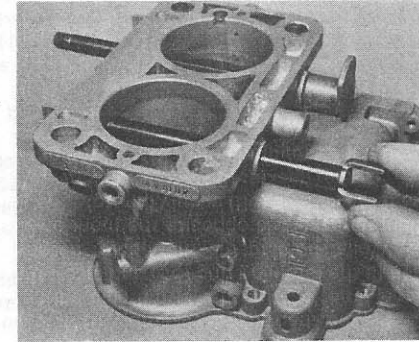
5.48 Throttle valve retaining screw location (DFAV type)



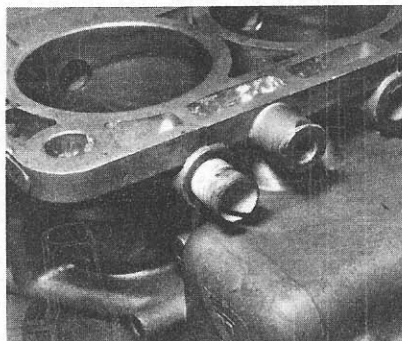
5.49a Removing a throttle valve (DFAV type)



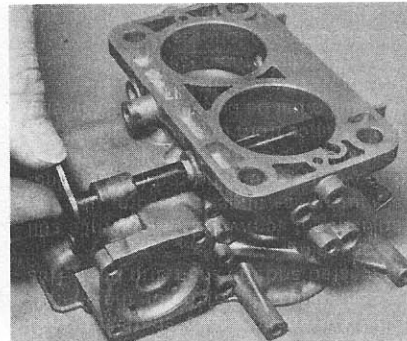
5.49b Throttle valve showing the idle bleed hole (DFAV type) (arrowed)



5.50a Removing a throttle shaft (DFAV type)



5.50b Removing a Teflon bush (DFAV type)



5.51 Removing the primary throttle shaft (DFAV type)

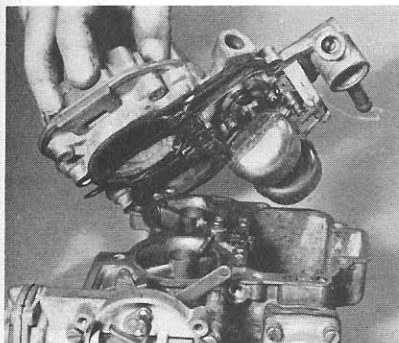
- 30 Unscrew and remove the retaining screw (38) and bush (91) then withdraw the wave washer (90).
- 31 Remove the fast idle lever (29) and spring (41) noting the position of the latter, then remove the washer (42).
- 32 Unscrew and remove the adjusting screw (32) and spring (31) from the lever (30).
- 33 Unscrew and remove the retaining nut (36) and spring washer (37), then withdraw the lever (39), spring (33) and spacer (34). The shaft (48) can now be removed (photo).
- 34 Mark the location of the adjusting stop plate (49) on the body (47), then remove the screw (50) and lift the plate out (photo).
- 35 Unscrew and remove the retaining screws (43) lift off the cover (44) and spring (45) (photo).
- 36 Carefully release the thin diaphragm, then withdraw the operating rod (46) from the body (47) (photo).
- 37 Unscrew and remove the starting duct inspection plug from the bottom of the body (47).
- 38 The automatic choke body is supplied complete with the fast idle cam and it is therefore not necessary to dismantle this item. However if a second-hand part is being fitted, the cam and bush may be driven out of the body using a suitable diameter metal drift.
- 39 Mark the position and location of the auxiliary venturis, then remove them from the carburettor barrels. If they are tight, open the throttle valves and use a plastic or wooden rod to tap them out. Failure of this method to remove the auxiliary venturis will necessitate obtaining Weber tool no 9610 150 0035 (photos).
- 40 Unscrew and remove the retaining screw (65) and spring washer (66) then withdraw the cover (77).
- 41 Invert the carburettor body, then bend back the tab washers (63).
- 42 Unscrew and remove the nuts (62 and 62A) from the ends of each throttle shaft. If they are tight, Weber tool no 9610 315 1201 should be used to hold the shaft stationary, otherwise the shaft could be buckled.
- 43 From the throttle shaft (20) located at the automatic choke side of the carburettor, remove the tab washer (63), throttle lever (64), toothed sector (70), lever (71), bush (72), wave washer (73), stop lever (74), spacer (75) and spring (100), if fitted.
- 44 From the throttle shaft (19) located furthest from the automatic choke mounting, remove the tab washer (63), toothed sector (78), lever (79), spacer (75) and spring (80).
- 45 Unscrew and remove the adjustment screws (67) from the toothed sectors, together with the lock washers (68) and plain washers (69), in order to separate the levers from the toothed sectors.
- 46 On DFAV types only, unscrew and remove the retaining screw (93) and withdraw the vent valve operating arm (95) and rod (99). Remove the bush (94), washer (96) and spring (97), then separate the rod from the arm by extracting the split pin (98) (photo).
- 47 Close each throttle valve in turn and mark the valves (21) with a pencil so that they can be refitted in their original positions.
- 48 Unscrew and remove the retaining screws (22) (photo).
- 49 Fully open the throttles and remove the valves (21) from the shafts (19 and 20) (photos).
- 50 Remove the shaft (19) from the carburettor body, then extract the Teflon bushes and mark them relative to their locations (photos).
- 51 Remove the shaft (20) from the carburettor body, withdraw the spacer (40), then extract the Teflon bushes and again mark them relative to their locations (photo).

6 Disassembly (34 DGAS and 38 DGAS types)

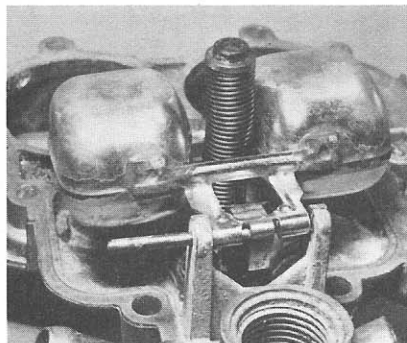
- 1 Thoroughly clean the carburettor exterior and wipe dry.
- 2 Referring to Fig. 9.10, unscrew and remove the fuel filter inspection plug (11) and extract the filter (10).
- 3 Disconnect the choke plate operating lever (37) from the

choke shaft (4) after prising out the C-clip with a small screwdriver.

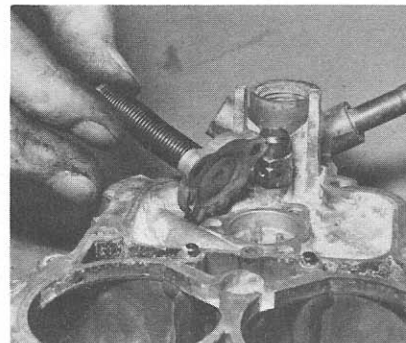
- 4 Unscrew and remove the carburettor cover retaining screws (3) together with the spring washers, then carefully lift the cover (1) from the main body (86) (photo).
- 5 Invert the carburettor cover (1) so that the float assembly (15) is uppermost, then extract the float fulcrum pin (90) and withdraw the float assembly (15) together with the needle of the needle valve (14). If necessary, use a suitable diameter pin punch to tap the pin from the two posts, but on no account prise the slotted post apart (photo).
- 6 Unhook the needle from the float assembly (15).
- 7 Lift the gasket (12) from the cover (1).
- 8 Unscrew and remove the retaining screws (91) and spring washers (92) and lift the power valve assembly (93) from the cover (1), taking care not to damage the diaphragm (photo).
- 9 Using a 10 mm socket or ring spanner, unscrew and remove the needle valve (14) seating and remove the gasket (13) (photo).
- 10 Unscrew the two main jets (19) and remove them from the bottom of the float chamber in the main body (photo).
- 11 Unscrew the idling jet holders (36) from each side of the carburettor body, then separate the idling jets (34) from their holders and remove the gaskets (35) (photos).
- 12 Unscrew and remove the air corrector jets (94) from the carburettor body (photo).
- 13 Invert the body and extract the emulsion tubes (89). If these are tight due to overtightening of the air corrector jets, use a selftapping screw to remove them but take care not to damage the tubes (photos).
- 14 Unscrew and remove the idling mixture adjusting screws (87) and springs (88) from the body (photo).
- 15 Unscrew and remove the throttle idling adjustment screw (73) and spring (74).
- 16 Unscrew and remove the full power valve (18) and gasket (17) from the bottom of the float chamber (photo).
- 17 Unscrew the accelerator pump delivery valve (97) and remove it together with the pump jet (96) and gaskets (95), then separate the gaskets and jet from the valve (photo).
- 18 Unscrew and remove the accelerator pump discharge blanking needle (16) (photo).
- 19 Unscrew the four screws (31) and withdraw the accelerator pump cover (41) together with the diaphragm (32) and spring (33). If necessary, peel the diaphragm assembly (32) from the cover (41) (photos).
- 20 Working on the carburettor cover (1), prise out the plug (8) and seal (7) using a screwdriver.
- 21 Note the location of each choke valve (5) and if necessary, mark them with a pencil.
- 22 Unscrew and remove the retaining screws (9), then withdraw the choke valves (5) from the shaft (4); the shaft (4) can now be removed from the cover (1).
- 23 Working on the carburettor body, unscrew the automatic choke water housing retaining bolt (46) and remove it together with the gasket (45) (photo).
- 24 Remove the cover (47) and gasket (48). Cut the gasket from the thermostat assembly (50) if it is stuck.
- 25 Unscrew and remove the retaining screws (44) and lift the automatic choke thermostat assembly (50) from the body (53), then remove the retaining ring (49) (photo).
- 26 Remove the disc gasket (51), then unscrew and remove the three retaining screws (42) and spring washers. Withdraw the automatic choke body (53), at the same time disengage the fast idling control rod (61) from the lever (64) (photo).
- 27 Disconnect the rod (61) from the fast idle lever (75) by extracting the split pin (60) (photo).
- 28 Note the location of the individual components of the automatic choke before dismantling them.
- 29 Prise the O-ring seal (69) from the side of the carburettor (photo).
- 30 Unscrew and remove the retaining screw (72) together with the lever (63) and washers (photo).
- 31 Separate the washer (62), lever (63), wave washer (70) and



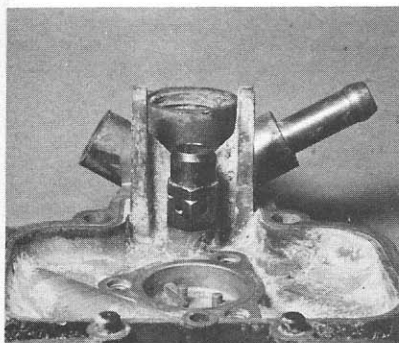
6.4 Removing the carburettor cover (DGAS type)



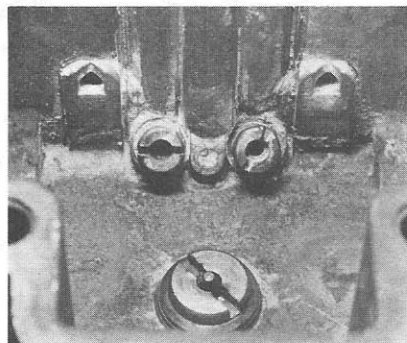
6.5 Withdrawing the float fulcrum pin (DGAS type)



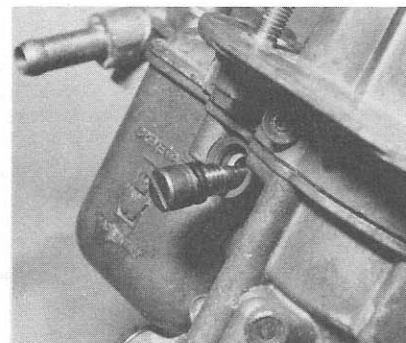
6.8 Removing the full power valve assembly (DGAS type)



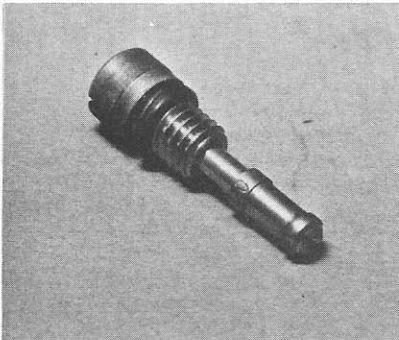
6.9 Needle valve seating (DGAS type)



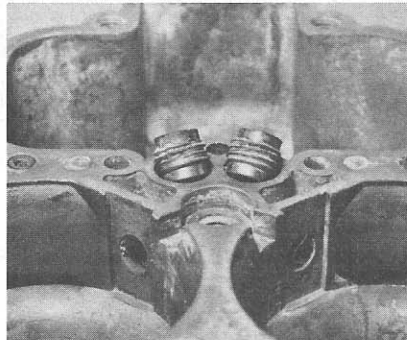
6.10 Main jet location (DGAS type)



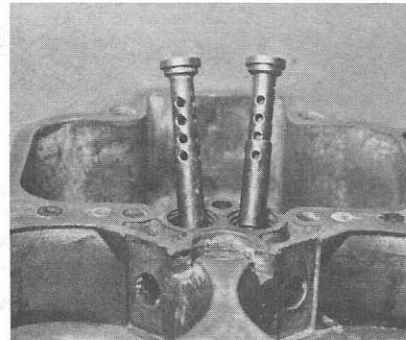
6.11a Removing an idling jet (DGAS type)



6.11b Idling jet and holder (DGAS type)



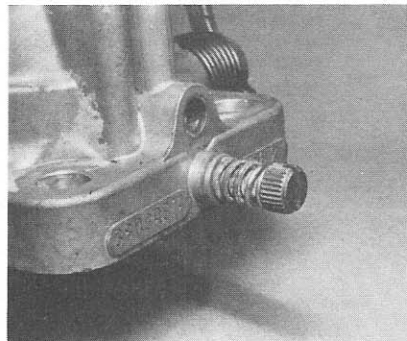
6.12 Removing the air corrector jets (DGAS type)



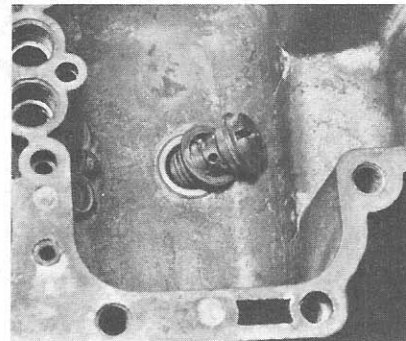
6.13a Removing the emulsion tubes (DGAS type)



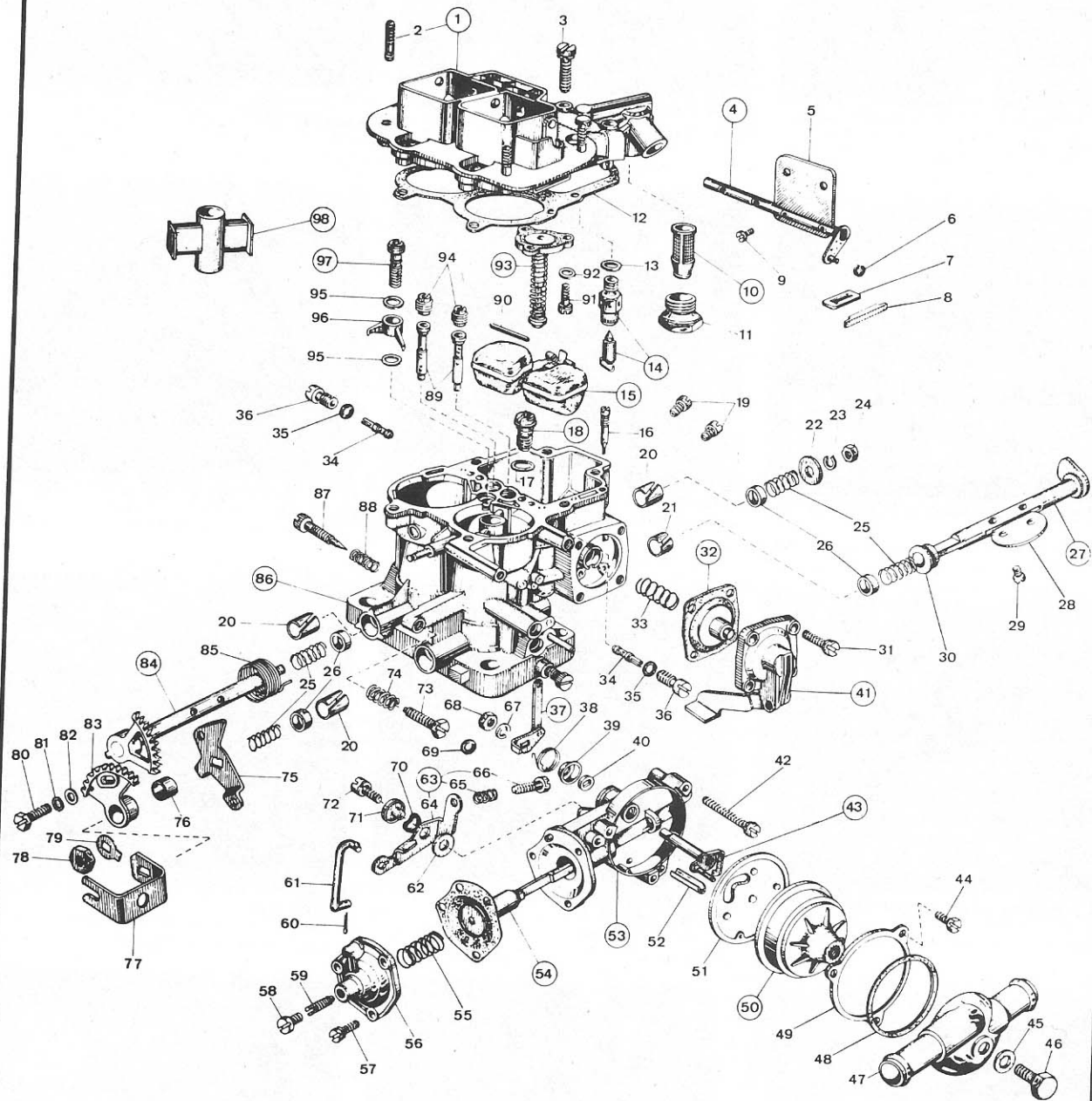
6.13b The emulsion tube (DGAS type)

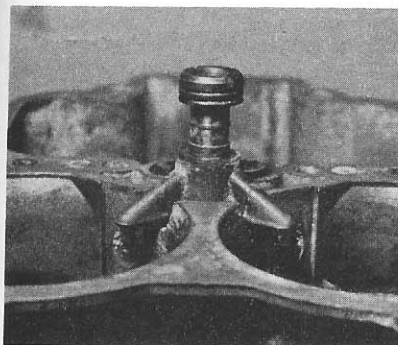


6.14 Location of an idling mixture adjusting screw (DGAS type)

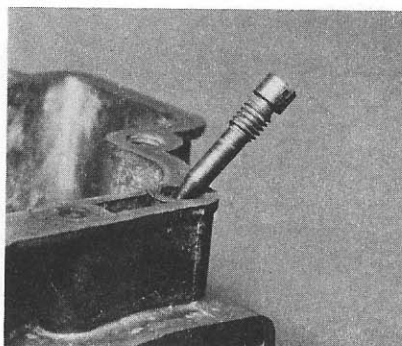


6.16 Removing the full power valve (DGAS type)

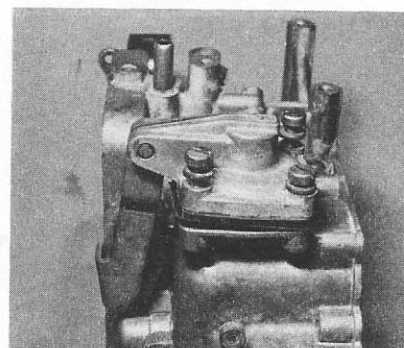




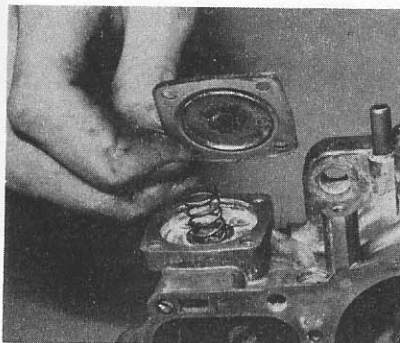
6.17 Removing the accelerator pump delivery valve (DGAS type)



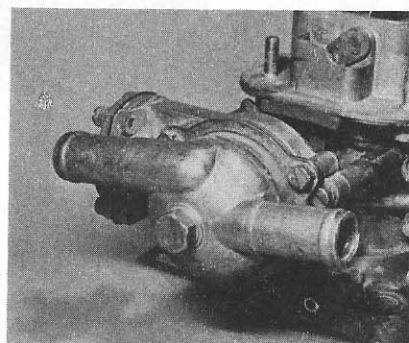
6.18 Removing the discharge blanking needle (DGAS type)



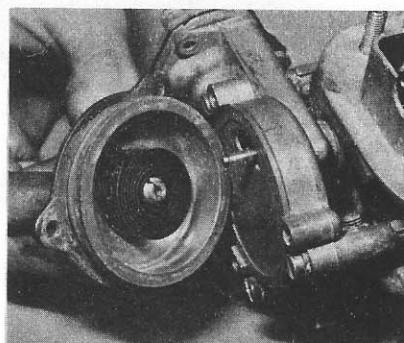
6.19a Acceleration pump cover location (DGAS type)



6.19b Removing the accelerator pump cover (DGAS type)



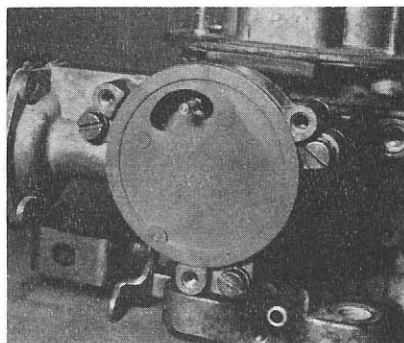
6.23 Automatic choke cover location (DGAS type)



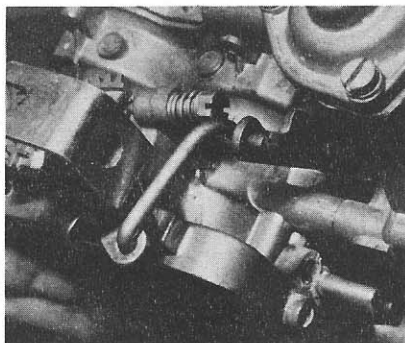
6.25 Removing the thermostat assembly (DGAS type)

Fig. 9.10 Exploded view of the 38 DGAS carburettor (typical) (Sec 6)

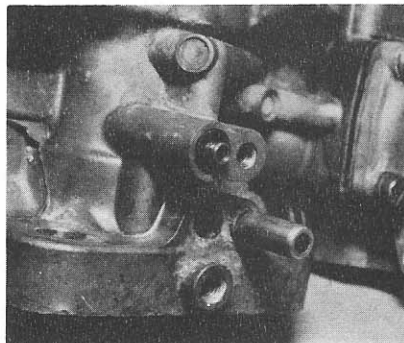
- | | | |
|------------------------------------|--------------------------------------|---|
| 1 Carburettor cover assy | 34 Idling jet | 67 Spring washer |
| 2 Stud | 35 Gasket for idling jet holder | 68 Throttle shaft fixing nut |
| 3 Carburettor cover fixing screw | 36 Idling jet holder | 69 Auto-choke O-ring seal |
| 4 Choke shaft and lever assy | 37 Choke control lever assy | 70 Washer for idle loose lever |
| 5 Choke throttle valve | 38 Spring for fast idle cam | 71 Bushing for idle loose lever |
| 6 Lock ring | 39 Spring retaining cover | 72 Screw securing fast idle loose lever |
| 7 Dust seal plate | 40 Washer for shaft | 73 Throttles adjusting screw |
| 8 Dust seal plug | 41 Accelerator pump cover assy | 74 Spring for throttle adjusting screw |
| 9 Choke plates fixing screw | 42 Choke fixing screw | 75 Toothed sector control lever |
| 10 Strainer assy | 43 Auto-choke shaft and lever assy | 76 Bushing for toothed sector |
| 11 Strainer inspection plug | 44 Screw for plate | 77 Throttle control lever |
| 12 Carburettor cover gasket | 45 Seal for water cover fixing screw | 78 Primary shaft fixing nut |
| 13 Gasket for needle valve | 46 Water cover fixing screw | 79 Lockwasher |
| 14 Needle valve assy | 47 Auto-choke water chamber | 80 Toothed sector fixing screw |
| 15 Float assy | 48 Water cover gasket | 81 Wave washer |
| 16 Pump discharge blanking needle | 49 Thermostat assy locking ring | 82 Flat washer |
| 17 Gasket for power valve | 50 Auto-choke thermostat assy | 83 Primary toothed sector |
| 19 Main jet | 51 Gasket for auto-choke body | 84 Secondary main shaft assy |
| 20 Plate for shafts | 52 Plate for auto-choke shaft | 85 Shaft return spring |
| 21 Plate for shafts | 53 Auto-choke body assy | 86 Carburettor body |
| 22 Washer for secondary shaft | 54 Choke diaphragm assy | 87 Idle adjusting screw |
| 23 Spring washer | 55 Spring for diaphragm | 88 Spring for idle adjusting screw |
| 24 Secondary shaft fixing nut | 56 Auto-choke cover | 89 Emulsifying tube |
| 25 Bush retaining spring | 57 Screw securing auto-choke cover | 90 Float fixing pin |
| 26 Bushing for shafts | 58 Plug | 91 Screw securing power valve |
| 27 Primary main shaft assy | 59 Diaphragm adjusting screw | 92 Flat washer |
| 28 Throttle valve | 60 Pin for fast idle rod | 93 Power valve assy |
| 29 Throttle valve fixing screw | 61 Fast idling control rod | 94 Air corrector jet |
| 30 Spacer | 62 Washer for fast idle loose lever | 95 Pump jet gasket |
| 31 Screw securing pump cover | 63 Fast idle loose lever assy | 96 Pump jet |
| 32 Accelerator pump diaphragm assy | 64 Lever | 97 Pump delivery valve assy |
| 33 Pump loading spring | 65 Spring | 98 Auxiliary venturi |
| | 66 Screw | |



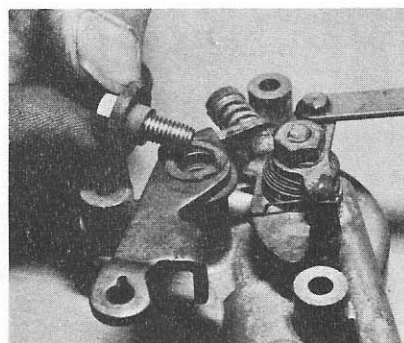
6.26 Insulation disc gasket location (DGAS type)



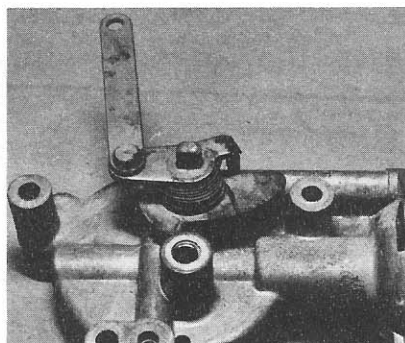
6.27 Location of the fast idle rod (DGAS type)



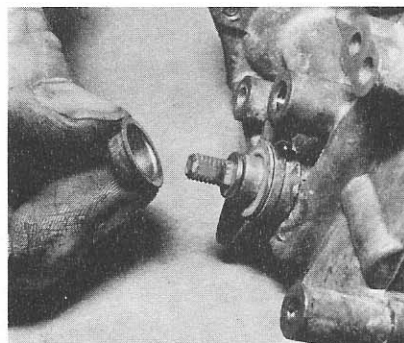
6.29 Automatic choke O-ring location (DGAS type)



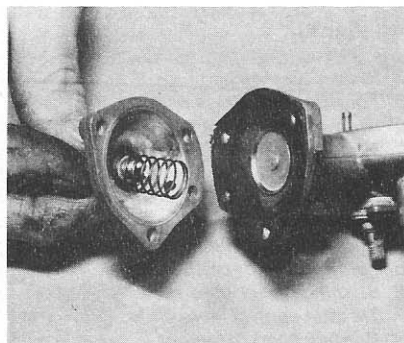
6.30 Removing the fast idle lever (DGAS type)



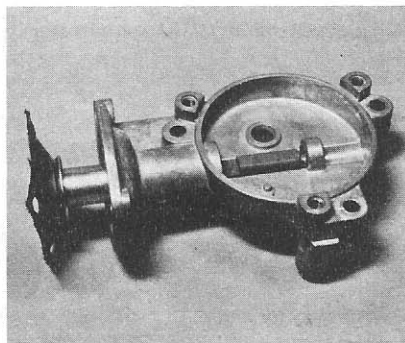
6.33a Removing the choke lever and spring (DGAS type)



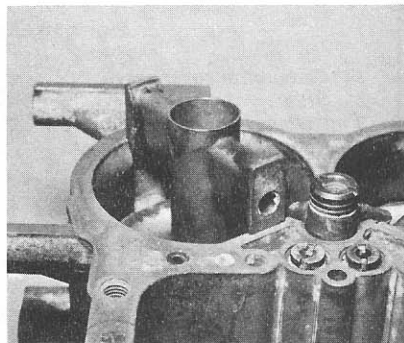
6.33b Removing the shaft cover (DGAS type)



6.34 Removing the diaphragm cover and spring (DGAS type)



6.35 Removing the operating rod (DGAS type)



6.38 Removing the auxiliary venturi (DGAS type)

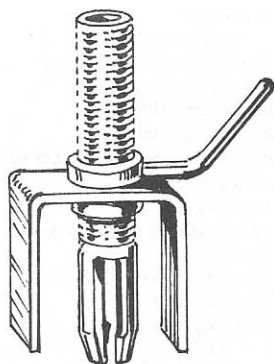
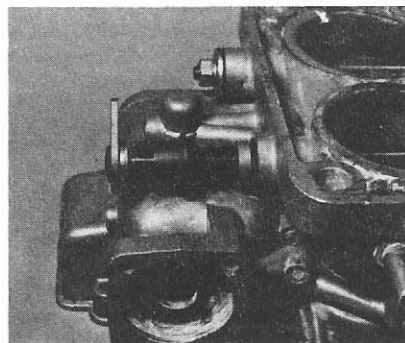
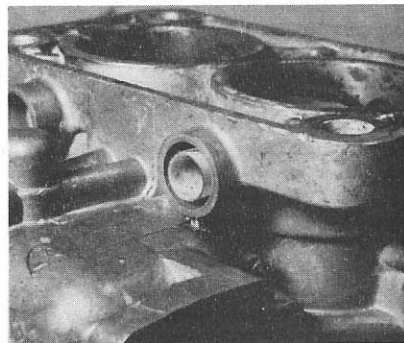


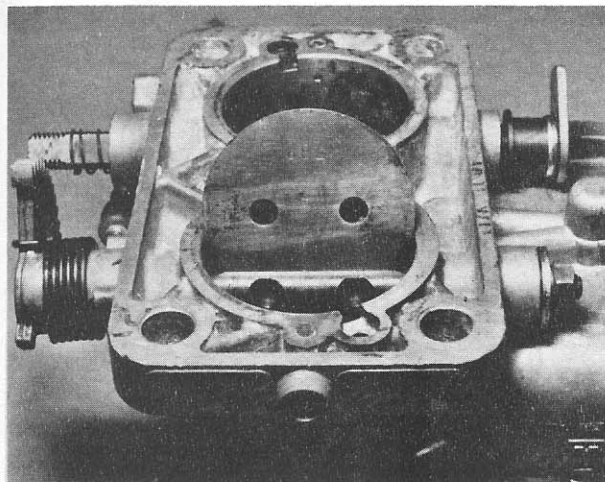
Fig. 9.11 Tool for removing the auxiliary venturis (Sec 6)



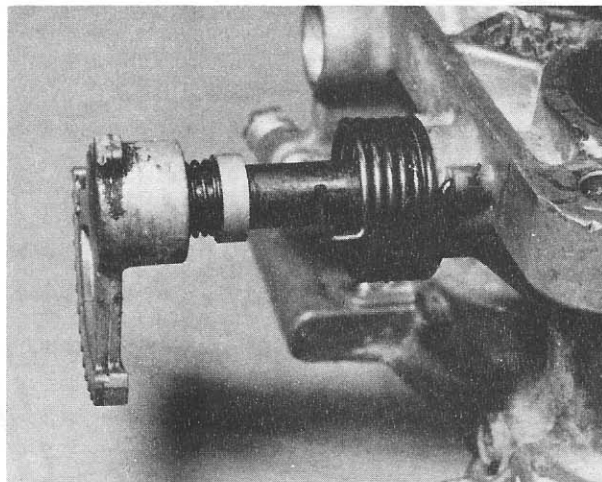
6.44 Withdrawing the primary throttle shaft (DGAS type)



6.45 Location of the Teflon bushes (DGAS type)



6.47 Removing a throttle valve (DGAS type)



6.50 Removing the secondary throttle shaft (DGAS type)

bush (71) from the screw (72).

32 Unscrew and remove the adjusting screw (66) and spring (65) from the lever (64).

33 Unscrew and remove the retaining nut (68) and spring washer (67), then withdraw the lever (37), spring (38), cover (39) and spacer (40). The shaft (43) can now be removed and the bearing (52) extracted from the body (53) (photos).

34 Unscrew and remove the retaining screws (57) and lift off the cover (56) and spring (55) (photo).

35 Carefully release the thin diaphragm, then withdraw the operating rod (54) from the body (53) (photo).

36 Unscrew and remove the plug (58) and adjusting screw (59) from the cover (56), noting the position of the screw.

37 The automatic choke body is supplied complete with the fast idle cam and it is therefore not necessary to dismantle this item. However if a second-hand part is being fitted, the cam, bush and spacer may be prised from the body using a wide blade screwdriver.

38 Mark the position and location of the auxiliary venturis (98) then remove them from the carburettor barrels (photo). If they are tight, open the throttle valves and use a plastic or wooden rod to tap them out. Failure of this method to remove the auxiliary venturis will necessitate obtaining Weber tool no 9610 150 0035.

39 Invert the carburettor body then bend back the tab washer (79).

40 Unscrew the nut (78). Provided that the lug on the fast idle lever (75) is intact, no harm can be done to the throttle valves or shaft; however if the lug is broken, the special Weber tool must be used to hold the shaft stationary while the nut is loosened.

41 Remove the nut (78), tab washer (79), lever (77) (noting its location), toothed sector assembly (83), spring (25) and bush (26). Gently tap the body to remove the bush (26) if necessary.

42 Unscrew and remove the sector screw (80), lock washer (81) and plain washer (82). Separate the lever (75) and bush (76) from the toothed sector (83).

43 Unscrew and remove the throttle valve retaining screws (29) from the throttle shaft with the accelerator pump cam fitted. Withdraw the throttle valve, noting which way round it is located. Mark it with a pencil if necessary.

44 Remove the throttle shaft (27) from the body, then remove the bush (26), spring (25) and spacer (30) (photo).

45 Extract the Teflon bushes (20 and 21) from the body and mark them relative to their locations (photo).

46 Hold the remaining throttle valve (28) closed and unscrew the nut (24). If this nut is excessively tight, it will be necessary to obtain the special Weber tool to hold the shaft stationary while the nut is loosened.

47 Unscrew and remove the throttle valve retaining screws (29), then open the valve against the spring tension and remove the throttle valve (28) (photo).

48 Release the spring tension and note the location of the return spring (85).

49 Remove the nut (24), spring washer (23), washer (22) and spring (25) and gently tap the body to remove the bush (26).

50 Remove the throttle shaft (84) from the body, then remove the bush (26), spring (25) and return spring (85) (photo).

51 Extract the Teflon bushes (20) from the body and mark them relative to their locations.

7 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 9600 325 1047, reform the idling jet seats by carefully rotating the tool. Finish the seatings by inserting Weber tool no 9610 315 1202 and gently tapping the top of the tool whilst rotating it (Fig. 9.12).

2 If the emulsion tube bores are discoloured and have signs of sediment build up, ream them clear again using Weber tool no 9600 325 0765. Rotate the tool slowly with a hand chuck until it moves quite freely, then remove it whilst still rotating it.

3 If on disassembly the choke shaft (8) is a tight fit in the carburettor cover (1) and it is of original diameter (6.0 mm), use Weber tool no 9600 035 0540 to ream the shaft bore clear with the aid of a hand chuck (Fig. 9.14). Should the shaft bores be excessively worn, a new carburettor cover (1) must be obtained, but note that normally the shaft itself will wear quicker than its bore, in which case a new shaft will cure the problem.

4 If the Teflon bushes which support the throttle shafts are worn, they should be renewed.

5 Check the internal channels of the carburettor body and cover 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 must be drilled out and the channels cleared and checked with the special Weber tool.

6 The channels are of three diameters, viz 1.0 mm, 1.5 mm and 2.0 mm. The corresponding tools are Weber tool nos 9620 175 1846, 9620 175 1847 and 9620 175 1848. Fig. 9.15 shows the location of the various channels.

7 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 Weber tool nos 9610

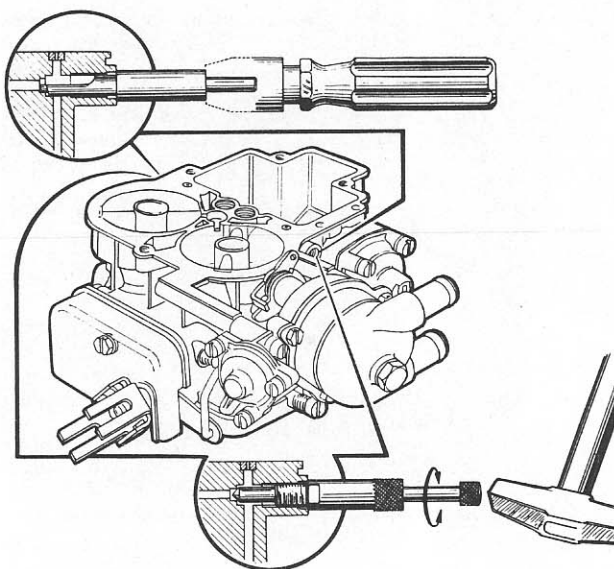


Fig. 9.12 Reforming the idling jet seats (Sec 7)

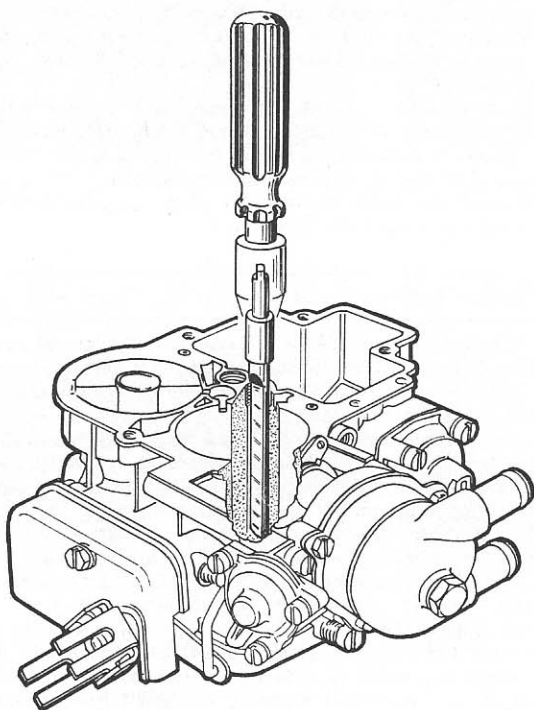


Fig. 9.13 Reaming the emulsion tube bores (Sec 7)

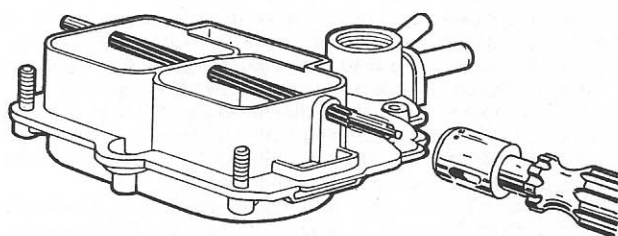


Fig. 9.14 Reaming the choke shaft bore (Sec 7)

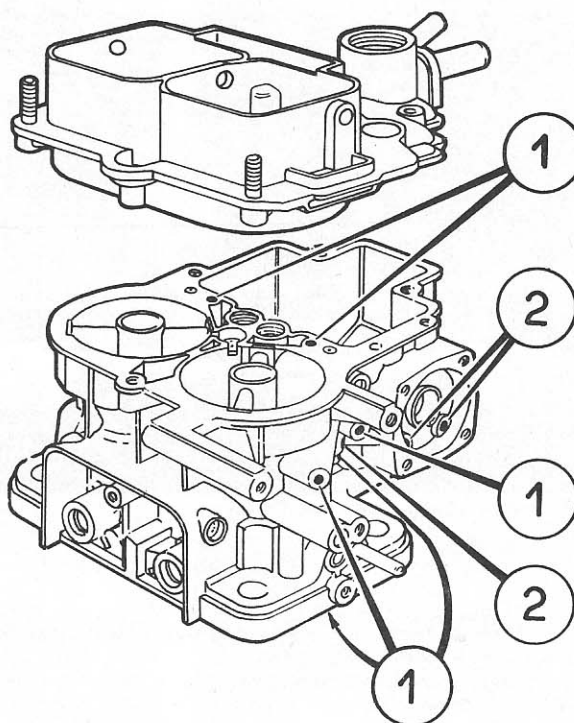


Fig. 9.15 Location of the internal channels of the carburettor body (Sec 7)

1 Idling channels 2 Accelerator pump channels

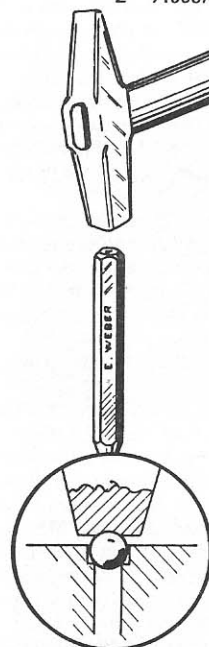


Fig. 9.16 Method of fitting the lead plugs (Sec 7)

315 0822 and 9610 315 0823 to expand them into their bores.

8 On 38 DGAS types, check the condition of the power valve diaphragm and diaphragm seat; if necessary, clean the seat with a little metal polish.

9 During the manufacture of the carburettor, a ball is inserted into the accelerator pump channel and retained by a brass plug (see Fig. 9.17). To check that this ball is free and unobstructed, shake the carburettor body and listen to the ball movement.

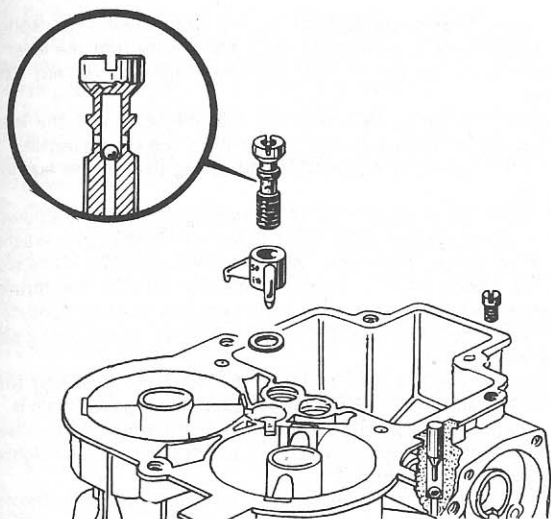
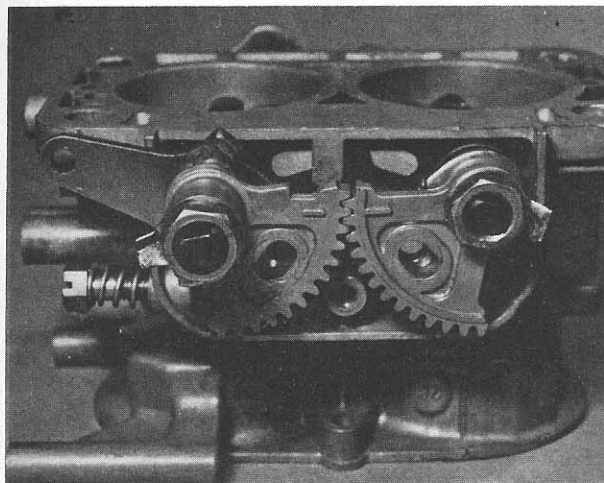
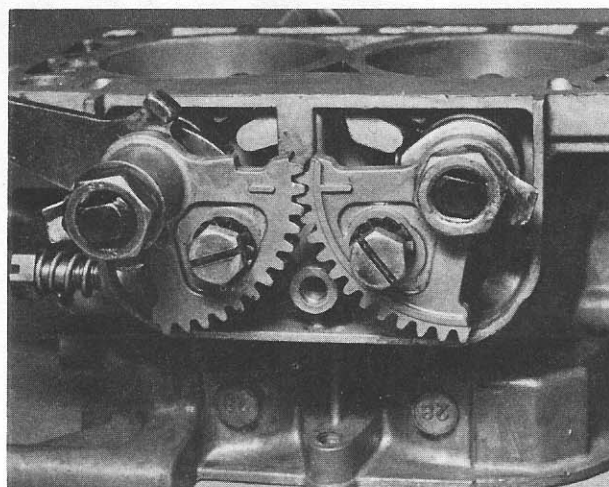


Fig. 9.17 Location of the accelerator pump ball valve (Sec 7)



8.9 Correct toothed sector alignment (DFAV type)



8.11 Fitting the sector adjustment screws (DFAV type)

10 Check that the internal channel of the automatic choke body is free and unobstructed. Also check that the diaphragm and corresponding surfaces are serviceable; if necessary clean the surfaces with metal polish.

11 Check the accelerator pump diaphragm and corresponding surfaces in the same manner to that described in paragraph 10.

12 Renew the diaphragm assemblies checked in paragraph 10 and 11 if necessary.

13 Check the accelerator pump lever for wear, especially on the type fitted with a roller bearing. Renew the lever if necessary.

14 Check the walls of the choke intake, where the choke valves rest when they are fully shut. If there is a deep wear ridge, this could cause the valves to temporarily stick shut, especially after an engine 'blow back'. The ridge should be removed using fine emery tape.

15 On 38 DGAS types, check the automatic choke shaft Teflon bush for wear and renew it if necessary.

8 Assembly (40 DFA and 40 DFAV types)

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

1 Fit the spacer (40) to the throttle shaft (20).

2 Insert the four Teflon bushes (76) into the carburettor body and lightly lubricate them with engine oil.

3 Insert the throttle shafts (19 and 20) into their correct locations in the carburettor body, making sure that the Teflon bushes are not displaced.

4 With the carburettor body inverted and the largest section of the accelerator pump cam on the shaft (20) uppermost, insert the throttle valve (21) and turn the shaft until the valve is shut. Make sure that the angled perimeter of the valve seats correctly in the barrel. The by-pass hole in the valve should be adjacent to the idling and progression holes in the barrel.

5 Insert the valve retaining screws (22) and tighten them evenly but without exerting excessive pressure on the shaft. It is recommended that new screws are always fitted as it is quite easy to cross thread previously peened screws. Lock the screws (22) by peening with Weber tool no 98010 900 whilst supporting the shaft (20) with a block of wood. Alternatively, coat the screw threads with a liquid locking agent (fuel resistant) prior to inserting them.

6 Insert the throttle shaft (19) and fit the throttle valve (21) in the same manner as described in paragraphs 4 and 5. On 40 DFAV types, the valve must be fitted with the vent operating lugs uppermost (with the carburettor inverted).

7 On DFAV types only, locate the vent operating rod (99) in the body, then fit it to the arm (95) and retain with the split pin (98). Locate the spring (97) to the body, then fit the bush (94), operating arm (95) and washer (96) to the retaining screw (93) and tighten the screw into the body. Tension the spring (97) and hook it over the arm (95) which should now rest on the lugs at the end of the throttle shaft.

8 Fit to the throttle shaft (19), the spring (80), spacer (75), lever (79), toothed sector (78) and tab washer (63); then fit and tighten the nut (62A) finger tight.

9 Fit to the throttle shaft (20) the spring (100) (if fitted), spacer (75), stop lever (74), bush (72), wave washer (73) and lever (71); then with both throttle valves shut, fit the toothed sector (70) so that the alignment marks on both sectors face each other (photo).

10 Fit the throttle lever (64), tab washer (63) and nut (62), tightening the latter finger tight only.

11 With both throttle valves held fully closed and the alignment marks on the two sectors facing each other, insert and tighten the two screws (67) together with the lockwashers (68) and plain washers (69) (photo).

12 Tighten the retaining nuts (62 and 62A) and lock them by bending the tab washers (63); if available, use the Weber tool no 9610 315 1201 to hold the shafts stationary. Alternatively, insert and tighten the idling adjustment screw (28) whilst

tightening the nuts.

13 Check that the two throttle shafts operate smoothly and that both throttle valves are synchronised exactly. If not, it will be necessary to loosen the nuts (62) and reset the adjustment screws (67).

14 Tension the return springs (80 and 100) (if fitted), using a length of welding rod hooked at one end and locate them onto the levers (74 and 79). Make sure that the springs are tensioned sufficiently and that no coils are trapped between the spacers and the main body.

15 Lubricate the toothed sectors with a little grease, then locate the cover (77) onto the body and tighten the retaining screw (65) together with the spring washer (66).

16 Fit the auxiliary venturis into their respective positions as noted previously, making sure that the supply channels are adjacent and that the nozzle cut away sections face the throttle valves.

17 Fit the fast idle cam and bush into the automatic choke body (47) if removed, making sure that the cam is positioned as shown in Fig. 9.8 (photo). Use a suitable diameter metal drift and support the body on a block of wood.

18 Insert and tighten the starting duct inspection plug into the bottom of the body (47).

19 Insert the operating rod (46) into the body (47) and locate the diaphragm over the brass dowel peg.

20 Locate the spring (45) and press the cover (44) onto the body (47), then insert and tighten the retaining screws (43) evenly.

21 Check that the operating rod (46) moves freely with the blade of a screwdriver.

22 Fit the adjusting stop plate (49) to the body (47) in its previously marked location, then tighten the retaining screw (50).

23 Lightly lubricate the shaft (48) with engine oil then insert it into the body (47).

24 Rotate the shaft (48) until it contacts the operating rod

(46), then fit the spacer (34), spring (33), lever (39), spring washer (37) and retaining nut (36). Make sure that the lever is positioned as shown in Fig. 9.8 then tighten the nut (36) (photo).

25 Hook the spring (33) over the fast idle cam and the lever (39) lug so that both are kept in contact by the spring tension.

26 Fit the adjusting screw (36) and spring (31) to the fast idle lever (30).

27 Locate the bush (91) on the retaining screw (38), followed by the wave washer (90), lever (29), spring (41) and washer (42), then tighten the screw (38) into the body (47). Make sure that the spring (41) is located correctly so that the tension moves the adjusting screw (32) off of the fast idle cam (photo).

28 Press the O-ring seal (35) onto the brass dowel at the side of the carburettor.

29 Engage the rod (61) to the front idle lever (29) and then insert the split pin (60) (if fitted) and bend the legs to retain it.

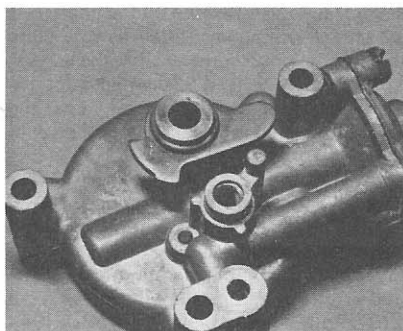
30 Locate the automatic choke to the carburettor body, insert the three retaining screws (51) and spring washers, and tighten the screws evenly (photos).

31 Engage the fast idling control rod (61) with the throttle lever (71), insert the split pin (60), and bend the legs to retain it.

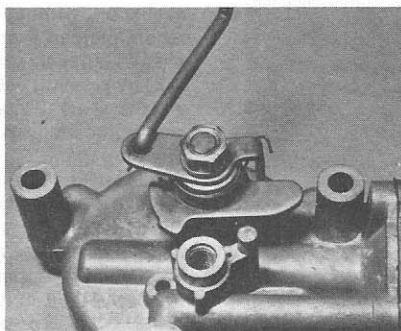
32 Working on the carburettor cover (1), lightly lubricate the choke shaft (8) with engine oil then insert it into the cover.

33 With the choke shaft (8) in the open position, fit the choke valves (7) into their location slots, then close the shaft to allow the valves to centralise.

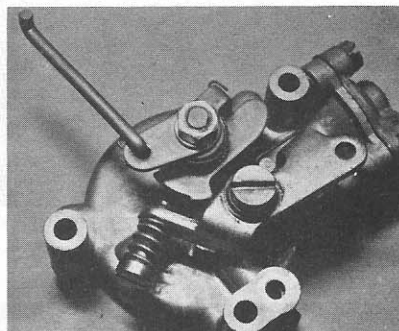
34 Holding the shaft closed, insert the valve retaining screws (6) and tighten them evenly without exerting excessive pressure on the brass shaft (8). It is recommended that new screws are always fitted as it is quite easy to cross-thread previously peened screws. Lock the screws (6) by peening with Weber tool no 98010 900, or alternatively by coating the threads with a liquid locking agent (fuel resistant) prior to inserting them. If the tool method is used, support the shaft (8) with a piece of wood.



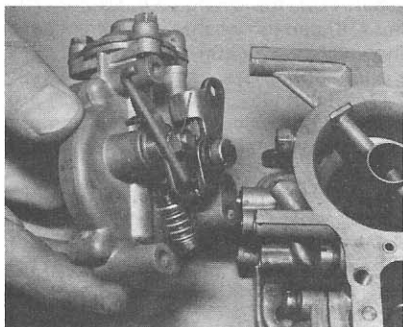
8.17 Correct positioning of fast idle cam (DFAV type)



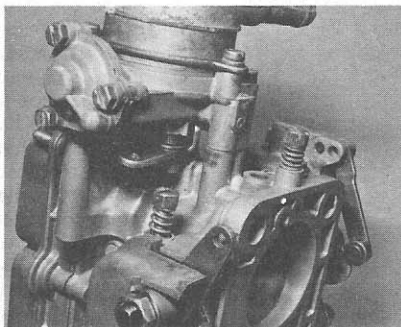
8.24 Fitting the choke rod and lever (DFAV type)



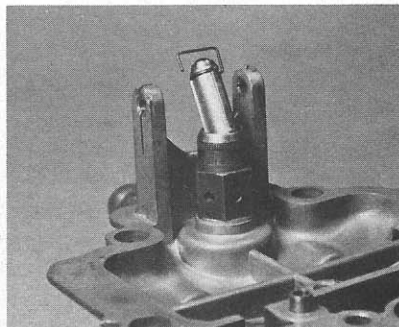
8.27 Correct positioning of fast idle lever (DFAV type)



8.30a Fitting the automatic choke body (DFAV type)



8.30b Location of the fast idle levers (DFAV type)



8.49 Inserting the needle into the valve seat (DFAV type)

- 35 Fit the seal (10) and plug (101) into the cover (1).
- 36 Insert the choke operating rod (16) through the seal (10) and engage it with the choke spindle arm, then retain it by inserting the split pin (15) and bending the pin legs.
- 37 Locate the diaphragm assembly (24) to the accelerator pump cover (25) then, with the carburettor body on end, fit the spring (23) into the pump chamber and lower the diaphragm and cover onto it.
- 38 Insert the accelerator pump cover retaining screws (26), depress the cover and tighten the screws in diagonal sequence. Make sure that the roller locates on the throttle shaft cam.
- 39 Fit and tighten the accelerator pump discharge blanking plug (18).
- 40 Fit the pump jet (86) to the accelerator pump delivery valve (87) followed by the gasket (85), then locate the pump jet into the carburettor body and tighten the delivery valve (87).
- 41 Fit the spring (27) to the throttle idling adjustment screw (28) and locate the screw in the carburettor body.
- 42 Fit the springs (82) to the idling mixture adjusting screws (81) and locate them in the carburettor body.
- 43 Insert the emulsion tubes (89) into the body then fit and tighten the air corrector jets (88).
- 44 Press the idling jets (84) into their respective holders (83) then tighten the holders into the carburettor body.
- 45 Fit and tighten the main jets (17) to the bottom of the float chamber.
- 46 Fit the gasket (11) to the needle valve (12) seating and tighten the seating into the carburettor cover (1).
- 47 On 40 DFAV types only, fit and tighten the vent and power valve (92) to the cover (1).
- 48 With the cover (1) inverted, fit the gasket (9).
- 49 Lower the needle into the needle valve (12) seating then insert the float tab beneath the needle hook and insert the fulcrum pin (14) through the two posts and float (photo).
- 50 The float level adjustment must now be checked in the following manner: Obtain a drill or dowel rod of 0.236 in (6.0 mm) diameter. Hold the carburettor cover vertically so that the float hangs from the fulcrum pin and the float arm is in light contact with the needle ball (ie the ball is not depressed). Using the drill, check that the distance from the cover gasket to the nearest part of the float is 0.236 in (6.00 mm). The annular seam must not be included in the distance and for this reason a groove must be filed or ground in the drill (photo).
- 51 If the dimension obtained in paragraph 50 is not correct, carefully bend the wide tab on the float as necessary.
- 52 Tilt the carburettor cover so that the float moves away from the cover and the narrow tab makes contact with the needle valve seating. Now, using a drill or dowel rod of 0.551 in (14.0 mm) diameter, check the needle valve fully open dimension using the method described in paragraph 50 (photo).
- 53 If the dimension obtained in paragraph 52 is not correct, carefully bend the narrow tab on the float as necessary (photo).
- 54 The difference between the dimension obtained in paragraphs 50 and 52 represents the needle valve stroke which

should be 0.315 in (8.0 mm).

55 Lower the carburettor cover (1) onto the main body, making sure that the vent valve operating rod (99) locates on the vent valve (92).

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

57 Engage the choke plate operating rod (16) with the lever (39) and retain with the split pin (15) by bending the pin legs.

58 Fit the fuel filter (5) and tighten the inspection plug (4) into the cover (1).

59 With the carburettor completely assembled, the automatic choke and idling adjustments must be made. To do this, first turn the throttle idling adjustment screw (28) until it just touches the throttle lever (74), then continue to screw it in 2 complete turns. Note that if this adjustment is being made with the automatic choke completely assembled, it will be necessary to first open the throttle fully, hold the choke valves open and release the throttle. It is preferable to hold the choke valves open while making the adjustment.

60 Turn both idling mixture screws (81) until they are in light contact with their seats, then back them off one complete turn each.

61 To adjust the automatic choke, first operate the throttle and hold the choke valves in their closed position. Using a 0.008 in

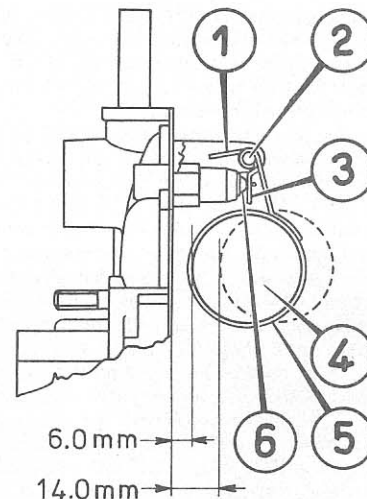
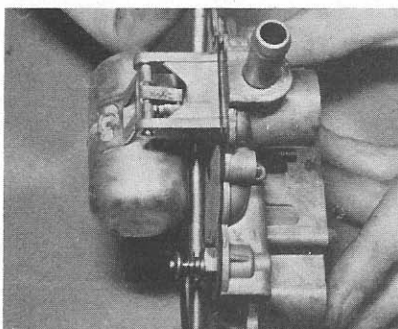


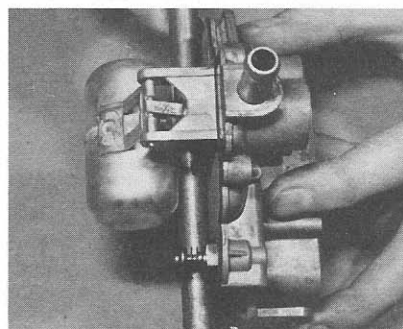
Fig. 9.18 Float level adjustment diagram (40 DFA and 40 DFAV types) (Sec 8)

- | | |
|---|-------------------|
| 1 | Stroke adjustment |
| 2 | Fulcrum pin |
| 3 | Closed adjustment |

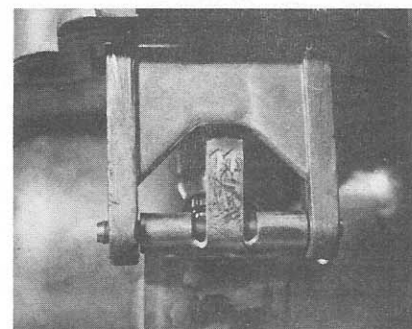
- | | |
|---|--------|
| 4 | Float |
| 5 | Seam |
| 6 | Needle |



8.50 Checking the closed float level clearances (DFAV type)



8.52 Checking the open float level clearance (DFAV type)



8.53 Float arm narrow tab location and float weight (DFAV type)

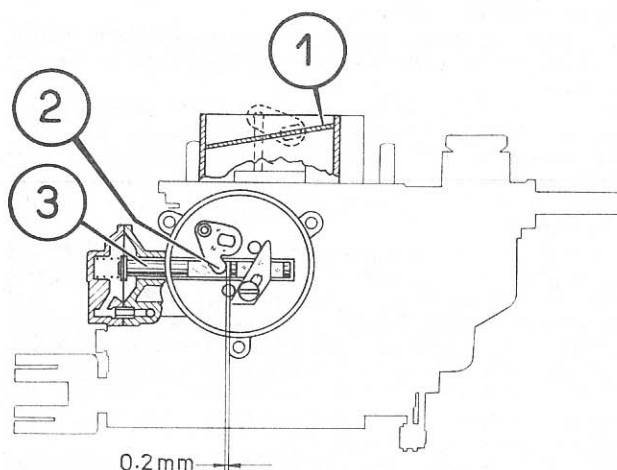


Fig. 9.19 Automatic choke minimum clearance check location (40 DFA and 40DFAV types) (Sec 8)

1 Choke valves
2 Shaft arm

3 Rod

(0.2 mm) feeler gauge, check that there is at least 0.008 in (0.2 mm) clearance between the automatic choke shaft arm (48) and the contact face of the operating rod (46). If not, the operating rod diaphragm may be twisted and the shaft arm bent. This should be rectified before proceeding.

62 Loosen the fast idle adjustment screw (32), then while still holding the choke valves shut under finger pressure, use the blade of a screwdriver to move the operating rod (46) against the stop plate (49). With the shaft arm in contact with the operating rod abutment, the distance from the lower edge of the choke valves and the intake wall must be between 0.137 in and 0.157 in (3.5 mm and 4.0 mm). Use a suitable drill shank to make the check and if necessary, adjust the position of the stop plate (49) to obtain the correct clearance (photos).

63 If a new automatic choke body (47) has been fitted, the alignment mark must now be stamped on the top of the body. To do this it is essential to obtain Weber tool no 9620 175 2951. The mark is made while keeping the choke valves completely shut by applying light pressure on the tool.

64 Fit the disc gasket (52) to the automatic choke body (47).

65 Fit the thermostat assembly (53) to the body (47) at the same time locating the bi-metallic spring onto the shaft (48), then fit the retaining ring (55) and insert the three screws (59).

66 Whilst holding the thermostat assembly (53) so that the alignment mark is opposite the mark on the body (47), tighten the three screws (59) evenly (photo).

67 Fit the gasket (54) and the cover (56) then insert and tighten the retaining bolt (58) with the gasket (57).

68 The automatic choke fast idling adjustment must now be made. Open and close the throttles and make sure that the fast idling adjustment screw (32) is against the fast idle cam highest point with the choke valves completely shut. Using a small drill or a feeler gauge, check that the distance from the throttle valves to the outer wall of the barrels by the progression holes is between 0.029 in and 0.031 in (0.75 mm and 0.80 mm). If not, adjust the fast idling screw (32) to give the correct clearance.

9 Assembly (34 DGAS and 38 DGAS types)

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

1 Insert the Teflon bushes (20) into the secondary throttle shaft bore of the carburettor body (86) and lightly lubricate them with a little engine oil.

2 Locate the return spring (85), spring (25) and bush (26) to the secondary throttle shaft (84), then insert it into the carburettor body from the side opposite the float chamber. Make sure that the Teflon bushes are not displaced and locate the

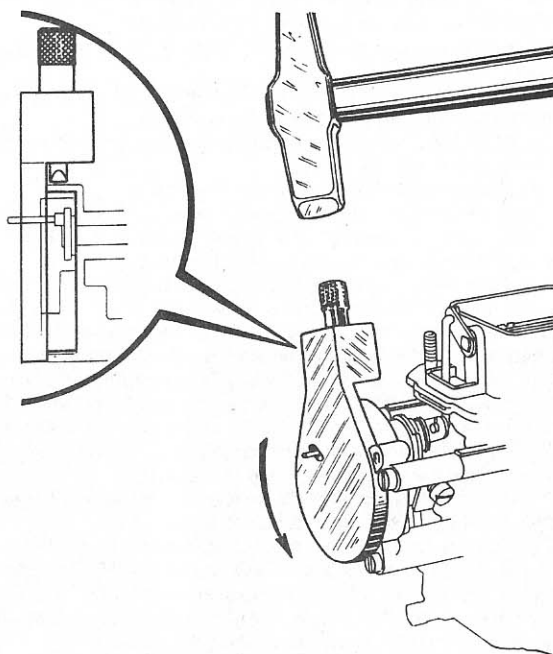
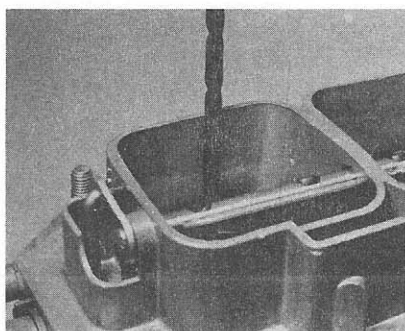
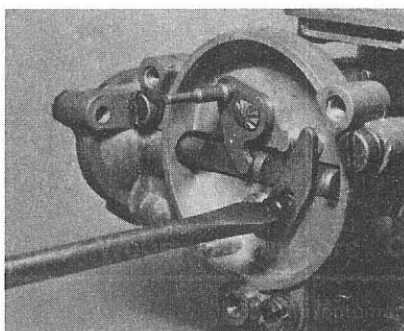


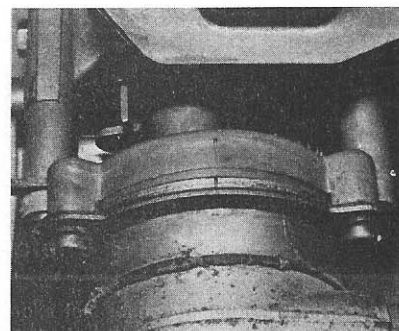
Fig. 9.20 Alignment marking tool for new automatic choke bodies (40 DFA and 40 DFAV types) (Sec 8)



8.62a Checking the choke valve clearance with a drill (DFAV type)



8.62b Adjusting the automatic choke stop plate (DFAV type)



8.66 Automatic choke alignment marks (DFAV type)

return spring (85) in the special hole.

3 Fit the bush (26), spring (25), washer (22), spring washer (23) and nut (24) to the end of the throttle shaft (84), then tighten the nut (84) whilst holding the shaft stationary with a screwdriver inserted through the toothed sector.

4 Tension the spring (85) by turning the toothed sector, then insert the throttle valve into the throttle shaft (84) and close the valve. Make sure that the angled perimeter of the valve seats correctly in the barrel and allow it to snap shut several times to centralise it.

5 Insert the throttle valve retaining screws (29) and tighten them evenly but without exerting excessive pressure on the shaft. It is recommended that new screws are always fitted to avoid cross-threading previously peened screws. Lock the screws (29) by peening with Weber tool no 98010 900 whilst supporting the shaft with a block of wood. Alternatively, coat the screw threads with a liquid locking agent (fuel resistant) prior to inserting them.

6 Insert the Teflon bushes (20 and 21) into the primary throttle shaft bore of the carburettor body (86) and lightly lubricate them with a little engine oil. Note that the smaller bush (21) is located at the float chamber end.

7 Locate the spacer (30), spring (25) and bush (26) to the primary throttle shaft (27) with the smaller diameter of the spacer against the accelerator pump operating cam.

8 Insert the throttle shaft (27) into the carburettor body from the float chamber side, making sure that the Teflon bushes are not displaced (photo).

9 With the accelerator pump cam facing the centre of the float chamber, fit the bush (26), spring (25) and lever (75), making sure that the threaded hole in the lever (75) is towards the secondary toothed sector (photos).

10 Fit the bush (76) to the throttle shaft (27) then press on the toothed sector (83) and mesh it with the secondary sector so that the alignment marks are in line (photo).

11 Fit the lever (77), tab washer (79) and nut (78).

12 Locate the spring (74) on the throttle idling adjustment screw (73), then insert the screw into the carburettor body and screw it in as far as it will go. The nut (78) may now be fully tightened and the locktab (79) bent. Fully unscrew the adjustment screw (73) but leave it in the carburettor body.

13 Open the primary throttle shaft (27) and insert the throttle valve (28), observing the procedure given in paragraphs 4 and 5 to centralise it. Fit the retaining screws (29).

14 Insert the sector screw (80) with lockwasher (81) and plain washer (82) and tighten it whilst holding both throttle valves completely shut; this will synchronise the throttle valves (photo).

15 Lubricate the toothed sectors with a little grease and check that the throttle valves operate smoothly and fully.

16 Fit the auxiliary venturis (98) into their respective positions as noted previously, making sure that the supply channels are adjacent and that the nozzle cut away sections face the throttle valves.

17 If removed, locate the fast idle cam on the bush followed by the spacer, then press the bush onto the rear of the automatic choke body (53) using a suitable diameter length of tubing. Note that when fitted the round contour of the cam must face the diaphragm end of the body with the flat edge uppermost (photo).

18 Fit the screw (59) and plug (58) to the cover (56), positioning the screw as previously noted.

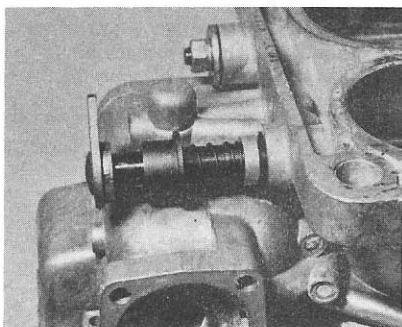
19 Fit the operating rod (54) to the body (53), at the same time locate the diaphragm over the brass dowel.

20 Locate the spring (55) into the cover (56) then fit the cover to the body making sure that the spring locates in the diaphragm plate.

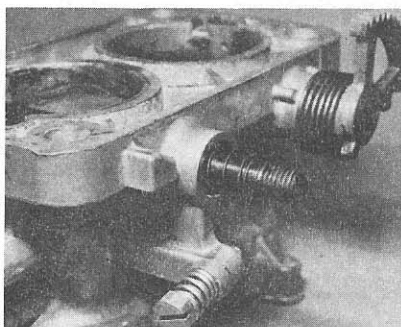
21 Insert and tighten the retaining screws (57) evenly.

22 Insert the Teflon bearing (52) into the body (53).

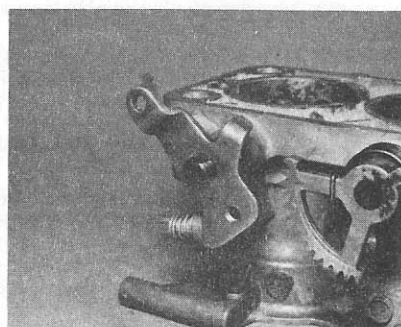
23 Lightly lubricate the shaft (43) with engine oil and fit it in



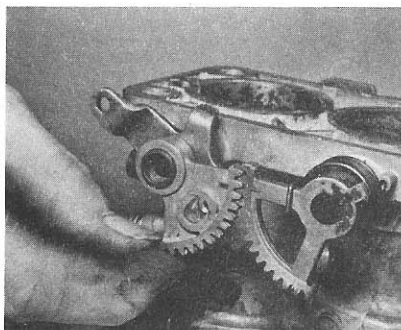
9.8 Inserting the primary throttle shaft (DGAS type)



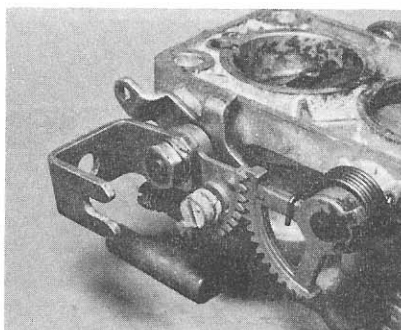
9.9a Fitting the spring to the primary throttle shaft (DGAS type)



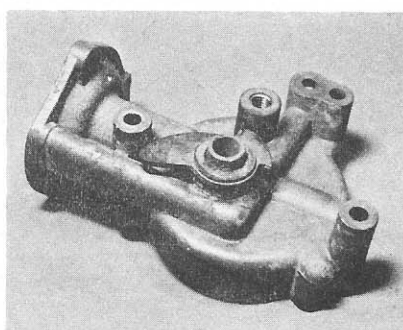
9.9b Fitting the lever to the primary throttle shaft (DGAS type)



9.10 Aligning the toothed sectors (DGAS type)



9.14 Fitting the sector adjustment screw (DGAS type)



9.17 Correct location of the fast idle cam (DGAS type)

the body (53) (photo).

24 Fit the spacer (40), cover (39), spring (38), lever (37), spring washer (67) and nut (68). Tighten the nut, being careful not to bend the arm on the end of the shaft (43). Make sure that the lever and spring are assembled as shown in Fig. 9.10 with the lever resting on the flat edge of the fast idle cam.

25 Fit the spring (65) to the adjusting screw (66) and fit the screw to the lever (64).

26 Locate the spring washer, bush (71), wave washer (70), lever (63) and washer (62) to the retaining screw (72), then tighten the screw into the body (53). Make sure that the fast idle screw (66) can locate on the stepped edge of the fast idle cam (photo).

27 Press the O-ring seal (69) to the side of the carburettor.

28 Engage the rod (61) to the fast idle lever (75) and retain it with the split pin (60).

29 Engage the rod (61) with the fast idle lever (64), then fit the automatic choke body (53) to the carburettor body (86). Insert the retaining screws (42) and spring washers and tighten them evenly.

30 Working on the carburettor cover (1), lightly lubricate the choke shaft (4) with engine oil and insert it into the cover.

31 With the choke shaft (4) in the open position, fit the choke valves (5) into their location slots, then close the shaft to allow the valves to centralise.

32 Holding the shaft closed, insert the valve retaining screws (9) and tighten them evenly without exerting excessive pressure on the shaft (4). It is recommended that new screws are always fitted to avoid cross-threading previously peened screws. Lock the screws (9) by peening with Weber tool no 98010 900 or alternatively, by coating the threads with a liquid locking agent (fuel resistant) prior to inserting them. If the tool method is used, support the shaft (4) with a piece of wood.

33 Fit the seal (7) and plug (8) into the carburettor cover (1).

34 Locate the accelerator pump diaphragm assembly (32) to the cover (41) then, with the carburettor body on end, fit the spring (33) into the pump chamber and lower the diaphragm and cover onto it.

35 Insert the accelerator pump cover retaining screws (31), depress the cover and tighten the screws in diagonal sequence, making sure that the pump lever locates on the throttle shaft cam.

36 Fit and tighten the accelerator pump discharge blanking needle (16).

37 Fit a gasket (95) to the accelerator pump delivery valve (97) followed by the pump jet (96) and a further gasket (95), then locate the pump jet into the carburettor body and tighten the delivery valve (97).

38 Fit and tighten the full power valve (18) and gasket (17) to the bottom of the float chamber.

39 Fit the springs (88) to the idling adjusting screws (87) and locate them in the carburettor body.

40 Lower the emulsion tubes (89) into the body (86) then fit and tighten the air corrector jets (94).

41 Press the idling jets (34) into their holders (36) and fit the gaskets (35), then tighten the holders (36) into the body (86).

42 Fit and tighten the main jets (19) to the bottom of the float chamber.

43 Fit the gasket (13) to the needle valve (14) seating and tighten the seating into the carburettor cover (1) using a 10 mm socket or ring spanner.

44 With the cover (1) inverted, locate the power valve assembly (93), then depress the valve with one hand and lift the valve cover slightly to settle the diaphragm. While keeping the valve depressed, insert and tighten the retaining screws (91) complete with spring washers (92).

45 Lower the needle into the needle valve (14) seating, then locate the float assembly (15) and insert the float tab beneath the needle hook (photo).

46 Insert the fulcrum pin (90) through the two posts and float.

47 The float level adjustment must now be checked in the following manner. Hold the carburettor cover vertically so that the float assembly hangs from the fulcrum pin and the float arm is in light contact with the needle ball (ie the ball is not depressed). Using vernier calipers, check that the distance from the cover to the furthest part of the two semi-floats is as given in the adjustment data. If not, carefully bend the wide tab on the float arm as necessary (photo).

48 Tilt the carburettor cover so that the float assembly moves away from the cover and the narrow tab makes contact with the needle valve seating. The distance from the cover to the furthest part of the two semi-floats should now be as given in the adjustment data. If not, carefully bend the narrow tab on the float arm as necessary (photo).

49 The difference between the dimensions obtained in paragraphs 47 and 48 represents the needle valve stroke which should be 0.393 in (10.0 mm).

50 Locate the gasket (12) onto the carburettor body (86) then lower the carburettor cover (1) onto the main body (86), at the same time inserting the choke control lever (37) through the dust seal (7).

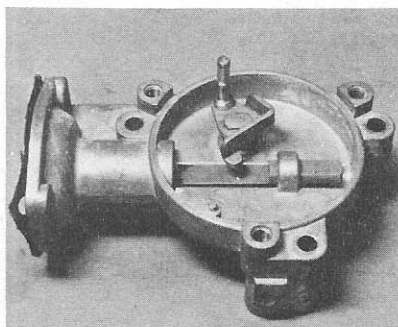
51 Fit the cover retaining screws (3) together with the spring washers and tighten them evenly in diagonal sequence.

52 Engage the choke plate operating lever (37) with the choke shaft (4) and retain by pressing the C-clip into the groove (photo).

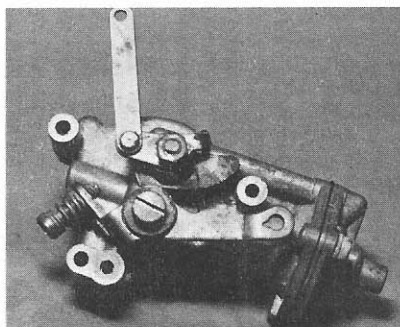
53 Fit the fuel filter (10) and tighten the inspection plug (11) into the cover (1).

54 With the carburettor completely assembled, the idling and automatic choke adjustments must be made. To do this, first turn the throttle idling adjustment screw (73) until it just touches the fast idle lever (75), then continue to screw it in 2 complete turns. Note that if this adjustment is being made with the automatic choke completely assembled, it will be necessary to first open the throttle fully, hold the choke valves open and release the throttle. It is preferable to hold the choke valves open whilst making the adjustment.

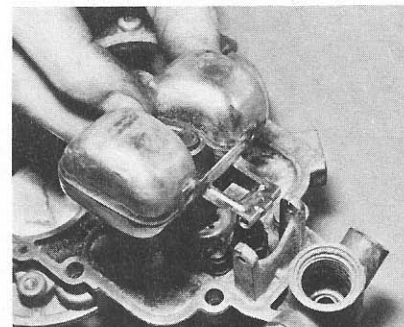
55 Turn both idling mixture screws (87) until they are in light



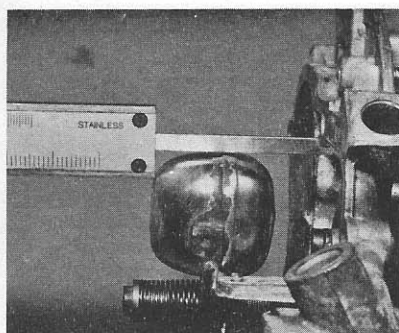
9.23 Fitting the automatic choke shaft (DGAS type)



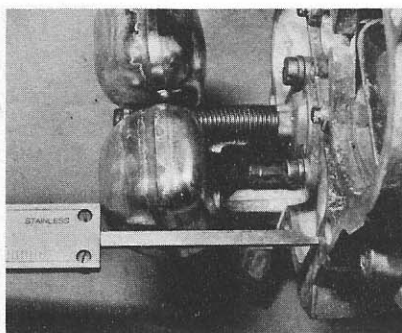
9.26 Fitting the fast idle lever (DGAS type)



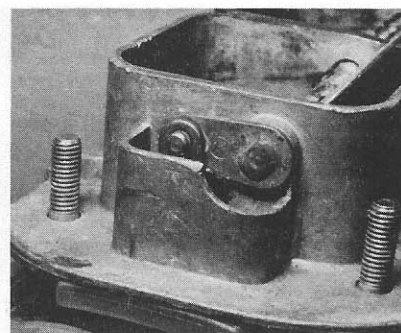
9.45 Fitting the float (DGAS type)



9.47 Checking the closed float level adjustment (DGAS type)



9.48 Checking the open float level adjustment (DGAS type)



9.52 Fitting the choke operating lever (DGAS type)

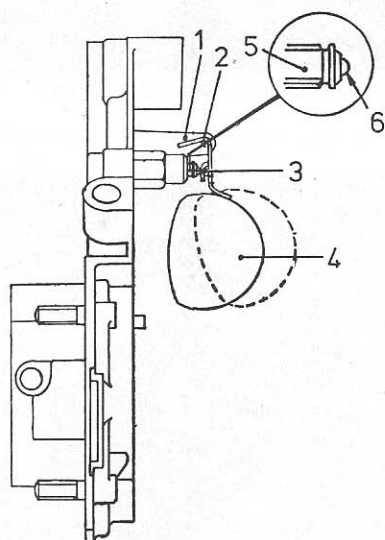


Fig. 9.21 Float level adjustment diagram (34 DGAS and DGAS types) (Sec 9)

- | | |
|---------------------|-------------------------|
| 1 Stroke adjustment | 4 Float |
| 2 Fulcrum pin | 5 Needle |
| 3 Closed adjustment | 6 Spring tensioned ball |

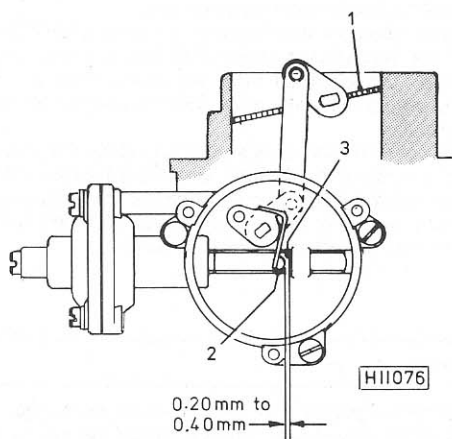


Fig. 9.22 Checking the shaft arm to rod clearance (DGAS types) (Sec 9)

- | | |
|----------------|----------------|
| 1 Choke valves | 3 Rod abutment |
| 2 Shaft arm | |

contact with their seats, then back them off one complete turn each.

56 To adjust the automatic choke, first fully unscrew the fast idle adjustment screw (66). The choke valve pull down dimension must now be checked.

57 Connect an elastic band between the automatic choke shaft (43) and the diaphragm cover (56) so that the choke valves are held shut. With the operating rod (54) in the rest position, the clearance between the shaft (43) arm and the rod (54) abutment must be between 0.007 in and 0.015 in (0.2 mm and 0.4 mm). Make the check with a feeler gauge. If it is not correct the diaphragm may be stretched or the shaft arm bent. Check and rectify both of these items before proceeding (photo).

58 Using a small electrician's screwdriver or length of welding rod, push the outer diameter of the operating rod (54) hard against the adjustment screw (59) by inserting it into the rod bore. The tension of the elastic band must be sufficient to overcome the tension of the spring inside the operating rod (54). This can be checked by temporarily opening the choke valves and observing whether the visible section of the rod (54) moves. Check that the distance from the lower edge of the choke valves to the intake wall is between 0.112 in and 0.124 in (2.85 mm and 3.15 mm). Make the check using a drill shank and if not correct, adjust the screw (59) as necessary, after first removing the plug (58) (photo).

59 Using the blade of a screwdriver, press both sections of the rod (54) hard against the screw (59). The distance from the lower edge of the choke valves to the intake well should now be the maximum choke valve gap given in the adjustment data. Make the check using a drill shank and if not correct, renew the operating rod (54) (photo).

60 If a new automatic choke body (53) has been fitted, the alignment mark must now be stamped on the top of the body. To do this it is essential to obtain Weber tool no 98028 600. The mark is made while keeping the choke valves completely shut by applying light pressure on the tool.

61 Fit and tighten the plug (58) into the diaphragm cover (56).

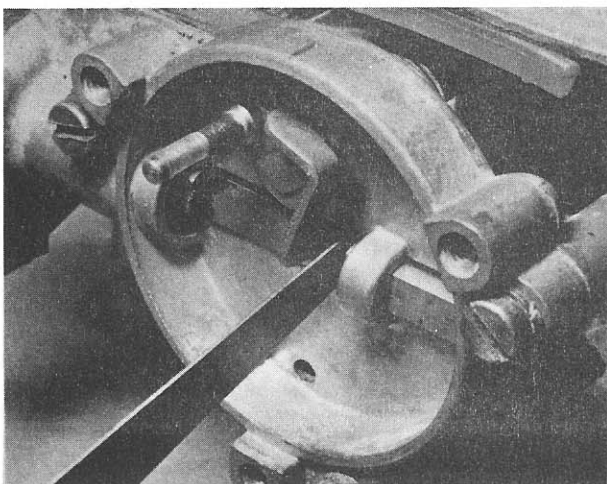
62 Fit the disc gasket (51) to the automatic choke body (53).

63 Fit the thermostat assembly (50) to the body (53), at the same time locating the bi-metallic spring onto the shaft (43), then fit the retaining ring (49) and insert the three screws (44) (photo).

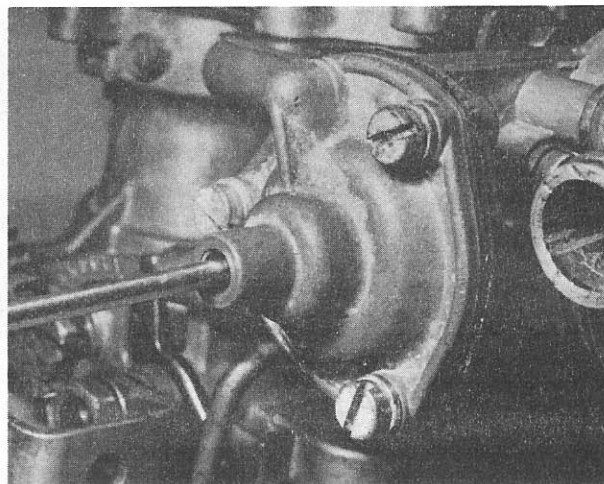
64 Whilst holding the thermostat assembly (50) so that the alignment mark is opposite the mark on the body (53), tighten the three screws (44) evenly (photo).

65 Fit the gasket (48) and the cover (47), then insert and tighten the retaining bolt (46) with the gasket (45).

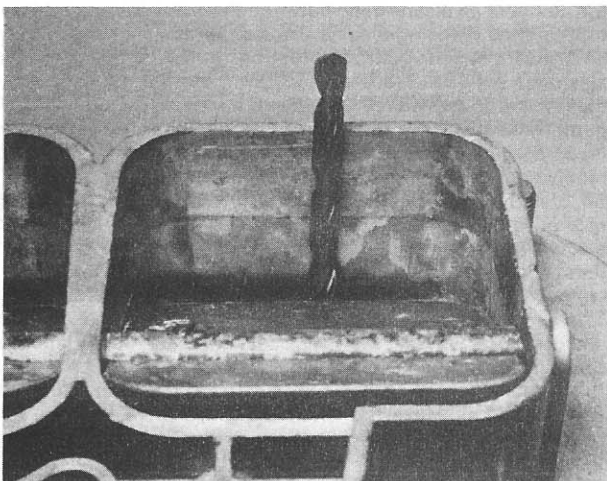
66 The automatic choke fast idling adjustment must now be made. Open and close the throttles and make sure that the fast idling adjustment screw (66) is against the fast idle cam highest point with the choke valves completely shut. Using a small drill or a feeler gauge, check that the distance from the throttle valves to the outer wall of the barrels by the progression holes is as given in the adjustment data. If not, adjust the fast idling



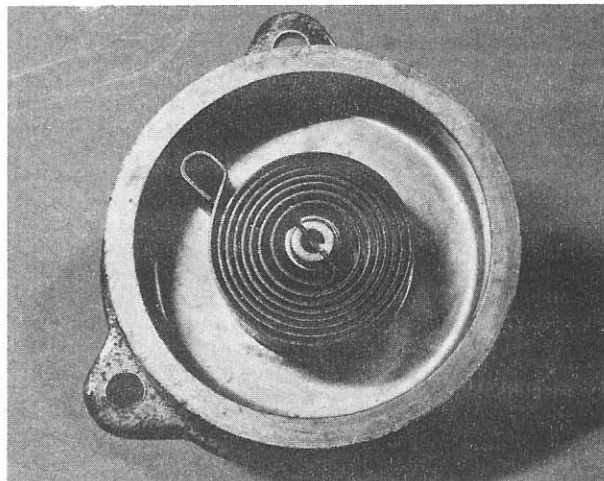
9.57 Checking the shaft arm to rod clearance (DGAS type)



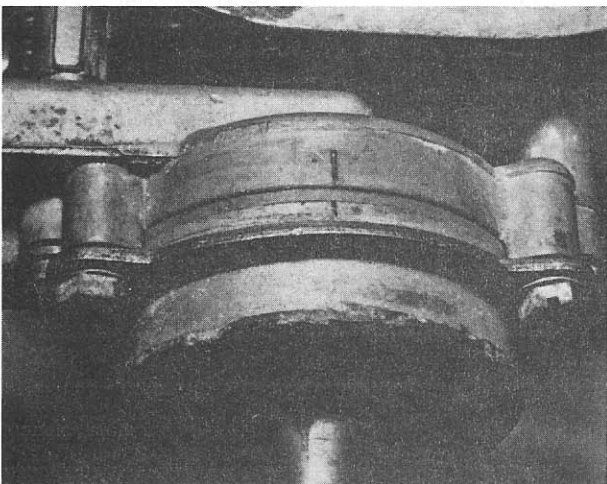
9.58 Adjusting the rod stop screw (DGAS type)



9.59 Checking the choke valve clearance with a drill (DGAS type)



9.63 Automatic choke thermostat bi-metallic spring (DGAS type)



9.64 Automatic choke alignment marks (DGAS type)

screw (66) to give the correct clearance.

67 Slightly open the throttles and, by moving the choke valves, position the adjustment screw (66) into the step on the fast idling cam. The distance from the lower edge of the choke valves to the intake walls must now be as given in the adjustment data.

68 Fully open the throttles and slowly close the choke valves. The fast idle cam should rotate until the adjustment screw (66) rests against the step. If not, re-check the idling screw (73) adjustment and the fast idling screw (66) adjustment and correct so that the above check is achieved.

10 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 Sections 8 and 9.
- 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).

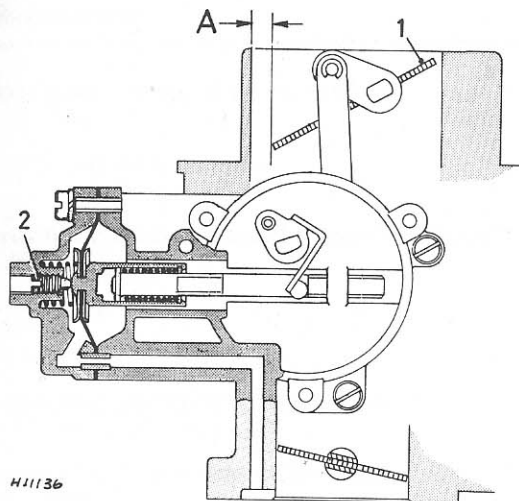


Fig. 9.23 Automatic choke minimum gap setting (DGAS types) (Sec 9)

- 1 Choke valves A Choke valve clearance
2 Adjustment screw

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

5 Turn the idle mixture adjustment screws in or out by equal amounts until the engine runs at the highest rpm commensurate with even running.

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

7 Ideally a vacuum gauge should be used to make the adjustment described in paragraph 5, in which case the mixture

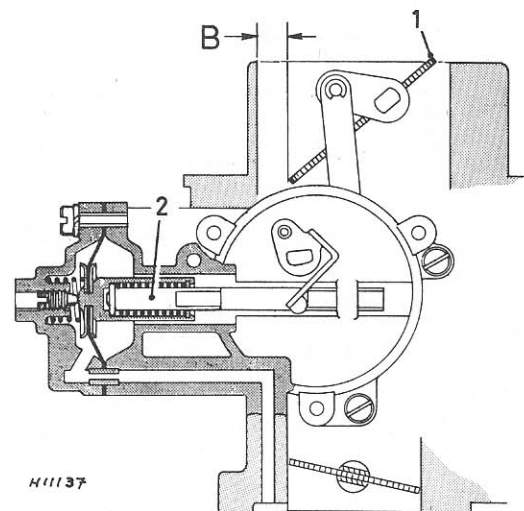


Fig. 9.24 Automatic choke maximum gap setting (DGAS types) (Sec 9)

- 1 Choke valves B Choke valve clearance
2 Operating rod

adjustment screws are adjusted to give the maximum vacuum reading.

8 When the adjustment is completed, switch off the engine and remove the tachometer and vacuum gauge if fitted.

9 On bypass idle type carburetors, the procedure is similar but the bypass idle adjustment screw should be first fully screwed in, then screwed out 1 full turn. The basic idle adjustment is then made in the normal way and the bypass idle adjustment used for any final adjustment of speed. If an exhaust analyser is available, the percentage of CO should be made on the basic idle adjustment, prior to making the final speed adjustment on the bypass idle screw.

11 Fault diagnosis

Symptom	Reason/s
Engine will not start	Faulty automatic choke Blocked fuel filter or jets
Uneven idling	Leaking carburettor flange or manifold gasket Loose idling jets or auxiliary venturis Excessive sediment or water in carburettor Throttle shafts and bearings or carburettor body excessively worn Faulty automatic choke Leaking ignition advance tube
Carburettor floods	Worn needle valve Leaking or damaged float assembly Incorrect float level adjustments Excessive sediment in fuel
Engine lacks performance	Incorrect tuning adjustments Incorrect float level adjustments Excessive sediment in fuel Faulty acceleration pump Throttle valves do not fully open
Excessive fuel consumption	Needle valve not seating Leaking or damaged float assembly Incorrect float level adjustments Faulty automatic choke Choked air filter