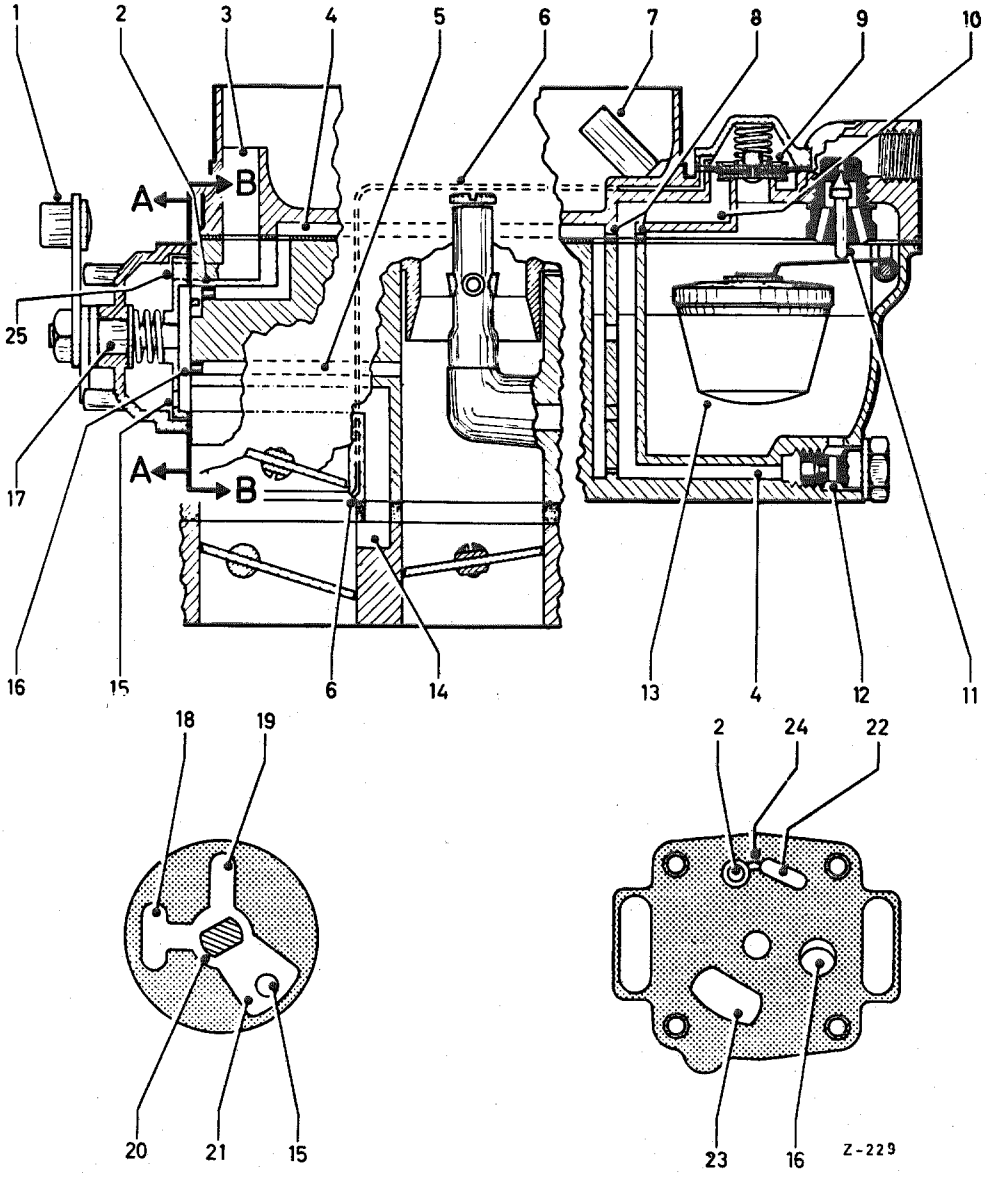
C. Starter Mechanism

The starter mechanism is manually operated by means of a bowden cable. If the starter knob is pulled right out, the starter mechanism is set in the cold start position. If the starter knob is pressed in toward the instrument panel until it clicks into the notch position, the mechanism is set to the warm-up position. Finally, when the starter knob is pressed hard against the instrument panel, the starter mechanism is switched off completely.



Starter rotary slide valve, view AA

Starter flange, view BB

Fig. 07 — 0/7

1 Starter lever
2 Graded bore in starter rotary slide valve
3 Air canal for starter mechanism
4 Fuel duct in starter system
5 Canal from starter flange to suction tube of Stage 1
6 Vacuum canal to starter air valve
7 Float chamber ventilation
8 Notch in carburetor cover
9 Starter air valve
10 Air canal from starter air valve to fuel duct (4)
11 Float needle valve
12 Starter fuel jet
13 Plastic float
14 Start mixture canal
15 Graded bore in starter rotary slide valve
16 Graded bore in starter flange
17 Starter rotary slide valve
18 Chamber in starter rotary slide valve
19 Chamber in starter rotary slide valve
20 Mixing chamber in starter rotary slide valve
21 Cavity in starter rotary slide valve
22 Fuel slot in starter flange
23 Entry to starter canal
24 Canal from 22 to 2
25 Graded bore from air canal to starter flange

a) **Cold start position** (Starter knob pulled right out)

The partial vacuum obtaining in the suction tube exerts an influence on the starter system (Fig. 07 — 0/7), via the gaps at the side of the vacuum valve and the start mixture canal (14). As a result of the partial vacuum, fuel is drawn up from the float chamber via the starter fuel jet Gs (12) into the canal (4). Air enters through the notch (8) in the carburetor cover which connects up with the float chamber. Thus there is already a kind of pre-mixture present in the canal (4) leading to the starter rotary slide valve. Furthermore, the notch is designed above all to prevent fuel from being drawn up by the siphon effect when the starter is not switched on and the starter rotary slide valve is not quite gas-tight. The pre-mixture enters the chamber (19) of the starter rotary slide valve through the graded bore (2). At the same time, air is drawn from the suction canal of Stage 1 into the chamber (18) of the rotary slide valve via the canal (5) (with the graded bore [16]). This air combines with the pre-mixture in the mixing chamber (20). From the mixing chamber (20), this pre-mixture, with air added, passes into the cavity (21). There is a further supply of air which comes from the air canal (3) via the graded bore (15) of this cavity which acts as a starter air jet. The pre-mixture, which with this additional air has now become a rich starting mixture, passes via the orifice (23) into the starting mixture canal (14). The fuel flow for this first phase — when starting the engine — is shown in Fig. 07 — 0/8.

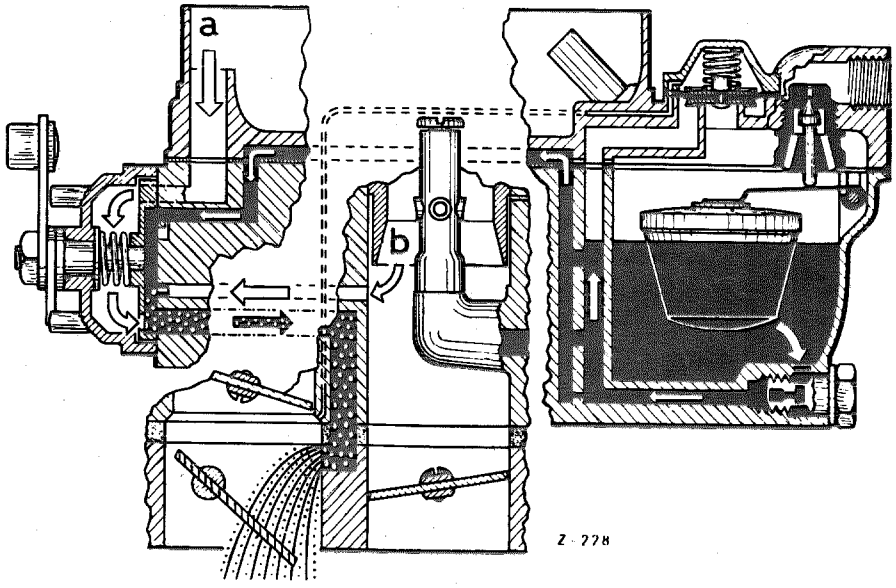


Fig. 07 — 0/8

Cold start — Phase 1 — starting
Engine not yet started

a) Starter air entry
b) Additional air entry

As soon as the engine starts, the increase in engine speed causes an effective partial vacuum beneath the mechanical throttle valve of Stage 2. This partial vacuum exerts a pull on the spring-loaded side of the diaphragm of the starter air valve (9), via the vacuum canal (6) (Fig. 07— 0/9). At the same time the pressure flow, which is now appreciable opens the vacuum valve slightly and raises the counterweight a little.

Due to the partial vacuum effect, the starter air valve opens and admits more air from the float chamber via the air tube (10) to the starter system via the canal (4). This additional air immediately attenuates the starting mixture after the engine has started, thus ensuring the proper conditions for it to continue running (Fig. 07 — 0/9).

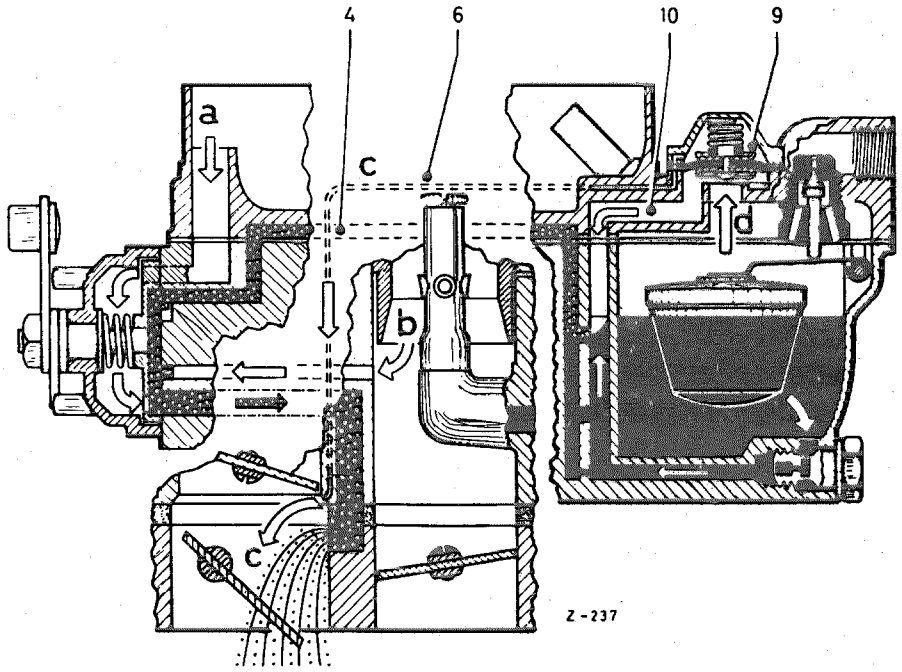


Fig. 07 — 0/9

Cold start — Phase 2 — after the engine starts

a) Starter air entry
b) Additional air entry
c) Vacuum
d) Air entry for attenuating start mixture

b) **Warm-up position** (starter pushed half-way in)

As soon as the engine has warmed up a little, after the car has been driven away, the starter knob can be pushed half-way in. The starter rotary slide valve then turns to the right; the chamber (19) of the slide valve is now opposite the slot (22) of the starter housing (see Fig. 07 — 0/7). As the slot (22) is connected to the graded bore (2) only by a fine canal (24) the amount of fuel passed is greatly decreased. The flow of the fuel is shown in Fig. 07 — 0/10).

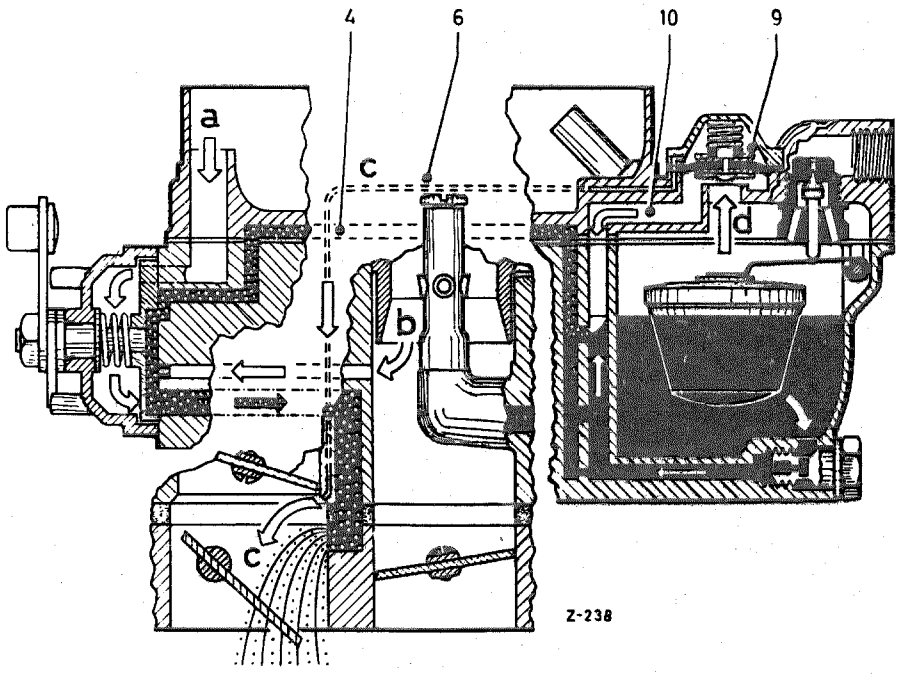


Fig. 07 — 0/10

Warm-up

c) **Driving away with starter knob pulled out**

When the car is driven away, the throttle valve of Stage 1 is opened by the depressed accelerator pedal. The deep depression (vacuum) which has hitherto prevailed at the throttle and vacuum valve moves into the mixing chamber of Stage 1 and in consequence considerably reduces the supply of start mixture which is passing via the start mixture canal (14) (Fig. 07 — 0/11). But this is compensated for by the start mixture drawn in via the canal (5) so that the supply of start mixture for the engine remains unaffected.

If as a result of quick acceleration from low engine speed the throttle valves are still further opened, the partial vacuum which has hitherto been appreciable, now loses considerably in effect. The starter air valve (9) which had opened immediately the engine started, now closes again so that the starter system produces a rich start mixture for the change-over just as it did at starting. As soon as the engine reaches sufficient r. p. m. the starter air valve, actuated by the partial vacuum which is forming again, once more opens and attenuates the start mixture. By this automatic action of the starter air valve, the cold engine is supplied with a correctly calculated start mixture suitable for any conditions.

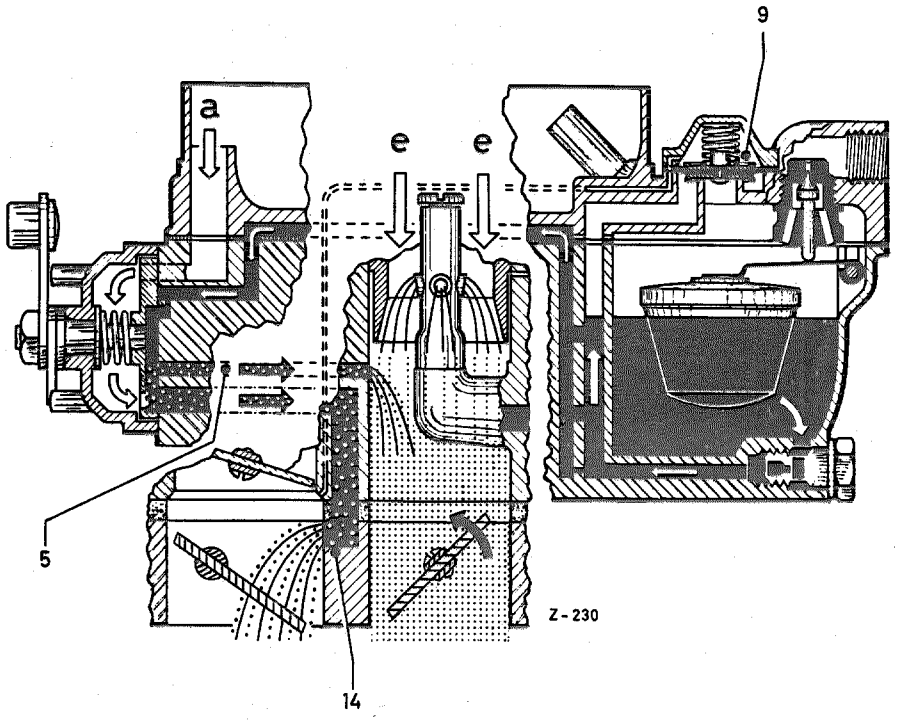


Fig. 07 — 0/11

Change-over

a) Entry of starter air
b) Main air supply

d) **Starter knob inoperative** (starter knob pushed right in)

The chamber (19) is turned away to the right, beyond the slot (22), when the starter rotary slide valve is turned (see Fig. 07 — 0/7). Thus the chamber (19) is no longer connected to the graded bore (2). The starter system is now rendered inoperative. In order to prevent fuel from being drawn from the starter system when the starter carburetor is switched off, the notch (8), mentioned above, has been made in the carburetor cover. This notch connects the float chamber with the start canal (4) and when slight leakage is present in the starter rotary slide valve, no siphon effect is obtained and only air — i. e., no fuel — can be drawn in (see Fig. 07 — 0/7).