B. Starter Mechanism

The starter mechanism of the carburetor works in two stages on the rotary slide valve principle. The starter mechanism is actuated by a bowden cable with a pull knob on the instrument panel. If the starter knob is pulled right out, the starter mechanism is set to the "cold-start position". If the starter knob is pressed in about halfway, the starter mechanism is set to the "warm-up position". If the starter knob is pressed in completely, the starter mechanism is out of operation.

Connecting the choke control is described in Job No. 30-6.

a) Cold Start Position

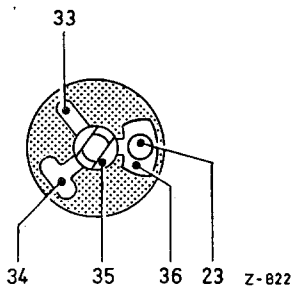
(Starter knob pulled right out)

In this position of the starter mechanism the bore (23) in the starter rotary slide valve is in the center of the starter mixture canal (25) in the starter flange of the carburetor housing.

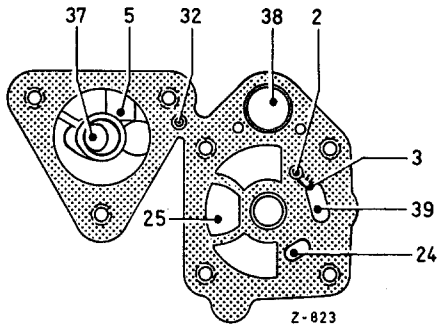
In the 1st phase of the cold start the partial vacuum obtaining in the suction tube exerts an influence on the starter system via the starter mixture canal (25) when the engine is being started. As a result fuel from the float chamber is drawn into the fuel canal (4) through the starter fuel jet (26). A certain amount of air enters at the same time through the notch in the carburetor cover which connects up with the float chamber; as a result a kind of pre-mixture is present in the fuel canal (4) leading to the starter rotary slide valve.

The notch is designed above all to prevent fuel from being drawn up by the siphon effect when the starter mechanism is inoperative and if the starter rotary slide valve should have a slight leak.

The pre-mixture enters the chamber (33) of the starter rotary slide valve through the graded bore (2) of the fuel canal (4) (Figs. 07-0/1 and 07-0/2).



Starter rotary slide valve



Starter flange of carburetor housing

Fig. 07-0/2

2 Graded bore of fuel canal (4)
3 Graded intake bore in starter flange for fuel slot (39)
5 Air canal form starter air valve to fuel canal (4)
23 Starter air bore in starter rotary slide valve
24 Additional air canal
25 Starter mixture canal
32 Vacuum canal for starter air valve
33 Chamber in starter rotary slide valve
34 Chamber in starter rotary slide valve
35 Mixing chamber in starter rotary slide valve
36 Cavity in starter rotary slide valve
37 Air canal from float chamber to starter air valve
38 Starter air canal
39 Fuel slot in starter flange

At the same time air is drawn from the suction canal of the carburetor via the canal (24) into the chamber (34) of the starter rotary slide valve. This additional air combines with the pre-mixture in the mixing chamber (35) of the starter rotary slide valve. From the mixing chamber this fuel-air mixture passes into the cavity (36) of the starter rotary slide valve. Here it mixes with the air which comes via the starter air canal (38) through the starter air bore (23) in the starter rotary slide valve which acts as a starter air jet. Through the starter mixture canal (25) this mixture now passes into the suction canal of the carburetor where it combines with the air streaming through the throttle valve gap to produce the finished starting mixture. Fig. 07-0/3 shows the mode of action of the starter mechanism during the 1st phase when the engine is being started.

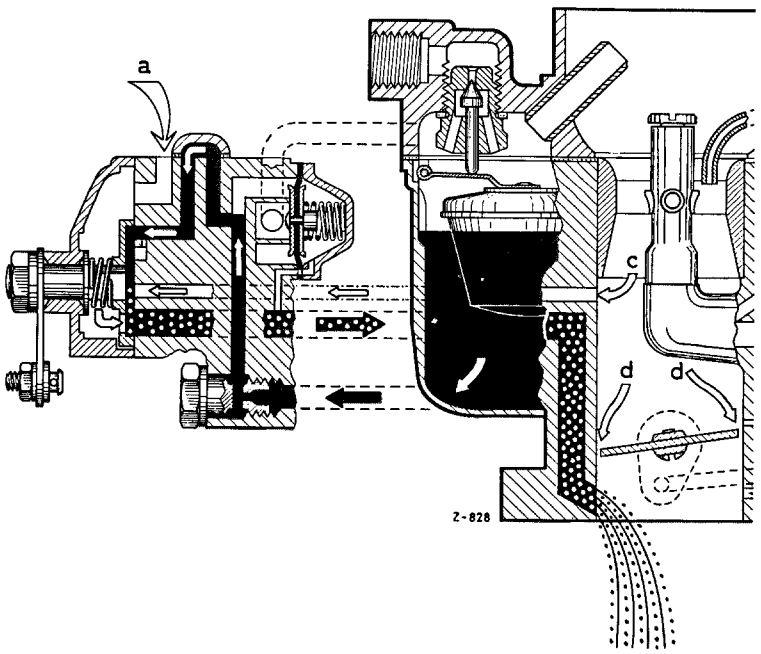


Fig. 07-0/3

Cold start — Phase 1
When starting the engine
(Starter air valve closed)

a) Starter air entry
c) Additional air entry from suction canal
d) Main air entering through throttle valve gap

As soon as the engine has started, the 2nd phase of the cold start begins. The increase in engine speed brings about an effective partial vacuum beneath the throttle valve. This partial vacuum exerts a pull on the spring-loaded side of the diaphragm of the starter air valve (6) via the vacuum canal (32) (see Fig. 07-0/4).

Due to the partial vacuum effect the starter air valve opens and admits more air to the starter system from the float chamber via the air canal (5) and the fuel canal (4). This additional air immediately leans out the starting mixture after the engine has started, thus ensuring the proper running conditions for the engine. Fig. 07-0/4 shows the mode action of the starter mechanism after the engine has started.

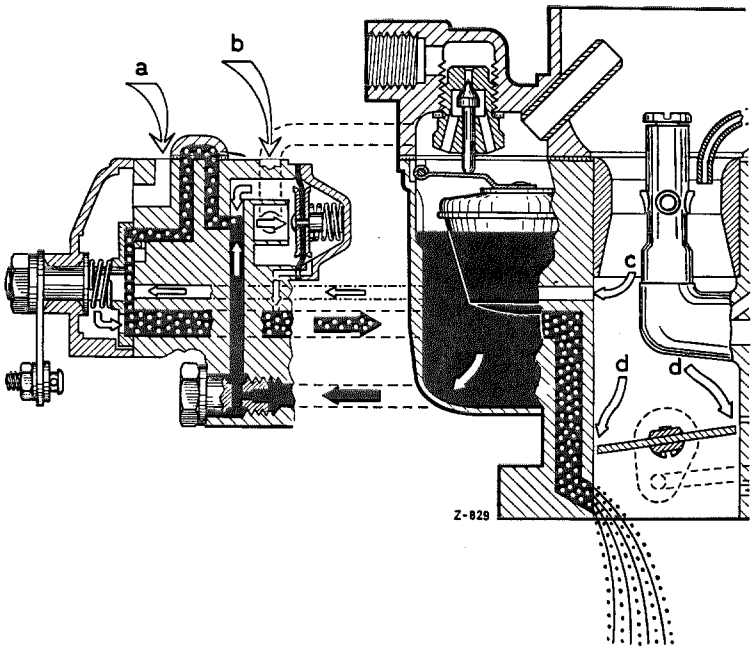


Fig. 07-0/4

Cold start — Phase 2
After the engine has started
(Starter air valve opened)

a) Starter air entry
b) Additional air entry via the starter air valve
c) Additional air entry from suction canal
d) Main air entering through throttle valve gap

b) Warm-Up Position

(Starter knob pushed halfway in)

As soon as the engine has warmed up a little, the starter knob can be pushed in halfway. As a result, the starter rotary slide valve is turned toward the right via the starter lever (22); the chamber (33) of the slide valve is now opposite the slot (39) of the starter flange (see Fig. 07-02). Since the chamber (33) is no longer connected with the fuel canal (4) by the bore (2), but only by the fine-graded bore (3), the amount of fuel admitted is greatly decreased and the start mixture is leaned out further. Fig. 07-0/5 shows the mode of action of the starter mechanism during warming-up.

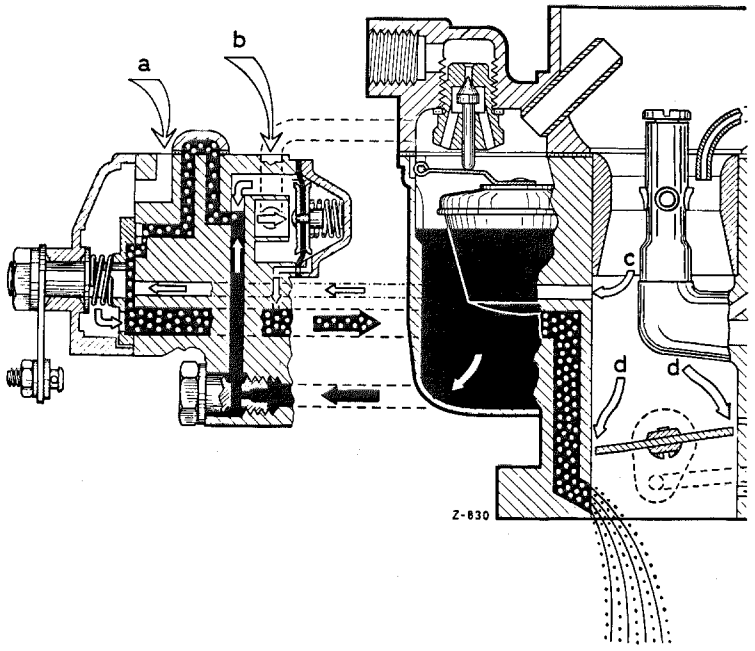


Fig. 07-0/5

Warm-up position
(Starter air valve open)

a) Starter air entry
b) Additional air entry via the starter air valve for attenuating the start mixture
c) Additional air entry from suction canal
d) Main air entering through throttle valve gap

c) Driving Away with Starter Knob Pulled Out

When the car is driven away with the starter knob pulled out, the partial vacuum in the suction canal is transferred upward by the opening of the throttle valve. As a result, the supply of start mixture from the canal (25) decreases. This is compensated for by the start mixture drawn in via the additional air canal (24) so that the supply of start mixture to the engine remains unaffected.

If as a result of quick acceleration from low engine speed the throttle valve is opened still further, the partial vacuum suddenly drops. The starter aire valve (6) 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 speed, the starter air valve, actuated by the partial vacuum which is increasing again, once more opens and leans out the start mixture. By this automatic action of the starter air valve the cold engine is supplied with a correctly proportioned start mixture suitable for all conditions and a satisfactory change-over to the main carburetion system is ensured when the starter knob is pulled. Fig. 07-0/6 shows the mode of action of the starter mechanism when the car is being driven away.

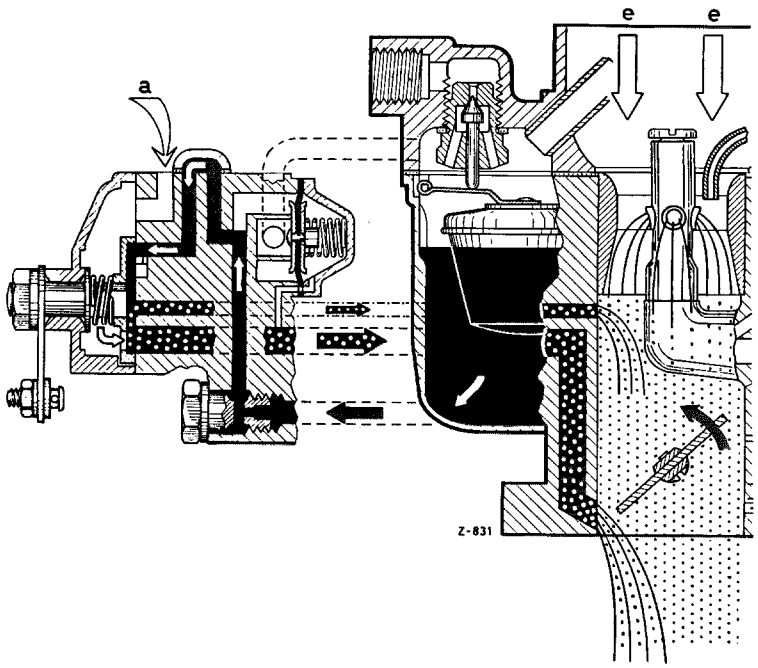


Fig. 07-0/6

Change-over with starter mechanism in action
(Starter air valve closed)

a) Starter air entry
e) Main air supply

Note: As a rule the car should be driven away with the starter mechanism in the "warm-up position". However, at very low temperatures the car can be driven away with the starter mechanism in the "cold-start position".

d) Starter Mechanism Inoperative

(Starter knob pushed right in)

When the starter knob is pushed right in, the starter rotary slide valve is turned to the right to a point where both the graded bore (2) and the slot (39) in the starter flange are completely covered. The starter mixture canal (25) is also closed. The starter system is now put out of action. In order to prevent fuel from being drawn from the starter system, when the starter mechanism is inoperative, but if the starter rotary slide valve is not quite tight, a notch as described in Section a) has been made in the carburetor cover. This notch connects the float chamber with the fuel canal (4). For that reason only air and no fuel can be drawn in from the starter system, when a slight leakage is present in the starter rotary slide valve.

C. Idle System

The idle system of the carburetor consists of the idle fuel jet, the idle air jet and the idle mixture adjustment screw.

a) Idle – Phase 1

The fuel which is drawn in via the idle fuel jet (14) is mixed with the air from the idle air jet (13), forming a mixture which passes into the idle canal (40). In the idle position a further supply of air for the idle mixture enters through the by-pass bores (42) above the throttle valve and then passes into the suction canal through the idle mixture bore (41) and combines with the air streaming through the throttle valve gap to form the final idle mixture (Fig. 07-0/7).

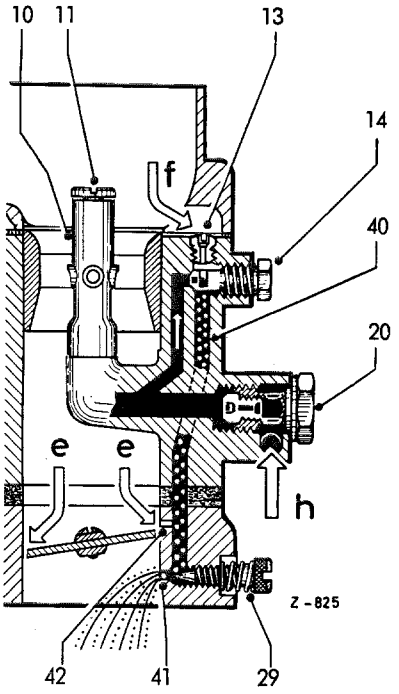


Fig. 07-0/7

Idle — Phase 1

e) Main air supply
f) Entry of idle air
h) Fuel feed

10 Mixing tube holder with mixing tube
11 Air correction jet
13 Idle air jet
14 Idle fuel jet
20 Main jet plug with main jet
29 Idle mixture adjustment screw
40 Idle canal
41 Idle mixture bore
42 By-pass bores