SERVICE MANUAL

Brandstofsystemen
'74 (Engels).

Export Service Department

AKTIEBOLAGET

VOLVO

GÖTEBORG . SWEDEN

GROUP 23

FUEL SYSTEM

CARBURETOR ENGINES

GENERAL INFORMATION

The B 20 A engine is equipped with a horizontal carburetor of type Stromberg 175 CD-2 SE, see Fig. 2-66.
The B 20 B engine is equipped with two horizontal carburetors of type SU-HIF 6, see Fig. 2-67.

The B 20 B engine in a car with right-hand drive is equipped with two horizontal carburetors of type Stromberg 175 CD-2 SE, see Fig. 2-68.

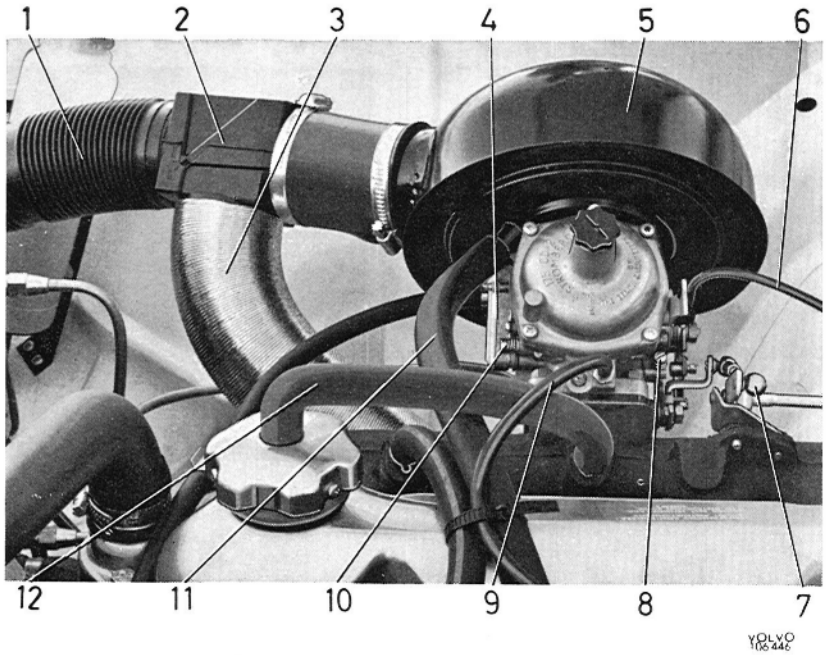


Fig. 2-66. Stromberg carburetor on B 20 A

1. Cold-air hose
2. Constant temperature device
3. Warm-air hose
4. Temperature compensator
5. Air cleaner
6. Choke wire
7. Throttle control
8. Throttle stop screw
9. Vacuum hose for distributor
10. Idle trimming screw
11. Fresh-air hose for crankcase ventilation
12. Hose for crankcase gases

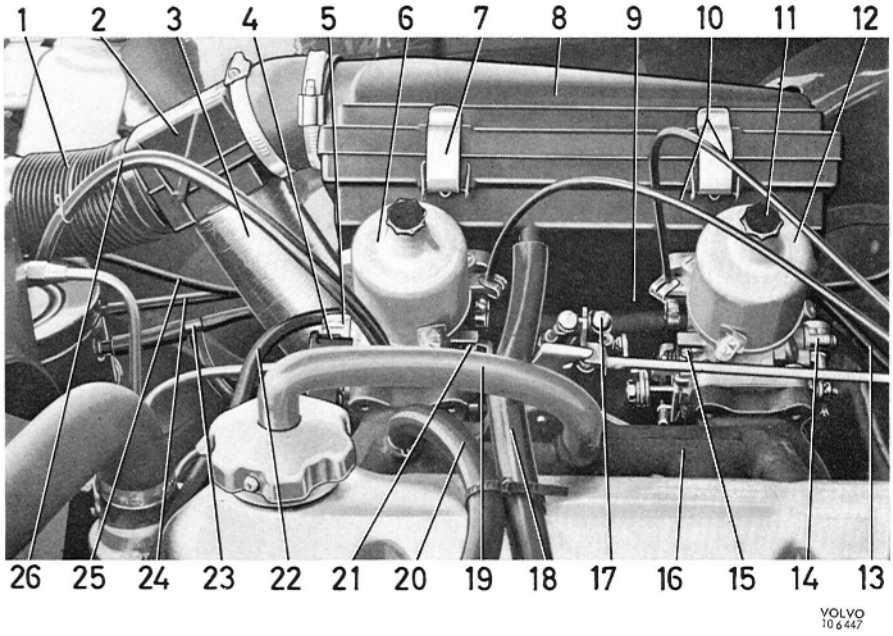
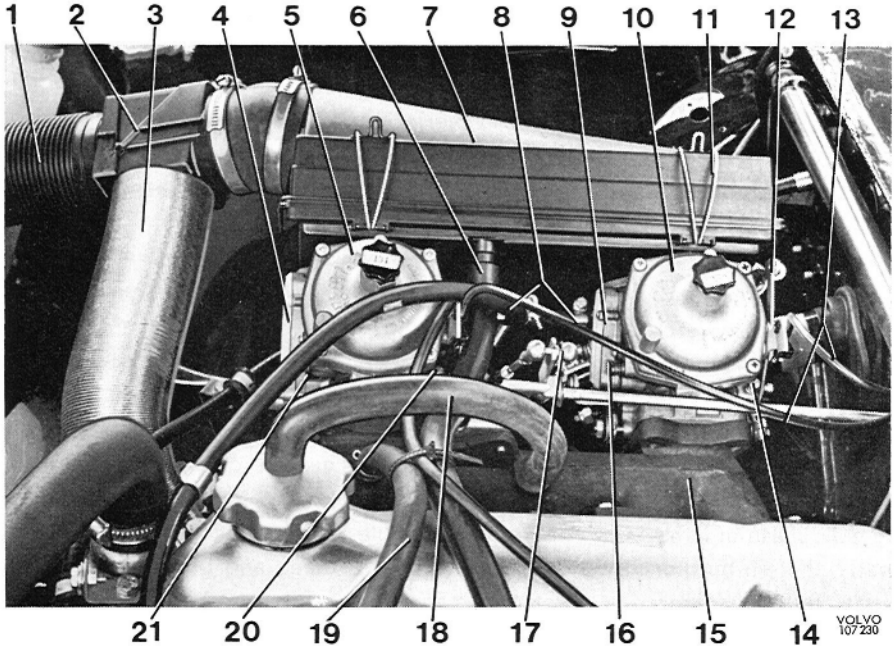


Fig. 2-67. SU carburetors on B 20 B

1. Cold air hose
2. Constant temperature device flap
3. Warm air hose
4. Guard for throttle spindle
5. Hot start valve
6. Front carburetor
7. Clamp for air cleaner cover
8. Air cleaner
9. Fuel hose
10. Choke wires
11. Hydraulic damper
12. Rear carburetor
13. Vacuum hose for distributor (Negative vacuum setting)
14. Hot start valve
15. Idle trimming screw
16. Mainfold
17. Throttle control
18. Fresh-air intake for crankcase ventilation
19. Hose for crankcase gases
20. Hose for brake servo
21. Idle trimming screw
22. Fuel hose
23. Hoses connected to hot start valves
24. Hose to fuel tank
25. Vacuum hose (joined to "negative connection" on carburetor)
26. Hose for fuel fumes

EGR valve, see Fig. 2-104



1. Cold-air hose
2. Constant temperature device flap
3. Warm-air hose
4. Temperature compensator
5. Front carburetor
6. Fresh-air intake for crankcase ventilation
7. Air cleaner
8. Fuel hoses
9. Temperature compensator
10. Rear carburetor
11. Clasp for air cleaner cover
12. Hot start valve
13. Choke wires
14. Throttle stop screw
15. Manifold
16. Idle trimming screw
17. Throttle control
18. Hose for crankcase gases
19. Hose for power brake
20. Throttle stop screw
21. Idle trimming screw

Fig. 2-68. Stromberg carburetors on B 20 B (r-h drive)

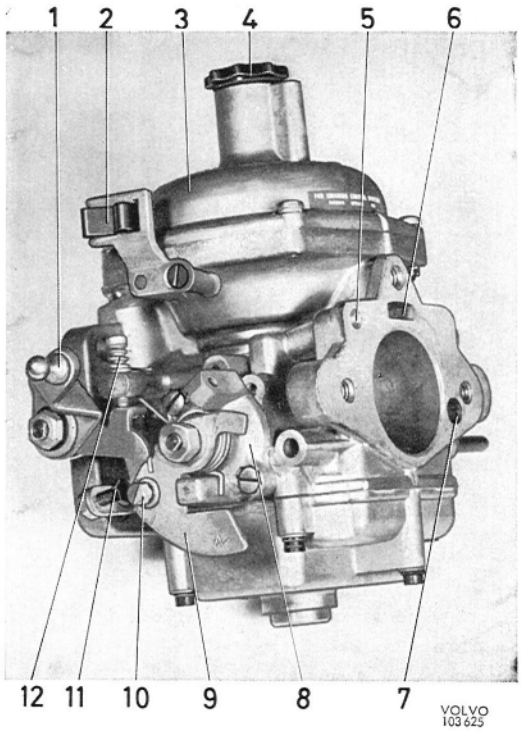


Fig. 2-69. Stromberg carburetor, left side, B 20 A

1. Lever for throttle control
2. Clamp for choke wire
3. Suction chamber
4. Hydraulic damper
5. Vent drilling from float chamber
6. Drilling for air supply under diaphragm
7. Drilling for air supply to temp. compensator and idle trimming screw
8. Cold start device
9. Cam disc for fast idle
10. Connection for choke control
11. Fast idle stop screw
12. Throttle stop screw

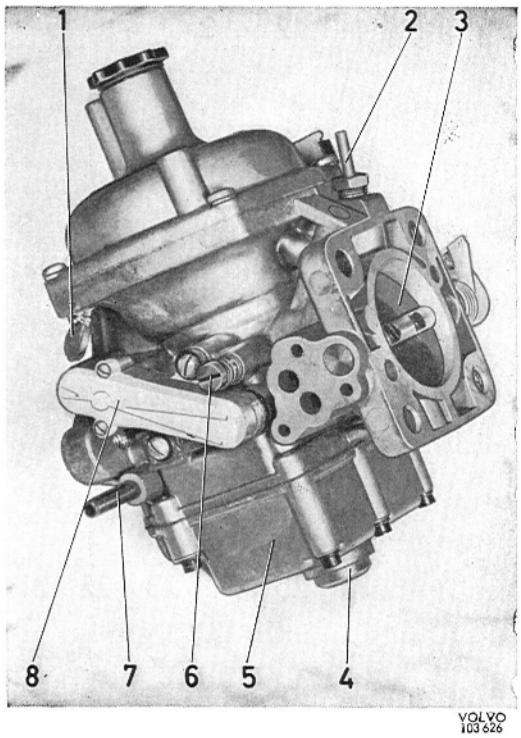


Fig. 2-70. Stromberg carburetor, right side, B 20 A

1. Sealed plug
2. Connection for vacuum hose to distributor (positiv setting)
3. Primary throttle
4. Float chamber plug
5. Float chamber
6. Idle trimming screw
7. Connection for fuel hose
8. Temperature compensator

ZENITH-STROMBERG CARBURETOR

The carburetor for the B 20 A engine is shown in Figs. 2-69 and 2-70. It has been designed to obtain cleaner exhaust gases by a gas evaporative control system.

It is provided with a fixed jet, pressed into the carburetor housing, the fuel flow orifice area is varied by means of a movable tapered needle. The position of the needle is determined by the carburetor housing vacuum operating an air valve in which the needle is installed in a spring-loaded suspension. The spring force always presses the needle against the same side of the jet and this ensures an accurately controlled fuel flow through the jet.

The carburetor consists of three main parts of light-alloy, the middle part comprises the carburetor housing. The lower section is a float chamber, which encloses the jet and the float. The upper section consists of a suction chamber cover, which forms a suction chamber together with a diaphragm fixed in the air valve. The suction chamber regulates the air valve lift and thereby the location of the needle in the jet.

By means of channels in the valve, the suction chamber is linked to the space between the carburetor throttle and valve.

The carburetor is equipped with a cold start device (8, Fig. 2-69) in order to provide the engine with extra fuel for cold starting.

The carburetor is equipped with a temperature compensator (8, Fig. 2-70). This is constructed as an air valve regulated by the carburetor temperature. It maintains the fuel-air mixture constant irrespective of the fuel temperature.

The throttle spindle is provided with seals to reduce wear on the spindles and bushings and also to eliminate air leakage.

Figs. 2-71, 2-72, 2-73 and 2-74 show carburetors for B 20 B engines.

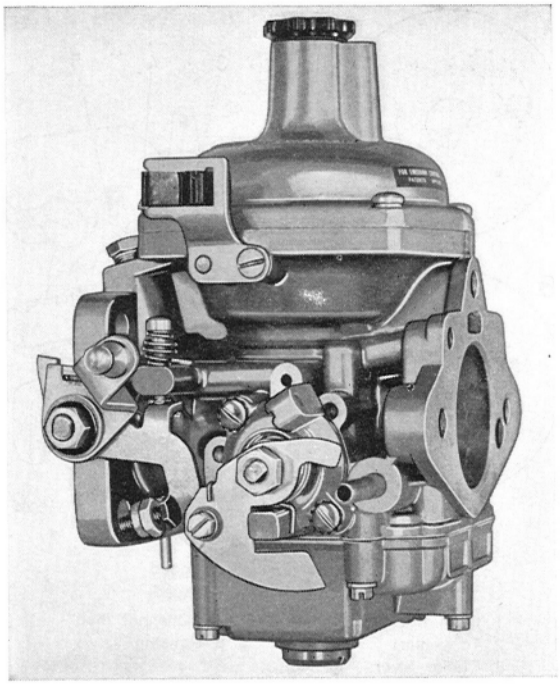


Fig. 2-71. Stromberg carburetor, front, left side, B 20 B

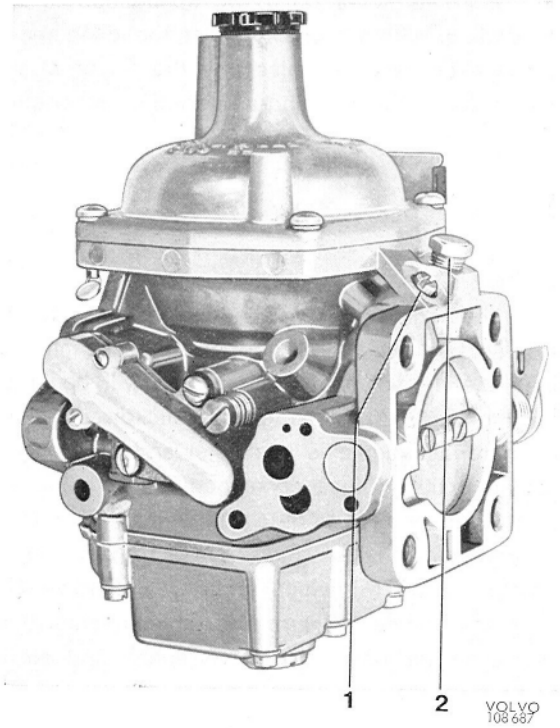


Fig. 2-72. Stromberg carburetor, front, right side, B 20 B

1. Plug for outlet for speed compensator (air conditioning)
2. Plug (vehicles equipped with Gas Evaporative Emission Control System have here a connection for the venting filter)

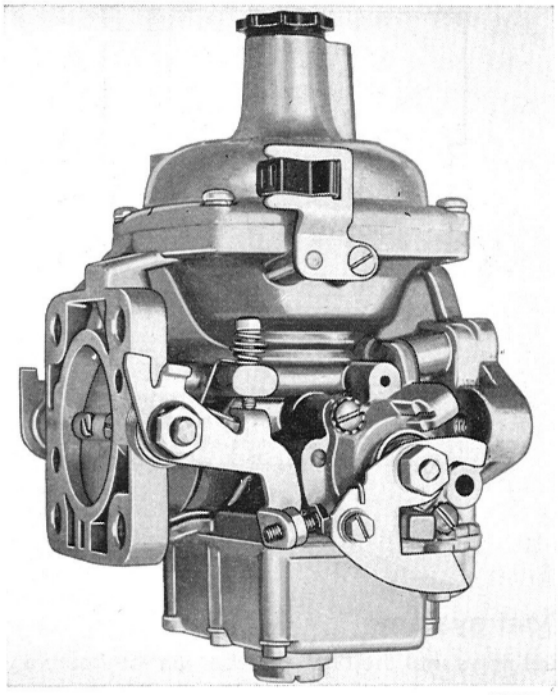


Fig. 2-73. Stromberg carburetor, rear, left side, B 20 B

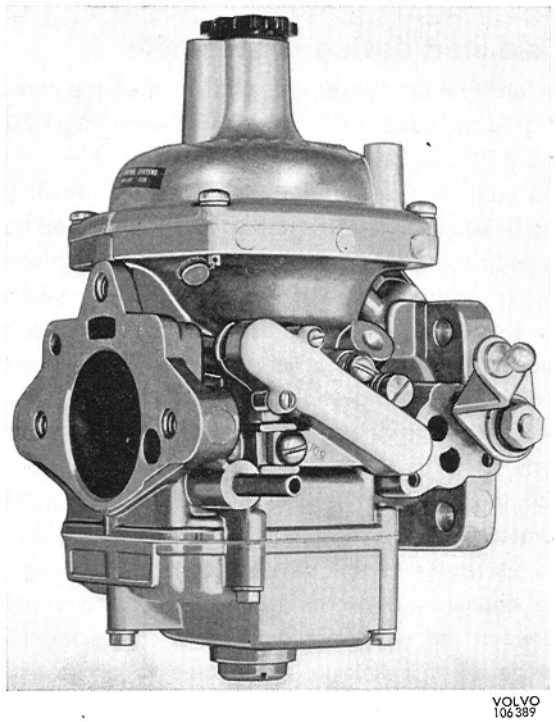


Fig. 2-74. Stromberg carburetor, rear, right side, B 20 B

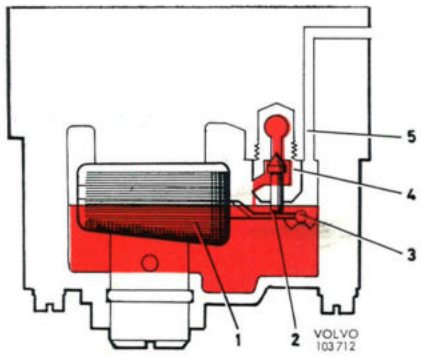


Fig. 2-75. Float system

1. Float
2. Float arm
3. Float shaft
4. Float valve
5. Venting channel from float chamber to air cleaner

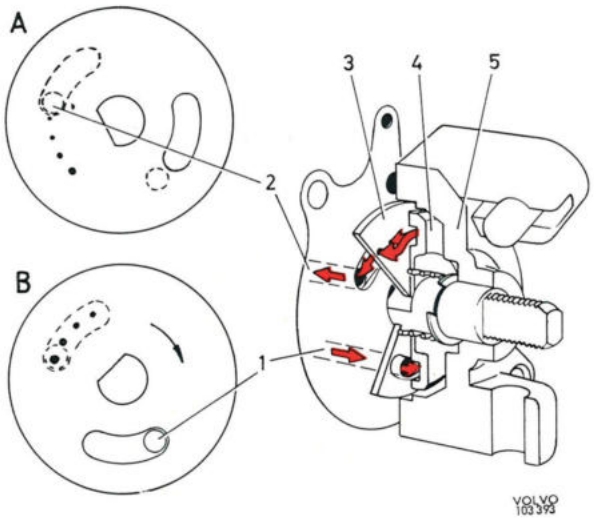


Fig. 2-76. Cold-start device

A. Cold-start device, designed
B. Cold-start device, engaged

1. From floatchamber
2. To venturi
3. Choke lever
4. "Channel disc"
5. Housing

Float system

Fuel flows into the float chamber via the float valve (4, Fig. 2-75). The float (1), which is made up of twin expanded rubber floats, is carried on a bridge in the lower part of the carburetor housing. As the fuel level rises, the float lifts and, by means of the float arm (2) and tab, closes the needle on its seating when the correct level has been attained.

The fuel goes through holes in the float chamber plug and then to the inside of the jet, where the level is the same as in the float chamber. Sealing between the float chamber plug and chamber is provided by an O-ring.

Cold start device and fast idle

To facilitate starting during cold weather, the carburetor is provided with a cold start device (Figs. 2-76 and 2-77).

The cold start device consists of a choke lever (3, Fig. 2-76) which is provided with four calibrated holes and an elongated opening as well as a channeled disc (4) mounted on a spindle which is operated by the choke control. On the same spindle, outside the housing (5), there is a cam disc (9, Fig. 2-69) with connection for the choke control pull wire. When the cold start device is engaged, the valve disc turns and this links up the channel, (1, Fig. 2-76) from the float chamber via one or several of the calibrated holes to the channel on the other side of the valve disc and further through the drilling in the channel (2), which terminates in the venturi between the vacuum plunger and choke flap. By means of this link-up the engine receives extra fuel (richer mixture) to facilitate cold starting. At the same time, a little extra air is obtained by means of the choke device. When the choke control is pushed in, the valve disc turns and closes the inlet to the channel. At the same time as the cam disc is operated, the throttle flap opening is also influenced in such a way that turning the cam disc opens the throttle through the fast idle stop screw (11, Fig. 2-69) and the lever, before any of the calibrated holes open the connection to the fuel drilling. With this arrangement, the idling speed can, if necessary, be raised by the driver of the vehicle during the warming-up period of the engine.

Idling

When the engine is idling, the vacuum in the carburetor suction chamber is low and the column between the air valve and the bridge will be small (see Fig. 2-78). At this stage, the thicker section of the metering needle is in the jet and thus only a small quantity of fuel, corresponding to idling requirements, is sucked into the engine. The temperature compensator (Fig. 2-77) is regulated by a bi-metal spring (3) which influences a valve (2). When the engine is warm and the temperature in the carburetor rises, the valve opens and air is supplied to the carburetor venturi to compensate for the increase in the fuel flow, which is obtained due to the alteration in the fuel's viscosity, see Fig. 2-78. Fine adjustment of the engine idling speed can be made with the idle trimming screw (1, Fig. 2-77).

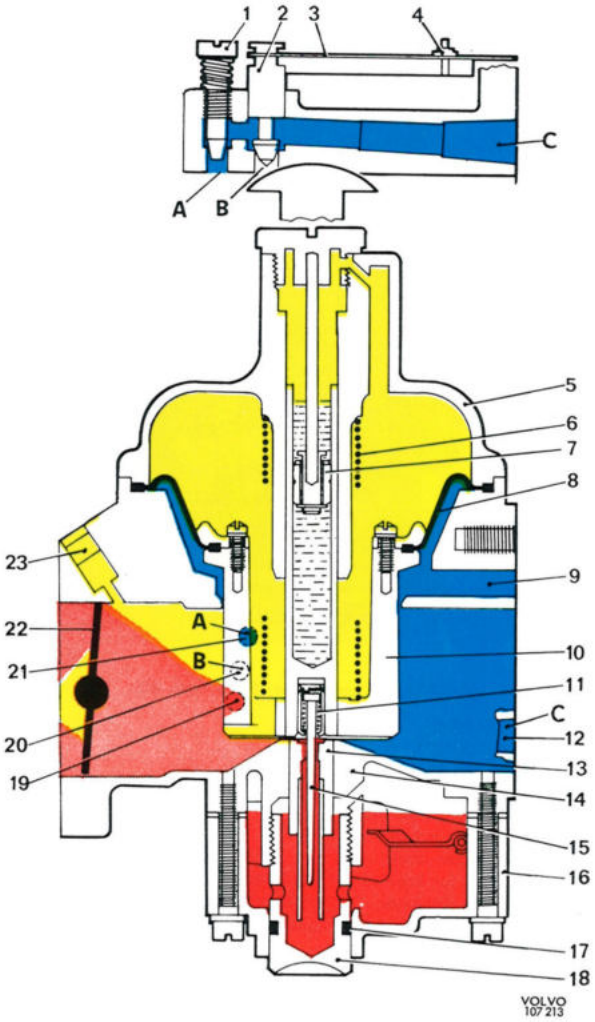


Fig. 2-77. Cold starting, principle

1. Idle trimming screw
2. Valve for temperature compensator
3. Bi-metal spring for temperature compensator
4. Adjuster nut
5. Suction chamber
6. Spring
7. Damper plunger
8. Diaphragm
9. Drilling for air supply under diphragm
10. Air valve
11. Metering needle suspension
12. Drilling for air supply to temp. compensator and idle trimming screw
13. Fuel jet
14. Carburetor housing (middle section)
15. Metering needle
16. Float chamber
17. Rubber ring
18. Float chamber plug
19. Drilling for cold start fuel (located in carb. opposite wall)
20. Drilling for extra air through temperature compensator
21. Drilling for extra air through idle trimming screw
22. Throttle
23. Vacuum outlet for distributor, B 20 A

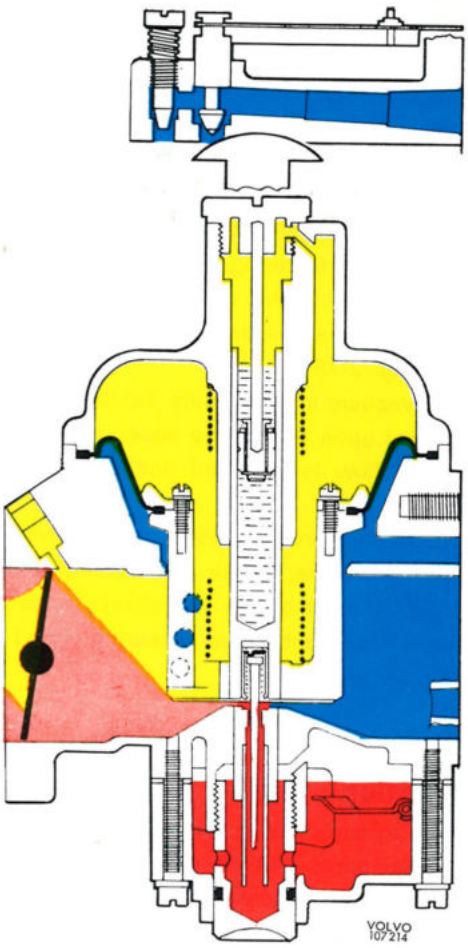


Fig. 2-78. Idling, warm engine

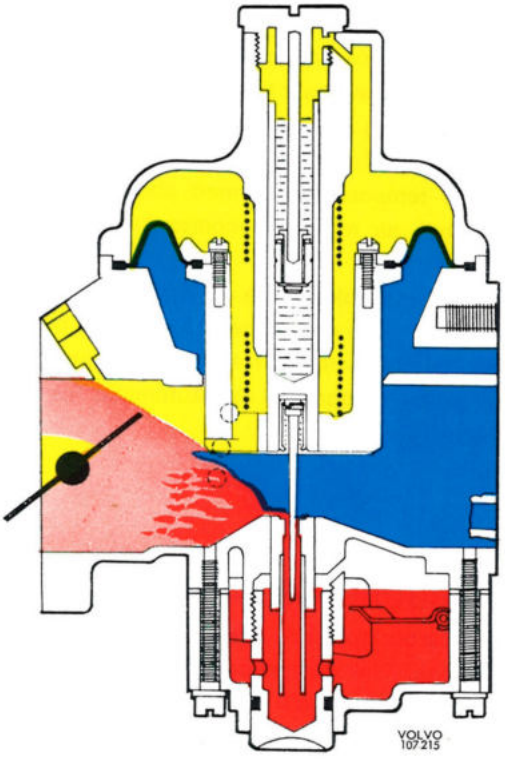


Fig. 2-79. Normal operation

Normal running

When the throttle flap opens, approximately the same vacuum is obtained in the suction chamber as in the engine intake manifold. Due to the pressure difference between the underside of the air valve, where there is pressure in the carburetor inlet port, and the upper side of the valve, where there is vacuum, the valve lifts from the bridge. This also lifts the tapered metering needle (15, Fig. 2-77), which is attached to the valve, out of the jet. The effective choke area widens and increases the fuel flow. See Fig. 2-79.

Since the vacuum in the engine induction manifold is dependent upon the engine speed and load, the correct fuel flow is obtained under all operating conditions.

Because of the variable choke area between the bridge and the valve, the air velocity and pressure drop across the jet orifice will always remain approximately constant, thus ensuring good fuel atomization at all speeds.

Acceleration

To provide at any point in the throttle range a temporary richer mixture at the moment the throttle is suddenly opened = acceleration, a hydraulic damper is incorporated in the valve rod. The hydraulic damper consists of a plunger mounted on a rod. The plunger operates in oil. When the throttle is suddenly opened, the vacuum in the suction chamber increases rapidly.

When the air valve (10, Fig. 2-77) lifts, the damper plunger (7) is forced against its seat and oil is prevented from flowing past the lower side of the damper plunger from the upper side, and this retards the movement of the valve (10). A more powerful vacuum is temporarily obtained above the jet so that the fuel- air mixture becomes for the moment richer.

The downward stroke of the air valve is assisted by the spring (6). The rod in the valve should be filled to approximately within a 1/4″ from the upper edge with oil which is approved as "Automatic Transmission Fluid, Type A".

SU CARBURETOR — HIF TYPE

Two SU carburetors are used for then twin-carburetor engine. The design can be seen from Figs. 2-80, 2-81, 2-82 and 2-83.

The carburetors are constructed for the exhaust emission control system. They are with a tempera-

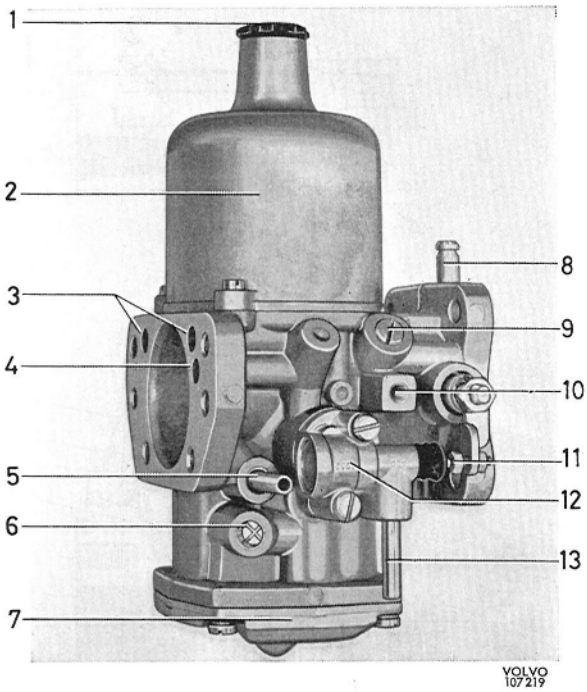


Fig. 2-80. SU carburetor, front, right side

1 Hydraulic damper
2. Suction chamber
3. Drillings for air supply under air valve
4. Vent hole from float chamber
5. Connection for fuel line
6. Jet adjusting screw
7. Float chamber cover
8. Connection for hose to venting filter (vehicles equipped with Evaporative Emission Control System)
9. Plug for outlet for speed compensator (air condition)
10. Boss for guard
11. Hot start valve adjusting screw
12. Hot start valve
13. Outlet from float chamber

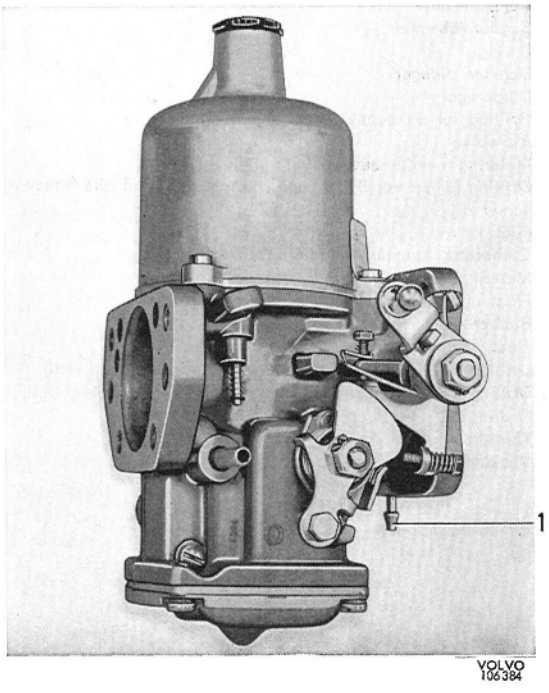


Fig. 2-81. SU carburetor, rear, right side

1. Vacuum hose connection for distributor

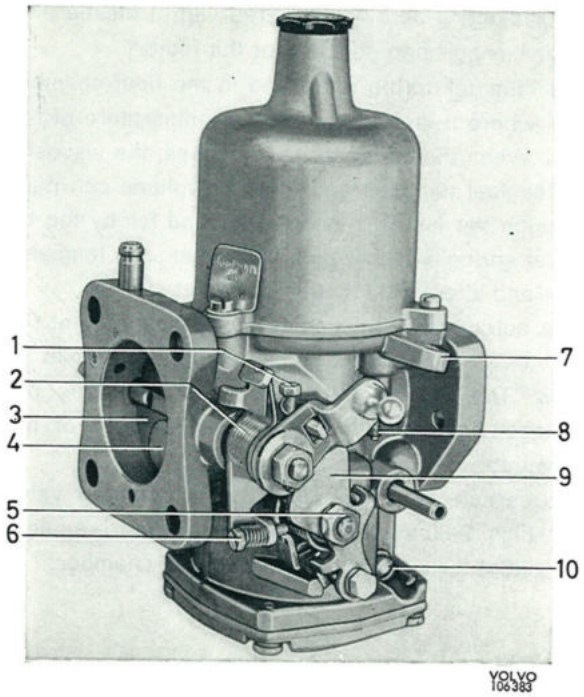


Fig. 2-82. SU carburetor, front, left side

1. Throttle stop screw
2. Return spring
3. Throttle
4. Overrev valve (vehicles equipped with Evaporative Emission Control System)
5. Cold-start device
6. Fast-idle stop screw
7. Attachment for choke control
8. Lift pin
9. Cam disc for fast idle
10. Screw head for float shaft

ture-controlled fuel jet, metering needle, spring suspension, hot start valve and, for the Canadian market, overrev valve in throttle.

The carburetor consists of a carburetor housing (12, Fig. 2-84), the lower part of which is designed

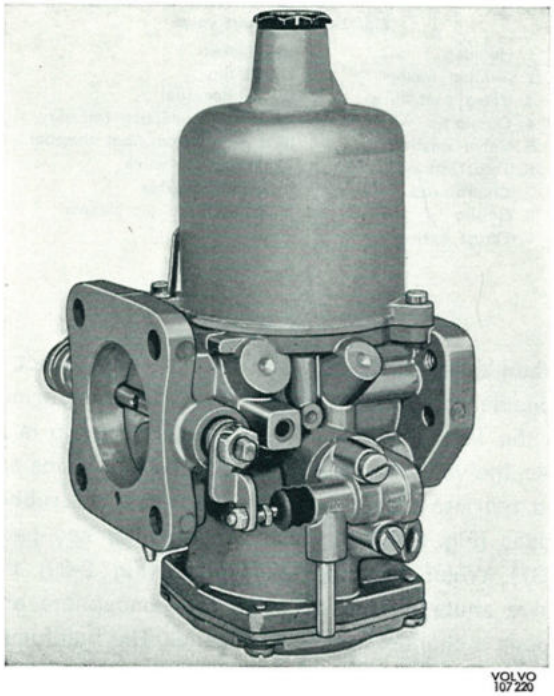


Fig. 2-83. SU carburetor, rear, left side

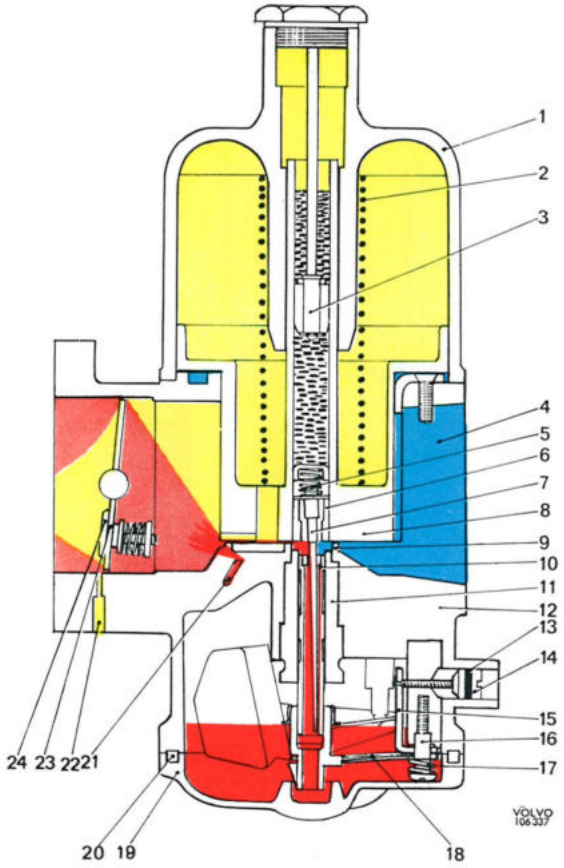


Fig. 2-84. Cold starting, principle

1. Suction chamber
2. Spring
3. Damper plunger
4. Air intake
5. Spring
6. Sleeve
7. Metering needle
8. Air valve
9. Bridge
10. Fuel jet
11. Jet sleeve
12. Carburetor housing
13. Rubber ring
14. Adjusting screw
15. Lever
16. Screw for bi-metal assembly
17. Spring
18. Bi-metal assembly
19. Floatchamber cover
20. Rubber seal
21. Drilling for cold start fuel
22. Vacuum outlet for ignition distributor (negativ setting)
23. Throttle
24. By-pass valve

as a float chamber, and an upper part which is called a suction chamber (1). A movable spring-loaded air valve (8) is located in the suction chamber. It is the lower section of the valve which regulates the volume of air admitted. The suction chamber is connected by channels to the space between the carburetor throttle and valve.

Located in the carburetor housing is an adjustable fuel jet (10), in which a movable tapered needle (7) varies the through-flow volume of fuel. The needle is mounted in the air valve and in a spring-loaded suspension (5). This spring load always forces the needle against the same side of the jet and results in an accurately regulated through-flow of fuel.

The fuel jet is manually adjusted by the adjusting screw (14) and automatically by the bi-metal spring (18).

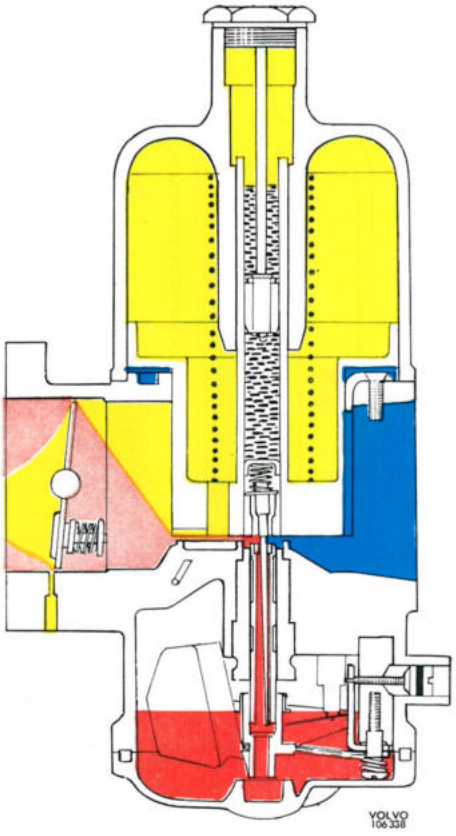


Fig. 2-85. Idling, hot engine

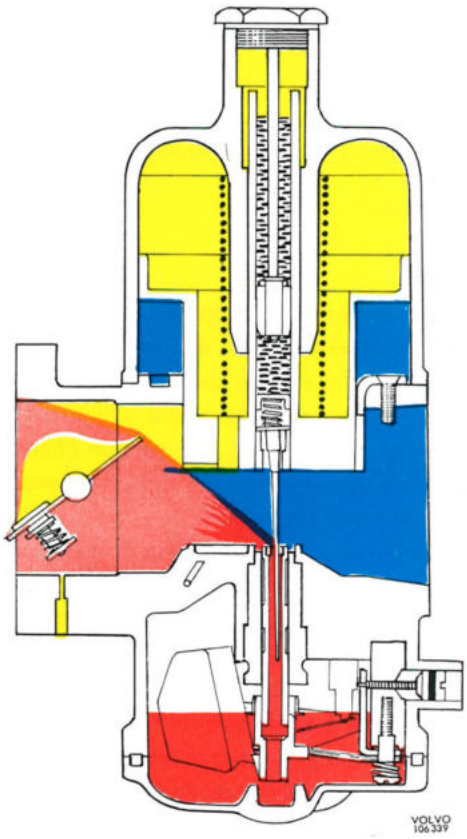


Fig. 2-86. Normal operation

The adjusting screw is covered with a plastic plug after having been adjusted at the factory.

The bi-metal spring is located in the float chamber fuel where it is actuated by the temperature of the fuel. When the temperature increases, the viscosity of the fuel changes and a larger volume can pass through the jet. This is compensated for by the bi-metal spring, which bends with change in temperature and alters the location of the jet.

This automatic regulation of the jet means that the carburetor is stable from a temperature point of view. The fuel-air mixture relationship does not change with alteration in the temperature of the carburetor.

The carburetor is equipped with a hot start valve (12, Figs. 2-80 and 2-87), the purpose is to regulate the outlet for a channel from the float chamber.

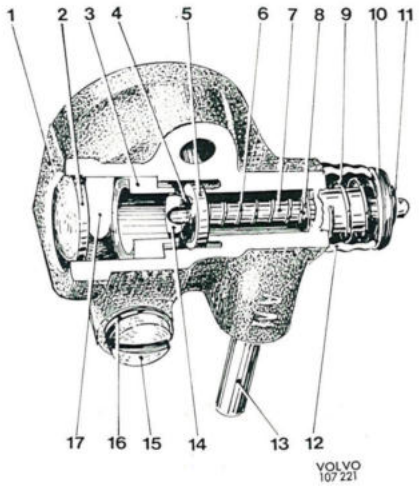


Fig. 2-87. Hot start valve

1. Housing
2. Sealing washer
3. Valve seat
4. Circlip
5. Valve washer
6. Thrust spring
7. Control rod
8. Circlip
9. Thrust spring
10. Washer
11. Circlip
12. Rubber seal
13. Hose connection (outlet)
14. Channel from float chamber
15. Screw for valve
16. Spring washer
17. Channel to air cleaner

When the weather is warm and the engine hot, a considerable amount of fuel fumes form especially in the float chamber. When the throttle flap is at idle, the valve is actuated so that the fuel fumes are led out into the atmosphere (Fig. 2-88) via rubber hoses (Fig. 2-90) (or to a venting filter see page 2-37). When throttling takes place (Fig. 2-89), the valve shuts off the outlet to the atmosphere and opens a channel for the air cleaner. The fuel fumes are led to the cleaner under suction with the air current and take part in the combustion.

By evacuating the fuel fumes to the atmosphere when the throttle flap is at idle, hot start difficulties are avoided.

The throttle spindle is provided with seals (Fig. 2-132) in order to reduce wear on spindle and bushings as well as eliminate air leakage.

On vehicles for the Canadian market an overrev valve (4, Fig. 2-82) is located in the carburetor throttle. This valve opens when the throttle is closed during engine braking. A suitable quantity of fuel-air mixture passes through the valve and this reduces considerably the volume of noxious exhaust gases (see Fig. 2-91).

The cold start device (5, Fig. 2-82) is connected manually. Turning the cold start device spindle opens a channel between the float chamber and venturi. Extra fuel for the venturi is obtained through this channel (see Fig. 2-93).

A damping device (3, Fig. 2-84) is located in the spindle of the valve in order to produce a temporarily richer fuel-air mixture with acceleration.

The rear carburetor is provided with a vacuum connection for the distributor. It is located on the upper side of the carburetor neck and accomplishes so called "positive" vacuum advance. Vehicles equipped with Gas Evaporative Emission Control System (Canada) are provided with a vacuum connection on the underside, Fig. 2-81, accomplishing "negative" vacuum advance.

These vehicles have also on the front carburetor a vacuum connection (8 Fig. 2-80) for the Evaporative Emission Control Filter and, next to it, a connection for the EGR valve. Both connections are "positive".

For Canda, the levers on both carburetors are rigidly connected to the throttle shaft, not via the flange as on other carburetors. The reason is that, if the throttle return spring is defective, the throttle control return spring can bring the throttle back to idle position.

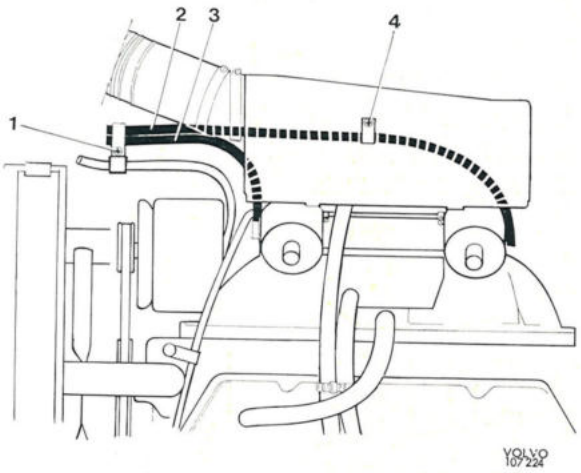


Fig. 2-90. Hoses installed from hot start valves (does not apply to vehicles with Gas Evaporative Control)

1. Clamp
2., 3. Hoses from hot start valve
4. Clamp

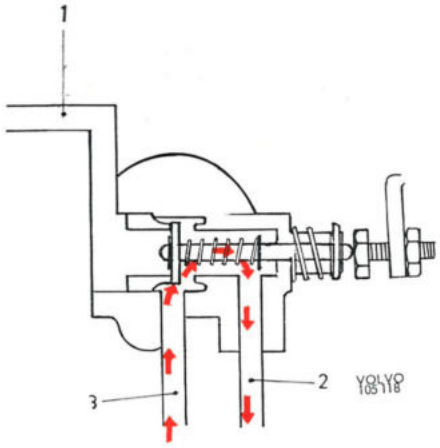


Fig. 2-88. Principle, hot start valve with throttle control inidling position

1. Channel to air cleaner
2. Channel to atmosphere or venting filter
3. Channel from float chamber

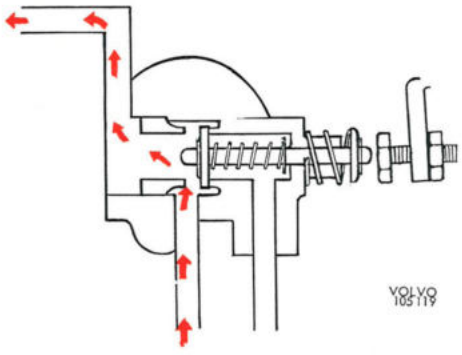


Fig. 2-89. Principle, hot start valve with throttle control in running position

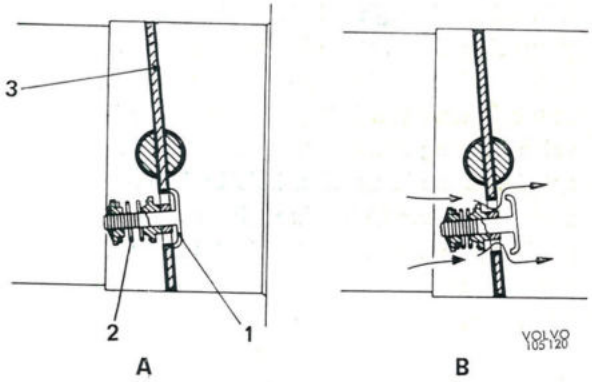


Fig. 2-91. Overrev valve (only on vehicles with Gas Evaporative Emission Control)

A. Idling and running
B. Engine braking

1. Valve
2. Thrust spring
3. Primary throttle

Float system

Fuel flows into the float chamber through the float valve (4, Fig. 2-82). The float (9) is journaled on a float spindle (7). When the fuel level rises, the float lifts and at the proper fuel level the float valve is shut off by the float tab.

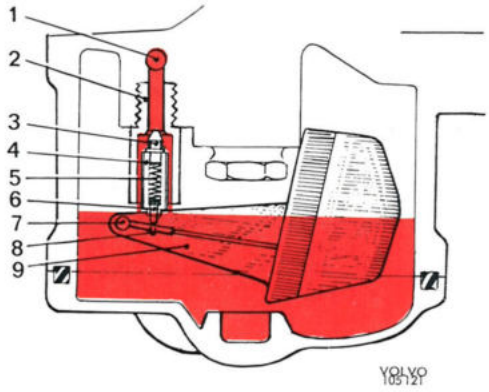


Fig. 2-92. Float system

1. Fuel inlet
2. Float valve house
3. Float valve point
4. Float valve
5. Spring
6. Spring-loaded pin
7. Float spindle
8. Retainer
9. Float

Cold start device and fast idle

During cold starting, the fuel-air mixture is given extra fuel through the cold start device. This device consists of a valve housing (14, Fig. 2-93) partly located in a space in the lower section of the carburetor housing and is provided with seals (8 and 15). A pivotable spindle (16) is located in the center of the valve housing. When the spindle is turned to cold start position, fuel is drawn from the bottom of the float chamber through the channel (2) to the space round the valve housing. From there it is taken through a hole in the valve housing, a channel in the center of the spindle and a channel in the carburetor housing to the carburetor venturi at the bridge. The linkage between the hole in the valve housing and the channel in the center of the spindle is made up of a hole and a V-slot. When the spindle turns, the through-flow area is altered gradually in the V-slot, and at full turn, the fuel goes directly through the hole, see Fig. 2-93. In this way the quantity of additional fuel is regulated. A channel (4) between the float chamber space above the fuel level and the channel (2) for the fuel give the cold start fuel a little extra supply of air. The fast idle cam (6) follows the pivotal movement of the spindle and actuates the position of the throttle. The fast idle cam opens the throttle slightly before the slot in the spindle reaches the hole in the valve housing. With this arrangement, the driver can raise the idling speed while the engine is warming up.

Idling

When the engine is idling, the vacuum in the carburetor suction chamber is low and the column between the air valve and bridge is narrow (Fig. 2-85). The metering needle is then positioned in the thicker section of the jet and only a small amount of fuel, corresponding to idling requirements, is drawn into the engine. The amount of air is determined by the size of the column between the valve and the bridge.

Running

When the throttle is opened, the suction chamber obtains about the same vacuum as in the engine intake manifold. Owing to the pressure difference between the bottom side of the air valve, where there is pressure at the inlet port of the carburetor, and the top side of the valve, where there is vacuum, the valve lifts from the bridge and also causes the tapered needle (7, Fig. 2-84) secured at the valve to lift from the jet. The effective choke area widens and increases the fuel flow. Since

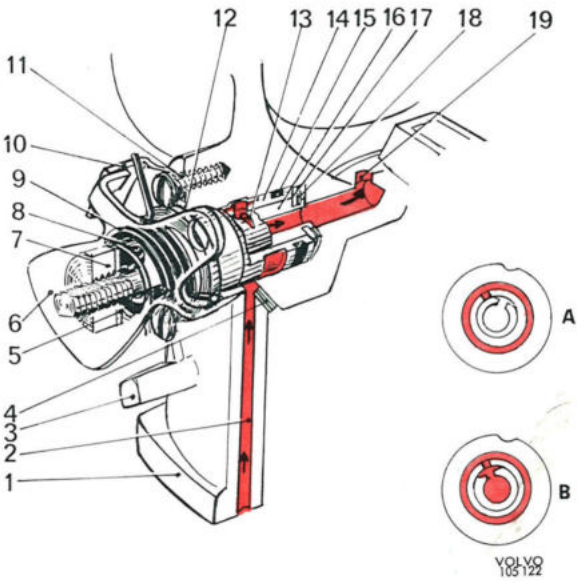


Fig. 2-93. Cold start device

A. Disengaged
B. Engaged
1. Charburetor housing
2. Channel from float chamber
3. Stop tab for lever
4. Channel for additional air
5. Tab washer
6. Cam for fast idle
7. Nut
8. Seal
9. Return spring
10. Spring retainer
11. Screw
12. Packing
13. V-slot
14. Valve housing
15. Seal
16. Spindle
17. Washer
18. Circlip
19. Channel to carburetor venturi

the vacuum in the engine induction manifold is dependent upon the engine speed and load, correct fuel flow is obtained for all operating conditions. Because of the variable choke area between the bridge and the valve, the air velocity and pressure drop across the jet will always remain approximately constant, thus ensuring good fuel atomization at all speeds.

Acceleration

To provide at any point in the throttle range a temporarily richer mixture at the moment the throttle is suddenly opened = acceleration, a hydraulic damper is incorporated in the valve rod. The hydraulic damper consists of a damper plunger (3, Fig. 2-84) mounted on a rod. The plunger operates in oil. When the throttle is suddenly opened, the vacuum in the suction chamber increases rapidly.

When the air valve (8) lifts, the damper plunger is forced against its seat and oil is prevented from flowing past the lower side of the damper plunger from the upper side, and this retards the movement of the valve (8). A more powerful vacuum is temporarily obtained above the jet so that the fuel-air mixture becomes richer for the moment.

The downward stroke of the air valve is assisted by the spring. The rod in the valve should be filled within 1/4″ from the upper edge with oil which is approved as "Automatic Transmission Fluid, Type A".

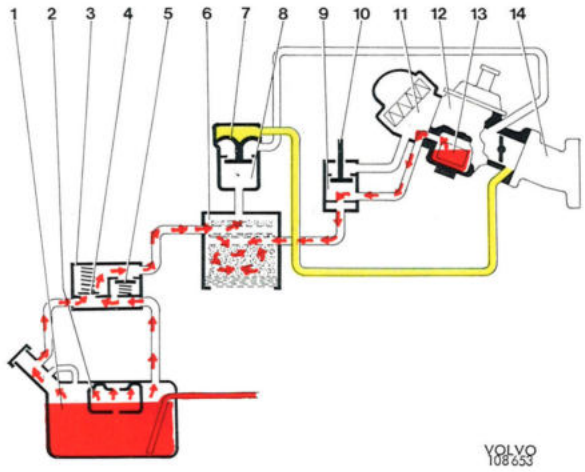


Fig. 2-94. Gas Evaporative Emission Control System. Function with control rod (10) at idle position

1. Fuel tank
2. Expansion tank
3. Equalizing valve
4. Overpressure valve
5. Underpressure valve
6. Venting filter
7. Diaphragm
8. Vacuum valve
9. Hot start valve
10. Control rod
11. Air cleaner
12. Carburetor
13. Float chamber
14. Intake manifold

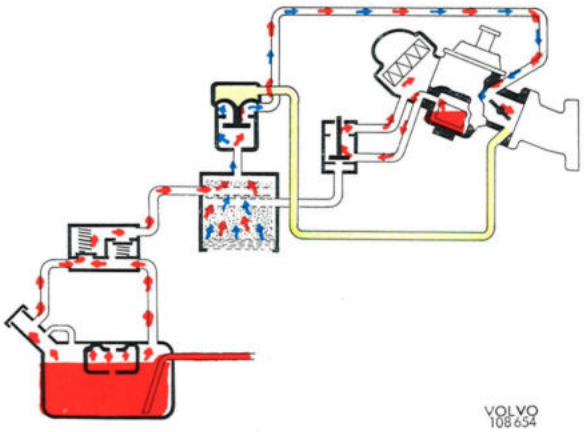


Fig. 2-95. Gas Evaporative control system. Function with control rod at running position

GAS EVAPORATIVE EMISSION CONTROL SYSTEM

Vehicles intended for Canada are equipped with a Gas Evaporative Emission Control system, which prevents fuel fumes from tank and carburetor to be released out into the atmosphere.

The system comprises equalizing valve 3, venting filter 6, vacuum valve 8 and hot start valve 9, Fig. 2-94. See also Figs. 2-96 to 2-103.

The expansion tank 2 (all models) is also a part of the Gas Evaporative Emission Control System, as it absorbs the warm gas expansion at full tank.

Figs. 2-94 and 2-95 show the function of the system. Fuel fumes formed in the fuel tank, especially during hot weather, are led through the hoses to the equalizing valve 3, see the red arrows.

The equalizing valve 3 comprises the overpressure valve 4 and the underpressure valve 5. The valve 4 opens when the pressure exceeds .05—.2 kp/cm^2 = .7—3 psi and the fuel fumes are directed to the venting filter 6 where they are absorbed by active carbon.

The valve 3 prevents fuel (in curves etc.) from being pressed up in the hose and to the venting filter. The valve 5 opens when the tank underpressure exceeds .1—.2 kp/cm^2 = 1.4—2.8 psi and air is led to the tank via the venting filter.

Fuel fumes from the float chamber are led via the valve (3) to the venting filter when the engine has been switched off or during idling. Throttling shuts off the connection between the venting filter and the float chamber so that the fumes travel via the valve to the air cleaner. (Fig. 2-95).

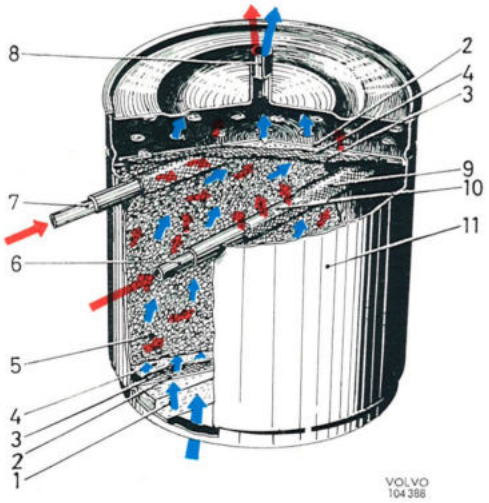


Fig. 2-96. Venting filter

1. Foam plastic filter (replace every 40 000 km =24 000 miles)
2. Plate (perforated)
3. Wire net (gauze)
4. Felt
5. Active carbon
6. Hose connection from expansion container
7. Hose connection from hot start valve
8. Connection to air valve
9. Wire net stocking
10. Perforated pipe
11. Canister

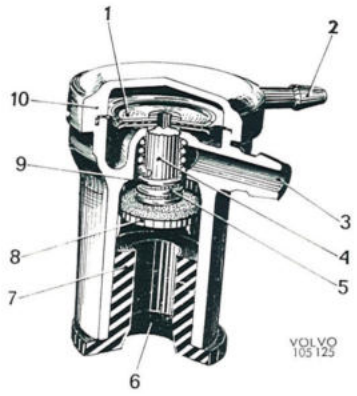


Fig. 2-97. Air valve

1. Diaphragm
2. Connection for hose to rear carburetor
3. Connection for hose to front carburetor
4. Valve rod
5. Thrust spring
6. Connection for venting filter
7. Rubber sleeve
8. Valve
9. Valve seat
10. Housing

The air valve (Fig. 2-97) controls the connection between the venting filter and the carburetor venturi. The space above the diaphragm (1) is connected by a line to the carburetor venturi on the side of the throttle facing the induction manifold, see Fig. 2-94.

The vacuum in the induction manifold depends on the engine load and speed.

At high vacuum, the vacuum valve is kept closed (Fig. 2-94). When the vacuum drops, the valve opens and air is drawn through the venting filter and vacuum valve to the carburetor venturi. Fuel fumes stored in the venting filter follow the air into

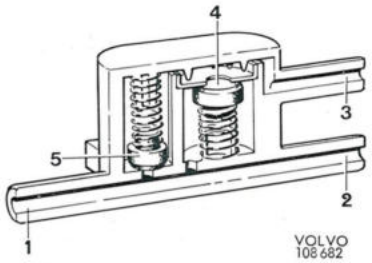


Fig. 2-98. Equalizing valve (located on the fuel tank)

1. Hose from the tank filler neck.
2. Hose from tank (fuel gauge sender)
3. Hose from venting filter
4. Underpressure valve
5. Overpressure valve

the engine and take part in the combustion (Fig. 2-95). The valve (9), which is known as the hot start valve, is to be found on all vehicles with twin carburetors. The difference between a valve used on a vehicle with or without a gas exaporative system is that in the latter case there is no hose from the valve to the venting filter and the fumes are led directly out into the atmosphere when the engine is switched off or idling.

HOT START VALVE

For the SU-carburetor, the hot start valve is described together with the carburetor.

The function of the hot start valve on the Stromberg carburetor is as follows:

During warm weather and when the engine is hot a great deal of fuel fumes develop in the float chamber. These are vented through a channel to the air cleaner and result in the engine obtaining a somewhat "richer" fuel mixture. This makes it difficult to start the engine. To counteract this on B 20 B, the hot start valve is attached to the connection between the float chamber and air cleaner by hoses.

When the throttle is at idling position, the lever (1, Fig. 2-102) presses against the valve control (2). The piston (14) is thereby lifted to its upper position by the control rod (16). The connection between the float chamber and air cleaner is closed and fuel fumes are led directly out into the atmosphere through the outlet (12).

When the accelerator pedal is depressed (see Fig. 2-103), the lever (1) releases the valve control (2) and the piston (14) is pressed by the spring (15) against its lower position. The outlet (12) is shut off, the fuel fumes are led into the air cleaner and, when the engine starts running, then through the

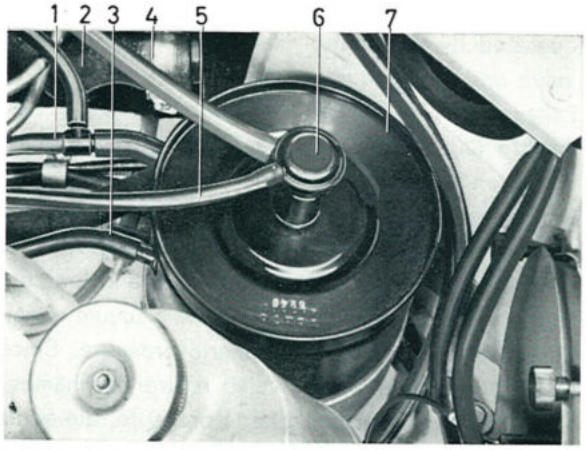


Fig. 2-99. Venting filter

1. Hose for rear carburetor hot start valve
2. Hose for front carburetor hot start valve
3. Hose from fuel tank via expansion tank
4. Hose for front carburetor positive vacuum connection
5. Hose for rear carburetor negative vacuum connection
6. Air valve
7. Venting filter

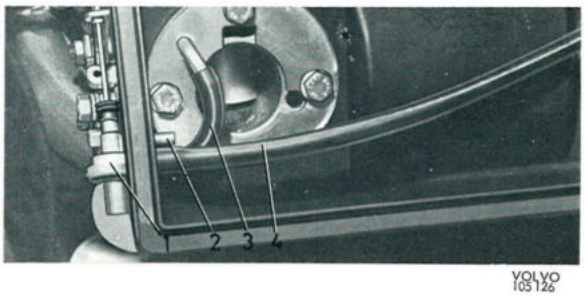


Fig. 2-100. Hose connections, Zenith-Stromberg

1. Hot start valve
2. Outlet to air cleaner
3 and 4. Hoses to carburetor floatchamber

carburetor and into the engine combustion chambers.

If it is to function properly, it is important that the hot start valve is accurately adjusted so that it has proper contact with the carburetor lever.

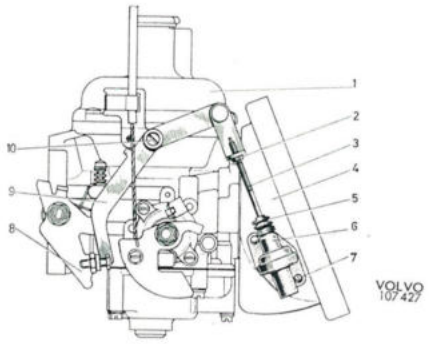


Fig. 2-101. Hot start valve on Zenith-Stromberg carburetor (B 20 B)

1. Carburetor
2. Lock nut
3. Control rod
4. Air cleaner, lower section
5. Rubber seal
6. Hot start valve
7. Attaching rivet
2. Throttle lever
9. Valve control
10. Screw for valve control

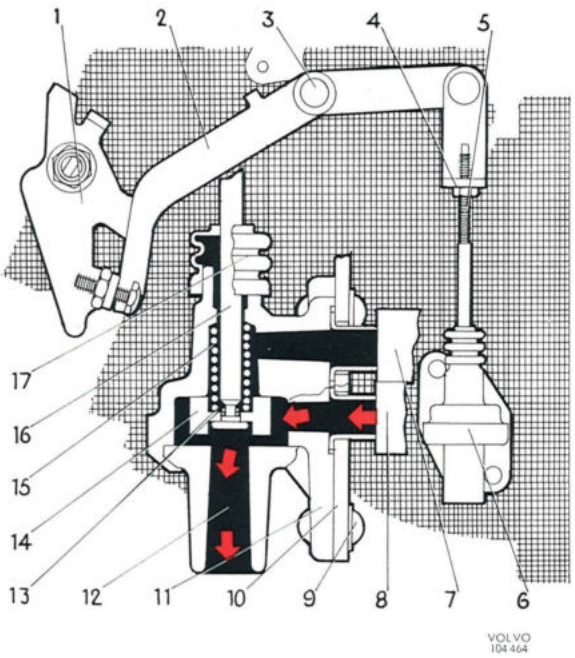


Fig. 2-102. Hot start valve, function, idling (Zenith-Stromberg carburetor)

1. Throttle lever
2. Valve control
3. Screw for valve control
4. Lock nut
5. Control rod
6. Hot start valve
7. Outlet to air cleaner
8. Hose to float chamber
9. Rivet
10. Air cleaner housing
12. Outlet to atmosphere
13. Rubber rings
14. Piston
15. Thrust spring
16. Control rod
17. Rubber seal

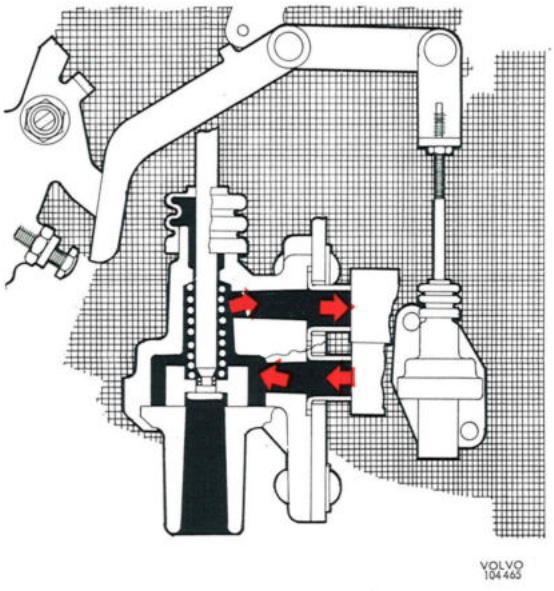


Fig. 2-103. Hot start valve, function, driving (Zenith-Stromberg carburetor)

EXHAUST GAS RECIRCULATION (EGR)

Vehicles for the Canadian market and with B 20 B-engines are equipped with Exhaust Gas Recirculation. This makes for cleaner exhaust gases when driving on half throttle.

The system consists of a recirculation line (1, Fig. 2-104) between the exhaust manifold and the intake manifold, and a vacuum-operated EGR valve (2) connected to the return channel. The system is operated by the control line (4) between the EGR valve and the carburetor venturi.

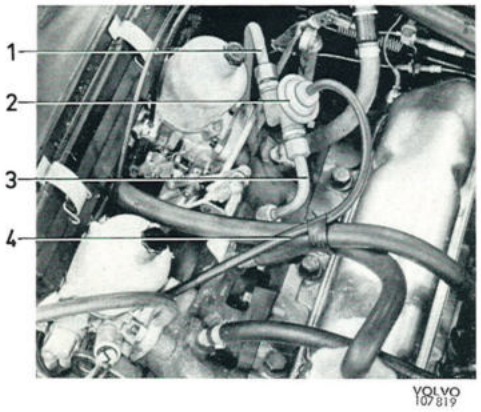


Fig. 2-104. EGR valve, installed

1. EGR line to exhaust manifold
2. EGR valve
3. EGR line to intake manifold
4. EGR line to carburetor

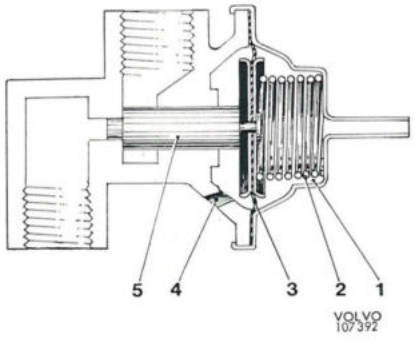


Fig. 2-105. EGR valve

1. Vacuum chamber
2. Return spring
3. Diphragm
4. Reference chamber
5. Piston

Exhaust gas recirculation takes place when the throttle flap is **between** the closed (idle) and the half-open position (full throttle).

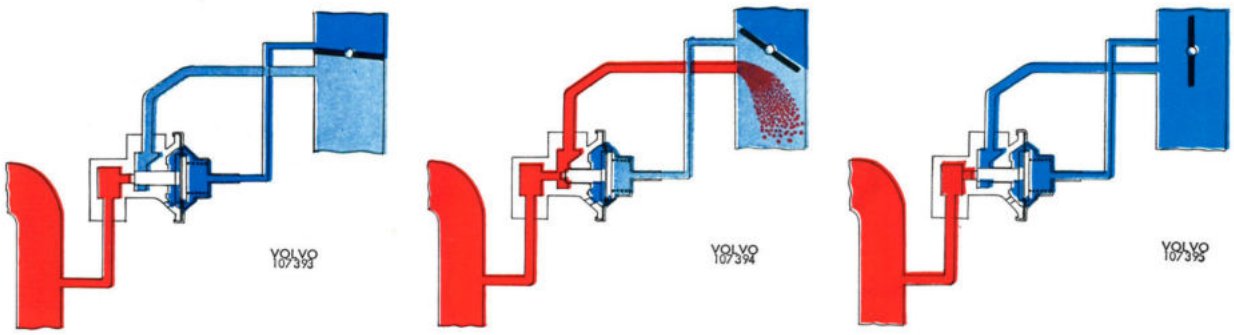
When the throttle flap is closed, Fig. 2-106a, the opening for the control line on the EGR valve is in front of the air shutter. The pressure in the control line and also in the EGR valve vacuum chamber is then equal to atmospheric pressure. Since the pressure in the EGR valve reference chamber is always equal to atmospheric pressure, the same pressure exists on both sides of the diaphragm and this keeps the valve in a closed position under the force of the spring. In other words, there is no exhaust gas recirculation.

When the throttle flap is partly open, Fig. 2-106b, the opening for the control line "moves" behind the air shutter. Behind the throttle flap there is partial vacuum which is transmitted to the vacuum chamber of the EGR valve. The atmosperic pressure in the EGR valve reference chamber now presses the diaphragm backwards so that the valve opens. Exhaust gas recirculation now takes place to the intake manifold and back into the cylinders.

With a fully open throttle flap, Fig. 2-106c, there is atmospheric pressure in the intake manifold and this is transmitted to the vacuum chamber of the control valve. The pressure on both sides of the diaphragm is now equal so that the valve is closed by the spring. Exhaust gas recirculation has now stopped.

When adjusting the carburetors, it is particularly important that the synchronizing is done accurately in order to ensure the function of the exhaust gas recirculation.

The EGR system should be cleaned at certain intervals, see "Service Procedures".



a b c

Fig. 2-106. EGR valve, function

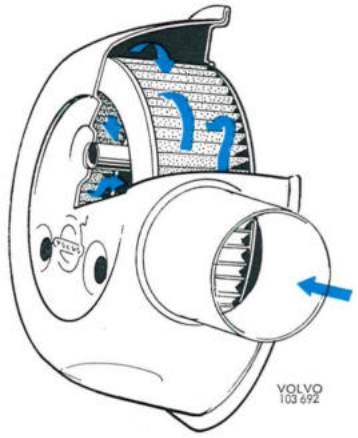


Fig. 2-107. Air cleaner B 20 A

AIR CLEANER

The air cleaner functions both as a cleaner for the intake air and as an intake.

The air cleaner (Fig. 2-107) on the B 20 A units is replaced complete. Change it every 40 000 km (24 000 miles) or earlier if driving conditions require it.

(For certain markets the B 20 A is equipped with an air cleaner as shown in Fig. 2-108.)

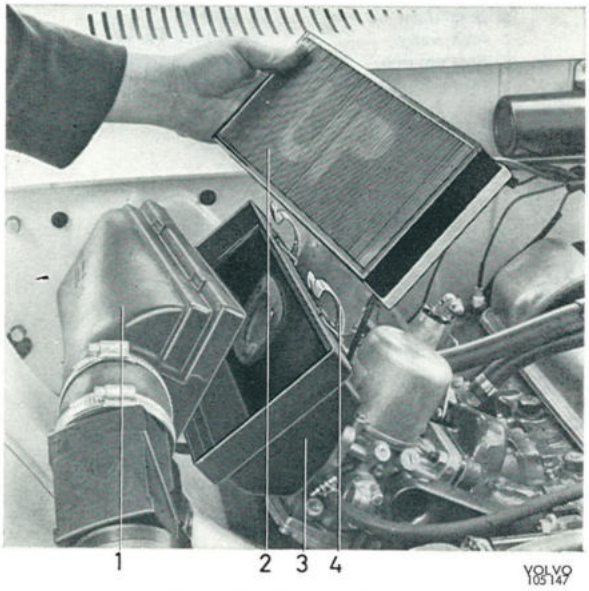


Fig. 2-108. Air cleaner B 20 B

1. Air cleaner housing, cover
2. Cleaner insert
3. Air cleaner housing, bottom section
4. Clamp

The air cleaner (Fig. 2-108) on the B 20 B engine has a replaceable paper insert. Note that the inserts for the SU carburetors and the Stromberg carburetors differ and must not be confused.

The engine is equipped with a **constant air temperature unit** for the air cleaner, see Fig. 2-109.

The constant air temperature unit consists of a flap housing (5), a hose (6) for cold air and heat-resistant hose (7) for warm air as well as a heater plate (8), which is secured to the exhaust pipe. The thermostat (2) in the flap housing is inserted in the air cleaner housing and regulates the flap (4) by the

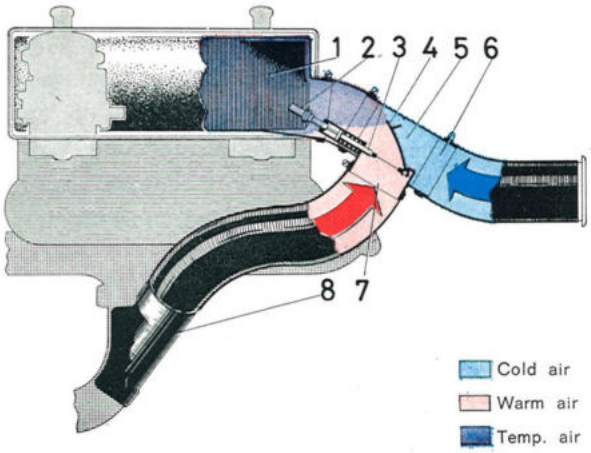


Fig. 2-109. Constant air temperature unit

1. Air cleaner
2. Thermostat
3. Flap control
4. Flap
5. Flap housing
6. Cold-air intake
7. Warm-air intake
8. Heater plate

flap control (3). The warm air taken at the exhaust pipe and the cold air taken at the front of the vehicle are regulated by the flap, mixed. The temperature of the mixture then influences the thermostat. In this way, the air supplied to the carburetors is maintained at a constant temperature of appriximately 90°F.

This device eliminates the formation of ice in the carburetor. It also ensures that the driving properties of the vehicle are independent of the temperature of the outside air.

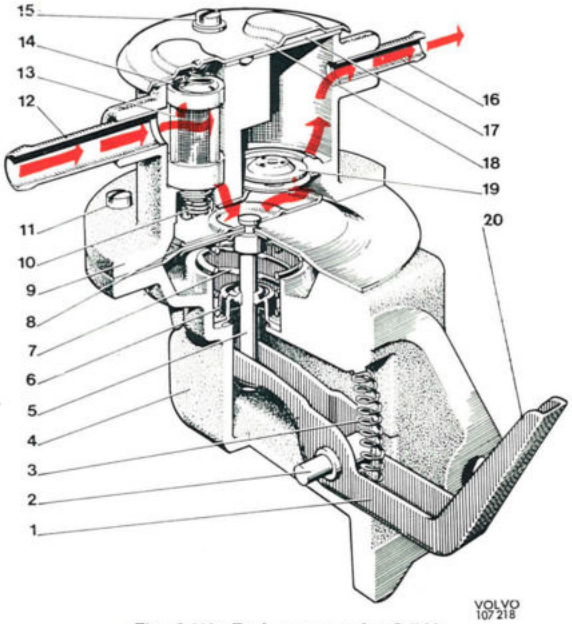


Fig. 2-110. Fuel pump, make S E V.

1. Rocker arm
2. Shaft
3. Spring
4. Lower pump body
5. Thrust rod
6. Seal
7. Spring
8. Diaphragm
9. Upper pump body
10. Inlet valve
11. Screw for body
12. Inlet
13. Filter
14. Spring
15. Screw for cover
16. Outlet
17. Seal
18. Cover
19. Outlet valve

FUEL PUMP

The fuel pump is of the diaphragm type and is driven by a cam on the camshaft. When the rocker arm in the pump is pressed upwards by the cam, the diaphragm is pulled downwards and fuel is drawn up to the pump. When the rocker arm returns, the diaphragm is pressed upwards by a spring (5, Fig. 2-111) and fuel is fed to the float chamber in the carburetor. When the level in the float chamber is sufficiently high, the float valve closes and the pressure in the delivery line rises until the pressure on the upper side of the pumping action ceases. The red arrows show the direction taken by the fuel.

Two alternative fuel pumps are used. One (Fig. 2-110) is of S.E.V. make and the other (Fig. 2-111) is produced by Pierburg.

For both the pumps, the filter (13, Figs. 2-110 and 2-111) should be cleaned after every 10 000 km (6 000 miles). No parts are stocked for these pumps. If the pumps are defective, they must be replaced by new ones, of make Pierburg. However, there is a filter kit for both the pumps when cleaning.

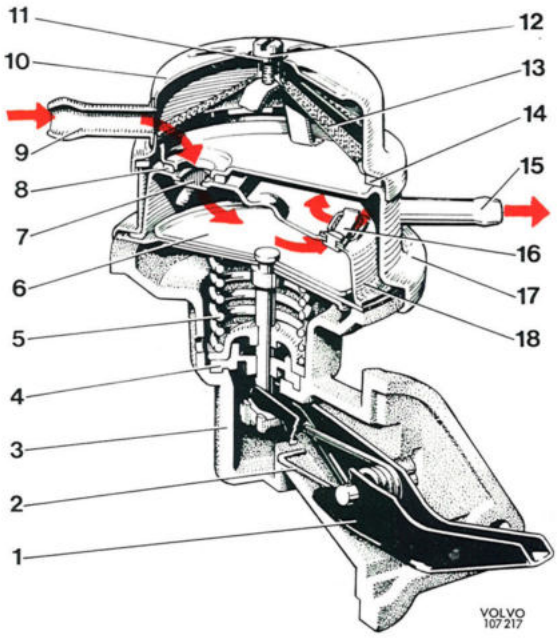


Fig. 2-111. Fuel pump, make Pierburg

1. Lever
2. Spring
3. Lower pump body
4. Seal
5. Spring
6. Diaphragm
7. Inlet valve
8. Sealing ring
9. Inlet
10. Cover
11. Washer
12. Screw
13. Filter
14. Sealing ring
15. Outlet
16. Outlet valve
17. Upper pump body
18. Valve housing

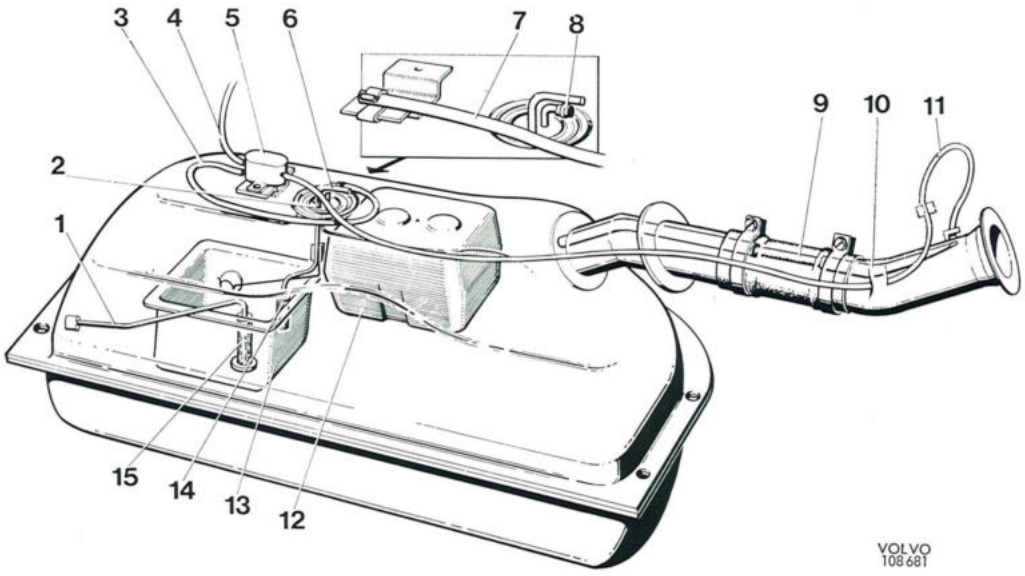


Fig. 2-112. Fuel tank

Type: Gas Evaporative Control System. P. 7 and 8 show type without Gas Evaporative Control System

1. Fuel outlet, fuel injection engines
2. Fuel gauge sender
3. Hose, connecting tank and equalizing valve
4. Hose to venting filter
5. Equalizing valve
6. Fuel outlet, carburetor engines (fuel return line on vehicles with fuel injection engines)
7. Equalizer hose from tank filler neck, see p. 11 (version without equalizing valve)
8. Rubber plug for connection to hose acc. to p. 3 (version without equalizing valve)
9. Hose
10. Venting pipe
11. Equalizer hose
12. Expansion tank
13. Baffle can (vehicles with fuel injection engines only)
14. Fuel filter, carburetor engines
15. Fuel filter, fuel injection engines.

FUEL TANK

Fig. 2-112 shows the tank. The tank capacity is 60 liters = 15.8 US gallons = 13.2 Imp. gallons. The built-in plastic expansion tank has a volume of 5 liters = approx. 5 quarts.

The expansion tank is provided with an equalizing hole on the upper side and an excess hole on the underside. The excess hole is sized to accomplish a slow filling. When the fuel tank is filled, the expansion tank has still a capacity to absorb the increased fuel volume when the fuel is subject to temperature increases.

Vehicles equipped with fuel injection have the tank equipped with a baffle can with fuel outlet through the filter (15). The fuel return line is connected to (6), which serves as fuel outlet in cars equipped with carburetor engines.

The filter (15), in cars with fuel injection engines, is accessible after removal of the tank drain plug. The filter should be cleaned every 20 000 km = 12 000 miles.

The filter (14), in cars with carburetor engines, is accessible after removal of the fuel gauge sender, see Fig. 2-113. The filter should be cleaned every 40 000 km = 24 000 miles.

The tank is provided with the ventilation pipe (10) and the equilizer hose (11). The hose is clamped to the bracket on the tank (see 7, Fig. 2-112) and ends in the air.

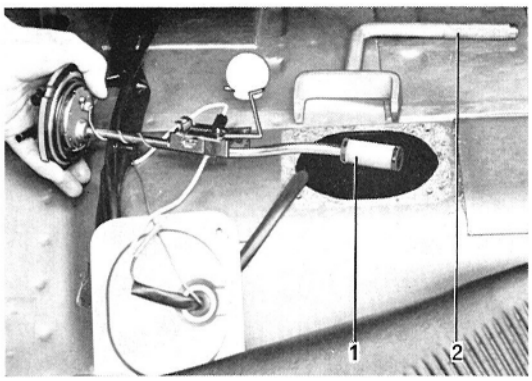


Fig. 2-113. Fuel gauge sender removed

1. Filter for cars equipped with carburetor engines.
2. Tool 999 5016

Vehicles equipped with Gas Evaporative Emission Control System have the hose connected to the equalizing valve (5). The valve is also connected to the tank via the hose (3), and to the venting filter (carbon filter, carbon canister) in the engine compartment via hose (4).

For equalizing valve function, see under "Gas Evaporative Control System".