Units

The basic units as well as the derived units used throughout the Service Manual are in accordance with the SI system.

As a supplement to these, a number of other units are specified within brackets.

The following symbols for the various units have been used in this issue:

SI unit	Supplementary unit unit
mm	in
kg	lb
N	lbf
Nm	lbfft
bar	psi
l	qt(US)
°C	°F

Conversion factors

1 in = 25,4 mm	1 mm = 0.039 in
1 lbf = 4,45 N	1 N = 0,23 lbf
1 lbfft = 1,36 Nm	1 Nm = 0,74 lbfft
1 psi = 0,07 bar	1 bar = 14,5 psi
1 qt = 0,95 l	1 l = 1,05 qt

Codes for different markets

The specified codes refer to the market variants of the cars

AT	Austria	FR	France
AU	Australia	GB	Great Britain
BE	Belgium	GR	Greece
CA	Canada	IS	Iceland
CH	Switzerland	JP	Japan
DE	Germany	IT	Italy
DK	Denmark	ME	Middle East
ES	Spain	NL	Holland
EU	Europe	NO	Norway
FE	Far East	SE	Sweden
FI	Finland	US	U.S.A.

Technical data

CO values and engine speeds (applicable to engines at normal running temperature).

As from 1981 models with Sweden specifications and 1983 models with Switzerland specifications, the CO checks should be carried out at an engine speed of 2000 r/min with the hoses to the vacuum control unit, the crankcase ventilation and the EGR system (where applicable) disconnected. On all other cars, the check should be carried out at 850 r/min.

Note
1983 models onwards: The secondary CO adjusting screw on Stromberg carburettors must be screwed fully home before any adjustment of the CO value is made.

Engine	Model year	Specification	C0%	Engine CO speed	value idling speed	Idlingspeed, r/min, 50
Single carburettor (CM, CA)	1981-	Sweden	1,5-2,0	2000	4,5% max.	850
	-1983	Europe	0,5-2,5	850	-	850
	1983	Switzerland	1,5-2,0	2000	0,4-1,6%	850
	1984-	Switzerland	1,4-2,0	2000	0,4-1,6%	850
	1984-	Europe	0,2-1,0	850		850
	1985-	Sweden	1,4-2,0	2000	0,4-1,6%	850
Twin carburettors (TM,TA)	1981-	Sweden	0,75-1,25	2000	4,5% max.	
	-1982	Europe	0,5-2,5	850	-	
	1983-	Switzerland	0,75-1,25	2000	3,5% max.	
	1983-84	Europe	0,2-1,0	850	-	

Temperature compensator

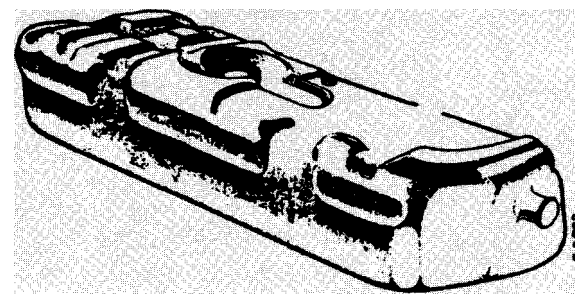
Opening at room temperature (20°C/68°F)	mm (in)	0,1-0,3(0.004-0.012)

Fuel pump

Fuel pressure at starter motor speed	bar(psi)	0,17-0,25(2.5-3.6)

Quantity of fuel

remaining when
fuel warning light
comes on, approx: 7 l (1.85 USgal)



Carburettor

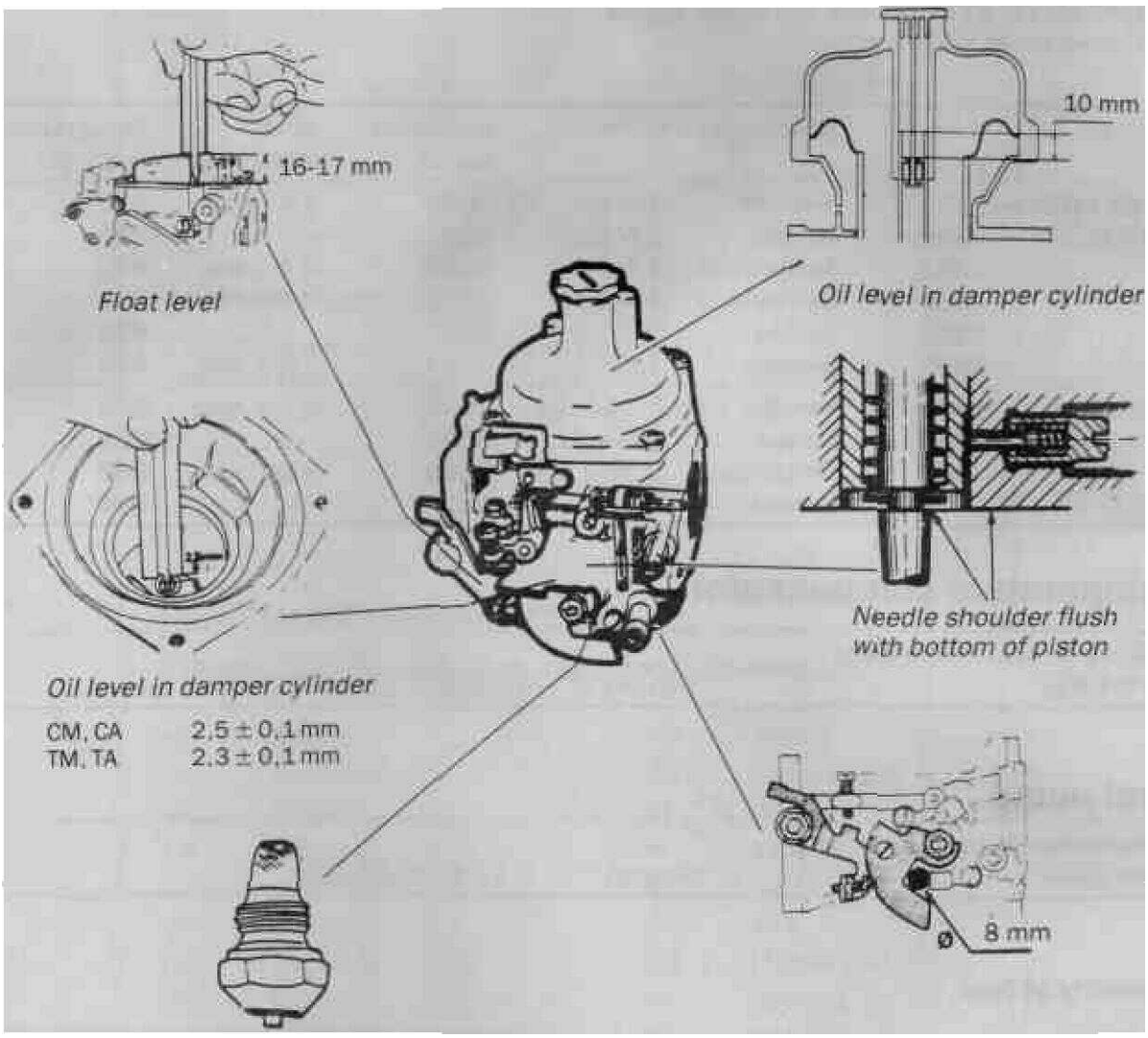
Carburettor type

Single carburettor	(CM, CA): -1984	175 CD
	(CM, CA): 1985-	175CDSEVX
	(CM,CA):1987-	175CDUS
Twin carburettors	(TM,TA).-1984	150 CD

Fuel needle designation

CM, CA	B1DS
TM, TA	B5EQ

Stromberg



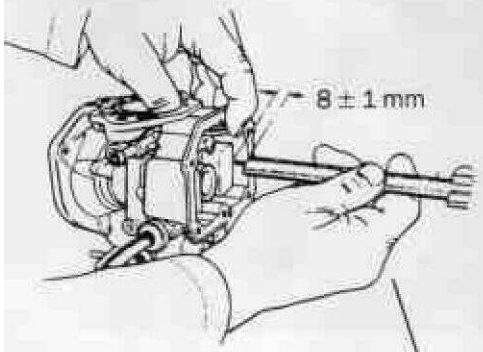
Float valve

Fast idling speed, cam

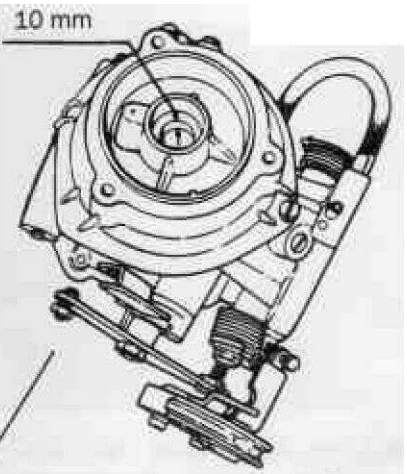
CM 1981-82	1100±50r/mm A6
CM 1983	1350±50r/min AS
CA.CM 1984-	1350±50r/mm AS
TM,TA 1981-84	1100±50r/mm A5

Idling speed 850 ± 50 r/min

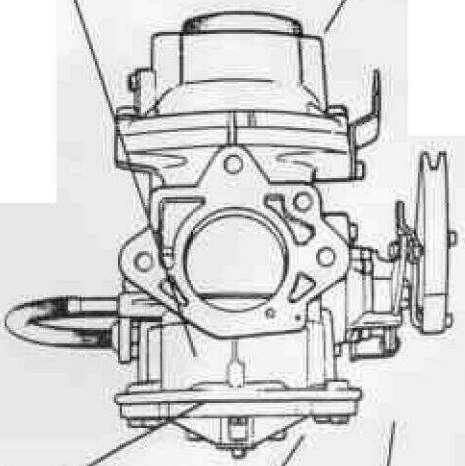
Plerburg

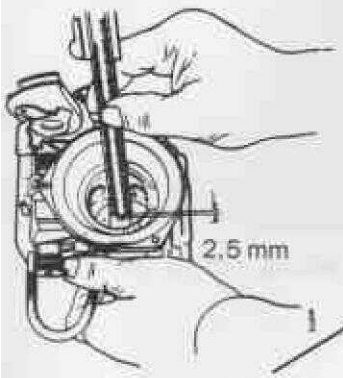


Float level



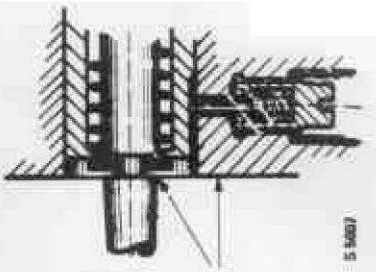
Oil level in damper cylinder





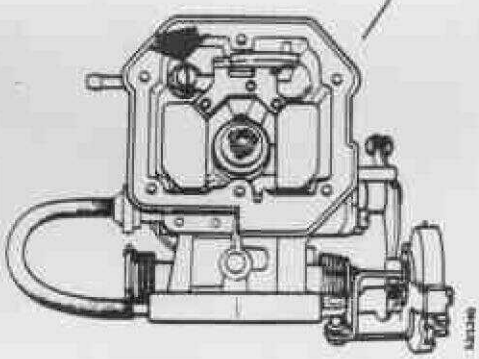
Basic setting:

2,5 mm below the bridge

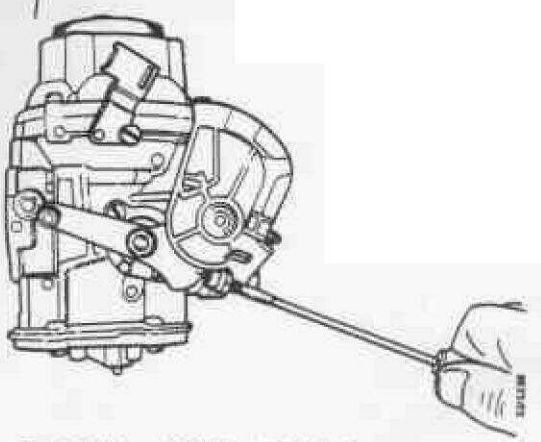


Needle (type YC)

Needle shoulder flush with bottom of piston



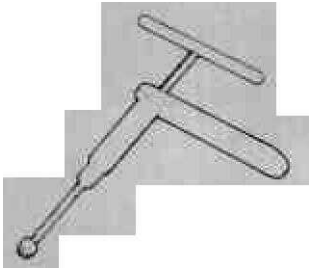
Position of float valve



Fast idling: 1350 ± 50 r/min
Cam 4

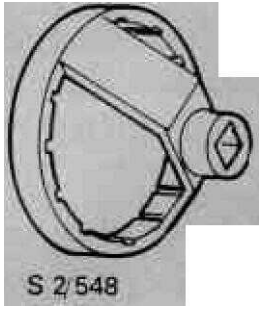
Idling 850 ± 50 r/min

Special tools



8393035 Adjusting toot, for metering needle {Stromberg)

8392789 Drift for installation of fuel jet (Stromberg)



83 93 365 Key for fuel gauge sensor unit

Technical description

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General

The engine is equipped with one or two Stromberg horizontal carburettors.

As from 1987 models, the engine is equipped with a Pierburg carburettor.

Single carburettor (Stromberg)

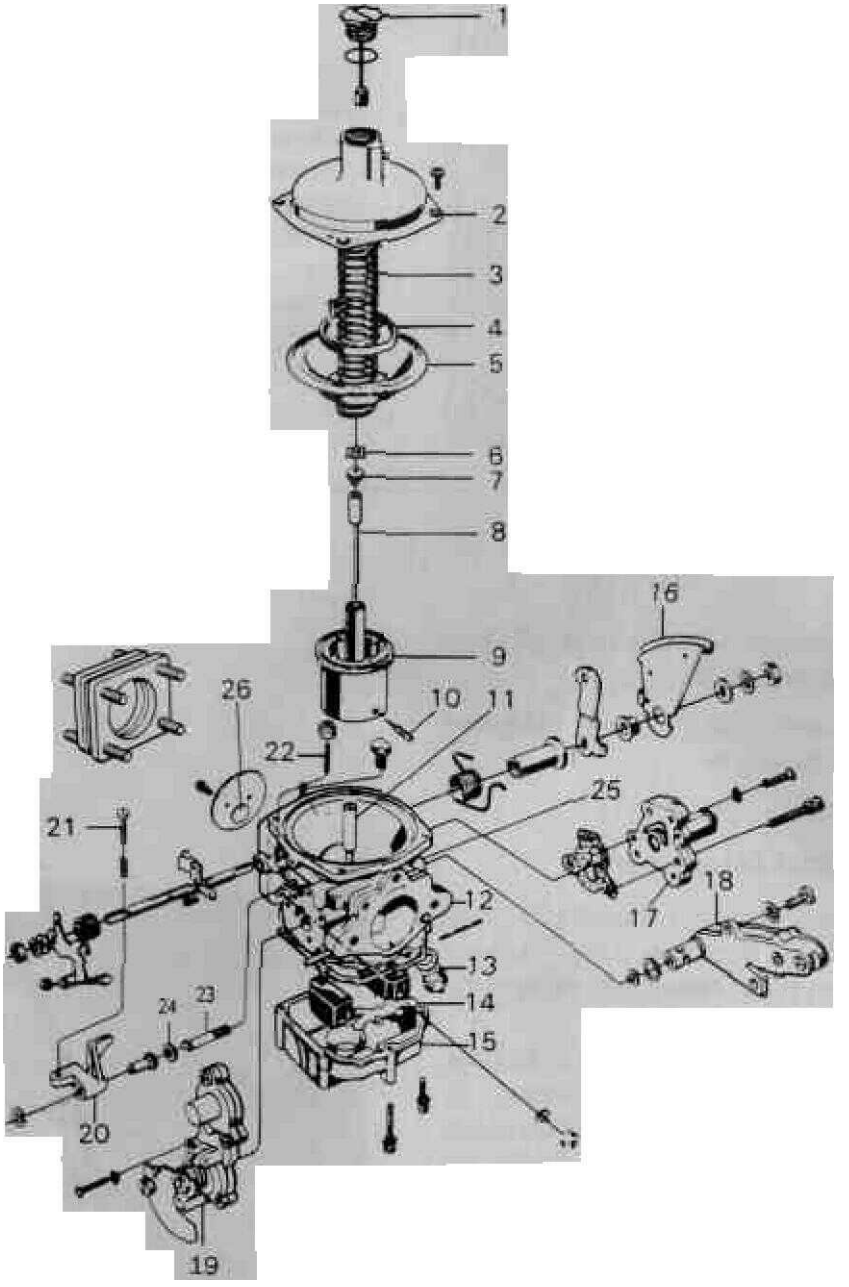
The carburettor, made of light alloy metal, comprises three main sections: the vacuum chamber, the carburettor body (casting) and the float chamber.

The vacuum chamber, which is the top part of the carburettor, has a diaphragm at the bottom, to which a piston is attached, and communicates with the inlet port of the carburettor through two drillings in the piston.

The fuel jet is press-fitted in the carburettor body, which isthe middle section of the carburettor. The cross-sectional area of fuel flow inside the jet orifice is varied by a moving tapered needle, attached to a piston whose position is varied by variations in the depression inside the carburettor body. The piston also regulates the cross-sectional area of the flow of induction air. Thus, the engine always receives the correct amount of fuel and air under all load conditions.

The bottom section of the carburettor, the float chamber, houses a float which opens and closes the float valve by means of a tab on the float arm.

Twin carburettors



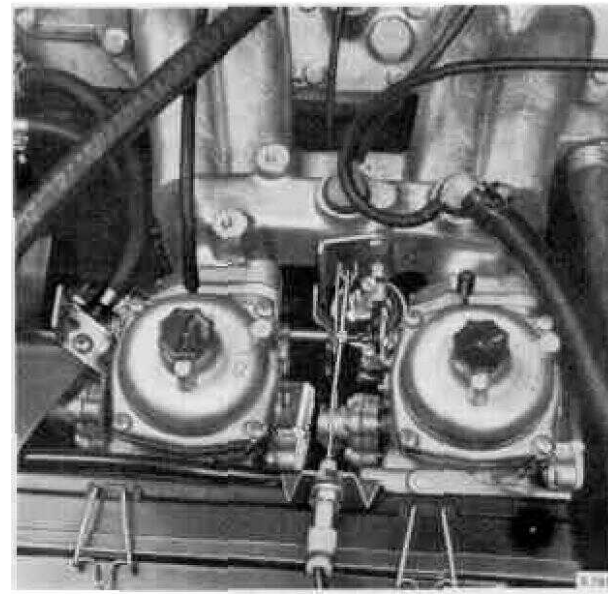
Carburettor (Stromberg)

1 Damper and oil cap assembly
2 Vacuum chamber cover
3 Spring
4 Retaining ring for diaphragm
5 Diaghragm
6 Retaining clip
7 Adjusting screw
8 Metering needle
9 Vacuum piston
10 Setscrew with spring loaded plunger
11 Jet
12 Carburettor body
13 Float valve
14 Float and arm
15 Float chamber
16 Throttle cam lever
17 Deceleration valve (not Sweden spec.)
18 Temperature compensator
19 Cold start device with cam lever
20 Arm, float chamber ventilation
21 Idling adjusting screw
22 Adjusting screw, float chamber ventilation
23 Spindle
24 Spacer (single carburettors only)
25 CO adjusting screw
26 Deceleration valve (1985 models onwards)

Twin carburettors

The carburettors used on twin-carburettor engines are similar in principle to those on single-carburettor engines.

Located in front of the two carburettors is an air box, which serves both carburettors and is connected to the air cleaner by means of a hose. The inlet manifold passages from the rear carburettor go to number 1 and 2 cylinders and from the front carburettor to cylinders number 3 and 4. A connecting passage links the two manifolds and this serves to correct any minor variations in the fuel/air mixture from the two carburettors.



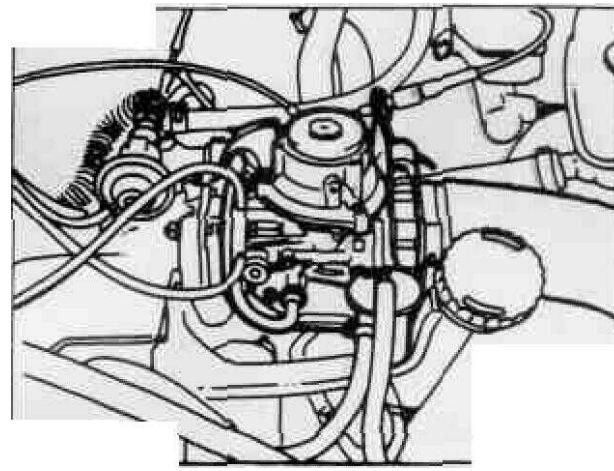
Twin carburettors

Pierburg 175 CDUS carburettor

The 175 CDUS carburettor is a horizontal, constant-depression (CD) carburettor with a mixing chamber diameter of 45 mm (1 3/4").

In a constant-depression (CD) carburettor, the vacuum is the mixing chamber does not vary, i.e. the pressure of the air stream is practically constant, regardless of the engine speed or load.

The piston and thus the jet are controlled by a vacuum, which varies with the throttle opening, the engine speed and the engine load. The interaction of these factors and the atomization of the fuel (due to the nearly constant vacuum resulting from a constant air speed at the jet) cornprise the basic principle of a constant-depression (CD) carburettor The combination of a variable jet system and an air-controlled vacuum piston provides stepless adjustment of the fuel/ air mixture supplied to the engine, from idling to full load.



,4s from 1987 models, the engine is equipped with a Pierburg carburettor. *

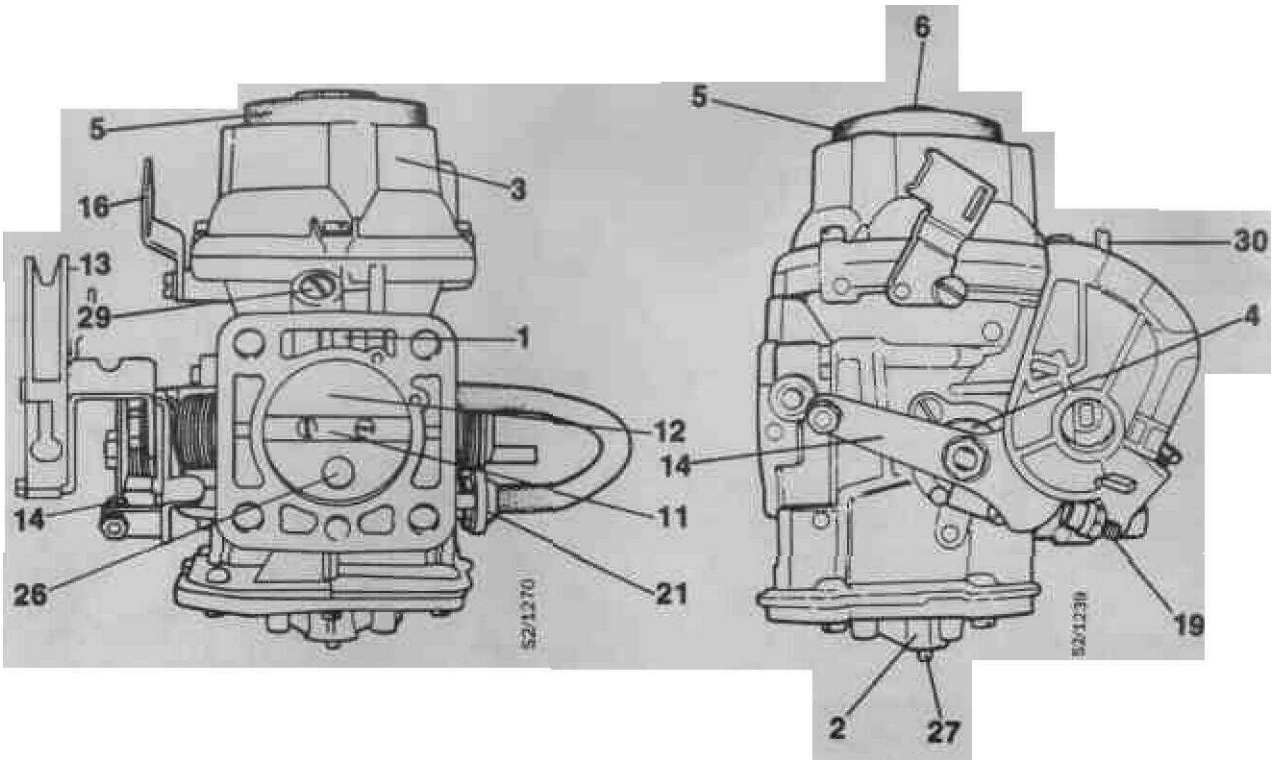
Because of the central location of the jet system, the carburettor can be installed horizontally, or inclined at the angle of up to 26°.

The fuel supply to the jet is regulated by the double float, and is kept at a constant level, so that centrifugal, braking and acceleration forces will not affect the fuel/air mixture.

The CDUS carburettor is equipped with a choke disc controlled by a manual choke control, a deceleration valve (overrun braking valve), which reduces exhaust emissions during overrun braking and gear-changing and a device which allows the idling mixture to bypass the throttle.

At idling speed, the mixture bypasses the almost closed throttle, via the idling shut-off valve, and flows direct to the inlet manifold. This provides a higher effective cacuum for delivery of the mixture and thus guarantees smooth idling.

Another feature of this carburettor is the temperature compensation function of the main jet. The jet holder contains bi-metal washers, which move the jet axially when the temperature changes. This, in turn, changes the flow area of the jet. The fuel flow is thus adjusted to suit the prevailing operating temperature.

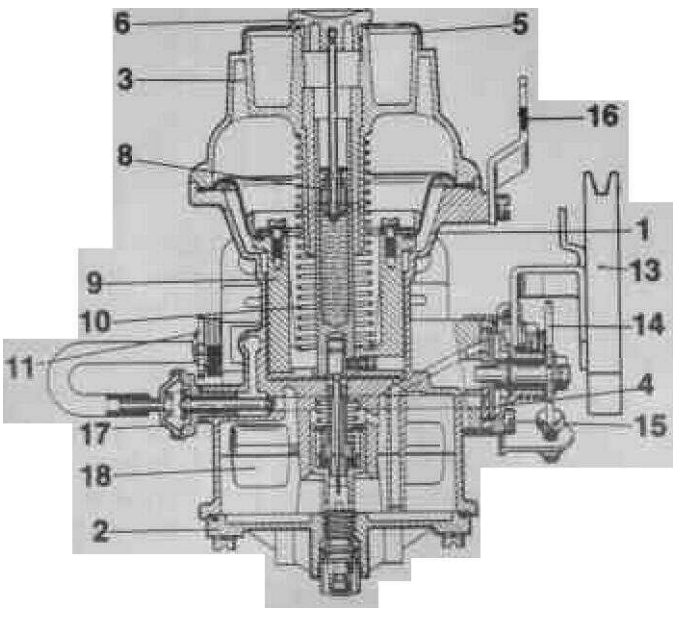


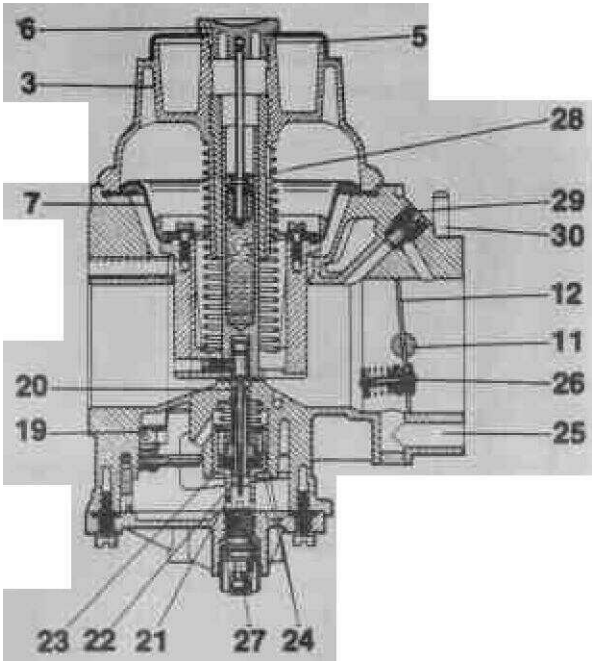
1 Carburettor body
2 Float chamber cover
3 Carburettor top cover
4 Choke disc
5 Cover
6 Oil filler plug
11 Throttle spindle
12 Throttle butterfly
13 Throttle lever
14 Choke lever
16 Choke cable guide
26 Deceleration valve
27 CO adjusting screw
29 Plug (connection for idling speea adjustment valve for cars equipped with AC)
30 Spigot for vacuum line to distributor

Carburettor design

The carburettor consists of four main parts, held together by screws:

Carburettor body
Float chamber cover
Carburettor top cover
Choke mechanism





1 Carburettor body
2 Float chamber cover
3 Carburettor top cover
4 Choke disc
5 Cover
6 Damper piston and oil cap assembly
7 Piston diaphragm
8 Damper piston
9 Vacuum piston
10 Vacuum piston spring
11 Throttle spindle
12 Throttle butterfly
13 Throttle lever
14 Choke lever
15 Fast idling adjusting screw
16 Choke cable guide
17 Modulator valve (lean-mixture valve)
18 Float
19 Float valve
20 Jet
21 Jet holder
22 Needle
23 Bi-metal washers
24 Springs
25 Idling by-pass passage
26 Deceleration valve
27 CO adjusting screw
28 Damper oil
29 Plug (connection for idling speed adjustment valve for cars equipped with AC)
30 Spigot for vacuum line to distributor

Auxiliary devices

Shut-off valve for idling mixture

The induction system incorporates a shut-off valve for the idling mixture to prevent the engine running on after the Ignition has been switched off. The valve, a solenoid valve, fitted in the underside of the inlet manifold, opens when the ignition is switched on.

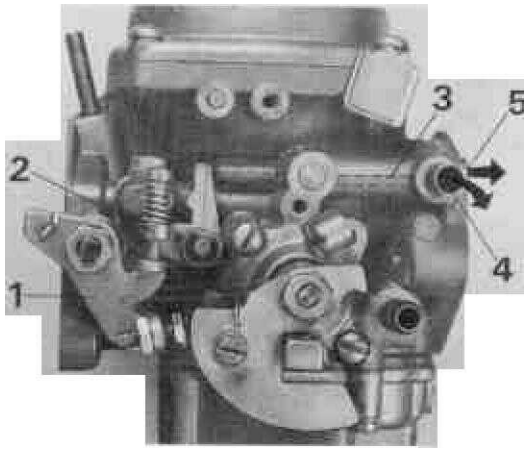
Idling control valve

On cars with AC, the carburettor is equipped with an idling control valve instead of plug 29. This valve opens when the AC compressor cuts in, thereby enriching the mixture and preventing a decrease in the engine speed.

Float system

Stromberg

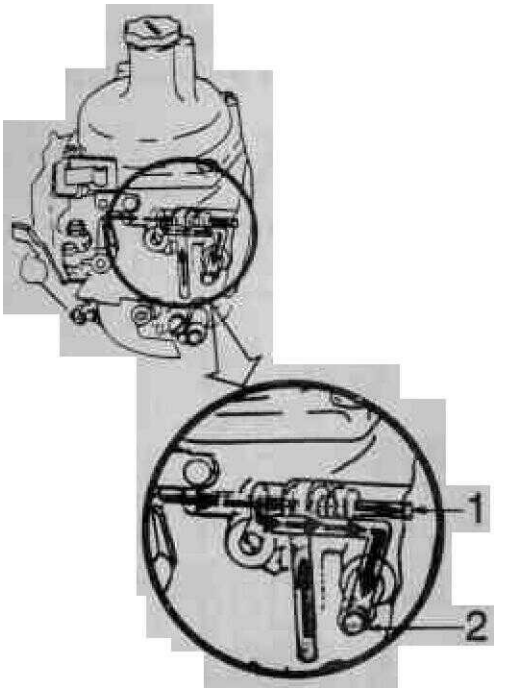
Fuel enters the float chamber through the float valve. The float, which is double, is mounted on the float chamber by an arm and spindle, which fits into two retaining clips. As the fuel level rises, the float rises with it, and when the correct level is reached, the float valve is closed by a tongue on the float arm. Fuel is also drawn Into the jet, where the level will be the same as in the float chamber (engine at standstill).



Float chamber ventilation, twin carburettors

1 Throttle stop and fast idle lever
2 Throttle relay lever and idle adjust screw
3 Ventilation valve
4 Ventilation outlet, throttle shut
5 Ventilation outlet, throttle open

The carburettors are fitted with a special float chamber vent valve. When the throttle valve is closed, a iris expelled directly through a venthole in the carburettor. When the throttle valve is opened, ventilation of the float chamber will be by means of the air cleaner connection.



Float chamber ventilation

1 Ventilation through air cleaner
2 Direct atmospheric ventilation

Pierburg

The float system controls the fuel flow by means of the float, which operates the float valve via the float arm, thereby keeping the fuel level in the float chamber constant under all conditions.

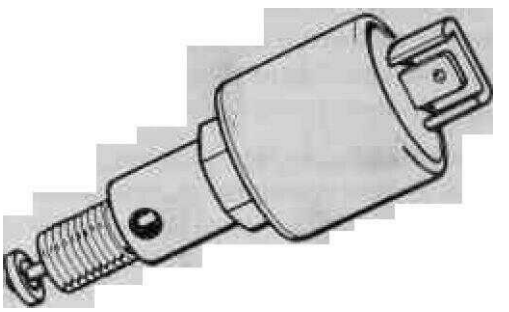
The fuel supplied by the fuel pump flows through the supply tube and the open float valve in the float chamber. As the fuel level rises, the float also rises, pressing the float valve needle against its seat. When the preset fuel level has been reached, the float valve closes and will not reopen until the fuel level in the float chamber hasagain fallen.

When the engine is running, the float chamber is vented via the valve in the chamber to the air filter (internal venting).

With the engine at a standstill, venting is via the valve in the float chamber to the engine compartment {external venting).

The valve is located in the air inlet flange

When the engine is running, this valve is closed, and the internal vent passage open. When the ignition is switched off and the engine has stopped, the electrical supply to the valve is cut off, causing the passage for internal venting to close and the passage for external venting to open.

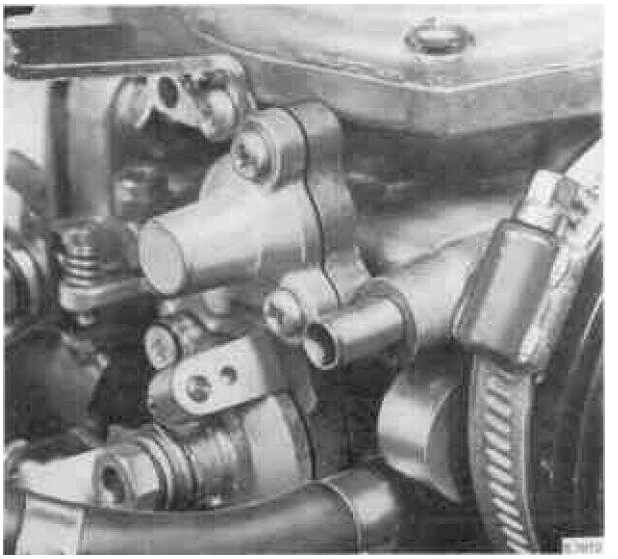


Float chamber vent valve

Cold-start device (choke)

The carburettor is equipped with a cold-start device to assist starting and running the engine from cold.

As the engine warms up, the choke control is pushed in to maintain the correct fuel/air mixture as the fast-idling speed decreases.



Cold-start device (Stromberg)

Stromberg

When the choke control is pulled out, a disc (4) is rotated and fuel flows from the float chamber through one, two, three or four of the holes in the disc. The fuel flow through the disc is determined by the number of the holes that are not blanked off. Additional airtothe disc is drawn in through air jet (3), to form an emulsion with the fuel. The additional fuel/air mixture then flows into the mixing chamber through passage (6a).
(Refer to Fig. A.)

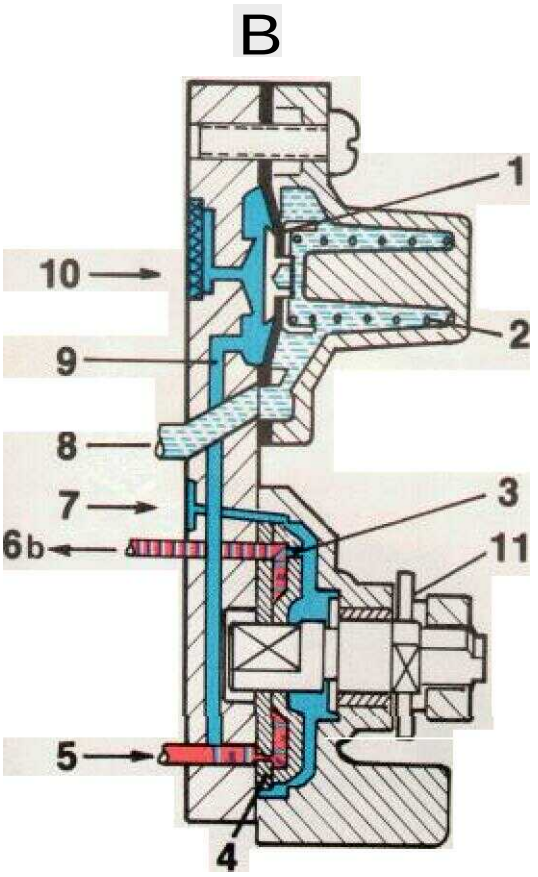
To enable the engine to run smoothly under all driving conditions, the quantity of choke fuel is optimized to meet the requirement during acceleration or at full throttle (Fig. A). This quantity of fuel is much greater than that needed when the car is travelling at a constant speed.

A leaner mixture is obtained as follows (Fig. B).

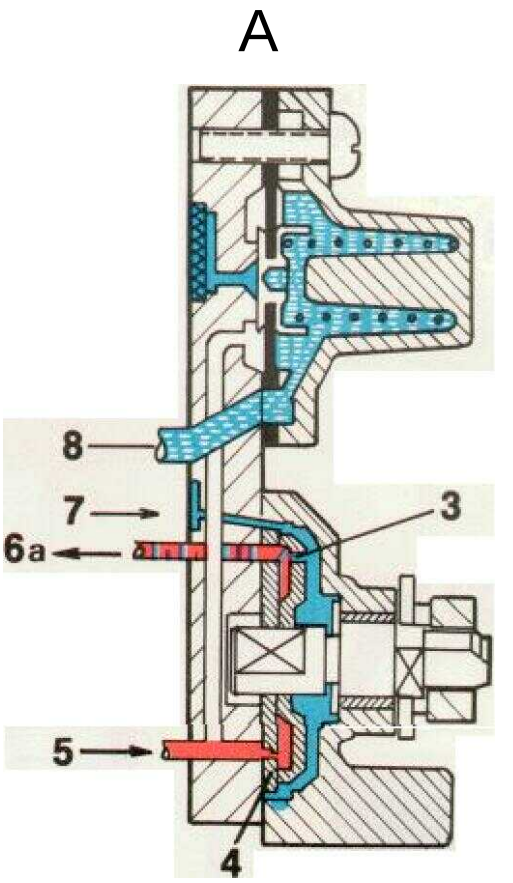
At constant speed (constantthrottle opening), a depression is present in the inlet manifold. Via connecting passage (8) the depression acts on the diaphragm (1), once the force of the spring (2) has been overcome, allowing air to be drawn through passage (9) into the fuel inlet passage (5). The fuel/air mixture flows through the disc (4), where additional air is drawn in through air jet (3). This lean mixture (6b) then flows into the mixing chamber, providing additional fuel/air.

On renewed acceleration (opening of the throttle), the mixture is automatically enriched (load-sensing choke), since there is a reduction in the depression in the inlet manifold, which allows the spring loading on the diaphram to close the air-bleed port.

Operating principle of the cold-start device (Stromberg)



At constant speed



On starting, during acceleration and at full throttle

= **Fuel**

= **Air (at atmospheric pressure)**

— **Strong depression**

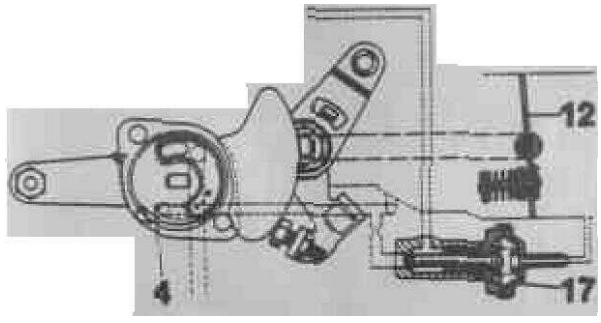
- **Weak depression**

= **Fuel/air mixture**

1 Diaphragm
2 Diaphragm spring
3 Air jet
4 Disc
5 Fuel inlet passage (from float chamber)
6 a Fuel/air passage (rich mixture to mixing chamber)
6 b Fuel/air passage (lean mixture to mixing chamber)
7 Air inlet from atmosphere (as from 1984 models)
8 Passage to inlet manifold
9 Air-bleed passage
10 Air-bleed passage inlet from atmosphere
11 Fast-idiingcam

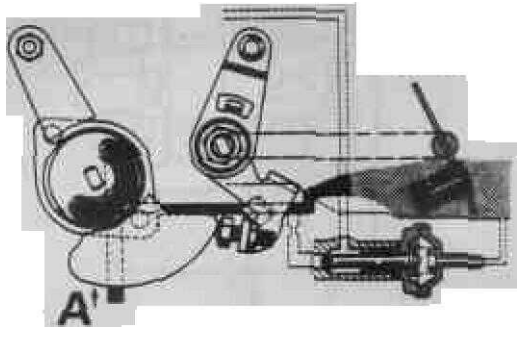
Pierburg

rhe choke disc, which is controlled by the choke control, permits reliable starting and warm-up of the engine, regardless of the ambient temperature. When a car is started from cold, a rich fuel/air mixture is required at first. When the choke control is withdrawn, the throttle (12) is partially opened (fast idling) and the choke disc (4) is turned to a position in which the fuel apertures are opened.



4 Choke disc
12 Throttle butterfly
17 Modulator (lean-mixture) valve

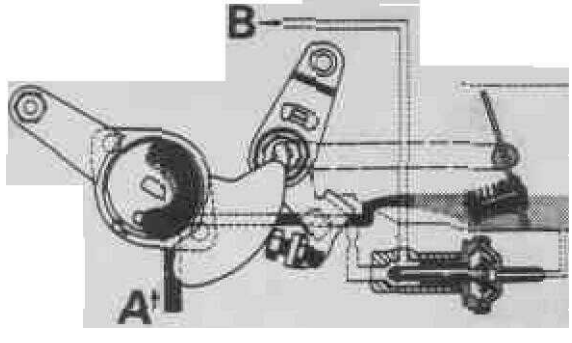
During starting, fuel is metered from the float chamber (A) via the fuel apertures in the choke disc (4).



Cold starting

A Fuel supply from float chamber

Immediately after the engine has started, the modulator valve (lean-mixture valve) (17) opens in the inlet manifold. Thus, the air required for a leaner mixture flows through a passage (B), from the clean-air side of the air cleaner.



Warm starting

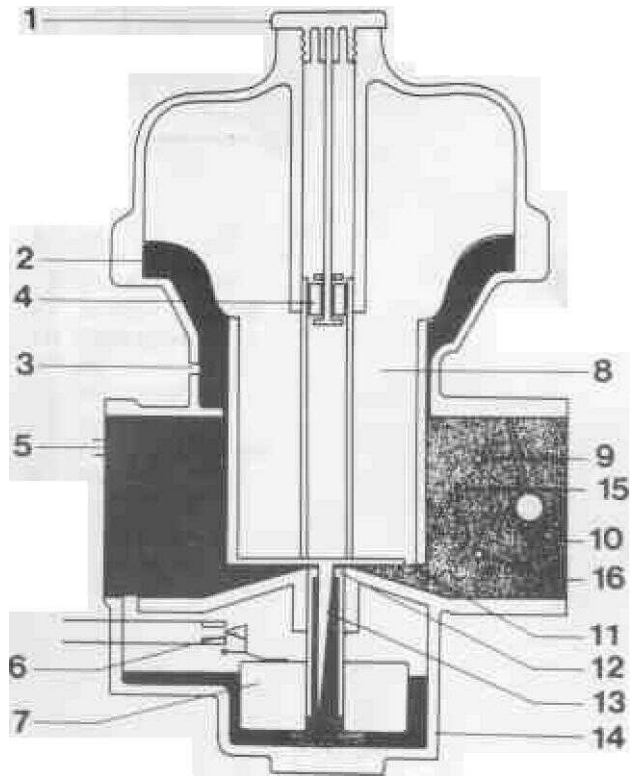
B Air supply

Fast idling

When the choke control is pulled out, a cam, which acts on the throttle, is rotated. The further the choke control is withdrawn, the faster will be the fast idling speed.

Idling (Stromberg)

The carburettor does not have a separate idling system. At idling speed there is a depression in the vacuum chamber. In this position the thickest section of the tapered metering needle is in the jet orifice and only a small quantity of fuel, sufficient for idling, is inducted into the cylinders. The air/fuel mixture should be set while the engine is idling by adjusting the relationship between the metering needle and the jet aperture. This is effected by altering the orifice adjusting screw which raises or lowers the tapered metering needle and it is this setting which then covers the entire range of engine speeds. The idling speed is changed by adjusting the setting of the throttle stop screw (idle-adjust screw). On twin-carburettor engines the throttles can be synchronized by adjusting the clamping bolt on the coupling assembly between the two throttle spindles. The carburettor is equipped with a temperature compensator to maintain a constant fuel/air mixture regardless of engine temperature. The temperature compensator consists of an atmospheric valve controlled by a bi-metallic strip. The valve starts to open when the temperature of the air at the temperature compensator reaches 68°F (20°C) approx. Additional air is introduced through a vent which discharges behind the airvalve shaft.

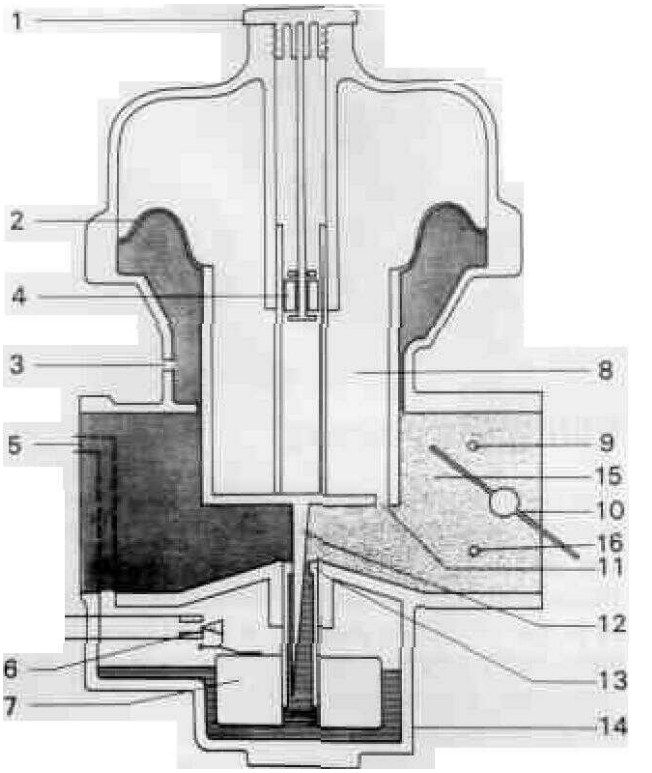


Carburettor with throttle closed (Stromberg)

1 Damper piston and oil cap assembly
2 Diaphragm
3 Compensating aperture
4 Damper piston
5 Float chamber vent.
6 Floatvalve
7 Float
8 Vacuum piston
9 Starting-fuel aperture
10 Throttle butterfly
11 Vacuum aperture
12 Needle
13 Jet orifice
14 Float chamber
15 Constant-depression chamber (CD chamber)
16 Aperture for additional air (temperature compensation)

Acceleration (Stromberg)

A damper piston is provided in the centre of the air valve in order to provide a richer mixture when the throttle is opened rapidly (acceleration). The damper consists of a piston, which runs in oil, attached to a rod. When the throttle is opened quickly the depression in the vacuum chamber increases rapidly. When the air valve rises the piston damper is forced against its seat preventing the oil from flowing past which retards the movement of the air valve. This causes a temporary increase in the depression above the jet orifice and the air/fuel mixture is enriched. The downward movement of the air valve is spring-assisted.



Carburettor with throttle open (Stromberg)

1 Damper piston and oil cap assembly
2 Diaphragm
3 Compensating aperture
4 Damper piston
5 Float chambervent.
6 Valve
7 Float
8 Vacuum piston
9 Starting-fuel aperture
10 Throttle butterfly
11 Vacuum aperture
12 Jet orifice
13 Needle
14 Float chamber
15 Constant-depression chamber (CD chamber)
16 Aperture for additional air (temperature compensation)

Normal driving (Stromberg)

When the throttle is opened, the pressure in the vacuum chamber, which is in communication with the top of the diaphragm, falls, causing the piston to rise to a new position, stabilizing the depression in the vacuum chamber. As the needle rises with the piston, the flow of fuel is adjusted to the flow of air.

Idling (Pierburg)

This carburettor is not equipped with a separate idling system. Instead, the idling mixture depends on the position of the throttle butterfly (12), the vacuum piston (9) and the taper needle (22) in the jet, which controls the fuel flow.

Turning the adjusting screw (27), which is in contact with the jet holder (21), alters the position of the jet (20), thus also changing the annular gap between the jet and the needle.

When the adjusting screw is turned clockwise, the annular gap is reduced, thus providing a leaner idling mixture. Turning the screw anticlockwise has the opposite effect.

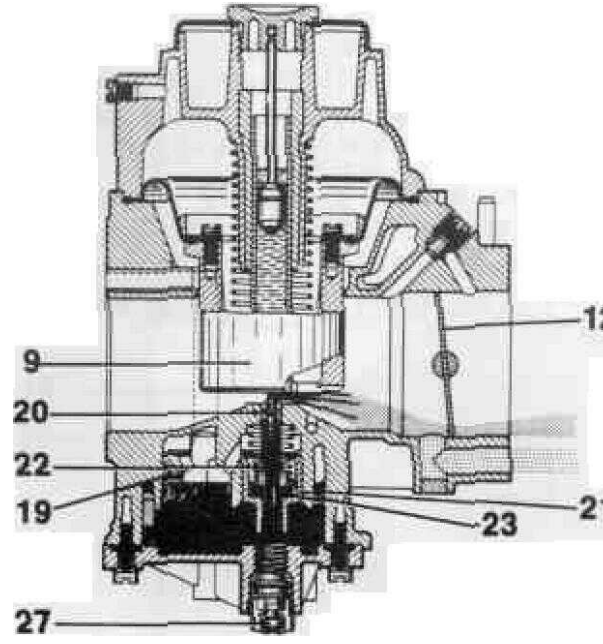
When the engine is running, the resulting vacuum causes fuel to be drawn into the mixing chamber, where it is mexed with the air flowing past the top of the jet.

The carburettor is equipped with a by-pass device for the idling mixture. Most of the idling mixture flows from the mixing chamber, past the throttle-which is set to a minimum opening-and into the inlet manifold. The rest of the idling mixture flows through the throttle gap, into the engine.

The bi-metal washers (23), located below the jet, contract when the temperature of the fuel and the surrounding metal is low.

As the temperature increases, the bi-metal washers expand axially in the jet holder, causing the annular gap between the jet and the taper needle to decrease. This results in a leaner mixture at higher temperatures and a richer mixture at lower temperatures.

This temperature compensation helps to ensure that the optimum fuel/air ratio will be maintained, regardless of the viscosity of the fuel.



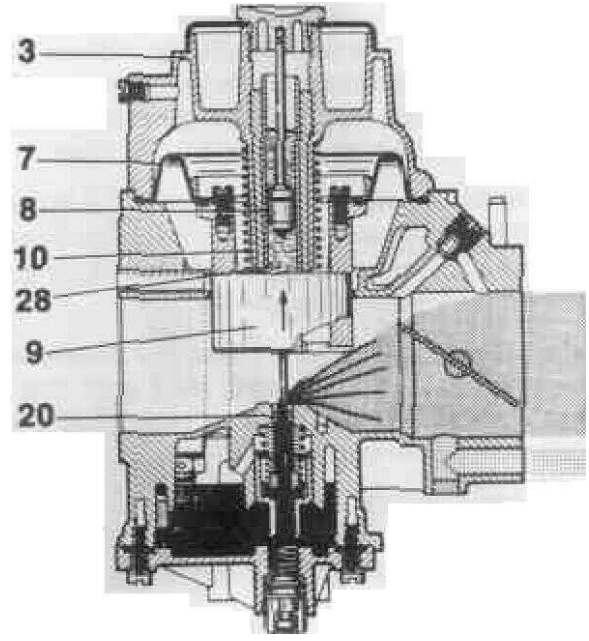
Idling

9 Vacuum piston
12 Throttle butterfly
19 Float valve
20 Jet
21 Jet holder
22 Needle
23 Bi-metalwashers
27 Adjustingscrew

Acceleration (Pierburg)

When the accelerator is suddenly depressed, a richer fuel/air mixture is required briefly. This temperary enrichment of the mixture is achieved by means of vacuum piston spring (10) and damper piston (8) in the damper oil (28).

When the throttle is suddenly opened, the damper piston prevents an immediate upward movement of the vacuum piston (9). The vacuum of the jet (20) briefly increases, thus enriching the fuel mixture.



Acceleration

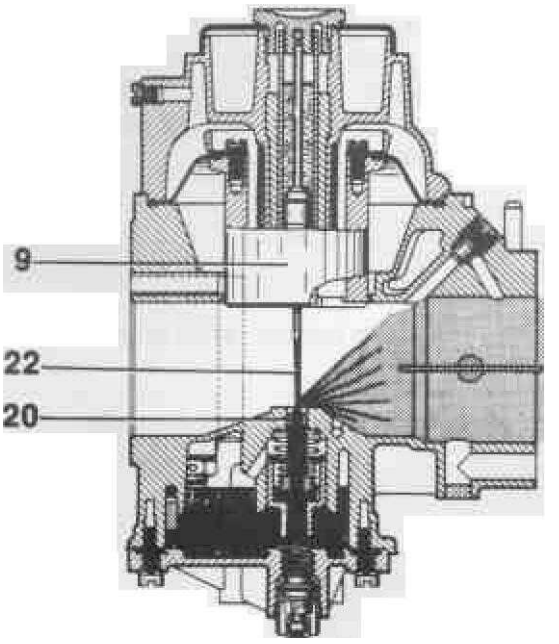
3 Carburettor cover
7 Diaphragm
8 Damper piston
9 Vacuum piston
10 Vacuum piston sprinj
20 Jet
28 Damper oil

Normal driving (Pierburg)

When the throttle is opened the vacuum acts on a chamber in the carburettor cover (3), through the compensating passages in the bottom of the vacuum piston, and thus also on the diaphragm (7) on the vacuum piston (9). Due to the difference between the vacuum in the chamber and the atmospheric pressure on the underside of the diaphragm, the piston is raised by an amount proportional to the air flowing past the throttle, and the cross-sectional area of the intake is increased. The air velocity and the vacuum at the jet (20) thus remain practically constant, and provide reliable atomization of the fuel atall engine speeds.

Full-load operation (Pierburg)

The more air drawn through the carburettor, the higher position of the vacuum piston (9) and the needle (22). The piston reaches its highest position at full load and maximum engine speed and the proportional increase of the annular gap at the jet (20) matches the fuel supply to the amount of air being drawn in. The shape of the needle ensures that the fuel/air ration is steplessly adjusted to the correct value under all operating conditions.



Full-load operation

9 Vacuum piston
20 Jet
22 Needle

Engine overrun

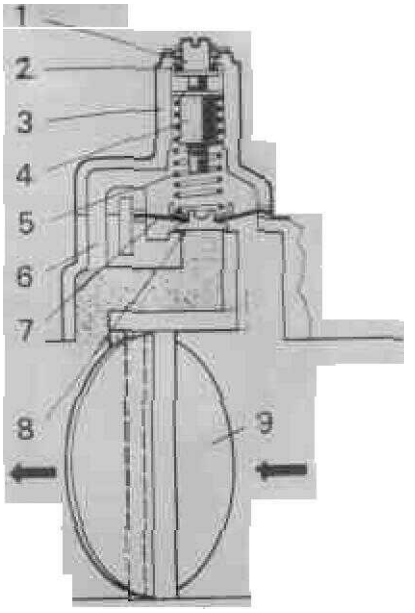
Sweden **specification**

A mechanical dashpot delays the closure of the throttle when the accelerator is released.

Sweden specification 1984 and earlier models

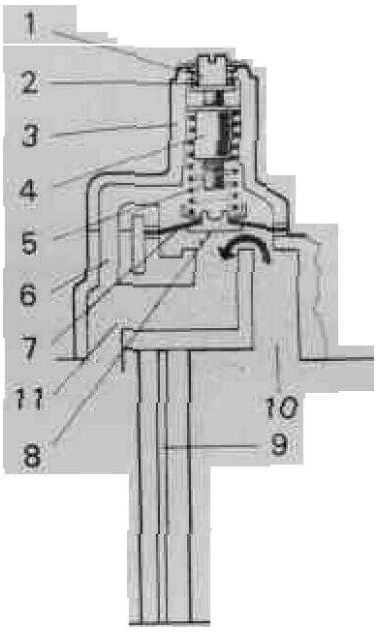
Europe specification (1984 and earlier models)

The carburettor is equipped with a diaphragm valve which is affected by the manifold depression during overrun, thereby opening the throttle by-pass and permitting the correct air/fuel mixture to reach the engine.



Deceleration valve, normal driving

1 Adjusting screw
2 Rubber ring
3 Cover
4 Nut
5 Spring
6 Passage to diaphragm upper side

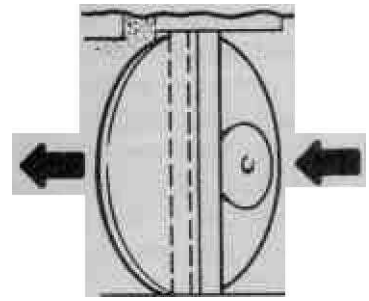


Deceleration valve, engine overrun

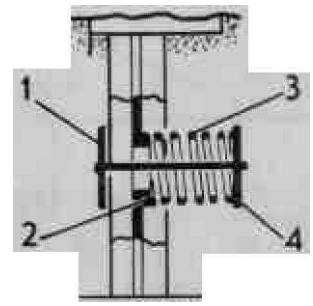
7 Diaphragm
8 Valve
9 Throttle
10 Air/fuel mixture inlet passage
11 Air/fuel mixture outlet passage

1985 models onwards

A poppet valve is incorporated in the throttle butterfly. On engine overrun, the valve opens a port in the butterfly, allowing the correct mixture of fuel and air to be admitted to the engine.



Deceleration valve, normal driving



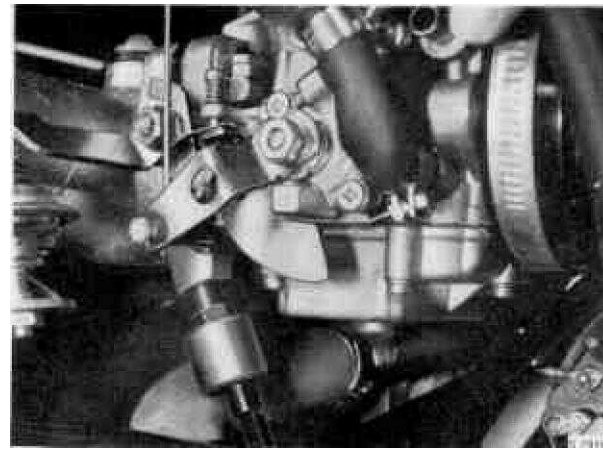
Deceleration valve, engine overrun

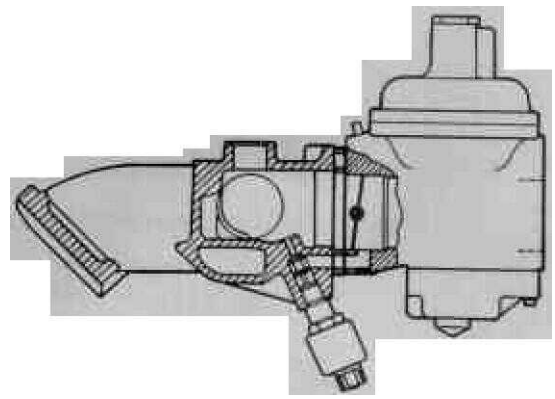
1 Poppet valve
2 Spring seat
3 Spring
4 Spring seat

Idling shut-off valve

Carburettor engines are equipped with an idling shut-off valve to eliminate the engine running on after the ignition has been switched off.

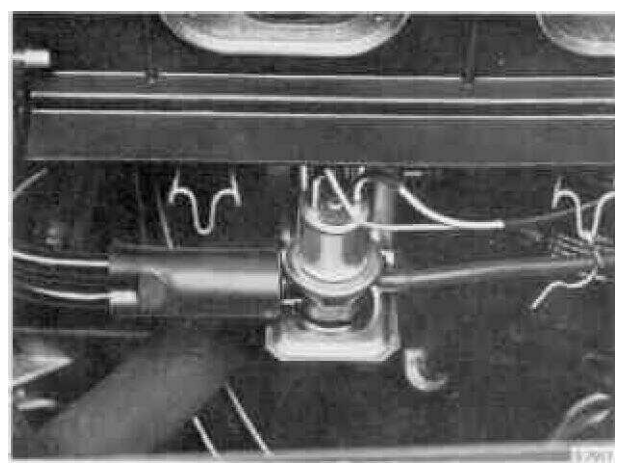
Single carburettor engines obtain their air/fuel mixture at idling speed through a small aperture in the throttle butterfly and through a throttle by-pass passage. When the ignition isturned off the by-pass passage is blocked by a spring-loaded solenoid which is then deprived of its electric current. The air/fuel mixture can now only pass through the aperture in the throttle butterfly, which is insufficient to keep the engine running, which therefore stops.

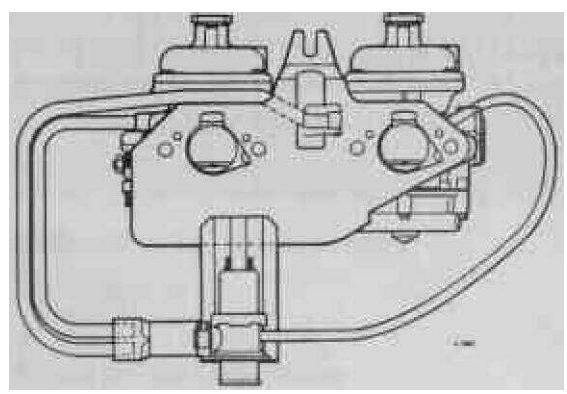




Idling shut-off valve, single carburettor

Twin carburettor engines incorporate a solenoid valve which regulates communication between the section of the float chamber above the fuel level and the constant-depression (CD) chamber. When the ignition is switched off, a time relay closes a circuit which causes the solenoid valve to open the connection to the float chamber, giving rise to a depression above the fuel level. This eliminates the pressure difference, needed for fuel to be drawn through the needle valve, and the engine therefore stops. Current to the solenoid flows for a limited time only; after six seconds, therefore, with the engine-idle, the relay will be de-energized.





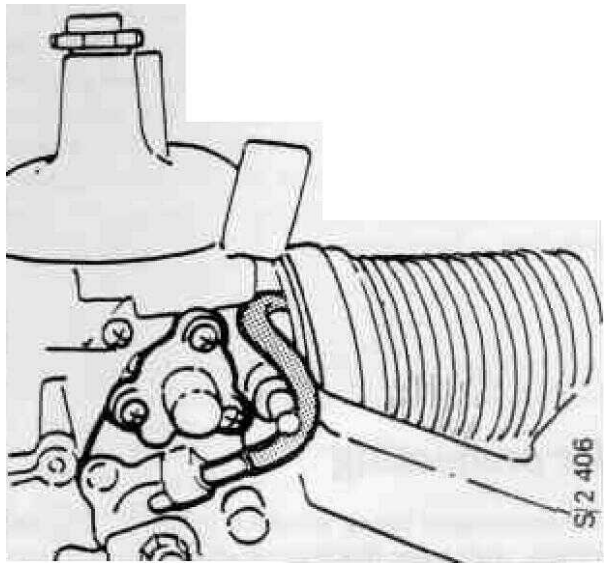
Idling shut-off valve, twin-carburettors

Stromberg carburettors (as from 1984 models)

Preheated air for cold-start device (choke)

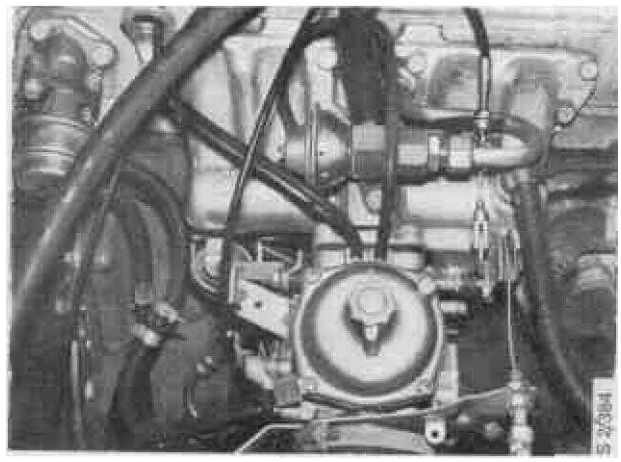
As from 1984 models, the induction air for the cold-start device is preheated. The preheated air enters the air intake hose to the carburettor and flows through a hose to the cold-start device.

When the air is preheated, condensation is reduced, with a consequent reduction in the risk of moisture freezing in the system.



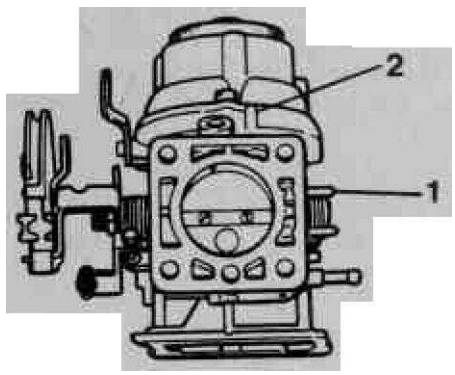
Outlet for EGR valve

In conjunction with the introduction of the EGR system, the carburettor has been equipped with two vacuum outlets. The outlet marked 'E' is connected to the pressure upstream of the throttle butterfly. This outlet is for control of the EGR valve. The other outlet is in communication with the pressure downstream of the throttle butterfly and is connected to the vacuum control unit on the distributor.



Stromberg

1 Outlet for EGR valve
2 Vacuum control unit (distributor)



Pierburg

1 Outlet for EGR valve
2 Vacuum control unit (distributor)

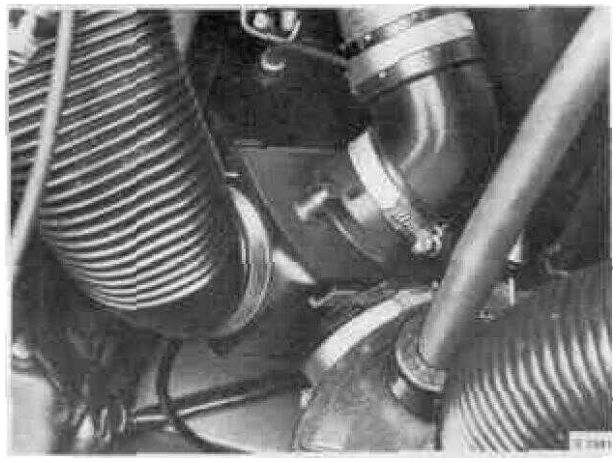
Air cleaner

The air cleaner is positioned at the front of the left wheel housing and is connected to the carburettor by means of a hose. Its purpose is twofold: to clean the air inducted into the engine and to reduce the noise caused by the induction system. The air cleaner element, which is made of a special grade of paper, must not be washed or wetted, but should be replaced at the specified service interval.

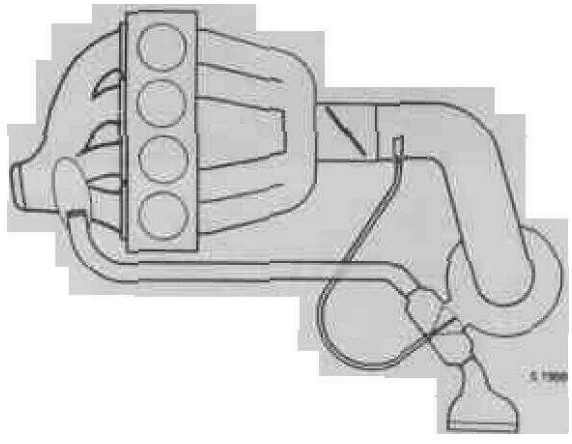
Air preheating

A thermostatic valve, situated in the air cleaner intake, regulates the temperature of the induction air.

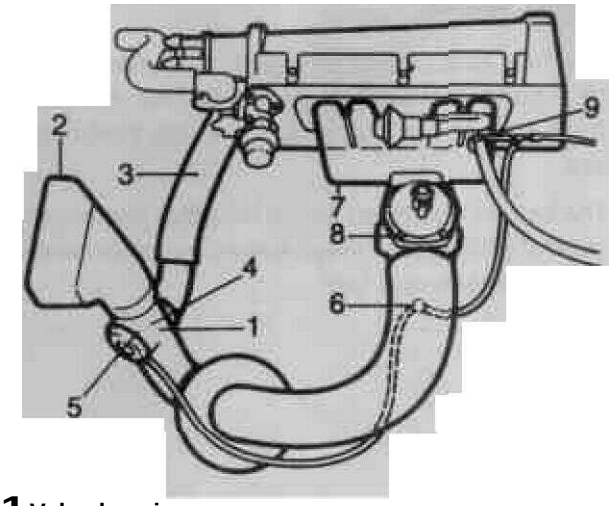
There are two air intakes in the valve housing: one for cold air and one for heated air. The heated air is drawn in through an insulated hose from a hot spot on the exhaust manifold.



On 1985 and earlier carburettor engines, the valve is activated by a thermostat in front of the carburettor. The thermostat senses the temperature of the pre-mixed induction air and maintains it at 23-37°C (73-98°F) by means of a cable. In operation the valve therefore alternates between the non-preheated and preheated position.



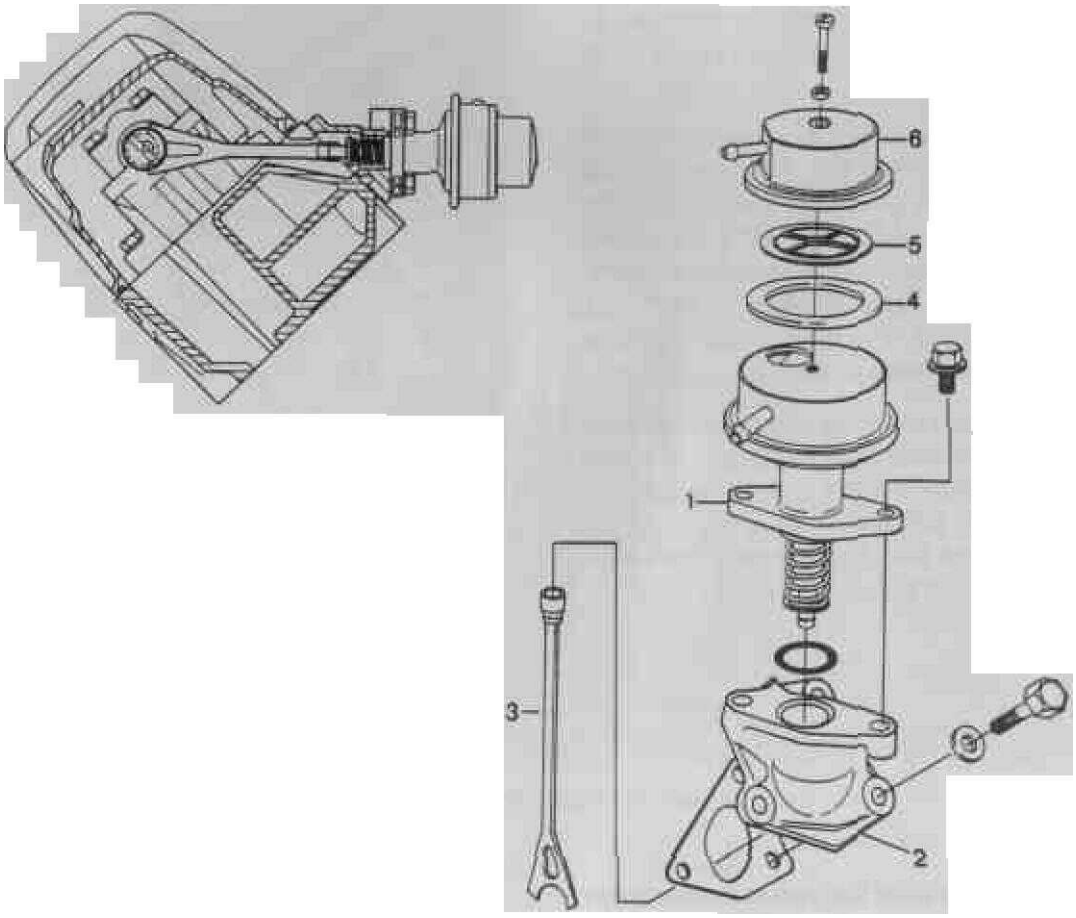
As from 1986 models, the valve butterfly in carburettor engines is controlled not only by a thermostat but also by a bimetallic strip in the air induction hose upstream of the carburettor. The bimetallic strip senses the temperature of the induction air and uses the depression in the inlet manifold to operate the valve butterfly. When the engine is under full load, and the depression in the inlet manifold is weaker, the butterfly is controlled by the thermostat. This system ensures that the induction air to the engine is always at the correct temperature of 25 ± 5°C {77 ± 15°F).



1 Valve housing
2 Cold-air intake
3 Preheated air intake
4 Valve butterfly
5 Thermostat body
6 Bimetallic strip
7 Inlet manifold
8 Carburettor
9 Crankcase ventilation

Fuel pump

The fuel pump is a diaphragm pump, driven by a push-rod from an eccentric on the camshaft. Apart from the filter, which can be removed for cleaning (up to engine No. D 052892), the pump cannot be dismantled for overhaul or repair.



1 Fuel pump body
2 Adaptor
3 Push-rod
4 Seal
5 Filter
6 Cover

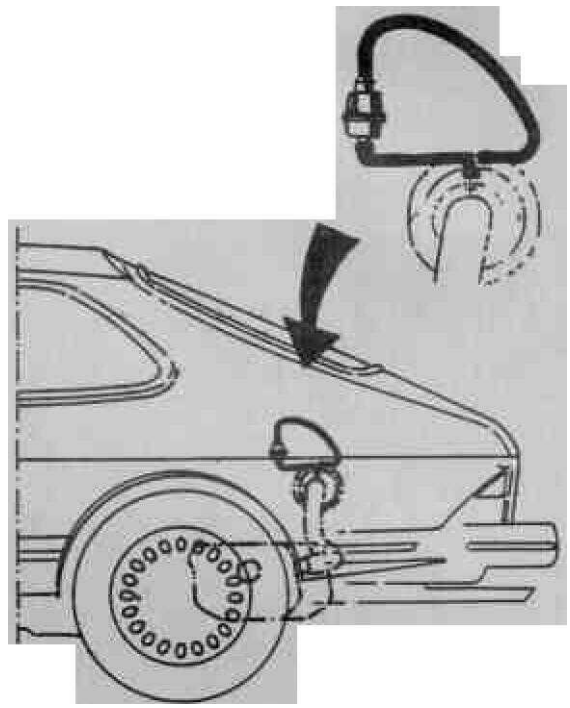
Fuel tank

The fuel tank, made of injection-moulded plastic, houses the fuel gauge sender unit, the pump inlet line and a connection for the fuel return line.

The tank is equipped with a breather system and overfill protection, which allows for expansion of the fuel inside the tank.

Fuel tank venting and overfill protection

When fuel is added to the tank air is evacuated partially through breather pipe 3. An air cushion is formed at the top of the tank when the level of fuel reaches the lower opening of the breather pipe (3), owing to the action of a restriction (5) positioned in the breather hose for the upper section of the tank (4). The restriction hinders rapid changes in volume when the car is being refuelled but does not affect gradual changes in volume occasioned by temperature changes or movement of the car.



The tank is vented externally through the vent hose (6) which runs from the filler pipe up the rear corner pillar and along the roof (above the headlining) down through the left front corner pillar and opening into the engine compartment. In cars produced as from the latter half of the 1985 model year, the vent hose is connected to a spigot on the outer end of the filler pipe.

Under normal conditions, the filler cap makes a tight seal with the filler pipe. However, the cap incorporates a vacuum valve which will prevent the fuel tank from collapsing as a result of the pressure difference that could arise if the ventilation system should become blocked.

Fuel lines

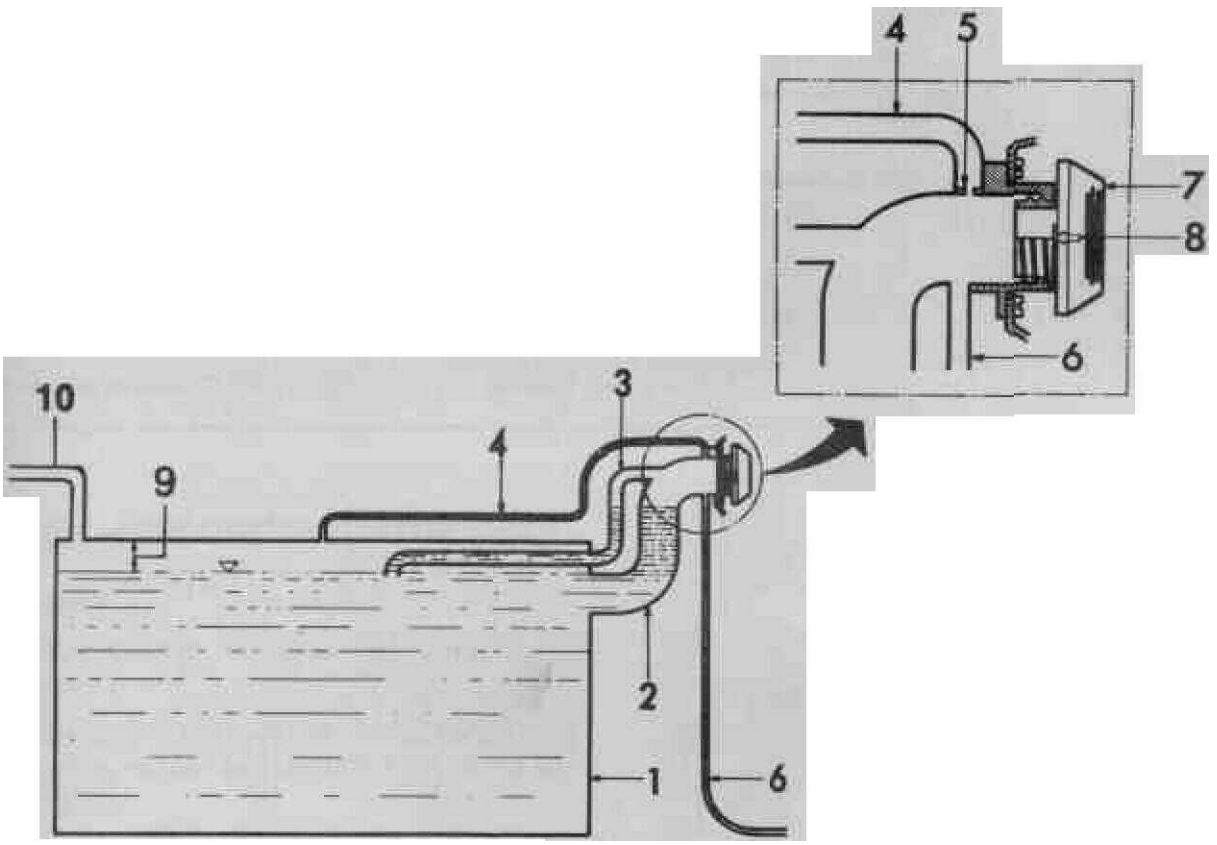
The fuel system includes both plastic and rubber fuel lines. Plastic pipes are used for runs through the body, and rubber hoses for connections to the fuel tank, fuel pump and carburettor.

The fuel supply and fuel return lines, which run together between the fuel tank and fuel pump, are routed along the rear-seat member and LH side member.

Body lead-throughs are sited to the left in the bulkhead panel and to the right in the floor-pan pressing for the rear axle. The lines enter the engine compartment through the LH wheel-arch bracket.

Return fuel

Surplus fuel is returned to the fuel tank via the fuel return line, which is connected to a restriction-type branch connector between the fuel pump and the carburettor. As from 1986 models, the fuel return line is connected to the fuel-return outlet on the vapour trap.



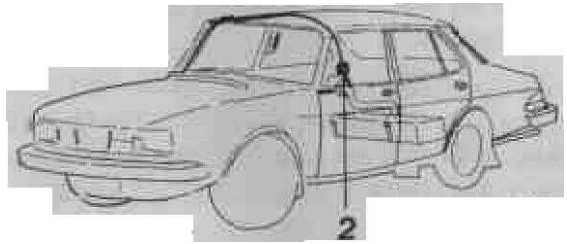
Fuel tank ventilation and breather system

1 Fuel tank
2 Filler pipe
3 Breather pipe
4 Breather hose
5 Restriction
6 Vent hose
7 Filler cap
8 Vacuum valve
9 Expansion space
10 Fuel return line

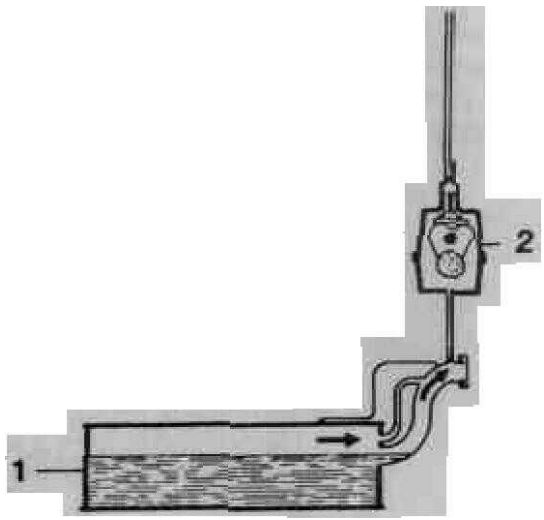
Roll-over valve

1984 model cars onwards are equipped with a roll-over valve. The valve is connected to the vent hose for the fuel tank and prevents petrol escaping in the event of the car being involved in a collision.

The valve is located on the right-hand side in the luggage compartment, mounted on the reinforcement panels inside the rear wing.



Location of the roll-over valve



1 Fuel tank
2 Roll-over valve

Carburettor

Single carburettor (Stromberg)
Removal 231-1
Dismantling 231-2
Cleaning 231-3
Assembly 231-4
Refitting 231-7

Twin carburettors (Stromberg)
Removal 231-8
Dismantling 231-9
Cleaning and assembly 231-11
Refitting 231-12

Single carburettor (Pierburg)
Removal 231-13
Dismantling 231-15
Cleaning 231-16
Assembly 231-16
Refitting 231-19

Changing the adjusting screw in the vacuum piston (Stromberg) 231-20

Checking and replenishing damper oil 231-22

Changing the jet 231-23

Basic setting of metering needle 231-24

Temperature compensator (Stromberg) 231-25

Choke modulator (Stromberg) 231-27

Checking the modulator valve and hose (Pierburg) 231-27

Float chamber vent valve 231-28

Idlingshut-off 231-30

Engine run-on 231-31

Checking and adjusting
Choke (twin carburettors) 231-31
Choke control (Pierburg) 231-32
Fast idling (Pierburg) 231-33
Choke (Pierburg) 231-33

Basic setting of needle (Stromberg) 231-34

Checking the needle (Pierburg) 231-35

Synchronization of twin carburettors 231-35

CO setting (Stromberg) 231-36

CO setting (Pierburg) 231-40

Fault diagnosis-high CO value 231-43

Adjustingscrews (twin carburettors) 231-44

Choke 231-45

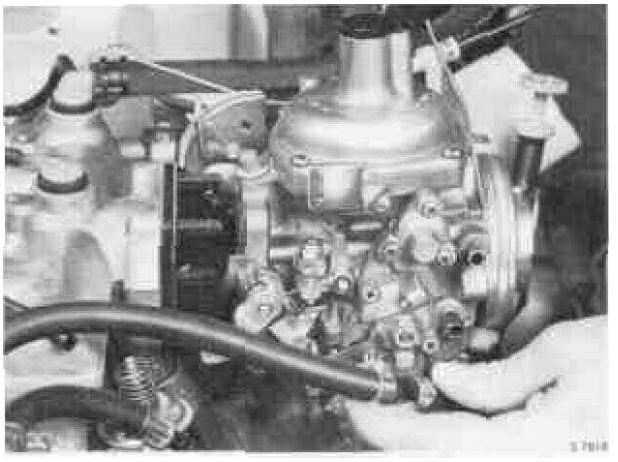
Vapourtrap 231-47

Single-carburettor (Stromberg)

Removal

1 Disconnect the inlet hose from the carburettor.

2 Disconnect the fuel line, throttle and choke control cables and vacuum hose to the distributor.



3 Remove the screw for the dipstick tube.

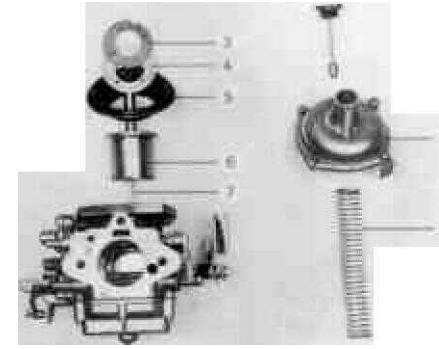
4 Back off the four retaining nuts and lift off the carburettor.

Dismantling

Tools: Adjusting tool 8393035

1 Remove the vacuum chamber cover (1) and spring (2).

2 Remove the piston (6) with the diaphragm (5).

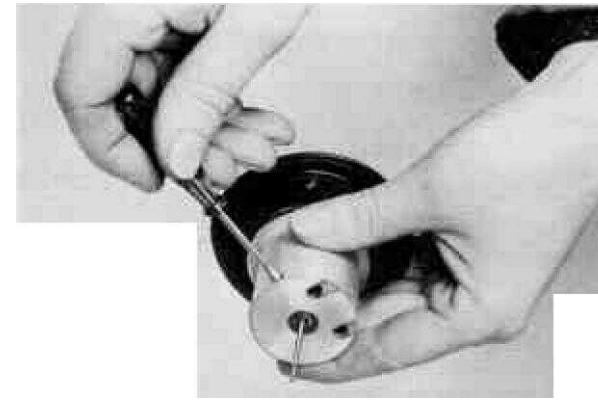


Carburettor

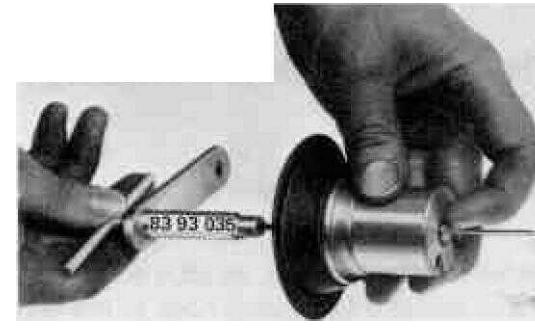
1 Vacuum chamber cover
2 Spring
3 Metal retaining ring
4 Plastic washer
5 Diaphragm
6 Vacuum piston
7 Metering needle

3 Remove the needle as follows:

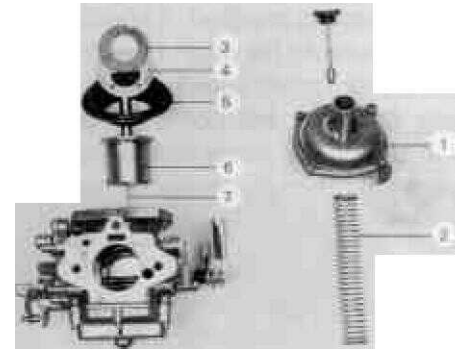
a Slacken the setscrew.



b Turn the adjusting screw counter-clockwise, using tool 83 93 035, until the needle is free. Backoff the setscrew until it is clear of the needle shoulder, then remove the needle.



4 Remove the screws, retaining ring (3), plastic washer (4) and diaphragm (5).



Carburettor

1 Vacuum chamber cover
2 Spring
3 Metal retaining ring
4 Plastic washer
5 Diaphragm
6 Vacuum piston
7 Metering needle

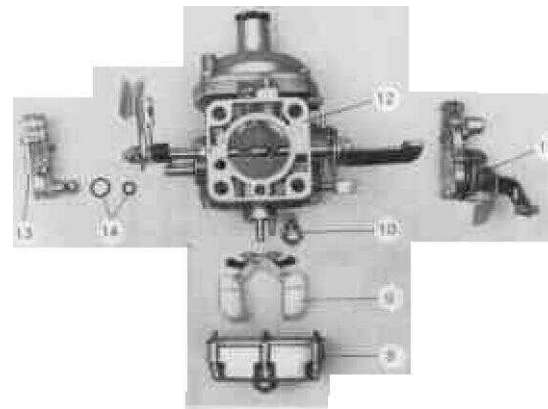
5 Remove the float chamber (8).

6 Carefully disengage the float spindle from the retaining clips and remove the float (9).

7 Remove the float valve (10) and washer.

8 Remove the cold start mechanism (11).

9 Remove the temperature compensator (13) and the rubber gaskets (14).



8 Float chamber
9 Float
10 Float valve
11 Cold start assembly
12 Carburettor body
13 Temperature compensator
14 Rubber gaskets

Cleaning

Wash the carburettor parts in paraffin.

Caution
The diaphragm should only be cleaned with paraffin.
Avoid using volatile cleaning agents such as trichloroethylene.

Check that the diaphragm is in good condition. If the diaphragm is cracked, it should be replaced. Check the needle for wear; bent or worn needles should be replaced. Check that the contact and sealing surfaces are not damaged. Clean the hole in the choke valve disc by means of compressed air. Clean the temperature compensator and check that the valve moves freely.

Refer to the separate sections on the needle-adjusting screw, jet, temperature compensator and float-chamber ventilation.

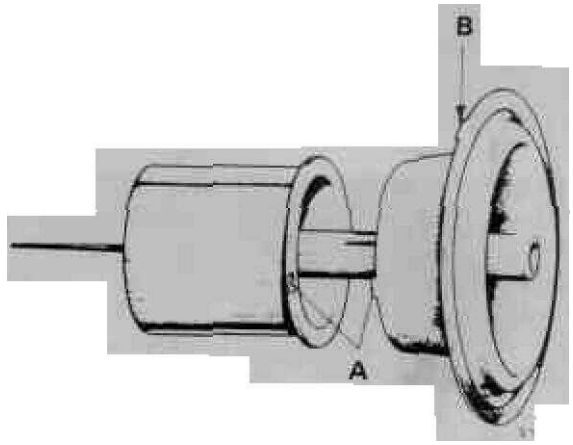
Assembly

Tools: Adjusting tool 83 93 035
Vernier calliper

1 Fit the diaphragm on the vacuum piston so that the inner locating tab engages the corresponding slot in the piston (A).

Note
If, after having been allowed to dry for a while, the diaphragm is still so distended that it will not fit into the piston, renew it. A distended diaphragm will usually revert to its original form after a while.

Place the plastic washer (4) and retaining ring (3) carefully in position, lining up the screw holes with those in the piston and diaphragm, without turning the ring, and match ing the notches in the ring with the tab on the diaphragm.



A Inner tab and matching slot in vacuum piston
B Outer tab to match slot in carburettor body.

2 Fit the needle as follows:

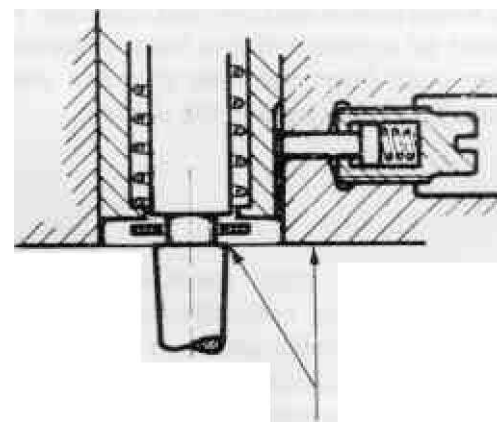
a Insert the spring housing of the needle into the vacuum piston. Screw in the setscrew until the spring-loaded pin drops into the groove in the side of the spring housing.

b Screw the spring housing onto the adjuster by turning the adjuster with Alien-key tool 83 93035.

c Adjust the position of the needle, which is correct when the needle shoulder is flush with the bottom of the piston.

d Tighten the setscrew.

This position Is the basic setting for subsequent CO adjustment.



Needle shoulder flush with bottom of piston

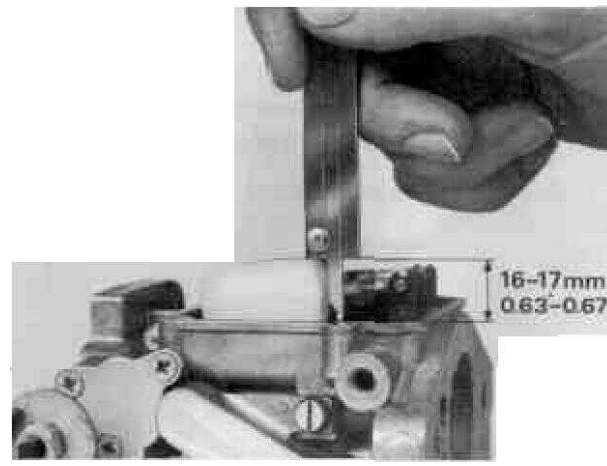
3 Install the piston complete with diaphragm and spring in the carburettor body. Make sure that the outer tab on the diaphragm engages the matching slot in the carburettor body. Place the vacuum chamber cover carefully in position, aligning the marks. The groove and locating rim should be a good fit; if not fit a new part. Tighten the screws.

4 Fit the float valve and washer, and assemble the float and spindle. The flat side of the float faces away from the carburettor body.

5 Check the float level as follows:

a To check the float level the carburettor must be removed from the engine and inverted with the float chamber and gasket off.

b For the level to be correct the highest point of the float should be 16-17 mm {0.63-0.67 in) above the flange of the carburettor body (gasket removed) when the float valve is closed. If the level is not correct, adjust by bending the end tab at the float valve.



Note
Do not bend the arm between the float and the spindle.

6 Fit a new gasket and the float chamber. First insert all screws and give them a few turns, then push down the float chamber until it butts firmly and tighten the screws.

7 Fit the cold start mechanism. If the mechanism has been dismantled, fit the choke disc, spindle and cam lever as illustrated. The calibrated holes should face away from the cable linkage.

8 Check the setting of the temperature compensator and that it operates freely (see section "temperature compensator") and mount it together with the rubber gaskets.

To refit

1 Fit the inlet manifold gasket.

2 Fit the carburettor into the inlet manifold.

3 Connect the fuel line, throttle cable and choke cable, and the vacuum hose to the distributor.

4 Fit the dipstick tube mounting bolts.

5 Connect the inlet hose to the carburettor.

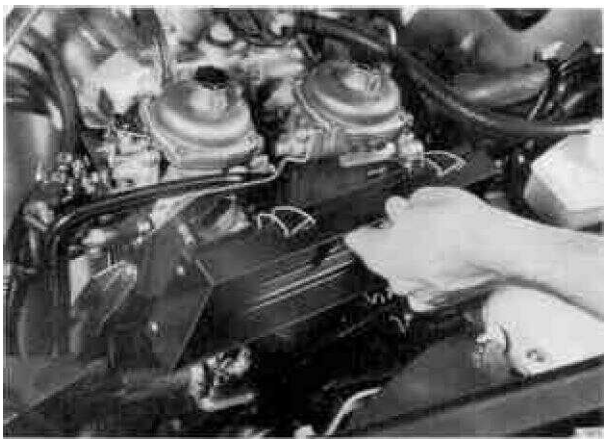
6 Fill the damper cylinder with oil: the oil level should be within 10mm (0.394 in) of the top of the damper cylinder.

7 Set the idling speed and CO content

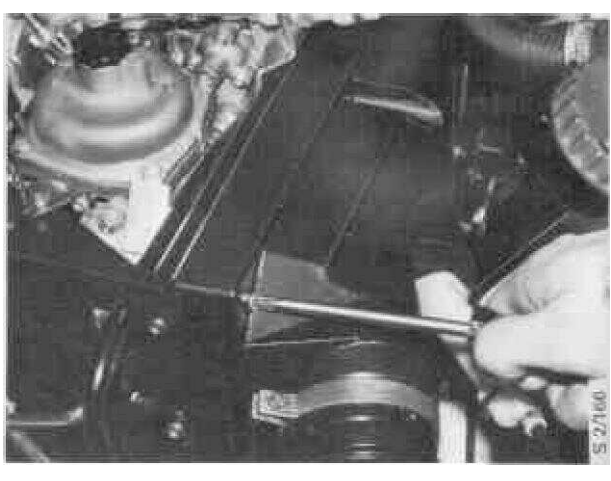
Twin-carburettors (Stromberg)

To remove

1 a Up to and incl. 1982 models:
Unclip the four wire clips holding the air box cover, loosen the air cleaner hose clip and remove the cover together with the intake hose.



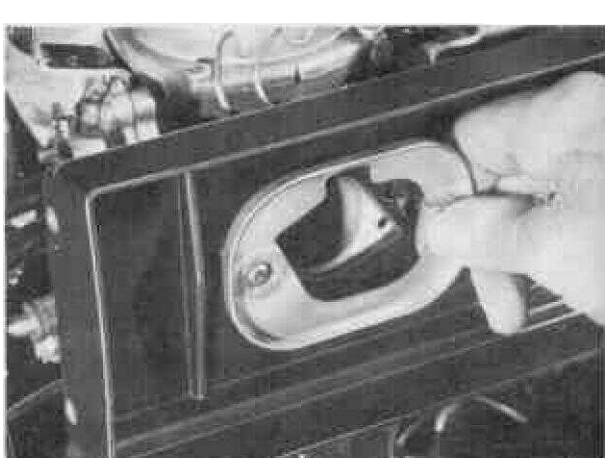
b As from 1983 models:
Remove the air box cover retaining screws and the cover on the dipstick tube. Lift up the toggle fastener for the dipstick tube. Slacken the hose clip at the air cleaner and remove the cover complete with intake hose.



2 Disconnect the throttle and choke cables from the carburettors.

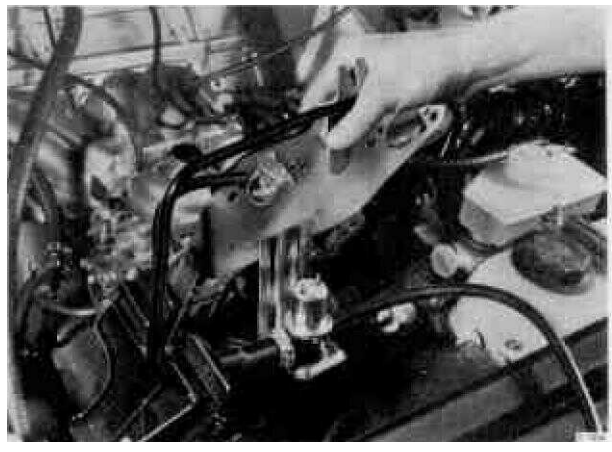
3 Remove the clips from the choke linkage and remove the linkage from the operating rod.

4 Remove the air box retaining screws and remove the box, the throttle cable bracket, the choke lever and the gaskets.



5 a Undo the clips and disconnect the fuel pipe.

b Remove the suction hoses from the carburettors.



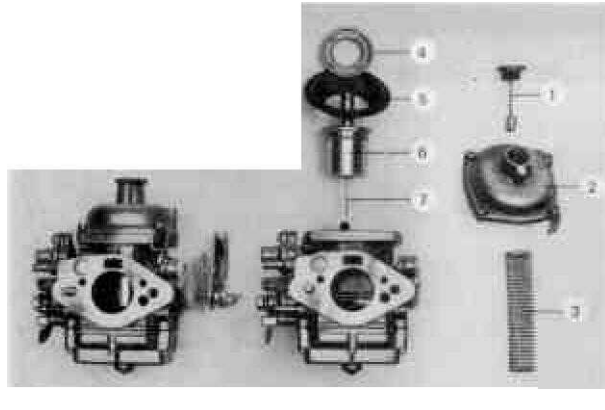
6 Remove the carburettor retaining nuts and lift out both carburettors simultaneously.

Dismantling

Tools: Needle adjusting tool 83 93 035

1 Remove the vacuum chamber cover (2) and spring (3).

2 Remove the vacuum piston (6) and diaphragm (5).



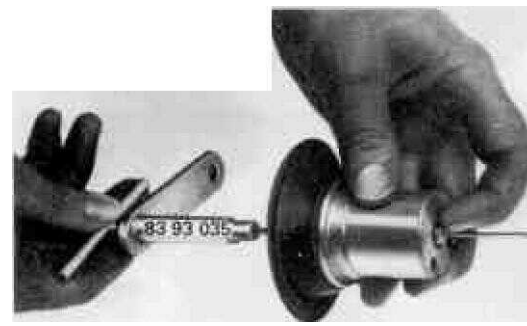
Carburettor

1 Damper and oil cap assembly
2 Vacuum chamber cover
3 Spring
4 Retaining ring
5 Diaphragm
6 Piston
7 Metering needle

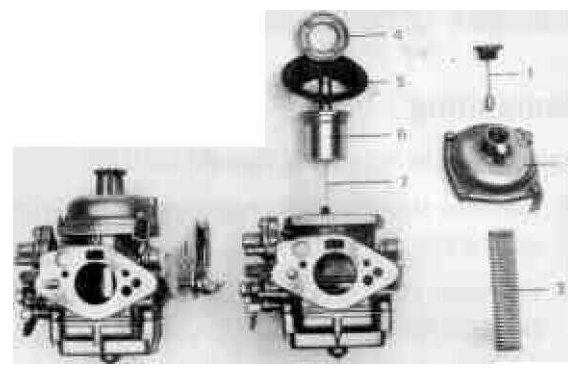
3 Remove the metering needle as follows:

a Back off the setscrew.

b Turn the adjusting screw inside the damper counter-clockwise using adjusting tool 8393035 until the needle is free.
Back off the setscrew until it is clear of the needle shoulder, then remove the needle.



4 Remove the screws, aluminium retaining ring (4) and diaphragm (5).



Exploded view of twin carburettors (A)

1 Damper and oil cap assembly
2 Vacuum chamber cover
3 Spring
4 Retaining ring
5 Diaphragm
6 Piston
7 Metering needle

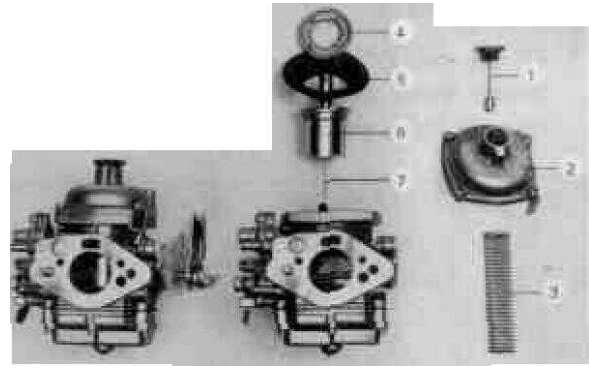
5 Remove the float chamber (9).

6 Carefully separate the float spindle from the retaining clips and remove the float (8).

7 Remove the float valve and washer.

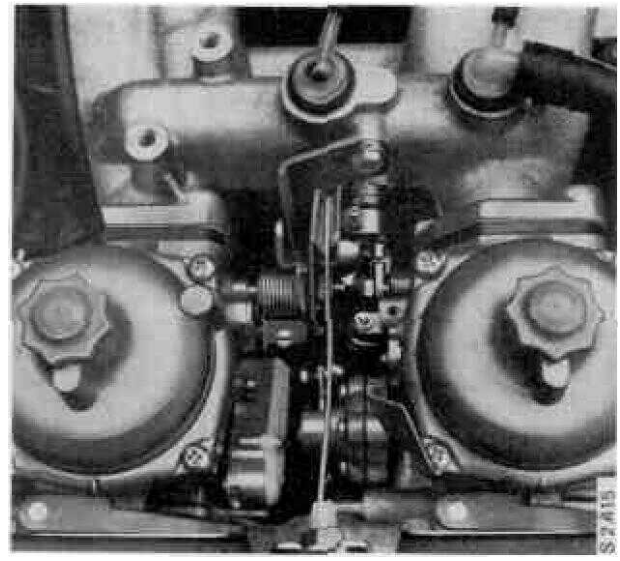
8 Remove the cold start mechanism (10).

9 Remove the temperature compensator (11). Save both rubber gaskets (12).



Exploded view of twin carburettors (B)

8 Float
9 Float chamber
10 Cold start mechanism
11 Temperature compensator
12 Rubber seals
13 Idling speed adjusting screw



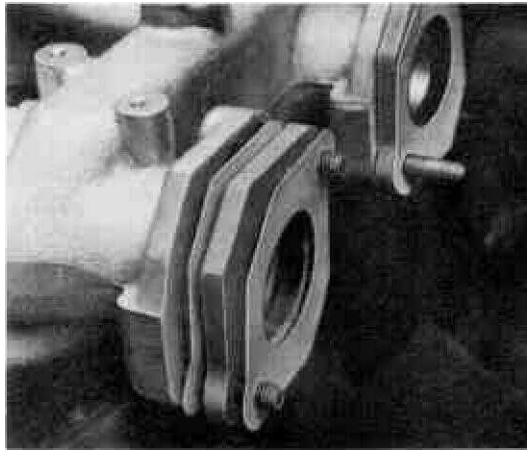
Idling adjustment screw Europe specification as from year model 1984

Cleaning and **assembly**

The procedure for cleaning and assembly of the carburettors is the same as for the single carburettor (see page 231-3)

To refit

1 Fit the two gaskets with the insulation between them to each of the inlet manifold flanges (as shown).



2 Mount the two carburettors simultaneously and secure by means of the nuts and washers. Ensure that the springwhich keeps the rear carburettor arm and adjusting screw in contact with the arm of the front carburettor is fitted.

3 a Connectthefuel line andfitthe clips.

b Connect the vacuum hose.

4 Fit the gaskets, bracket, air box and flange washers to the carburettors.

5 Fit the choke links to the connecting rods andfitthe clips.

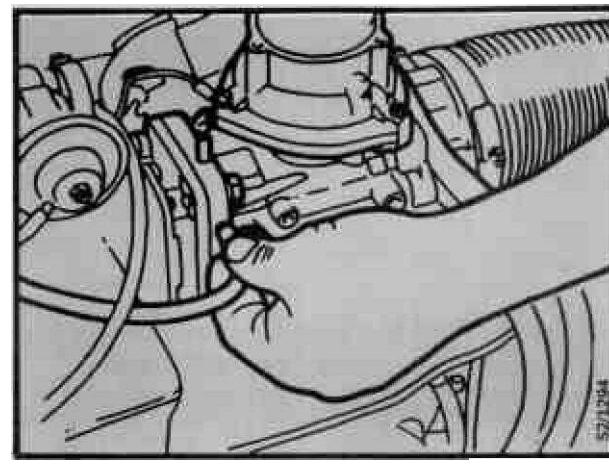
6 Connect the throttle and choke cables.

Single carburettor (Pierburg)

To remove

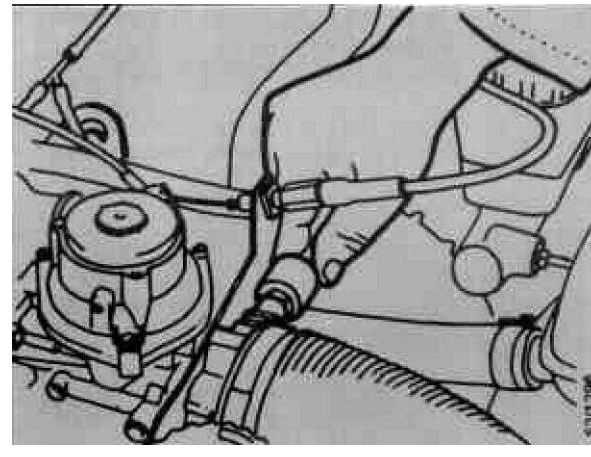
Disconnect the positive {+) lead from the battery.

1 Disconnect the hoses to the EGR valve and distributor.



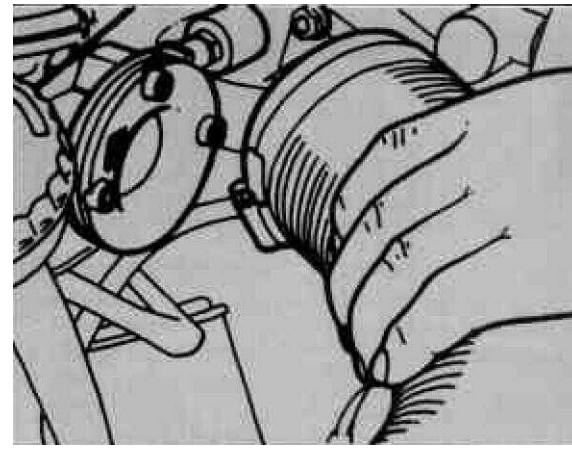
2 Disconnect the earth lead from the top of the carburettor.

3 Disconnect the electrical lead from the float chamber ventilation shuft-off valve.

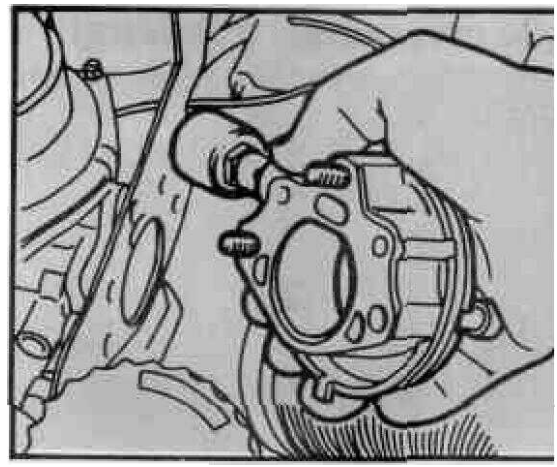


4 Disconnect the accelerator and choke cables.

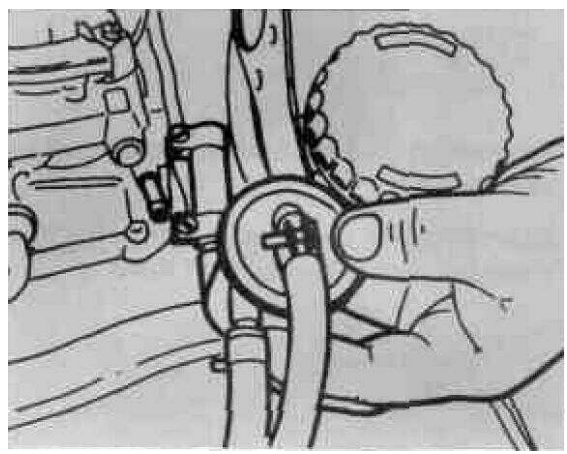
5 Disconnect the inlet hose from the carburettor flange.



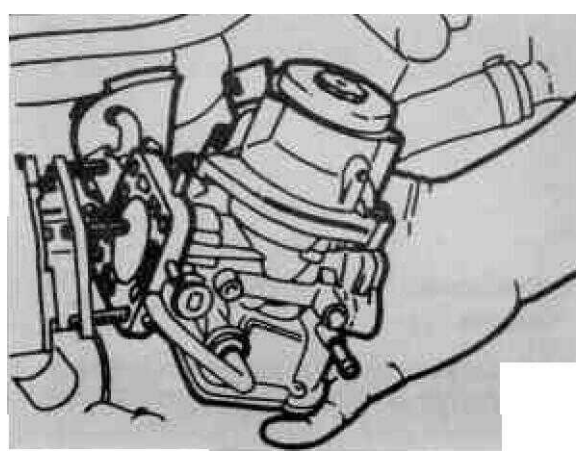
6 Remove the flange and the gaskets.



7 Remove the fuel hose from the carburettor, complete with vapour trap and clamp.



8 Unbolt the carburettor from the flange on the inlet manifold.



To dismantle

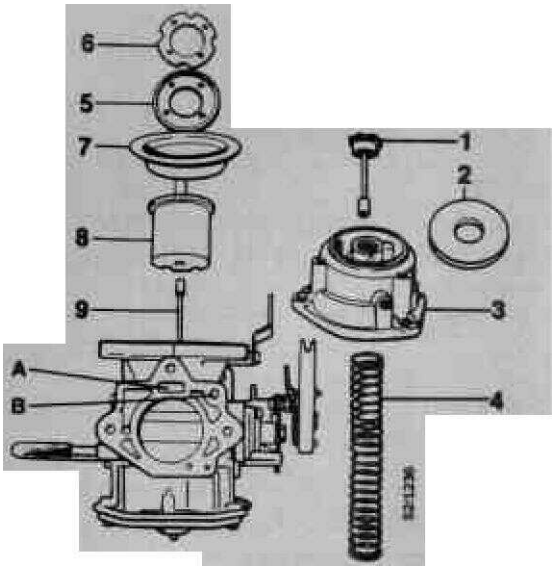
1 Remove the damper piston (1) and the cover (2).

2 Remove the carburettor cover (3) and the spring (4).

3 Remove the vacuum piston (8) and diaphragm (7).

4 Release the setscrew and remove the needle (9) from the piston.

5 Remove the diaphragm (7) from the piston (8) by removing the screws, the retaining ring (5) and the plastic washer (6).



Carburettor

1 Damper piston
2 Cover
3 Carburettor cover
4 Spring
5 Metal retaining ring
6 Plastic washer
7 Diaphragm
8 Piston
9 Needle

A Passage under vacuum piston
B Float chamber vent passage

6 Remove the float chamber cover (10).

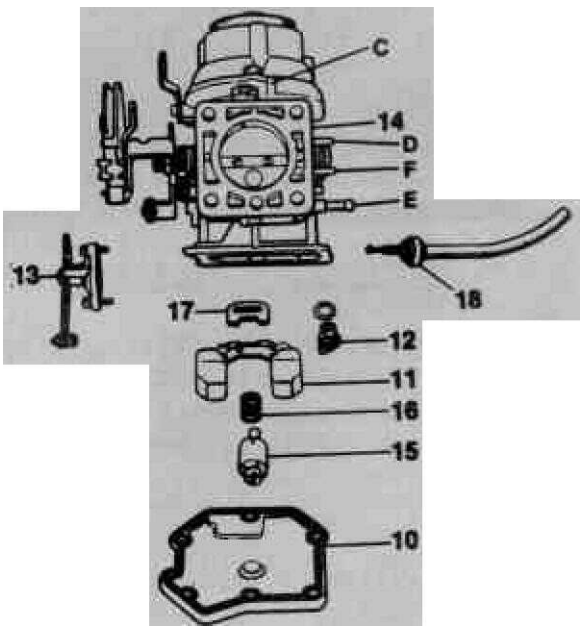
7 Remove the jet (15) and the spring (16).

8 Remove the plastic bracket (17) for the float, and then remove the float (11).

9 Remove the float valve (12) and the washer.

10 Remove the choke (13).

11 Remove the modulator valve (18).



10 Float chamber cover
11 Float
12 Float valve
13 Choke mechanism
14 Carburettor body
15 Jet
16 Jet spring
17 Plastic bracket
18 Modulator valve

C Signal outlet for distributor
D Signal outlet for EGR
E Fuel inlet spigot
F Modulator valve spigot

To clean

Wash the carburettor components in paraffin {kerosine).

Note
Clean the diaphragm in paraffin (kerosine) only. Do not use highly-volatile cleaning agents such astrichlorethylene.

Check that the diaphragm is in good condition. If it has split, fit a new one.

Check the needle for wear and replace it if it is bent or worn. Check that all contact and sealing surfaces are undamaged.

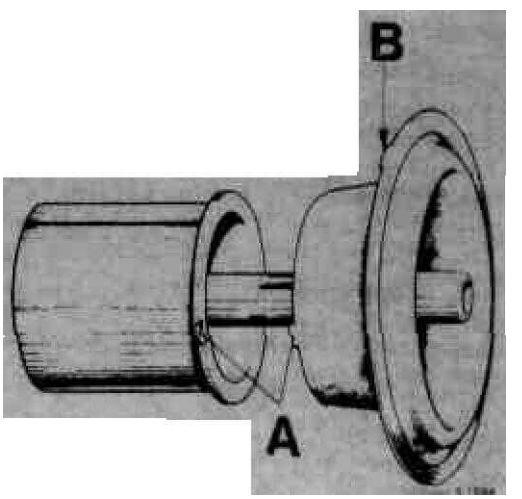
Check that the choke disc and corresponding sealing surface on the carburettor body are not scratched. Clean the holes in the choke disc with compressed air.

To assemble

1 Fit the diaphragm on the vacuum piston so that the inner locating tab (A) engages the corresponding slot in the piston.

Note
If, after drying for a while, the diaphragm is still so distended that it will not fit into the slot, renew it. A distended diaphragm will usually revert to its normal shape after being allowed to dry for a while.

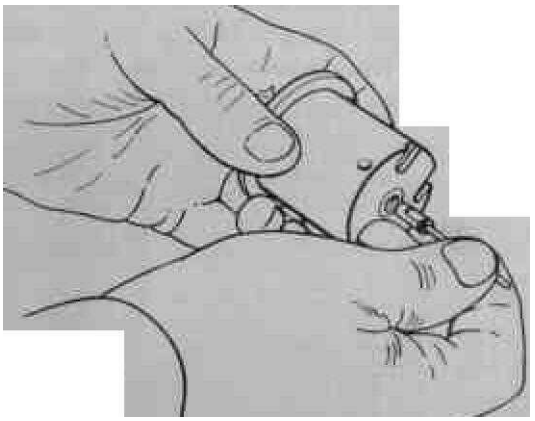
Place the plastic washer and metal retaining ring in position so that the screw holes are in line with those in the piston and diaphragm, without twisting the ring, and with the notch matching the tab on the diaphragm. Fit and tighten the screws.



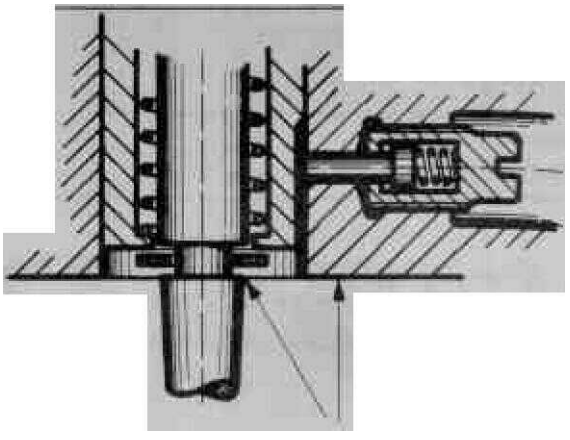
A Innertaband matching slot in vacuum piston
B Outer tab to match slot in **carburettor** body

2 Fit the needle as follows:

a Insert the spring housing of the needle into the vacuum piston, with the flat surface facing the setscrew.

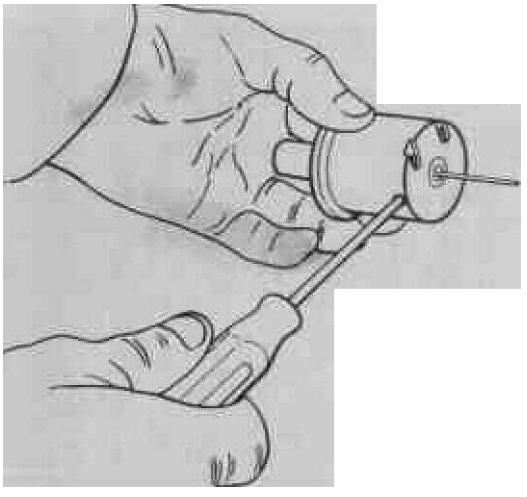


b Adjust the needle so that the shoulder is flush with the bottom of the piston.

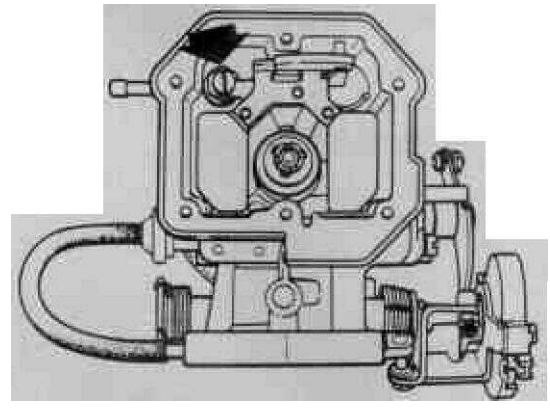


Needle should flush with bottom of piston

c Tighten the setscrew.

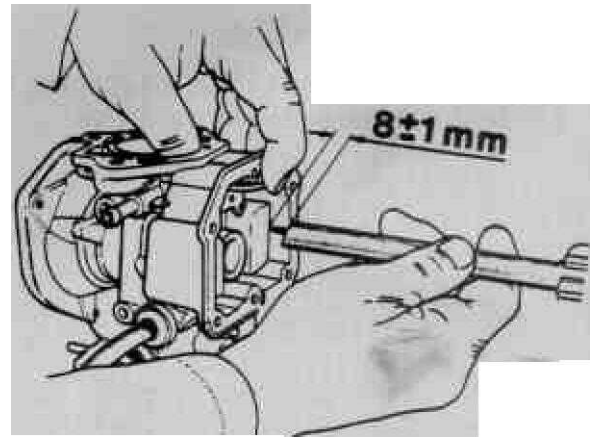


Fit the float valve and washer and the float and spindle. Make sure that the adjusting tab on the float is inserted under the locking needle of the float valve. Fit the plastic bracket.



4 Check/adjust the float level

Press down on the plastic bracket to position the float correctly. Tilt the carburettor (approx. 10°) until the float arm just touches the ball on the needle valve.



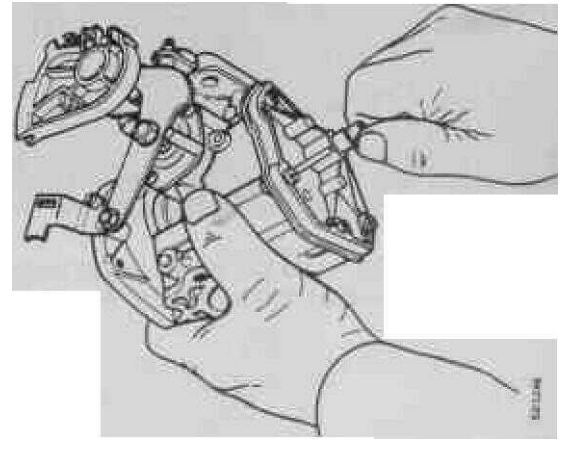
Note
The ball must not be pressed home.

Measure the float height to the gasket face. Adjust the height, as necessary, to the correct value of 8 ± 1mm by bending the tab at the needle valve.

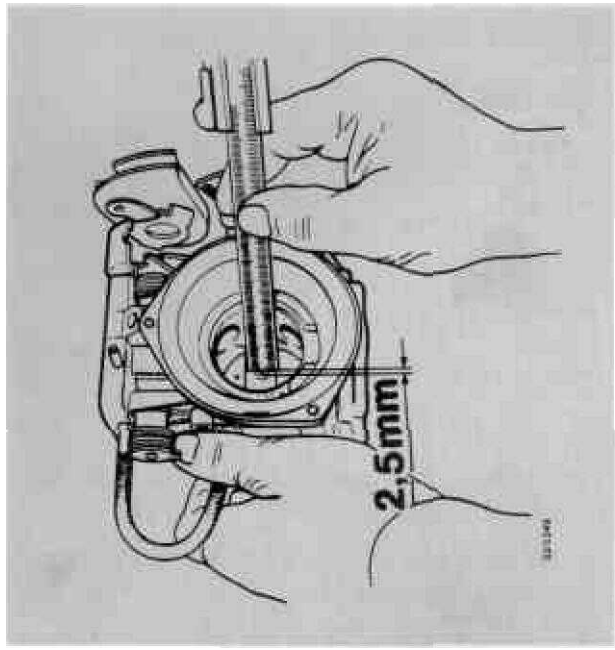
5 Fit the jet spring and the jet.

6 Fit the float chamber cover.

7 Carry out basic setting of the fuel jet.



Adjust the height by means of the adjusting screw on the float chamber cover. The jet should be 2,5 mm (0.098 in) below the face of the jet bridge (at 20°C;68°F).



Note
Take care not to press down on the spring-loaded jet with the calliper, as this will affect the read-ins.

8 Fit the piston, with the diaphragm and spring, into the carburettor body. Make sure that the tab on the diaphragm fits into the corresponding slot in the carburettor body. Fit the carburettor cover in position as indicated by the marks, and tighten it.

9 Fit the cover and the damper piston.

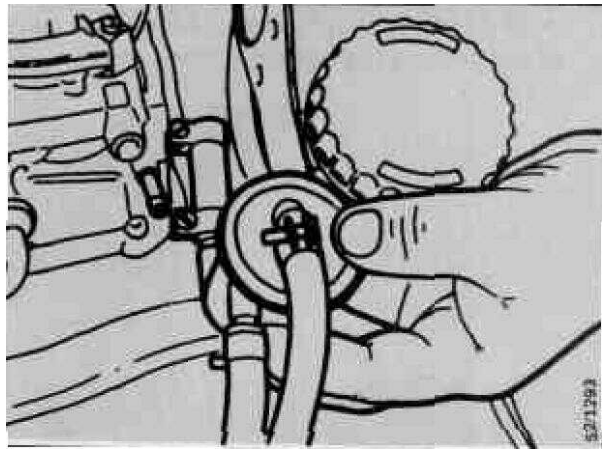
10 Fit the modulator valve.

11 Fit the choke.

To refit

1 Fit the carburettor to the rubber of the inlet manifold.

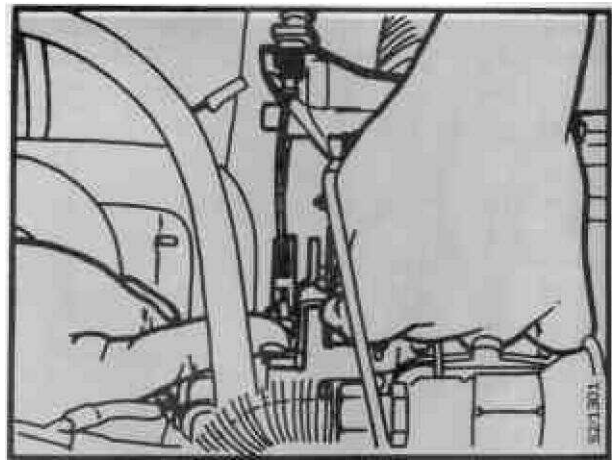
2 Connect the fuel hose to the carburettor and fit the vapour trap and clamp.



3 Fit the flange to the carburettor.

4 Connect the inlet hose to the carburettor.

5 Fit the throttle and choke cables.



6 Connect the electrical lead to the float chamber ventilation shut-off valve.

7 Fit the earth lead to the top of the carburettor.

8 Connect the hoses for the EGR valve and distributor.

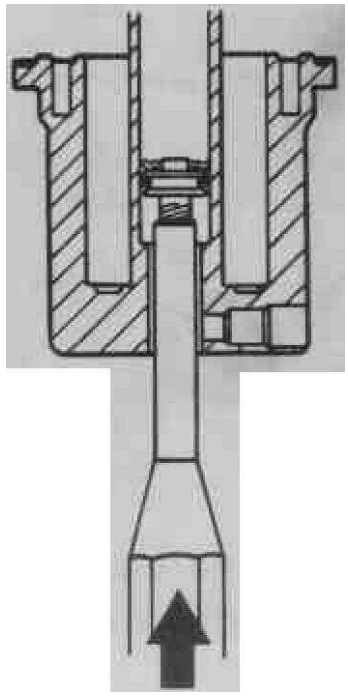
9 Fill the damper cylinderwith oil.

10 Run the engine until it reaches normal operating temperature and then adjust the CO setting, idling speed and fast idling speed.

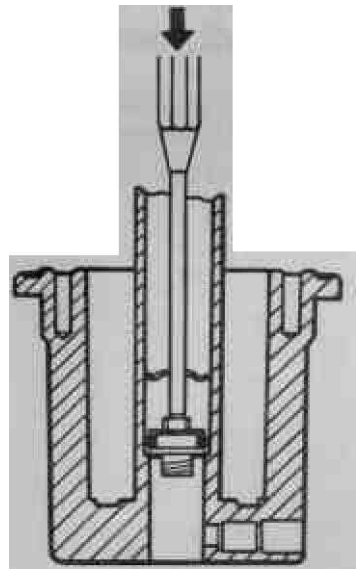
Changing the adjusting screw in the vacuum piston (Stromberg)

Removal (vacuum piston **with needle removed)**

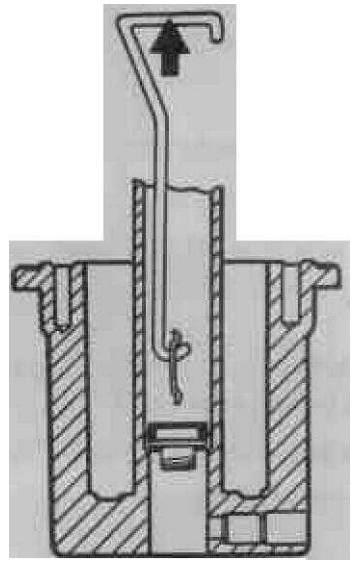
1 Using a drift, press out the adjusting screw until it protrudes a few centimetres (an inch or so) beyond the bottom of the piston.



2 Press in the adjusting screw again.



3 Rock the retaining washer to loosen it and then remove it by means of a bent piece of wire. The adjusting screw can now be removed.



Refining

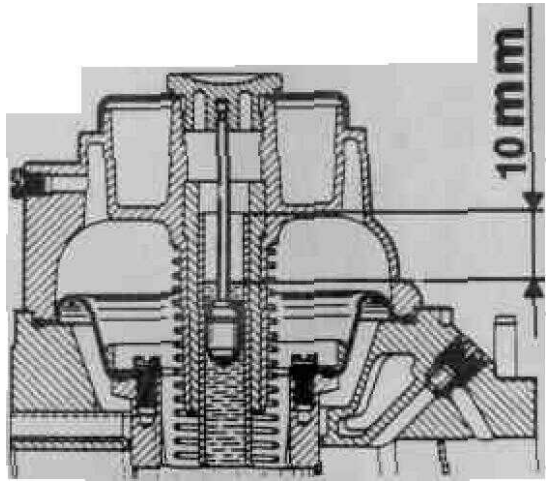
1 Using a drift, press the adjusting screw with '0' ring into the piston.

NOTE
Grease the '0' ring with Vaseline or the equivalent to prevent the ring from being damaged on fitting by any scoring on the cylinder bore.

2 Press a new retaining washer into the damper cylinder using a drift.

To check and top up the oil in the damper cylinder

Check the oil level, which should be 10 mm (0.04 in) below the top of the cylinder. Top up, as necessary, using automatic transmission oil.



Pierburg carburettor

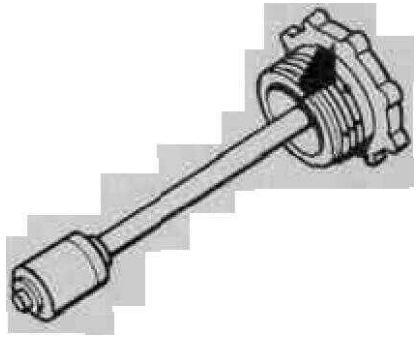
To check the damper piston

Check for damage and wear.

Check the axial play of the damper piston, which should be between 0.5 mm and 1,5 mm (0.02 - 0.06 in).

In case of any defect, replace the entire damper piston and oil cap assembly.

Check that the vent hole in the oil cap is open.



Changing the jet

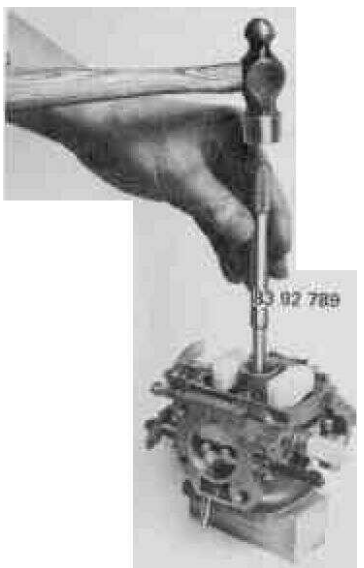
Stromberg

Tools: Drift 83 92 789

The jet is press-fitted in the carburettor body and should not be moved from the specified position. However, the jet can be changed using tool 83 92 789 as follows.

1 Remove the carburettor and then take off the vacuum chamber cover and remove the vacuum piston and float chamber cover. ,

2 Tap out the jet using tool 83 92 789.

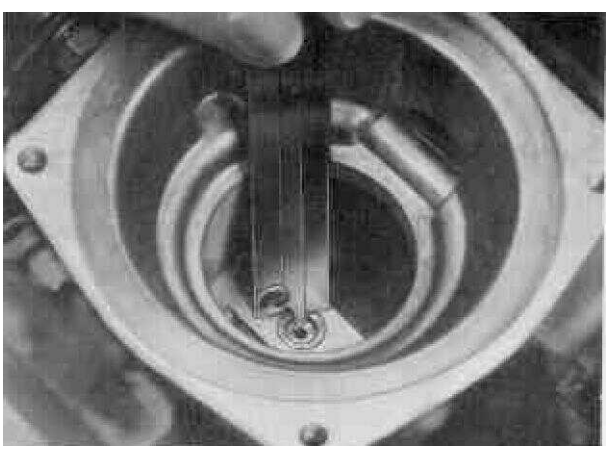


3 Using the tool, tap in the new jet from the float chamber side, using drift 8392789, until the distance of the jet below the level of the bridge in the carburettor body is as follows:

Single carburettors: 2,5 ±0,1 mm (0.0984 ±0.0039 in)

Twin carburettors: 2,3 ±0,1 mm {0.0906 ±0.0039 in)

If you happen to tap the jet in too far, it can be tapped back from above using the same tool.



Caution

Avoid resting any type of measuring tool against the upper, inner surface of the jet when tapping it into position. Even the si ightest deformation in the surface can affect the jet orifice.

Plerburg

To remove

1 Remove the carburettor from the car and then remove the damper piston and carburettor cover.

2 Empty all fuel from the carburettor.

3 Remove the float chamber cover.

4 Remove the jet and the return spring.

Tom

1 Fit the return spring and the new jet.

2 Refit the float chamber cover complete with gasket.

3 Adjust the height of the jet (see below).

4 Fit the carburettor cover and damper piston.

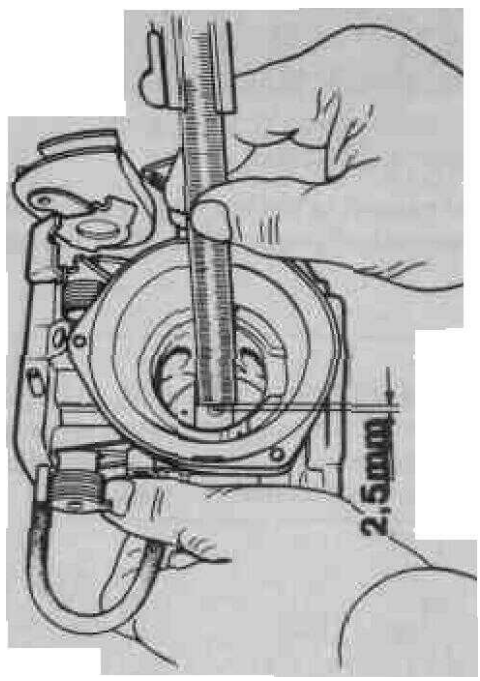
5 Refit the carburettor.

Basic fuel-jet setting (Pierburg)

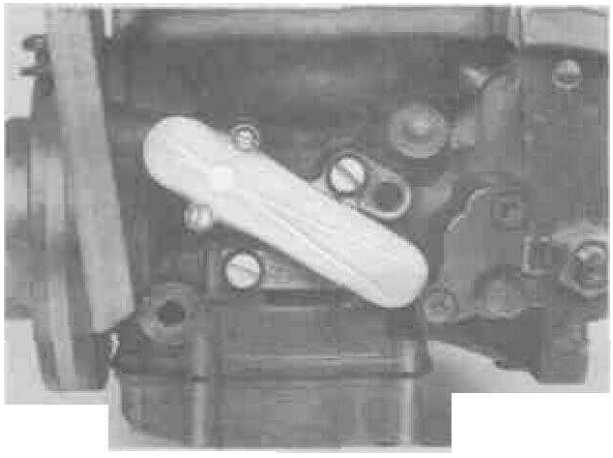
When measuring, remember that the jet is spring-loaded.

Adjust the height by means of the adjusting screw in the float chamber cover.

The jet should be set 2,5 mm (0.098 in) below the face of the bridge in the carburettor body.



Temperature compensator (Stromberg)



The temperature compensator serves to maintain a constant fuel/air mixture, regardless of the ambient carburettor temperature. The temperature compensator valve is governed by a bi-metallic strip which, on heating, opens an air passage past the vacuum piston. The valve opens at around 20°C (68°F).

In the event of the idling speed dropping rapidly after prolonged idling, particularly in warm weather, check the operation of the temperature compensator by removing the plastic cover and pressing in the valve, whereupon the tickover should become less smooth. If the valve is stiff or sticks it can be adjusted, provided that it is not scratched or coated with deposits. Should this prove to be the case, fit a new valve.

Adjustment

Note

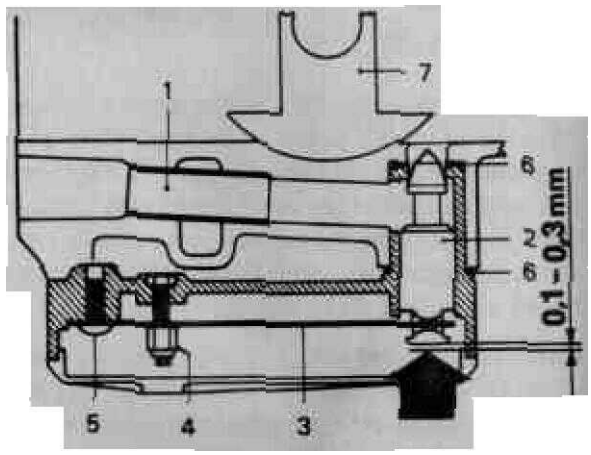
The temperature compensator is adjusted at the factory and should therefore not be tampered with unless absolutely necessary.

Back off the bi-metallic strip retaining screw slightly and centre the valve by pressing it towards its seating. Retighten the screw.

Setting

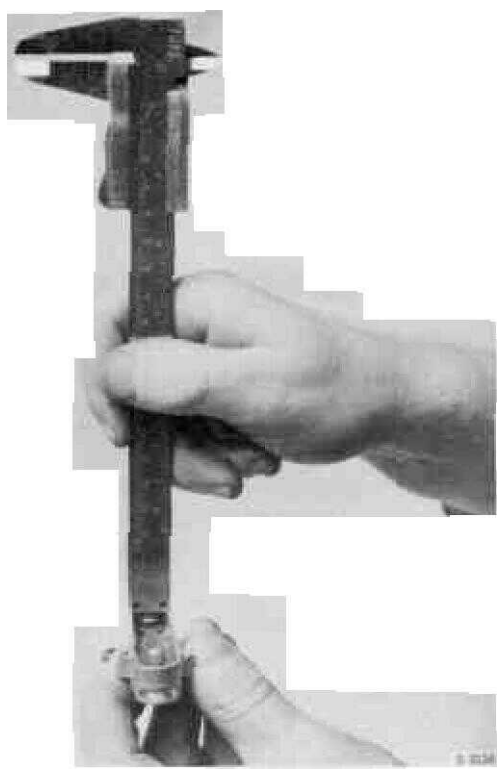
At 20°C (68°F) the valve should have opened 0,1-

0,3 mm (0.004-0.012 in). To check the setting, the temperature compensator should be removed from the carburettor and kept at a temperature of 20°C (68°F) until it has acquired this temperature. Setting is by means of the bi-metallic strip adjusting nut.



Temperature compensator

1 Air passage
2 Valve
3 Bi-metallic strip
4 Adjusting nut
5 Bi-metallic strip retaining screw
6 Seal
7 Jet bridge



Changing

Change the temperature compensator as a complete unit. To remove it, undo the two slotted screws.

Note
Both the outer and inner rubber gaskets must be exchanged.

Choke modulator (Stromberg)

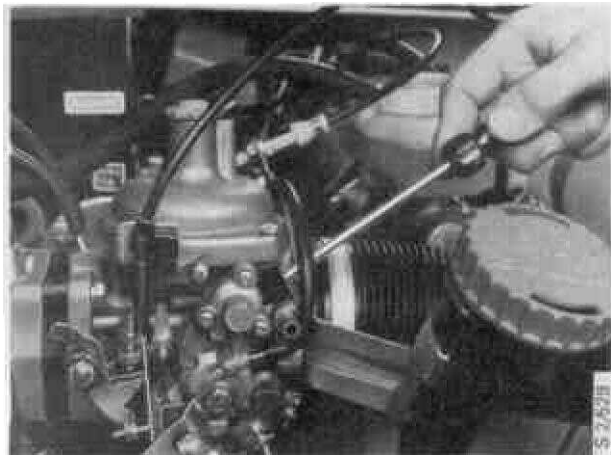
To check

1 Connect exhaust extraction equipment and a CO meter.

2 Start the engine and run it up to normal operating temperature.

3 Pull the choke control out to about one-third of its travel.

4 Use a finger or a piece of fabric tape to seal off the filter orifice in the choke modulator.

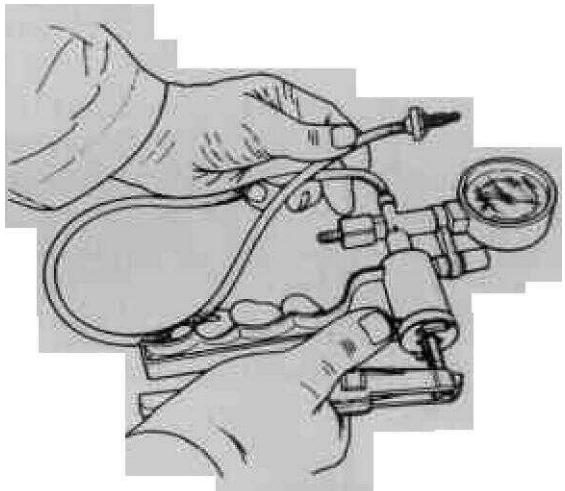


Note
The filter orifice must be tightly sealed. If the choke modulator is working properly, the CO value will increase markedly.

To check the modulator valve and hose (Pierburg)

Suck at the valve and check that it opens and closes.

Check that the hose is intact and that it is still flexible and soft.

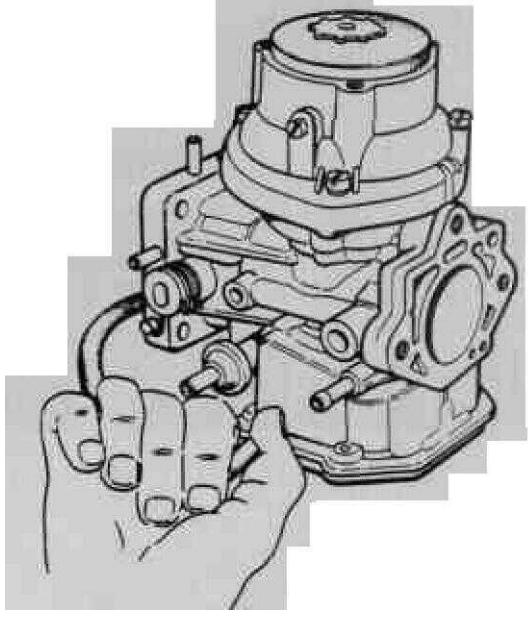


The valve can also be checked as follows when the CO content is checked.

Run the eingine at fast idling speed.

Disconnect the hose from the valve and plug it, whereupon the CO valve should increase. Reconnect the hose, whereupon the CO valve should fall.

If there is no change in the CO content, fit a new valve or remove the valve and blow clean the passages with compressed air.



Float chamber vent valve

Checking and setting

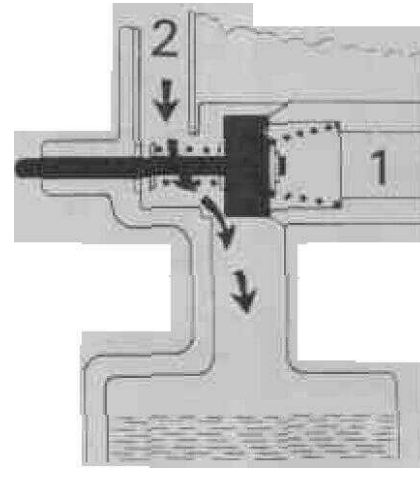
Stromberg

The valve should be set so that atmospheric air is drawn in through the connection to the air cleaner.

1 Connect a hose to the mouth of the atmospheric air pipe.

2 Blow down the hose. If the fuel pipe is notfitted and connected to the pump, the fuel inlet connection must be sealed off.

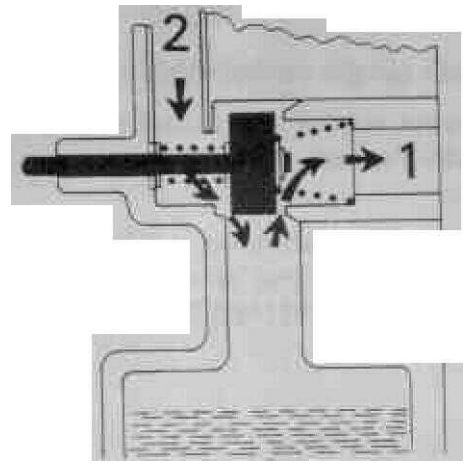
a With the throttle fully closed it should not be possible to blow through the connection {as the float chamber is an enclosed space).



Throttle valve fully closed

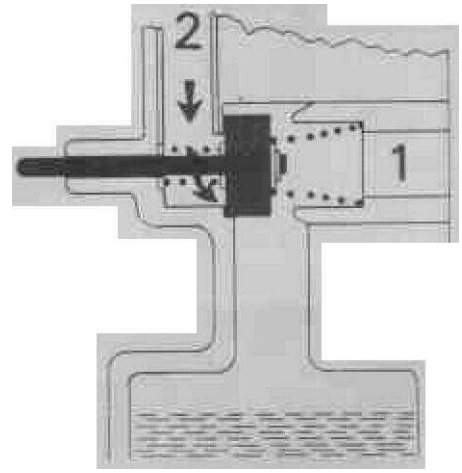
1 Airfrom air cleaner
2 Atmospheric air

b If the throttle is opened 2-3 mm (0.08-0.112 in) (at the throttle stop) a passage will be opened for internal air flow, making it possible to blow through the connection.



*Throttle valve open **2-3** mm (0.08 - 0.112 in)*

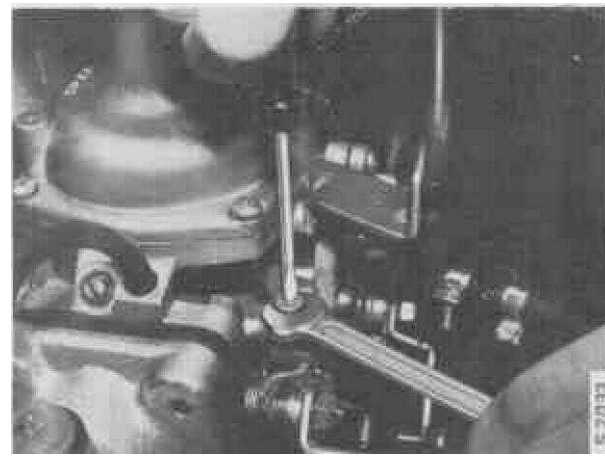
c If the throttle is opened a fraction more, the passage should close again.



Throttle valve open a fraction more,

3 Release the locknut and adjust the valve by rotating the setting screw. Use the procedure outlined in steps 2a and 2b.

4 The idling speed, CO setting and synchronization (twin carburettors only) must be checked following the above adjustments and reset if necessary.



Plerburg

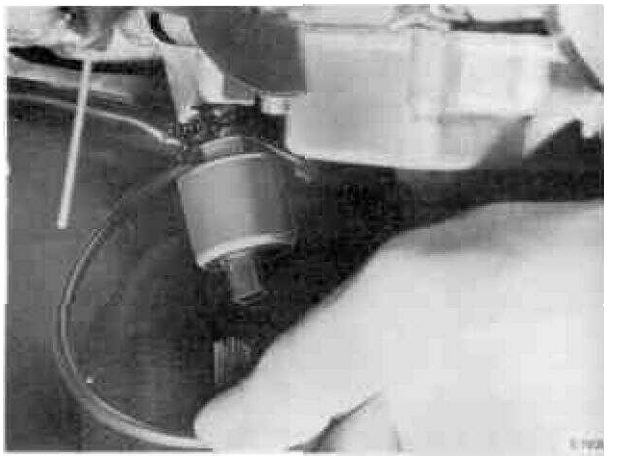
Switch on the ignition and pull off the plug on the electrical connector to the valve, which should cause a clicking sound to be heard.

Idling shut-off

To check single carburettor engines

1 Connect a tachometer and let the engine run at idling speed.

2 Temporarily disconnect the lead from the shut-off valve and check that the idling speed drops by at least 200 r/min.



Note
The engine will run on after the ignition has been turned off if the idling speed is too high.

To check twin-carburettor engines

Disconnect the standard and blow into the connections for the float chamber vent valves:

a With the ignition turned on, or about 6 seconds after the igni tion has been switched off, the float chambervent valve should allow the entry of air from the atmosphere.

b The connection between the float chamber and the passage to the vacuum chamber should open within approx. 6 seconds of the ignition being turned off.

Engine runs on

The likely causes of the engine running on are as follows:

- Idling speed settoo high.
- Ignition timing too far advanced.
- Mixture in carburettor too weak (idling).

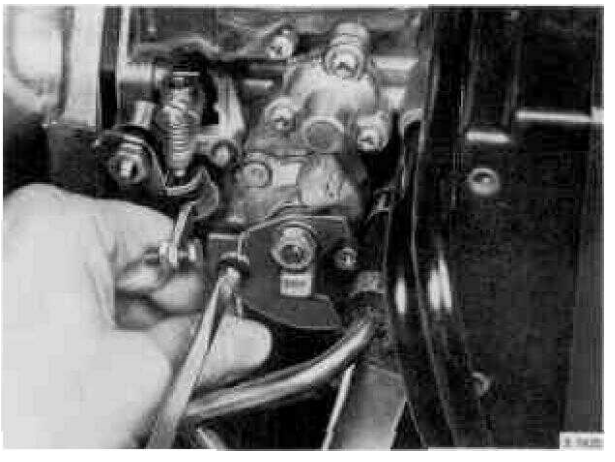
  These three factors tend to produce a wider opening of the throttle butterfly.

- Carbon deposits in combustion chamber (caused by prolonged use of choke and engine failing to reach normal running temperature).
- Grade of fuel too low - higher octane rating needed.
- Float chamberventilation incorrectly adjusted (twin carburettors only).

Checking and adjustment

Choke **Control (Twin carburettors)**

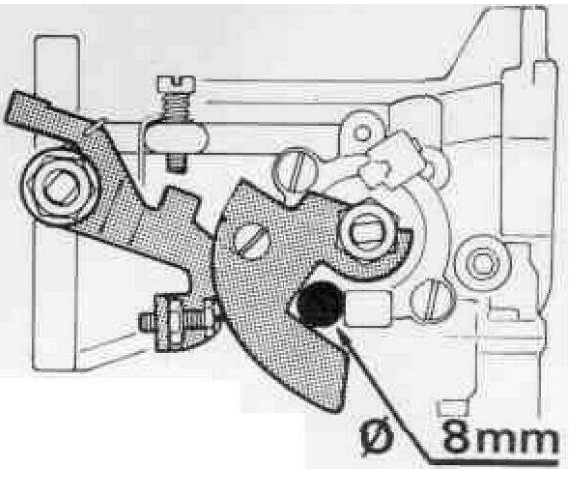
Check that both choke controls strike their stops at the same time. If necessary, adjust the control spindle linkages.



Fast **idling** (Stromberg)

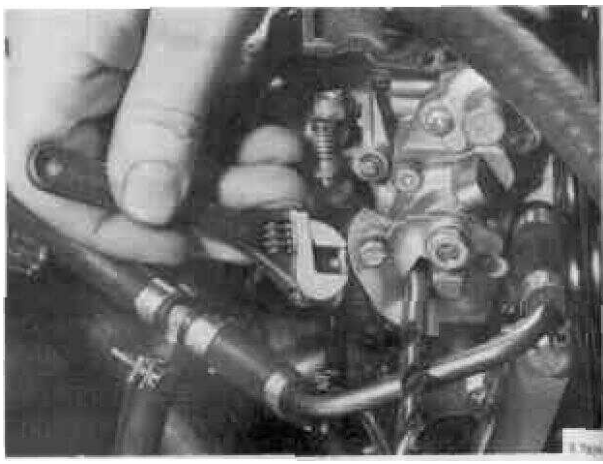
Check the fast id l ing speed with the engine warm as follows:
(Vacuum line to distributor plugged.)

a Place an 8 mm (0.315in) dia. spacer (drill bit) between the notch in the cam lever and the stop on the choke housing.



b Check that the fast idling speed is correct.

Adjust the stop screw on the throttle lever if required.



Code on	r/min	fast-idling cam
CM81-82	1100 ± 50	"A6"
CM 83	1350 ± 50	"A8"
CA,CM 84-	1350 ± 50	"ASA"
TMJA81-84	1100 ± 50	"A5"

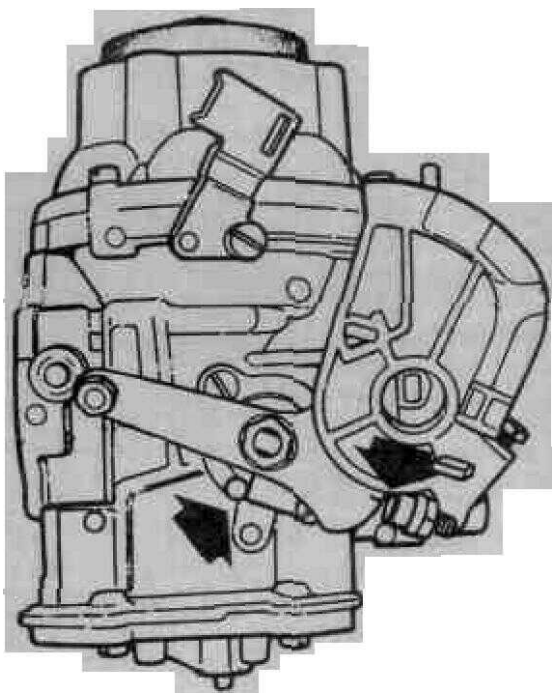
Note
If the code on the cam differs from that shown for a given engine variant, follow the setting applicable to the cam code.

Choke control (Pierburg)

Make sure the lever deflects fully when the choke is pulled out.

Push in the choke. Make sure the lever is at the lower limit of its travel and that the fast idling screw is not touching the lever.

Adjust as necessary.

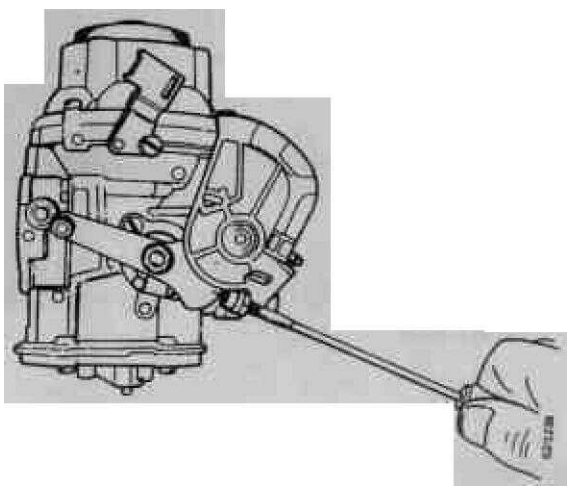


Fast idling (Pierburg)

Note
Disconnect the vacuum line to the distributor and run the engine to normal operating temperature.

Pull out the choke until the mark on the choke lever is in line with the fast idling screw.

Adjust the engine speed to 1350 ± 50 r/min by means of the fast idling screw.

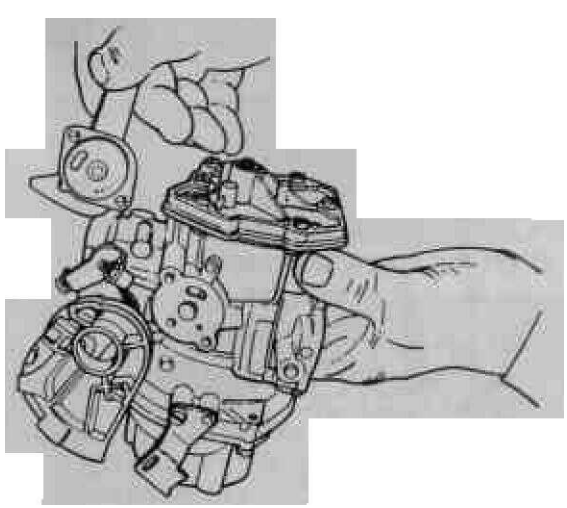


Choke **(Pierburg)**

Make sure the choke does not bind.

Check the valve disc and the corresponding sealing surface on the carburettor body.

Remove any minor scratches using fine emery cloth and lapping paste.



Basic setting of metering needle (Stromberg)

Tools: Needle adjusting tool 83 93 035

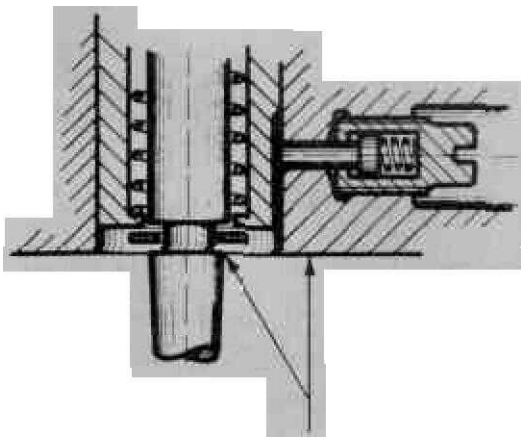
As regards twin carburettors, the basic setting must be adjusted on both. The jet is fixed in the carburettor and the height of the needle must therefore be adjusted to effect the basic setting. Proceed as follows.

1 Remove the damper and oil cap assembly.

2 Remove the.vacuum chamber cover and the return spring.

3 Withdraw the piston and diaphragm together.

4 Using tool 83 93 035, bring the should of the needle in line with the lower edge of the vacuum piston.



Needle should flush with bottom of piston

5 Fit the piston and diaphragm complete in the carburettor, making sure that the outer tab on the diaphragm engages the matching slot in the carburettor body.

6 Fit the spring and vacuum chamber cover, making sure that the marks coincide, and then fit and tighten the screws.

7 Check and if necessary fill oil in the damper cylinder and fit the damper piston.

Fine adjustment of the setting is effected in conjunction with the subsequent CO check.

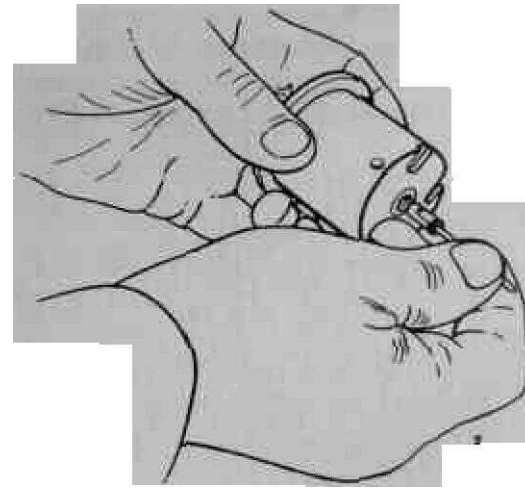
To check the needle **(Pierburg)**

Check the needle for signs of wear or damage and also the needle setting.

Release the setscrew to adjust the height of or to replace the needle.

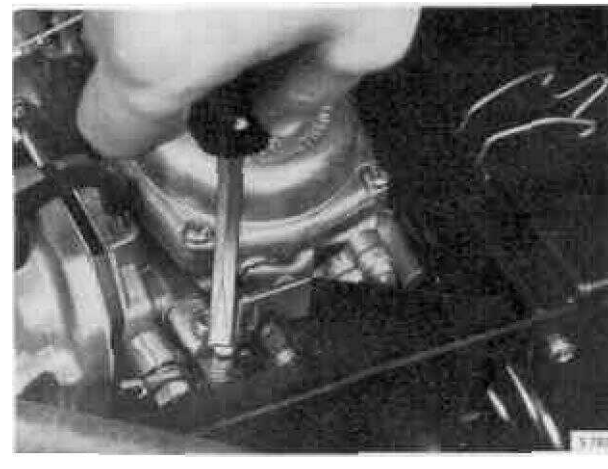
Make sure that the flat in the needle shoulder is towards the setscrew.

The needle designation is stamped on the needle and can be seen after the needle has been withdrawn from the socket (needle shoulder).



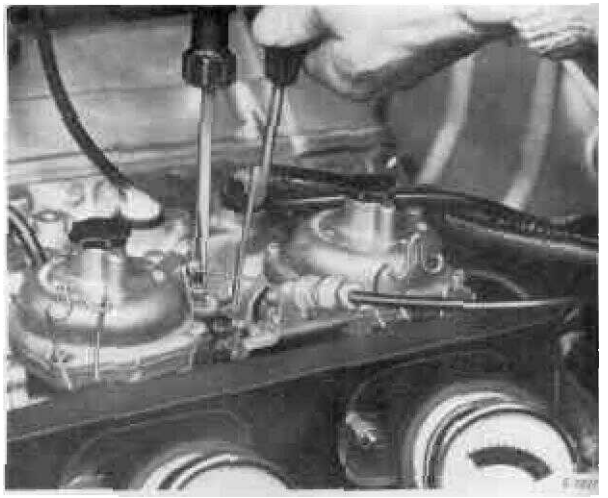
To synchronize twin **carburettors**

1 Run the engine to normal operating temperature and then let it idle. The idling speed adjusting screw serves both carburettors and is located on the front carburettor. Location of idling speed adjusting screw, 1984 Europe spec, models onwards.



Placement of adjusting screw, Europe specification, as from year model 1984

Synchronize the carburettors by means of the adjusting screw on the linkage between the two carburettors. Compare the air flow through the carburettors by means of a synchro-tester. The adjusting screw should be locked by means of the locknut after setting.



CO-setting (Stromberg)

Before adjusting the CO setting:

1. Change the engine oil.
2. Check the condition of the spark plugs.
3. Check the HT leads.
4. Check the valve clearance.
5. Check the position of the camshaft (timing) .
6. Check the ignition timing.
7. Check the idling speed.
8. Check the float chamber ventilation.
9. Checktheoil level inthecarburettordashpot damper.
10. Check the air preheater/air cleaner.
11. Check the delay valve.
12. Check the radiator fan.
13. Check the fuel shut-off valve.
14. Check the fast-idling speed (engine at normal running temperature).
15. Check the operation of the choke modulator by blanking off the filter aperture.
16. Check that the secondary CO adjusting screw is screwed fully home.

Note

To minimize the possible effect on the readings caused by various engine and exhaust emission control components, the CO setting on cars with Sweden specifications (and Switzerland, as from 1983 models) should be carried out at an engine speed of 2000 r/min. On Europe spec, cars, the setting should be made at idling speed.

CO-setting at 2 000 r/mln

1 Run the engine to normal temperature, connect a tachometer and set the speed to 2000r/min.

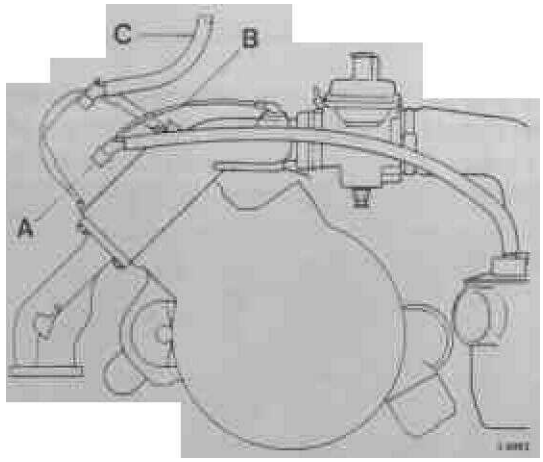
2 Disconnect the crankcase ventilation as follows:

A Disconnect the hose from the valve cover.

B Plug the end of the small-bore hose.

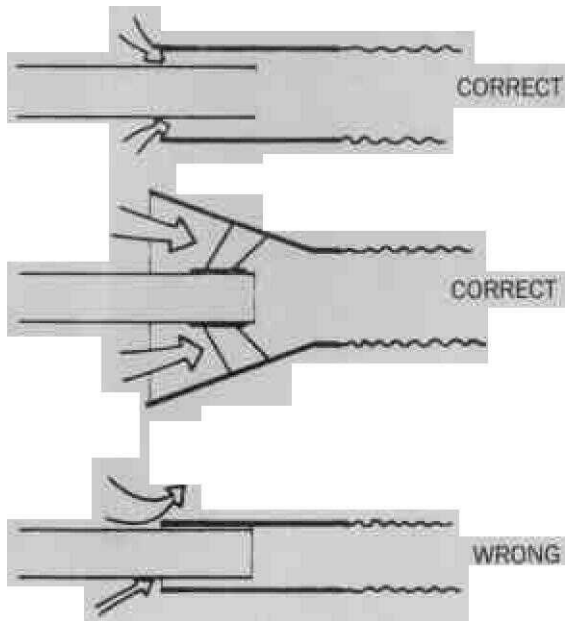
C Connect the evacuation hose to the valve cover.

Evacuate the crankcase gases from the outlet in the valve cover by connecting the other end of the hose to the evacuation hose of the building's extraction system, at a point downstream of the CO-meter probe, to ensure that the readings will not be affected.



Note
When connecting exhaust extraction equipment in conjunction with running the engine inside the workshop, avoid excessive depressurization of the exhaust system, as this may affect readings, e.g. of the CO content.

To prevent excessive extraction pressure, use an extraction hose with an open coupling.



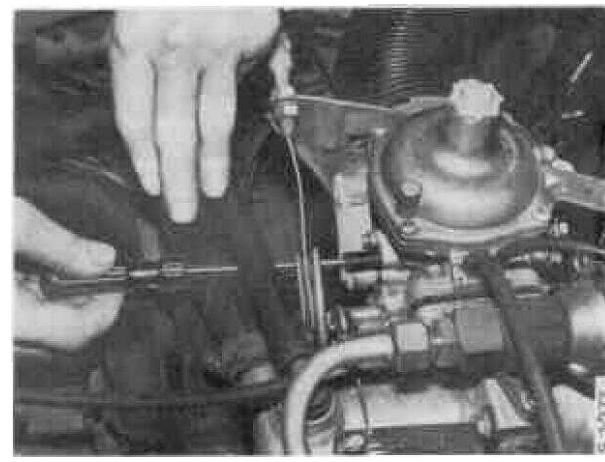
Secondary CO adjusting screw (single carb.)

Carburettors equipped with a secondary CO adjusting screw for use at idling speed are fitted to

single-carburettor cars as from engine no. 18191, Conventional adjustment of the CO content should be carried out as before at 2,000 r/min.

Note

In its normal setting, the secondary adjusting screw should be screwed right home, to the end of its travel. If during subsequent checking of the CO value at idling speed the value exceeds the specified maximum(4.5%), the CO content can be reduced using the secondary adjusting screw.



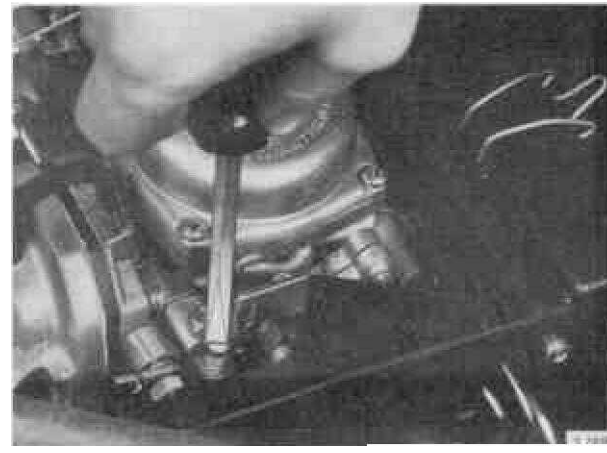
3 Disconnect the vacuum line from the distributor and blank off the end of the hose.

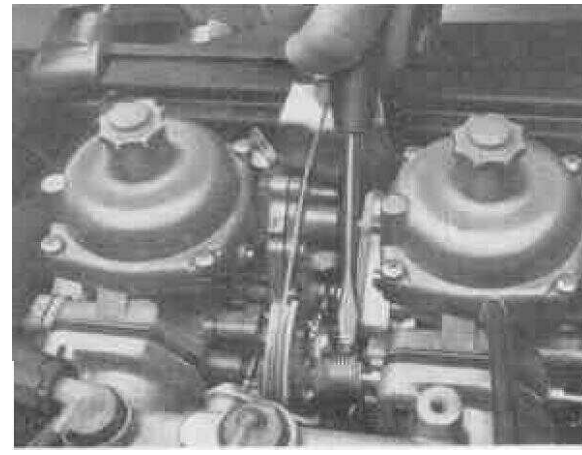
4 Plug the end of the vacuum hose to the EGR valve (where applicable).

5 Connect the CO meter and tachometer.

6 Switch on the daylight driving lights.

7 Read the CO value immediately after the radiator fan cuts in. If the reading is within the specified limits, reset the idlingspeed to 850 r/min.





Idling adjustment screw Europe specification as from year model 1984

CO-setting at 2 000 r/min

(Hoses to vacuum control unit, crankcase ventilation and EGR valve disconnected.)

Single carburettor:
1.75 ±0.25%

Twin carburettors:
1.010.25%

For adjustment, remove the dashpot damper pistons and then turn needle adjusting screwsby means of tool 8393035. Support the vacuum piston by means of the sleeve of the tool to prevent the rubber diaphragm from being damaged.

Rotate clockwise to Increase CO-value (needle raised).

Rotate counter-clockwise to reduce CO-value (needle lowered).

8 Remove the plugs and connect the crankcase ventilation, the EGR hose and the vacuum hose to the distributor.

9 Set the idling speed to 850 ± 50 r/min and check the CO-value.

Maximum CO reading at idling speed
Sweden 4.5%
Europe 3.5%

CO setting at 850 r/min (Idling speed)

1 Run the engine until it reaches its normal running temperature, so that the CO reading can be made just after the fan has cut in. The reading must be made with the headlights switched off.

Connect the CO meter and tachometer.

2 Check the idling speed, adjust as necessary and then read off the CO value.

Refer to the 'Technical data' section for the correct CO reading at 850 r/mln

Toadjust: Remove the damper piston (orpistons) and then use tool 83 93 035 to turn the needle adjusting screw. Use the sleeve of the tool to support the vacuum piston, to prevent damage to the diaphragm.
Turn the screw clockwise to increase the reading (needle raised).
Turn the screw counter-clockwise to red uce the reading (needle lowered).

3 Disconnect the CO meter and tachometer.

CO setting

Before adjusting the CO setting:

- Change the engine oil.

2 Check the spark plugs.

3 Check the HT leads.

4 Check the valve clearances.

5 Check the position of the camshaft (timing).

6 Check the ignition timing.

7 Check the float chamber ventilation.

8 Check the oil level in the damper cylinder.

9 Check the air preheater/air cleaner.

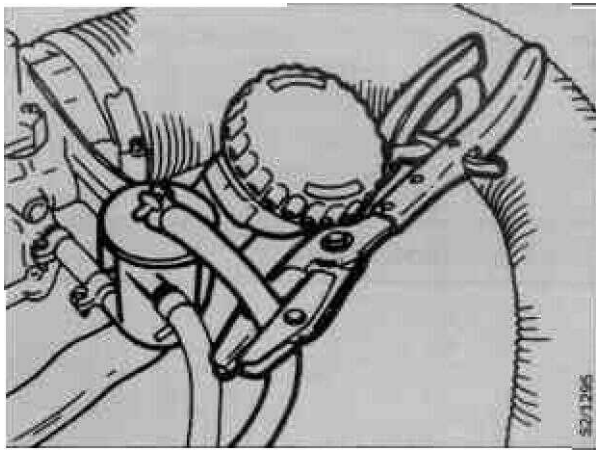
10 Check the delay valve (for vacuum control unit on distributor)

11 Check the radiator fan.

12 Check the fuel shut-off valve.

If the car has been taken into the workshop after having been outdoors at ambient temperatures below -10 C (14 F) and the fuel is thus cold, proceed as follows:

- Pinch closed the fuel return line at the carburettor until adjustment of the CO emission has been completed.
- Run the engine with the bonnet (hood) closed until the radiator fan has cut in.



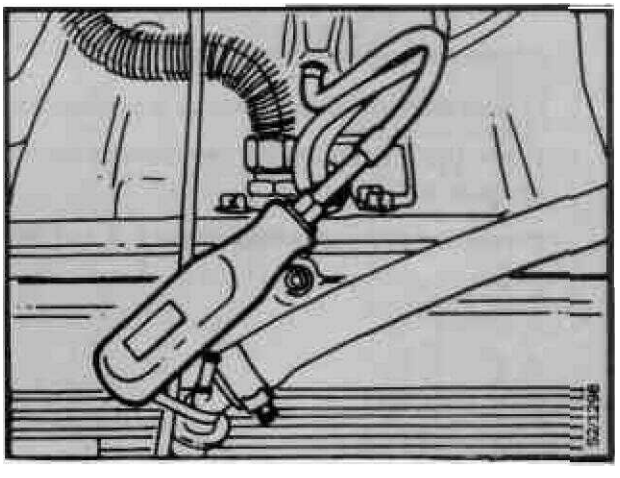
To check

1 Run the engine to normal temperature and connect a tachometer.

2 Disconnect the crankcase ventilation as follows:

a Disconnect the nipple from the valve cover.

b Plug the small-bore hose.



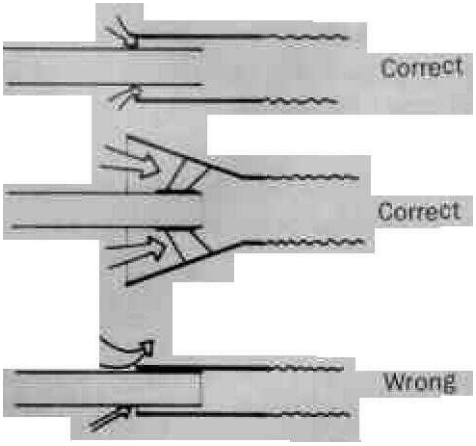
c Connect an evacuation hose to the valve cover.

Evacuate the crankcase gases by connecting a hose from the opening in the valve cover to the evacuation hose of the building's extraction system, at a point downstream of the CO meter sensor.

Note

When connecting exhaust extraction equipment for running the engine in the workshop, make sure that the resultant depression in the exhaust system is not too high, as this may affect the readings of the CO content.

To prevent excessive suction, use an extraction hose with an open coupling.



3 Disconnect the vacuum hose from the EGR valve and plug the hose.

4 Disconnect the vacuum hose from the vacuum control unit on the distributor and plug the hose.

5 Connect the CO meter.

6 Adjust the engine speed to 2 000 r/min.

7 Ensure that the choke control is pushed in.

8 Read the CO value immediately after the radiator fan cuts in.

CO setting value at 2 000 r/min: 1.7 ±0.3%

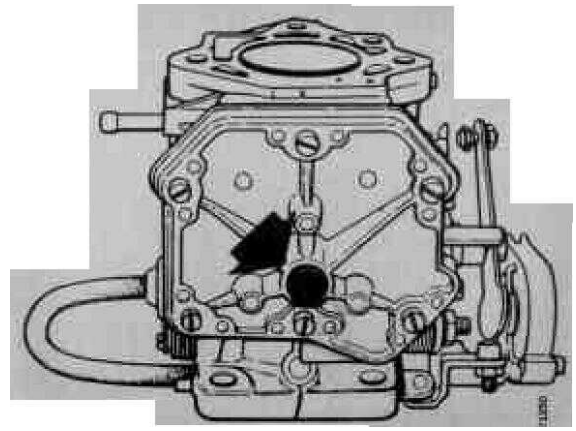
To adjust the CO setting

Adjust the CO emission by means of the adjusting screw on the float chamber cover.

The screw is sealed with a plastic plug. Prise out the plug with a screwdriver and fit a new plug after making the adjustment.

- Turn the screw clockwise (in) to reduce the CO content.
- Turn the screw anti-clockwise (out) to increase the CO content.

Use an 8-mm socket.



Caution

Do not use uninsulated tools, as there is a risk of short-circuiting unprotected electrical connections on the alternator and starter motor.

After adjusting the CO value

1 Adjust the idling speed to 850 ± 50 r/min.

2 Adjust the fast idling speed (at normal temperature) to 1350 ± 50 r/min.

Fault tracing when CO reading too high

1 Check the calibration of the CO meter.

2 With the engine at idling speed, disconnect the crankcase ventilation hose. If a lower CO reading is now obtained, this will be because of fuel in the engine oil. Change the oil and read off the CO content again.

3 Adjust the basic setting by removing the vacuum piston (orpistons) and makingsurethat the needle shoulder is level with the bottom of the vacuum piston.

Before refitting the components, clean the piston and carburettor. Read off the CO content again.

4 Check the setting of the air preheater valve (see section 232).

5 Check that items 2 to 6 inclusive under "Before adjusting the CO setting" have been carried out correctly; if not, run through the procedure again.

Note
Do not take CO readings when the engine temperature is above normal, as this will result in faulty readings.

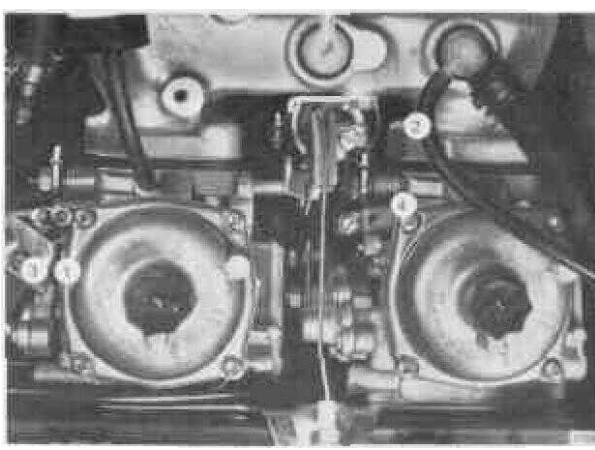
Adjusting screws (twin carburettors)

1 Vent valve, float chamber, front carburettor

The setting is fixed and adjustment is not normally necessary. In the event of any adjustment being made, this will affect the settings of adjusting screws 2, 3 and 4. These must therefore be readjusted in the given order.

2 Synchronizing the throttle valves

This is carried out in conjunction with checking the idling speed and CO-setting. Any adjustment will affect the settings of adjusting screws 3 and 4, which must also subsequently be readjusted in the given order.



Adjusting screws, 1983 models and earlier

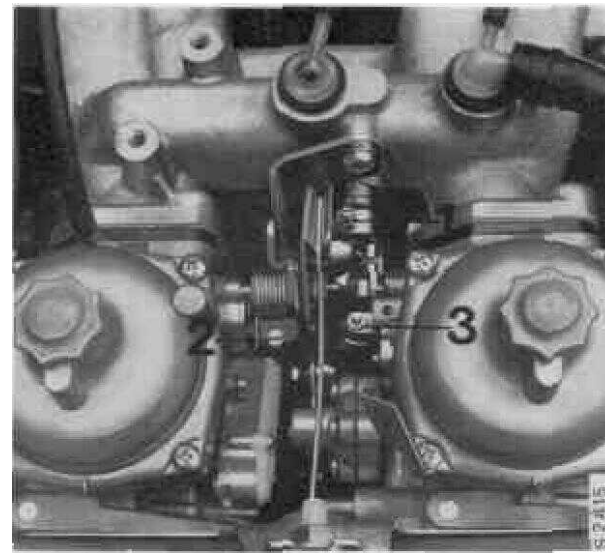
1 Vent valve, float chamber, front carburettor
2 Synchronizing the throttle valves
3 Idling setting
4 Vent valve, float chamber, rear carburettor

3 Idling setting

If any adjustment is made it wilt affect the setting of adjusting screw 4, which should also be checked.

4 Vent valve, float chamber, rear carburettor

Adjust if adjusting screw 1, 2 or 3 has been altered.



Europe specification cars as from 1984 models

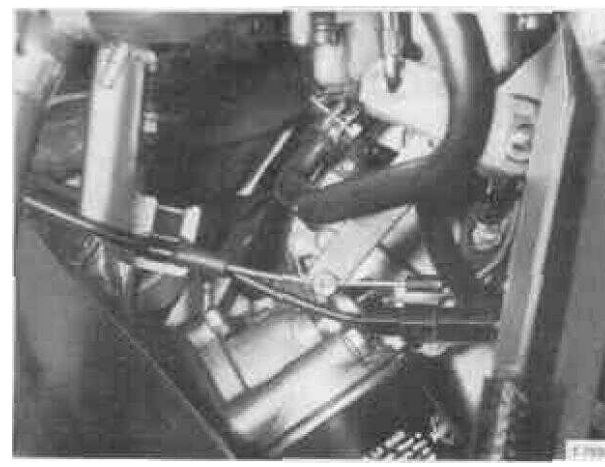
1 Synchronizing the throttle valves
2 Idling setting
3 Vent valve, float chamber, rear carburettor

Choke cable

Removal **of choke** cable, **earlier models**

1 Detach the choke cable and the sheath from thecarburettor(s). Note the run of the cable. Free the cable from the clips in the engine compartment.

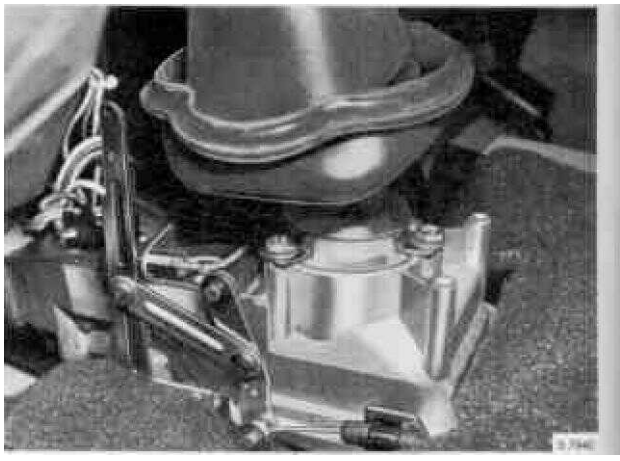
Note
The end of the cable is covered by a rubber protective piece to prevent injury to hands when working with the controls.



2 Loosen and lift up the gear lever cover and then disconnect the cable and sheath from the gear lever housing.

3 Withdraw the cable from the bulkhead grommet and then remove it.

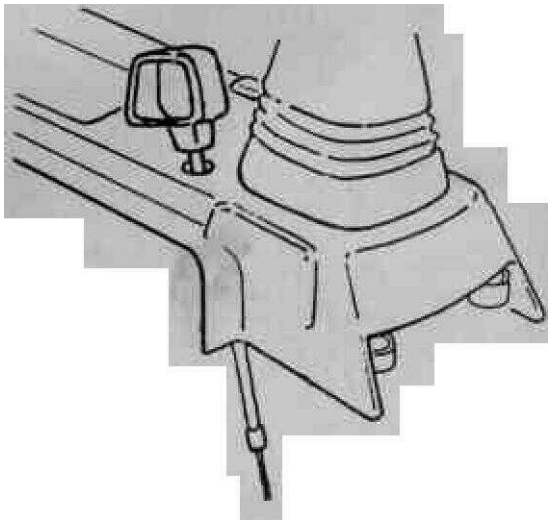
Refit in the reverse order.



Removal of choke cable, later models

1 Disconnect the cable and sheath at the carburettor {or carburettors). Note the cable run. Free the cable from its clips in the engine compartment.

2 Unscrew the choke control handle.

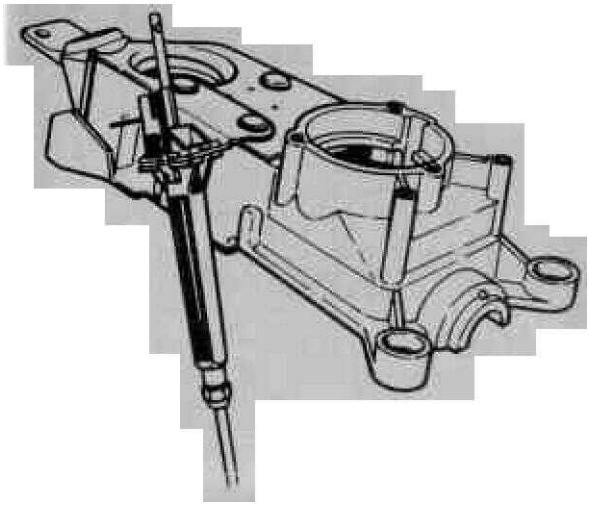


Choke control as from 1982 models.

3 Slacken the screws in the cover of the gear lever housing and raise it so that the cable and sheath can be disconnected from the housing.

4 Disconnect the wiring.

5 Free the cable atthe bulkhead grommet and withdraw it.



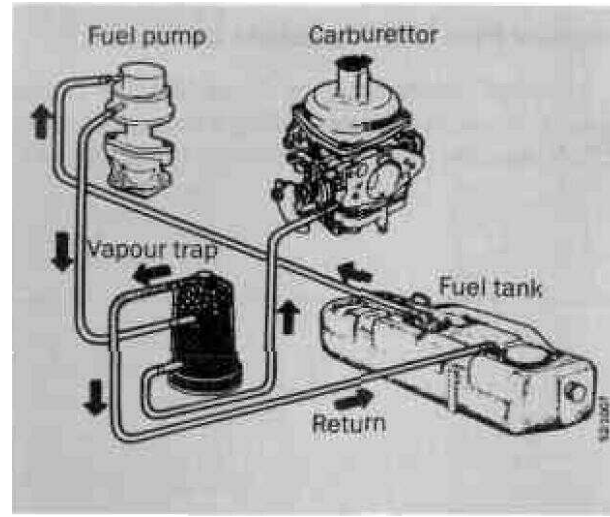
Refit in the reverse order.

Vapour trap

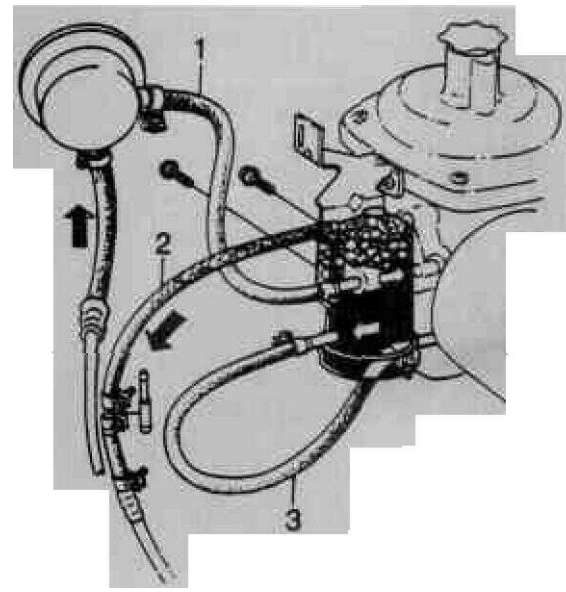
Vappor trap 1986

Because of the increasing proportion of volatile substances in the fuel, there is now a greater likelihood of vapour locks occurring in the fuel system, resulting in erratic performance of the engine immediately after starting and at high ambient temperatures.

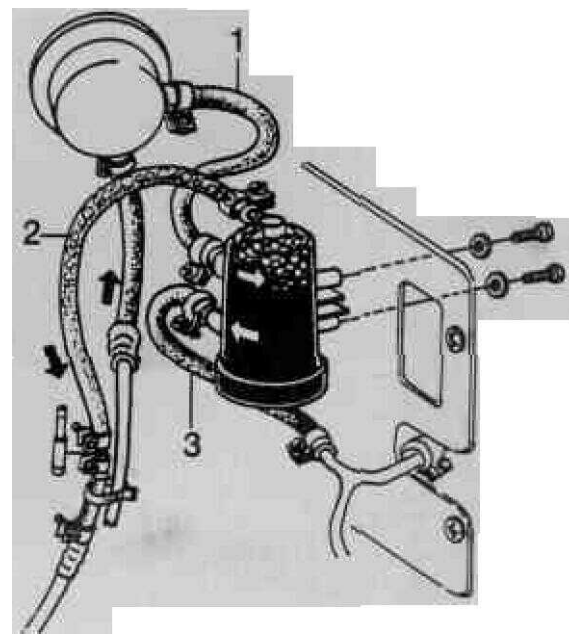
To overcome this problem, a vapour trap has been fitted in the line between the fuel pump and carburettor. Any bubbles in the fuel rise to the top of the vapour trap and then flow through a return line back to the fuel tank.



Operating principle of vapour trap



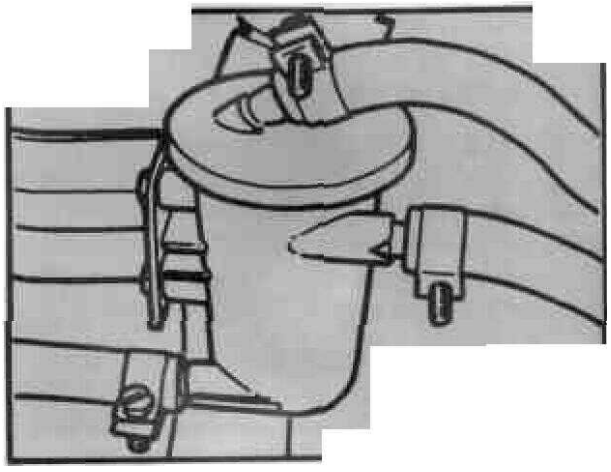
Single carburettors



Twin carburettors

Vapour trap 1987 models onwards

A modified vapour trap, on which the fuel outlet is on the opposite side, is fitted to cars as from 1987 models.



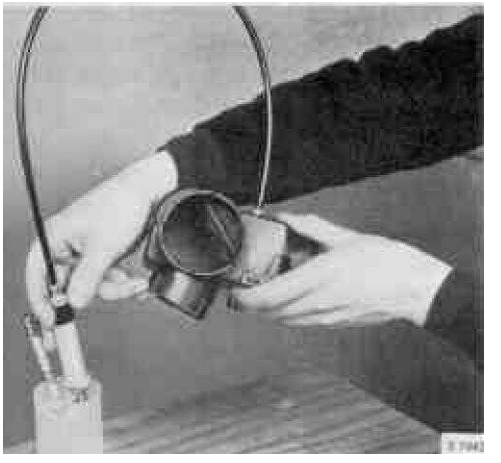
Induction system

Checking the preheater butterfly (-1985) 232-1
Checking the preheating system (1986-) 232-3
Changing the bimetallic valve 232-3

Checking the preheater butterfly (-1985)

A rough check of the valve operation can be made by noting its movement when the cold air intake is removed.

A more accurate check can be made by removing the valve body with the cable and the thermostat and immersing it in hot or cold water and checking the position of the valve from the figures below.



23°C (73°F) - preheated air only
37°C(99°F)-cold air only

Note
When performing this check the cable should adopt approximately the same position as it has in the car.

Checking the fit of the thermostat

A check should be made of the fit of the thermostat in all 1982 model cars with single or twin carburettors and 1983 model cars with chassis nos. up to and including AD 1013633, AD 20 05225 and AD 60 01036.

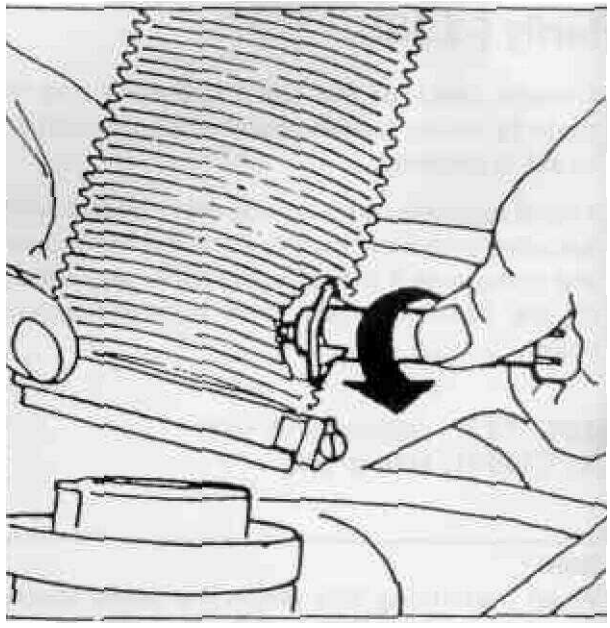
If the thermostat body can be rotated easily by hand, adjust it so that the distance between the plastic sleeve and the thermostat body is 9± 1mm (0.35 ±0.04 in). Lock the thread with Loctite IS496, Saab part nr. 83 43 808.

Even if no adjustment is made to the thermostat, apply Loctite to the thread.

Note
After the valve and thermostat have been adjusted, check the carburet tor setting.

To fit

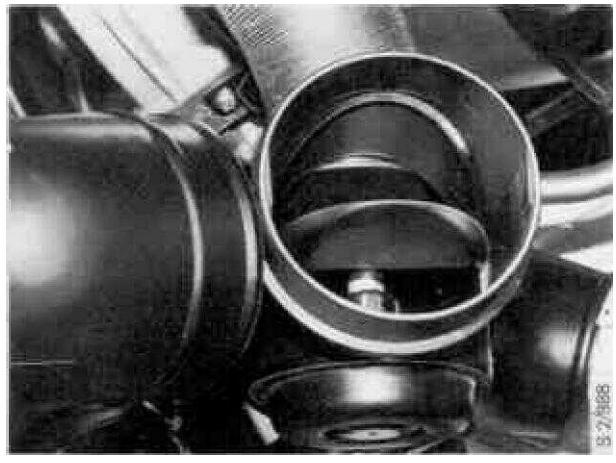
Fit the thermostat first. Check that the valve closes the cold air intake at 20°C (68°F). If the valve is open, slacken the plastic nut for the cable sheath and turn it through 180°, in the direction it will go, to select a new position for fitting. This changes the direction in which the cable-tension acts, exerting a force on the valve in the direction of the cold air intake.



Note
When fitting a new preheater valve body assembly, make sure that the thermostat is securely fitted.

Checking the preheating system (1986 models onwards)

1 Detach the preheater valve body from the air cleaner so that the butterfly can be observed.



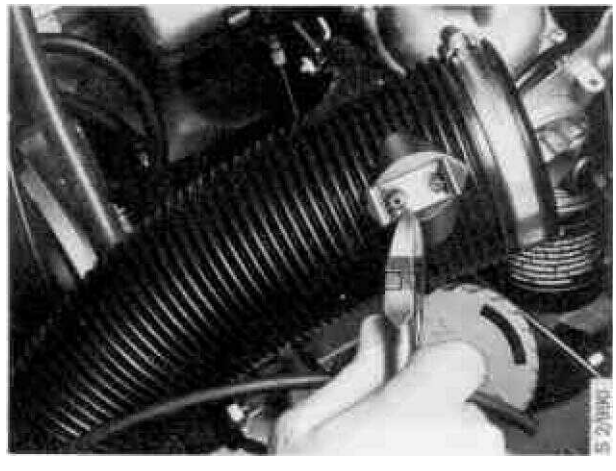
2 Detach the air intake hose from the carburettor to expose the bimetallic valve.

3 Start the engine and allow air at a minimum temperature of 30°C (86°F) to be drawn through the bimetallic valve. Observe the butterfly and check that it closes the port for preheated air. Next allow air at a temperature below 20°C (68°F) to be drawn in through the bimetallic valve and this time make sure that the butterfly closes the cold-air port.

To change the bimetallic valve

1 Detach the vacuum lines from the underside of the air intake hose at the carburettor.

2 Snip off the retaining clip for the bimetallic valve and remove the valve from the hose.



Note
When fitting a new valve, always use a new clip.

Fuel system

Removal	233-1	Cleaning the fuel filter	233-2
Refitting	233-1		

To remove

Disconnect the fuel hoses from the pump. Remove the fixing bolts and washers, and then remove the pump and gasket. The pump cannot be dismantled and consequently cannot be overhauled in the event of damage to the diaphragm or valves; the entire unit must then be replaced.

Up to and including engine no. D052892:

The filter can be removed for cleaning or replacement with the pump in situ.

Remove the cover retaining screw and lift off the cover.

To refit

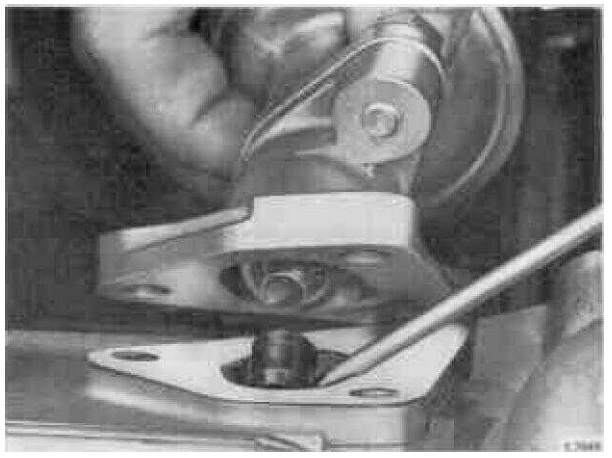
Always fit a new gasket. If the fuel pump has been removed with the valve cover in situ, refitas follows.

1 Fit together the pump body and adaptor.

2 Apply sealant to the cylinder head flange and then fit a new gasket.

3 Guide the push-rod into the groove in the camshaft. Twist the push-rod to ensure that is has engaged in the groove.

4 Use a small screwdriver to hold the push-rod in position and guide the end of the pump link rod into the collar of the push-rod.



Press the pump against the flange and hold it there while fitting and tightening the three fixing bolts.

Cleaning the filter

Remove the screw in the centre of the pump cover, liftoff the cover and remove the filter and seal. Clean the filter and cover.

Reassemble.

As from engine no. D052893, the filter is an integral part of the fuel pump and therefore cannot be dismantled for cleaning.

Fuel tank and fuel lines

Removal of tank	234-1	Replacing fuel lines inside car	234-4
Refitting of tank	234-2	Fuel gauge sender unit	234-5
Fuel lines	234-3	Replacing the roll-over valve	234-6

Fuel tank

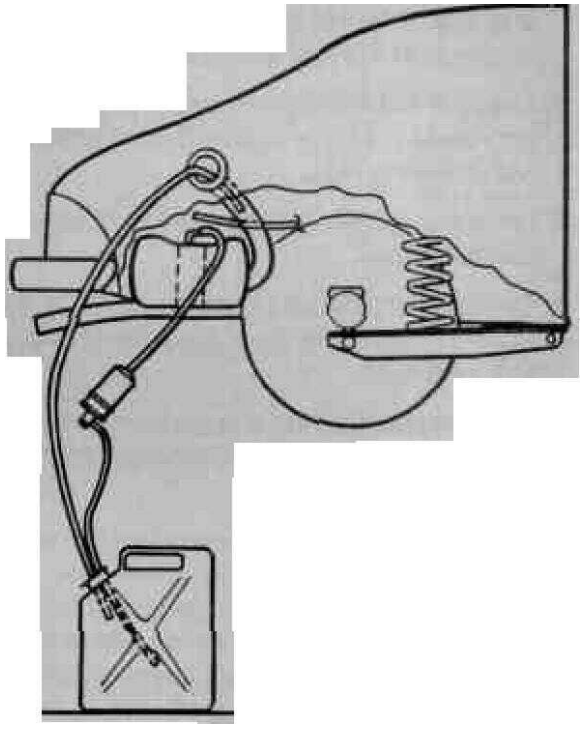
To remove

1 Disconnect the earth lead from the battery.

2 Jack up the rear of the car.

3 Drain the fuel tank. To prevent the emission of hydrocarbons into the workshop, drain the tank by means of a closed system.

Connect an electric fuel pump (designed for injection engines) to the inlet line of the fuel tank and pump the fuel through a hose into a container. The work should be done with the car jacked up.



4 Remove the rear floor panel in the luggage compartment.

5 Remove the fuel gauge sender unit plate.

6 Disconnect all electrical connections from the tank.

7 Disconnect the filler pipe and ventilation hoses from the fuel pump.

Disconnect the fuel line from the tank.

8 Remove the securing strap nuts under the tank.

9 Lower the tank.

To fit

Check that the rubber seals are undamaged and that they are correctly fitted round the opening for the fuel gauge sender unit.

2 Check that the straps are properly mounted, and cover the filler and vent hose openings with masking tape.

3 Lift the tank into position and suspend it in the two straps.

4 Centre the tank and tighten the nuts. Remove the masking tape from the filler pipe and vent hose.

5 Connect the fuel line and the hose to the filler pipe. Make sure that the rubber grommet is in place.

6 Connect the vent hoses between the upper filler pipe section and top of the tank. Connect the cables to the fuel gauge sender unit and replace the access panel. Replace the floor panel and rear floor cover in the luggage compartment.

7 Lower the rear of the car.

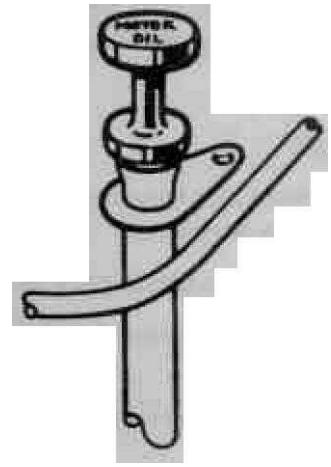
8 Connect the battery earth lead.

Fuel pipes

Fuel pipe runs

Fuel pipes should not come into contact with any object that could result in wear through chafing. **The risk of wear from chafing is particularly great from contact with plastic components** subjected to engine vibrations (e.g. other fuel pipes, the dipstick pipe, throttle cable, etc.).

It is therefore of special importance when working in the engine compartment that all fuel pipes are run clear of such equipment. Sheath the pipes with PVC sleeves if contact is unavoidable.



Checking fuel pipes

Follow the pipes and check to see if there is any evidence of wear through chafing.

Special care should be taken when checking pipes that touch or are run near plastic components.

Re-route the pipes and fit PVC sleeves if chafing is detected. If the wear is greater than half of the thickness of the pipe wall then the fuel pipe should be replaced.

Checking pipe connections

Check fuel pipe connections for leaks.

Replacing fuel lines inside the car

The fuel line from the tank to the engine compartment runs through the passenger compartment along the left-hand sill beam.

To remove

1. Remove the kick plate and turn back the carpet from the sill beam.
2. Remove the tape holding the fuel line.
3. Remove the insulation felt from the bulkhead.
4. Disconnect the fuel line in the engine compartment.

   Disconnect the connection at the fuel pump.
5. Undo the clip and disconnect the fuel line from the fuel tank.

To fit

1. Clean the fuel line by blowing through with compressed air. Close the ends with masking tape.
2. Push the fuel line through the hole in the bulkhead and the spring link bracket and connect the line in the engine compartment.
3. Insert the rubber grommets in the hole in the bulkhead panel and in the front hole in the spring link bracket.
4. Push the fuel line into position and connect it at the rear where it passes through the body. Secure the line with tape in two places along the sill beam.
5. Fit the insulation felt to the bulkhead panel. Replace the carpet and kick plate.