THE WEBER 32DIR CARBURETTOR
As used on Volvo 300 series cars with The B14 engine.

GENERAL WARNING

BEFORE CARRYING OUT WORK IN THE UNDERBONNET AREA INVOLVING THE FUEL SYSTEM

DISCONNECT THE BATTERY

IF RELEVANT MAKE SURE YOU HAVE NOTED
ANY RADIO SECURITY CODES

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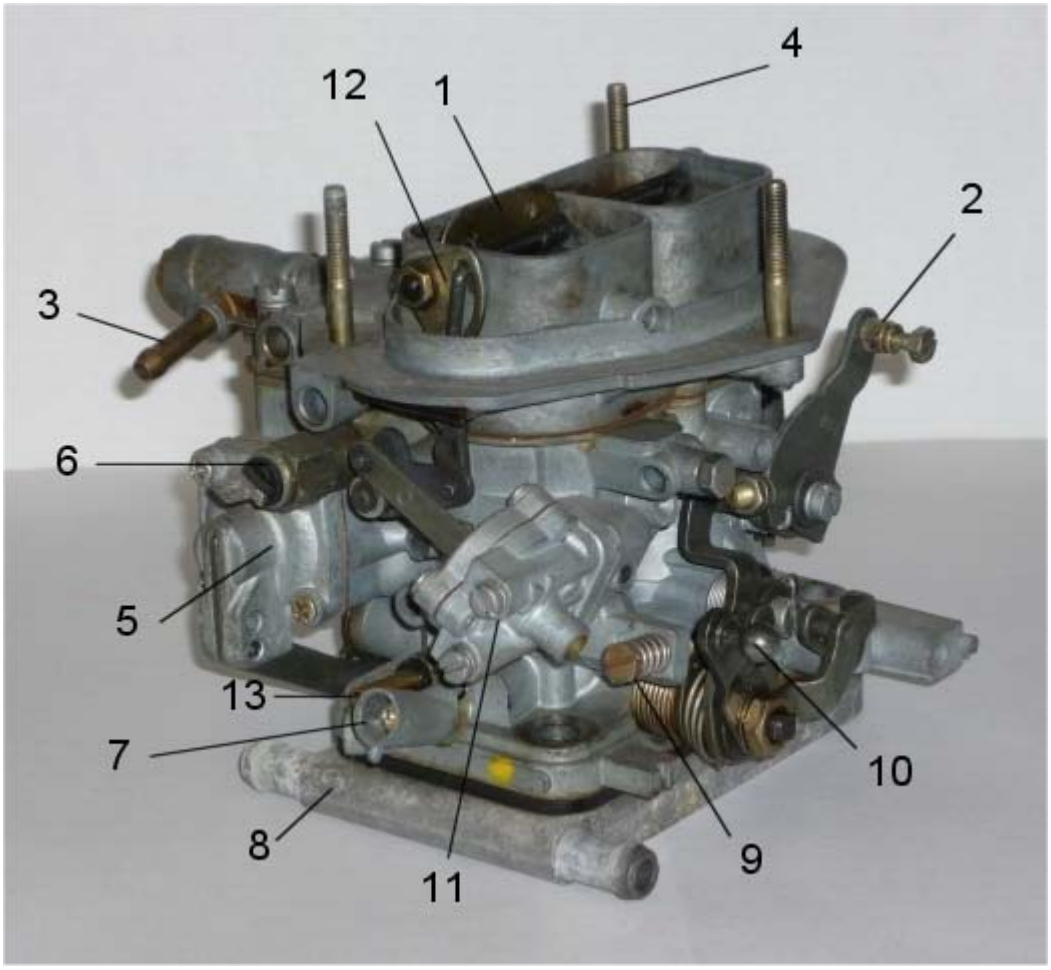
THE WEBER 32DIR CARBURETTOR

(As used on the Volvo 300 series with the B14 engine)

The fueling needs of the B14 engine fitted to Volvo 300 models in the UK has, since the beginning of production in 1976, been served by various versions of the Weber 32DIR carburettor.

For this guide I shall concentrate on the 32DIR 100-104 as fitted to B14.4E engines in ‘84’ and ‘85’ year models. The 32DIR 109 used from ‘86’ until production ceased in ‘91’ is much the same, differing only in the fitment of a switch (part of a fuel shutoff device to control the idle solenoid).



1. Choke flap.
2. Choke lever.
3. Fuel inlet pipe.
4. Air cleaner housing stud.
5. Accellerator pump.
6. Idle valve.
7. Idle mixture screw.
8. Pre-heating flange.
9. Idle speed adjustment.
10. Throttle lever.
11. Choke pull-off device.
12. Choke pull-off linkage.
13. Vacuum connection for Renix.

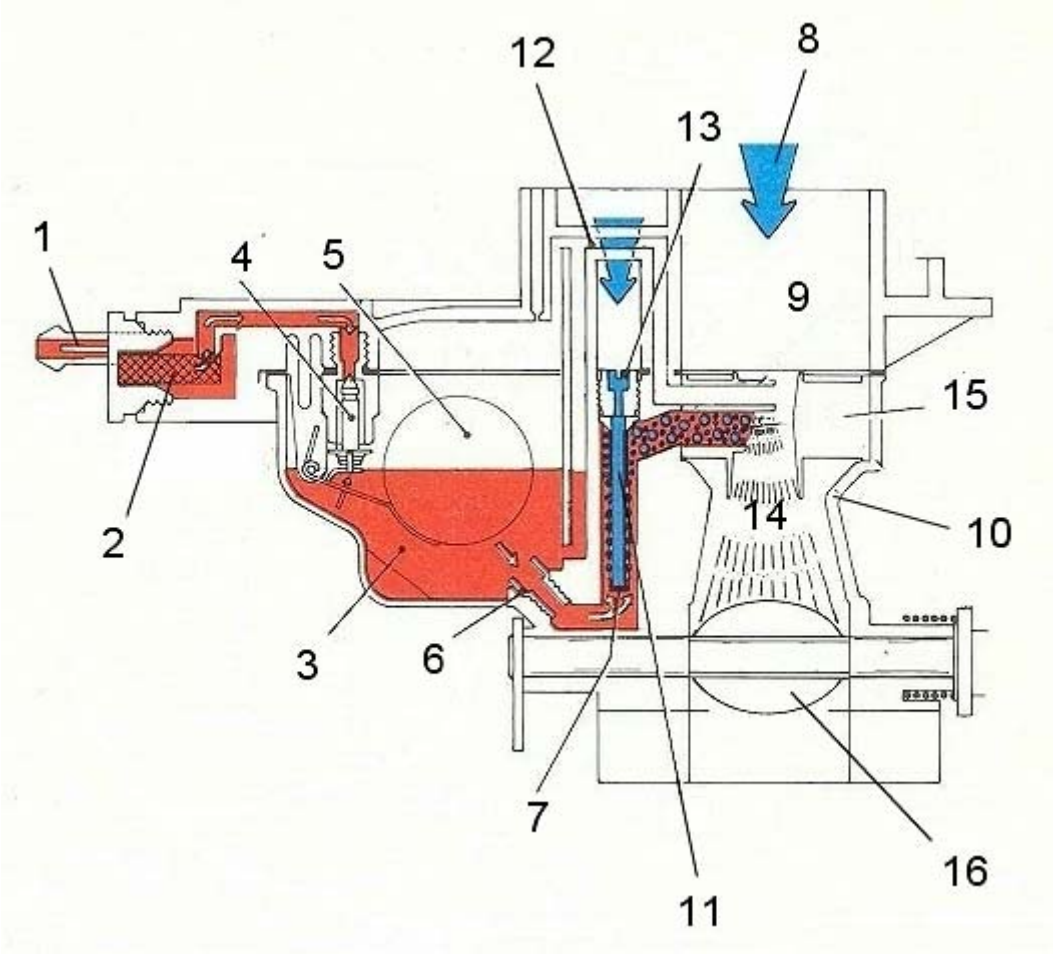
14. Choke push-on lever.
15. Float chamber vent link.
16. Vent cap.
17. Full load enrichment device,
18. Fuel filter housing.
19. Secondary idle mixture jet.
20. Primary choke (venturi). .
21. Secondary choke (venturi).
22. Vacuum connection for crankcase breather.

The 32DIR is a fixed jet, downdraft, carburettor with two barrels (more correctly called chokes) with the primary choke having a mechanically operated choke flap. The throttle discs open differentially (ie.the secondary barrel throttle disc begins to open only after the primary disc has reached the approximately three-quarter open position) This is also known as progressive opening.

The 32DIR is equipped with a water heated baseplate connected to the vehicle cooling system.

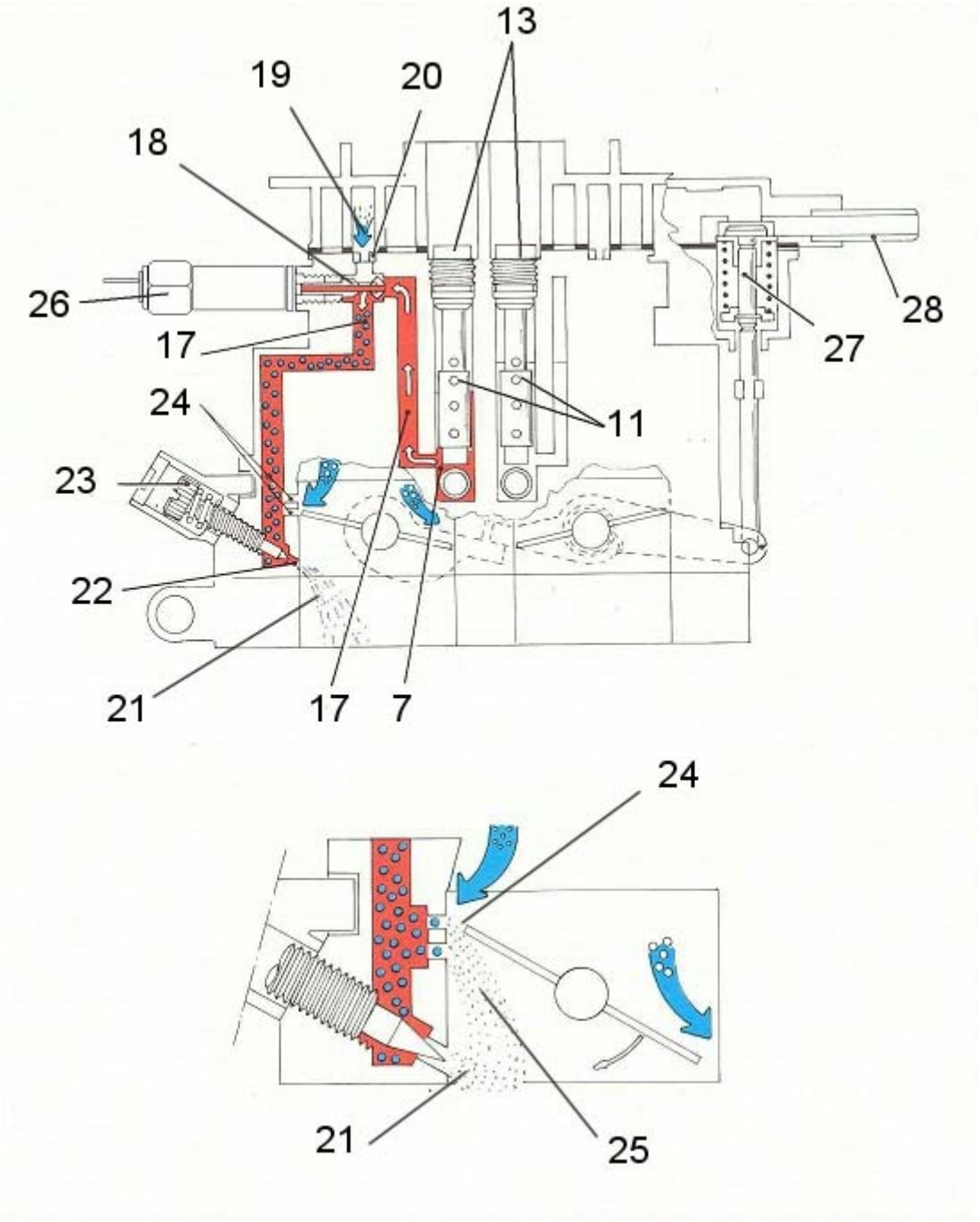
Depending on the version the 32DIR is also equipped with various full load or high speed enrichment systems and will have one of two idle control types (constant CO, or as is the case with the 57, 100 or 109, so called limited CO).

Basic Principles of Operation



The condition above illustrates a state of part throttle cruise.

Each choke (barrel) has a similar system of main jet, emulsion tube and air correction jet with fuel, air and mixture flows determined by the sizes of the jets. Fuel is supplied to the inlet pipe (1) and passes through a filter (2) into the float chamber (3) by way of the needle valve (4). The float (5) controls the needle valve and hence the level of fuel in the float chamber. From the float chamber fuel flows through the main jets (6) into the primary wells (7). Airflow (8) into the chokes (9) creates a low pressure zone below the choke venturi (10) which draws fuel up past the emulsion tubes (11) which mixes the fuel with air (12) drawn down through the air correction jets (13). The resultant mixture (14) enters the choke via the auxiliary choke (15) (also known as the auxiliary or secondary venturi) and into the engine past the throttle disc (16).



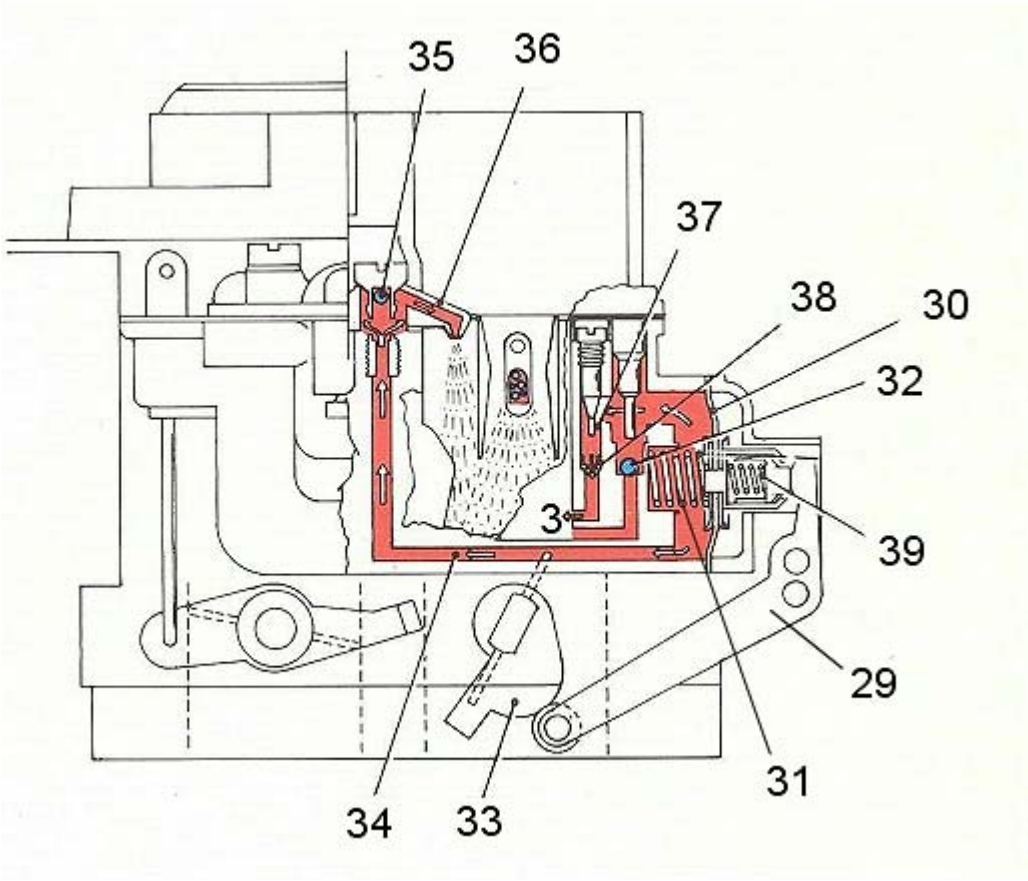
Idling takes place on the primary choke only. With both throttle discs closed the engine creates a low pressure zone below the discs and in the idle passages (17). Fuel is drawn from the primary well (7) and past the idle mixture jet (18). Air (19) is drawn down through the orifice (20) and mixes with the fuel. The mixture (21) is drawn out into the engine from opening (22) which is regulated by mixture screw (23). As the throttle is opened the progression ports (24) are sequentially opened allowing extra mixture to enter the engine. This gives a smooth progression from idle to part throttle conditions. The 32DIR has idle circuits in both barrels (to smooth progression to secondary throttle opening) but in versions prior to 104 and 109 the secondary mixture jet has been replaced with a blind jet (to seal the circuit).

When the engine is switched off the electrically operated solenoid valve (26) seals the idle mixture jet (18) to prevent “running on”.

At idle, ambient pressure is maintained in the float chamber through vent valve (27) and vent (28). As the throttle is opened the vent valve closes. Venting of the float chamber at idle prevents fumes being drawn into the venturi and affecting the idle mixture.

The idle system described here is the so called “limited CO” type. “Constant CO” systems as used on most 32DIRs prior to the 1984 year models (versions 83 and 93) have an additional air bleed screw which is used to adjust the idle speed (adjusted by a throttle stop screw on versions 57, 104 and 109).

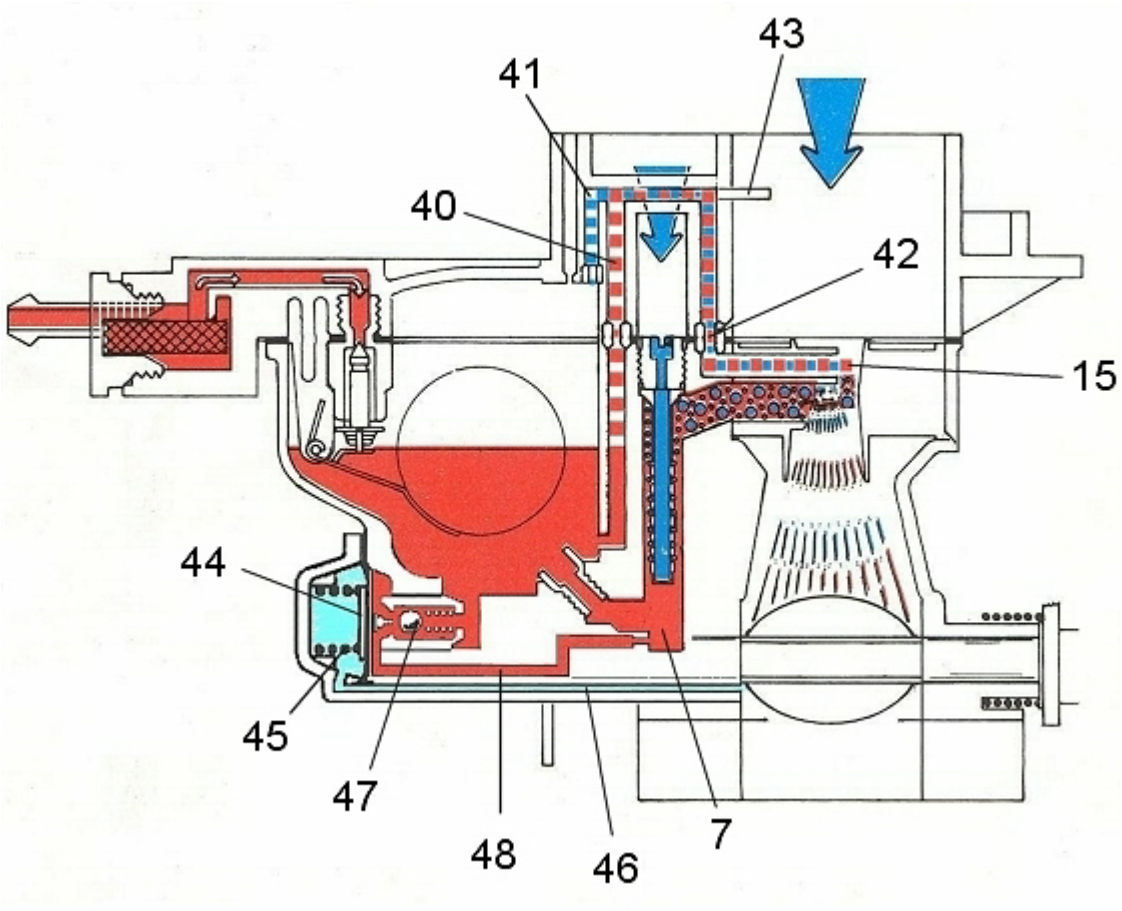
In addition to the conditions above a carburettor must also cope with acceleration and high load with both high and low air flow. These are met by differing mixture enrichment devices - the first being the accelerator pump.



When the throttle is closed the accelerator pump is charged with fuel. On closed throttle the actuating lever (29) is in the relaxed position. The pump diaphragm (30) is pushed outwards by spring (31). This causes fuel to be sucked out of the float chamber (not shown but represented by (3)) through the non return valve (32) and into the pump. Opening the throttle causes the cam (33) to move the lever (29) which pivots against the diaphragm pushing it inwards (against spring (31)). This

injects fuel into the primary choke via passage (34), non return valve (35) and spray jet (36). Excess fuel from the pump is returned to the float chamber by a passage containing a calibrating screw (37) (not 93,104 & 109) and orifice (38). Abrupt opening of the throttle will compress spring (39), the function of which is to extend the injection period after full throttle is reached which it does by overcoming spring (31) moving the diaphragm further inwards than is achievable by the lever alone.

Under conditions of high load and high airflow a further enrichment system operates.

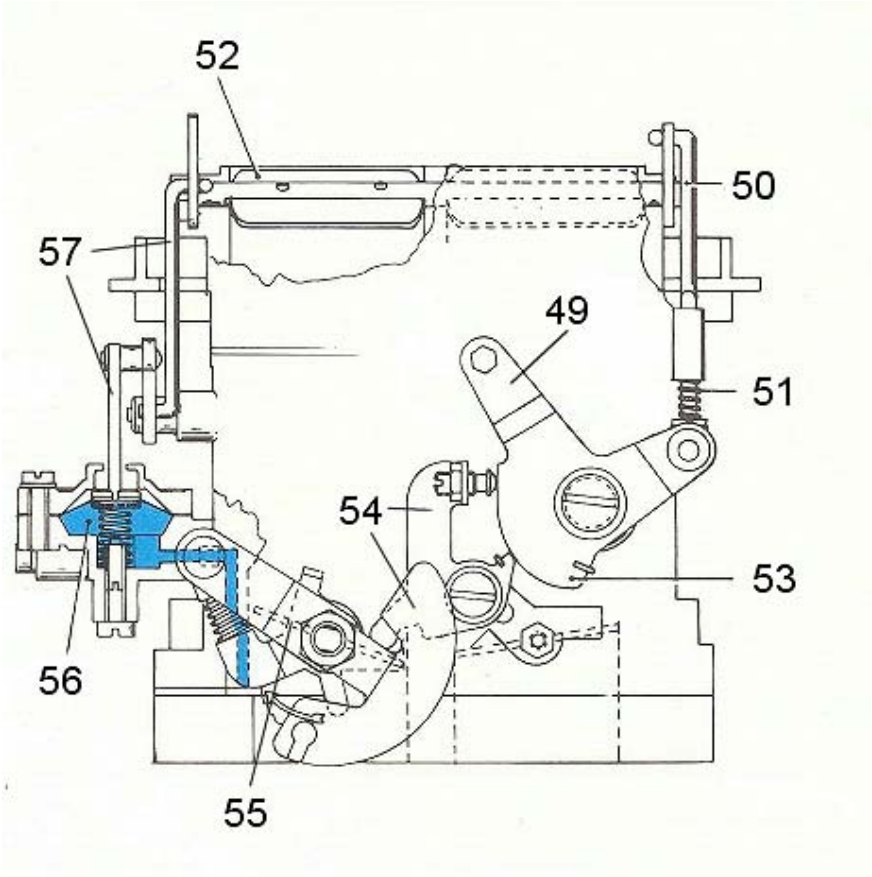


Fuel is drawn directly from the float chamber up passage (40). Air is drawn through passage (41). The resultant mixture passes through jet (42) and enters the choke by way of the auxiliary venturi (15). This system operates purely by the speed of airflow through the choke and in the 32DIR 104 and 109 takes place only in the primary barrel only. In earlier carb versions 57,83, and 93 the enrichment occurs in the secondary barrel only. In type 57 the enrichment is delivered by a jet (43) rather than by the auxiliary venturi.

32DIR versions 104 and 109 have, in addition, a further enrichment system which is designed to operate under high load, but low airspeed conditions. Under normal driving conditions the lowered pressure below the throttle discs (engine vacuum) is sufficient to hold diaphragm (44) outwards, compressing spring (45). This vacuum is sourced from the primary barrel by passage (46). This allows ball valve (47) to

remain shut. A sudden opening of the throttle at low speed greatly reduces the vacuum (pressure rises towards ambient) which allows the spring (45) to push the diaphragm inwards and open the ball valve (by a “pin” on the diaphragm). This admits extra fuel to passage (48) which connects to the primary well (7).

To enable cold starting the carburettor must deliver a mixture very rich in petrol. This is accomplished by restricting the airflow by means of a flap at the top of the primary barrel (early versions 57 and 83 are equipped with a flap in the secondary barrel also).



Lever (49) is operated by the dashboard control by a bowden cable (a solid not a flexible wire). Pulling the choke cable outwards rotates the lever which moves the rod (50) upwards and closes the choke flap (52) (also known as a strangler valve). In addition the lever (49) is equipped with a cam (53) which by way of linkages (54) causes the primary throttle disc (55) to open slightly (this is to give an increased idle speed during cold start conditions). To ensure that the engine still receives sufficient air a pneumatic choke pull off servo is fitted. After starting the vacuum developed below the primary throttle disc acts on servo (56) which by way of linkages (57) partially open the choke flap, the movement being accomodated by compression of the spring (51).

32DIR Versions used on the UK market

Year models ‘76’ & ‘77’ Engine B14.0E 32DIR 57 - 8400
Has choke flaps in both barrels and remote air cleaner with pipe to carb top. Has throttle position sensing microswitch to control CVT. Constant CO system.

Year model ‘78’ Engine B14.0E 32DIR 57 - 8401
Double choke flaps, remote air cleaner, microswitch discontinued in favour of tachometric relay CVT control, constant CO system.

Year models ‘79’ & ‘80’ Engine B14.1E 32DIR 83 - 100
Double choke flaps, remote air cleaner, constant CO system.

Year model ‘81’, Engine B14.2E 32DIR 93 - 100
Double choke flaps, constant CO system. Carb top changed to allow air cleaner housing to be directly fixed to carb by 3 studs/nuts.

Year models ‘82’ & ‘83’ Engine B14.2E 32DIR 93 - 101
May have double choke flaps or one on primary barrel only, direct air cleaner, constant CO system.

Year models ‘84’ & ‘85’ Engine B14.4E 32DIR 104 - 100
Single choke flap, direct air cleaner. Has additional full load enrichment and a ‘limited’ CO system.

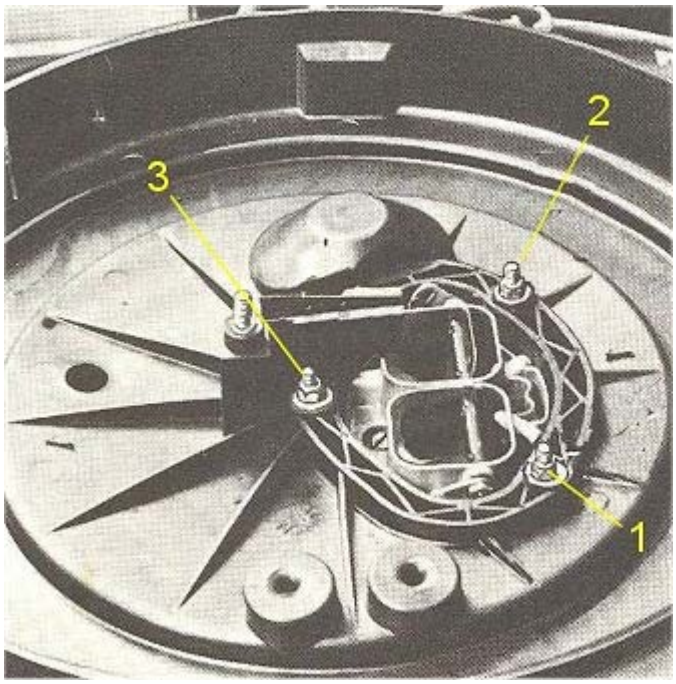
Year models ‘86’ & newer Engine B14.4E 32DIR 109 - 100
Single choke flap, direct air cleaner, full load enrichment, limited CO system. Closed throttle sensing switch added to signal fuel shut off system.

Removal of a 32DIR 104 - 100 from a 1984 year model 340

Undo the air cleaner housing lid centre nut and release the overcentre clips.

Lift off the lid and take out the air cleaner element. If the element is dirty discard it and replace with a new one on re-assembly.

Remove the three nuts securing the air cleaner housing to the top of the carburettor (1), (2) & (3).



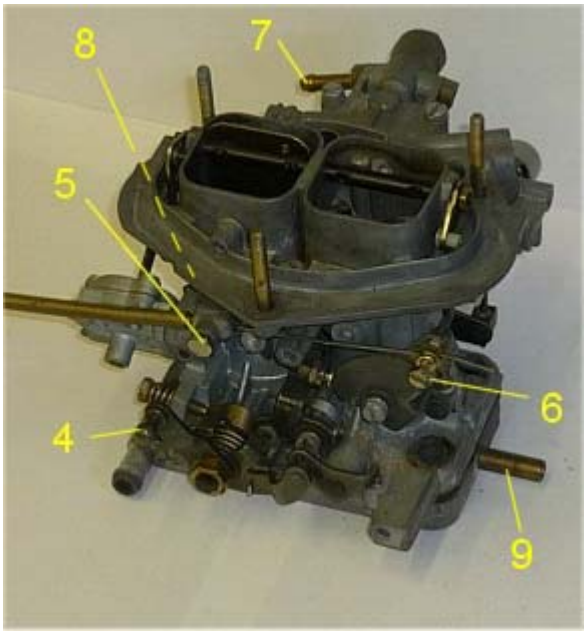
Make sure that that the nuts do not fall into the open chokes.

Early versions of the air cleaner housing had an additional mounting from the rim to the engines rocker cover.

Pull off the corrugated pre-heat pipe from the exhaust manifold heat shield.

Disconnect the engine breather hose from the base of the housing to the rocker cover taking great care of the plastic 'T' piece as this becomes very brittle with age.

Lift away the air cleaner housing and recover the gasket that fits between it and the carburettor top.



Disconnect the throttle linkage rod at the ball joint (4) (pulls off).

Loosen the choke cable clamping screws (5), for the outer cable and (6) for the inner cable.

Disconnect (and plug) the fuel supply pipe from the inlet (7).

Pull off the vacuum pipe for the Renix unit (8) - connection not visible in this picture.

Pull off the engine breather pipe from connection (9).

Clamp off the coolant hoses that run to the water heated carburettor base plate and disconnect them at the plate (also called pre-heating flange).

Disconnect the wiring from the idle solenoid valve, and, on later 32DIR 109 - 100 versions, the wiring from the throttle adjustment screw switch. (the idle solenoid wire is Blue/Red and the throttle switch is Black).

Loosen and remove the four nuts and washers that secure the carburettor to the inlet manifold. Lift off the carburettor.

Between the carburettors water heated base plate and the manifold is a plastic insulating block (which will either remain stuck to the pre-heat flange or to the manifold). Remove it. It will be one of two types either a plastic plate with separate gaskets, or with gaskets bonded on.

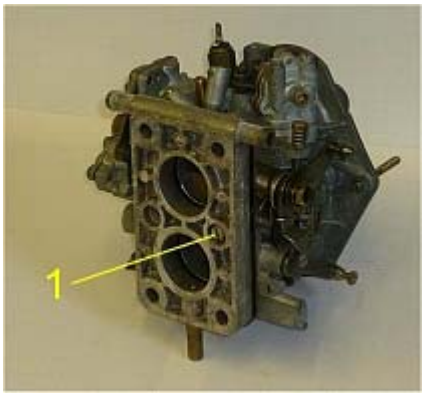
The picture above shows the two possible types of insulating block between the inlet manifold and the carburettors pre-heating baseplate.

Remove any traces of old gasket from the mounting face on the manifold and cover, or plug the open hole with eg. clean rag to prevent the entry of dirt or debris prior to re-installing the carburettor.

Dismantling, Inspection and Re-assembly of a 32DIR 104-100 (also applies to a type 109-100).

Before any dismantling takes place the carburettor should be visually examined for broken parts, cracks, or any other obvious damage. There is no benefit in expending time on a unit that cannot be economically repaired.

Remove the pre-heat flange which is secured to the base of the carburettor by a slot headed setscrew (1).



Between the flange and the carburettor will be found a second insulating block with gaskets on either side. As with the block between the flange and the manifold these gaskets may be separate or bonded to the block but in almost all cases the block will have bonded gaskets.

This picture shows the pre-heat flange and the upper insulating block.

The base of the carburettor should be examined for any distortion and whilst major problems are not common in this area (unlike the Solex Z10 on B172K engines) warpage is by no means unknown. Use a straight edge and feeler gauges to determine the condition of the base.

If the degree of warpage is minor, say no more than 0.2mm along the length of the base, it should be perfectly possible to “dress” the base flat using a suitable block of wood and 320grit “wet n’ dry”. A piece of thick plywood 150mm x 60mm would be ideal. I would suggest using White Spirit as a lubricant.

The carburettor top and the three air cleaner mounting studs should be examined for distortion or damaged threads. It is common to find loose studs or failed studs replaced with nuts and bolts. If this is found, consideration should be given to repair of the carburetter top using proprietary thread inserts (“Helicoils” or similar).

Assuming that no major damage has been found and the base is serviceable the carburettor should now be cleaned as much as is possible. Professional unit reconditioners would use a chemical cleaning tank but I have found that much of the muck, oil and petrol residues may be removed by using White Spirit. Use a suitable tray (my wife has yet to find her baking tray) and a selection of paint brushes.

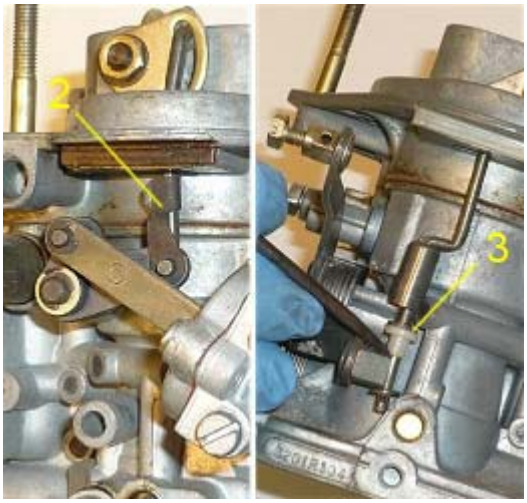
I do not recommend washing the carburettor with petrol - as is suggested in some well known workshop guides. It really can be too dangerous!!

Stubborn residues can be tackled with an appropriate carburettor cleaning spray from a motor factors or car accessory shop.

Blow the carburettor dry. Ideally you should have access to a compressed air line and blow gun but you can get by using a compressed gas aerosol spray.

Before dismantling begins prepare a clean working area and have available some means of separating various parts ie:- a number of small trays in which sub assembly parts can be kept together.

Remove the tubular fuel filter from behind the brass plug (14mm).

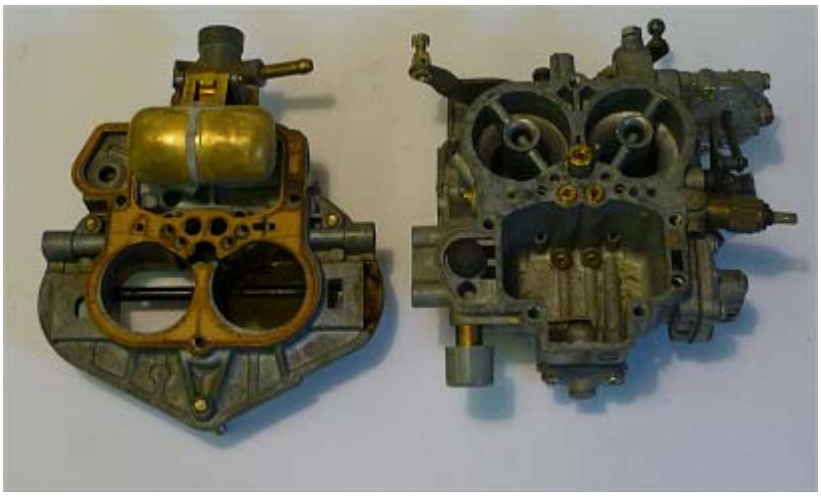


Remove the spring clip (2) from the choke pull off diaphragm linkage rod and detach the rod from the pivot lever.

Detach the mechanical choke operating rod by lifting the white nylon locking sleeve (3) against spring pressure and moving it sideways out of the choke cam lever.

Remove both choke rods, noting carefully the positions of the various ‘R’ clips, washers and plastic bushes.

Remove the plastic endcaps and plate seals through which the choke rods pass.



Unscrew the five slot headed set screws that secure the carburettor top to the body. Lift the top away vertically and lay it down. It will come away with the float and needle valve assembly

Remove the float pivot spindle and lift the float away with the needle valve (it will be hooked over a tag on the float) Note how it fits.

Remove the needle valve holder (10mm).

Lift off the old top to body gasket.

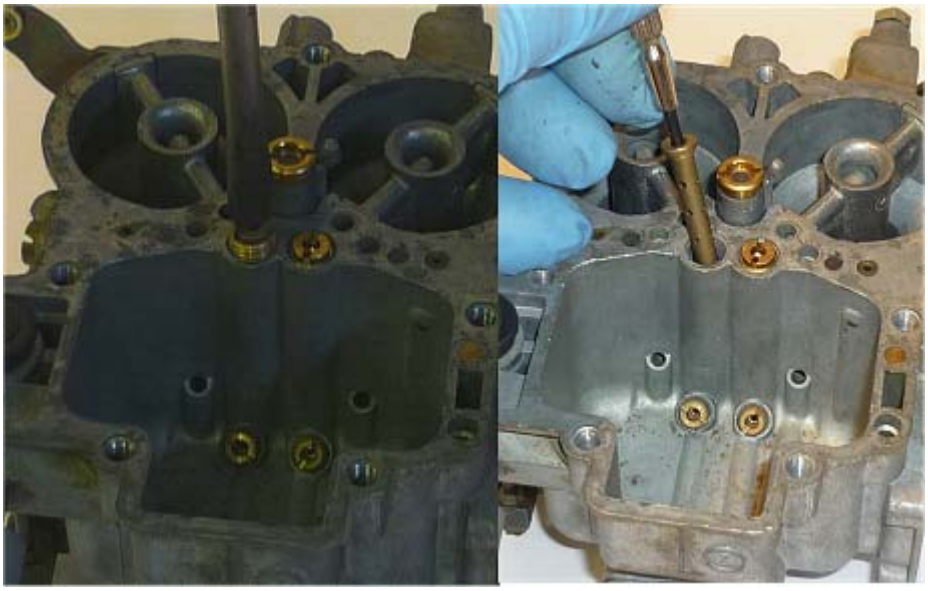
Remove the four set screws securing the accelerator pump cover and take out the pump diaphragm amd spring.

Note their positions for reassembly.

Check that the pump lever moves freely.

Remove the idle solenoid with the primary barrel idle jet.
Note the sealing washer.

Remove the second choke idle jet.



Remove both air correction jets, emulsion tubes, and main jets.
Note the emulsion tubes are a sliding fit in the body.

Keep the primary choke jets separate from the secondary choke jets.

Unscrew and lift out the accelerator pump jet and one way valve.

Note the copper sealing washers.

Remove the idle mixture screw and its spring.

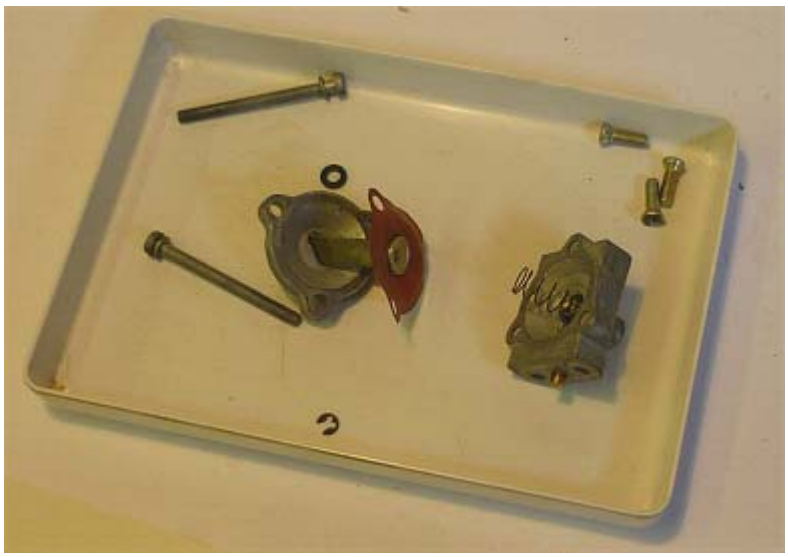
Remove the auxilliary venturii by pulling them upwards (they are held in by a spring arrangement in their outer ends).

Ensure they do not become mixed up.

Remove the circlip (4) from the pneumatic choke diaphragm rod and free it from the pivot linkage.

Remove the securing screws and pull away the diaphragm housing.

Note the sealing ‘O’ ring where the housing fits to the body.



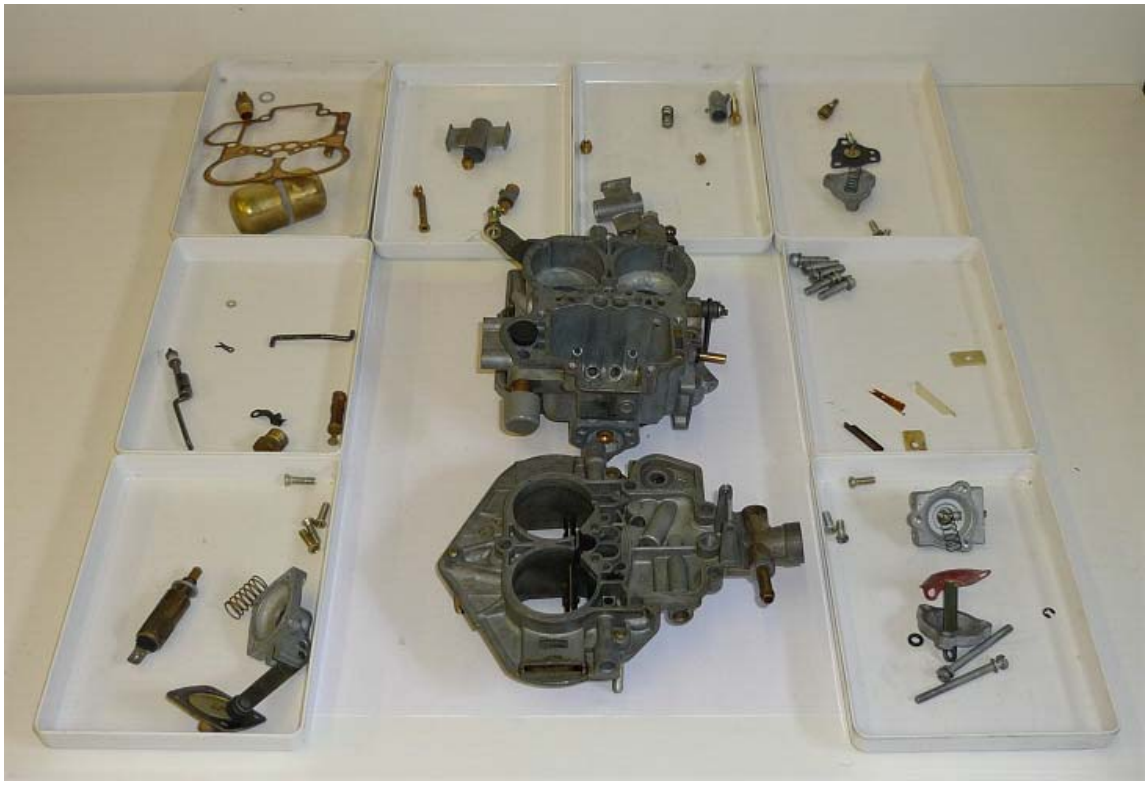
Mark the two halves of the diaphragm housing to ensure re-assembly is correct and remove the three set screws. Take out the diaphragm and spring.

Note their positioning.

Mark the housing of the low speed enrichment device and the carburettor body to ensure correct re-assembly and remove the three setscrews. Remove the housing and spring.

Take out the diaphragm, noting its correct orientation.

The carburettor should now be in the state shown below.



For a general clean up and overhaul it should not normally be necessary to dismantle the carburettor further. Unless there is a definite problem, the throttle linkages and return springs should be left alone. Limit your attention to cleaning and lubricating with a light machine oil. The 32DIR does not have a history of spindle and bush wear.

Using an air line and blowgun (or an aerosol of compressed air) blow through all the various passages and ports in the carburettor. Blow also through the various jets. Remember the primary idle mixture jet on the end of the idle solenoid.

If you have all your spare parts ready you should now be ready for re-assembly. As a matter of course, on re-assembly, all gaskets and seals should be replaced together with the accelerator pump, pneumatic choke pull-off and low speed enrichment diaphragms and the float needle valve. Volvo produced a comprehensive rebuild kit under part no. 3342570 which was NLA the last time I enquired.

For this guide I am using a “Webcon” rebuild kit part no. 9301010500 which covers the 32DIR 104 and 109 versions. Unfortunately this kit does not contain the upper or lower insulating plates or gaskets but does include the parts shown below.

The kit has a range of parts for other 32DIR versions and should cover types 57, 83, and 93 as well as 104 & 109.

The upper insulating plate and gaskets seem no longer to be available so it may be necessary to use the original plate and make new gaskets from suitable material.

The lower insulation plate (between the pre-heat flange and manifold) are no longer available but “Webcon” supply suitable alternatives (for a Ford DVG carburettor) that will fit. Plate with bonded gaskets, Webcon part no. 9990002600 and single gaskets to use with the original plate, Webcon part no. 9990001000 two needed.

Examine the threads in the carburettor body for the top retaining screws. If a thread is damaged and cannot be restored with a ‘tap’, consideration should be given to having a “Helicoil” repair carried out.

Check the operation of the float chamber vent valve. When the throttle is opened the valve should above the carburettor base as shown. On releasing the throttle the vent rod and cap must retract back down.

If the vent valve is at all sticky then the spring and pivot (6) should be oiled with a light oil and the linkage “worked” to free it

Install the low speed enrichment device by aligning the diaphragm as shown. Refer to the markings made during dissassembly and fit the housing and spring. Tighten the three securing screws ensuring that the diaphragm is not twisted or pinched.

Install the auxilliary venturii. Ensure that they go in the correct chokes and that their fitting springs face away from the centre.

Fit the accelerator pump jet ensuring that it is turned to spray into the primary choke .

At this point it would be wise to ensure that the Various jets are of the correct size. Each jet will have a number stamped on it - the picture shows an air correction jet from a 32DIR 109 - 100. It is size 180. Unless the carburettor has been “fiddled” with in the past the jets will almost certainly be correct.

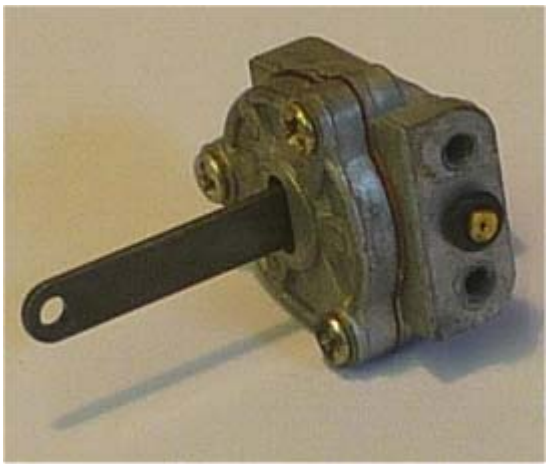
Fit a new ‘O’ ring to the secondary idle jet and holder holder, install and tighten.

Install the main jets, emulsion tubes and air correction jets. Make sure they go in their correct chokes.

Assemble the idle mixture screw with its spring and shroud and install it. Take great care not to cross thread it as it is a very fine thread on most 32DIR versions.

Assemble the pneumatic choke pull off device. Ensure the diaphragm rod is parallel to the mounting face and that the diaphragm is not twisted or pinched.

Fit a new ‘O’ ring to the vacuum port.



Hook the diaphragm rod on to the pivot linkage, align the diaphragm housing on the carburettor body, fit and tighten the mounting set screws.

Fit the circlip to the pivot link.

Assemble the accelerator pump, fit the spring into the pump body, and the diaphragm with the operating pin outwards as shown. Fit the pump cover and tighten the four securing screws. Make sure that the operating arm moves freely in the cover and that the roller that runs on the throttle spindle cam is also free. Lubricate if necessary.

Test the idle solenoid valve by earthing the body and applying 12v+ to the teminal. The solenoid should click and the operaring pin should draw back to open the idle mixture jet. Disconnect the 12v+ supply and the pin should return to seal the idle jet. (this will be seen much more clearly if the idle mixture jet is removed from the solenoid first. (the jet is a push fit)). Install with a new sealing washer.

Fit and tighten a new float needle valve holder to the carburettor top. Use a new sealing washer.

Test the float to ensure there are no leaks. Shake the float to see if it contains liquid and weigh it - its dry weight should be 11g. Immerse the float in warm water and check that there are no bubbles escaping. If the float shows signs of leaking it would be best to source a replacement float. (Being brass the float can be repaired but the problem is getting “leaked in” petrol out again).

Hang a new needle valve onto the float tag and lower the float such that the valve locates into its holder.

Insert the float pivot pin and gently “nip up” the split pivot post.

Fit a new gasket to the carburettor top (use the “open” gasket from the kit).

Hold the carburettor top at an angle of 45deg. Such that the float tag rests on the needle valve but does not compress it.

It should be possible to insert a 7mm drill bit between the float and gasket without moving the float or having a gap. If this is incorrect the float height can be adjusted by bending the tag that rests on the needle valve.

Lower the carburettor top on to the base and fit the five securing screws. Tighten them progressively.

Install a new fuel filter (make sure it goes in the correct way - tag outwards). Fit and tighten the brass plug. The plug has a cone surface and needs no separate seal.

Insert the plastic plate seals and fit the choke linkages.

On the mechanical side feed the rod in from below and engage the top 90deg. bend in the white plastic clip in the choke flap spindle link.

At the lower end lift the plastic bush against spring pressure and slide the rod into the choke cam arm. Release the plastic bush and let it seat in the cam arm connector.

On the pneumatic side feed the rod In from above ensuring that the end of the rod with the ‘R’ clip hole in it is uppermost. Hook the top end into the slot in the choke flap splndle link and fit the white nylon washer and ‘R’ clip.

Engage the lower end in the pivot link hole and fit the spring clip.

Fit the plate seal covers.

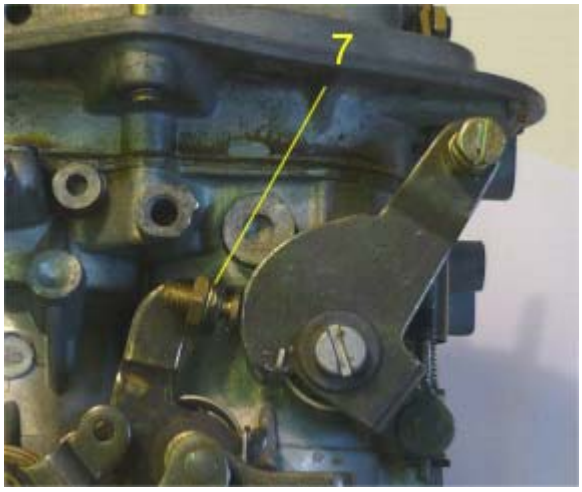
Fully open the throttle and ensure that the float chamber vent valve rod rises by 2.5 mm. If this measurement it incorrect the stroke of the rod may be adjusted by holding the rod with a small screwdriver (it has a slot in the end) and turning the white plastic bush at the bottom end. Or, hold the bush and turn the rod. Turning the rod clockwise will reduce the stroke, anticlockwise will increase it.

Close the choke flap fully and hold the linkage in the closed position. Open the flap against the spring pressure in the link rod (this the amount by which the pneumatic pull off diaphragm will open the choke when the engine starts on “full choke”. A 4.5mm drill bit should just fit as shown.

I have never known this setting to be incorrect but it can be adjusted by shimming the mechanical link rod and adjusting the throw of the pneumatic pull off diaphragm.

Close the choke flap fully and check the amount by which the primary throttle disc opens. A 0.9mm drill bit should just fit between the throttle disc and the venturi wall. This gives an increase in idle speed under cold start conditions.

If this value is incorrect it may be adjusted using the screw and nut (7) that is acted on by the choke linkage cam.



Fit the pre-heat flange with a new upper insulating plate and/or gaskets.
Note:- It may be necessary to make replacement gaskets and re-use the old plate.

Installation of the carburettor.

Ensure that no debris has fallen into the inlet manifold and that the mounting surface for the carburettor is free from gasket residue.

Install a new lower insulating plate, or at least new gaskets to the old one. Slide it down over the carburettor mounting studs.

Position the carburettor on the manifold studs (obvious but make sure it's the correct way round). Fit and progressively tighten the four securing nuts and washers.

Connect the wiring to the idle solenoid (Blue/Red) and on a 32DIR 109 the wiring to the throttle switch (Black).

Fit the coolant hoses to the pre-heat flange, tighten the hose clips and release the clamps preventing coolant loss.

Fit the engine breather hose to the connection on the pre-heat flange.

Fit the vacuum hose from the Renix unit.

Unplug the fuel supply pipe and install on the carburettor, tighten the hose clip.

Snap fit the throttle linkage ball joint on to the carburettor.

Connect the choke cable. Insert the outer cable into the mount on the carburettor and pass the inner cable through the clamp on the choke cam arm. Tighten the screw securing the outer cable making sure that you do not crush the cable. Ensure the dashboard control is pushed fully in and tighten the screw securing the inner cable to the choke cam arm.

Adjust the throttle linkage. Make sure that the throttle arm on the carburettor is in the fully closed position at rest and that fully open throttle is achieved when the throttle pedal is fully depressed. If full throttle cannot be achieved the the ball jointed link rod can. be adjusted. Make sure that the link rod locknuts are tightened.

Re-install the gasket between the air cleaner housing and carburettor.

Fit the air cleaner housing, connecting the corrugated warm air pipe to the exhaust manifold shroud and the engine breather from the Rocker Cover to the underside of the housing. Fit and tighten the three nuts (use new "nylocs") securing the housing to the carburettor. DO NOT OVERTIGHTEN!

Install the air cleaner element, fit the lid ensuring it is aligned correctly, tighten the centre nut and secure the side overcenter clips.

Screw the idle mixture screw in fully and back it out by two turns (as a starting point).

Re-connect the battery and start the engine with the choke fully closed. It will take some time as the float chamber must refill.

On starting, the fast idle speed on full choke should be around 1800-2000 rpm. Run the engine until warm, progressively opening the choke as the engine reaches operating temperature.

Set the idle speed with the throttle stop screw to about 800rpm.

In the absence of a CO% meter adjust the mixture screw in and out to obtain the fastest and smoothest idle possible. If you have access to a meter set the CO to 2.0%

Re-adjust the idle speed to:-
800rpm for CVT cars,
900rpm for Manual cars.

Roadtest the car.

Recheck the idle speed and idle mixture. Check for any coolant or fuel leaks.

APPENDIX 1

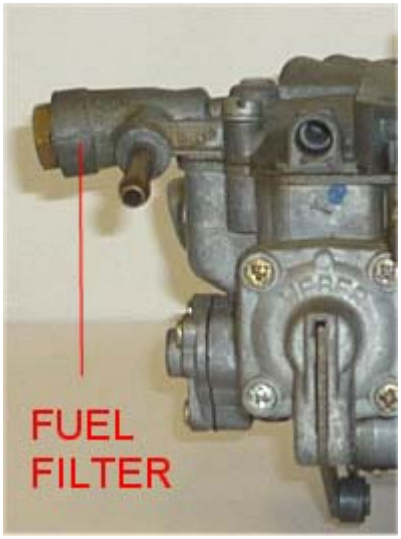
Significant differences between versions of the Weber 32DIR

1. Fuel filter positions.

On 32DIR types 57 and 83 the fuel filter fits vertically into the carburettor top.

On 32DIR types 93, 104 and 109 the fuel filter fits horizontally.

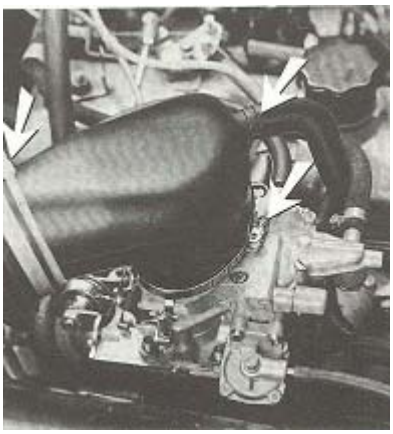
In both cases the filter sits behind a brass plug.



2.Pneumatic low speed enrichment device

This device is present on 32DIR types 104 and 109 only.

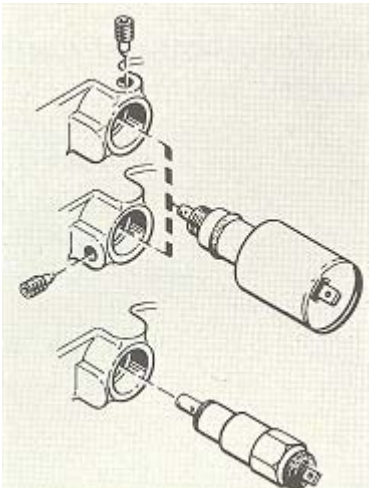
3. Air cleaner fitment.



On 32DIR types 57 and 83 the air filter is in a remorely mounted canister which is connected to the carburettor top by plastic trunking.

On types 93, 104 and 109 the air cleaner housing is directly secured to the carburettor top by studs and self locking nuts.

4.Idle solenoids.



On 32DIR types 57 and 83 a “large body” solenoid is used, screwed into place, sealed by an ‘O’ ring and secured by an “allen” grub screw.

Type 93 uses either a “large body” or a “small body” solenoid, screwed into place and sealed with a composite washer. No grub screw is used.

Types 104 and 109 use a “small body” solenoid, screwed into place and sealed with a composite washer. No grub screw is used.

Note the two sizes of idle solenoid with their idle jets.

5. CO% and idle speed adjustment.

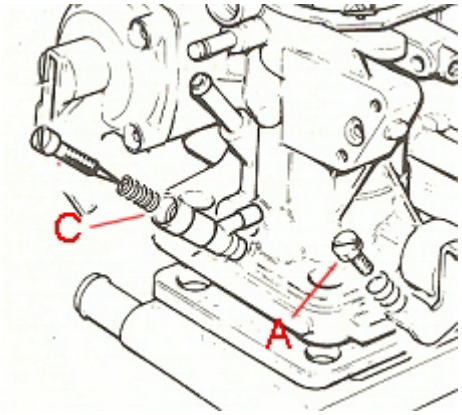
The 32DIR type 57 is equipped with a “limited CO” idle circuit.

Types 83 and 93 have “constant CO” idle circuits.

Types 104 and 109 have “linited CO” idle circuits.

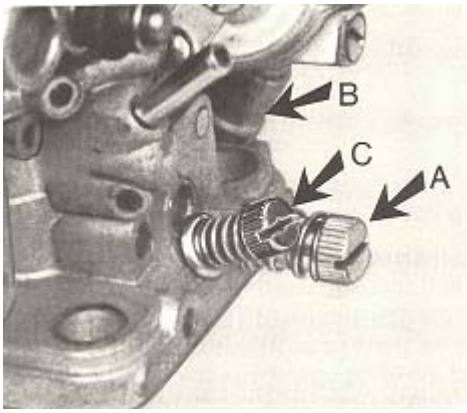
For type 57, idle speed is adjusted by throttle stop screw (A).

Idle mixture is adjusted by screw (C).



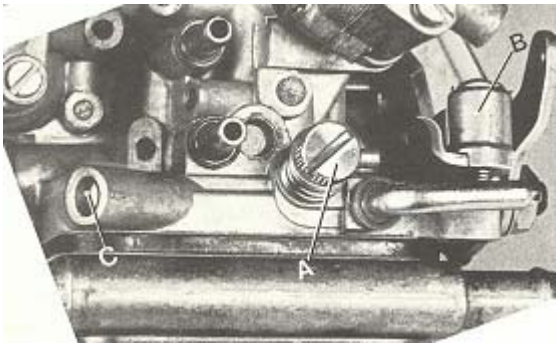
For type 83, idle speed is initially set to 600rpm by screw (B) with screw (A) having been screwed fully in. The final correct idle speed is then set by (A).

Idle mixture is set by screw (C).



For type 93, idle speed is initially set to 600rpm by screw (B) with screw (A) having been screwed fully in. The final correct idle speed is then set by (A).

Idle mixture is set by screw (C). (note different position to that used on type 83).

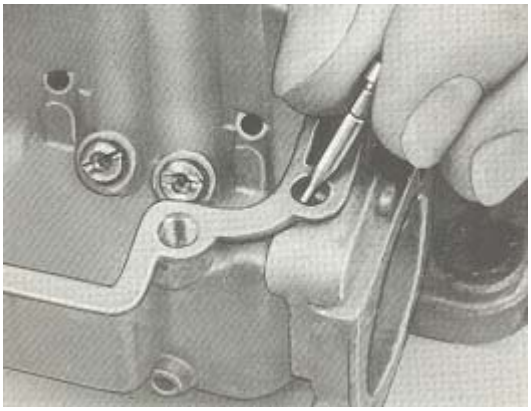


For types 104 and 109 the adjustments are made as shown.

6. Secondary choke idle circuit.

On types 57, 83, and 93 the secondary choke idle circuit is not used and is sealed by a blank jet in the holder.
On types 104 and 109 the circuit is active and helps a smooth transition during opening of the secondary throttle flap.

7. Accelerator pump metering.



On types 57 and 83 the accelerator pump mechanism uses a calibration screw for metering purposes.

On types 93, 104 and 109 this is replaced by a fixed calibration orifice in the pump body.

8. Accelerator pump jet.

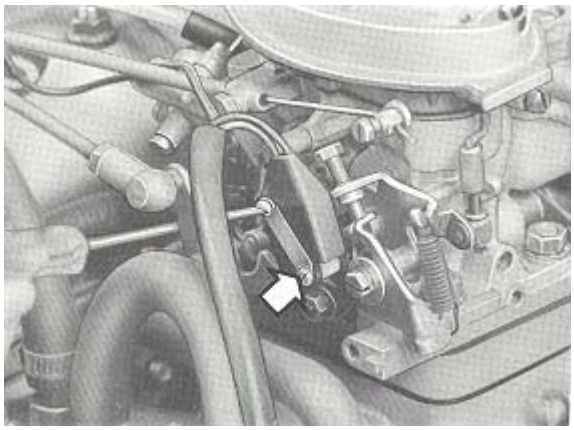
On types 57 and 83 the accelerator pump jet has twin nozzles spraying into both chokes.

On types 93, 104 and 105 a single nozzle sprays into the primary choke only.

9. Choke flaps.

Types 57 and 83 choke flaps for both barrels.
Types 93, 104 and 105 have a single choke flap covering the primary barrel only.

10. CVT control switch.



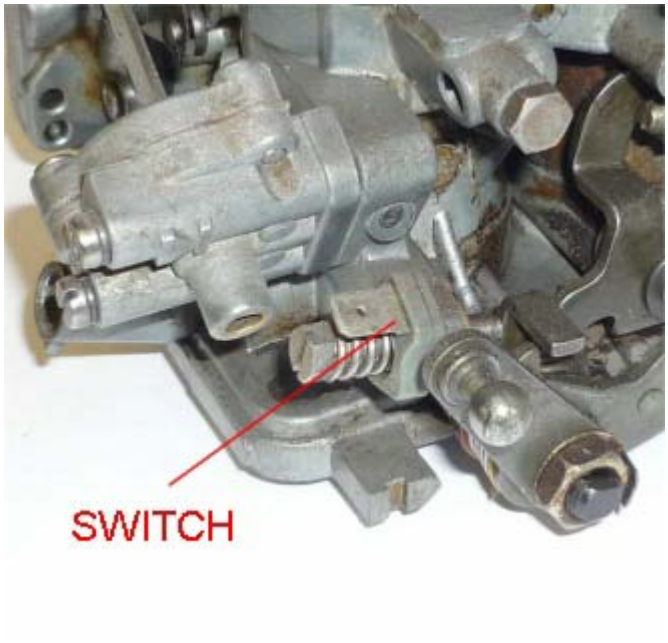
The 32DIR type 57 on 1976 and 1977 year models only is equipped with a throttle position sensing microswitch as part of the CVT control system.

For type 57 on 1978 year models and types 83, 93, 104 and 105 this is deleted its role being taken by a tachometric relay sensing engine speed via the ignition,

11. Fuel shut off switch.

The 32 DIR type 109 is fitted With a switch on the throttle stop screw to sense a closed throttle condition.

This is used by the fuel shut off system (on decelleration) that is fitted to 1986 and later year models.

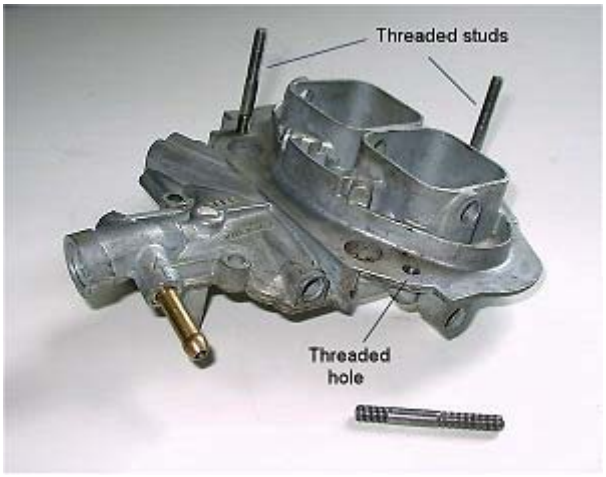


APPENDIX 2

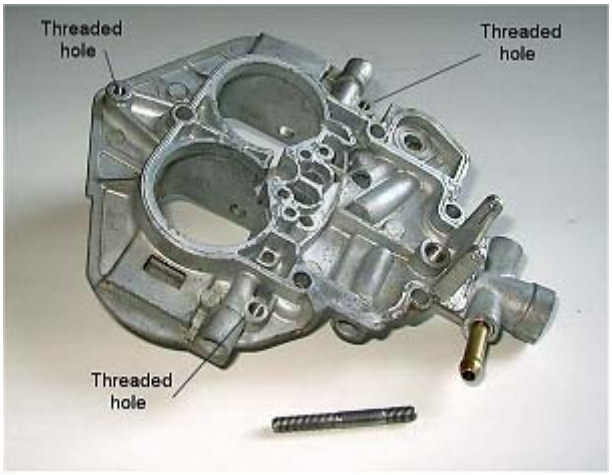
Known issues with 32DIR carburettors.

By far the major problem with 32DIR carburettors surrounds the method of mounting the air cleaner housing on types 93, 104 and 109 (1981 year models and later).

Originally designed with a mounting from the air cleaner housing to the engine rocker cover as well as the three mounting studs on the carburettor top no problems were initially encountered. Part way through the ‘81’ model year the extra mounting was discontinued leaving only the mounting studs/nuts. Since then problems have been seen with thread failures in the carb top (where the studs fit) and a tendancy for the air cleaner housing to loosen in service often leading to overtightening of the mounting nuts (in an attempt to solve the issue) increasing the likelyhood of thread failure.



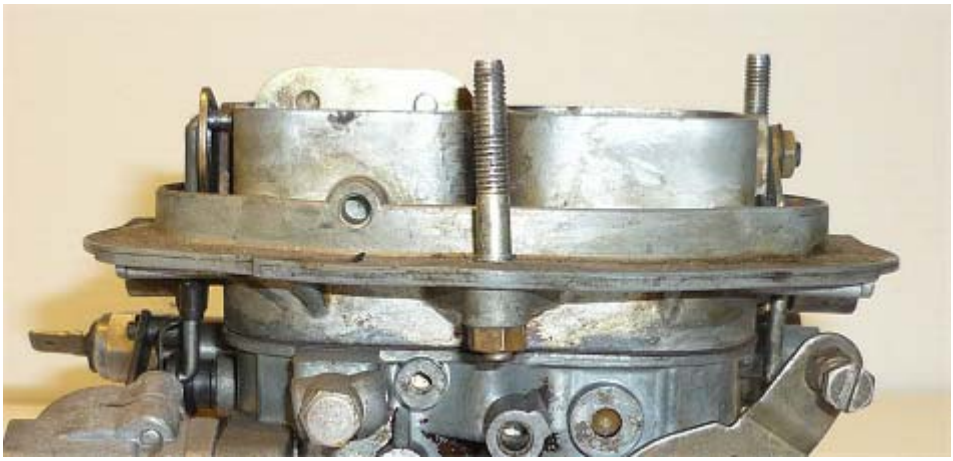
This shows the subject studs.



These are the thread that fail.

A typical case where a stud has been overtightened causing the thread in the carburettor top to fail.

I have seen many attempts to rectify this problem (including one case of woodscrews being used) but the usual method is to use a longer stud and fit a nut on the lower end.



Above shows a typical DIY repair leaving a misaligned stud and a nut.

The preferred solution is to have an engineering shop fit thread repairs such as “Helicoil” enabling you to re-use the original studs.

Alternatives would be to tap an oversize thread in the carburettor top and use stepped studs, or oversize studs which would require enlarging the relevant holes in the air cleaner housing.

A second issue is a general tendancy for the five setscrews that secure the carburettor top to the base to loosen leading to failure of the thread in the

carburettor base. In this case a thread repair (or another carburettor) is the only answer as there is insufficient material in the base to tap an oversize thread with any hope of success.

It is often found that the float chamber vent rod sticks, caused by general road dirt and heat. The answer is to lubricate the linkage and return spring ar the base of the vent rod using a light machine oil.

Another common issue with 32 DIR type 104 is a hot start problem caused by fuel vapourisation and I reproduce here a “factory” bulletin issued in late 1985.

VOLVO

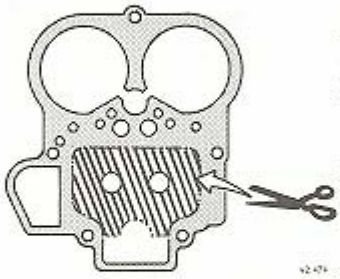
PRODUCT	SECTION	GROUP
P	2	23

Service Bulletin

RE: Starting problems with a hot engine 340	NO. 98
	DATE Nov. '85

Modification of Weber carburettor

On B 14.4S/S engines it is possible under certain conditions (depending on the ambient temperature and the quality of the petrol) for problems to occur when starting a hot engine and/or for the engine to hesitate after a hot start. In this case, volatile petrol in the hot carburettor is causing the fuel to reach the venturi unevenly. To solve this problem, follow the method given below.

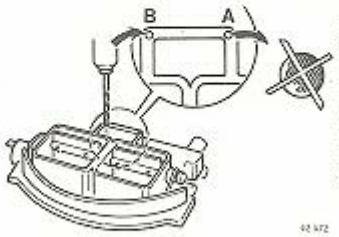


A1

Remove the float chamber cover

- remove the air filter
- remove the cover from the float chamber
  See the Repairs and maintenance Service Manual 2(23).

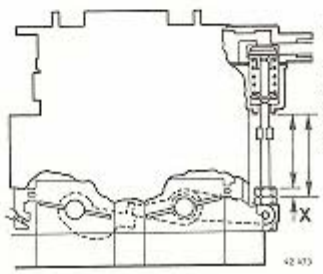
Use a new gasket and modify this as shown in the drawing (1) by cutting away the shaded section.



A2

Check the float chamber cover

Before reassembling, first check that the two Ø 4 mm bores are present in the cover (see Fig. 2).
If bore (B) is not present, it must in that case be drilled in the cover (likewise Ø 4 mm).
If there is a filter in bore (A) and/or bore (B), this must be removed.



A3

Assembly

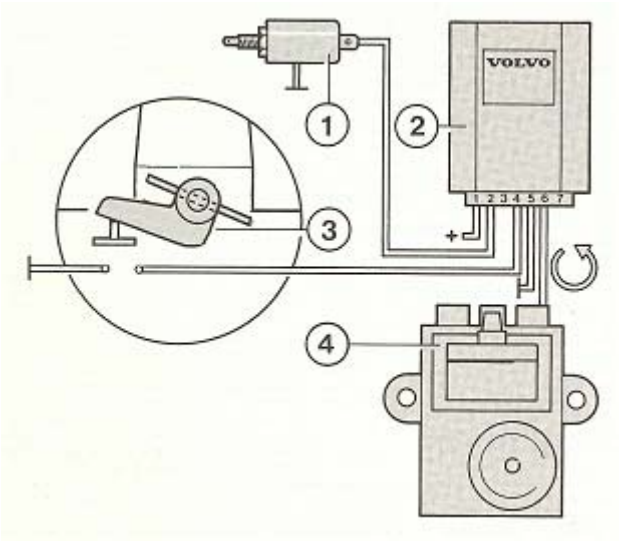
Assembly is in reverse order to disassembly.
Check the setting of the float chamber ventilation; dimension X (Fig. 3) should be 2.5 mm.
Check for correct operation.

The “webcon” rebuild kit contains a pre adapted top gasket.

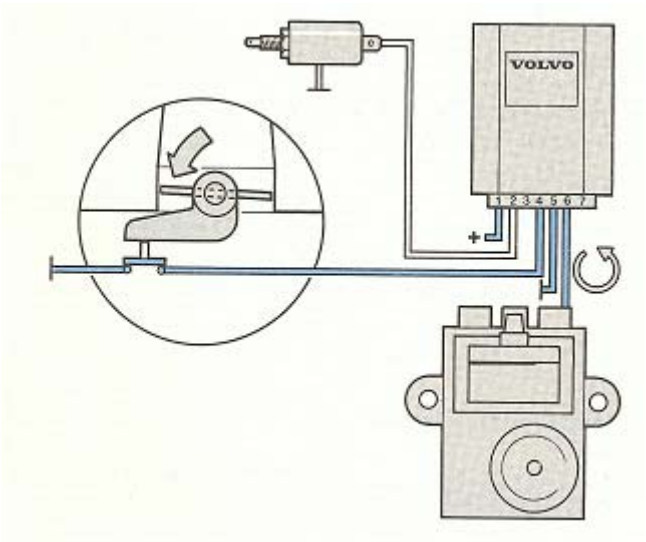
APPENDIX 3.

Over-run fuel cut-off 32 DIR 109 - 100.

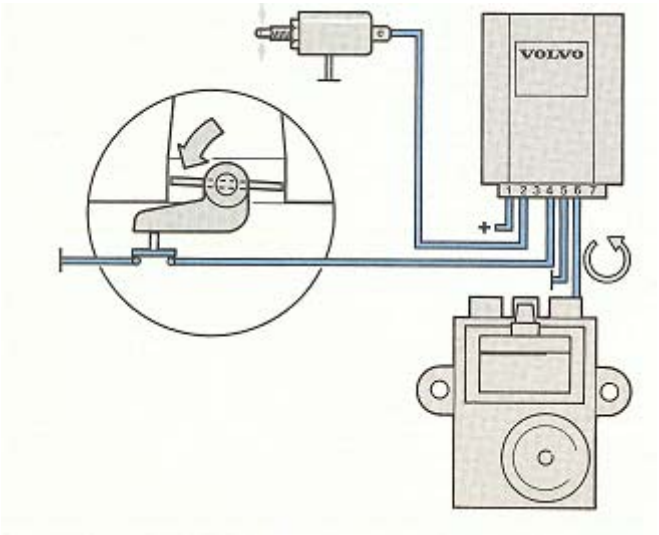
From the 1986 year model a fuel shut off device has been used to minimise emissions and improve fuel consumption. When the throttle is closed abruptly a relay interrupts the power supply to the idle solenoid thus cutting off the fuel supply. The relay (located on the LH inner wing) also monitors engine speed such that when the speed drops to 1600rpm the solenoid is re-energised to allow idling if the throttle remains shut.



1. The idle solenoid.
2. The control relay.
3. The carburettor switch.
4. The Renix ignition unit.



When the throttle is closed and the engine speed is above 1600rpm the control relay interrupts power to the idle solenoid.



When engine speed drops to 1600rpm the control relay again energises the idle solenoid. Idle function is restored.

When the throttle is re-opened the carburettor switch signal is lost which deactivates the control relay which also allows power to remain to the idle solenoid.

APPENDIX 4.

Specifications.

Determining the correct jet sizes for the 32DIR series is not easy - almost every source give slightly different values (even factory manuals vary from issue to issue for the same carburettor version).

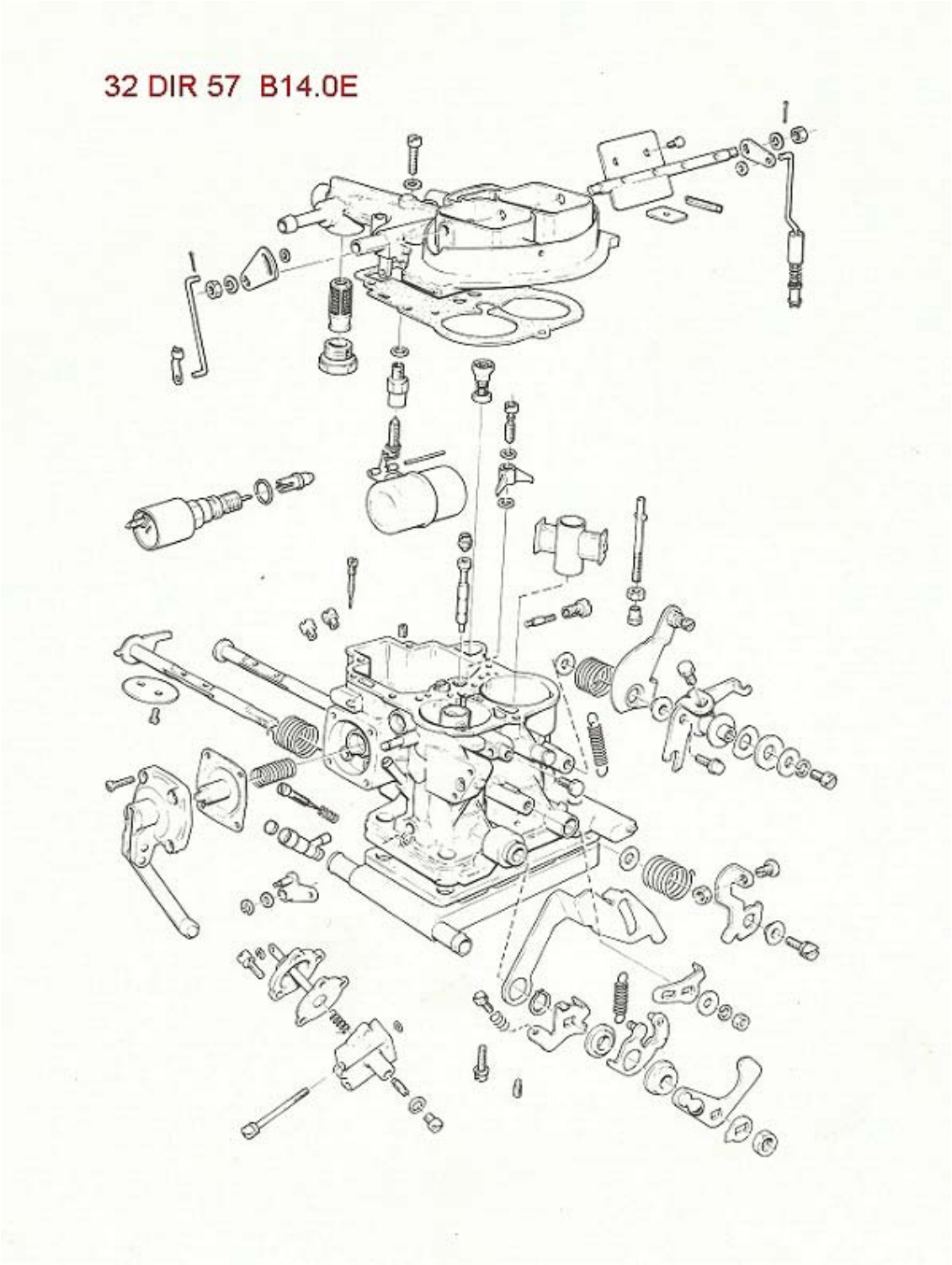
Having researched a range of genuine factory manuals and a number of aftermarket sources I have come up with the listings on the following page which is probably as accurate as it is possible to get.

Basic settings and CO% and idle adjustment figures are not in dispute and all sources seem to give jet sizes within a narrow range.

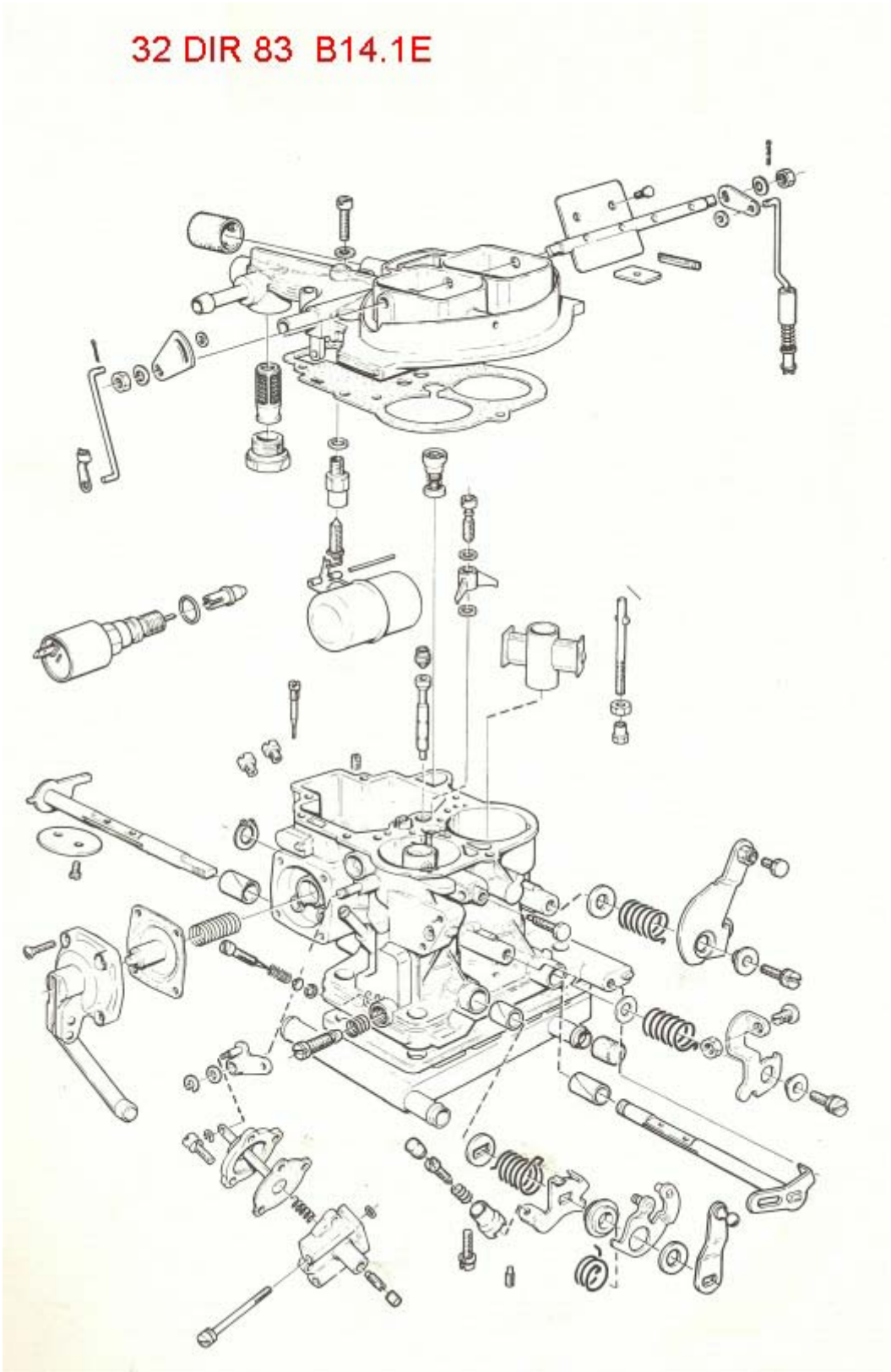
32 DIR type	**57 – 8400**		**83 – 100**		**93 – 101**		**104 – 100**		**109 – 100**	
Primary / Secondary choke	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
Venturis diameter (mm)	23	24	24	24	24	24	23	24	23	24
Main Jets	125 – 130	117 – 113	110 – 115	132 – 135	110 – 115	132 – 135	115 – 120	135 – 140	120 – 125	135 – 140
Air Correction jets	170 – 190	125 – 145	170 – 190	125 – 145	145 – 165	145 – 165	185 – 195	185 – 195	180 – 200	180 – 200
Emulsion Tubes	F53	F6	F20	F6	F20	F6	F20	F20	F20	F20
Idle Jet(s) (fuel)	44 – 47		40 – 50		47 – 53		47 – 53	47 – 53	47 – 53	47 – 53
Idle Jet(s) (air)	125 – 145		105 - 125		125 – 145		130 – 140	65 – 75	130 – 140	65 – 75
Auxillary venturis diameter	3.5	4.5	3.5	4.5	3.5	4.5	3.5	4.5	3.5	4.5
Accelerator Pump	50		60		45		45		45	
Float Height with gasket	7mm		7mm		7mm		7mm		7mm	
CO% Check (adjust)	1.5 – 4.0 (2.5)		1.5 – 3.0 (2.0)		1.5 – 3.0 (2.0)		1.5 – 3.0 (2.0)		1.5 – 3.0 (2.0)	
Idle Speed (rpm) CVT Man	750	N/A	800	900	800	900	800	900	800	900

APPENDIX 5.

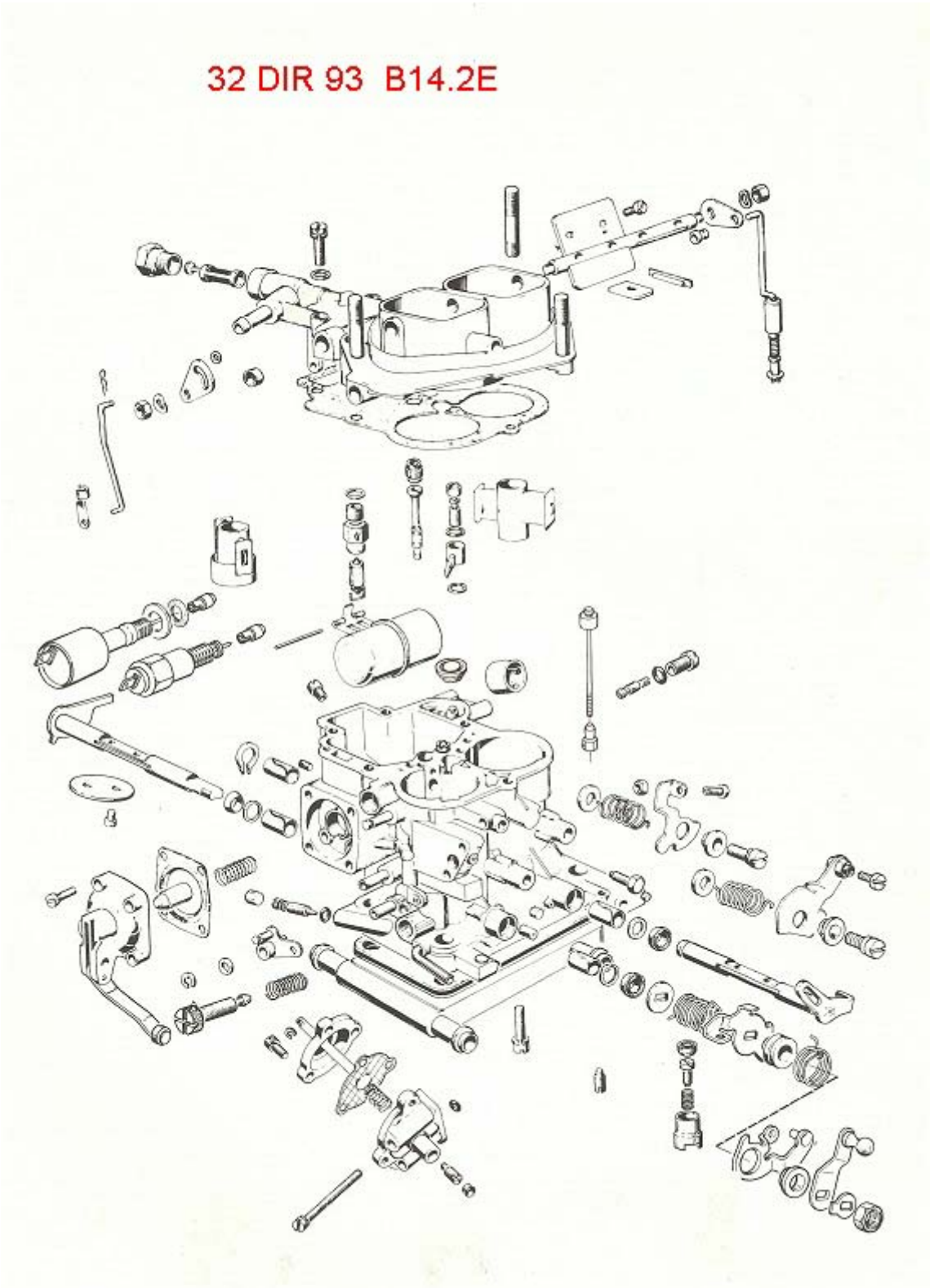
Exploded views.

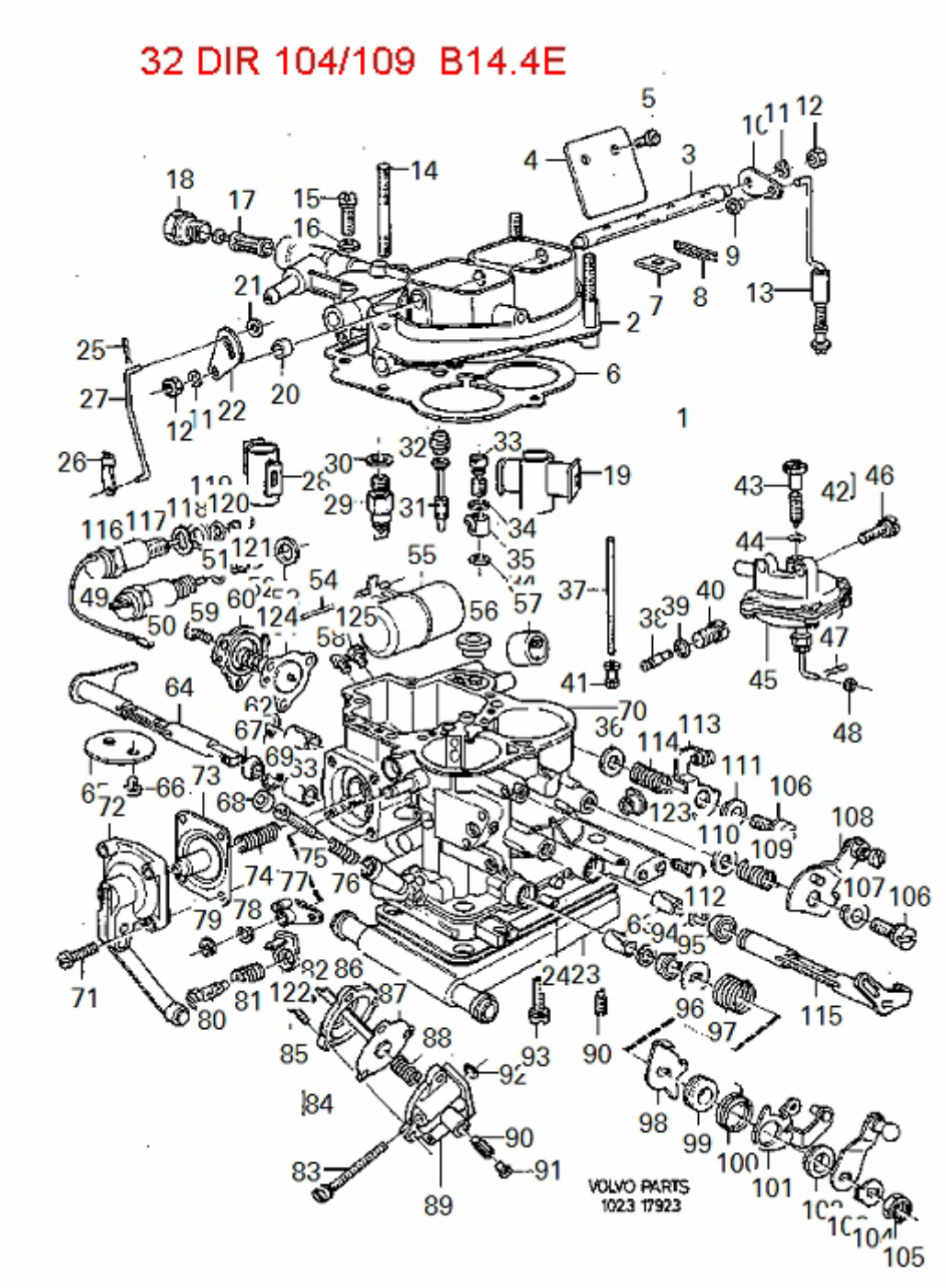


32 DIR 83 B14.1E



32 DIR 93 B14.2E




32 DIR 104/109 B14.4E
VOLVO PARTS
1023 17923