Chapter 17
Solex 30/30, 32/34 & 34/34 Z2 (CISAC)

Contents

Manufacturer	**Citroën**		**Citroën**		**Citroën**	
Model	**AX GT & Sportif**		**BX 14**		**BX 14E/14RE**	
Year	**1988 to 1992**		**1983 to 1988**		**1983 to 1988**	
Engine code	K2A (TU3S)		150A (XY6C)		150C (XY6C)	
Capacity (cm³)/no. of cyls	1360/4		1360/4		1360/4	
Oil temperature (°C)	90		80		80	
Transmission	–		–		–	
Carb. ident. (Solex)	32/34 Z2 13460		30/30 Z2 13142		32/34 Z2 13178	
Carb. ident. (vehicle)	PSA 409		CIT329		CIT348	
Idle speed (rpm)	750 ± 50		700 ± 50		800 ± 50	
Fast idle speed (rpm)	1400 ± 50		–		–	
CO @ idle (% vol.)	0.8 to 1.2		0.8 to 1.2		0.8 to 1.5	
Special conditions	–		–		–	
Stage (venturi)	**1**	**2**	**1**	**2**	**1**	**2**
Venturi diameter (K)	24	27	24	25	24	25
Idle jet (g)	44 or 45		40		40	
Main jet (Gg)	117	130	115	120	115	120
Air correction jet (a)	155	175	165	180	155	160
Emulsion tube (s)	27	AZ	ZD	ZC	ZE	ZC
Accelerator pump jet (i)	35	35	35 or 40	35	35	35
Float level (mm)	35		33 ± 1		33 ± 1	
Needle valve (mm) (P)	1.8		1.6		1.6	
Basic throttle position (PF)	–		–		–	
Idle position (PRN)	–		–		–	
Idle position (ORF)	–		–		1°10′	
Choke fast idle gap (mm)	0.8		0.9		0.75	
Fast idle position (OP)	20°20′		15°		–	
Fast idle position (OPF)	–		–		12°50′	
Fast idle position (OPR)	–		–		–	
Choke pull-down (mm) (OVAD)	3.0		3.2 ± 0.5		3.7 ± 0.5	
Vent valve (mm)	–		–		–	

Manufacturer	Peugeot		Peugeot		Peugeot	
Model	205 1.4 XS, SR, GT		505 1.8		505 1.8	
Year	1988 to 1992		1985 to 1986		1985 to 1986	
Engine code	TU3S (K2A) (62kW)		XM7A (105C) (62kW)		XM7A (105C) (62kW)	
Capacity (cm^3)/no. of cyls	1360/4		1796/4		1796/4	
Oil temperature (°C)	80		90		90	
Transmission	–		MT		AT	
Carb. ident. (Solex)	32/34 Z2 13460		32/34 Z2 13356		32/34 Z2 13430	
Carb. ident. (vehicle)	409		388		388/1	
Idle speed (rpm)	750 ± 50		900 ± 50		900 ± 50	
Fast idle speed (rpm)	–		–		–	
CO @ idle (% vol.)	1.5 ± 0.5		1.5 ± 0.5		1.5 ± 0.5	
Special conditions	–		–		–	
Stage (venturi)	1	2	1	2	1	2
Venturi diameter (K)	24	27	24	26	24	26
Idle jet (g)	44 or 45		43	70	43	70
Main jet (Gg)	117	130	117 ± 5	127 ± 5	117	127
Air correction jet (a)	155	175	155	155	155	155
Emulsion tube (s)	27	AZ	–		–	
Accelerator pump jet (i)	35	35	35	40	35	40
Float level (mm)	35		33 ± 1		33 ± 1	
Needle valve (mm) (P)	1.8		1.8		1.8	
Basic throttle position (PF)	–		–		–	
Idle position (PRN)	–		–		–	9°
Idle position (ORF)	–		–		–	
Choke fast idle gap (mm)	0.8		–		–	
Fast idle position (OP)	20°20'		23°		24°	
Fast idle position (OPF)	–		–		–	
Fast idle position (OPR)	–		–		–	
Choke pull-down (mm) (OVAD)	3.0		2.3		2.3	
Vent valve (mm)	–		–		–	

1 Principles of operation

The following technical description of the Solex Z2 carburettor should be read in conjunction with the more detailed description of carburettor principles in Chapter 1. The Z2 is sometimes referred to as a 'CISAC' carburettor.

Construction

The Solex Z2 carburettor is a downdraught progressive twin venturi instrument. The venturis are arranged so that the secondary throttle valve will not start to open until the primary throttle valve is about two-thirds open. The choke control is manual in operation.

The throttle shafts are made of steel, while the throttle plates, and all the emulsion tubes and jets, are manufactured from brass. The internal fuel channels and air passages are drilled, and sealed with lead plugs where necessary. On some variations, a heating flange is bolted to the carburettor base, through which hot engine coolant is piped. The purpose of the flange is to improve atomisation of the air/fuel mixture during the warm-up period. Some versions use a throttle body heater to prevent carburettor icing. The heater is normally operational with the ignition on, and functions on the PTC (positive temperature coefficient) principle; as the temperature rises, the heater resistance also rises.

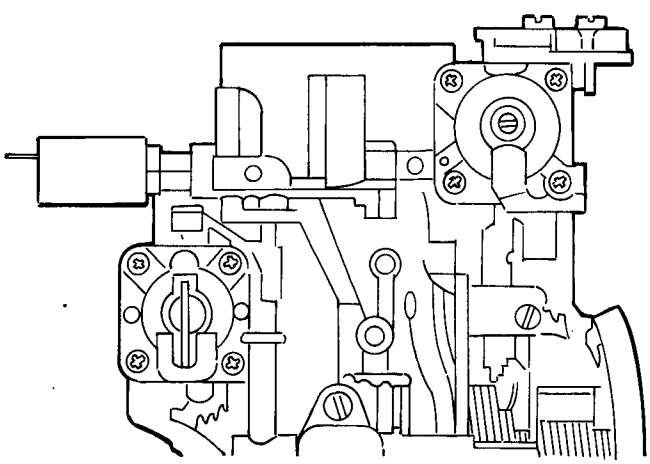

Fig. 17.1 Solex Z2 carburettor (Sec 1)

Fuel control

Fuel flows into the carburettor through a fine mesh filter. The fuel level in the float chamber is controlled by a needle valve and plastic float assembly. An anti-vibration ball is incorporated into the needle valve design.

The float chamber is vented internally, to the clean-air side of the air filter. A calibrated fuel return system is provided on some variations, to ensure that relatively cool fuel is supplied to the carburettor.

Idle, slow running and progression

Fuel, sourced from the main well, passes into the idle channel through a metered idle jet; here it is mixed with a small amount of air from a calibrated air bleed. The resulting emulsion is drawn through a channel, to be discharged from the idle orifice under the primary throttle plate. A tapered mixture screw is used to vary the outlet, and this ensures fine control of the idle mixture.

A progression slot provides extra enrichment as it is uncovered by the opening throttle during initial acceleration.

The idle speed is set by an adjustable screw. The adjustable mixture screw is tamperproofed at production level. in accordance with emission regulations.

Idle cut-off valve (some variations)

An idle cut-off valve is used to prevent run-on when the engine is shut down. It utilises a 12-volt solenoid plunger to block the idle jet when the ignition is switched off.

Accelerator pump

The Solex Z2 accelerator pump is controlled by a diaphragm, and is mechanically operated by a lever and cam attached to the primary throttle linkage. During acceleration, fuel is pumped through a ball valve located in the pump injector, and is discharged into both primary and secondary venturis. The inlet ball valve is located in a channel from the float chamber; excess fuel/air mixture is returned to the float chamber through a separate fuel channel.

Main circuit

The amount of fuel discharged into the airstream is controlled by a calibrated main jet. Fuel is drawn through the main jet, into the base of a

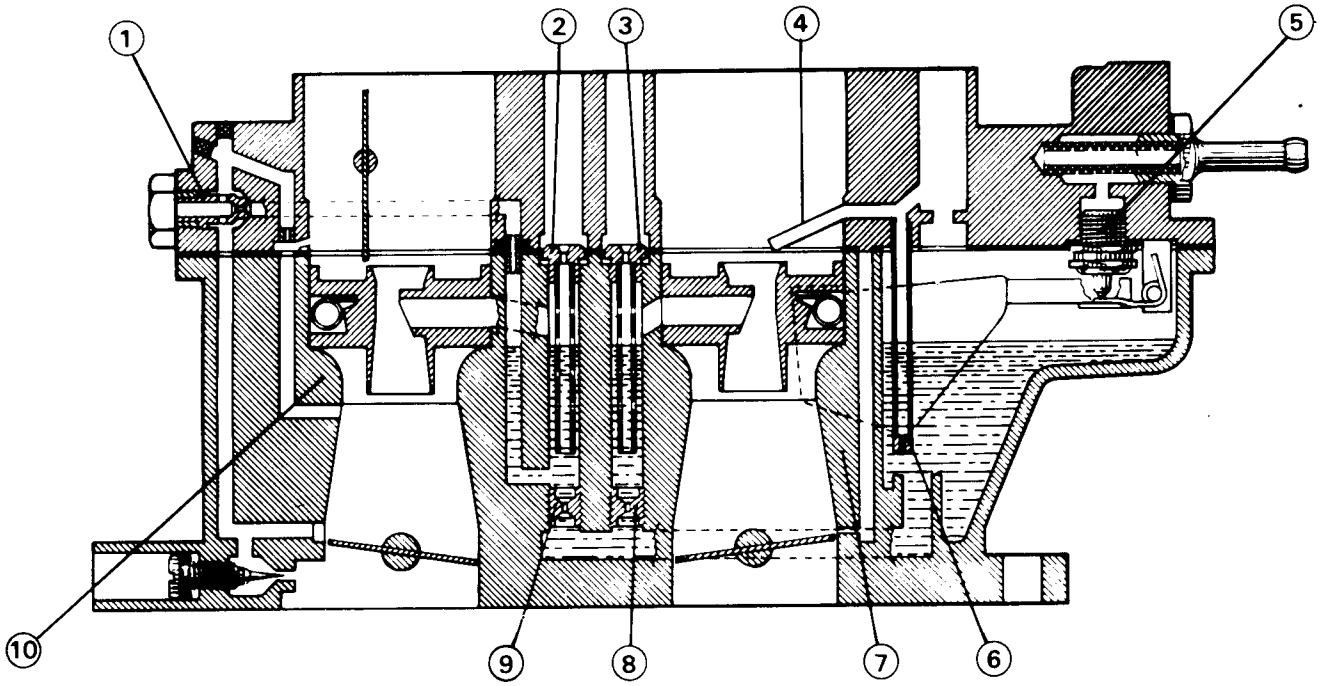

Fig. 17.2 Main and idle circuits (Sec 1)

1 *Idle fuel jet*
2 *Combined air corrector jet with emulsion tube – primary venturi*
3 *Combined air corrector jet with emulsion tube – secondary venturi*
4 *Full-load enrichment nozzle*
5 *Float needle valve*
6 *Full-load enrichment fuel jet*
7 *Secondary venturi*
8 *Main jet – primary venturi*
9 *Main jet – secondary venturi*
10 *Primary venturi*

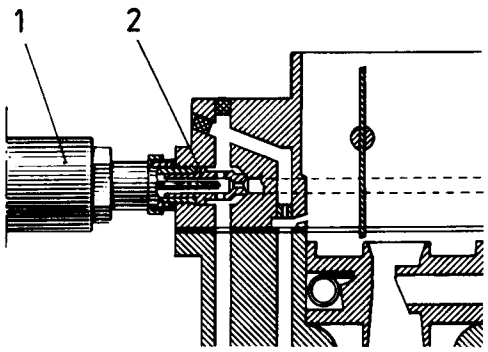

Fig. 17.3 Idle cut-off valve (Sec 1)

1 *Idle fuel jet*
2 *Idle cut-off valve*

vertical well which dips down into the fuel in the float chamber; an emulsion tube is placed in the well. The fuel is mixed with air, drawn in through the air corrector and through the holes in the emulsion tube. The resulting emulsified mixture is discharged from the main orifice through an auxiliary venturi.

Part-load enrichment (power valve)

Fuel flows from the float chamber into the enrichment chamber, through a fuel channel and a brass inlet valve. An air passage is taken from under the throttle plate to the cover of the chamber. At idle, and during light-throttle operation, manifold vacuum draws the diaphragm back against spring pressure. The diaphragm pintle is withdrawn from the valve, and the spring-loaded ball seats to close off the inlet channel. Under acceleration and wide-open throttle operation, the vacuum in the manifold is depleted. The diaphragm returns under spring pressure, and the power diaphragm pintle pushes the ball to open the inlet valve. Fuel then flows through the valve into the enrichment chamber; from here, it passes through a calibrated jet into a fuel channel leading to the primary main well. The fuel level rises in the well, and the fuel mixture is enriched.

Secondary action

Once the primary throttle plate is about two-thirds open, the secondary throttle plate will start to open. At full-throttle, the linkage is arranged so that both throttle plates will be fully open.

A progression circuit is used to prevent hesitation as the secondary throttle plate starts to open. An emulsified mixture is discharged into the secondary venturi, via a progression drilling, at the initial opening of the secondary throttle plate.

Once the secondary throttle plate has opened, the action of the secondary main circuit is similar to the primary circuit.

Manual choke operation

The manual choke is operated by a dash-mounted cable control. When the cable is pulled, it operates a lever that pulls the choke flap closed across the primary air intake. Fast idle is achieved with the aid of a curved cam attached to the choke operating lever. An adjustable screw, attached to the throttle lever and butting against the cam, is used to vary the fast idle speed.

During engine warm-up, the cable control should be progressively pushed home until the choke flap is fully open.

Choke pull-down

Once the engine has fired, the choke flap must open slightly, to weaken the mixture and avoid flooding. This is achieved by using manifold vacuum to actuate a diaphragm; a linkage attached to the diaphragm then pulls upon the choke flap.

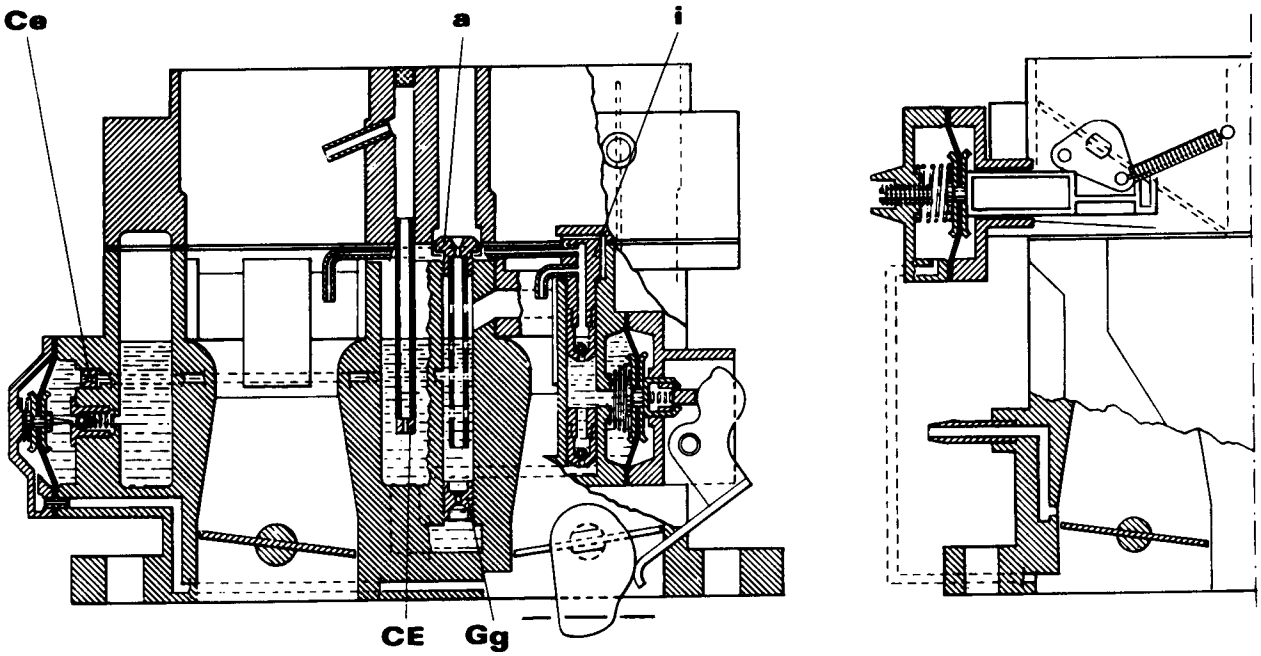

Fig. 17.4 Accelerator pump and enrichment circuits (Sec 1)

a Combined air corrector jet with emulsion tube – primary venturi
Ce Part-load enrichment fuel jet
CE Full-load enrichment fuel jet
i Accelerator pump injector
Gg Main jet – primary venturi

2 Identification

The Solex identification code is stamped on a metallic tag, attached to the cover by an upper body fixing screw. The tag quotes the Solex part number and the vehicle manufacturer part number, and identifies the carburettor type. Later carburettors may have this information stamped upon the carburettor body.

13460 Solex part number
409 Vehicle manufacturer part number
32-34 Z2 Carburettor type

Where the tag is missing, refer to Chapter 2, Section 1 for other ways of identifying the carburettor.

3 General servicing

Read this Chapter in conjunction with Chapter 2, which describes some of the operations in more detail. It is assumed that the carburettor is removed for this service. However, many of the operations can be tackled with the carburettor in place. Where this is undertaken, first remove the carburettor upper body, and soak the fuel out of the float chamber using a clean tissue or soft cloth.

Dismantling and checking

1 Remove the carburettor from the engine (refer to Chapter 2, Section 2 for general advice on removing a carburettor).
2 Check the carburettor visually for damage and wear (refer to Chapter 2, Section 3).
3 Remove the idle cut-off valve assembly (where fitted), and clean it with carburettor cleaner. Test the plunger operation by connecting the valve to the battery, or other voltage supply (or use the valve supply wire in the engine compartment). Touch the valve body to earth with the ignition 'on'. Repeat this several times, and ensure that the plunger tip advances and retracts cleanly. Renew the valve if the action is faulty, if cleaning does not improve its operation.
4 Remove the five screws, and detach the carburettor upper body.
5 Inspect the float chamber for corrosion and calcium build-up.
6 Tap out the float pin, and remove the float, needle valve and float chamber gasket.
7 Use a straight edge to check for distorted flanges on all facing surfaces.
8 Check that the anti-vibration ball is free in the valve end.
9 Check the needle valve tip for wear and ridges.
10 The float should be checked for damage and ingress of petrol.
11 Renew the float pin if it shows signs of wear.
12 Unscrew the fuel inlet tube, and inspect the fuel filter. Clean the filter housing of debris and dirt, and renew the filter if necessary.
13 Remove the mixture screw, and inspect the tip for damage or ridges.
14 The accelerator pump injector is a push fit in the body. Carefully prise it from its location, and test it by shaking it. No noise from the outlet ball would indicate that the valve is seized.
15 Remove the four screws, and detach the accelerator pump cover, diaphragm and spring. Check the diaphragm for fatigue and damage.
16 Remove the idle jet from the upper body.
17 Unscrew the primary and secondary combined air corrector and emulsion tubes.
18 Use a long thin screwdriver to unscrew the main jets – they are located at the bottom of the emulsion tube wells. Invert the carburettor over a cupped hand to catch the jets as they fall out of the wells. **Note:** *The primary main jet is located on the power valve side of the carburettor, and the secondary main jet is located on the choke side of the carburettor.*
19 Note the sizes and locations of all the jets, for correct installation during reassembly.
20 Check the jet calibration against the specifications. It is possible that the jets may have been transposed (or the wrong size fitted) during the last overhaul.
21 Check that the channels from the float chamber into the emulsion tube wells are clear.
22 Remove the three screws, and detach the power valve housing cover, spring and diaphragm from the body. Check the diaphragm for fatigue and damage.
23 The brass outlet (power) valve is cast into the body, and is not removable. The ball in the outlet valve should seal the outlet. Depress and release the ball with a small screwdriver, and it should move smoothly in and out.
24 Unscrew and remove the small power jet from inside the power

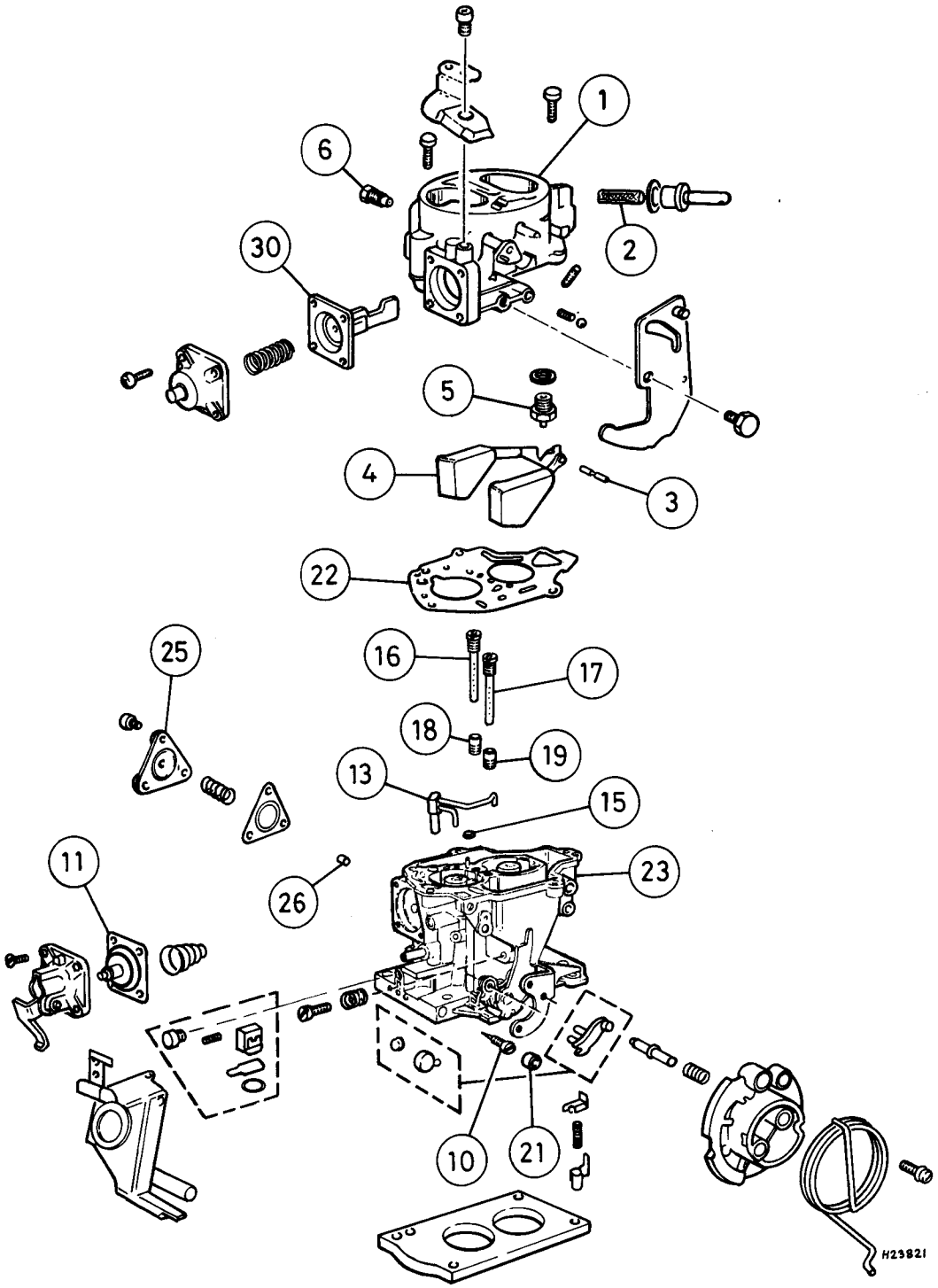

Fig. 17.5 Exploded view of Solex Z2 carburettor (Sec 3)

1 *Upper body*
2 *Fuel inlet filter*
3 *Float pin*
4 *Float*
5 *Needle valve*
6 *Idle jet (primary)*
10 *Idle mixture control screw*
11 *Accelerator pump diaphragm*
13 *Pump injector*
15 *O-ring*
16 *Emulsion tube and air corrector – primary venturi*
17 *Emulsion tube and air corrector – secondary venturi*
18 *Main jet – primary venturi*
19 *Main jet – secondary venturi*
21 *Tamperproof cap*
22 *Float chamber gasket*
23 *Main body*
25 *Part-load enrichment diaphragm*
26 *Part-load enrichment jet*
30 *Choke pull-down diaphragm*

valve housing. Check that the channel into the emulsion tube well is clear.
25 Do not disturb the adjustment of the secondary throttle angle, unless absolutely necessary.
26 Remove the four screws, detach the choke pull-down cover, and remove the spring and diaphragm from the housing. Check the diaphragm for fatigue.
27 Clean the jets, carburettor body assemblies, float chamber and internal channels. An air line may be used to clear the internal channels once the carburettor is fully dismantled. **Warning:** *If high-pressure air is directed into the channels and passages with the diaphragms still in place, diaphragm damage may result.* Spraying carburettor cleaner into all the channels and passages in the carburettor body will often clear them of gum and dirt.

Reassembly

During reassembly, a complete set of new gaskets should be fitted. Also renew the needle valve, the float pin, and all diaphragms. Inspect and renew (where necessary) the mixture screw, main jet, air corrector/emulsion tubes, idle jet, and the accelerator pump injector. Renew worn linkages, screws, springs, and other parts where necessary.

Ensure that all the jets are firmly locked into their original positions (but do not over-tighten). A loose jet can cause a rich (or even lean) running condition. Clean all mating surfaces and flanges of old gasket material, and reassemble with a new gasket. Ensure that housings are positioned with their air and fuel routes correctly aligned.
1 Refit the choke diaphragm and spindle assembly to the choke housing. Refit the spring and cover, and secure with the four screws.
2 Check that the secondary throttle plate is fully closed. The adjustment screw should not normally be used to alter the throttle plate position. However, if necessary, it can be adjusted so that the plate is open just enough to prevent its seizure in the throttle body.
3 Refit the power jet into its original position.
4 Refit the power diaphragm, spring and cover assembly, and secure with the three screws.
5 Refit the main jets and emulsion tube/air correctors into their original positions (do not transpose the jets).
6 Screw the idle jet into the upper body, and lock it firmly into position.
7 Refit the accelerator pump spring, diaphragm and cover assembly, and secure with the four screws.
8 Carefully refit the accelerator pump injector, after renewing the small seal on the injector body.
9 Refit the idle mixture screw. Turn the screw in gently, until it just seats. From this position, unscrew it two full turns – this will provide a basic setting, to allow the engine to be started.

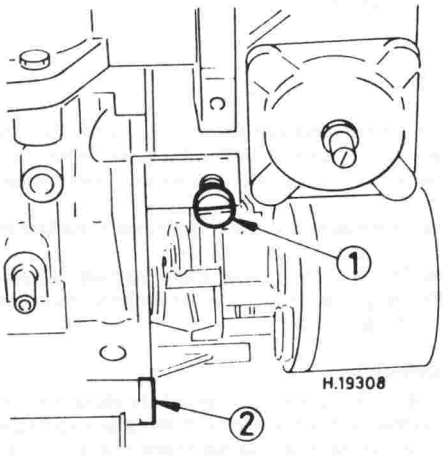

Fig. 17.6 Idle adjustment screws (Sec 4)

1 Idle speed adjustment screw
2 Idle mixture control screw

10 Clean or renew the fuel filter, and refit the inlet tube with a new sealing washer.
11 Locate a new float chamber gasket in position on the upper body.
12 Fit the new needle valve assembly, using a new sealing washer. Ensure that it is firmly locked into position (but do not over-tighten). Refit the float, and secure with the float pin.
13 Adjust the float level with reference to Section 4.
14 Refit the upper body to the main body, and secure with the five screws.
15 Refit the idle cut-off valve (where used).
16 Ensure that the choke flap and linkage move smoothly and progressively, and inspect the operating mechanism for stickiness and wear.
17 Adjust the choke fast idle and pull-down with reference to Section 4.
18 Refit the carburettor to the engine (refer to Chapter 2, Section 2 for general advice on installing a carburettor).
19 Always adjust the carburettor idle speed and mixture after any work has been carried out on the carburettor – preferably with the aid of a CO meter. Refer to Section 4 for details.

4 Service adjustments

Adjustment pre-conditions

Refer to Chapter 2, Section 4 for general advice on the pre-conditions for correct adjustment of this carburettor.

Idle speed and mixture (CO)

1 Run the engine at 3000 rpm for 30 seconds to clear the manifold of fuel vapours, then allow the engine to idle.
2 Use the idle speed screw to set the specified idle speed (refer to the specifications at the start of this Chapter).
3 Check the CO level; if incorrect, remove the tamperproof plug and adjust the idle mixture screw to obtain the correct level. Turning the screw clockwise (inwards) will reduce the CO level, and turning the screw anti-clockwise (outwards) will increase the CO level. *Refer to Chapter 2, Section 4 for a method of setting the idle mixture without the aid of a CO meter.*
4 Repeat paragraphs 2 and 3 until *both* adjustments are correct.
5 Clear the manifold every 30 seconds during the setting operation by running the engine at 3000 rpm for 30 seconds.
6 Increase the speed to 2000 rpm, and note the CO reading. The 'cruise' reading should be less than half the idle CO reading.
7 Fit a new tamperproof plug to the mixture control screw on completion.

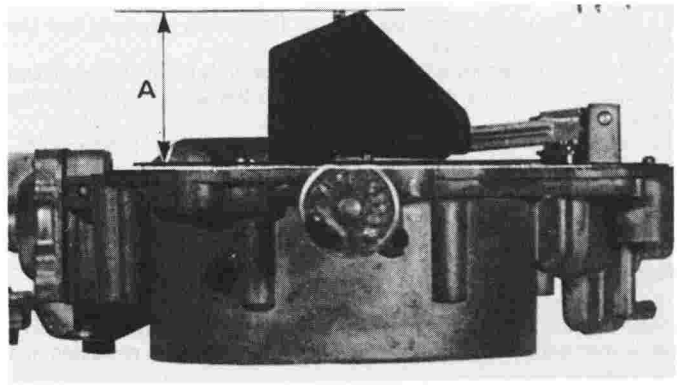

Fig. 17.7 Float level checking (Sec 4)

A Float level

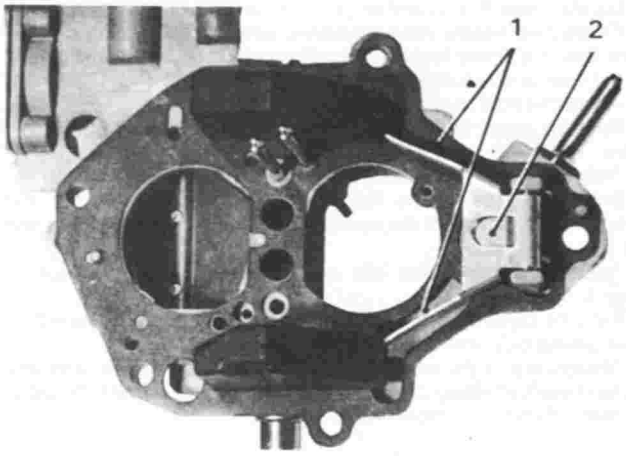

Fig. 17.8 Float level adjustment (Sec 4)

1 Float arms *2 Inner float tag*

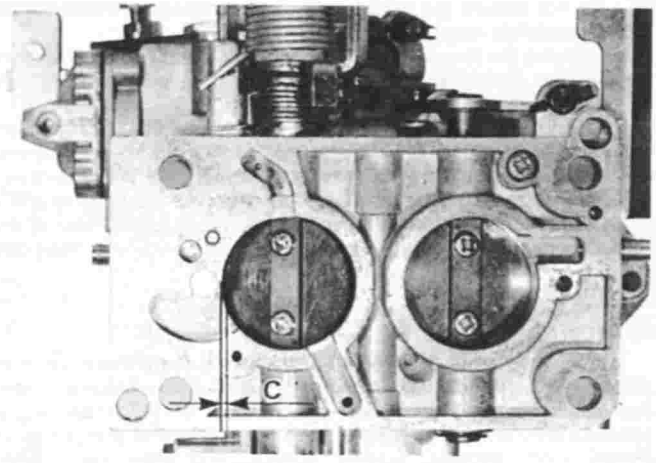

Fig. 17.9 Fast idle checking (Sec 4)

C Fast idle clearance

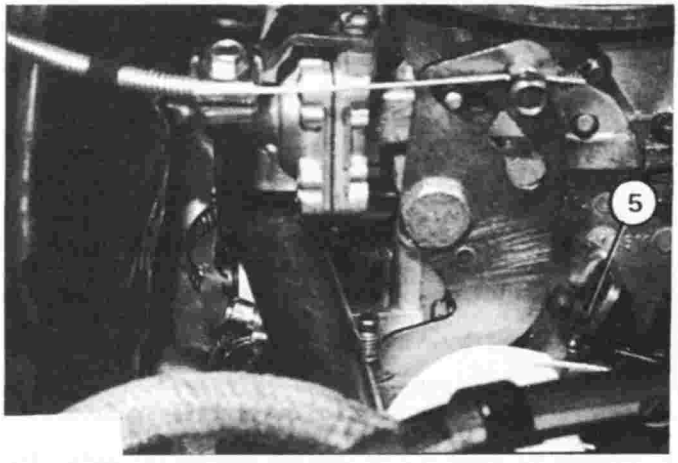

Fig. 17.10 Fast idle adjustment (Sec 4)

5 Fast idle adjustment screw

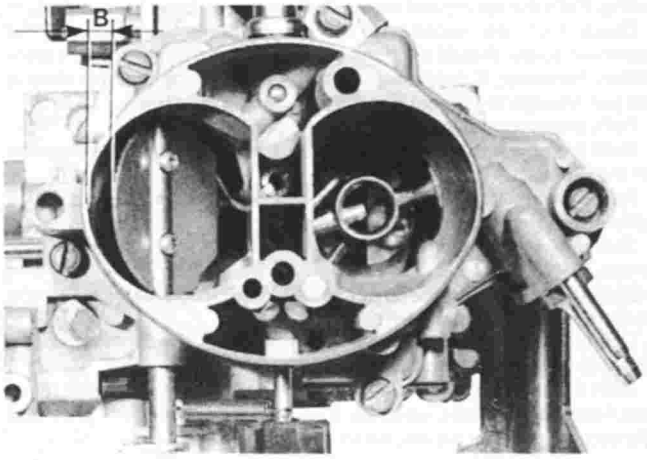

Fig. 17.11 Choke pull-down checking (Sec 4)

B Pull-down clearance

Float level

8 Invert the upper body, so that the float faces upwards and the needle valve is depressed.
9 Measure the distance between the upper body (with its gasket) and the upper face of the plastic float (refer to the specifications for the correct float level).
10 Adjust as necessary by bending the inner float tag (2) in Fig. 17.8.
11 The upper faces of the float should not differ in height by more than 1 mm. Adjust by bending the float arms (1) if necessary.

Choke adjustments

Fast idle

12 The carburettor must be removed from the engine in order to make the following fast idle adjustment. Refer to Chapter 2, Section 4 for a method of setting the fast idle speed without removing the carburettor.
13 Invert the carburettor, and pull the choke operating lever to fully close the choke flap. The fast idle screw will butt against the fast idle cam and force open the throttle plate, to leave a small clearance (C) in Fig. 17.9.
14 Use the shank of a twist drill to measure the clearance between the wall of the throttle bore and the throttle plate. Refer to the specifications for the required drill size. **Note**: *Measure from the side opposite the progression holes.*
15 Adjust as necessary by turning the fast idle adjustment screw (5) in Fig. 17.10 in the appropriate direction.
16 **Note**: *The fast idle throttle angle may also be set by means of a Solex or Pierburg throttle angle gauge. Refer to the specifications for the appropriate throttle angle.*

Vacuum pull-down

17 Pull the choke operating lever to fully close the choke flap.
18 Use a small screwdriver to push the diaphragm operating rod up to its stop. At the same time, use the shank of a twist drill to measure the gap between the lower section of the choke flap and the air intake. Refer to the specifications for the required drill size.
19 Remove the plug in the diaphragm cover, and adjust as necessary by turning the adjustment screw in the appropriate direction. Renew the plug when adjustment is complete.

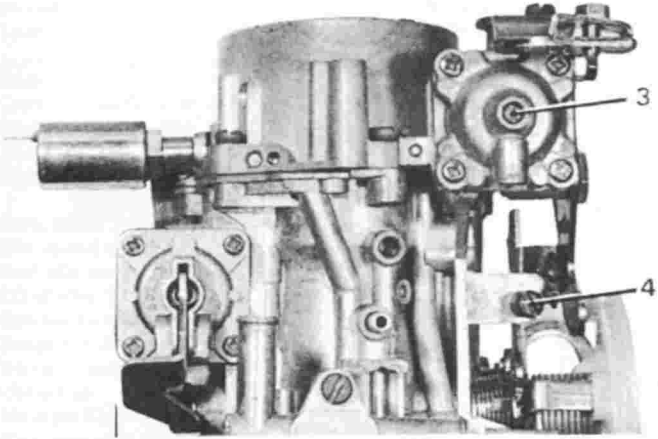

Fig. 17.12 Choke pull-down adjustment (Sec 4)

3 Pull-down adjustment screw

4 Idle speed adjustment screw (for information only)

5 Component testing

Throttle body heater

Refer to Chapter 2, Section 5 for a method of testing the electrical throttle body heater.

6 Fault diagnosis

Refer to Chapter 2, Sections 5 and 6 for diagnosis of general carburettor faults.