

# Chapter 4 Part A:

## Fuel and exhaust systems - carburettor models

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### Degrees of difficulty

<b>Easy</b> , suitable for novice with little experience 	<b>Fairly easy</b> , suitable for beginner with some experience 	<b>Fairly difficult</b> , suitable for competent DIY mechanic 	<b>Difficult</b> , suitable for experienced DIY mechanic 	<b>Very difficult</b> , suitable for expert DIY or professional 
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### Specifications

#### Fuel pump

Operation	Mechanical from camshaft
Pressure	0.25 to 0.36 bar

#### Carburettor application

1.2 litre models	32 TL
1.3 litre models:	
13N engine	35 PDSI
13SC engine	2E3
13NB engine	1B1
1.4 litre models	2E3
1.6 litre models	
16SH engine	Varajet II
16SV engine	2E3

#### 32TL Carburettor data - 12SC engine

Needle valve	1.75 mm
Venturi diameter	25 mm
Main jet	117
Mixture outlet	2.5 mm
Air correction jet	75
Mixture	F96
Idle fuel jet	47
Idle air jet	90
Idle mixture jet	210
Auxiliary mixture fuel jet	35
Auxiliary mixture air jet	170
Auxiliary mixture jet	100
Full load enrichment jet	65
Partial load enrichment jet (idle)	40
Partial load enrichment jet (main)	40
Accelerator pump jet	45

## 4A•2 Fuel and exhaust systems - Carburettor models

### 32TL Carburettor data - 12SC engine (Continued)

Accelerator pump return jet	30
Accelerator pump delivery	6.5 to 9.5 cc per 10 strokes
Pull-down reduction jet	35
Pull-down adjustment (choke valve gap)	4.3 to 4.8 mm
Throttle valve gaps:	
Fast idle	0.6 to 0.7 mm
Mechanical pull-down	0.8 to 0.9 mm
Fast idle speed	3600 to 4000 rpm
Float level	23.5 to 24.0 mm
Vacuum at idle speed	1 to 20 mbar

### 35 PDSI Carburettor data - 13N engine

Needle valve	1.75 mm
Needle valve sealing ring	2.5 mm
Venturi diameter	26 mm
Mixture outlet	2.4 mm
Accelerator pump delivery:	
Manual gearbox	10 ± 1.0 cc per 10 strokes
Automatic transmission	7 ± 1.0 cc per 10 strokes
Accelerator pump arm	Throttle valve shaft
Main jet	X122.5
Air correction jet	80
Idle cut-off jet	50
Pump injector tube	50
Enrichment jet in float chamber:	
Manual gearbox	50
Automatic transmission	70
Enrichment jet in cover:	
Manual gearbox	100
Automatic transmission	80
Auxiliary fuel jet	35
Auxiliary mixture jet	5.0

### 2E3 Carburettor data - 13SC engine

	Primary	Secondary
Venturi diameter	20 mm	24 mm
Main jet	X97.5	X112.5
Air correction jet	80	100
Emulsion tube code number	88	60
Partial load enrichment orifice	0.5 mm	-
Pre-atomiser diameter	8 mm	7 mm
Mixture outlet orifice	2.5 mm	3.0 mm
Idle fuel jet	37.5	-
Idle air jet	130	-
Full load enrichment jet	-	85 to 105
Automatic choke adjustment data:		
Choke valve pull-down gap	2.1 to 2.5 mm	
Fast idle speed	2400 to 2800 rpm	
Throttle valve fast idle gap	1.1 to 1.2 mm	
Accelerator pump delivery:		
Manual transmission	10.3 to 12.7 cc per 10 strokes	
Automatic transmission	7.8 to 10.2 cc per 10 strokes	
Float level	29 to 30 mm	

### 1B1 Carburettor data - 13NB engine

Venturi	25 mm
Air correction jet/emulsion tube	57.5/18
Main jet	X112.5
Auxiliary jet	42.5/155
Idle jet	47.5/147.5
Part-load enrichment:	
In housing	100
In adapter	0.3
Float level (not adjustable)	28.5 ± 1 mm
Throttle valve gap:	
Manual	0.55 to 0.65 mm
Automatic	0.70 to 0.80 mm
Choke valve gap	3.1 to 3.5 mm
Accelerator pump delivery	4.5 to 7.5 ml per 10 strokes
Fast idle speed	3500 to 3900 rpm

**2E3 Carburettor data - 14 NV engine**

	Primary	Secondary
Venturi diameter	20 mm	24 mm
Main jet	X95	X110
Air correction jet	117.5	90
Emulsion tube	103	51
Part load enrichment	0.55 mm	-
Idle fuel jet	45	-
Idle air jet	130	-
Full load enrichment jet	-	57.5 to 77.5
Check valve gap (see text):		
Vacuum, small	1.7 to 2.1 mm	
Vacuum, large	2.5 to 2.9 mm	
Mechanical (full throttle)	1.5 to 3.5 mm	
Throttle valve gap	0.8 to 0.9 mm	
Accelerator pump delivery	10.5 to 13.5 ml per stroke	
Float level	29 ± 1 m	
Fast idle speed	2200 to 2600 rpm	

**Varajet II Carburettor data - 16SH engine**

Fast idle speed:	
Manual gearbox	2050 to 2150 rpm
Automatic transmission	2250 to 2350 rpm
Choke valve gaps (see text):	
A	2.8 to 3.4 mm
B	2.3 to 2.8 mm
C	9.5 to 10.5 mm
Automatic choke cover adjustment	1 mark towards L
Float level	4.5 to 6.5 mm
Idle jet	0.65 mm
Primary main jet	204
Primary main jet needle	151
Secondary main jet	3.20 mm
Secondary main jet needle	2.20 mm (marked G)
Float needle valve diameter	1.93 mm

**2E3 Carburettor data - 16 SV engine**

	Primary	Secondary
Venturi diameter	20 mm	24 mm
Main jet	X95	X105
Air correction jet	110	80
Emulsion tube	88	51
Idle fuel jet	42.5	-
Idle air jet	132.5	-
Full load enrichment jet	-	85 to 105
Choke valve gap (see text):	<b>Manual</b>	<b>Automatic</b>
Vacuum, small	1.3 to 1.7 mm	1.4 to 1.8 mm
Vacuum, large	1.9 to 2.3 mm	2.0 to 2.4 mm
Mechanical (full throttle)	1.5 to 3.5 mm	3.0 to 5.0 mm
Throttle valve gap	0.8 mm	
Accelerator pump delivery:		
Manual	10.5 to 13.5 ml per 10 strokes	
Automatic	7.5 to 10.5 ml per 10 strokes	
Fast idle speed:		
Manual	2000 to 2400 rpm	
Automatic	2500 to 2900 rpm	

**Idle speed adjustment data**

Idle speed:	
All models with manual gearbox	900 to 950 rpm
All models with automatic transmission	800 to 850 rpm (in P)
CO level at idle	1.0 to 1.5%

**Recommended fuel grade**

Minimum octane rating (see Section 2):	
1.2 litre models:	
Vehicles up to February 1985	98 RON leaded (4-star) or 95 RON unleaded (unleaded premium)**
Vehicles from February 1985 onwards	98 RON leaded (4-star) or 95 RON unleaded (unleaded premium)*
1.3 litre models:	
13N and 13NB engines	91 RON leaded (4-star) or 95 RON unleaded (unleaded premium)
13SC engine	98 RON leaded (4-star) or 95 RON unleaded (unleaded premium)*

## 4A•4 Fuel and exhaust systems - Carburettor models

### Recommended fuel grade (Continued):

1.4 litre models	98 RON leaded (4-star) or 95 RON unleaded (unleaded premium)
1.6 litre models:	
16SH engines	98 RON leaded (4-star) or 95 RON unleaded (unleaded premium)*
16SV engines	98 RON leaded (4-star) or 95 RON unleaded (unleaded premium)***

\*If the ignition timing is retarded by 3°, 95 RON unleaded (unleaded premium) petrol can be used (see Chapter 5 for details)

\*\*After 5 tankfuls of unleaded fuel, one tankful of leaded fuel **must** be used

\*\*\*If the octane rating plug is position correctly, 95 RON unleaded (unleaded premium) petrol can be used (see Section 2 for details)

### Torque wrench settings

	Nm	lbf ft
Inlet manifold nuts or bolts:		
1.2 litre models	23	17
1.3 and 1.4 litre models	20	15
1.6 litre models	22	16
Carburettor securing nuts:		
1.2 litre models	18	13
1.3 and 1.4 litre models	20	15
1.6 litre models	15	11
Fuel pump to camshaft housing:		
1.3 and 1.4 litre models	20	15
1.6 litre models	15	11

## 1 General information

The fuel system consists of a fuel tank mounted under the rear of the car, a mechanical fuel pump and a carburettor. The fuel pump is operated by an eccentric on the camshaft and is mounted on the rear of the cylinder head. The air cleaner contains a disposable paper filter element and incorporates a flap valve air temperature control system which allows cold air from the outside of the car and warm air from the exhaust manifold to enter the air cleaner in the correct proportions.

The fuel pump lifts fuel from the fuel tank via a filter and supplies it to the carburettor. Excess fuel is returned from the anti-percolation chamber to the fuel tank.



**Warning:** Many of the procedures in this Chapter require the removal of fuel lines and connections which may result in some fuel spillage.

**Before carrying out any operation on the fuel system refer to the precautions given in Safety first! at the beginning of this Manual and follow them implicitly. Petrol is a highly dangerous and volatile liquid and the precautions necessary when handling it cannot be overstressed.**

## 2 Unleaded petrol - general information and usage

**Note:** The information given in this Chapter is correct at the time of writing and applies only to petrols currently available in the UK. If updated information is thought to be required check with a Vauxhall dealer. If travelling abroad consult one of the motoring organisations (or a similar authority) for advice on the petrols available and their suitability for your vehicle.

1 The fuel recommended by Vauxhall is

shown in the Specifications, followed by the equivalent petrol currently on sale in the UK.

2 RON and MON are different testing standards; RON stands for Research Octane Number (also written as RM), while MON stands for Motor Octane Number.

3 If it is wished to run the vehicle on 95 (RON) unleaded petrol the following operations **must** first be carried out; this is necessary to avoid detonation (knocking and pinking) which could lead to possible engine damage.

### 1.2 litre models

4 On 1.2 litre models produced prior to February 1985, unleaded fuel can be used in these models but note that to every five tankfuls of unleaded fuel used, one tankful of leaded fuel must also be used.

5 On later models, to allow the vehicle to run on 95 (RON) unleaded petrol, the ignition timing **must** be retarded by 3° (see Chapter 5 for details). Do not use 95 (RON) unleaded petrol if the ignition timing has not been retarded.

### 1.3 litre models

6 On models with 13N and 13NB engines, 95 (RON) unleaded fuel can be used without any modifications.

7 On models with a 13SC engine, to allow the vehicle to run on 95 (RON) unleaded petrol, the ignition timing **must** be retarded by 3° (see Chapter 5 for details). Do not use 95 (RON) unleaded petrol if the ignition timing has not been retarded.

### 1.4 litre models

8 All models can be run on 95 (RON) unleaded fuel can be used without modification.

### 1.6 litre models

9 On models with a 16SH engine, to allow the vehicle to run on 95 (RON) unleaded petrol, the ignition timing **must** be retarded by 3° (see

Chapter 5 for details). Do not use 95 (RON) unleaded petrol if the ignition timing has not been retarded.

10 Later models with a 16SV engine have a fuel octane rating coding plug in the ignition system wiring harness (see illustration). The plug which is located on the right-hand side of the engine compartment, is set during production to give optimum engine output and efficiency when run on 98 (RON) fuel. To run the vehicle on 95 (RON) unleaded fuel, make sure the plug is set to the "95" position (95 should be visible on the side of the plug). To reset the plug, release its locking clip then remove the plug and rotate it through half a turn (180°) before reconnecting it. **Note:** *After making the adjustment, the octane rating of the fuel used is found to be so low that excessive knocking still occurs, seek the advice of your Vauxhall dealer.*

## 3 Air cleaner housing - removal and refitting



### Removal

- 1 Remove the centre retaining nut or bolt or the three screws from the air cleaner cover.
- 2 Lift the air cleaner off the carburettor,



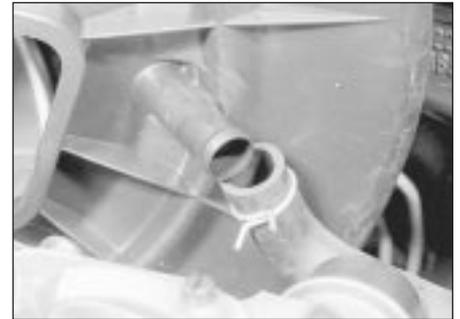
2.10 Octane plug in the "95" position - later 1.6 litre models



3.2a Hot air pick-up tube (arrowed) engages with air cleaner



3.2b Air cleaner vacuum hose connection



3.2c Air cleaner hose connection

disengaging the hot air pick-up from the manifold shroud (where necessary), together with the breather and vacuum hoses (see illustrations).

### Refitting

3 Refit by reversing the removal operations, making sure that the gasket or sealing ring is in place on the carburettor.

## 4 Air cleaner air temperature control system - general information

### 1.2 litre models

1 Inlet air pre-heating is controlled manually by a flap valve located in the side of air cleaner casing. The valve can be set in any one of three positions according to seasonal operating temperature as shown in the following table.

*Summer position - above 10°C*

*Intermediate position - 10°C to -5°C*

*Winter position - below -5°C*

2 In terms of fuel economy the engine will run most efficiently with the valve set in the summer position and least efficiently in the winter position. Providing the engine is running smoothly, and accelerates evenly, the summer position may be retained down to 0°C. If roughness or hesitation occurs, move the flap valve to the next position.

3 The three positions are shown on the air cleaner cover. In the winter position only hot air from the hot air box on the exhaust manifold enters the air cleaner. In the summer position only cold from the air cleaner inlet spout enters. In the intermediate position a blended supply from both sources enters the air cleaner.

### 1.3, 1.4 and 1.6 litre models

4 A thermostatically controlled air cleaner is used to regulate the temperature of the air entering the carburettor according to ambient temperatures and engine load. The air cleaner has two sources of supply, through the normal inlet spout (cold air) or from a hot air box mounted on the exhaust manifold (hot air).

5 The airflow through the air cleaner is controlled by a flap valve in the air cleaner spout, which covers or exposes the hot or

cold air ports according to temperature and manifold vacuum.

6 A vacuum motor operates the flap valve and holds it fully open when the temperature in the air cleaner is below a predetermined level. As the air inlet temperature rises the vacuum motor opens or closes the flap valve dependent entirely on manifold vacuum. Thus, during light or constant throttle applications, the flap valve will remain open, supplying the carburettor with hot air, and will close under heavy throttle application so that only cold air enters the carburettor.

7 As the temperature in the air cleaner rises further the vacuum motor closes the flap valve therefore allowing only cold air to enter the carburettor under all operating conditions.

8 The vacuum motor is operated by vacuum created in the inlet manifold and is controlled by a temperature sensing unit located inside the air cleaner.

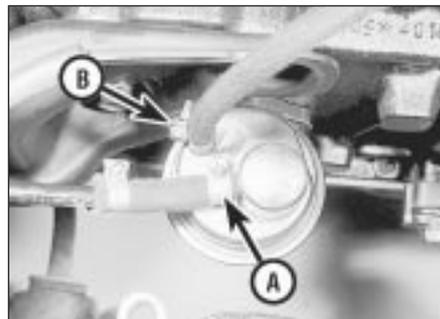
## 5 Fuel pump - testing, removal and refitting



**Note:** Refer to the warning note in Section 1 before proceeding.

### Testing

1 To test the fuel pump on the engine, disconnect the outlet pipe which leads to the carburettor, and hold a wad of rag over the pump outlet while an assistant spins the engine on the starter. *Keep the hands away from the electric cooling fan.* Regular spurts of fuel should be ejected as the engine turns.



5.4 Fuel inlet (A) and outlet (B) hose connections - typical

2 The pump can also be tested by removing it. With the pump outlet pipe disconnected but the inlet pipe still connected, hold a wad of rag by the outlet. Operate the pump lever by hand, moving it in and out; if the pump is in good condition the lever should move and return smoothly and a strong jet of fuel ejected.

### Removal

3 Disconnect the battery earth lead.

4 Mark the pump inlet and outlet hoses, for identification purposes then slacken both retaining clips (see illustration). Place wads of rag beneath the hose unions to catch any spilled fuel then disconnect both hoses from the pump and plug the hose ends to minimise fuel loss.

5 Remove the pump retaining nuts or bolts and washers and withdraw the pump from the engine. Recover the spacer and (where necessary) the gaskets on either side of it (see illustration).

### Refitting

6 Refitting is a reversal of removal, but use new flange joint gaskets (where necessary).

## 6 Fuel tank sender unit - removal and refitting



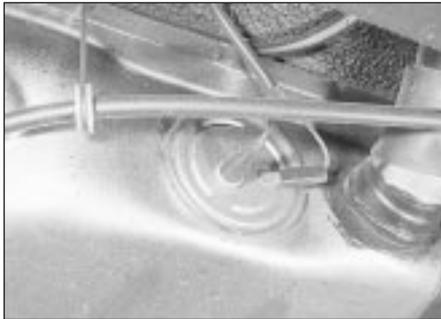
**Note:** Refer to the warning note in Section 1 before proceeding.

### Removal

1 Proceed as described in Section 7, paragraphs 1 to 3.



5.5 Removing the fuel pump (1.3 litre engine shown)



6.2 Fuel gauge sender unit (screw-fit sender unit)

2 Disconnect the electrical leads from the sender unit (see illustration).

3 To remove the sender unit, either engage a flat piece of steel as a lever between two of the raised tabs on the sender unit and turn it anti-clockwise to release it, or undo the retaining bolts (as applicable) (see illustration).

4 Withdraw the sender unit carefully to avoid bending the float arm. Recover the sealing ring.

### Refitting

5 Refit in the reverse order to removal, using a new sealing ring if necessary.

## 7 Fuel tank - removal and refitting

**Note:** Refer to the warning note in Section 1 before proceeding.

### Removal

1 Disconnect the battery negative lead cap. Remove the fuel tank filler cap.

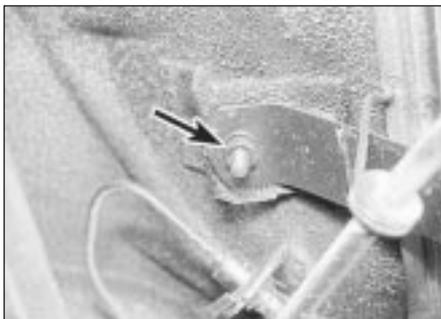
2 A drain plug is not provided and it will therefore be necessary to syphon or hand pump all the fuel from the tank before removal.

3 Having emptied the tank, jack up the rear of the car and support it on axle stands (see "Jacking and Vehicle Support").

### Hatchback and Saloon models

4 Remove the exhaust system as described in Section 27.

5 Measure and record the length of exposed



7.12 One of the fuel tank retaining strap nuts (arrowed)



6.3 Fuel gauge sender unit secured by bolts

thread protruding through the handbrake cable adjusting locknut at the compensating yoke on the rear axle.

6 Hold the cable with pliers or a spanner, unscrew the adjusting nut and remove the cable end from the yoke.

7 Remove the retainer and detach the cable from the connecting link located just to the rear of the handbrake lever rod.

8 Detach the cable from its retainers on the fuel tank and underbody and move it clear of the tank.

9 Disconnect the two electrical leads from the fuel gauge sender unit.

10 Remove the single bolt which secures the fuel filler pipe to the underbody.

11 Slacken the hose clips and disconnect the filler pipe from the tank neck (see illustration). Unclip the vent hose.

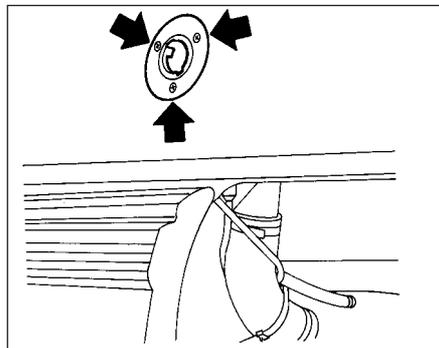
12 Support the tank with a jack and suitable blocks of wood, or have an assistant hold it up, then undo the two retaining strap nuts (see illustration).

13 Pivot the straps out of the way of the tank

14 Lower the tank slightly and, when sufficient clearance exists, disconnect the overflow and vent hoses from the top of the tank

15 Lower the tank fully and slide it out from under the car.

16 If the tank is contaminated with sediment or water, remove the sender unit and swill out the tank with clean fuel. If the tank is damaged, or leaks, it should be repaired by a competent specialist or renewed. **Do not** attempt to solder or weld a fuel tank yourself.



7.17 Fuel filler pipe retaining screws - Estate model



7.11 Fuel tank filler pipe-to-neck junction

### Estate and Van

17 The procedure is similar to that just described, but note the following points:

- a) The fuel filler pipe must be unscrewed from the rear quarter panel (see illustration).
- b) There is no need to disconnect the handbrake cable or to remove the exhaust system.

### Refitting

18 Refit in the reverse order to removal. Renew hoses, clips etc as necessary, and adjust the handbrake on completion, as described in Chapter 1.

## 8 Accelerator cable - removal, refitting and adjustment

### Removal

1 Remove the air cleaner as described in Section 3.

2 Extract the spring clip (when fitted) and disconnect the cable ball end from the carburettor throttle lever (see illustration).

3 Slide the cable outer bush out of the support bracket on the carburettor (see illustration).

4 Inside the car, release the cable from the 'keyhole' fitting on the pedal by easing back the spring and prising the cable end out of the slot.

5 Release the grommet from the bulkhead and pull the cable into the engine compartment.



8.2 Accelerator cable ball and spring clip



8.3 Accelerator cable bracket and bush

**Refitting**

6 Refit in the reverse order to removal.

**Adjustment**

7 Adjust the cable, by selecting the appropriate position of the spring clip behind the cable outer bush, to give a small amount of free play in the inner cable when the pedal is released. On 1.3 litre models with 13NB engine, make sure that with the choke control pushed fully home there is a small clearance between the fast idle adjuster screw and the choke cam plate (see illustration).

**9 Accelerator pedal - removal and refitting**

**Removal**

- 1 If necessary, remove the under-dash trim on the driver's side to improve access.
- 2 Disconnect the accelerator cable from the pedal, as described in Section 8.
- 3 Prise the spring clip off the end of the accelerator pivot. Remove the pedal, recovering any spacers, washers, bushes etc, and unhooking the pedal return spring.

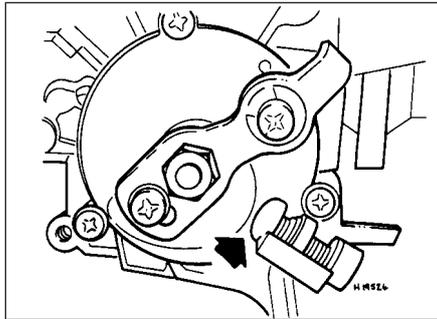
**Refitting**

4 Refit in the reverse order to removal. Adjust the accelerator cable if necessary on completion, as described in Section 8.

**10 Choke cable - removal, refitting and adjustment**

**Removal**

- 1 Disconnect the battery earth lead.
- 2 Tap out the small pin which secures the choke control knob to the cable end fitting. Unscrew and remove the knob.
- 3 Undo the retaining ring or nut which secures the choke control to the facia. Push the control into the facia and disconnect the warning light switch (when fitted).
- 4 Remove the air cleaner, as described in Section 3.
- 5 Disconnect the choke inner and outer cable from the carburettor (see illustration). On some carburettors the inner cable is secured



8.7 Accelerator cable adjustment to provide clearance at point arrowed

by a grub screw which must be undone with an Allen key.

6 Release the bulkhead grommet and remove the cable.

**Refitting**

7 Refit in the reverse order to removal, adjusting the cable as follows.

**Adjustment**

8 Adjust the positions of the inner and outer cables at the carburettor so that, with the control knob pushed home, there is a small amount of slack in the inner cable. Secure the cable in position then operate the choke control knob and check that the choke linkage opens fully.

**11 Carburettor - description**

- 1 Several types and makes of carburettor are fitted to the vehicles covered by this manual. All are of the downdraught type.
- 2 The 32 TL carburettor fitted to the 1.2 engine is a fixed jet, single barrel instrument. The 35 PDSI and 1B1 fitted to low compression versions of the 1.3 engine are similar.
- 3 The 2E3 carburettor fitted to normal compression versions of the 1.3 engine is a fixed jet, twin barrel instrument. Opening of the throttle valves is sequential; the primary throttle valve is opened mechanically, but the secondary throttle valve is opened by vacuum developed in both venturis. Primary and secondary transition systems, and a part load



10.5 Choke cable inner clamp screw (arrowed)

enrichment valve, ensure efficient operation under all speed and load conditions.

4 The GM Varajet II carburettor fitted to 1.6 models is also a twin barrel type, but the main fuel jet is controlled by a tapered needle valve. The design is well proven and has been used on several earlier models.

5 All carburettors have a bypass system for providing idle mixture, and an accelerator pump for mixture enrichment when the throttle is opened rapidly.

6 When an automatic choke is fitted, the choke cover is heated electrically when the engine is running; as the cover warms up, the choke is released. On the 2E3 carburettor the choke cover is also heated by engine coolant. Both types of automatic choke need to be 'primed' by depressing and releasing the accelerator pedal before starting the engine from cold.

**12 32 TL carburettor - adjustments**

*Note: Under normal operating conditions only the carburettor idle adjustments described in Chapter 1 will need attention. Checking and adjustment of the following settings is not a routine operation and should only be necessary after carburettor overhaul or if the operation of the carburettor is suspect.*

**Idle speed and mixture**

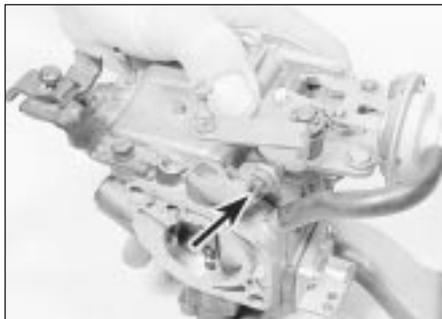
1 Refer to Chapter 1.

**Fast idle**

- 2 This operation may be carried out with the carburettor installed or removed. If the carburettor is removed, rotate the choke linkage on the side of the carburettor until the linkage arm is against its stop and the choke valve is fully closed.
- 3 With the linkage held in this position a small drill bit, of diameter equal to the fast idle valve gap given in the Specifications, should just slide between the throttle valve and the carburettor barrel (see illustration).
- 4 If adjustment is necessary slacken the locknut on the fast idle adjusting screw (see illustration) and turn the screw as necessary to achieve the specified setting. Tighten the locknut after adjustment.



12.3 Using a drill bit to check the fast idle gap



12.4 Fast idle adjusting screw (arrowed)

5 If the carburettor is in the car, first allow the engine to reach normal operating temperature and then if necessary adjust the idle speed, as described in Chapter 1. Also make sure that, when the choke knob is pulled fully out, the linkage rotates to the fully closed position with the linkage arm against its stop. If necessary adjust the choke cable (Section 10).

6 Connect a tachometer to the engine in accordance with the manufacturer's instructions.

7 Start the engine and, with the choke knob pulled fully out, compare the engine speed with the fast idle speed setting given in the Specifications. If adjustment is necessary slacken the locknut and turn the fast idle adjusting screw to achieve the specified speed. Tighten the locknut after adjustment.

8 Switch off the engine and disconnect the tachometer.

### Choke valve gap

9 Run the engine until normal operating temperature is reached and then switch off and remove the air cleaner.

10 Pull the choke knob fully out and check that the linkage rotates to the fully closed position with the linkage arm against its stop. If necessary adjust the choke cable (Section 10).

11 With the choke knob still pulled out, start the engine and check that a drill of diameter equal to the choke valve gap dimension will just slide between the valve and choke barrel. If necessary slacken the locknut and turn the adjusting screw above the vacuum unit until the correct gap is achieved (see illustrations).

12 Switch off the engine, tighten the locknut and refit the air cleaner.

### Accelerator pump delivery

13 With the carburettor installed, and the air cleaner removed, start the engine and allow it to idle for a few seconds, then switch it off.

14 Look down the carburettor barrel and open the throttle by hand. As the throttle is opened, a squirt of petrol should emerge from the accelerator pump jet. If no petrol is delivered, the pump is faulty or the jet is blocked.

15 The above check only serves to show whether or not the pump is working. For an accurate check, the carburettor must be removed.



12.11a Using a drill bit to check the choke valve gap

16 With the carburettor assembled and the float chamber full of fuel, place the carburettor over a measuring cylinder. Take appropriate fire precautions.

17 Operate the throttle over its full stroke 10 times, taking about 3 seconds per stroke. Catch the fuel delivered by the pump in the measuring cylinder. The desired delivery is given in the Specifications. No adjustment is possible: cleaning or renewal of the pump components will be necessary if the delivery is incorrect.

### 13 35 PDSI carburettor - adjustments



*Note: Under normal operating conditions only the carburettor idle adjustments described in Chapter 1 will need attention. Checking and adjustment of the following settings is not a routine operation and should only be necessary after carburettor overhaul or if the operation of the carburettor is suspect.*

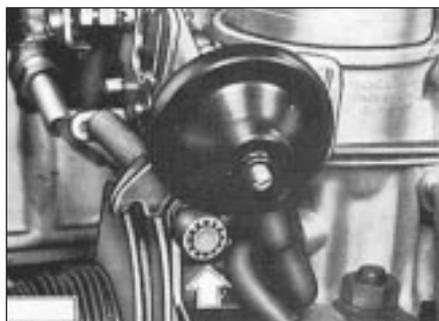
#### Idle speed and mixture

1 Refer to Chapter 1

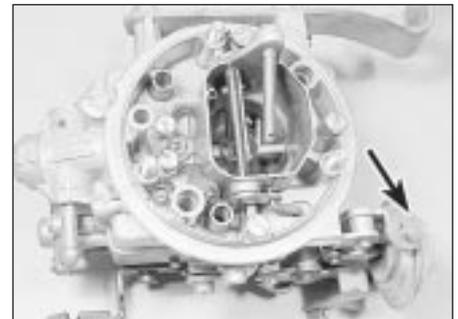
#### Fast idle

2 The fast idle system comes into play when the choke control is operated. It is adjusted by a screw which acts on the throttle spindle lever (see illustration).

3 Adjustment is correct when, with the choke control pushed in and the throttle released, the end of the screw is just in contact with the lever.



13.2 Fast idle adjustment screw (arrowed)



12.11b Choke valve gap adjusting screw (arrowed)

### Accelerator pump delivery

4 The stroke of the accelerator pump can be adjusted by turning a nut on the end of the pump operating rod. The desired delivery is given in the Specifications.

5 Apart from the above points, the procedure is described in Section 12, paragraphs 13 to 17.

6 Check that the stream of fuel ejected from the accelerator pump delivery tube hits the throttle valve shaft. Adjust if necessary by careful bending of the delivery tube.

### 14 1B1 carburettor - adjustments



*Note: Under normal operating conditions only the carburettor idle adjustments described in Chapter 1 will need attention. Checking and adjustment of the following settings is not a routine operation and should only be necessary after carburettor overhaul or if the operation of the carburettor is suspect.*

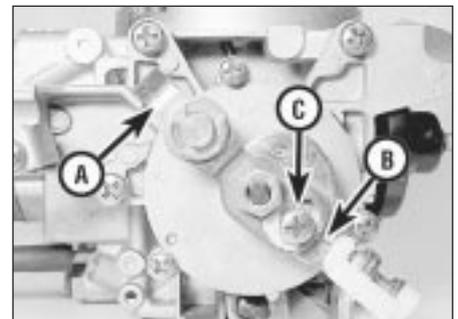
#### Idle speed and mixture

1 Refer to Chapter 1.

#### Fast idle

2 Bring the engine to normal operating temperature and connect a tachometer (rev counter) to it. Stop the engine.

3 Pull the choke control fully out. Check that the choke lever on the carburettor is resting against its stop, and that the index notch on the cam plate is aligned with the mark on the adjuster screw (see illustration). Slacken the



14.3 Fast idle adjustment

1 Lever against stop 3 Cam plate screw  
2 Index notch



14.4 Removing the tamperproof cap from the fast idle adjustment screw

screw on the cam plate if necessary and correct the alignment, then retighten the screw.

4 Start the engine without touching the throttle. With the choke valve fully open, the fast idle speed should be as given in the Specifications. If adjustment is necessary, remove the tamperproof cap and turn the adjustment screw until the speed is correct (see illustration).

#### Choke unit cover

5 The index notches on the cover and carburettor housing must align (see illustration). Slacken the cover clamp screws if necessary to adjust, then retighten the screws.

6 If the choke cover is removed for any reason, ensure when refitting that the opening lever is positioned to the left of the drive lever (see illustration).



14.5 Notches on choke cover and carburettor housing (arrowed) aligned

#### Vacuum pull-down unit

7 If suspected of malfunction this unit can be checked using a hand vacuum pump and gauge. Disconnect the vacuum hose from the throttle body and connect the vacuum pump. Apply vacuum to the pull-down unit; if the vacuum drops, the unit is leaking and must be renewed.

#### Choke valve gap

8 Refer to Section 12, paragraphs 9 to 12 noting the adjustment and measurement points are shown here (see illustrations). Lock the screw with paint on completion.

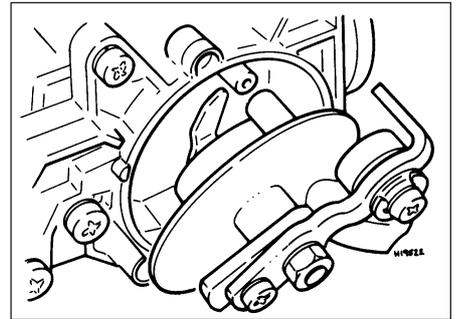
#### Throttle valve basic adjustment

9 This requires special measuring equipment and must be left to a Vauxhall dealer or a carburettor specialist.

#### Accelerator pump delivery

10 A rough check may be made without removing the carburettor as follows. Remove the air cleaner and run the engine for a few seconds, then switch it off. Look into the carburettor venturi and open the throttle fully by hand. As the throttle is opened, a clean double jet of fuel should be seen spraying from the delivery tube. If not, remove the carburettor and make further checks as follows.

11 Refer to Section 15, paragraphs 20 to 23 for the procedure noting that the adjustment point is as shown (see illustration).



14.6 Position choke cover with opening lever to the left of drive lever

### 15 2E3 carburettor - adjustments



**Note:** Under normal operating conditions only the carburettor idle adjustments described in Chapter 1 will need attention. Checking and adjustment of the following settings is not a routine operation and should only be necessary after carburettor overhaul or if the operation of the carburettor is suspect.

#### Adjustments with carburettor fitted

##### Idle speed and mixture

1 Refer to Chapter 1.

##### Fast idle

2 The engine must be at operating temperature and the idle speed and mixture must be correctly adjusted. Remove the air cleaner to improve access.

3 Position the fast idle adjustment screw on the second highest step of the fast idle cam. Connect a tachometer to the engine. Make sure that the choke plate is fully open.

4 Start the engine without touching the throttle pedal and compare the engine speed with that given in Specifications. If adjustment is necessary, remove the tamperproof cap from the head of the fast idle screw by crushing it with pliers and adjust by means of the screw (see illustration).

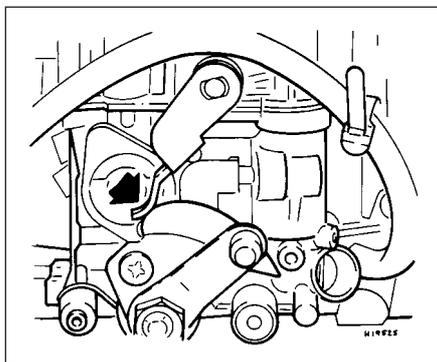
5 When adjustment is correct, stop the engine and disconnect the tachometer. Fit a new tamperproof cap where this is required by law.



14.8a Choke valve gap adjustment screw (arrowed)



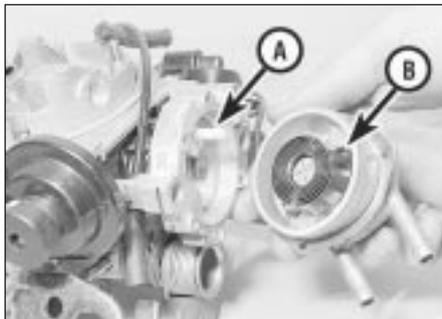
14.8b Measuring the choke valve gap using a twist drill



14.11 Accelerator pump adjustment point  
Loosen clamp screw (under arrow) and rotate the cam plate



15.4 Fast idle adjustment screw under tamperproof cap (arrowed)



15.7 Choke drive lever (A) engages with loop (B)

**Choke pull-down**

**Note:** This adjustment can also be done with the carburettor removed.

6 Remove the air cleaner.

7 Remove the choke cover by removing the three screws and the securing ring. There is no need to disconnect the coolant hoses, just move the cover aside. Notice how the loop in the end of the bi-metallic spring engages in the choke drive lever (see illustration).

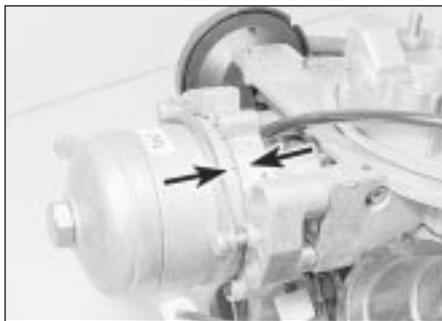
8 Move the choke drive lever to close the choke valve completely. Position the fast idle screw on the highest step of the cam.

**1.3 litre models**

9 Apply vacuum to the choke pull-down unit (at the hose nearest the carburettor body) using a modified hand pump or by making a connection with a rubber hose or plastic tube between the choke vacuum unit of the carburettor and the inlet manifold of another vehicle (engine running). Apply light pressure to the choke drive lever in a clockwise direction (as if to close the choke valve) and check the choke valve gap by inserting a gauge rod or twist drill of the specified size. If adjustment is necessary, turn the adjusting screw on the side of the choke housing (see illustrations).

**1.4 and 1.6 litre models**

10 Disconnect both vacuum hoses from the pull-down unit then, using a small screwdriver, press in the pull-down arm adjusting screw (see illustration 15.9b) until some resistance is felt. In this position the choke valve gap should correspond to the value given in the Specifications for the 'small' gap. Adjust if necessary by turning the screw on the pull-down unit.



15.12 Choke cover alignment marks (arrowed)



15.9a Checking the choke pull-down gap. Apply vacuum to hose arrowed



15.9b Choke pull-down adjusting screw

11 Press in the screw further until the arm moves to its stop. In this position the choke valve gap should correspond to the value specified for the 'large' gap. Adjust if necessary by turning the arm adjusting screw.

**All models**

12 Refit the choke cover, making sure that the spring loop engages in the choke drive lever. Align the notches in the choke cover and choke housing when tightening the screws (see illustration).

**Throttle damper adjustment - automatic transmission models**

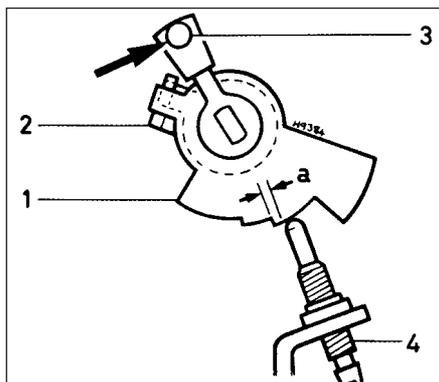
13 To adjust the damper, slacken the locknut and screw the damper in or out until there is a clearance of 0.05 mm between the end of the damper and the throttle lever. From this position, screw the damper towards the throttle lever by 2½ turns, then secure it with the locknut.

**Adjustments with carburettor removed**

**Fast idle cam position**

14 The choke pull-down adjustment previously described must be correct. If not already done, remove the choke cover.

15 Open the throttle, then close the choke valve by light finger pressure on the choke drive lever. Release the throttle.



15.16 Fast idle cam adjustment

- |                     |                                      |
|---------------------|--------------------------------------|
| 1 Fast idle cam     | 4 Fast idle adjustment screw         |
| 2 Adjustment lever  | $a = 0.2 \text{ to } 0.8 \text{ mm}$ |
| 3 Choke drive lever | $(0.08 \text{ to } 0.32 \text{ in})$ |
- (press in direction arrowed)

16 Check that the fast idle adjustment screw is resting on the second highest step of the fast idle cam, in the position shown (see illustration). If not, first check that the choke return spring is correctly positioned. then adjust by bending the lever 2.

17 Refit and secure the choke cover, observing the alignment marks.

**Throttle valve fast idle gap**

18 Position the fast idle adjustment screw on the highest step of the fast idle cam.

19 Use a gauge rod or twist drill of the specified diameter to measure the opening of the primary throttle valve. Adjust if necessary at the fast idle adjustment screw. (This is a preliminary adjustment; final adjustment of the fast idle speed should take place with the engine running.)

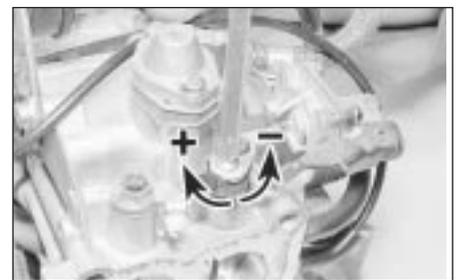
**Accelerator pump delivery**

20 It will be necessary to feed the float chamber with fuel from a small reservoir during this test. Take all necessary fire precautions when dealing with fuel and fuel vapour.

21 Position the primary barrel over an accurate measuring glass. Fully open and close the throttle ten times, taking approximately one second for each opening and pausing for three seconds after each return stroke. Make sure that the fast idle cam is not restricting throttle travel at either end.

22 Measure the quantity of fuel delivered and compare it with the specified value.

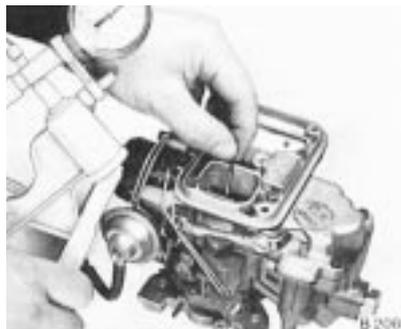
23 If adjustment is necessary, release the clamp screw and turn the cam plate in the desired direction (see illustration). Tighten the clamp screw and recheck the pump delivery.



15.23 Accelerator pump delivery adjustment: + to increase, - to decrease

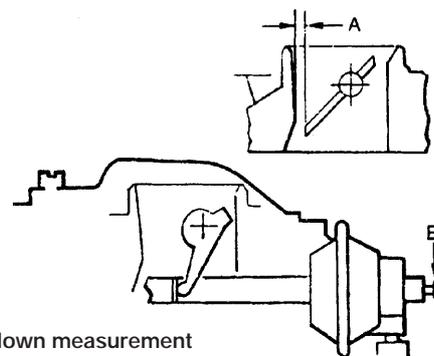


16.4 Fast idle screw (arrowed) positioned on cam second highest step



16.10 Choke pull-down measurement

A See Specifications (Choke valve gap A)



B Adjustment screw

## 16 Varajet II carburettor - adjustments



**Note:** Under normal operating conditions only the carburettor idle adjustments described in Chapter 1 will need attention. Checking and adjustment of the following settings is not a routine operation and should only be necessary after carburettor overhaul or if the operation of the carburettor is suspect.

### Automatic choke carburettor

#### Idle speed and mixture

1 Refer to Chapter 1.

#### Fast idle speed

2 The engine must be at operating temperature and normal idle adjustments must be correct. The air cleaner must be removed and its vacuum hose plugged.

3 Connect a tachometer to the engine.

4 Slightly open the throttle valve plate so that the fast idle adjusting screw can be positioned on the second step of the cam (see illustration).

5 Start the engine without touching the accelerator. The engine speed should be as specified; if not, turn the fast idle adjusting screw as necessary.

#### Choke pull-down (gap A)

6 In order to be able to carry out this adjustment, a suitable vacuum pump must be available. It is possible to create sufficient vacuum using a modified hand pump or by making a connection with a rubber hose or plastic tube between the choke vacuum unit of the carburettor and the inlet manifold of another vehicle (engine running).

7 Remove the air cleaner.

8 Position the fast idle screw on the uppermost step of the cam. Check that the choke valve plate is fully closed. This may not be the case if the choke cover is still warm, in which case use a rubber band to close it.

9 Apply vacuum to the choke vacuum unit as described in paragraph 6.

10 Measure the gap A between the edge of the choke valve plate and the wall of the carburettor. Measure at the flatter side of the

valve plate. A twist drill or similar should be used as a gauge (see illustration). The gap should be as specified.

11 If necessary, turn the screw B to bring the gap to the specified clearance. If the gap was found to be too small, it will probably be necessary to bend the pullrod slightly to provide sufficient clearance for movement of the adjustment screw.

12 On completion of adjustment, lock the adjustment screw with a drop of suitable sealant.

13 Now check the play between the baffle flap lever and the pullrod with the vacuum source still connected so that the pullrod is in the fully extended position (see illustration). The clearance A must be as shown. Where necessary, bend the end of the pullrod to bring the clearance within tolerance.

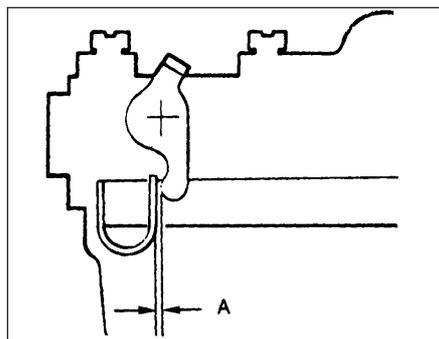
#### Choke fast idle (gap B)

14 Close the choke valve with a rubber band.

15 Open the throttle and position the fast idle screw on the second highest step of the fast idle cam. Release the throttle and check that the screw stays on the step.

16 Open the choke valve slightly and release it in order to let it find its correct position. Check the choke valve gap B by the same method as when checking the pull-down gap.

17 If adjustment is necessary, remove the carburettor and take off the choke cover. Bend the rod which connects the fast idle cam to the choke valve lever until the gap is correct.



16.13 Baffle flap lever-to-pullrod clearance  
A = 0.1 to 0.3 mm

18 If adjustment has been necessary, recheck the pull-down gap after refitting the carburettor.

### Full throttle opening

19 Close the choke valve with a rubber band.

20 Open the throttle fully and hold it open while measuring the choke valve gap C.

21 If adjustment is necessary, carefully bend that part of the linkage shown (see illustration). Bend the tag to the right to increase the gap, to the left to decrease it.

### Automatic choke cover

22 The pointer on the choke housing cover should be set against the mark given in the Specifications. If there is a tendency to stall or hesitate during warm-up, it is permissible to turn the cover through one or two divisions towards R (rich). The clamp ring screws must be slackened to do this.

23 If the ignition is switched on with the engine cold (approx 20°C), the choke valve should open fully in three to four minutes. If a longer time is required, check the choke valve for free movement; renew the choke cover if the valve is free.

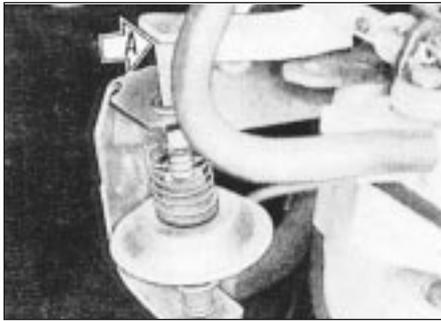
### Accelerator pump

24 With the engine at operating temperature and the accelerator released, no clearance should exist between the pump operating lever and the pump plunger.

25 Have an assistant depress the accelerator to its full extent and hold it there. Press the pump plunger with a screwdriver and check that it will move further downwards before resistance is encountered.



16.21 Full throttle opening adjustment - bend tang G to adjust choke gap



16.28 Carburettor throttle damper

A Damper pin      B Locknut

26 Bend the pump operating lever as necessary to achieve these conditions.

27 Check that when the pump plunger is depressed, a jet of fuel is delivered towards the inner venturi. If not, dismantle the carburettor. And clean or renew the pump components.

### Throttle damper adjustment (automatic transmission only)

28 Automatic transmission models are equipped with a throttle linkage damper, the purpose of which is to stop the throttle snapping shut suddenly when the pedal is released (see illustration).

29 Correct adjustment of the damper is carried out as follows. Release the damper locknut and unscrew the damper until the damper pin is only just touching the throttle lever. From this position, screw the damper back in between 3 and 4 complete turns, then secure with the locknut.

### Part load regulator screw adjustment

30 Problems such as jerking or hesitation at light throttle openings, or excessive fuel consumption despite moderate driving habits, may be due to incorrect adjustment of the part load regulator screw.

31 It is emphasised that this adjustment should not be attempted until all other possible causes of the problems mentioned have been investigated.

32 Remove the carburettor from the vehicle.

33 Prise out the metal plug covering the part load regulator screw (adjacent to the fuel inlet union).

34 If stalling or hesitation is the reason for adjustment - ie the mixture is too weak - turn the screw one-quarter turn anti-clockwise.

35 If excessive fuel consumption is the problem ie the mixture is too rich turn the screw one-quarter turn clockwise.

36 Refit the carburettor and test drive the vehicle to see if any improvement has occurred. If necessary a further adjustment can be made, but **do not** deviate from the original setting by more than half a turn of the screw.

37 Fit a new metal plug on completion, where this is required by law.

## Manual choke carburettor

### Idle speed and mixture

38 Refer to Chapter 1.

### Fast idle speed

39 The idle speed must be correct and the engine must be at operating temperature. Remove the air cleaner and plug its vacuum hose.

40 Pull out the choke until the mark on the fast idle cam is aligned with the tip of the fast idle adjustment screw (see illustration). Hold the choke valve plate open with a rubber band.

41 Connect a tachometer to the engine.

42 Start the engine and check the fast idle speed against that given in the Specifications. If adjustment is necessary, turn the fast idle adjustment screw; the tamperproof cap over the screw head may be removed by crushing it with pliers.

43 Switch off the engine when adjustment is correct. Fit a new tamperproof cap where this is required by law.

### Choke pull-down (gap A)

44 Remove the air cleaner.

45 Pull the choke control out fully. Apply vacuum to the choke vacuum unit, as described in paragraph 6. With the vacuum applied, measure gap A (see illustration 16.11 and Specifications). Correction is by means of the adjusting screw on the vacuum unit.

46 Check the clearance between the baffle flap lever and the pullrod, as described in paragraph 13.

### Other adjustments

47 Accelerator pump and part load regulator screw adjustments are as previously described for the automatic choke carburettor.

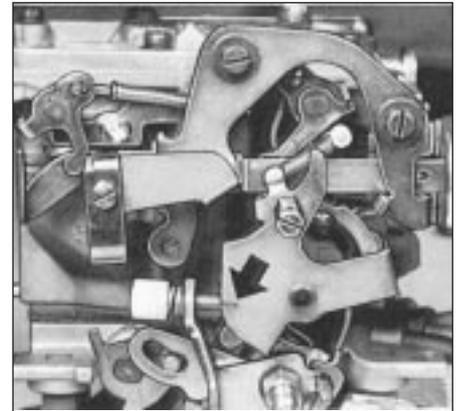
## 17 Idle cut-off solenoid - description and testing

1 Some of the carburettors described in this Chapter are fitted with an idle cut-off solenoid. This is an electrically-operated valve which interrupts the idle mixture circuit when the ignition is switched off, thus preventing the engine from running-on.

2 The idle cut-off solenoid is energised all the time that the ignition is switched on. A defective solenoid, or a break in its power supply, will cause the engine to stall or idle roughly, although it will run normally at speed.

3 If the operation of the solenoid is suspect, first check (using a 12 volt test lamp) that battery voltage is present at the solenoid terminal when the ignition is on.

4 With the solenoid unscrewed from the carburettor, connect the body of the solenoid to the negative terminal of a 12 volt battery. When the battery positive terminal is connected to the solenoid centre terminal,



16.40 Mark on the fast idle cam (arrowed) must be aligned with the tip of the screw

there should be an audible click and the needle at the tip of the solenoid should retract.

5 A defective idle cut-off solenoid must be renewed.

## 18 Carburettor - removal and refitting

**Note:** Refer to the warning note in Section 1 before proceeding.

### Removal

1 Disconnect the battery earth lead.

2 Remove the air cleaner, as described in Section 3.

3 Disconnect the choke cable (manual choke models) or the automatic choke electrical and/or coolant connections. Plug the coolant hoses to avoid spillage.

4 Disconnect the fuel supply hose from the carburettor or vapour separator. Be prepared for fuel spillage. On carburettors with a fuel return hose attached, disconnect that too. Plug the fuel hoses.

5 Disconnect the accelerator cable, as described in Section 8.

6 Disconnect the distributor vacuum hose.

7 Disconnect the idle cut-off solenoid wire (when fitted).

8 Disconnect any remaining hoses or wires, then remove the securing nuts and lift the carburettor off its studs. Recover the gasket.

### Refitting

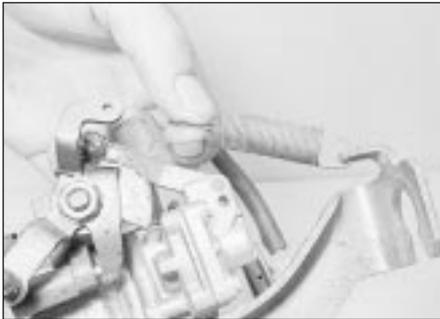
9 Refit in the reverse order to removal, noting the following.

a) Use a new gasket if the old one was damaged.

b) Adjust the accelerator cable and (when fitted) the choke cable, as described in Sections 8 and 10.

c) If coolant hoses were disturbed check the coolant level after running the engine and top-up if necessary.

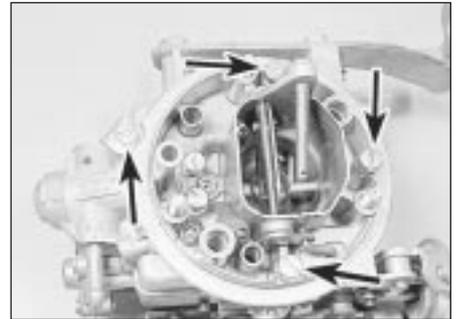
d) Adjust the idle speed and mixture, as described in Chapter 1.



19.3 Removing the throttle return spring



19.4 Disconnecting the vacuum hose



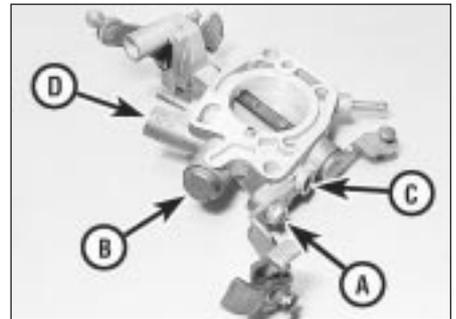
19.5a Four screws (arrowed) secure the carburettor cover to the float chamber housing



19.5b Separating the cover from the float chamber housing



19.6 Undo the screw (arrowed) to separate the throttle valve and float chamber housings



19.7 Throttle valve housing components support bracket screw (A), blanking plug (B), idle mixture screw (C) and idle speed screw (D)

### 19 32 TL carburettor - overhaul



**Note:** In the rare event of a complete carburettor overhaul being necessary, it may prove more economical to renew the carburettor as a complete unit. Check the price and availability of a replacement carburettor and of its component parts before starting work; note that most sealing washers, screws and gaskets are available in kits, as are some of the major sub-assemblies. In most cases it will be sufficient to dismantle the carburettor and to clean the jets and passages.

- 1 Remove the carburettor from the engine.
- 2 Clean the carburettor externally using a suitable cleaning solvent, or petrol in a well ventilated area. Wipe the carburettor dry with

a lint-free cloth and prepare a clean uncluttered working area.

3 Disconnect the throttle return spring from the linkage and the support bracket on the side of the carburettor (see illustration).

4 Disconnect the vacuum unit hose from the outlet on the throttle valve housing (see illustration).

5 Undo the four retaining screws and separate the carburettor cover from the float chamber housing (see illustrations).

6 At the base of the carburettor undo the single securing the throttle valve housing to the float chamber housing (see illustration). Separate the two housings.

7 Undo the screw securing the choke cable support bracket to the throttle valve housing and lift off the bracket. Undo the blanking plug

and remove the seal ring from the housing (see illustration).

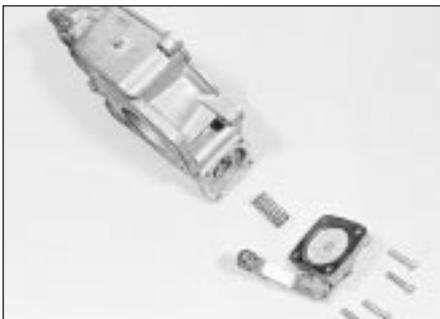
8 As a guide to refitting, count and record the number of turns necessary to screw the auxiliary idle mixture screw and the basic idle mixture screw fully into the housing. Now remove the two screws.

9 Undo the four screws and remove the accelerator pump cover, diaphragm, and spring from the float chamber housing (see illustration).

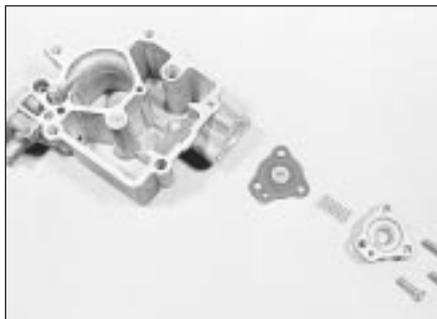
10 From the other side of the float chamber housing, undo the three screws and remove the enrichment valve cover, diaphragm and spring (see illustration).

11 Carefully withdraw the fuel discharge nozzle from the housing (see illustration).

12 Tap the float pivot pin out of the pivot



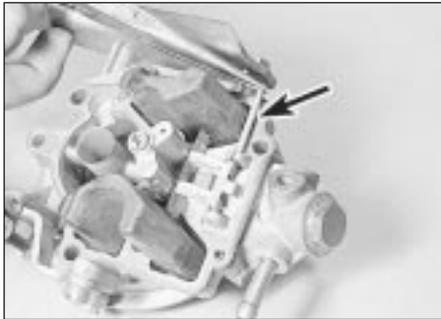
19.9 Accelerator pump components



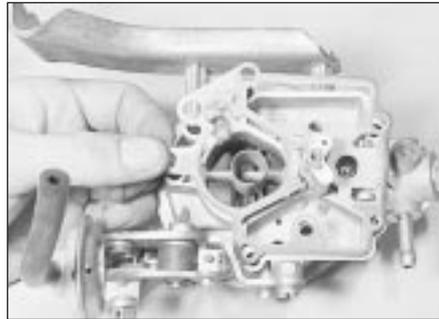
19.10 Enrichment valve components



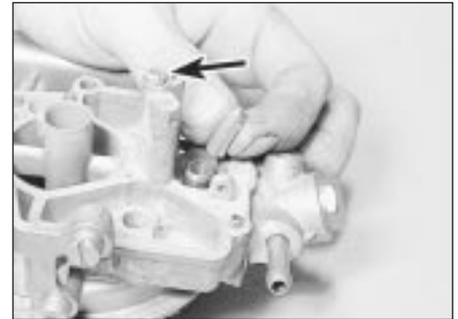
19.11 Removing the fuel discharge nozzle



19.12 Extracting the float pivot pin



19.13 Lift off the gasket



19.14 Removing the float needle valve.  
Main jet is arrowed

posts and withdraw the pin using long-nosed pliers (see illustration).

13 Lift out the float and then remove the gasket from the carburettor top cover (see illustration).

14 Lift out the float needle valve and then unscrew the main jet (see illustration).

15 Unscrew all the jets and plugs from the carburettor cover, making a careful note of their locations (see illustration). Remove the mixture tube from the air correction jet bore.

16 Withdraw the pre-atomiser from the top cover venturi (see illustration).

17 Undo the retaining plug and withdraw the fuel filter adjacent to the inlet hose connection on the top cover.

18 If necessary the choke valve operating linkage and vacuum unit can be removed from the top cover. Undo the three retaining screws and the retaining clips for the operating cam

and choke valve rod. Remove the cam and spring, disengage the operating rod from the cam and choke valve lever and withdraw the assembly (see illustration).

19 With the carburettor now dismantled, clean the components in petrol in a well ventilated area. Allow the parts to air dry.

20 Blow out all the jets and the passages in the housings using compressed air or a tyre foot pump. Never probe with wire.

21 Examine the choke and throttle valve spindles and linkages for wear or excessive side-play. If wear is apparent in these areas it is advisable to obtain an exchange carburettor.

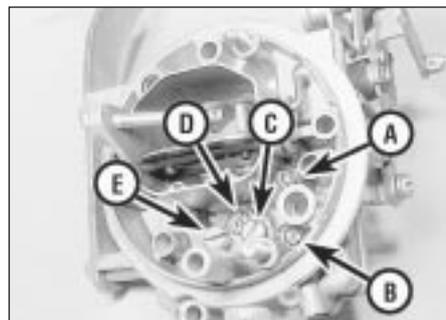
22 Check the diaphragms and renew them if they are punctured or show signs of deterioration.

23. Examine the float for signs of deterioration and shake it, listening for fuel inside. If so renew it, as it is leaking and will give an incorrect float level height causing flooding.

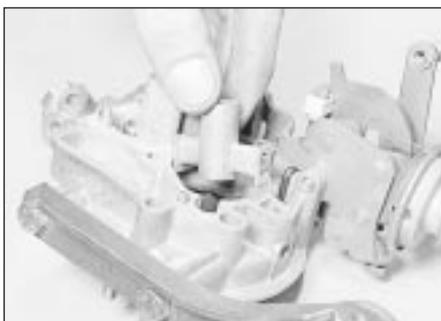
24 Blow through the float needle valve assembly while holding the needle valve closed, then open. Renew the valve if faulty, or as a matter of course if high mileages have been covered.

25 Obtain the new parts as necessary and also a carburettor repair kit which will contain a complete set of gaskets, washers and seals.

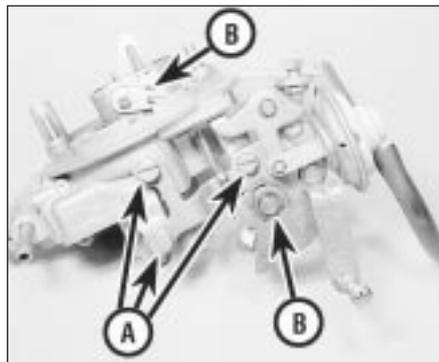
26 Reassemble the carburettor using the reverse of the dismantling procedures, but carry out the settings and adjustments described in Section 12 as the work progresses.



19.15 Plugs (A and B), idle jet (C), air correction jet (D) and auxiliary fuel/air jet (E) in carburettor cover



19.16 Removing the pre-atomiser



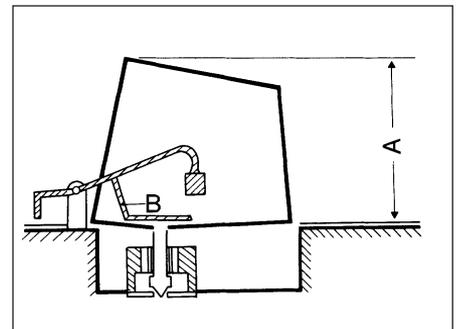
19.18 Choke linkage screws (A) and retaining clips (B)

## 20 35 PDSI carburettor - overhaul

**Note:** In the rare event of a complete carburettor overhaul being necessary, it may prove more economical to renew the carburettor as a complete unit. Check the price and availability of a replacement carburettor and of its component parts before starting work; note that most sealing washers, screws and gaskets are available in kits, as are some of the major sub-assemblies.

1 Major carburettor overhaul is not a routine operation and should only be carried out when components are obviously worn. Removing of the cover and mopping out the fuel and any sediment from the fuel bowl, and clearing the jets with compressed air is usually sufficient to keep a carburettor in good working order.

2 With the carburettor removed from the engine and cleaned externally, remove the clip which retains the fast idle rod to the lever on the choke valve plate spindle (see illustration).

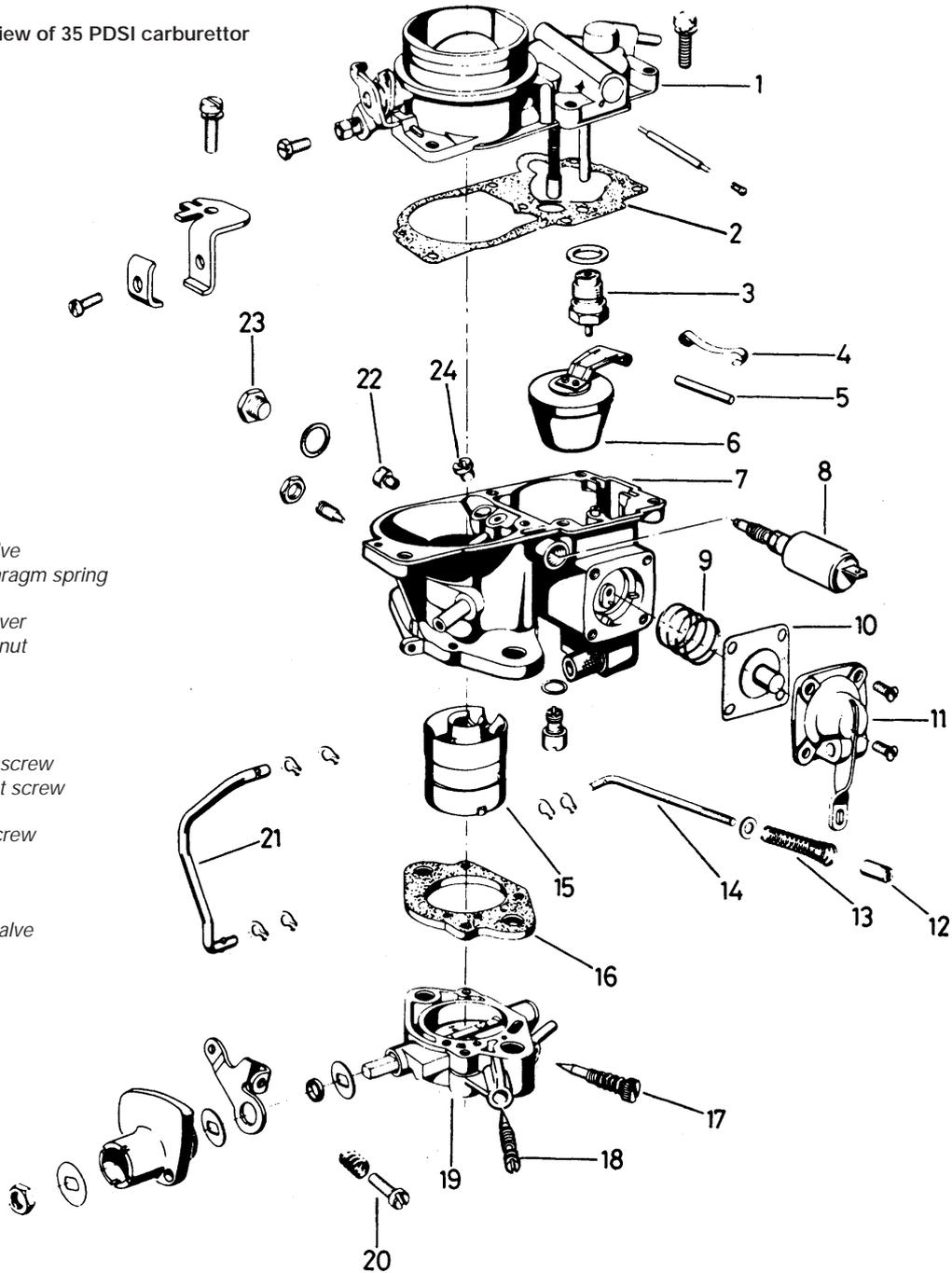


19.27 Float level measurement

A Measurement point  
B Bend here to adjust

20.2 Exploded view of 35 PDSI carburettor

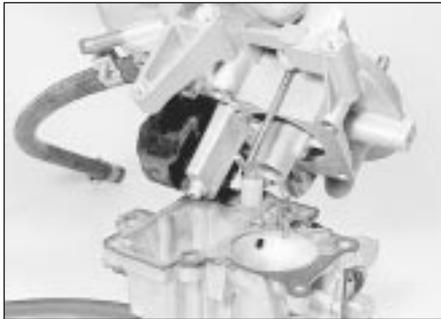
- 1 Cover
- 2 Gasket
- 3 Fuel inlet needle valve
- 4 Float pivot pin clip
- 5 Float pivot pin
- 6 Float
- 7 Body
- 8 Fuel cut-off solenoid valve
- 9 Accelerator pump diaphragm spring
- 10 Diaphragm
- 11 Diaphragm housing cover
- 12 Accelerator pump rod nut
- 13 Spring
- 14 Accelerator pump rod
- 15 Venturi
- 16 Gasket
- 17 Idle speed adjustment screw
- 18 Idle mixture adjustment screw
- 19 Throttle valve block
- 20 Fast idle adjustment screw
- 21 Fast idle link rod
- 22 Main jet
- 23 Main jet plug
- 24 Part load enrichment valve



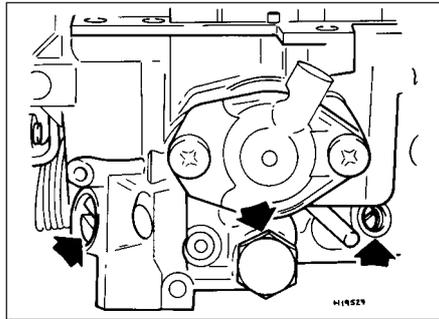
3 Extract the six screws and remove the cover.  
 4 Use a socket wrench to unscrew the fuel inlet needle valve.  
 5 Extract the screw plug and withdraw the metering pin.  
 6 Extract the spring clip and withdraw the float from the carburettor bowl.  
 7 The part load enrichment valve is screwed into the base of the float bowl.  
 8 The main jet can be unscrewed if the plug in the float bowl is extracted and a screwdriver

inserted through the hole.  
 9 The throttle valve housing is held to the main body of the carburettor by two securing screws. To remove the housing, first disconnect the accelerator pump link and then extract the screws.  
 10 The accelerator pump housing can be dismantled by extracting the four pump housing screws.  
 11 Clean all components and examine for wear or damage.  
 12 Blow through all jets and passages with

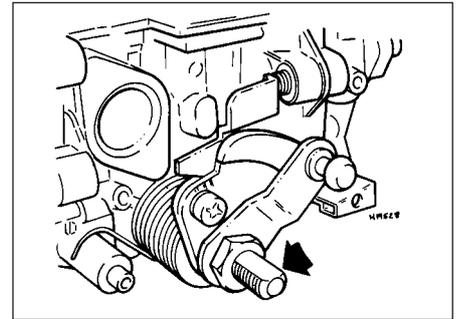
air from a tyre pump; never probe them with wire in an attempt to clean them or their calibration will be ruined.  
 13 Renew all seals, gaskets, diaphragms etc; these will be available in the form of an overhaul kit.  
 14 No provision is made for float level adjustment, nor is any checking procedure or dimension specified.  
 15 Reassemble the carburettor in the reverse order to dismantling, observing the settings and adjustments described in Section 13.



21.3 Lifting off the carburettor top cover



21.4 Adjustment screws and idle cut-off valve plug (arrowed)



21.5 Throttle valve shaft lever and nut (arrowed)

## 21 1B1 carburettor - overhaul



**Note:** In the rare event of a complete carburettor overhaul being necessary, it may prove more economical to renew the carburettor as a complete unit. Check the price and availability of a replacement carburettor and of its component parts before starting work; note that most sealing washers, screws and gaskets are available in kits, as are some of the major sub-assemblies. In most cases it will be sufficient to dismantle the carburettor and to clean the jets and passages.

- 1 Remove the carburettor from the engine.
- 2 Detach the vacuum unit pull-down hose from the throttle body housing.
- 3 Remove the four retaining screws and separate the top cover from the carburettor body (see illustration).

- 4 Remove the idle speed and mixture adjustment screws, and the idle cut-off valve or plug (see illustration).

- 5 If necessary the throttle valve lever, cam plate and return spring can be removed after removal of the shaft nut (see illustration). As they are removed, note their relative positions.

- 6 Remove the two retaining screws and lift off the part-load enrichment device cover, spring and diaphragm (see illustration).

- 7 Remove the accelerator pump collar, piston and spring (see illustrations).

- 8 Pull the accelerator pump delivery tube out of the carburettor body (see illustration). Note the spring and ball.

- 9 Press out the float pin and remove the float and needle valve (see illustrations).

- 10 Unscrew and remove the main jet (see illustration).

- 11 Remove the choke thermal and vacuum units by undoing the three retaining screws.



21.6 Removing the part-load enrichment device

- 12 Unscrew and remove the idle fuel/air and auxiliary fuel/air jets from the carburettor body, taking note of the location of each (see illustration).

- 13 Further dismantling is not recommended.



21.7a Removing the accelerator pump collar ...



21.7b ... the piston ...



21.7c ... and the spring



21.8 Removing the accelerator pump delivery tube



21.9a Removing the float ...



21.9b ... followed by the needle valve

Clean and inspect the various components as described in Section 19, paragraphs 19 to 25. 14 Reassembly is a reversal of the dismantling procedure. Note that float level is not adjustable on this carburettor.

15 After refitting, adjust the idle speed and mixture setting as described in Chapter 1 then carry out the other adjustments described in Section 14 of this Chapter.

## 22 2E3 carburettor - overhaul



**Note:** Refer to the note at the beginning of Section 21.

1 With the carburettor removed from the vehicle, drain the fuel from the float chamber and vapour separator. Clean the outside of the carburettor.

2 Remove the hoses and wires from the carburettor, making identifying marks or notes to avoid confusion on reassembly (see illustrations).

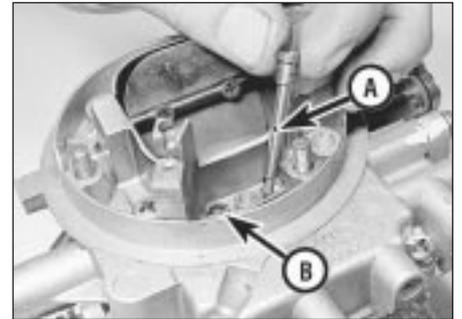
3 Access to the jets and float chamber is obtained by removing the top half of the carburettor, which is secured by five screws. Blow through the jets and drillings with compressed air, or air from a foot pump - do not probe them with wire. If it is wished to remove the jets, unscrew them carefully with well-fitting tools.

4 Remove the fuel strainer from the inlet pipe by hooking it out with a small screwdriver, or by snaring it with a long thin screw. Renew the strainer (see illustration).

5 Clean any foreign matter from the float chamber. Renew the inlet needle valve and



21.10 Removing the main jet



21.12 Idle (A) and auxiliary (B) fuel/air jets

seat if wear is evident, or if a high mileage has been covered. Renew the float if it is punctured or otherwise damaged.

6 No procedure has been specified for float level adjustment. Simply check that the inlet needle valve is closed completely before the float reaches the top of its stroke.

7 Renew the diaphragms in the part load enrichment valve and in the accelerator pump. If additional pump or valve parts are supplied in the overhaul kit, renew these parts also.

8 Further dismantling is not recommended. Pay particular attention to the throttle opening mechanism if it is decided to dismantle it: the interlocking arrangement is important.

9 Reassemble in the reverse order to dismantling. Use new gaskets and seals throughout; lubricate linkages with a smear of molybdenum based grease.

10 Before refitting the carburettor, carry out the checks and adjustments described in Section 15.

## 23 Varajet II carburettor - overhaul



**Note:** Refer to the Note at the beginning of Section 21.

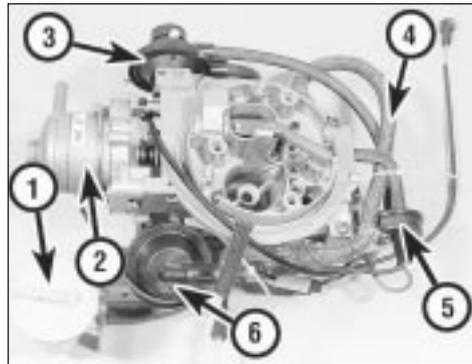
### Automatic choke type

1 It is rare for the carburettor to require complete dismantling; indeed, normally where this is required then it would probably be more economical to renew the complete unit.

2 It will usually be found that the first few operations described in the following paragraphs to remove the cover will be sufficient to enable cleaning of the jets and carburettor float chamber to be carried out.

3 With the carburettor removed and external dirt cleaned away, pull off the vacuum hose from the choke vacuum unit (see illustration).

4 Extract the three screws from the automatic choke retaining ring and withdraw the assembly.

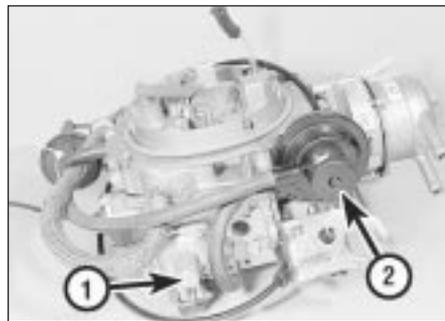


22.2a Top view of 2E3 carburettor

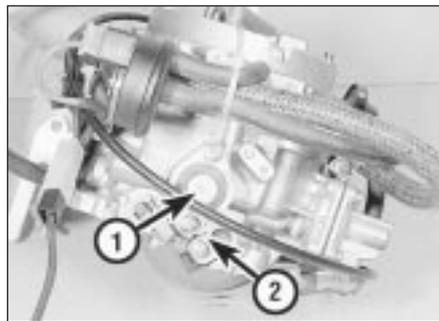
- 1 Vapour separator
- 2 Choke cover
- 3 Choke pull-down unit
- 4 Fuel hose
- 5 Thermostime valve
- 6 Secondary throttle vacuum unit



22.2b 2E3 carburettor - choke cover side view



22.2c Side view showing accelerator pump (1) and choke pull-down unit (2)



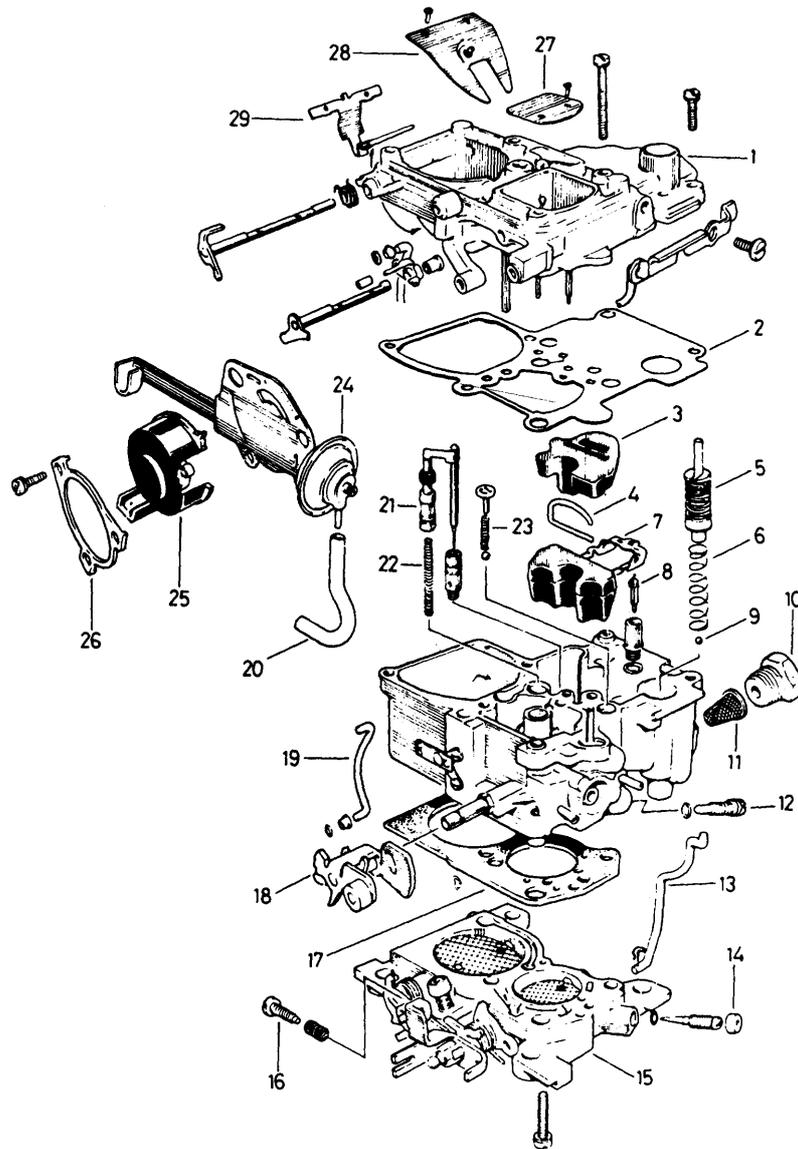
22.2d View showing part load enrichment valve (1) and accelerator pump cam (2)



22.4 Fuel inlet fuel strainer

23.3 Exploded view of Varajet II carburettor

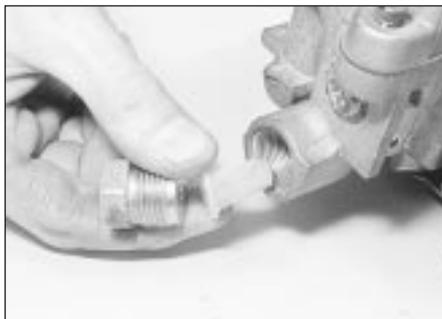
- 1 Cover
- 2 Gasket
- 3 Packing piece
- 4 Float pin
- 5 Accelerator pump piston
- 6 Spring
- 7 Float
- 8 Fuel inlet needle valve
- 9 Check ball (accelerator pump)
- 10 Fuel inlet union
- 11 Fuel filter
- 12 Idle speed adjustment screw
- 13 Link rod
- 14 Idle mixture adjustment screw
- 15 Throttle valve block
- 16 Fast idle screw and spring
- 17 Gasket
- 18 Fast idle cam
- 19 Fast idle link rod
- 20 Vacuum hose
- 21 Part load needle valve and piston
- 22 Spring
- 23 Suction valve and check ball
- 24 Choke vacuum unit
- 25 Choke housing cover
- 26 Cover retainer
- 27 Choke valve plate (primary barrel)
- 28 Baffle flap (secondary barrel)
- 29 Full load needle valve



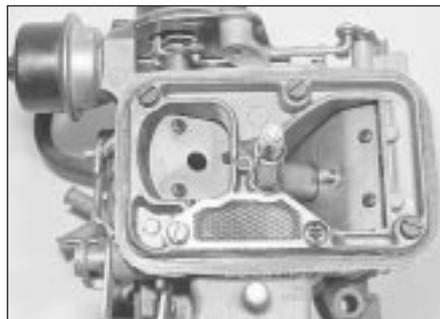
5 Extract the split pin and disconnect the accelerator pump rod from the lever.  
 6 Unscrew the fuel inlet nozzle and extract the gauze filter from inside (see illustration).  
 7 Extract the retaining clip and disconnect the choke connecting rod from the cam.

8 Extract the three short and four long carburettor cover retaining screws (see illustration).  
 9 Remove the cover making sure that, as it is withdrawn, the gasket remains behind on the flange of the float chamber. Remember that

the accelerator pump plunger is under spring tension.  
 10 Remove the accelerator pump plunger and spring and carefully peel off the cover gasket. Remove the pump suction valve spring retainer (see illustration).



23.6 Fuel inlet union and gauze



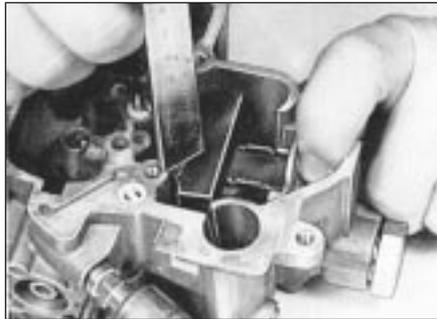
23.8 Varajet II carburettor top cover



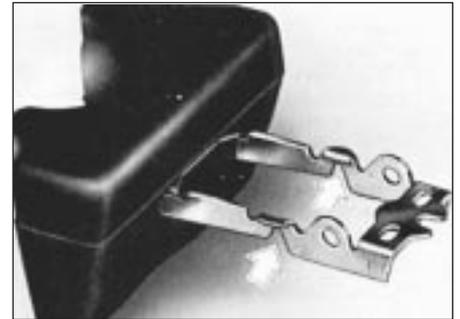
23.10 Accelerator pump plunger and spring



23.13 Float and needle valve



23.22 Measuring the float level



23.23 Float adjustment points (arrowed)

11 Pull or twist out the vacuum piston spring and needle of the carburettor first stage. Take care not to bend the retaining bracket or partial load needle.

12 If necessary, the partial load plunger may be withdrawn by gripping its rod with a pair of pliers.

13 Remove the packing piece, float and needle from the float chamber (see illustration). Empty the fuel from the chamber.

14 Note their location and unscrew the jets.

15 Extract the four retaining screws and remove the throttle valve plate block.

16 Further dismantling is not recommended.

17 Clean all components and renew any that are worn or damaged. If the throttle valve plate spindle is worn then the complete throttle block must be renewed. Clean jets and passages with air pressure only; never probe with wire or their calibration will be ruined.

18 Obtain a repair kit which will contain all the necessary renewable items, including gaskets.

19 Reassembly is a reversal of dismantling, but observe the following points.

20 When assembling the accelerator pump, ensure that the check ball is correctly located.

21 Check that the needle valve spring is correctly located on the float arm bracket. There should be approximately 0.2 mm free play between the spring and the bracket. Correct if necessary by carefully bending one item or the other.

22 Refit the float, needle valve and pivot clips. Check the float level, with the gasket fitted, by applying moderate finger pressure to the float arms and pivot clip to close the needle valve (see illustration). The top surface of the float should be the specified distance below the carburettor top flange.

23 Correct the float level if necessary by carefully bending the float arms at the points shown (see illustration).

24 When installing the cover to the carburettor body, take care that the accelerator pump plunger does not become wedged.

25 Make sure that the breather screen is in position.

26 Check that the bi-metallic spring of the

automatic choke engages positively with the choke valve plate spindle arm.

27 Check the operation of the throttle valve plate lever. Remember that the secondary valve plate does not open until the primary valve plate has opened by two-thirds of its travel. The secondary throttle valve plate will not open until the choke valve plate is fully open after the engine has reached operating temperature.

28 Carry out those checks and adjustments in Section 15 which can be performed with the carburettor on the bench.

29 After refitting, set the idle speed and mixture, (Chapter 1), then carry out any adjustments outstanding from Section 15.

### Manual choke type

30 The operations are very similar to those described in the preceding paragraphs, but the references to automatic choke components should be ignored.

## 24 Inlet manifold - removal and refitting



### Removal

#### 1.2 litre models

1 The manifold may be removed with or without the carburettor. In either case, refer to Section 18 and follow the steps preparing for carburettor removal.

2 Disconnect the brake servo vacuum hose.

3 Remove the three screws which secure the manifold to the cylinder head (see illustration).

4 Remove the manifold and recover the gasket.

#### 1.3, 1.4 and 1.6 litre models

5 Drain the cooling system, as described in Chapter 1.

6 Remove the alternator, as described in Chapter 5.

7 Release the coolant pipe from the inlet manifold and clutch housing.

8 On 1.3 models, disconnect the coolant temperature gauge lead.

9 Refer to Section 18 and either remove the carburettor, or follow the steps preparing for carburettor removal.

10 Disconnect the brake servo vacuum hose.

11 Remove the securing nuts and withdraw the manifold. Recover the gasket.

### Refitting

12 Refit in the reverse order to removal, using a new gasket. Tighten the manifold nuts progressively to the specified torque. On 1.3, 1.4 and 1.6 litre models refill the cooling system and adjust the alternator drivebelt, as described in Chapter 1.

## 25 Exhaust manifold - removal and refitting



### Removal

#### 1.2 litre models

1 Raise and securely support the front of the car (see "Jacking and Vehicle Support").

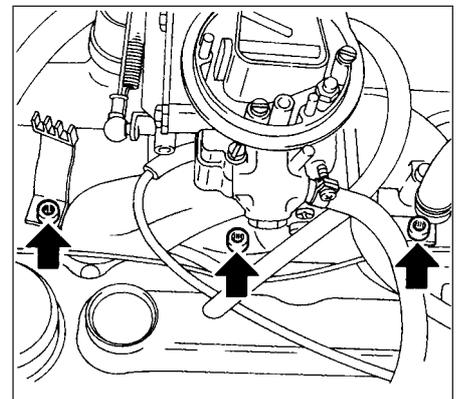
2 From under the car, separate the manifold-to-downpipe joint by removing the two bolts and recovering the tension springs.

3 Remove the air cleaner, as described in Section 3.

4 Remove the six bolts which secure the exhaust manifold to the cylinder head. Remove the manifold and recover the gasket.

#### 1.3, 1.4 and 1.6 litre models

5 Remove the air cleaner, as described in Section 3. Also remove the hot air shroud; noting how its sections fit over the manifold.



24.3 Three screws (arrowed) securing inlet manifold - 1.2 litre models



27.4a Exhaust system flexible joint



27.4b Exhaust system rubber mounting ring



27.5 Graphite sealing ring fitted at the flexible joint

6 Remove the securing nuts or bolts from the manifold-to-downpipe joint.

7 Remove the manifold securing nuts and withdraw the manifold from the studs. Recover the gaskets.

### Refitting

#### 1.2 litre models

8 Refit in the reverse order to removal, using a new gasket. Tighten the manifold securing bolts progressively, starting in the middle and working towards the ends, to avoid destructive stresses. Use a little anti-seize compound on the downpipe joint, and a new seal if necessary.

#### 1.3, 1.4 and litre models

9 Refit in the reverse order to removal. Use a new gasket and tighten the nuts as described in paragraph 5. Also renew the gasket or seal at the downpipe joint.

**26 Inlet manifold pre-heater (1.6 litre models with automatic transmission) - general information, removal and refitting**



### General information

1 An electric manifold pre-heater is fitted to some 1.6 litre models (fitted with a 16SH engine) with automatic transmission. If it malfunctions, warm-up time will be prolonged and cold driveability will suffer.

### Removal

2 Disconnect the battery earth (negative) lead.

3 Disconnect the pre-heater wiring multi-plug.

4 Remove the screws which secure the pre-heater to the inlet manifold. Pull the pre-heater downwards and remove it.

### Refitting

5 Refitting is the reverse of the removal procedure. Make sure that the pre-heater and manifold are clean, and use a new sealing ring.

### 27 Exhaust system - inspection, removal and refitting



### Inspection

1 The exhaust system should be examined for leaks, damage and security at the intervals given in Routine Maintenance. To do this, apply the handbrake and allow the engine to idle. Lie down on each side of the car in turn, and check the full length of the exhaust system for leaks while an assistant temporarily places a wad of cloth over the end of the tailpipe. If a leak is evident repairs may be made using a proprietary exhaust repair kit. If the leak is excessive, or damage is evident, the relevant section should be renewed. Check the rubber mountings for condition and security and renew them if necessary.

### Removal

2 To remove the exhaust system, jack up the front and/or rear of the car and support it securely on axle stands (see "Jacking and Vehicle Support"). Alternatively drive the front or rear wheels up on ramps or over a pit.

3 The system is made up of three or four sections. The front and rear sections can be removed independently, but to remove a middle section it will be necessary to remove an adjacent end section also. It is certainly easier to free stubborn joints with the complete system removed from the car.

4 To remove a front or rear section, remove the U-bolt clamps which hold the section together. Unhook the section from its rubber mounting rings, and for the front section unbolt the manifold or downpipe (see illustrations). Free the joints and remove the section concerned. The application of penetrating oil will be of assistance in freeing seized joints. Heat from a blowlamp can also be helpful, but take great care to shield the fuel tank, fuel lines and other vulnerable or inflammable areas.

### Refitting

5 Use a little exhaust jointing compound when assembling joints. Renew clamps, rubber rings, seals and gaskets as a matter of course unless they are in perfect condition (see illustration).

6 When refitting the complete exhaust system, position it so that the mountings are evenly loaded before tightening the U-bolt clamps.