Chapter 21
Weber 32/34 TLDE

Contents

Specifications

Manufacturer	Fiat		Fiat		Fiat	
Model	Regata 75		Regata 85		Strada 85	
Year	1985 to 1988		1985 to 1988		1985 to 1988	
Engine code	138 C3.045		149 A5.000		149 A5.000	
Capacity (cm³)/no. of cyls	1498/4		1498/4		1498/4	
Oil temperature (°C)	100		100		100	
Transmission	–		–		–	
Carb. identification	32/34 TLDE 2/150		32/34 TLDE/150		32/34 TLDE 2/150	
Idle speed (rpm)	850 ± 50		850 ± 50		850 ± 50	
Fast idle speed (rpm)	–		–		–	
CO @ idle (% vol.)	1.0 ± 0.5		1.0 ± 0.5		1.0 ± 0.5	
Special conditions	–		–		–	
Stage (venturi)	1	2	1	2	1	2
Venturi diameter	21	24	21	24	21	24
Idle jet	50	60	47	40	50	60
Main jet	112	140	110	140	112	140
Air correction jet	165	155	160	160	165	155
Emulsion tube	F74	F25	F74	F25	F74	F25
Accel. pump jet	40		40		40	
Float level 1 (mm)	30 ± 0.25		30 ± 0.25		30 ± 0.25	
Float level 2 (mm)	–		–		–	
Float stroke (mm)	–		–		–	
Needle valve size (mm)	1.75		1.75		1.75	
Choke fast idle gap (mm)	0.95 ± 0.05		0.95 ± 0.05		0.95 ± 0.05	
Choke pull-down (mm)	4.5 ± 0.25		4.5 ± 0.25		4.5 ± 0.25	
De-choke (mm)	–		–		–	
Defuming/vent valve (mm)	–		–		–	

Manufacturer	Fiat	Fiat	Fiat
Model	Tempra 1.4	Tempra 1.4 Selecta	Tempra 1.6
Year	1990 to 1991	1990 to 1991	1990 to 1991
Engine code	159A2.000 (56kW)	159A2.000 (56kW)	159A3.00 DOHC (62kW)
Capacity (cm³)/no. of cyls	1372/4	1372/4	1581/4
Oil temperature (°C)	100	100	100

Manufacturer	Fiat		Fiat		Fiat	
Model	Tempra 1.4		Tempra 1.4 Selecta		Tempra 1.6	
Year	1990 to 1991		1990 to 1991		1990 to 1991	
Transmission	MT		AT		MT	
Carb. identification	32/34 TLDE 21/151		32/34 TLDE 22/750		32/34 TLDE 23/151	
Idle speed (rpm)	850 ± 50		850 ± 50		850 ± 50	
Fast idle speed (rpm)	1300 ± 50		1300 ± 50		1300 ± 50	
CO @ idle (% vol.)	1.0 ± 0.5		1.0 ± 0.5		1.0 ± 0.5	
Special conditions	–		–		–	
Stage (venturi)	1	2	1	2	1	2
Venturi diameter	21	24	21	24	21	24
Idle jet	47	40	47	40	47	40
Main jet	110	123	110	122	107	123
Air correction jet	160	160	160	160	160	160
Emulsion tube	F74	F25	F74	F25	F74	F25
Accel. pump jet	40		40		40	
Float level 1 (mm)	30 ± 1		30 ± 1		30 ± 1	
Float level 2 (mm)	–		–		–	
Float stroke (mm)	–		–		–	
Needle valve size (mm)	1.75		1.75		1.75	
Choke fast idle gap (mm)	1 ± 0.05		1 ± 0.05		1 ± 0.05	
Choke pull-down (mm)	3 ± 0.25		3 ± 0.25		3 ± 0.25	
De-choke (mm)	–		–		–	
Defuming/vent valve (mm)	–		–		–	

Manufacturer	Fiat		Fiat		Fiat	
Model	Tempra 1.6 Selecta		Tipo 1.4		Tipo 1.4 Selecta	
Year	1990 to 1991		1988 to 1990		1988 to 1990	
Engine code	159A3.000 DOHC (62kW)		160A1.000 DOHC		160A1.000 DOHC	
Capacity (cm³)/no. of cyls	1581/4		1372/4		1372/4	
Oil temperature (°C)	100		100		100	
Transmission	AT		MT		AT	
Carb. identification	32/34 TLDE 24/751		32/34 TLDE 4/150		32/34 TLDE 9/751	
Idle speed (rpm)	850 ± 50		825 ± 25		850 ± 50	
Fast idle speed (rpm)	1300 ± 50		1300 ± 50		1300 ± 50	
CO @ idle (% vol.)	1.0 ± 0.5		1 ± 0.5		1.25 ± 0.25	
Special conditions	–		–		–	
Stage (venturi)	1	2	1	2	1	2
Venturi diameter	21	24	21	24	21	24
Idle jet	47	40	50	40	50	40
Main jet	107	122	110	130	110	130
Air correction jet	160	160	160	160	160	160
Emulsion tube	F74	F25	F74	F25	F74	F25
Accel. pump jet	40		40		40	
Float level 1 (mm)	30 ± 1		30 ± 0.25		30 ± 0.25	
Float level 2 (mm)	–		–		–	
Float stroke (mm)	–		–		–	
Needle valve size (mm)	1.75		1.75		1.75	
Choke fast idle gap (mm)	1 ± 0.05		1 ± 0.05		1 ± 0.05	
Choke pull-down (mm)	3 ± 0.25		3.75 ± 0.25		3 ± 0.25	
De-choke (mm)	–		–		–	
Defuming/vent valve (mm)	–		–		–	

Manufacturer	Fiat		Fiat		Fiat	
Model	Tipo 1.4		Tipo 1.4 Selecta		Tipo 1.6	
Year	1990 to 1991		1990 to 1991		1988 to 1990	
Engine code	159A2.000 DOHC (56kW)		159A2.000 DOHC (56kW)		160A2.000 DOHC (56kW)	
Capacity (cm³)/no. of cyls	1372/4		1372/4		1580/4	
Oil temperature (°C)	100		100		100	
Transmission	MT		AT		–	
Carb. identification	32/34 TLDE 21		32/34 TLDE 22		32/34 TLDE 5/150	
Idle speed (rpm)	850 ± 50		850 ± 50		825 ± 25	
Fast idle speed (rpm)	1300 ± 50		1300 ± 50		1300 ± 50	
CO @ idle (% vol.)	1 ± 0.5		1.0 ± 0.5		1.0 ± 0.5	
Special conditions	–		–		–	
Stage (venturi)	1	2	1	2	1	2
Venturi diameter	21	24	21	24	21	24
Idle jet	47	40	47	40	47	40
Main jet	110	123	110	122	110	130
Air correction jet	160	160	160	160	160	160
Emulsion tube	F74	F25	F74	F25	F74	F25
Accel. pump jet	40		40		40	

Manufacturer	Fiat	Fiat	Fiat
Model	Tipo 1.4	Tipo 1.4 Selecta	Tipo 1.6
Year	1990 to 1991	1990 to 1991	1988 to 1990
Float level 1 (mm)	30 ± 1	30 ± 1	30 ± 0.25
Float level 2 (mm)	–	–	–
Float stroke (mm)	–	–	–
Needle valve size (mm)	1.75	1.75	1.75
Choke fast idle gap (mm)	1 ± 0.05	1 ± 0.05	1 ± 0.05
Choke pull-down (mm)	3 ± 0.25	3 ± 0.25	3.75 ± 0.25
De-choke (mm)	–	–	–
Defuming/vent valve (mm)	–	–	–

Manufacturer	Fiat		Fiat	
Model	Tipo 1.6		Tipo 1.6	
Year	1990 to 1991		1990 to 1991	
Engine code	159A3.000 DOHC (62kW)		159A3.000 DOHC (62kW)	
Capacity (cm³)/no. of cyls	1581/4		1581/4	
Oil temperature (°C)	100		100	
Transmission	MT		AT	
Carb. identification	32/34 TLDE 23		32/34 TLDE 24	
Idle speed (rpm)	850 ± 50		850 ± 50	
Fast idle speed (rpm)	1300 ± 50		1300 ± 50	
CO @ idle (% vol.)	1.0 ± 0.5		1 ± 0.5	
Special conditions	–		–	
Stage (venturi)	1	2	1	2
Venturi diameter	21	24	21	24
Idle jet	47	40	47	40
Main jet	107	123	107	122
Air correction jet	160	160	160	160
Emulsion tube	F74	F25	F74	F25
Accel. pump jet	40		40	
Float level 1 (mm)	30 ± 1		30 ± 1	
Float level 2 (mm)	–		–	
Float stroke (mm)	–		–	
Needle valve size (mm)	1.75		1.75	
Choke fast idle gap (mm)	1 ± 0.05		1 ± 0.05	
Choke pull-down (mm)	3 ± 0.25		3 ± 0.25	
De-choke (mm)	–		–	
Defuming/vent valve (mm)	–		–	

1 Principles of operation

The following technical description of the Weber 32/34 TLDE carburettor should be read in conjunction with the more detailed description of carburettor principles in Chapter 1.

Construction

The Weber TLDE carburettor is a downdraught, progressive twin venturi instrument, with a mechanically-controlled secondary throttle. The choke system is manually-controlled, and operates on the primary venturi only. A vacuum-controlled device is used to control fast idle during engine warm-up. The carburettor is constructed in three main bodies. These are the upper body, main body, and throttle body containing the throttle assemblies. An insulating block, placed between the main carburettor body and the throttle body, prevents excess heat transference to the main body.

The throttle and choke shafts, and the choke flap, are made of steel. The throttle valves are made of brass, as are all the emulsion tubes and jets, with the exception of the accelerator pump discharge injector, which is die-cast. The internal fuel channels and air passages are drilled, and sealed with lead plugs where necessary.

An idle cut-off valve is fitted to the idle circuit, and this device is further controlled by an ECU, to save fuel during deceleration.

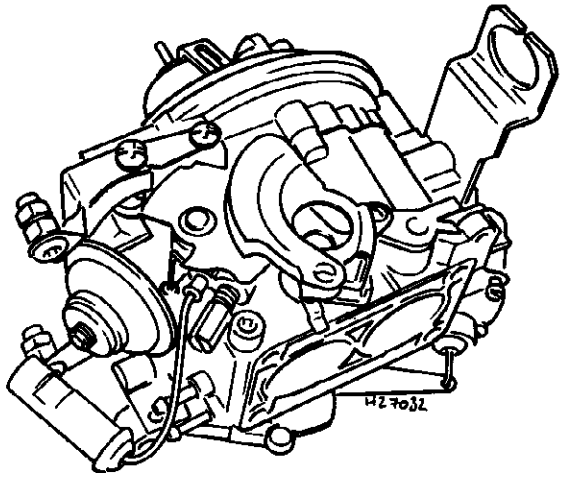


Fig. 21.1 Weber TLDE carburettor (Sec 1)

Fuel control

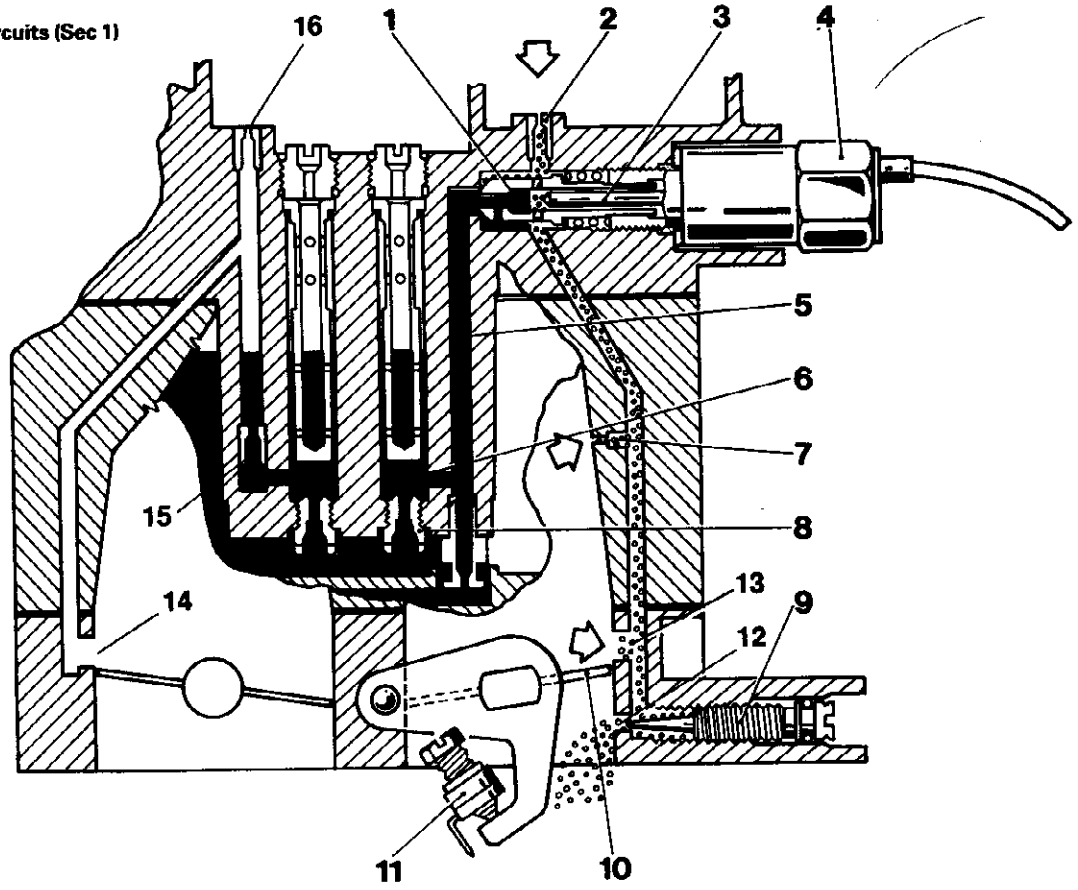
Fuel flows into the carburettor through a fine mesh filter. The fuel level in the float chamber is controlled by a needle valve and plastic float assembly. An anti-vibration ball is incorporated into the needle valve design. A clip, attached to the needle valve and to the float arm, prevents the needle from sticking in the seat as the fuel level drops. The float chamber is vented internally, to the clean-air side of the air filter. A calibrated fuel return system is provided, 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 upper body through a metered idle jet. Here it is mixed with a small amount of air from a calibrated air bleed. The emulsion formed is drawn through a channel to the throttle body, where it is 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, partially covered by the closed throttle at idle, provides additional enrichment as it is uncovered by the opening throttle during

Fig. 21.2 Idle and progression circuits (Sec 1)

1 *Idle jet*
2 *Air bleed*
3 *Plunger*
4 *Idle cut-off valve*
5 *Idle fuel channel*
6 *Main well*
7 *Anti-syphon hole*
8 *Main jet*
9 *Idle mixture control screw*
10 *Throttle valve*
11 *Throttle switch*
12 *Idle outlet*
13 *Primary progression outlet*
14 *Secondary progression outlet*
15 *Secondary idle jet*
16 *Air bleed*



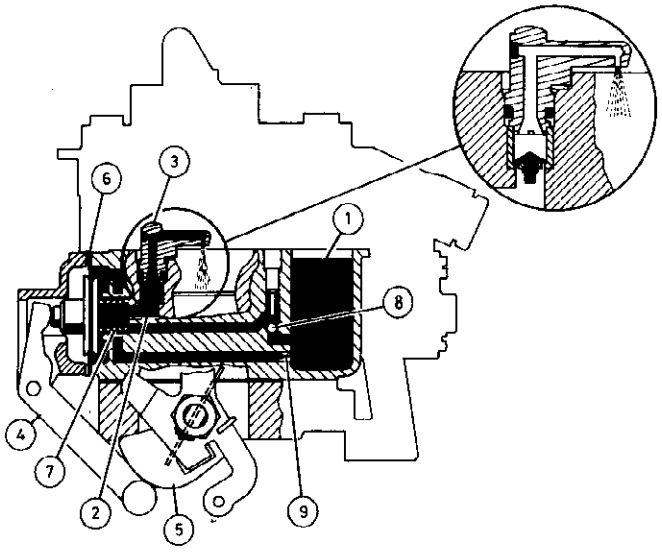


Fig. 21.3 Accelerator pump circuit (Sec 1)

1 *Float chamber*
2 *Fuel outlet channel*
3 *Pump injector*
4 *Pump actuating lever*
5 *Pump cam*
6 *Diaphragm*
7 *Spring*
8 *Inlet ball*
9 *Back bleed*

initial acceleration. An anti-syphon hole connects the idle fuel channel with the primary venturi.

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

Idle cut-off valve

When the ignition is switched on, a 12-volt solenoid activates the plunger to withdraw it from the idle jet. Once the ignition is switched off, the solenoid deactivates to block the idle jet. Running-on is thus prevented when the engine is shut down.

The device is also controlled by an electronic control unit (ECU), so that, during engine deceleration from high speeds with a closed throttle, the fuel supply to the engine is cut off. This results in a fuel saving, and in improved emissions. Once the engine speed falls below 1800 rpm, or the throttle is opened, the ECU reactivates the solenoid, and normal idle fuel flow is restored.

Where the ignition is controlled by Digiplex (as is the case with 1600 cc engines), the idle cut-off function is incorporated into the Digiplex ECU. Generally, a separate cut-off ECU is used for 1400 cc engines.

Accelerator pump

The accelerator pump is controlled by a diaphragm, and is mechanically operated by a lever and cam attached to the primary throttle linkage. The outlet valve is incorporated into the pump injector. The inlet valve consists of a brass valve assembly, located in a channel from the float chamber. Excess fuel is returned to the float chamber through a calibrated bush.

Temperature-controlled accelerator pump (some models)

When a lean mixture is provided for normal running conditions, poor driveability often occurs during the warm-up period. This device provides a means of enriching the mixture during this period. The accelerator pump is vacuum-controlled, and operates in a similar fashion to the mechanical pump above. Fuel is injected into the primary venturi through an additional injector nozzle. The vacuum supply is introduced via a thermal switch, mounted into the cooling system.

At a coolant temperature below 25°C (77°F), the vacuum signal draws the diaphragm back against spring pressure, and fuel is drawn into the pump chamber and outlet channel. As the engine speed

Fig. 21.4 Accelerator pump circuit with thermal switch (Sec 1)

1 *Pump injector*
2 *Outlet ball*
3 *Venturi depression*
4 *Inlet ball*
5 *Diaphragm*
6 *Spring*
7 *Thermal switch*
8 *Float chamber*

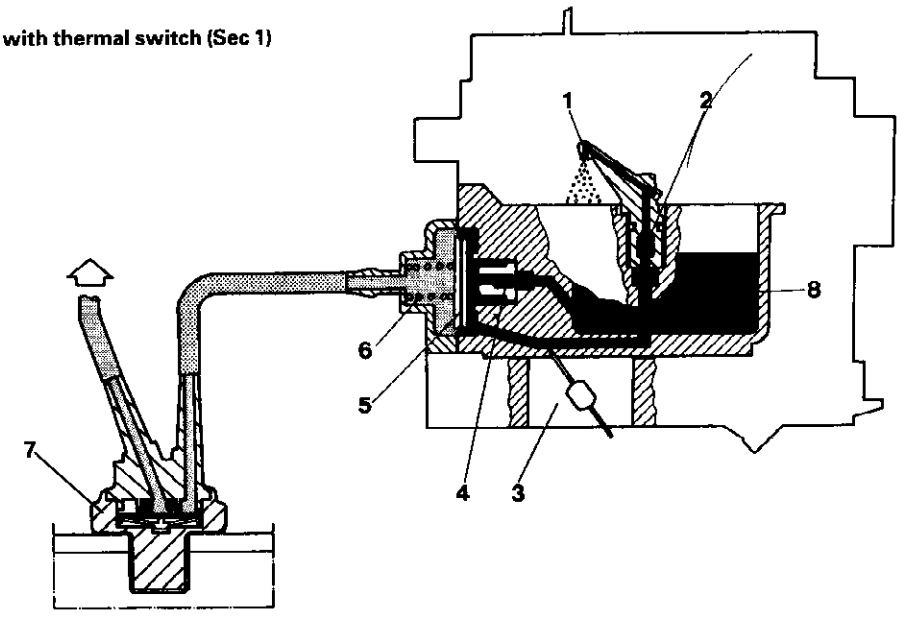
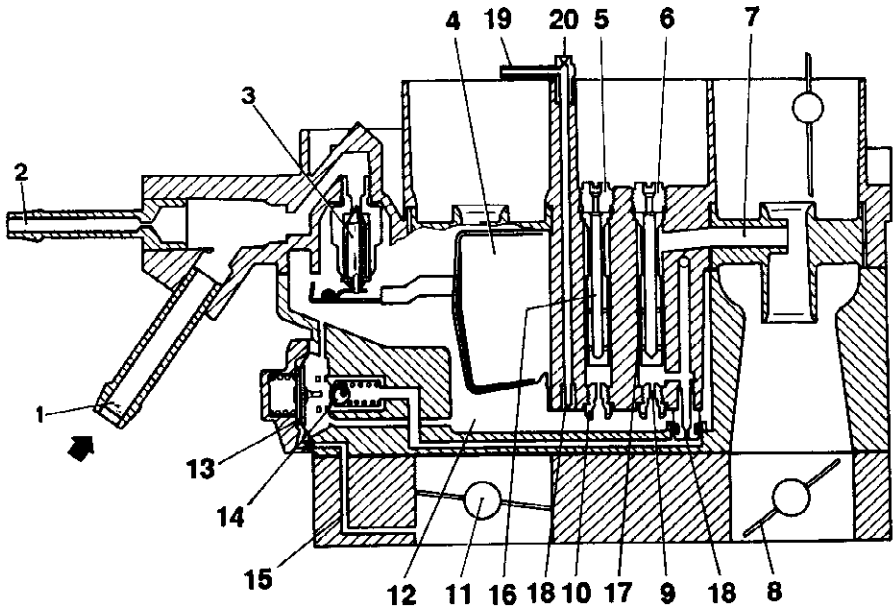


Fig. 21.5 Main, power and full-load circuits (Sec 1)

1 *Fuel inlet*
2 *Fuel return*
3 *Needle valve*
4 *Float*
5 *Air corrector (secondary)*
6 *Air corrector (primary)*
7 *Auxiliary venturi*
8 *Throttle valve (primary)*
9 *Main jet (primary)*
10 *Main jet (secondary)*
11 *Throttle valve (secondary)*
12 *Float chamber*
13 *Diaphragm*
14 *Power valve ball*
15 *Vacuum passage*
16 *Emulsion tube (secondary)*
17 *Emulsion tube (primary)*
18 *Calibrated bush*
19 *Full-load outlet*
20 *Air bleed*



increases, the depression in the venturi acts upon the discharge nozzle. Extra fuel is drawn past the pump outlet ball, where it is discharged into the main venturi from the injector. As the coolant temperature rises above 25°C, the vacuum passage is gradually closed, until at 45°C (113°F) it is fully closed. Less fuel, then, is drawn from the accelerator pump nozzle as the engine warm-up progresses. Once the engine has reached normal operating temperature, the temperature-controlled accelerator pump ceases to operate.

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 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 nozzle through an auxiliary venturi.

Power enrichment and economy circuit

Fuel flows from the float chamber into the power valve chamber through a fuel channel. An air passage is taken from under the throttle plate to the cover of the power diaphragm chamber. At idle, and during light-throttle operation, manifold vacuum draws the diaphragm back against spring pressure. The diaphragm pintle is withdrawn from the brass outlet valve, and the spring-loaded ball seats, to close off the outlet 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 outlet valve. Fuel then flows through the valve and a calibrated jet to supplement the fuel in the primary main well. The fuel level rises in the well, and the fuel mixture is enriched.

Secondary action

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

A progression jet is used to prevent hesitation as the secondary throttle plate begins to open. This jet is similar in construction and action to the primary idle jet, and is often referred to as the 'secondary idle jet'.

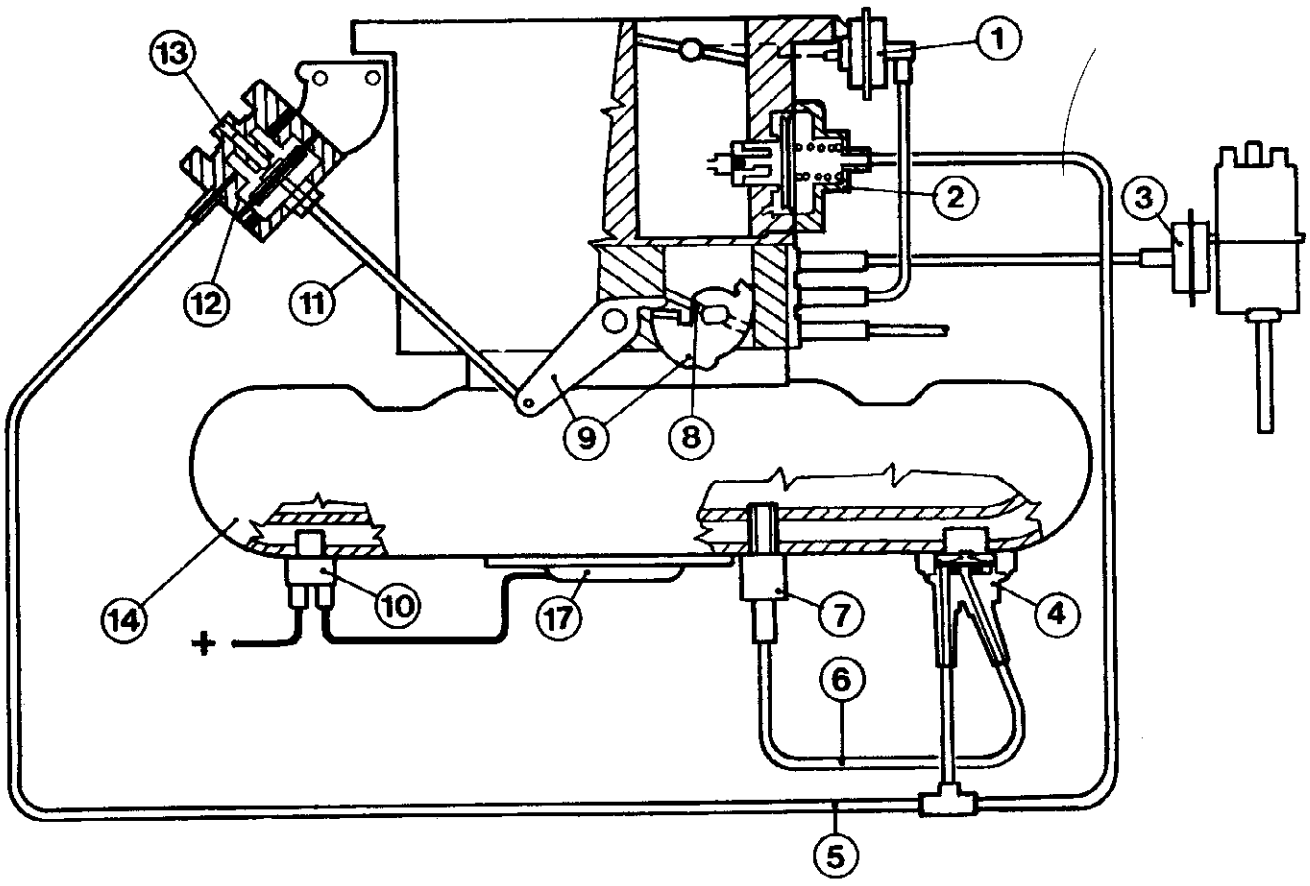


Fig. 21.6 Single-stage fast idle device (Sec 1)

1 *Choke pull-down diaphragm*
2 *Temperature-controlled accelerator pump*
3 *Ignition distributor*
4 *Thermal switch*
5 *Vacuum pipe*
6 *Vacuum pipe*
7 *Manifold vacuum connection*
8 *Throttle valve (primary)*
9 *Throttle levers*
10 *Thermal switch (manifold heater)*
11 *Rod*
12 *Fast idle device*
13 *Adjustment screw*
14 *Inlet manifold*

An emulsified mixture is discharged into the secondary venturi, via a progression slot, 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.

At full-load and high engine speeds, even more fuel is required. The velocity of air creates a depression sufficient to raise fuel from the float chamber into a channel. The fuel then passes through a calibrated bushing to the upper section of the secondary air intake. Here it is mixed with a small amount of air from a calibrated air bleed, and the emulsified mixture is then discharged into the airstream from the full-load enrichment orifice.

Choke operation

The manual choke is operated by a dash-mounted cable. When the cable is pulled, it operates a lever that pulls the choke flap closed across the 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.

Once the engine has fired, the choke flap must open slightly, to weaken the mixture and avoid flooding during idle and light-throttle operation. This is achieved by using manifold vacuum to actuate a diaphragm. A linkage attached to the diaphragm will then pull upon the choke flap.

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

Single-stage fast idle device (some models)

Towards the end of the warm-up period, the engine will reach a temperature where the choke can be pushed fully home, but full operating temperature is still not quite attained. During this time, the idle speed may fall to a level where stalling will occur. The single-stage fast idle device opens the throttle to maintain a fast idle.

A vacuum supply is introduced, via a thermal switch mounted into the cooling system. At a coolant temperature below 25°C (77°F), the vacuum signal draws the fast idle diaphragm back against spring pressure. A rod connected to the diaphragm pulls upon the primary throttle lever, to open the throttle plate. The extra air drawn past the plate causes the idle speed to increase.

As the coolant temperature rises above 25°C, the vacuum passage is gradually closed, until at 45°C (113°F) it is fully closed.

Once the engine has reached normal operating temperature, the fast idle device ceases to operate, and idle speed returns to normal.

The thermal switch for this device is normally the same one used to control the temperature-controlled accelerator pump. A T-piece on the outlet side of the switch pipes the vacuum to each unit.

Manifold heater

To improve atomisation of the air/fuel mixture during the warm-up period, an inlet manifold heating device is utilised. This operates through a thermal switch, so that manifold heating is discontinued once a coolant temperature of 65°C (149°F) is reached.

2 Identification

The Weber identification code is stamped on the float chamber body (choke side).

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 soak the fuel out of the float chamber using a clean tissue or soft cloth, after removing the upper body assembly.

Dismantling and checking

1 Remove the four screws which secure the carburettor to the engine.
2 Remove the carburettor from the engine (refer to Chapter 2, Section 2 for general advice on removing a carburettor).

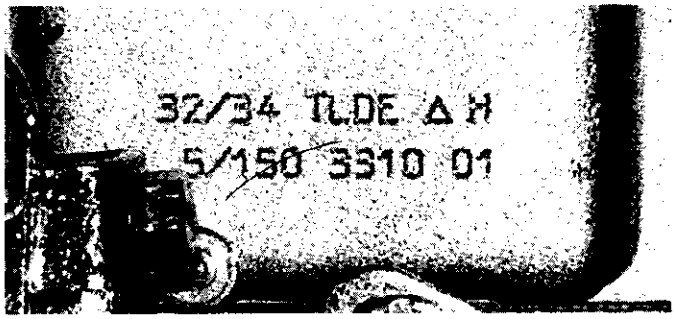


Fig. 21.7 Weber TLDE identification markings (Sec 2)

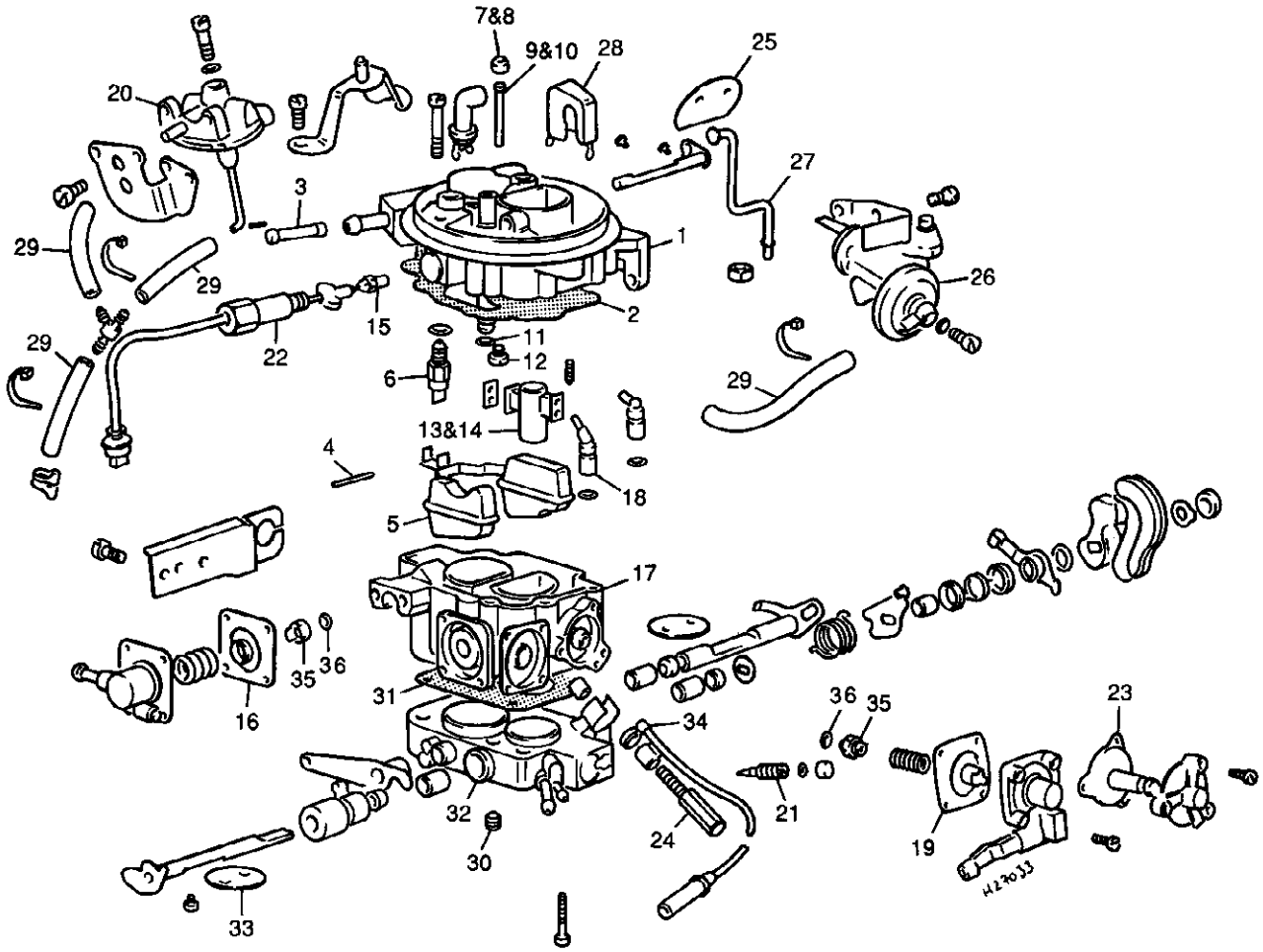


Fig. 21.8 Exploded view of Weber TLDE (Sec 3)

1 *Upper body*
2 *Float chamber gasket*
3 *Fuel inlet filter*
4 *Float pin*
5 *Float*
6 *Needle valve assembly*
7 *Air corrector (primary)*
8 *Air corrector (secondary)*
9 *Emulsion tube (primary)*
10 *Emulsion tube (secondary)*
11 *Main jet (primary)*
12 *Main jet (secondary)*
13 *Auxiliary venturi (primary)*
14 *Auxiliary venturi (secondary)*
15 *Idle jet (primary)*
16 *Accelerator pump diaphragm (temperature-controlled type)*
17 *Main body*
18 *Pump injector*
19 *Accelerator pump diaphragm*
20 *Fast idle device*
21 *Idle mixture control screw*
22 *Idle cut-off valve*
23 *Power valve diaphragm*
24 *Idle speed screw*
25 *Choke flap*
26 *Choke diaphragm*
27 *Choke link rod*
28 *Choke mechanism shield*
29 *Vacuum hose*
30 *Secondary throttle valve adjustment screw*
31 *Insulator block*
32 *Throttle body*
33 *Throttle valve*
34 *Throttle switch*
35 *Inlet valve*
36 *Seal*

3 Check visually for damage and wear (see Chapter 2, Section 3).
4 Disconnect the choke vacuum hose, then remove the two screws and detach the carburettor upper body.
5 Use a straight edge to check for distorted flanges on all facing surfaces.
6 Inspect the float chamber for corrosion and calcium build-up.
7 Tap out the float pin, and remove the float, needle valve and plastic clip, float chamber gasket, and needle valve seat.
8 Check that the anti-vibration ball is free in the valve end.
9 Check the needle valve tip for wear and ridges. This is more likely with the brass needle valve tip than when a viton one is used. Use a viton-tipped replacement when possible.
10 The float should be checked for damage and ingress of petrol.
11 Renew the float pin if it appears worn.
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 and ridges.
14 Attach a vacuum pump to the fast idle diaphragm,and operate the pump to obtain 300 mm Hg. The diaphragm should fully operate, and the vacuum must be maintained for a minimum of 10 seconds. Renew the diaphragm assembly if it fails these tests.
15 Remove the two screws and the circlip, and detach the fast idle assembly. Remove a further four screws, and detach the cover, diaphragm, and spring. Check the diaphragm for fatigue and damage.
16 Remove the four screws, and detach the accelerator pump cover, diaphragm, spring, and inlet valve. Check the diaphragm and inlet valve for fatigue and damage.
17 Remove the four screws, and detach the temperature-controlled accelerator pump cover, spring, diaphragm, and inlet valve. Check the diaphragm and inlet valve for fatigue and damage. Some inlet valves are not removable.
18 The two pump injectors are a push fit in the body. Carefully prise from their locations, and check the valves for damage or leakage.
19 Detach the primary idle jet and spring from the idle cut-off valve. The secondary idle jet is not removable. Note that the cut-off valve and primary idle jet assembly can be removed from the carburettor without removing the upper body.
20 Unscrew the primary and secondary main jets from the underside of the upper body. Unscrew the primary and secondary air correctors, and remove the emulsion tubes from the top of the upper body. Note that the air corrector and emulsion tubes can be removed from the carburettor body without removing the upper body.
21 Check that the emulsion tube wells are clear.
22 Note the jet sizes and locations, for correct installation during assembly. For reference, the primary main jet is located on the idle cut-off side of the carburettor.
23 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.
24 Remove the primary and secondary auxiliary venturis from the upper body where necessary. A Weber extractor tool is available for this purpose if required. Check that the primary and secondary auxiliary venturis are not loose in the main body, because this is a source of uneven running. If a venturi is loose, knurl the mating flanges with a file to ensure a tight fit.
25 Remove the three screws, and detach the power valve housing cover, spring, and diaphragm from the body. Check the diaphragm for damage. The brass outlet 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. Check that the channel into the emulsion tube well is clear.
26 Remove the two screws, and separate the carburettor main body and throttle body assemblies. The throttle body can be renewed separately if the spindles or throttle bores are worn.
27 Pull away the plastic shield that covers the choke mechanism. Inspect the choke spindle, linkage and operating mechanism for stickiness and wear.
28 Attach a vacuum pump to the choke vacuum connector, and operate the pump to obtain 300 mm Hg. Renew the diaphragm if it does not fully operate, or if vacuum is not maintained for a minimum of 10 seconds.
29 Remove the three screws, pull the lower choke link rod out of the plastic retaining collar, and detach the choke pull-down assembly.
30 Clean the jets, carburettor body assemblies, float chamber and internal channels. An air line may be used to clear 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 and float pin, and all diaphragms. Inspect and renew (where necessary) the mixture screw, main jets, idle jet, air corrector jets, emulsion tubes, and accelerator pump injector. Renew worn linkages, screws, springs, vacuum hoses and other parts where necessary.

Ensure that all 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 choke pull-down assembly, and secure with the three screws. Push the end of the lower choke link rod through the plastic collar, and clip it into position.
2 Assemble the main and throttle bodies with a new gasket block, and secure with the two screws.
3 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.
4 Refit the power diaphragm, spring, and cover assembly, and secure with the three screws. Renew the seal on the power valve jet which is adjacent to the primary main jet.
5 Refit the emulsion tubes, air correctors and main jets into their original positions (do not transpose the jets).
6 Push both pump injectors firmly into position, after renewing the small seal on each injector body.
7 Renew the temperature-controlled accelerator pump inlet valve seal. Refit the inlet valve (with the seal facing inwards), then the diaphragm, spring, and cover assembly, and secure with the four screws.
8 Renew the accelerator pump inlet valve seal. Refit the inlet valve (with the seal facing inwards), then the spring, diaphragm, and cover assembly, and secure with the four screws.
9 Refit the fast idle spring, diaphragm, and cover assembly, and secure with the four screws. Reconnect the link rod to the actuating lever, and secure with the circlip. Refit the assembly, and secure with the two screws.
10 Refit the idle mixture screw, after renewing the seal. Turn the screw in gently, until it just seats. From this position, unscrew it three full turns – this will provide a basic setting, to allow the engine to be started.
11 Clean or renew the fuel filter, and refit the fuel inlet tube.
12 Renew the float chamber gasket, and locate in position on the upper body. Renew the needle valve assembly. Screw the valve seat into the upper body, using a new sealing washer, and ensure that it is firmly locked into position (but do not over-tighten). Transfer the hairpin or plastic clip from the old needle valve to the ball end of the new one. Place the clip and valve assembly onto the inner float tag. Lower the float and needle valve assembly into the seat, and secure with the float pin.
13 Adjust the float level. Refer to Section 4 (this Chapter) for details on adjustment.
14 Refit the upper body to the main body, and secure with the two screws. Reconnect the choke pull-down hose.
15 Fit the spring and idle jet to the idle cut-off valve. Do not push the jet completely into the valve. When the valve is fitted to the upper body, the idle jet will find its own position. Refit the assembly, using a new sealing washer.
16 Adjust the choke fast idle, pull-down and fast idle device. Refer to Section 4 (this Chapter) for details on all adjustments.
17 Ensure that the choke flap and linkage move smoothly and progressively. Refit the plastic choke mechanism shield.
18 Refit the carburettor to the engine (refer to Chapter 2, Section 2 for general advice on installing a carburettor), and secure with the four screws.
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 (this Chapter) for details.

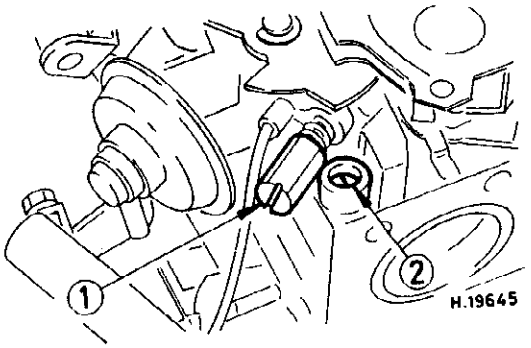


Fig. 21.9 Idle speed and mixture adjustment (Sec 4)

1 Idle speed screw *2 Idle mixture control screw*

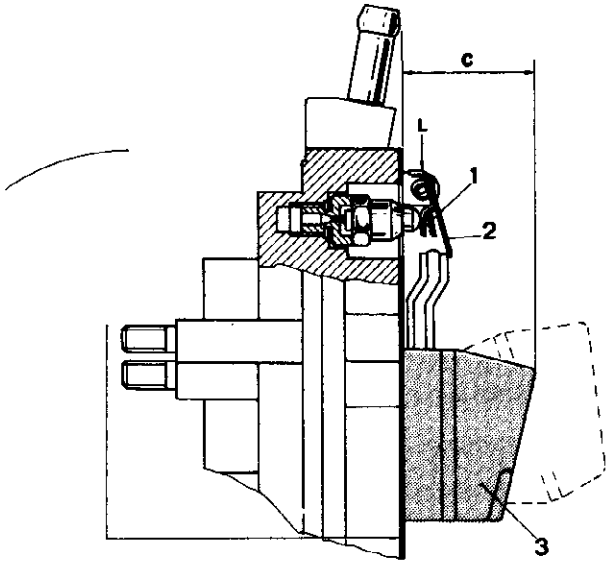


Fig. 21.10 Float level measurement (Sec 4)

1 Inner float tag *c Float level*
2 Float arm *L Outer float tag*
3 Float

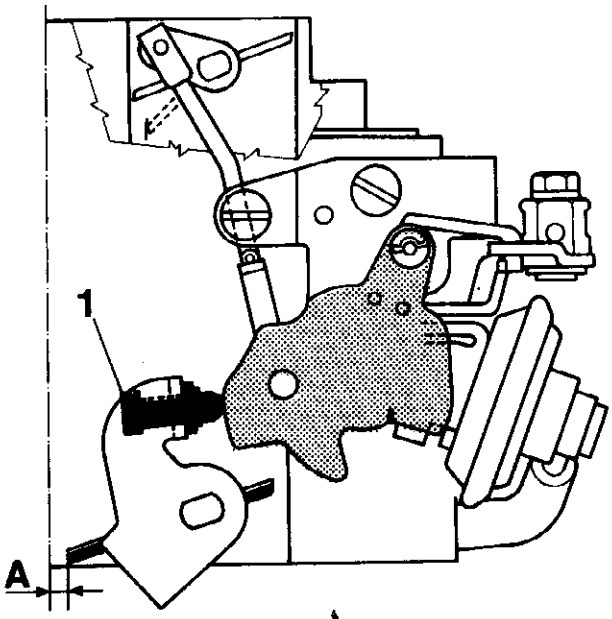


Fig. 21.11 Fast idle adjustment (Sec 4)

1 Fast idle adjustment screw *A Fast idle clearance*

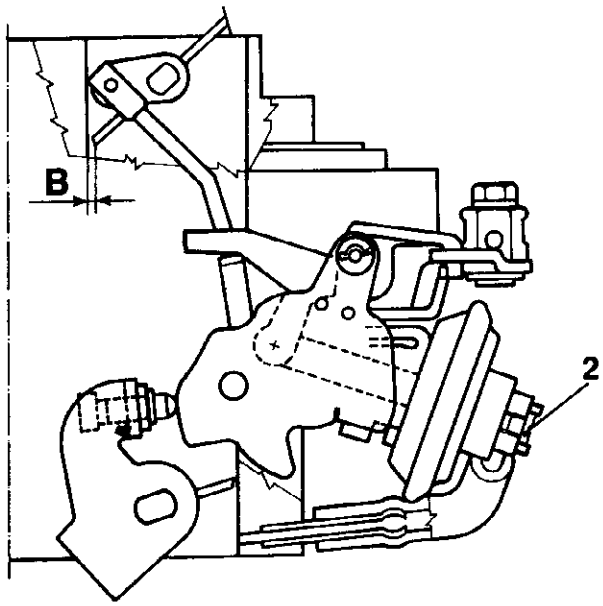


Fig. 21.12 Pull-down adjustment (Sec 4)

2 Pull-down adjustment screw *B Pull-down clearance*

4 Service adjustments

Adjustment preconditions

Refer to Chapter 2, Section 4 for general advice on the preconditions to 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 Remove the air filter assembly, and place it loosely on the carburettor. The vacuum and breather hoses must remain connected.
3 Use the idle speed adjustment screw to set the correct idle speed (refer to the specifications at the start of this Chapter).
4 Check the CO level. If it is not as specified, remove the tamperproof plug, and adjust the idle mixture control screw to achieve 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.
5 Repeat paragraphs 3 and 4 until both adjustments are correct.
6 Clear the manifold every 30 seconds during the setting operation by running the engine at 3000 rpm for 30 seconds.
7 Increase the speed to 2000 rpm, and note the CO reading. The 'cruise' reading should be less than half the idle CO reading.
8 Fit a new tamperproof plug to the mixture control screw.
9 Refit the air filter, ensuring that the vacuum and breather hoses are properly connected.

Float level

10 Hold the upper body in a vertical position, with the float tag gently touching the ball of the fully-closed needle valve.
11 Measure the distance between the upper body (with the gasket in place) and the top of the float.
12 Adjust as necessary by bending the float tag.

Manual choke

Fast idle

13 The carburettor must be removed from the engine in order to make the fast idle adjustment.
14 Invert the carburettor.
15 Pull the choke operating arm to fully close the choke flap. The adjustment screw will butt against the fast idle cam and force open the throttle plate, to leave a small clearance.
16 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, and measure the clearance from the progression holes.
17 Adjust as necessary by turning the adjustment screw in the appropriate direction.

Vacuum pull-down

18 Pull the choke operating arm to fully close the choke flap.
19 Use a vacuum pump (or a finger) to pull 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.
20 Remove the plug in the diaphragm cover, and adjust as necessary by turning the diaphragm adjustment screw in the appropriate direction. Renew the plug when adjustment is complete.

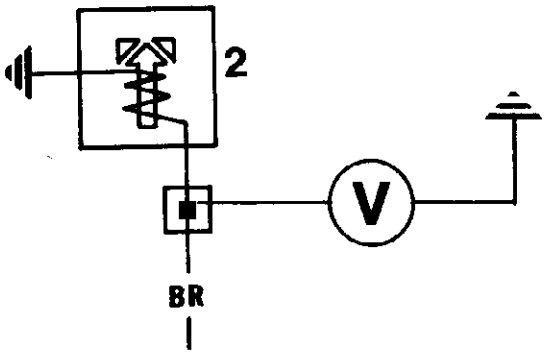


Fig. 21.13 Check voltage at idle cut-off valve (Sec 5)

2 Idle cut-off valve V Voltmeter BR White/red

Single-stage fast idle device

21 Check that the clearance between the throttle levers (9) (Fig. 21.6) is about 0.5 mm. Adjust as necessary by slackening the locknut and turning the diaphragm/rod in the appropriate direction. Retighten the locknut on completion.
22 Warm the engine to normal running temperature, and adjust the idle speed and mixture.
23 Allow the engine to idle, then disconnect the vacuum hose (5) (Fig. 21.6) from the fast idle device.
24 Connect the fast idle device to a vacuum source, and record the speed, which should be 1300 ± 50 rpm.
25 Remove the plug in the diaphragm cover, and adjust as necessary by turning the diaphragm adjustment screw in the appropriate direction. Renew the plug when adjustment is complete.
26 Refit all hoses into their original positions.

5 Component testing

Electronic idle cut-off system

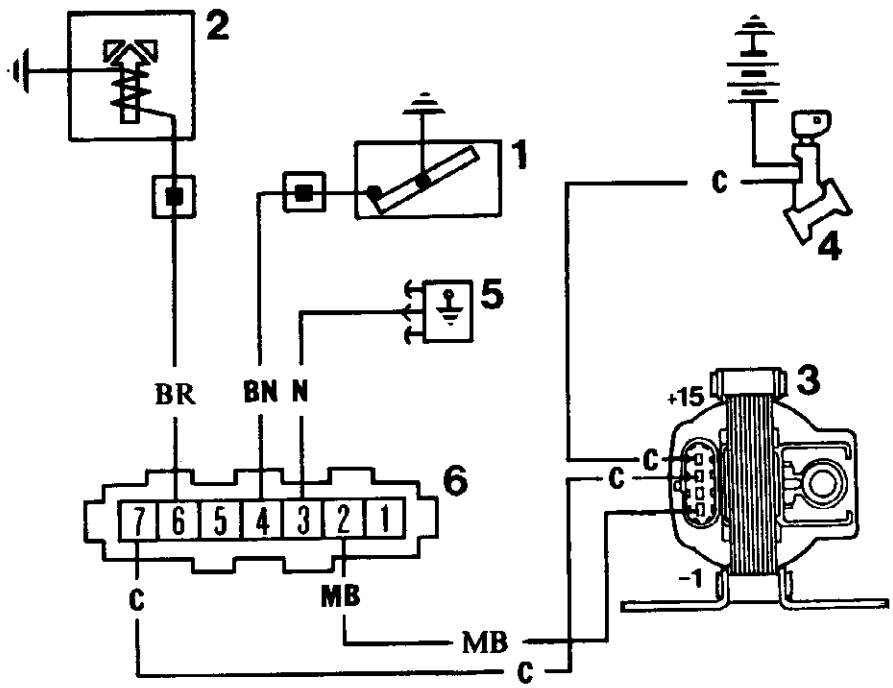
1 Connect a voltmeter from the idle cut-off valve to earth.
2 Turn the ignition on, and the voltmeter should indicate battery voltage.
3 Start the engine, and raise the engine speed to over 3000 rpm. The voltmeter should still indicate battery voltage.
4 Close the throttle, and decelerate the engine. Below 3000 rpm, the voltmeter should indicate zero volts, and then battery voltage as the speed falls below 1600 to 1700 rpm.
5 If the voltage indicated is not as specified in the tests above, carry out the following checks, according to which type of electronic control unit (ECU) is fitted. For guidance only, the separate ECU is normally fitted on 1400 cc engines, and the Digiplex type on 1600 cc engines.

Separate cut-off ECU

6 Peel back the rubber cover from the cut-off ECU multi-plug, and use the positive probe of a voltmeter (negative probe connected to earth) to

Fig. 21.14 Supplementary wiring diagram – idle cut-off valve and associated accessories (separate idle cut-off ECU) (Sec 5)

1 Throttle switch (closed)
2 Idle cut-off valve
3 Ignition coil
4 Ignition switch
5 Front left earth loom
6 Cut-off ECU
BN White/black
BR White/red
C Orange
MB Brown/white
N Black



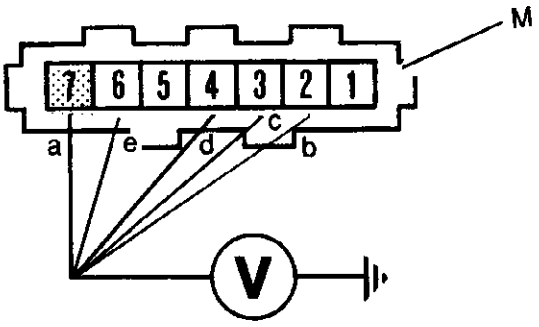


Fig. 21.15 Check voltages at idle cut-off ECU multi-plug (separate idle cut-off ECU) (Sec 5)

a Check voltage at terminal 7
b Check voltage at terminal 2
c Check voltage at terminal 3
d Check voltage at terminal 4
e Check voltage at terminal 6
M Multi-plug connection

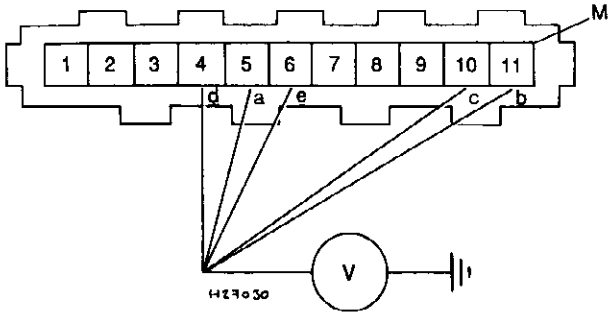


Fig. 21.17 Check voltages at Digiplex ECU multi-plug (Sec 5)

a Check voltage at terminal 5
b Check voltage at terminal 11
c Check voltage at terminal 10
d Check voltage at terminal 4
e Check voltage at terminal 6
M Multi-plug connection
V Voltmeter

probe for the following voltages at the terminals (multi-plug connected and ignition on).

(a) Terminal 7 : Battery voltage. If the voltage is low, or zero, check the wire back to the coil positive (+) terminal.
(b) Terminal 2 : Battery voltage. If the voltage is low, or zero, check the wire back to the coil negative (–) terminal.
(c) Terminal 3 : 0.2 volts maximum. If the voltage is higher, check the earth connection, and/or renew the earth wire.
(d) Terminal 4 : 0.2 volts maximum. Open the throttle, and the voltage should become battery voltage. If the voltage indicated is not as specified, check the earth to the throttle switch.
(e) Terminal 6 : Battery voltage. If the voltage is low, or zero, and the voltages at the other terminals are correct, renew the cut-off ECU.

7 If all connections are satisfactory, yet the idle cut-off operation is incorrect, suspect the ECU. Test the ECU by substitution, but only after all the connections have been thoroughly checked.

8 It is possible to bypass the idle cut-off system by bridging pin numbers 6 and 7 at the control unit. All the wires can still remain connected to the control unit. Engine and fuel system operation will not be impaired by this procedure, although fuel consumption may be (slightly) adversely affected.

Digiplex ECU

9 The Digiplex ECU is located behind the nearside headlamp. Remove the fixing screws and pull the unit from its location, so that the multi-plug is more accessible.

10 Peel back the rubber cover from the Digiplex multi-plug, and use the positive probe of a voltmeter (negative probe connected to earth) to

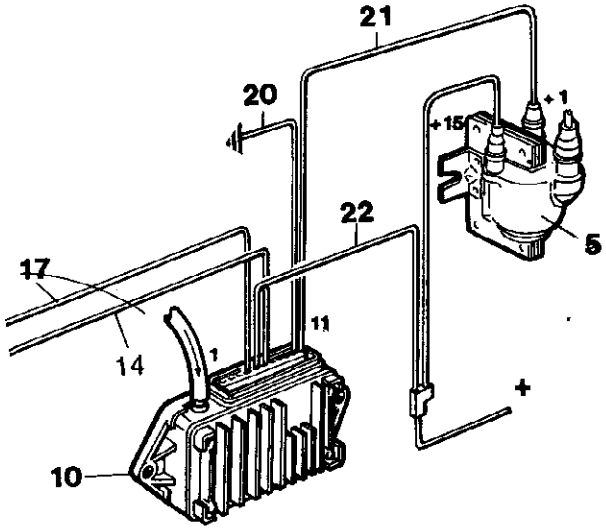


Fig. 21.16 Digiplex wiring chart (Sec 5)

5 Ignition coil
10 1600 cc engine : Digiplex ECU
14 Idle cut-off valve wire
17 Throttle switch wire
20 Earth wire
21 Rpm sensor wire
22 Voltage supply wire

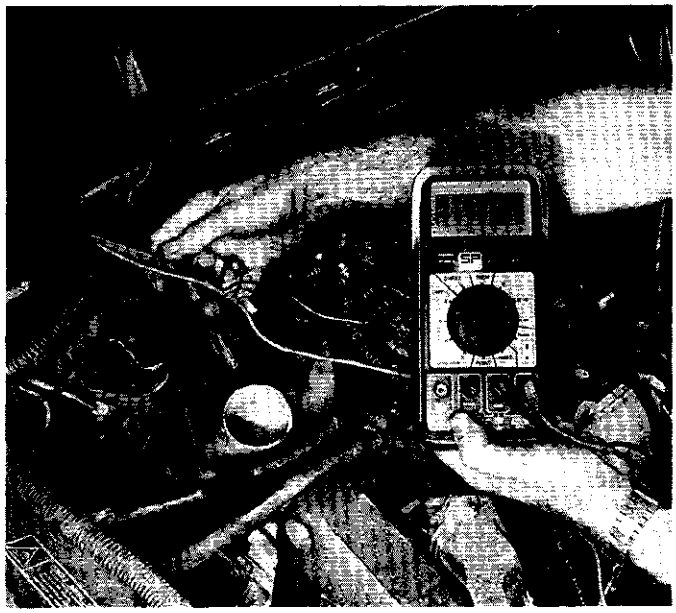


Fig. 21.18 Testing idle cut-off valve voltage (Sec 5)

probe for the following voltages at the terminals (multi-plug connected and ignition on).

(a) Terminal 5 : Battery voltage. If the voltage is low, or zero, check the wire back to the coil positive (+) terminal.
(b) Terminal 11 : Battery voltage. If the voltage is low, or zero, check the wire back to the coil negative (–) terminal.
(c) Terminal 10 : 0.2 volts maximum. If the voltage is higher, check the earth connection, and/or renew the earth wire.
(d) Terminal 4 : 0.2 volts maximum. Open the throttle, and 3.0 volts or more should be indicated. If the voltage indicated is not as specified, check the earth to the throttle switch.
(e) Terminal 6 : Battery voltage. If the voltage is low, or zero, and the voltages at the other terminals are correct, then the Digiplex ECU is suspect.

11 If all connections are satisfactory, yet the idle cut-off operation is incorrect, suspect the Digiplex ECU. Test the ECU by substitution, but only only after all the connections have been thoroughly checked.

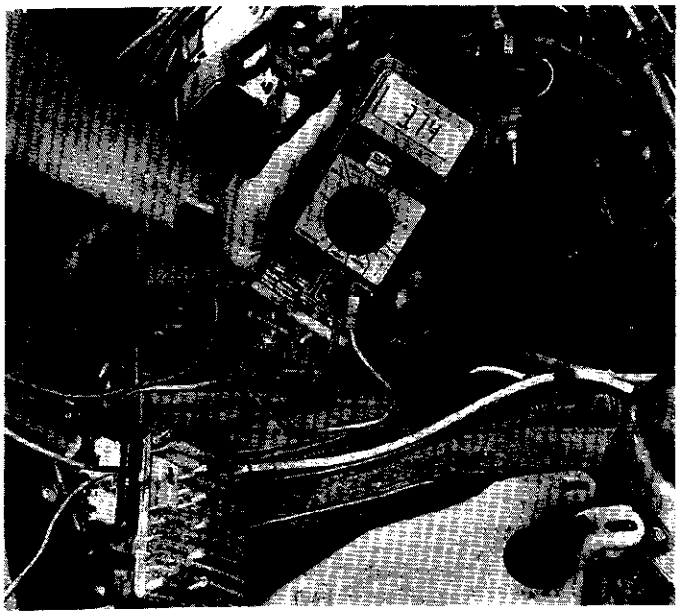


Fig. 21.19 Testing the Digiplex ECU (Sec 5)

Terminal 4 : Throttle closed – 0.2 volts maximum
Terminal 4 : Throttle open – 3.74 volts (typical)

Temperature-controlled accelerator pump

12 Disconnect the vacuum hose, and attach a vacuum pump to the temperature-controlled accelerator pump. Operate the vacuum pump to obtain 300 mm Hg.
13 Release the vacuum, and the injector should operate fully, injecting a small stream of fuel into the venturi. If not, check the diaphragm for damage, the pump injector for a blockage, and the pump inlet and outlet balls for seizure.

Thermal switch

14 Begin with the engine cold. Remove the vacuum hose from the thermal switch outlet pipe, and connect a vacuum gauge to the outlet connector.
15 At a coolant temperature below 25°C (77°F), full manifold vacuum should be obtained.
16 Run the engine, and allow it to warm up.
17 As the coolant temperature rises above 25°C, the gauge vacuum reading should fall.
18 At a coolant temperature above 45°C (113°F), zero vacuum should be registered. **Note:** *Because vacuum will be 'trapped' in the hose between the gauge and thermal switch, regularly remove and reconnect the gauge during the warm-up test.*
19 Renew the thermal switch if its operation is unsatisfactory.
20 Refit the vacuum hose.

6 Fault diagnosis

Refer to Chapter 2, Sections 5 and 6.

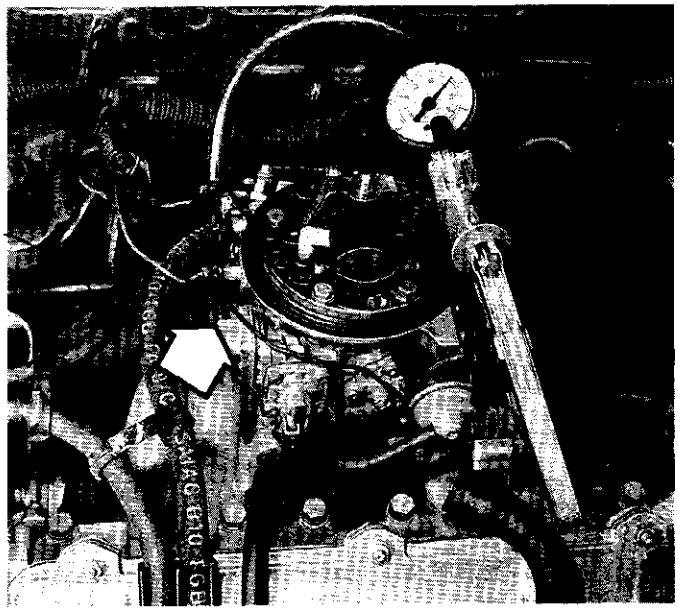


Fig. 21.20 Using a vacuum pump to test the temperature-controlled accelerator pump (Sec 5)

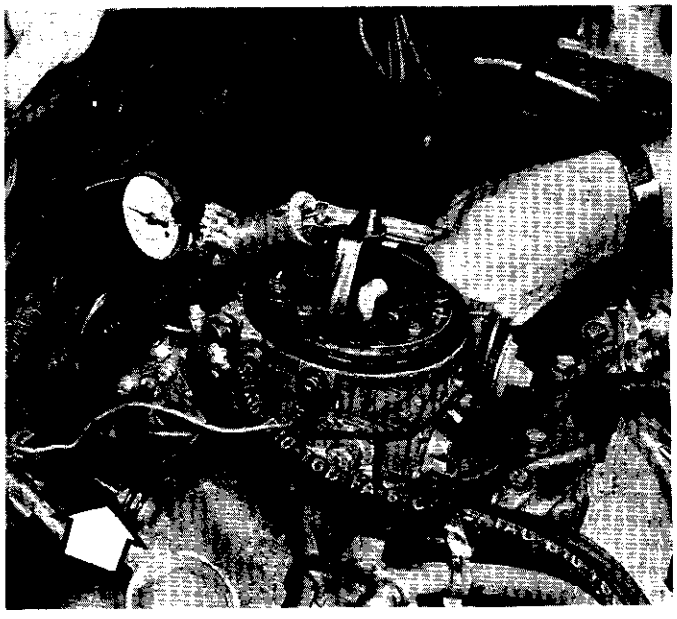


Fig. 21.21 Manifold vacuum at the thermal switch outlet pipe, with a coolant temperature below 25°C (Sec 5)