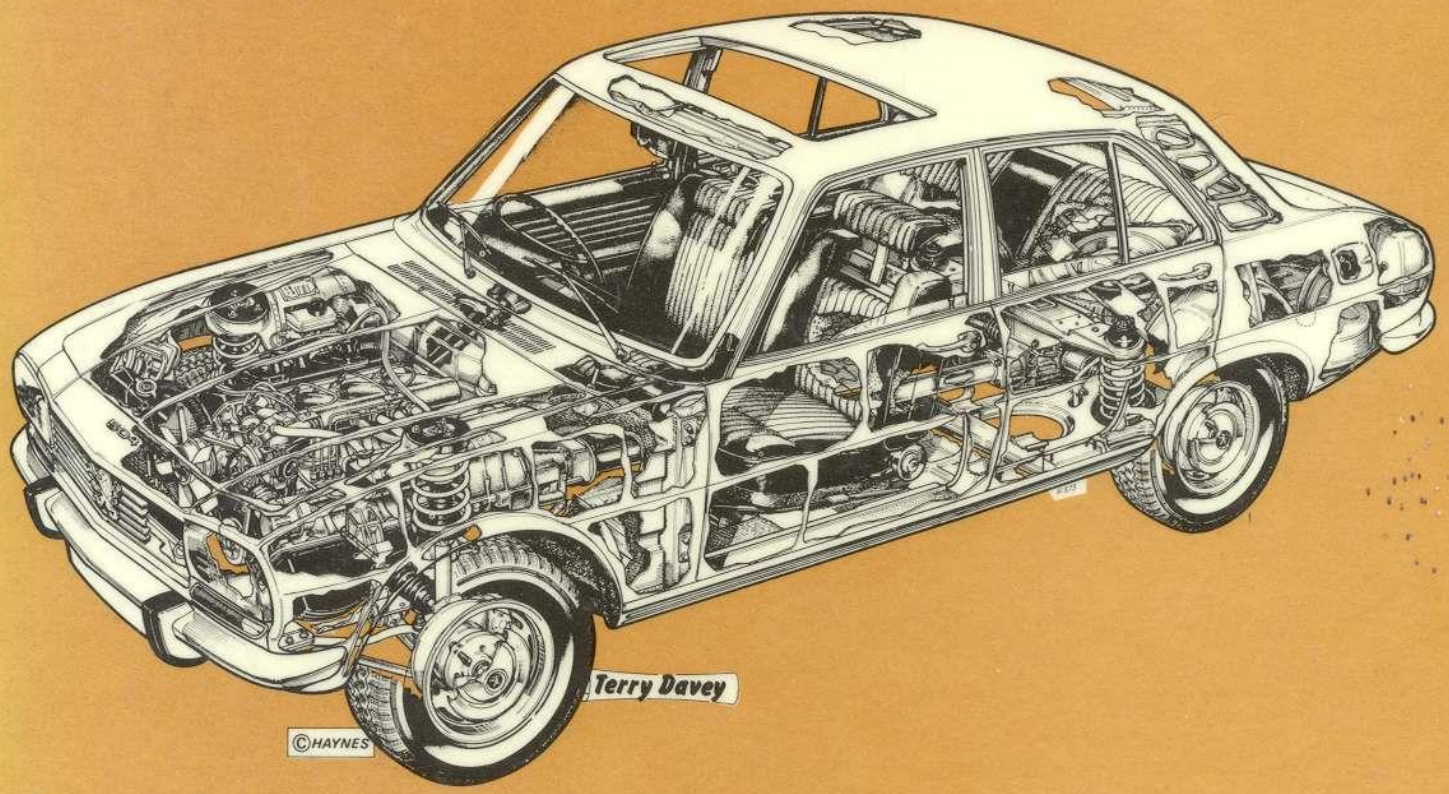
PEUGEOT 504

Petrol (gasoline) models '68 to '74
1796cc (109 cu in) □ 1971cc (120 cu in)

Haynes

Owners Workshop Manual



Part 3: Fuel injection system

30 General description - fuel injection system

1 The best way to understand the operation of the fuel injection system is to consider the basic operation of a conventional carburettor system first.

Obviously, the more fuel an engine burns the more power it will develop within obvious design limitations.

To ensure that the fuel is burnt correctly it must be mixed with air in the correct proportions. If the mixture is too rich, there will not be enough oxygen to support combustion as every motorist who has used the choke control too enthusiastically will know. If it is too weak, the burning process is slow and irregular - sometimes it is still going on when the inlet valve opens and 'spitting back' in the carburettor occurs. The basic function of the fuel system, then, is simply to provide the amount of fuel the engine needs at any given time mixed with the amount of air required to ensure that it is properly burnt.

2 The accelerator pedal, opening and closing the throttle, controls not the amount of fuel entering the engine but the amount of air. A measure of this amount is the suction which occurs on the carburettor side of the throttle (ie; the degree of vacuum set up there). This pressure drop causes the carburettor to release an amount of petrol vapour in ratio to the amount of air going in. This is easier said than done, as is obvious when one looks at the complexity of a modern carburettor as described in Sections 9 and 10.

In the past few years, insistance on the reduction of atmospheric pollution has lead to a demand for tighter control of the petrol/air mixture, and this has made the problems facing the carburettor designer even more difficult. For example, the maximum mixture varies with the temperature of the ingoing air, basically because when air is warm the same weight of air occupies more space and it is the weight of air to weight of fuel that must be considered **not** volume to volume. In the carburettor engine an attempt to improve matters is described in Section 26. However, the problem is dealt with in a different way in the fuel injection engine and the thermostatically operated flap and branch pipe to a hot spot on the exhaust system are not used.

3 The fuel injection system is entirely different from the carburettor because it does not rely directly on engine vacuum to control the amount of petrol drawn in. On each inlet stroke a measured amount of petrol is squirted into the inlet manifold, the amount being principally determined by the engine speed and throttle position, though there are other factors as well.

In the Kugelfisher system fitted to the Peugeot 504, the amount of petrol injected is controlled by varying the stroke of a special pump. The principle of operation is shown in Fig. 3.27.

Referring to the illustration the heart of the system is the hydraulic head (c) containing four metering systems (one of which is shown in section) comprising a piston (1) operating in one branch of a three-way channel whose other branches contain one-way valves. As the piston descends, fuel under pressure enters the system through the inlet valve, and as the piston comes up again petrol is forced out through the outlet valve. The piston is driven, via a tappet, from a camshaft which runs at half engine speed. There are four piston systems, one for each engine cylinder.

The amount of petrol pushed out is determined by the stroke of the piston. The piston is raised by a tappet (5) but its lowest point is determined by the position of the beam (3) on which its lower end rests (the tappet drives the piston through a hole in the beam). Both ends of this beam can be raised or lowered, one end is threaded onto a cranked rod which is attached to the richness lever (14), and if this lever moves downwards as shown in the illustration the end of the beam moves upwards, thus raising the centre part of the beam and shortening the stroke, so reducing the amount of petrol pushed out and making the mixture weaker.

Conversely, when the richness lever (14) is in its highest

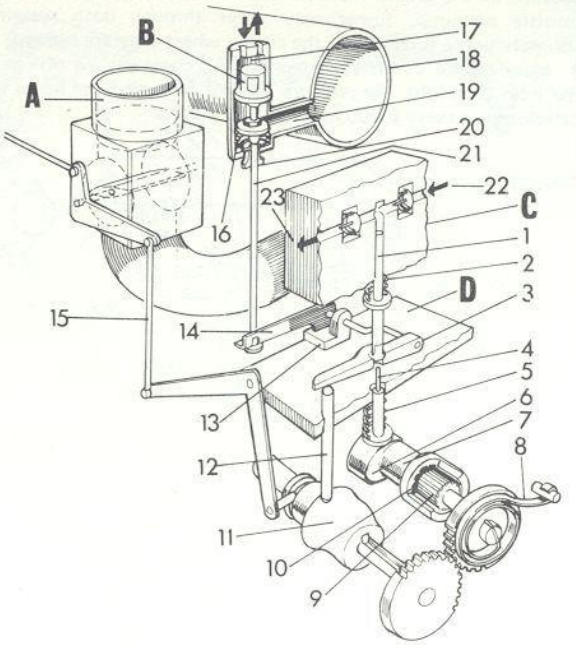


Fig 3.27 Principle of operation of fuel injection pump (Sec 30)

1 Piston
2 Piston spring
3 Stroke checking beam
4 Tappet
5 Spring
6 Cam
7 Camshaft
8 Checking spring
9 Armature
10 Magnetic bars sleeve
11 Adjustment can
12 Finder
13 Stop
14 Richness lever
15 Link rod
16 Thermo control spring
17 Water sleeve in manifold
18 Distributor
19 Air boost pipe
20 Valve
21 Control
22 Inlet valve
23 Delivery valve

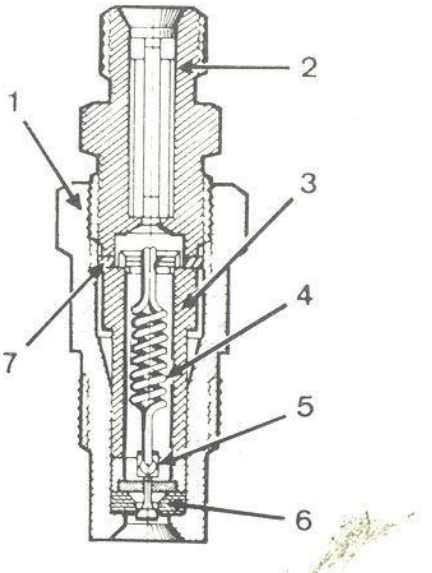


Fig 3.28 Cross-sectional view of injector (Secs 30 and 31)

1 Injector holder
2 Connection
3 Injector body
4 Spring
5 Valve
6 Seat
7 Steel joint washer

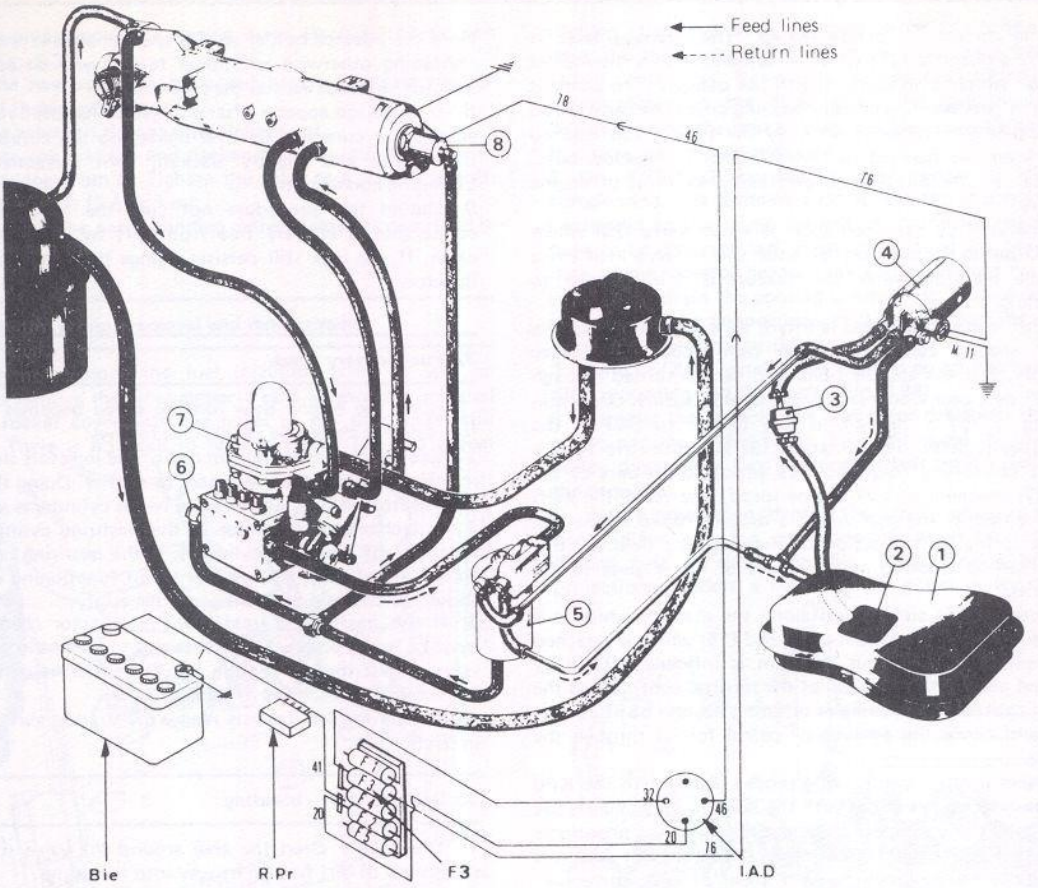


Fig 3.29 Petrol injection system as fitted to KF5 and XN2 engines

Bie	*Battery*	*1AD*	*Ignition switch*	*3*	*Pre-filter*	*6*	*Injection pump filter*
RPr	*Relay*	*1*	*Fuel tank*	*4*	*Electric lift pump*	*7*	*Injection pump*
F3	*Fuse*	*2*	*Fuel strainer*	*5*	*Degassing filter (fuel filter)*	*8*	*Electrovalve*

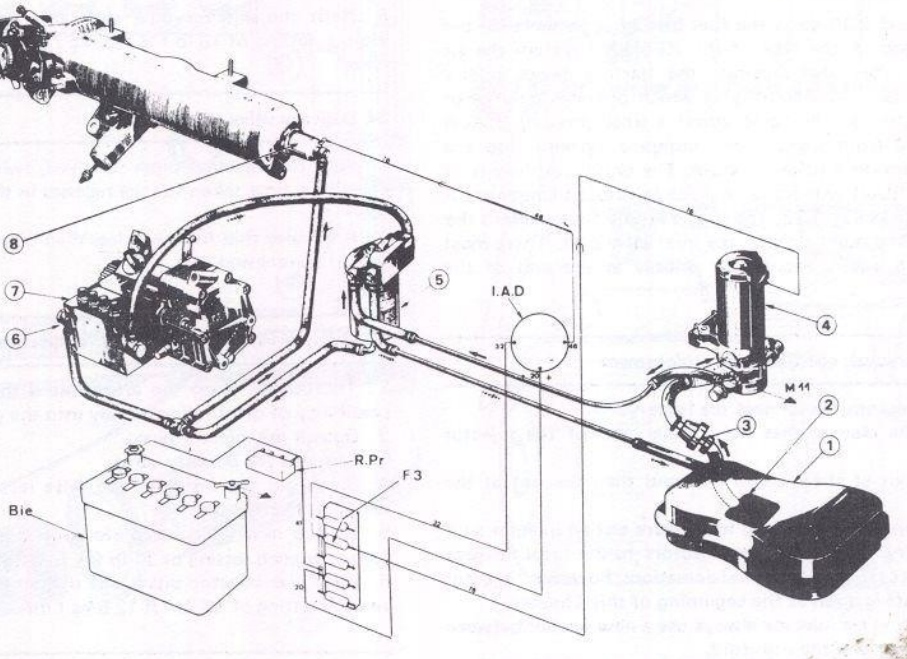


Fig 3.30 Petrol injection system as fitted to KF6 engine [For caption see Fig 3.29]

position the mixture is at its richest. The richness lever is operated by a pushrod (21) which is connected to a thermostat element (B) which is in contact with the coolant. The element expands as it gets warm, gradually pushing down the control rod as the temperature increases until by the time it has reached 50°C the lever has reached its lowest point. Thus below 50°C the richness of the mixture automatically varies with engine temperature.

Also operated by the thermostat is an air valve (20) which gradually closes as the pushrod descends; this allows a little extra air into the manifold when the mixture is rich in order to improve idling.

The other end of the beam is lifted, via a pushrod (12), by a specially shaped cam (11). This cam does not revolve continuously, but the spindle holding it can be turned through about 180° by a gear whose position is altered against the action of a spring (8) by a mechanism very similar to that of the magnetic speedometer. An armature (9) is concentric with a sleeve (10) containing magnetic bars which forms part of the camshaft (7) revolving at half engine speed. The faster the shaft revolves, the further the gear wheel is dragged round against the pull of the spring by the action of the magnetic field. By this means the cam is revolved and a degree of lift it gives to the beam is varied.

This same cam is also moved along the shaft to which it is keyed by a lever operated from a link rod (15) which is attached to the throttle control. Thus the cam is influenced both by engine speed and by the position of the throttle control, and the variation in cam position produces differing degrees of lift on the beam (3) and hence the amount of petrol forced through the outlet valve.

This sytem is employed on 504 models fitted with the KF6 engine. However models fitted with the KF5 or XN2 engines use a pump in which the richness lever is controlled by a pneumatic governor fitted to the top of the pump. This governor performs two functions; in conjunction with the "altitude corrector" which incorporates an aneroid, it adjusts the mixture to compensate for variations in barometric pressure, principally those brought about by altitude, and it adjusts the mixture during deceleration, preventing this from being too rich - thus achieving the same results as the 'fast idle' system on the carburettor engine.

Figs. 3.29 and 3.30 show the fuel feed arrangements for the two systems and in the case of the KF5/XN2 system the air feeds as well. They also illustrate the starting device briefly referred to earlier - an electro-valve which operates only when the starter motor is running to admit a small amount of fuel (under pressure from the primary pumping system) into the manifold to provide a richer mixture. The only components of the system not dealt with so far are the injectors themselves. A diagram is shown in Fig. 3.28. The fuel is simply squirted into the inlet manifold at a point close to the inlet valve port. There must be a nice even squirt and be no dribble at the end of the injection point.

31 Injector - removal, checking and replacement

1 For safety reasons, disconnect the battery.
2 Take off the clamps that hold either end of the injector supply pipe.
3 Undo the nut at the injector end and then the nut at the pump end.
4 Special equipment is required to pressure test an injector so it will be necessary to take all the injectors to the local Peugeot garage for testing. For information however injector performance data is given at the beginning of this Chapter.
5 When replacing an injector always use a new washer between the injector holder and the manifold.
6 Tighten the injector holder to the inlet manifold to a torque wrench setting of 14.5 lb f ft (2.0 kg f m).
7 Connect the pipe at the injector end first and tighten the connection to a torque wrench setting of 18 lb f ft (2.5 kg f m). Hold the injector holder with a spanner to take the strain whilst tightening otherwise additional torque will be applied to the injector holder as well as the pipe union.
8 If a leakage appears after an injector has been refitted do not attempt to cure this by over-tightening the connections. Start the engine and slightly slacken, then correctly tighten the offending connection.
9 Should this procedure not cure the leak check that the connection is entirely free from dirt by giving it a thorough clean. If the leak still persists change the complete pipe or the injector.

32 Fuel delivery check

When the engine slow running speed becomes irregular the fuel delivery should be checked as follows:
1 Slacken the union nut on one of the injectors slightly; as fuel leaks out the cylinder will start to misfire. Doing this to each of the injectors in turn will indicate which cylinder is at fault.
2 Interchange the injector in the misfiring cylinder with that from one of the other cylinders. If the misfiring now occurs on the other cylinder, the injector is not functioning correctly and should be checked and renewed if necessary.
3 If the misfiring is unaffected by injector change, the fault must be in the pump. The first step is to bleed the pump delivery valve as described in Section 33. Thereafter, it must be checked for leakage as described in Section 34.
4 If misfiring still persists renew the suction valve as described in Section 36.

33 Delivery valve - bleeding

1 Thoroughly clean the area around the valve so there is no possibility of dirt finding its way into the pump.
2 Remove the injector pipe completely.
3 Slacken the delivery valve nut.
4 Switch on the ignition and allow a small amount of fuel to flow out from around the nut.
5 Tighten the nut to a torque wrench setting of 36 lb f ft (5.0 kg f m).
6 Refit the injector pipe and tighten the union to a torque wrench setting of 18 lb f ft (2.5 kg f m).

34 Delivery valve - leakage check

1 With the injection pipes removed, switch on the ignition and check the time taken for the recesses in the valves to fill up with fuel.
2 Any valve that fills up in less than 30 seconds is defective and should be renewed.

35 Delivery valve - removal and replacement

1 Thoroughly clean the area around the valve so there is no possibility of dirt finding its way into the pump.
2 Detach the injector pipes.
3 Unscrew the delivery valve.
4 Clean out the inside of the valve recess and lightly smear it with a little clean oil.
5 Fit the new valve complete with spacer and tighten it to a torque wrench setting of 36 lb f ft (5.0 kg f m) (Fig. 3.31).
6 Refit the injector pipes and tighten the unions to a torque wrench setting of 18 lb f ft (2.5 kg f m).

36 Suction valve - removal and replacement

1 Thoroughly clean the area around the underside of the pump so there is no possibility of dirt finding its way into the pump.

2 Unscrew and remove the suction valve. Recover the 'O' ring and filter (Fig. 3.32).
3 Clean the new valve assembly and lightly lubricate the 'O' ring and the thread with clean oil.
4 Refit the valve but do not fully tighten yet.
5 Switch on the ignition and slacken off the suction valve until petrol is flowing from it. Tighten the valve to a torque wrench settting of 18 lb f ft (2.5 kg f m).
6 Finally bleed the corresponding delivery valve as described in Section 33.

37 Fuel injection pump - removal and replacement

1 In order to remove the fuel injection pump it will be necessary to remove the air chamber. Fig. 3.33 shows it propped up on the rocker cover with the hoses to the thermostat still connected. There is no need to remove them. The rod shown sticking up in the air is normally connected to the enrichment lever on the pump. The injection pipes have been removed completely, as have the oil vapour recirculation hose (disconnected at the filter end), the vacuum lines to the distributor and the brake servo, the electro-valve petrol line and feed wire, and the throttle cable.
2 On KF5/XN2 installations the system is slightly more complicated, one difference being that the thermostat hoses are connected to the pump instead of to the air chamber so they have to be disconnected. Raise the ends of the hoses above the level of the radiator header tank and it will not be necessary to completely drain the cooling system. Fig. 3.35 shows details of the various hose connections to the pump and the air chambers in case they become muddled.
3 On KF5/XN2 installations there is an oil line between the oil filter mounting and the pump (Fig. 3.34).
4 Remove the fanbelt, the alternator drivebelt, the crankshaft pulley and the timing cover. This will reveal the injection pump pulley driven by a flexible toothed belt from a similar pulley on the camshaft.
5 Before proceeding identify the timing reference marks on the two pulleys and the corresponding small projections on the driving belt as shown in Fig. 3.36. Notice how the two projections straddle a mark on the pump pulley while a single

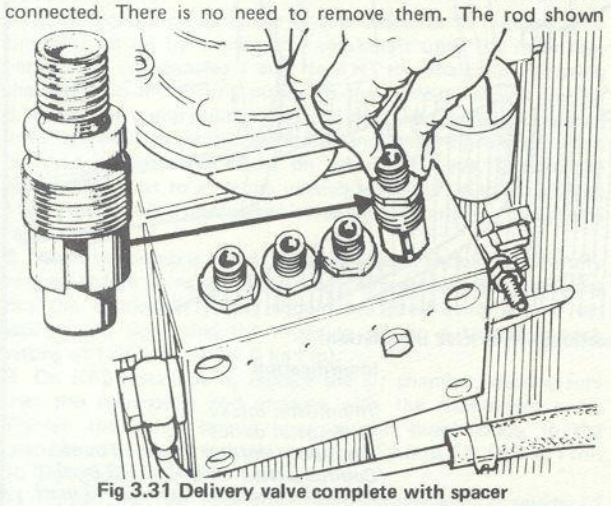


Fig 3.31 Delivery valve complete with spacer

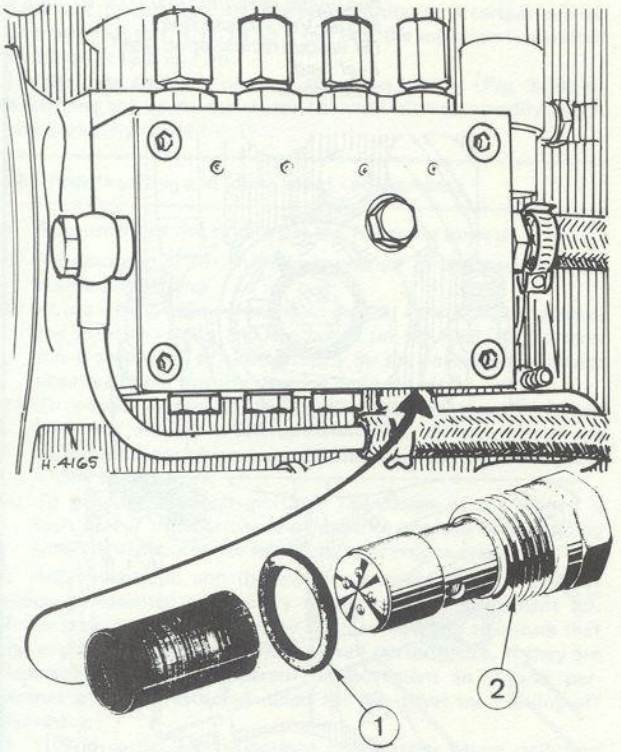


Fig 3.32 Suction valve and its location (Sec 36)

1 'O' ring *2 Valve assembly*

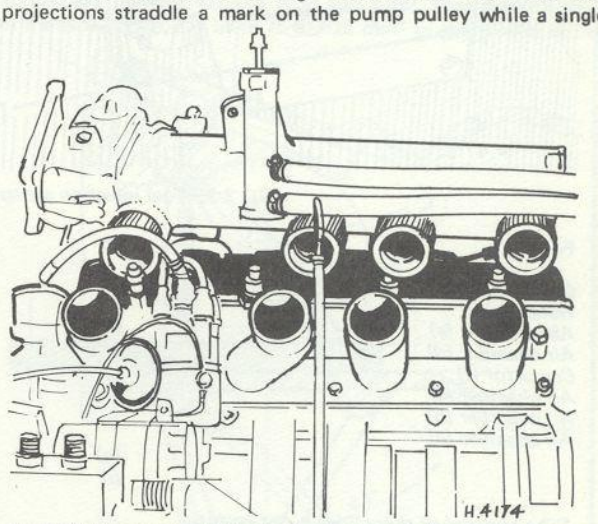


Fig 3.33 Air chamber detached and supported on rocker cover (Sec 37)

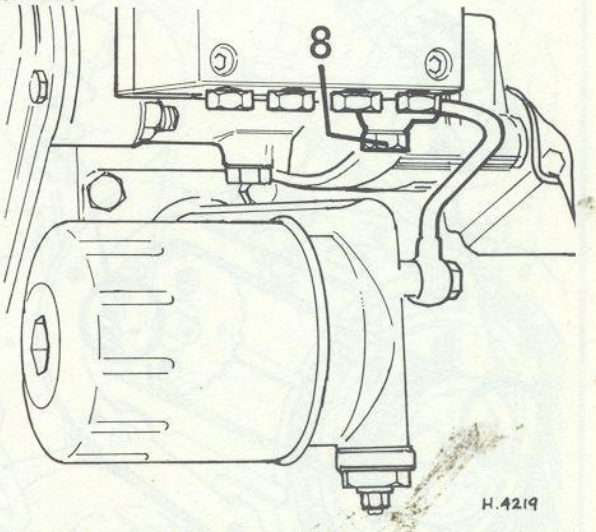


Fig 3.34 Location of oil line between injection pump and filter (Sec 37)

8 Union to underside of pump

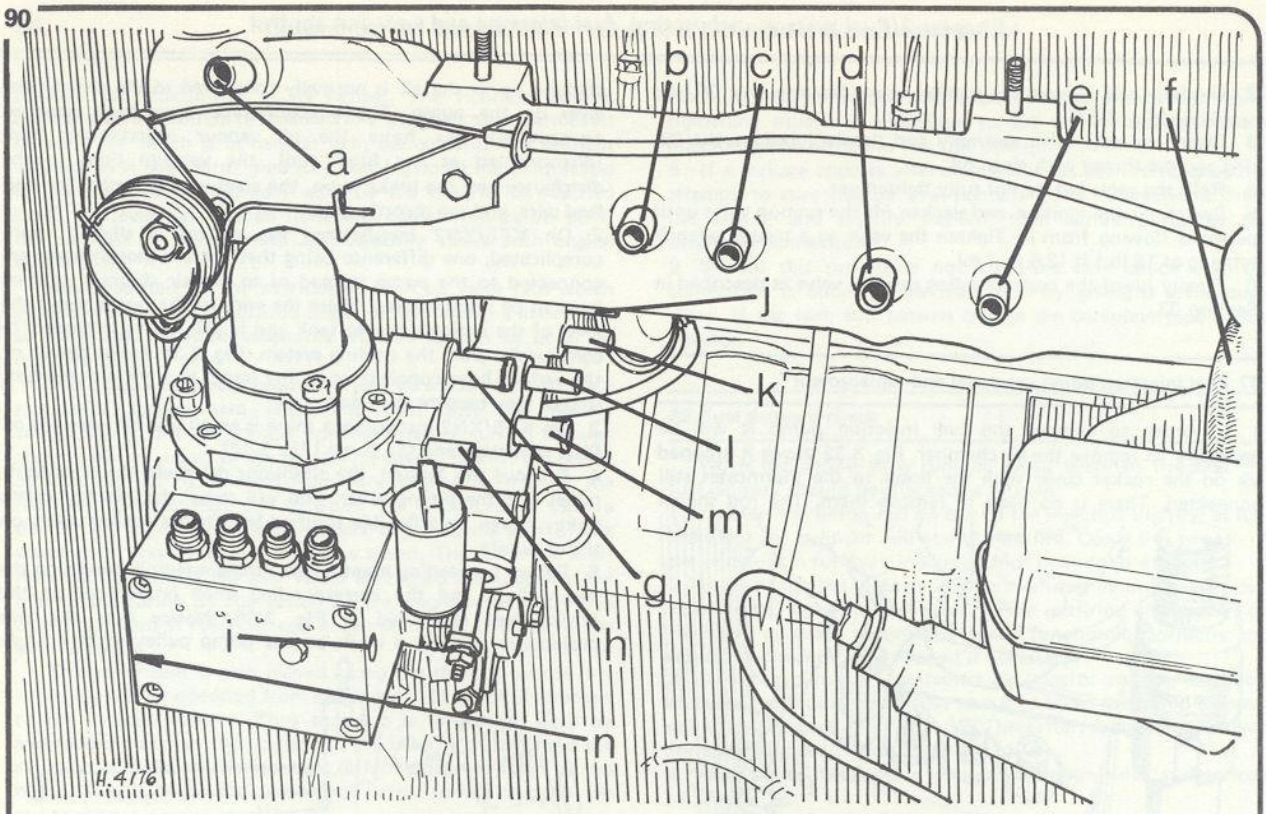


Fig 3.35 Fuel injection pump connections (KF5/XN2 installation)

From	To	Identification
Cylinder head	*(j)*	*Thermostat intake*
Water pump	*(k)*	*Thermostat outlet*
Air chamber (e)	*(l)*	*Fast idling air intake (O 10 mm)*
Air chamber (d)	*(m)*	*Counter pressure line (O 13 mm)*
Corrector (f)	*(g)*	*Altitude correction line (O 13 mm)*
Air chamber (a)	*(h)*	*Pneumatic governing line (O 10 mm)*
Air chamber (b)		*Master-Vac vacuum line**
Air chamber (c)		*Oil vapour recirculation line**
	(n)	*Fuel feed*
	(i)	*Fuel return*

**The removal of these lines is not essential*

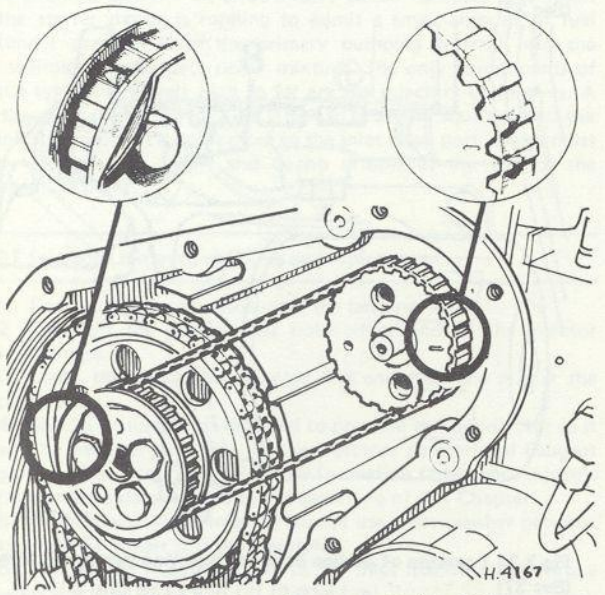


Fig 3.36 Timing reference marks (Sec 37)

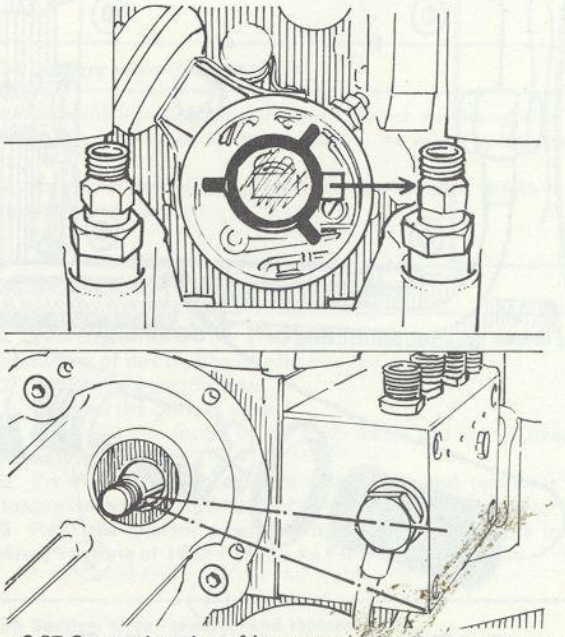


Fig. 3.37 Correct location of keyway and distributor rotor arm (Sec. 37)

projection coincides with a mark of the driving pulley. Notice also which way round the belt is fitted with the projections to the front. It will certainly be necessary to turn the crankshaft to line up the marks to the position shown in Fig. 3.36. Straighten up the lockwashers and remove the fixing nut holding the pump pulley to its spindle.

6 With the pulley removed the position of the keyway on the pump spindle should be as shown in Fig. 3.37. Should the spindle move as the pulley is being drawn replace the pulley and reposition the pulley mark.

The pulley being on a taper should come off quite easily. If it needs a little persuasion obtain and screw in bolts up to the timing case. Alternatively slacken off the two screws which hold the pump to the timing case and withdraw the pump until the pulley rests against the timing case when a gentle tap or two on the end of the spindle with a soft faced hammer will serve to loosen the pulley.

7 Refitting the pump is the reverse sequence to removal. The timing is set up by turning the crankshaft until the rotor arm contact lies between No 1 and No 3 HT terminals this will bring the mark on the driving pulley to the position shown in Fig. 3.36, and the pump pulley (keyed to the pump spindle) is turned until its mark is correctly positioned and the belt projections can be lined up with the marks on the two pulleys. Tighten the pump pulley nut to a torque wrench setting of 25 lb f ft (3.5 kg f m). Always use a new gasket between the pump and the timing case.

8 When the pump is fitted, the timing cover should be carefully entered before being refitted (using a new gasket), and following this the crankshaft pulley should be fitted using a new tab washer and tightening the retaining nut to a torque wrench setting of 123.5 lb f ft (17.0 kg f m).

9 On KF6 installations, replace the air chamber, making sure that the thermostat rod engages with the enrichment lever. Tighten the Allen screws securing the pump body to the chamber to a torque wrench setting of 14.5 lb f ft (2.0 kg f m).

10 Tighten the alternator belt.

11 Tighten the fuel feed union to a torque wrench setting of 14.5 lb f ft (2.0 kg f m), the return union to a torque wrench setting of 13 lb f ft (1.75 kg f m), and the injection line unions to 18 lb f ft (2.5 kg f m).

12 When the engine is running, bleed the oil line (Fig. 3.34) by slackening the upper connector (8) until oil runs steadily past it and then fully tighten.

38 Throttle setting and idling speed - adjustments

1 Adjustment of the system has the following objects:

a) To ensure that the throttle is opened to the correct small degree when idling.

b) In the KF6 system, to maintain correct synchronism between the throttle setting and the pump (in the KF5/XN2 system this is taken care of automatically by the pneumatic governor once the initial throttle opening has been set).

c) To ensure a correct relationship between the enrichment lever and the rod which operates it, ie; to ensure that the appropriate enrichment is obtained over the right range of engine temperature.

d) To produce the best mixture. The design of the system is such that if the mixture is adjusted to produce correct idling it will be right over the whole range of engine speeds.

2 Adjustments (a) and (b) are purely mechanical, they are of course an essential preliminary to the mixture adjustment (c). These procedures are devised by the manufacturer to ensure that the engine has the best possible overall performance. If they are departed from, any apparent improvement in engine performance over a restricted range will be offset by a falling off elsewhere.

3 This is particularly important in countries where pollution regulations are rigidly enforced. Incorrect adjustment, even where it makes no significant difference to engine performance, may well produce a degree of pollution outside the acceptable limits.

4 Before commencing work ensure that the ignition timing is correctly and accurately set. The contact breaker points and spark plugs must be in good order and correctly adjusted.

5 Make sure that there are no air leaks and that the air filter is in good condition and not blocked by dust and dirt. This is doubly important in the KF5/XN2 system which depends on a vacuum governor and extra care should be taken to see that all lines connected to the air chamber are in first class condition.

39 KF6 system - throttle adjustment

1 Check that the distance between centres of the ball heads on the link rod is 3.65±0.004 in (97.3±0.1 mm). If necessary slacken off one of the locknuts and screw the associated ball head in or out until the correct distance is obtained. Be sure that the faces of the ball heads are in line with each other.

2 With the link removed, lock the lever on the pump body by inserting a 0.20 in (5.0 mm) rod through the hole or slot in the pump lever into a blind hole in the pump body (see Fig. 3.38). **Do not** slacken the bolt clamping the lever to its spindle.

3 Slacken the bolt (2) Fig. 3.38 and 3.39). Now insert a strip of metal 0.266±0.001 in (6.75±0.025 mm) in the groove at the

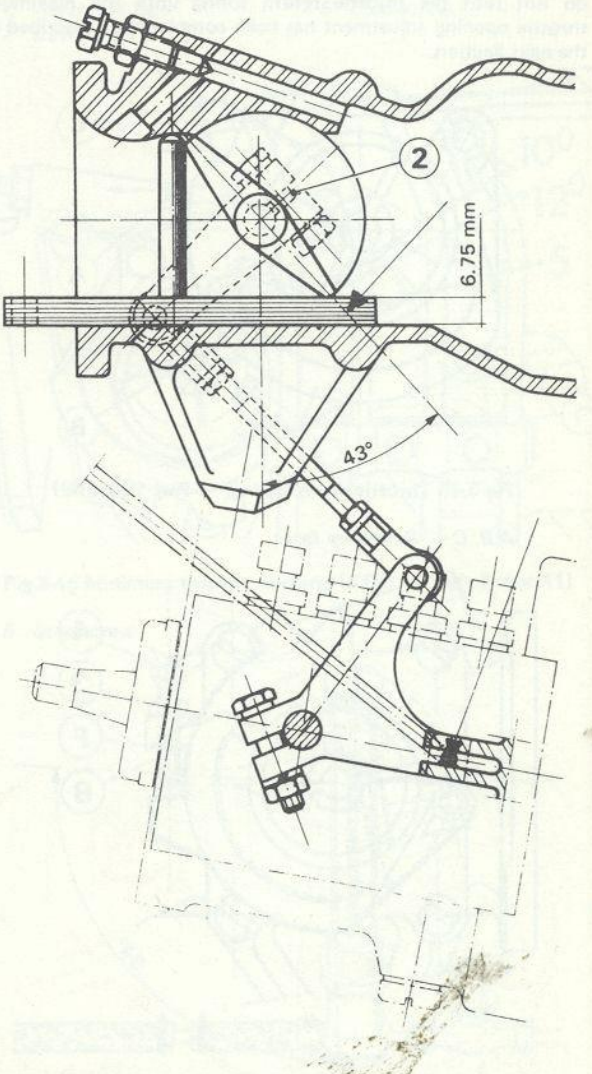


Fig 3.38 Throttle adjustment - KF6 System (Sec 39)

Arrows show metal gauges to be used (See text)

bottom of the throttle entrance. Figs. 3.38 and 3.39 show the gauge used by Peugeot garages in position. The rod sticking out of the metal strip has no critical dimensions, it is simply there to push up against the throttle flap so that this is firmly held against a metal strip when the gauge is pushed into the throttle flap housing.

4 With the throttle flap and the pump lever both locked into their reference positions - the lever by the rod and the throttle flap by the gauge - replace the link, engaging its ball heads with the levers on the pump and on the throttle spindle, and tighten the bolt (2) leaving a clearance of 0.8 ins (2.0 mm) between the lever and the housing. The pump and throttle are now correctly aligned.

5 It now remains to align the throttle drum correctly. This has three reference faces as shown in Fig. 3.40. It is secured to the spindle by an Allen screw which is accessible after removal of the throttle return spring. Slacken this screw and line the reference face (A) with the lower face (F) of the boss on the air chamber as shown in Fig. 3.41. When tightening the Allen screw, leave a clearance of 0.004 in (1 mm) between the drum and the housing.

6 Alignment of the pump and throttle is now complete. Remove the gauge and the rod. Check that the system operates smoothly. Do not forget to lubricate all moving parts. Finally, do not refit the throttle return spring until the maximum throttle opening adjustment has been completed as described in the next Section.

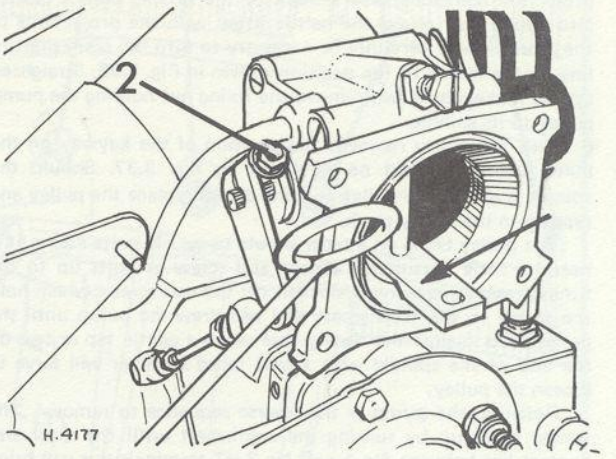


Fig 3.39 Inserting metal strip into groove at bottom of throttle entrance (Sec 39)

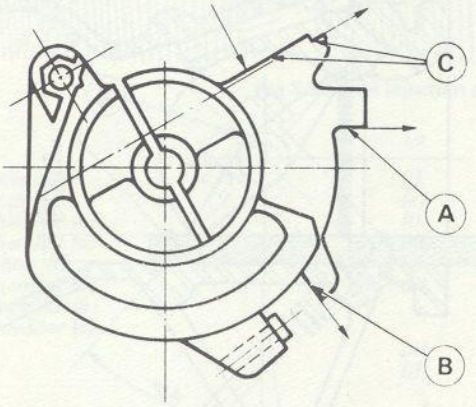


Fig 3.40 Throttle drum setting — Part 1 (Sec 39)

A,B, C — Reference faces

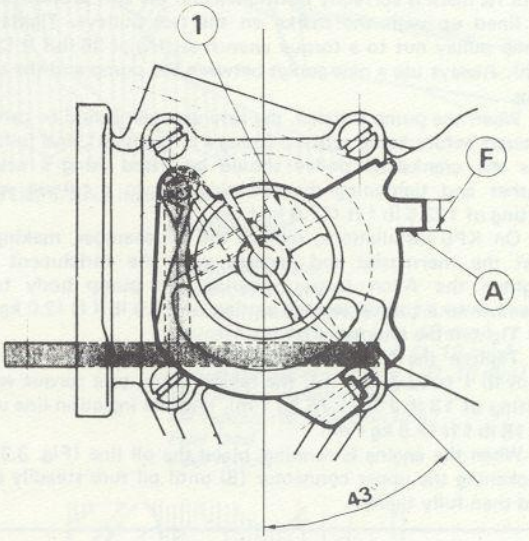


Fig 3.41 Throttle drum setting — Part 2 (Sec 39)

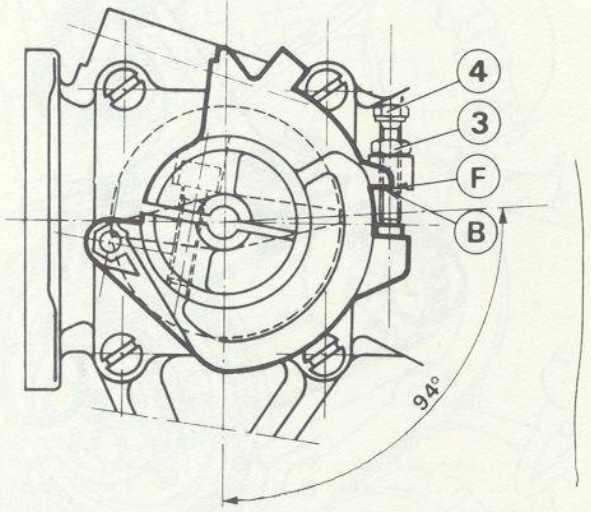


Fig 3.42 Maximum throttle opening (KF6) — Part 1 (Sec 40)

B Reference face
F Lower face
3 Locknut
4 Stop screw

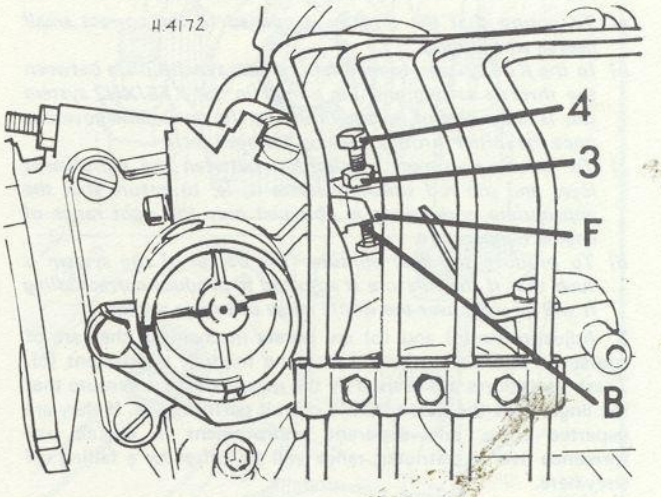


Fig 3.43 Maximum throttle opening (KF6) — Part 2 (Sec 40)
[For caption see Fig 3.42]

40 KF6 system - maximum throttle opening

1 Maximum throttle opening is controlled by a stop screw (4), (Figs. 3.42 and 3.43) and this should be set to bring the reference face (b) into line with the lower face (f) of the boss on the housing.
2 Check that by depressing the accelerator pedal fully maximum throttle opening is obtained. If all is well refit the return spring.

41 KF6 system - minimum throttle opening

1 Minimum throttle opening is controlled by the stop screw (5) (Figs. 3.44 and 3.45). It is set by adjusting this screw until the 10° face of (C) (ie; the longer face) lines up with the lower face (F) of the boss on the air chamber.
2 If it is found that regular idling cannot be obtained with this setting, the minimum opening can set to 12° by aligning the shorter part of face (C) with the boss on the air chamber; this may possibly lead to back firing, in which case the setting should be somewhere between these two positions. Notice that the idling speed is not controlled by the throttle opening, but by the mixture adjustment (See Section 43). The need for a greater degree of throttle opening is only found in new engines as a general rule.

42 Enrichment adjustments

1 For these adjustments the thermostat which controls the enrichment lever must be maintained at a temperature of 77° F (50° C). As well as operating the enrichment lever, this thermostat opens an air valve into the cold air chamber to give a little boost on starting and cold idling conditions.
2 In order to moniter and regulate the thermostat temperature, Peugeot garages use the thermometer and tap arrangement shown in Fig. 3.46. This is connected in series with the hose from the thermostat housing to the water pump. It should not be beyond the ingenuity of a resourceful owner to make up an equivalent.
3 For setting up the enrichment control, the engine should be running and the temperature stabilized to 77° F (50° C). The stabilization is of course, obtained by adjusting the tap.
4 Refer to Fig. 3.47, the nut (7) at the top of the rod operating the enrichment lever must be set so that there is a clearance of 0.004± 0.004 in (1.0± 1.0 mm) between the nut and the housing when the thermostat temperature is at 77°F (50°C). It will be necessary to grip the rod with a pair of pliers or a suitable key whilst the nut is turned using a 10 mm spanner.
5 When the nut is correctly adjusted, stop the engine and close the tap on the thermometer. Hold the feeler gauge in position until it is gripped by the nut as the rod tries to withdraw into the housing when the thermostat cools down.
6 Now slacken the locknut (9) using an 8 mm spanner and adjust the nut (10) using a 10 mm spanner to free off the lever (11) until it comes against the stop (12) on the injection pump. Now screw up the nut (10) until it just touches the enrichment lever and tighten the locknut (9).
7 Adjustment is now complete and the feeler and thermometer can be removed.

43 KF6 system - idling adjustment

1 Run the engine until it reaches its normal operating temperature; at this stage, of course, the electro-magnetic fan will be engaged.
2 Referring to Fig. 3.48 slacken the locknut (13) and adjust the air bleed screw (14) to obtain an engine speed of 800-850 rpm. It will be found that screwing it in decreases the engine speed and screwing it out increases it.

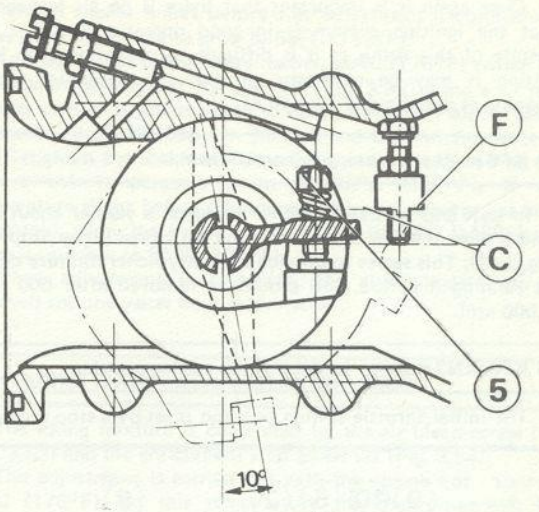


Fig 3.44 Minimum throttle opening (KF6) — Part 1 (Sec 40)

C Reference face
F Lower face
5 Stop screw

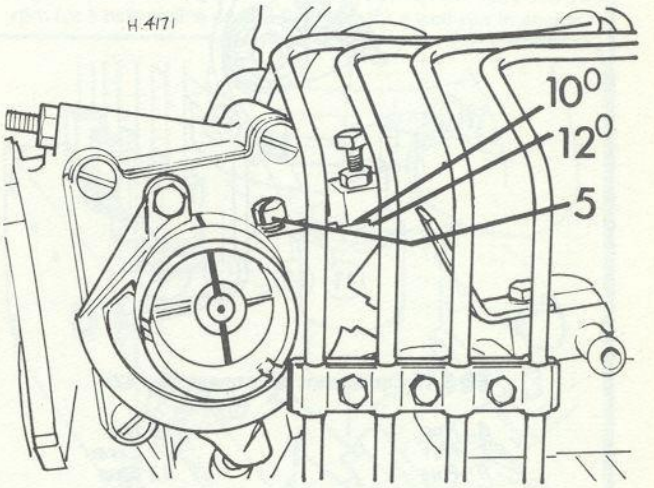


Fig 3.45 Minimum throttle opening (KF6) — Part 2 (Sec 41)

5 Stop screw

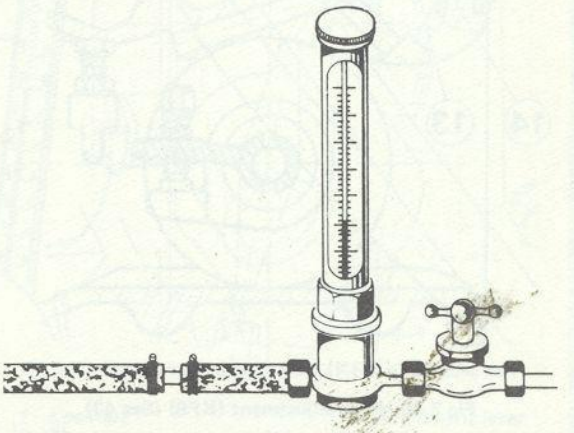


Fig. 3.46 Tap and thermometer arrangement used for enrichment adjustments (Sec 42)

3 Once again it is important that there is no air leakage and that the ignition system is in good operational order. If in despite of this being so it is difficult to obtain an even idling setting it may be necessary to alter the minimum throttle opening as described in Section 41.

44 KF6 engines - running-in - enrichment

In new and reconditioned KF6 engines a washer about 0.02 in (0.5 mm) thick is fitted under the enrichment lever stop (12) (Fig. 3.47). This serves to provide a slightly richer mixture during the running-in period, and should be removed after 600 miles (1,000 km).

45 KF5/XN2 system - initial throttle setting position

1 The initial throttle setting position is set by a stop screw (5), (Fig. 3.49) which bears against a pad (6) on the air chamber. The setting must be such that as soon as the throttle flap moves it start to uncover a jet housed in the air chamber; Fig. 3.50 shows this and gives an idea of how the setting is checked.

2 Check the setting by first removing the plug (2) (Fig. 3.51) being careful not to lose a thin washer with a small hole in it. It is in fact a correction jet and may become dislodged when the plug is taken out. The various bits and pieces that are located behind this plug are shown in Fig. 3.50.

3 Insert a small light in place of the plug. Fig. 3.51 shows a suitable light holder in-situ and Fig. 3.50 gives a diagrammatic view of the set up.

4 Arrange a mirror so that a reflection of the flap located in the housing can be seen.

5 If the setting is correct a small strip of light must appear as soon as the throttle flap is moved slightly away from the stop position. Should the check show a light all the time or a light does not start to show immediately the flap is moved, the stop

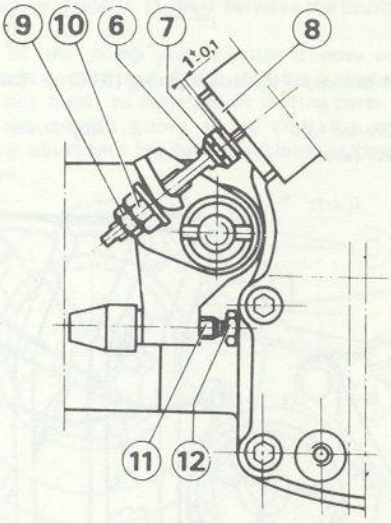


Fig 3.47 Enrichment adjustment (Sec 42)

6 Rod
7 Nut
8 Plug
9 Locknut
10 Nut
11 Lever
12 Stop

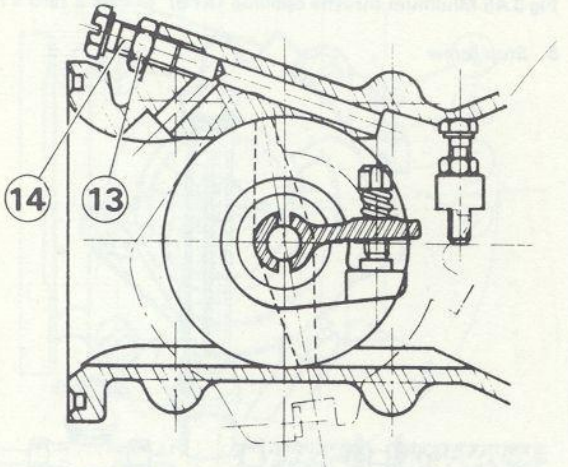


Fig 3.48 Idling adjustment (KF6) (Sec 43)

13 Locknut *14 Air bleed screw*

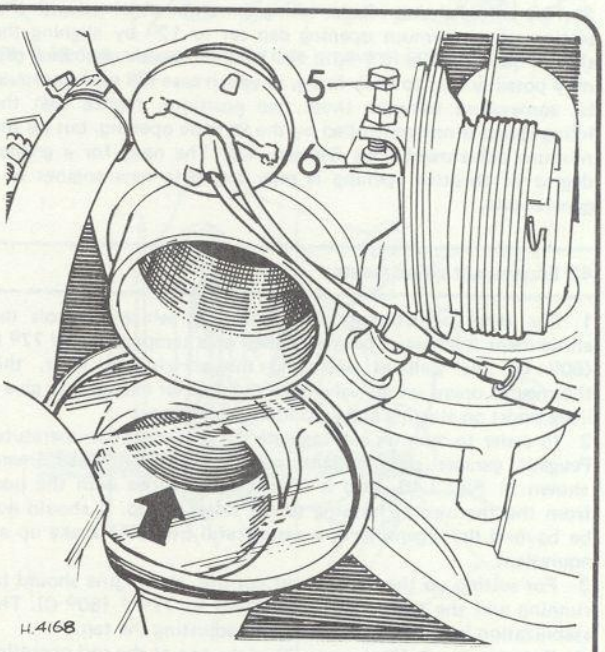


Fig 3.49 Initial throttle setting position (KF5/XN2) (Sec 45)

5 Stop screw *6 Pad*

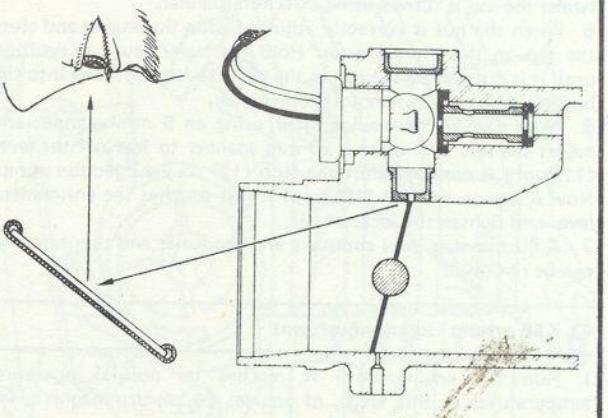


Fig 3.50 Cross-section through air chamber showing light and mirror (Sec 45)

screw (5) must be altered.
6 If adjustment is necessary, unscrew the locknut and then screw the stop screw up slightly until a thin strip of light appears above the top edge of the throttle flap. Now slacken the screw off slowly until the light just disappears and then screw it back in a maximum of a tenth of a turn to obtain a slight clearance - the strip of light should just reappear.
7 Retighten the locknut, making sure that the stop screw setting is not altered. Finally recheck the setting.
8 Make sure that the correct jet (paragraph 2) is correctly in place. Refit the plug (2) (Fig. 3.51) oiling the thread and using a new 'O' ring. Finally tighten the plug to a torque wrench setting of 14.5 lb f ft (2.0 kg f m).

46 KF5/XN2 system - enrichment adjustment

1 This adjustment must be carried out with the engine at a temperature of between 75° and 76°C (167-176°F). To check the temperature, Peugeot garages use the thermometer and tap arrangement shown in Fig. 3.46 connected in series with the water return hose from the thermostat - this is the hose connected to outlet (K) (Fig. 3.35)
2 The adjustment is carried out by slackening off the locknut (1) using a 10 mm spanner, gripping the rod (4) with a pair of pliers or a suitable key. Run the engine until the thermometer indicates a temperature of 80°C (176°F) making sure that this figure is reached by a temperature rise and not a temperature fall. If the engine is hot before this adjustment is commenced allow the temperature to drop to 65°C (149°F).
3 As soon as the temperature reaches 80°C (176°F) switch off the engine. Now adjust the nut (2) (Fig. 3.52) using a 17 mm spanner until it is just possible to insert a special Peugeot gauge numbered '8.0112P' between the nut and the enrichment lever (3). Retighten the locknut. This adjustment must be carried out before the temperature drops to 75°C (167°F). If the temperature drops below this figure before adjustment has been completed, allow the engine to cool down to 65°C (149°F) and warm it up again to 80°C (176°F).
4 When adjustment is complete, the thermometer can be removed and the water hose reconnected.

47 KF5/XN2 system - idling mixture adjustment

1 The idling mixture is controlled by the air bleed screw (1). (Fig. 3.53) and the enrichment stop screw (2) (Fig. 3.54).
2 The adjustment is carried out with the engine hot - approx. 80°C (176°F). At this temperature the electromagnetic fan should be engaged.
3 First adjust the air bleed screw until the engine speed is 900 rpm on a new engine (ie; less than 3,000 miles - 1500 km) or 850 rpm on an engine that has been well run in.
4 Next raise the enrichment lever (3) (Fig. 3.55) slowly. The engine speed should increase slightly to between 1020 and 1050 rpm for a new engine or 950-970 rpm for a well run in engine.

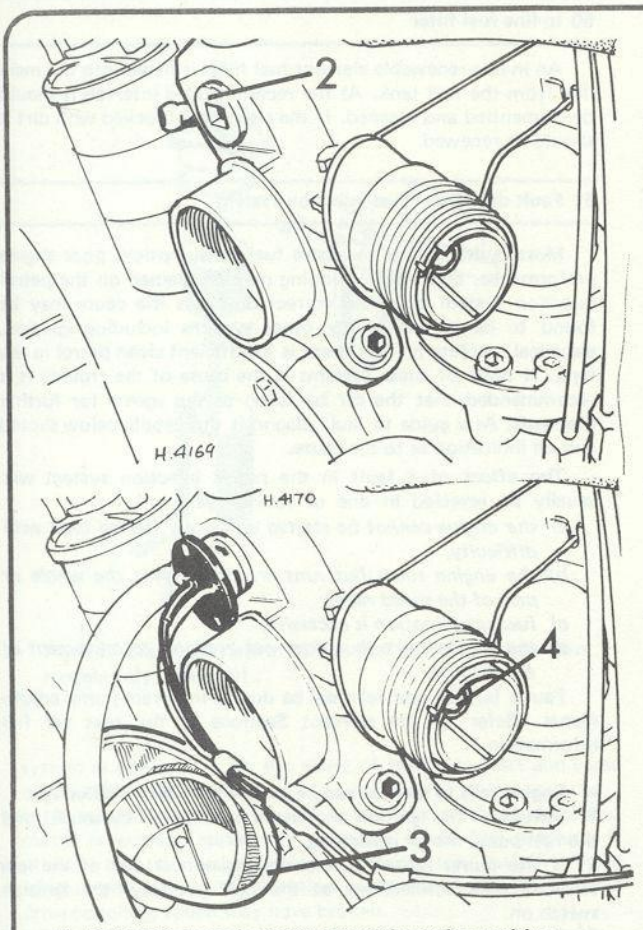


Fig 3.51 Adjustment of initial throttle setting position (KF5/XN2) (Sec 45)

2 Plug
3 Mirror
4 Nut

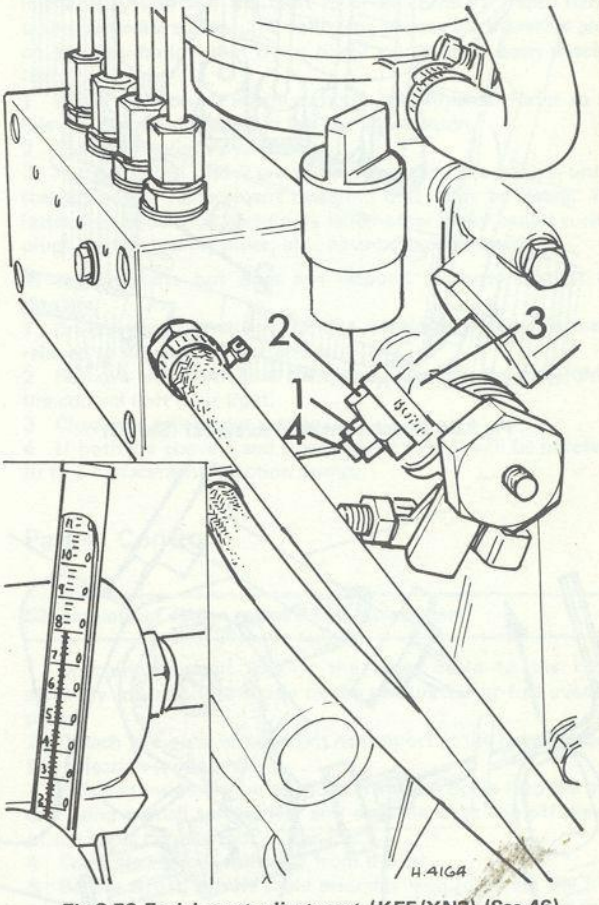


Fig 3.52 Enrichment adjustment (KF5/XN2) (Sec 46)

1 Locknut
2 Nut
3 Enrichment lever
4 Rod

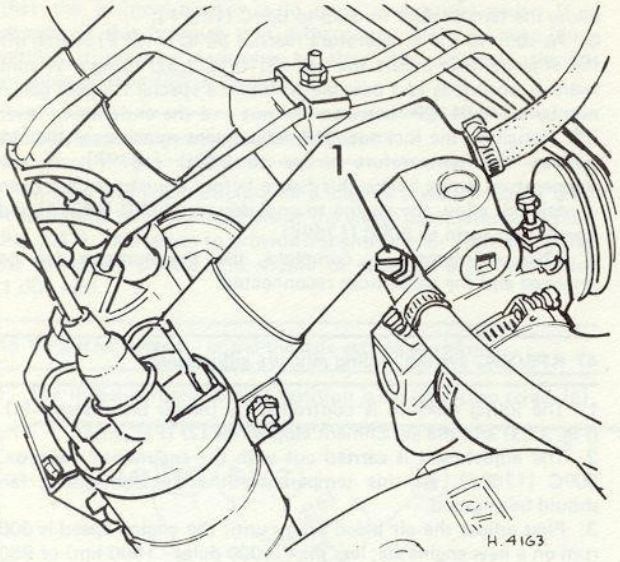


Fig 3.53 Location of air bleed screw (1) (Sec 47)

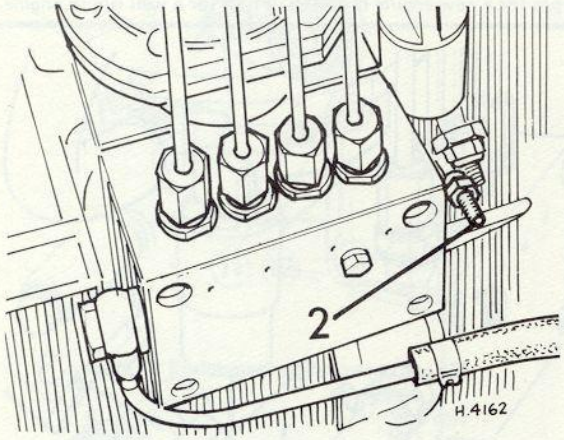


Fig 3.54 Enrichment stop screw (2) (Sec 47)

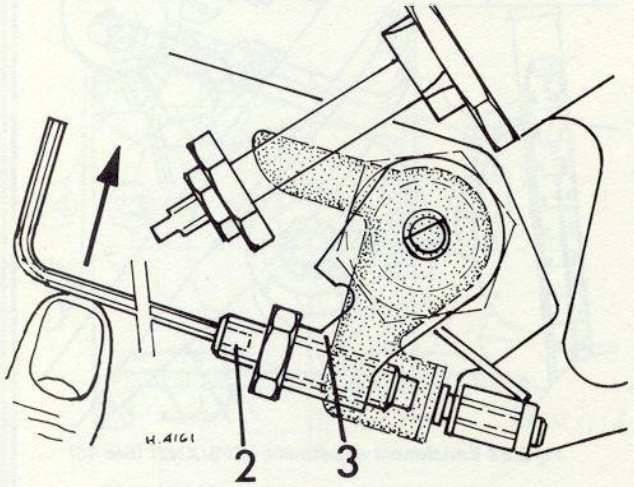


Fig 3.55 Idling mixture adjustment (Sec 47)

2 Allen key in stop screw *3 Enrichment lever*

5 If the engine speed with the enrichment lever raised exceeds these figures, the mixture is too lean. In this case, screw in the stop screw (2) a quarter of a turn. If the speed is less, the mixture is too rich and the stop screw should be unscrewed a quarter of a turn.

6 After adjusting the stop screw, reset the engine speed to the original figure and then repeat the procedure just described. Make any further adjustments to the stop screw until the correct speed increase is obtained when the enrichment lever is raised.

48 Fuel lift pump - general description

When fuel injection equipment is fitted an electric lift pump is used instead of the mechanically operated type as found on normal carburettor engines. This lift pump is located at the rear of the car. Removal and replacement of the pump is a straightforward operation and will present no problems. However, for safety reasons, always disconnect the battery before detaching the fuel lines.

49 Air cleaner - maintenance

Generally an oil bath type air cleaner is used. Fig. 3.56 shows two types that have been used. For full servicing information refer to Section 3.

50 In-line fuel filter

An in-line renewable element fuel filter is fitted into the main line from the fuel tank. At the recommended intervals it should be dismantled and cleaned. If the element is blocked with dirt it should be renewed.

51 Fault diagnosis - fuel injection system

Most faults such as excessive fuel consumption, poor engine performance, and erratic running may be blamed on the petrol injection system but after correct diagnosis the cause may be found to be in one of the other systems including ignition, electrical, cooling or that there is insufficient clean petrol in the tank. If none of these systems is the cause of the trouble it is recommended that the car be taken to the agents for further diagnosis. As a guide to fault diagnosis the details below should give an indication as to the cause.

The effect of a fault in the petrol injection system will usually be revealed in one of four ways:

a) the engine cannot be started or can be started only with difficulty;
b) the engine starts but runs erratically over the whole or part of the speed range;
c) fuel consumption is excessive;
d) the engine starts but does not respond to movement of the throttle.

Faults (a), (b) and (c) may be due to incorrect pump adjustments. Refer to the relevant Sections in the text for full information.

a) Engine fails to start or can be started only with difficulty.

1 Switch on the ignition and check (audibly or by touch) that the fuel pump motor is running.

2 If the pump motor is running, disconnect one of the low tension cable connections at the coil but leave the ignition switch on.

3 Grip each injector feed line in turn lightly with the hand and crank the engine. A distinct pulsation should be felt with each line as fuel is injected.

Note: The feed lines are cleated together and must be separated to avoid the misleading effect of reflected pulsations.

If obvious pulsations are felt in each line the petrol injection

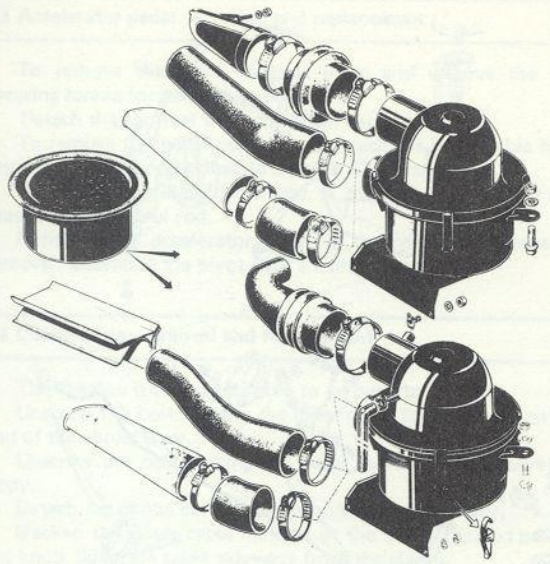


Fig 3.56 Exploded views of oil bath type air filters fitted to fuel injection models (Sec 49)

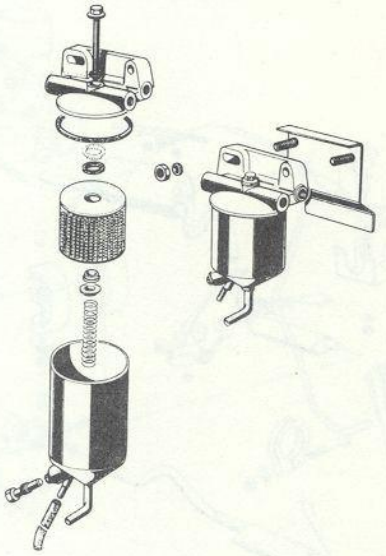


Fig 3.57 Exploded view of in line fuel filter [Fuel injection models only] (Sec 50)

system is unlikely to be the cause of failure to start and some other cause must be found.

If pulsations cannot be felt in any line although the pump motor is working apparently normally, check fuel pressure. If pressure and relief valve settings are satisfactory, switch off the ignition and remove the injection pump for examination of the drive coupling, which may have broken.

Finally, remember to restore the coil low tension connection.

b) Engine starts but runs erratically over the whole or part of the speed range.

1 Check the setting of the injection pump adjustments. Refer to the relevant Sections in the text for full information. Erratic running may otherwise be caused by:

An irregularity in the fuel supply to one cylinder only or some failing which is affecting all cylinders. In the former case, the fault is most likely to be a stuck open injector and fouling of the associated spark plug will almost certainly have occurred.

2 Short circuit each plug to earth in turn and if one does not affect the engine running note when shorted out, remove, clean and refit this plug.

3 Withdraw the associated injector from the engine and detach from its feed line.

4 Connect the injector to a dry, filtered air supply at a pressure of 80 psi in the forward (injection) direction. This will almost invariably cure a faulty injector (sticking open due to a foreign particle becoming trapped) and if it does so the injector can be refitted to the engine. If it does not, a new injector must be fitted.

Note: Plastic feed pipes must not be heat treated to enable fitment, but must be put on cold.

5 Where the failure affects all cylinders but is more pronounced with higher speed, check pressure and relief valve setting. If the injection pump has recently been removed, check that it has not been fitted 180° out as regards timing.

6 Provided that the timing is correct; the injection pump working correctly; the injectors are in good order; and fuel pressure is satisfactory; then a faulty relay or blown fuse is indicated.

c) Fuel consumption excessive.

This may not necessarily arise from a defect in the petrol injection system and the fault must be correctly traced before taking remedial action. The following checks are therefore given on the assumption that other likely causes have been checked first:

1 Check for correct injection pump adjustments. Refer to the relevant Sections in the text for full information.

2 Check the relief valve setting.

3 If the above 1 and 2 are satisfactory then the control unit is suspect and a replacement metering unit must be fitted. This latter step should be taken only when other likely causes such as plugs, points, leaking pipes, etc., have been eliminated.

d) Engine starts but does not respond to movement of the throttle:

1 Ensure the movement of the accelerator pedal is being relayed to the throttle butterflies.

2 Remove and check that the pipe connecting the manifold to the control unit is air tight.

3 Check the relief valve setting.

4 If both the above 1 and 2 are satisfactory, it will be necessary to fit a replacement injection pump.

Part 4: Controls

52 Accelerator cable - removal and replacement

1 Unscrew the bolt locking the inner cable to the clamp assembly located on the side of the carburettor or fuel injection pump.

2 Detach the outer cable from its support at the carburettor or fuel injection pump end.

3 Working inside the car push the little cup down into the main cup using a small screwdriver and ease the large cup off the end of the pedal control rod.

4 Carefully remove the cable from the car.

5 Before fitting a new cable assembly well lubricate the inner cable with engine oil. Do not use grease as it will cause the cable to stiffen especially in cold weather.

6 Refitting the accelerator cable is the reverse sequence to removal. Before fully tightening the clamp bolt, remove the air cleaner and check for correct butterfly movement on carburettor models. Fuel injection models - refer to Section 39.