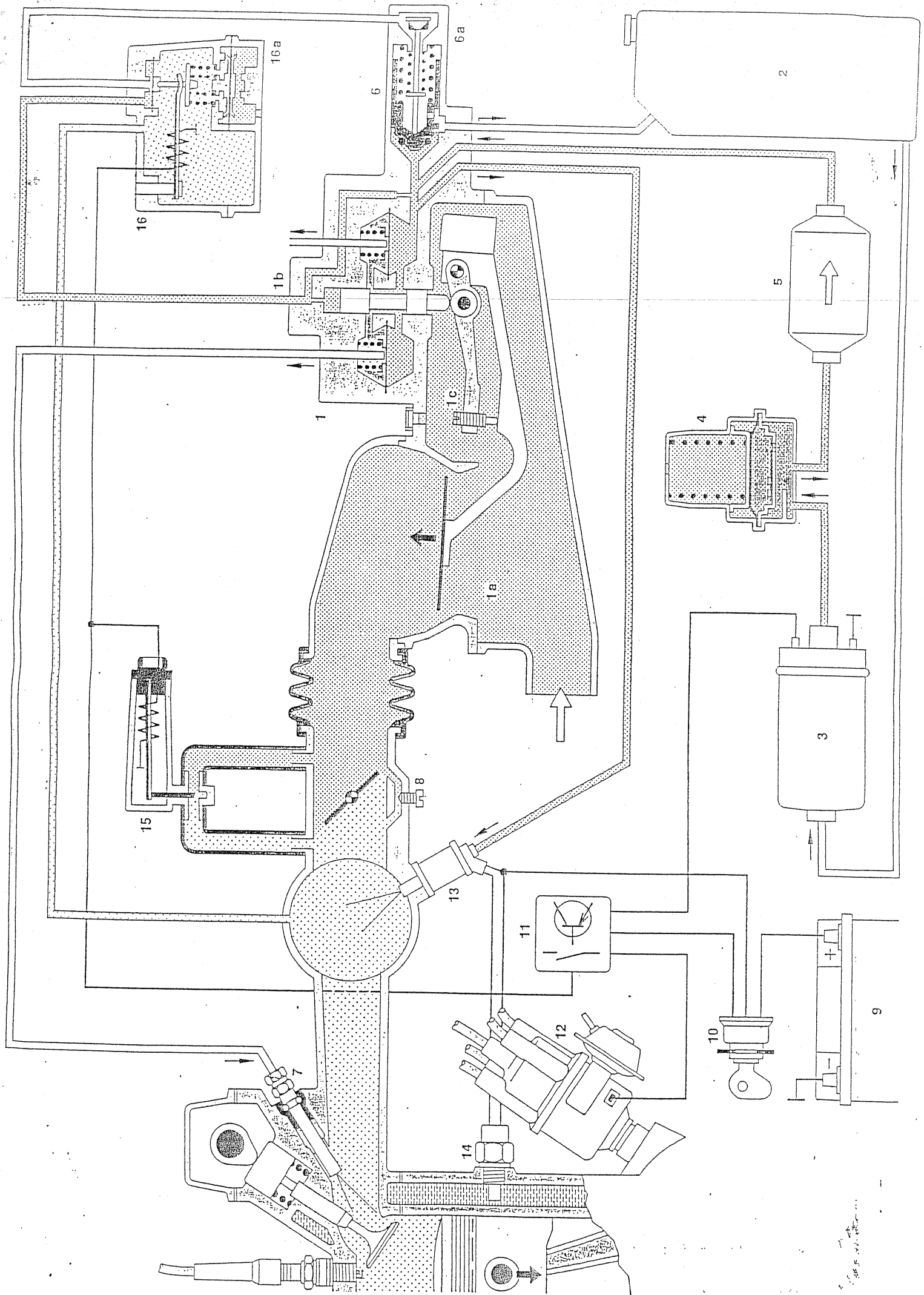
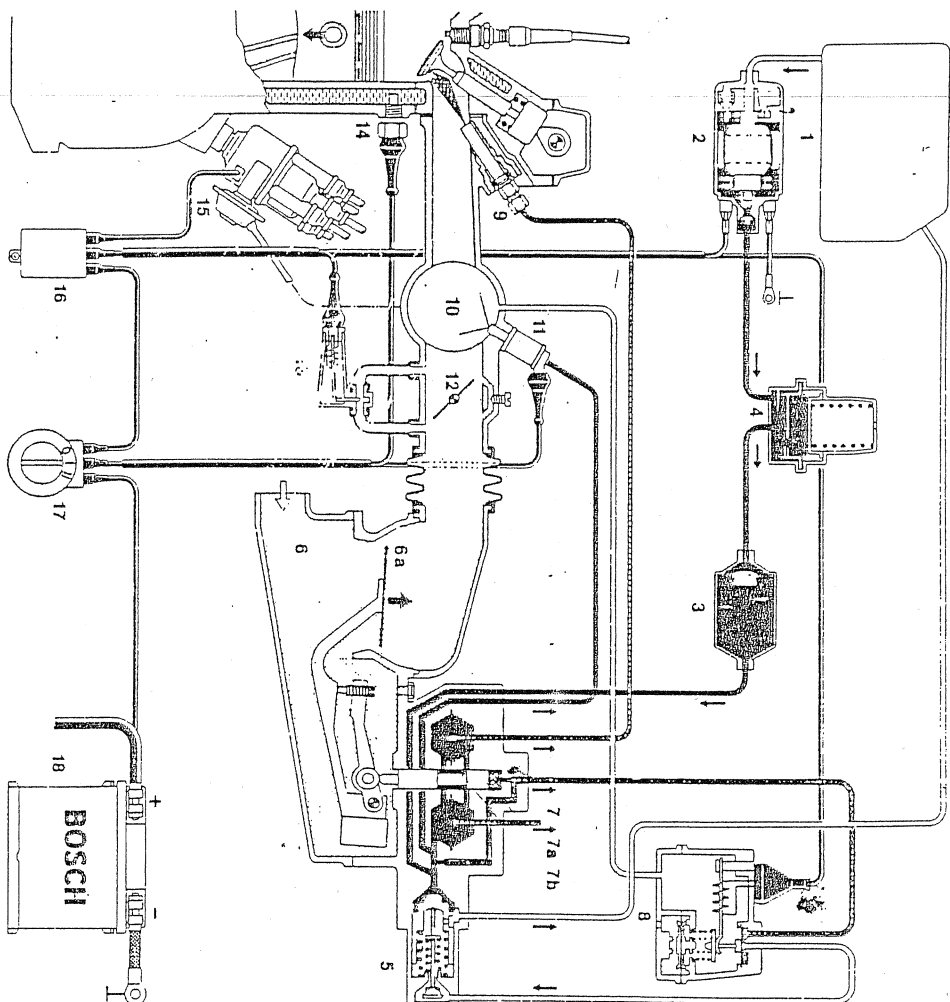




Pressure ratio and components of K-Jetronic



- 1 Fuel tank
- 2 Electric fuel pump
- 3 Fine filter
- 4 Fuel accumulator
- 5 System-pressure regulator
- 6 Air-flow sensor with air-flow sensor plate (6 a)
- 7 Fuel distributor with control plunger (7 a) and its control edge
- 8 Warm-up regulator
- 9 Injection valve
- 10 Intake manifold
- 11 Cold-start valve
- 12 Throttle valve
- 13 Auxiliary-air device
- 14 Thermo-time switch
- 15 Ignition distributor
- 16 Control relay
- 17 Ignition-starter switch
- 18 Battery

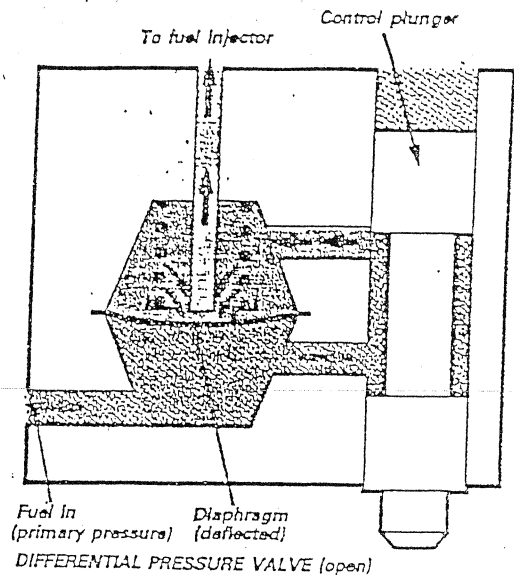
- System pressure
- Injection pressure
- Control pressure
- Suction line resp. return
- Atmospheric pressure
- Pressure in manifold
- Coolant

DIFFERENTIAL PRESSURE VALVES

The mixture control unit also houses the differential pressure valves (one per cylinder or metering barrel slit). The purpose of these is to maintain a constant pressure drop at the metering slit, regardless of the fuel quantity passing through.

Each valve consists of two chambers, separated by a steel diaphragm, loaded to 4.7bar by a spring in the upper chamber. This upper chamber is fed by fuel from the metering slits and, in turn, feeds fuel to the injectors. The lower chambers of each valve are interconnected and subject to primary (pump) pressure.

The differences in pressure which would normally prevail, due to a changing rate of fuel flow, are counteracted by the diaphragm flexing (under spring pressure) and increasing or decreasing the gap between it and the valve seat at the base of the outlet pipe.

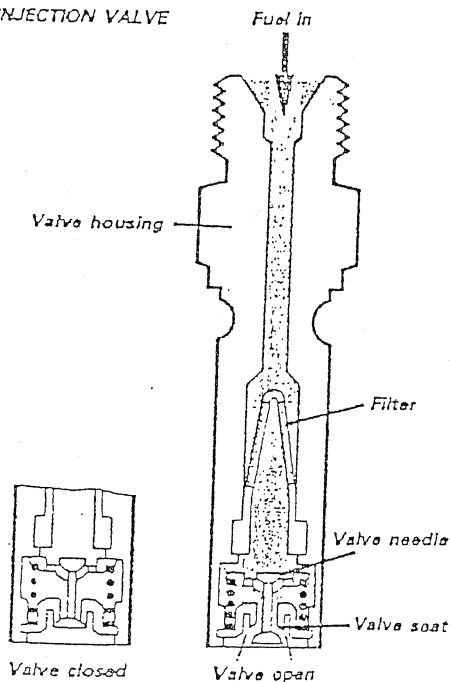


INJECTION VALVES

The injection valves are a push fit into the special holders which insulate them from engine heat. They have no metering function and inject fuel whenever fuel pressure in the delivery pipes from the distributor exceeds 3.3bar.

In use, the valve needle vibrates at a high frequency, ensuring good fuel atomisation even with the smallest of injected quantities. When the engine is switched off, the valves should close tightly, forming a non-drip seal.

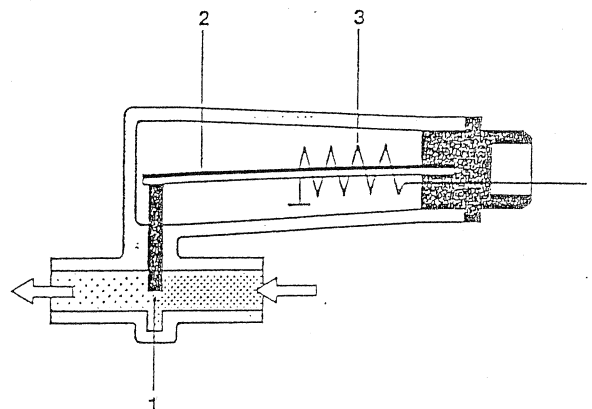
FUEL INJECTION VALVE



AUXILIARY AIR DEVICE

In most carburettor systems the choke mechanism is designed to provide a fast idle until the engine reaches its correct operating temperature. With the K-Jetronic fuel injection layout, the auxiliary air device fulfils a similar role.

The device consists of a sliding disc valve, which opens or closes a by-pass port across the throttle valve. The disc is moved by a bi-metal spring which, when cold, causes the disc to slide into the open position. As the now ingoing air still causes the sensor plate to lift, it results in the engine receiving sufficient air/fuel mixture to provide a steady (fast) idle until the engine warms up and the bi-metal spring closes the disc valve.



Auxiliary-air device
1 Bypass line with pivoting plate
2 Bimetal
3 Electrical heating

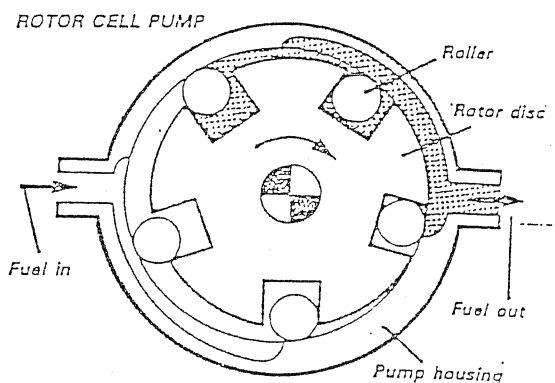
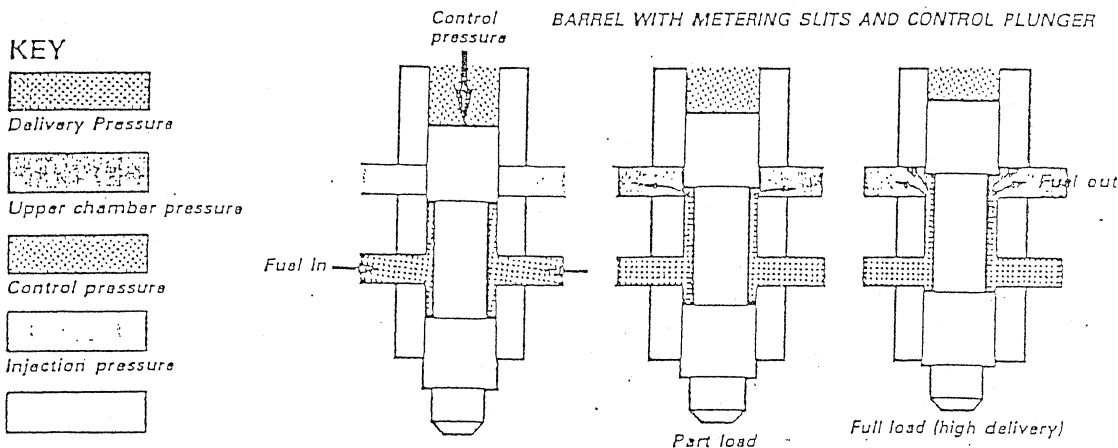
This air flow moves the sensor plate from its zero or rest position, the degree of movement being directly related to the volume, or rather mass, of air drawn in. This, in turn, is dependent upon the throttle valve position; the wider open the throttle, the greater the air flow and increased movement of the sensor plate.

Movement of the sensor plate and its lever is transmitted through the secondary lever to the control plunger. The position of this plunger controls the amount of fuel to be injected.

The barrel in which the plunger operates is produced with a number of vertical slits in the upper part of its body. These slits are covered by the plunger when the sensor plate is in its zero (rest) position and then

progressively uncovered as the sensor plate moves the plunger upwards. As shown in the diagram below, upward movement of the plunger allows an ever increasing amount of fuel to flow through the uncovered slits to the differential pressure valves and on to the injectors.

The quantity of fuel injected is therefore directly related to the position of the sensor which, in turn, is dependent on air flow.



ELECTRIC FUEL PUMP

The permanent magnet type motor drives a rotor cell pump in which an offset rotor with metal rollers in grooves around its circumference turns within a circular housing. Centrifugal force causes the rollers to move out against the housing and act as seals. The fuel is carried in the cavities between the rotor and housing which, in effect, decrease as the rotor turns, pumping fuel out through a one-way valve to the accumulator.

The pump motor is surrounded by fuel and new assemblies are supplied full of a fuel/preservative mixture. Do not, at any time, allow the pump to run dry — it will ruin the roller to housing seals.

The only repair to a pump is replacement of the one-way valve. Any other defect in the pump itself will necessitate a new unit.

FUEL FILTER

The fuel filter acts much like its counterpart in an ordinary carburettor system, only much more so. Closer tolerances in the fuel injection equipment require much finer filtration of the fuel — the slits in the fuel distributor barrel, for instance, are only about 0.2mm (0.004in) wide.

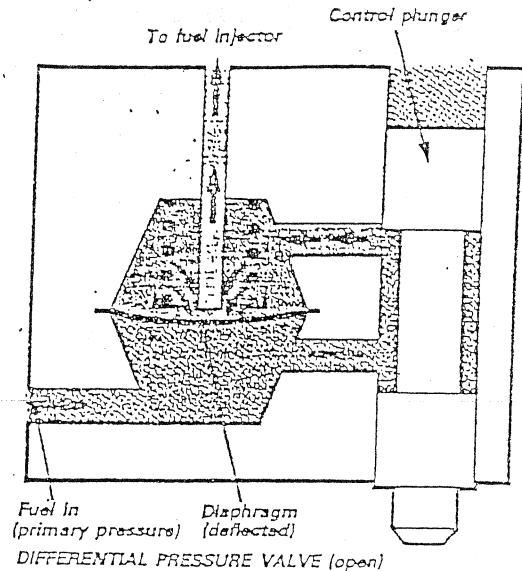
Fuel flow through the filter is only one way. Therefore, it's essential to ensure that any replacement is fitted the right way.

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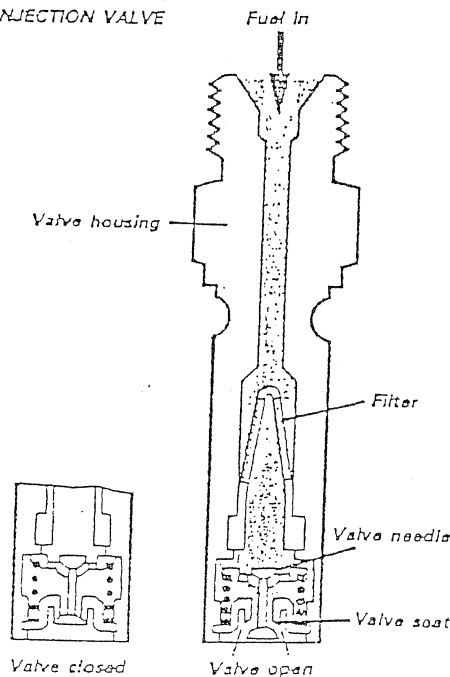


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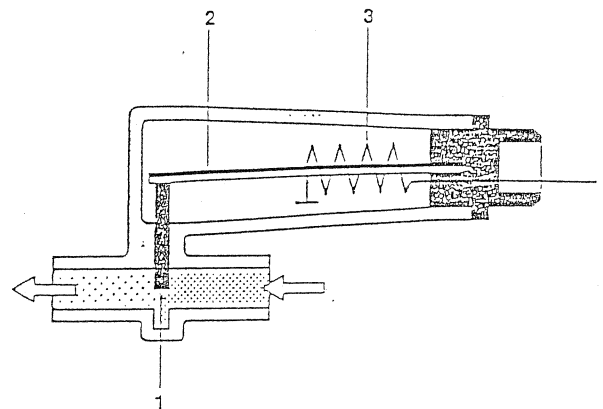
FUEL INJECTION VALVE



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- Auxiliary-air device
- 1 Bypass line with pivoting plate
 - 2 Bi-metal
 - 3 Electrical heating

COLD START VALVES

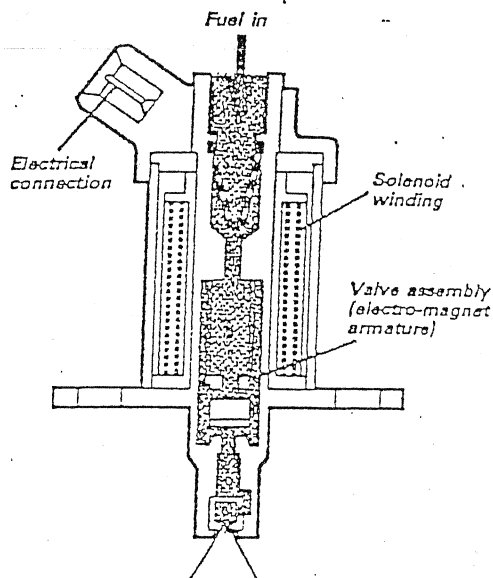
In cold start conditions, part of the injected fuel is lost, due to condensation on the cold cylinder walls. The cold start valve, working in conjunction with the thermo-time switch, compensates for this by supplying extra fuel.

The valve itself is of the solenoid operated type, opening when supplied with an electrical current from the thermo-time switch. This switch consists of a bi-metal strip operating a couple of contacts. When cold, these contacts are closed, allowing

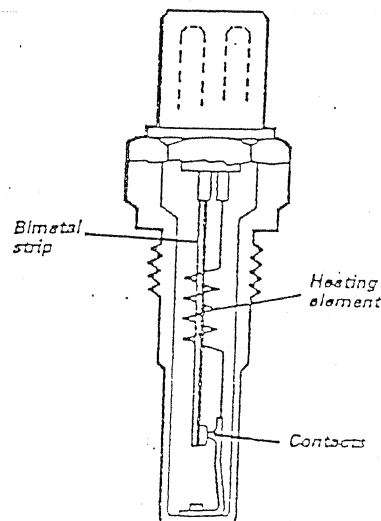
current to pass from the ignition switch to the cold start valve.

As the engine warms up, the bi-metal strip opens the contacts and the cold start valve closes. To avoid flooding the engine, a heating element is incorporated into the thermo-time switch, causing the contacts to open after a set time. At -20 degrees C, this would be approximately eight seconds.

The valve nozzle is designed to give the ingoing fuel a swirl action, so as to provide good atomisation.

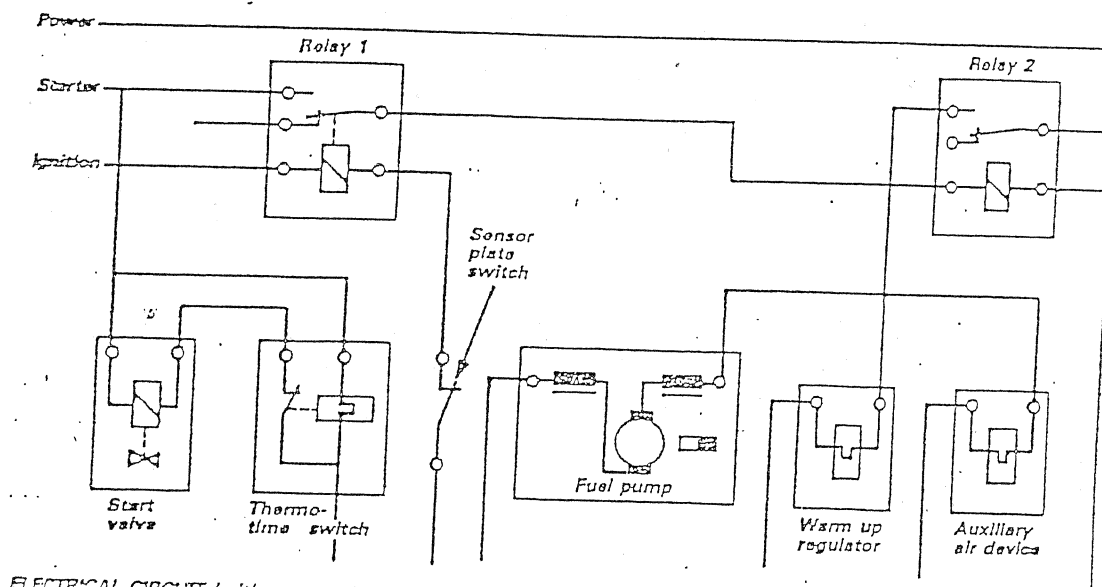


COLD START VALVE (operating)



THERMO-TIME SWITCH

ELECTRICS



ELECTRICAL CIRCUIT (with sensor plate switch)

Any fuel system using an electrically operated pump should have some safety device, whereby the pump will only operate when the engine is running. This would ensure that, in the event of an accident or ruptured fuel line, the pump would stop when the engine did.

Strictly speaking, this safety device is not part of the fuel injection system, for it is included in the car's wiring layout. As such, it can vary from model to model. The majority, however, now use a relay which is switched on electronically by a pulse