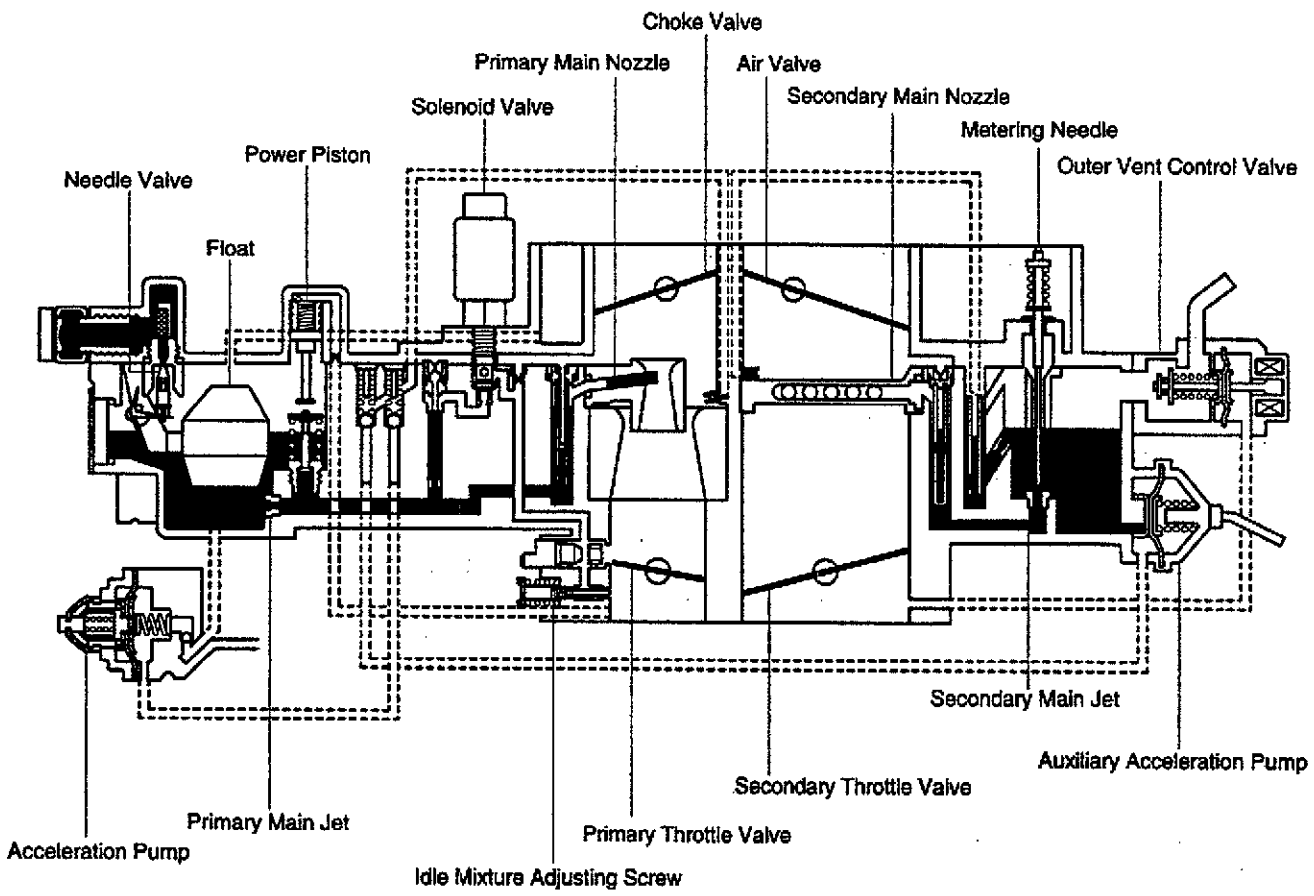
FUEL SYSTEM

DESCRIPTION



P18391

CARBURETOR

In this type of double barrel carburetor, air and fuel are mixed in a single barrel (venturi chamber) when the engine is under comparatively light loads, as when driving at low to medium speeds. When the engine is under a heavy load or is running at high speeds, air and fuel are mixed in both barrels (venturi chambers).

The carburetor utilizes venturi vacuum to spray the required gasoline mixture through the main nozzle to the intake manifold. The carburetor consists of a venturi which detects the airflow, a main jet and nozzle which measures the amount of fuel, and a throttle valve and other parts which are used to adjust the intake air pressure. Gasoline fed from the fuel pump accumulates for a short time in the float chamber. The level inside the chamber is kept constant by the float. During the induction cycle, the air pressure inside the chamber reduces. This causes air to flow into the cylinder from air cleaner through the carburetor and intake manifold. The speed of this air is increased when it passes through the narrowed portion of the carburetor body, that is, the venturi. The pressure drops in this area and results in gasoline being sprayed from the main nozzle in a jet. The amount of gasoline sprayed is determined mainly by the airflow in response to the amount the throttle valve is opened, and by the venturi vacuum. The sprayed gasoline is scattered by the flow of high speed air and vaporized, and this fuel—air mixture is directed into the intake manifold.

Float System

The float system temporarily stores gasoline sent from the fuel pump and also serves the function of maintaining the amount of accumulated fuel (the fuel level) at a constant level.

Primary Low Speed System

The primary low speed system is used to supply gasoline for low engine speeds, when the throttle valve is opened only an extremely small amount.

Solenoid Valve

Turning off the ignition switch closes the solenoid valve and stops the supply of fuel to the low speed circuit. Turning the ignition switch on causes current to flow through the solenoid valve coil, opening the valve and allowing the supply of fuel to the low speed circuit.

Primary High Speed System

The primary high speed system is the most used operating system, in which the negative pressure generated by the passage of air through the venturi is used to suck out gasoline. This system operates to mix fuel for a wide range of speeds, and therefore has a great influence on the performance of the carburetor. The high speed system is designed to deliver an economical mixing ratio. However, auxiliary systems such as the acceleration system or the power system are used when a larger output is required.

Secondary Low Speed System

The secondary throttle valve starts to open when the primary throttle valve is open approximately 50°, and becomes fully open when the primary throttle valve is fully open.

Secondary High Speed System

The amount of gasoline sucked out from the secondary main nozzle depends on the opening angle of the air valve. When the secondary throttle valve opens, air flows to the secondary side, causing a vacuum at the opening angle of the air valve and main nozzle. The fuel quantity is decided by the metering needle and main jet. When the secondary throttle valve is fully open, the air valve opens fully if the engine speed reaches 3,200 rpm or more.

Power System

The primary high speed system is designed to use fuel economically. However, when the engine's output is high, a greater quantity of fuel is required than can be delivered by the primary high speed system. The extra fuel required for high output is supplied through the power system, which delivers a rich gas mixture to the high speed system.

Acceleration System

Depressing the accelerator pedal suddenly during normal driving requires an increase in the engine's output, and at such a time, the carburetor must supply a rich gas mixture to the engine. However, even though the amount of air is increased immediately when the throttle valve is opened, the gas mixture becomes temporarily diluted due to the weight of the gasoline being greater than that of air. The acceleration system has been adopted to prevent this delay by supplying a rich gas mixture during acceleration.

The acceleration pump always operates, regardless of the coolant temperature, but the auxiliary acceleration pump (AAP) operates only when the coolant temperature is low.

Choke System

The choke system makes it easier to start the engine when the temperature is low. At such times, cranking speed is lower and as a result, the intake negative pressure is also lower, reducing the amount of fuel supplied. In addition, since the intake manifold is cold, gasification of fuel is poor and the gas mixture delivered to the combustion chamber is thin, making starting difficult. The choke system supplies a rich gas mixture to the intake manifold to overcome this problem.

Outer Vent Control Valve (OVCV)

While the engine is stopped, if gasoline vapor from the float chamber passes through the air vent and a large amount collects in the intake manifold, engine restartability will decline. To prevent this, an outer vent control valve (OVCV) is fitted. When the engine is stopped, this valve opens and releases the gasoline vapor from the carburetor to be absorbed by the charcoal cannister, from where it is drawn to the engine during engine operation.

FUEL FILTER

Gasoline used for fuel contains a small proportion of dirt or moisture. If permitted to reach the narrow channels of the carburetor or the jet nozzle, these contaminants would soon clog them and cause the engine to stall. The fuel filter is designed to remove the dirt and moisture from the fuel. Fuel passes through an element in the filter. This element slows the rate of flow of the fuel, causing the moisture and particles of dirt, etc. to settle out. The lighter contaminants are filtered by the filter element.

FUEL PUMP

The fuel pump pumps fuel from the fuel tank and delivers it to the carburetor. The fuel pump in this engine is a mechanical type (diaphragm type) pump which is operated directly by the camshaft.

The diaphragm type fuel pump uses a diaphragm, which moves up and down in a pump chamber. Two valves are located in the each pump chamber opposite the direction of operation. This up and down motion of the diaphragm creates a pumping action.