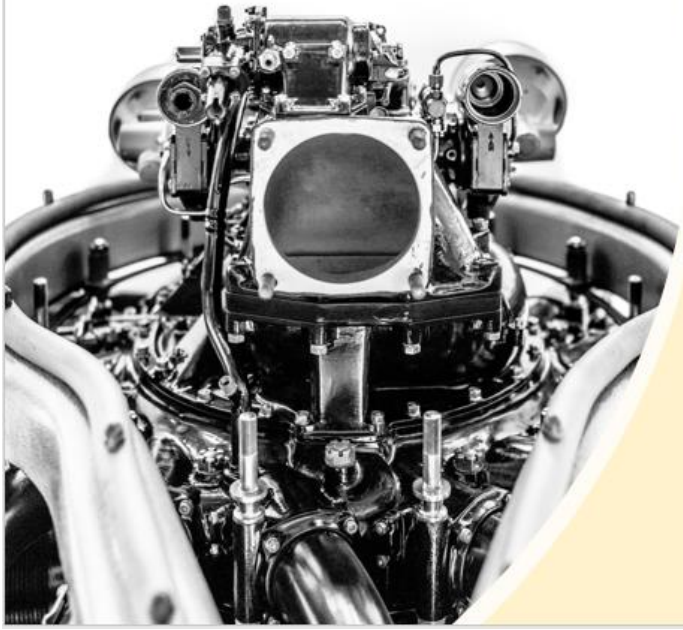

Engine Fuel System

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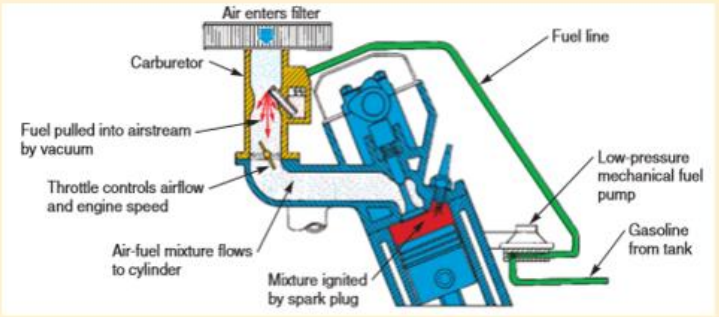
Ph.D.

SI Engine Fuel System (Carburettor)

- Fuel is stored in the float chamber at a predefined level.
- The throttle valve controls the position and amount of air vacuum in the main barrel.
- This vacuum pulls the fuel from different carb. systems based on engine demand.



Single Barrel Carburettor

The size and number of carburettors depend on the size of the engine and its performance. Therefore, many types are designed such as:

- Single barrel carburetor.
- Two-barrel carburetor.
- Four-barrel carburetor.

Another classification depend on the direction of flow, such as:

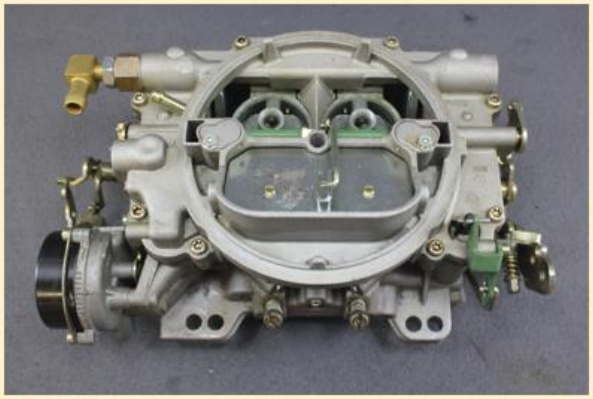
- Down draft carburetor.
- Side draft carburetor.
- Up draft carburetor.

Carburettor Components

Based on their function, carburettors comprise many systems

- Idle system
- High power system.
- Acceleration system
- Chock system.
- Throttle system.
- Float system.
- Fuel metering system.

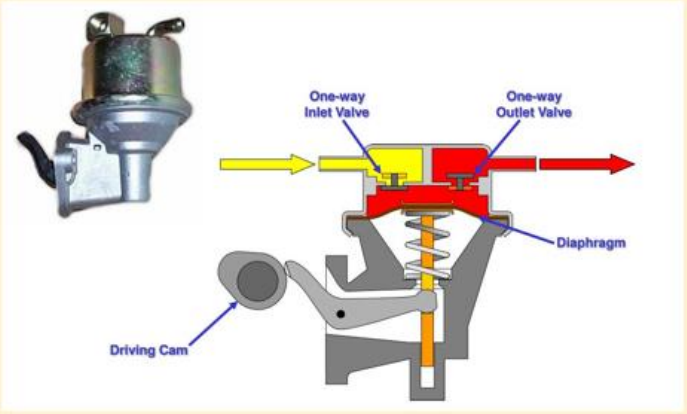
These systems are synchronized to work in a sequential form base on engine demand of the speed and applied load.



The Fuel Pump

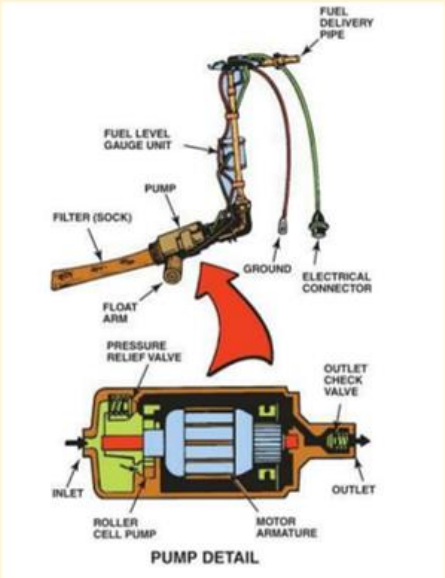
The mechanical fuel pump transfers the fuel from the fuel tank to the carburettor. It is driven by the camshaft. It comprises:

- A flexible diaphragm.
- Two check valves.
- A retaining spring.
- A cam-follower lever.



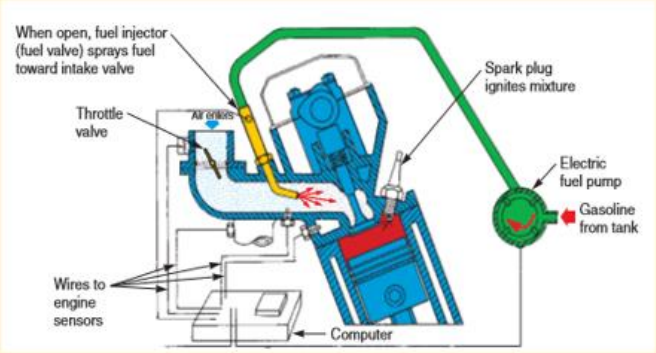
The Electric Fuel Pump

- It is a positive displacement pump that delivers the fuel at high pressures.
- The pump is driven by an electric motor.
- There is a check valve at the exit to prevent fuel back flow.
- A pressure relief valve is also fitted to maintain the fuel pressure at a desired level.



Port-injection Fuel System

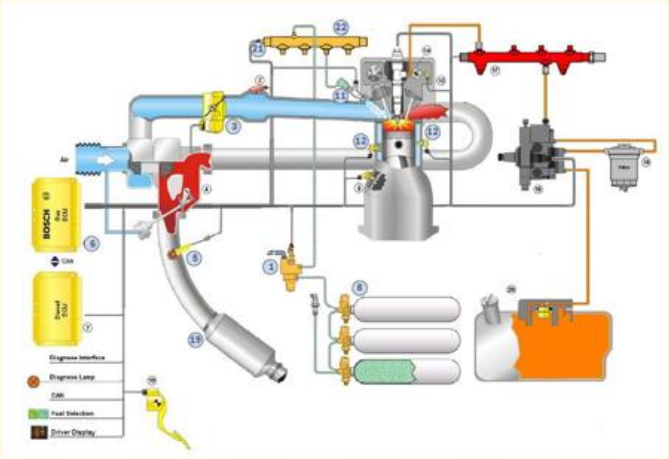
- The fuel is injected at the beginning of suction stroke into each inlet port at moderate pressures.
- The amount of fuel injected depends on data gathered from several sensors then compared to a preloaded program in the ECU.
- This will guarantee an ample time to form a semi-homogeneous mixture.



Dual Fuel Common Rail Fuel Injection System

Two types of fuels are used
Diesel fuel.
Compressed natural gas CNG.

- The Diesel fuel is delivered at a very high pressure (2000 bar) to the common rail.
- The fuel is injected into the combustion chamber from 7 holes of 200µm diameter.
- The injection timing and scenario is electronically controlled.
- The CNG is injected into the inlet port. It is also electronically controlled.



Diesel Fuel System

- A high-pressure fuel injection pump delivers the fuel to the fuel injectors.
- The injectors spray the fuel directly into the combustion chamber.
- The nozzles open either mechanically by the high fuel pressure, or electronically by signals from the ECU.
- There might be preloaded injection scenarios.
- There is no throttle valve and spark plugs.