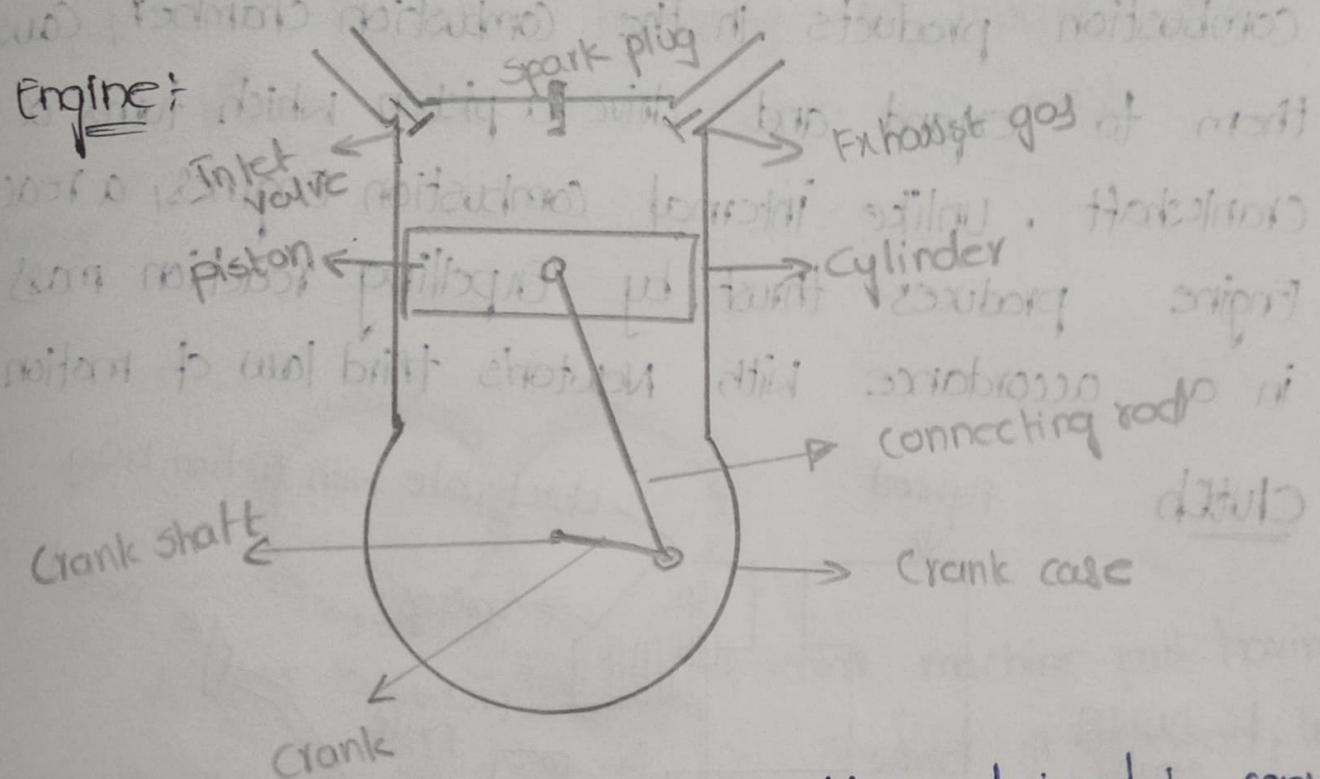


Explain the Automobile components with neat diagram



An Engine or motor is a machine designed to convert one or more forms of energy into mechanical energy. Engine takes four stages of the four-stroke gasoline-fueled internal combustion cycle with electrical ignition source:

1. Induction (Fuel Enters)

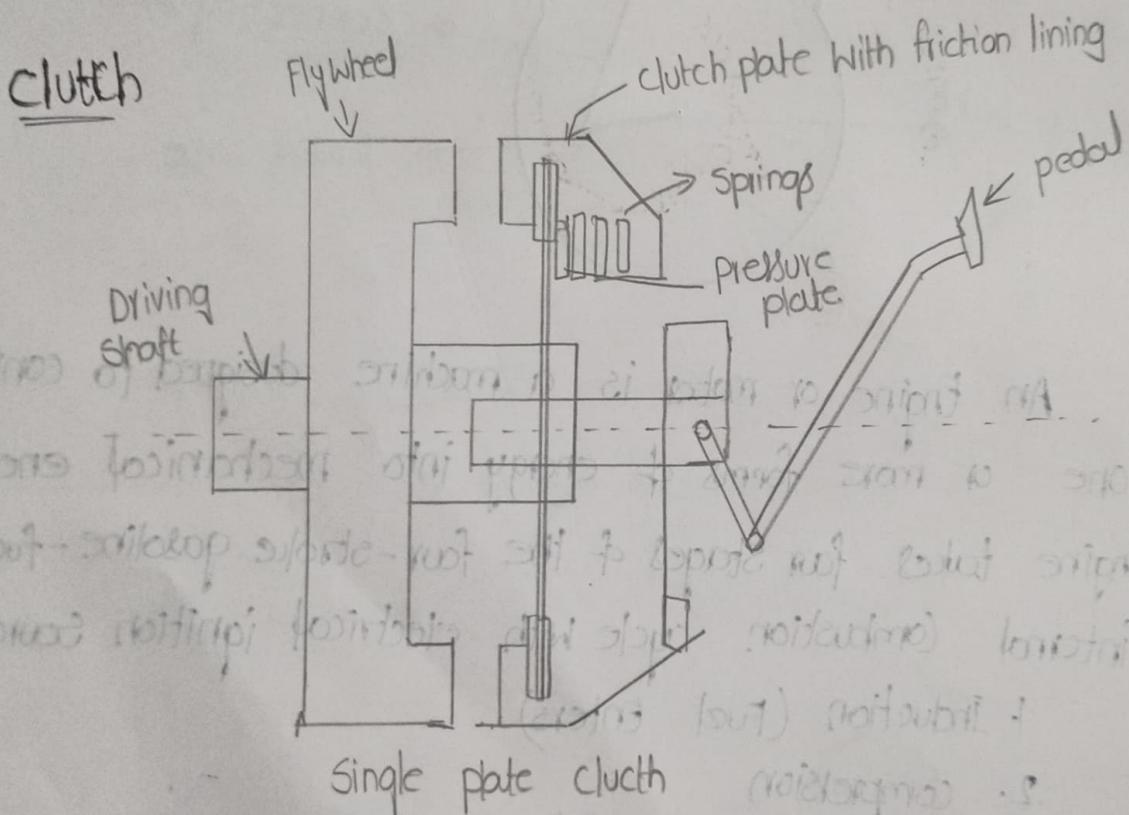
2. compression

3. ignition (Fuel is burnt)

4. Emission (Exhaust out)

Mechanical heat engines convert heat into work via various thermodynamic processes. The internal combustion engine is perhaps the most common example of a

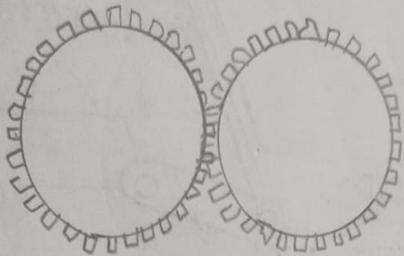
mechanical heat engine, in which heat from the combustion of a fuel causes rapid pressurisation of the gaseous combustion products in the combustion chamber, causing them to expand and drive a piston which turns a crankshaft. Unlike internal combustion engines, a reaction engine produces thrust by expelling reaction mass in accordance with Newton's third law of motion.



A clutch is a mechanical device that engages and disengages power transmission, especially from a drive shaft to a driven shaft. In the simplest application, clutches connect and disconnect two rotating shafts (driven shafts) or line shafts.

In these devices, one shaft is typically attached to an engine or other power unit, while the other shaft provides output power for work. Typically, the motions involved are rotary, but linear clutch also exist.

Gear:



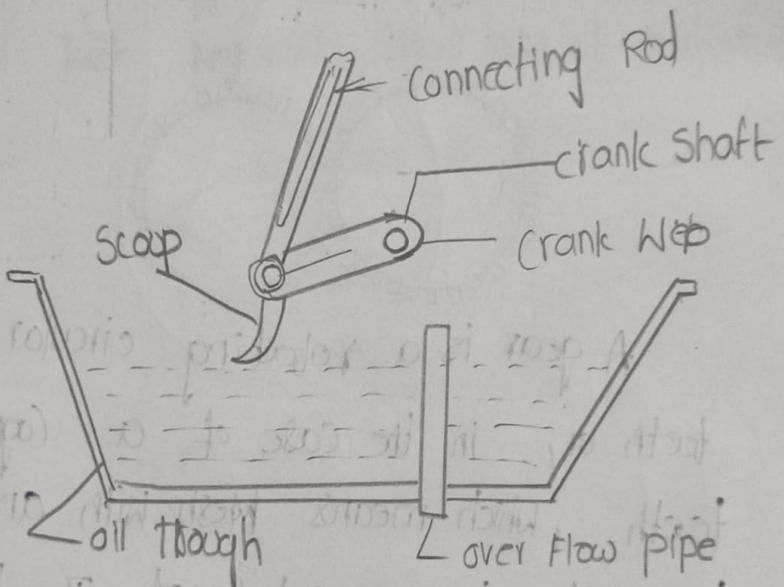
A gear is a rotating circular machine part having cut teeth or, in the case of a cogwheel or gearwheel, inserted teeth, which means mesh with another toothed part to transmit torque and speed. The basic principle behind the operation of gears is analogous to the basic principle of levers. A gear may also be known informally as a cog. Gears can change the speed, torque, and direction of a power source. Gears of different sizes produce a change in torque, creating a mechanical advantage, through their gear ratio and thus may be considered a simple machine.

2 Explain Lubrication System with neat diagram of splash and pressurized System.

Lubricating System's are 2 types

- 1] splash System
- 2] pressurized System

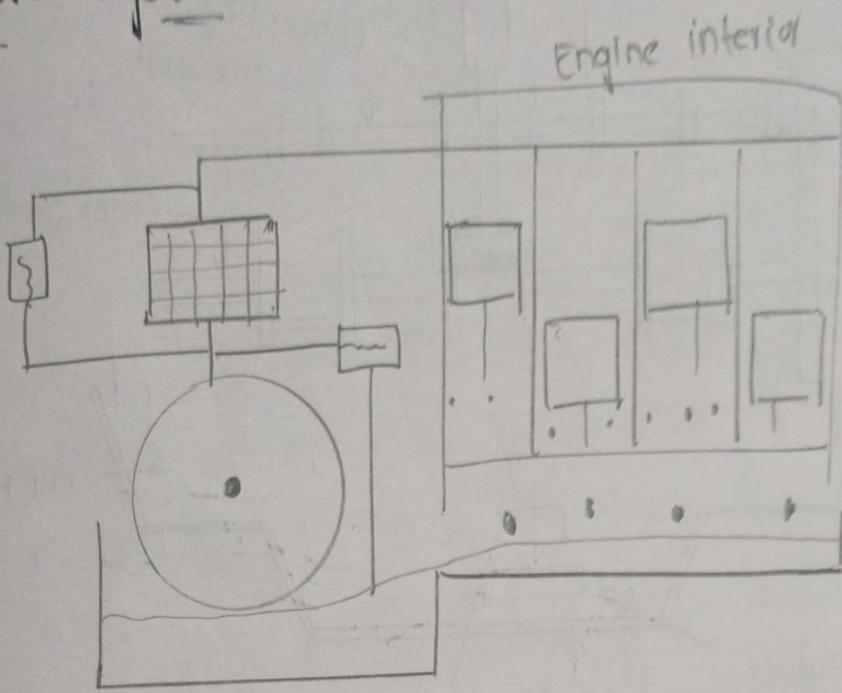
Splash System:



This was employed for the engines of early motor cycles. It is one of the cheapest methods of engine lubrication. A scoop is made in the lowest part of the connecting rod and the oil is stored in the oil trough. It being pumped there from the crank case oil pump. When the engine runs the scoop cause the oil to splash on the cylinder walls each time it passes through its B.D.C position. This effects the lubrication of engine walls, judgeon pin main

crankshaft bearings, big end bearings etc.

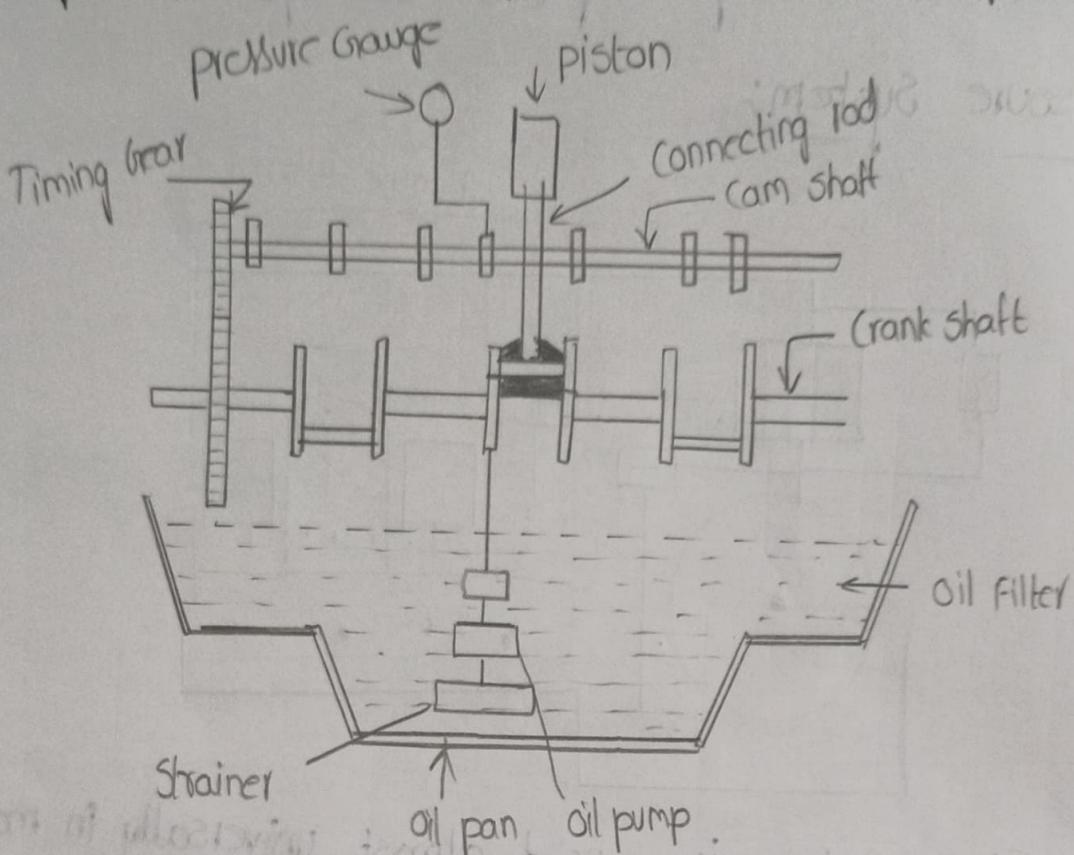
pressure system:



This System is used almost universally in modern car engines. The splash system though cheaper is not suitable for automobile engines because of the absence of positive lubrication. In the pressure system, an oil pump takes the oil from the wet sump through a filter to the main oil gallery at a pressure of 200 to 400 kpa. The oil pressure is controlled by means of a pressure relief valve situated in the filter units or the pump housing.

3

Explain Lubrication System with neat diagram.



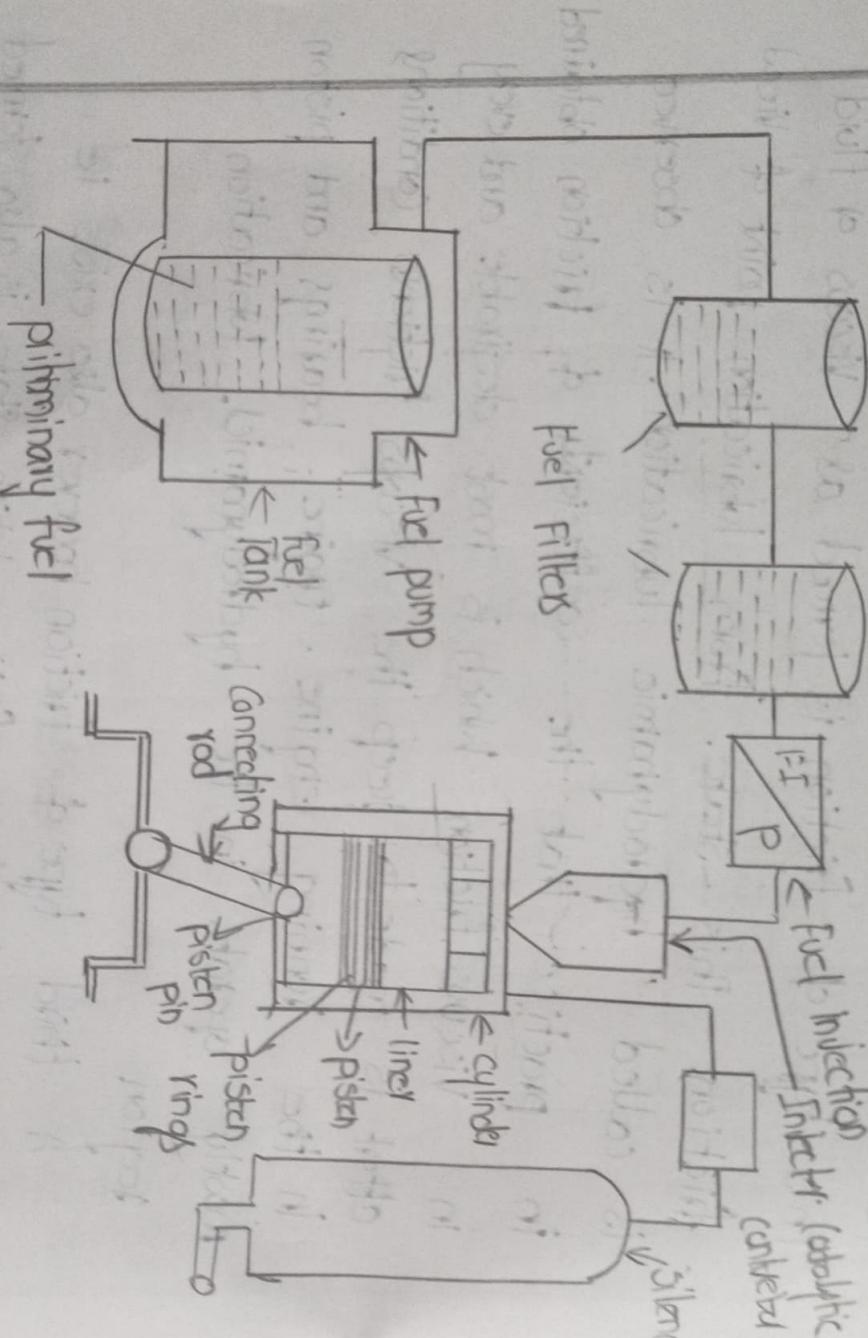
Lubrication circuit is one of the most important and in the Engine. The Engine cannot run smoothly for more than a few minutes without the lubricating oil. When ever two metallic surface move over each other under direct contact dry or solid friction is produced. This is due to irregularities on the two surfaces interlocking each other. The dry friction thus produced produces a lot of heat and results in wear of the metal surface.

However some lubricating oil is interposed between two surfaces so that the two are not in actual physical contact with each other, the only resistance to motion remains the resistance of the oil itself. This type of friction is termed as viscous or fluid friction. This state from lubrication point of view is called hydrodynamic lubrication. It is observed in practice that the coefficients of friction obtained in viscous friction which is most desirable and easy effort is made to keep the viscous friction conditions in the running engine. Engine bearings and piston mostly operate in the hydrodynamic lubrication region.

A third type of friction however also exists i.e. dry or boundary friction which state is also termed boundary lubrication from lubrication view point. In this some lubricant is there but that is not sufficient to cause the complete separation of the two surfaces i.e. only their high spots touch. In this the friction co-efficients are undoubtedly higher than in case of viscous friction, but nevertheless they are far less than the co-efficients in dry friction. Boundary lubrication may exist in piston rings and valve train.

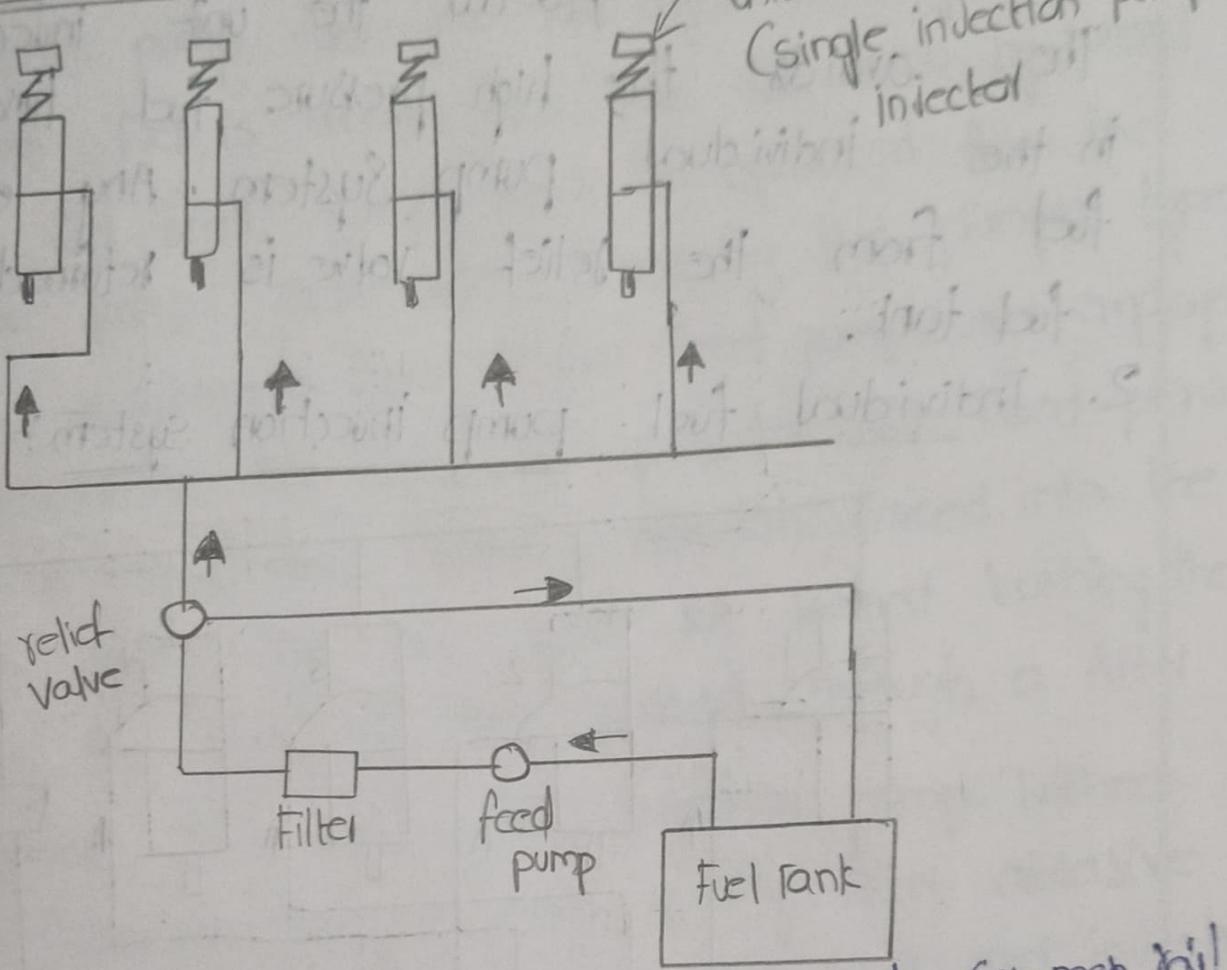
4 Explain fuel injection system of diesel Engine

With line diagram



The function of a fuel injection system is to inject proper quantity of fuel into the engine cylinders at the correct time and at a predetermined rate. Fuel injection system of diesel engine is of two types

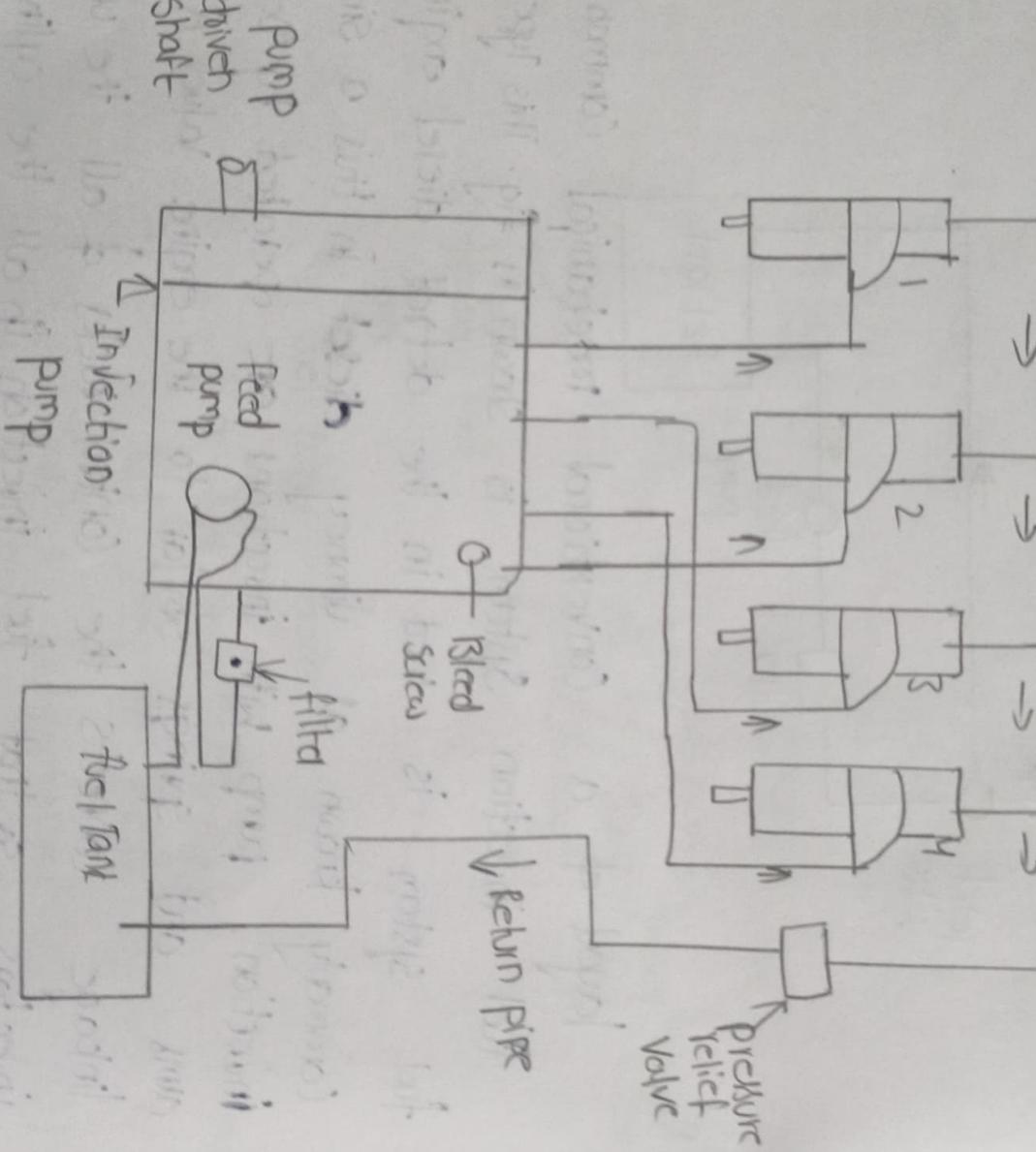
1] Common rail fuel injection system



layout of a conventional mechanical common rail fuel injection system is shown in fig. This type of fuel system is used in the Detroit diesel engine, commonly known as Jimney. It is operated by Docker injection pump with injections directed in this a single linkage connects the control racks of all the unit injectors so that fuel injection in all the cylinders may be equal and simultaneously controlled. The feed pump and supplied at low pressure through a filter, to the low pressure common

fail and therefore go to all the unit injections. The avoids the high pressure fuel line necessary in the individual pump system. Any excess fuel from the injector valve is returned to the fuel tank.

2. Individual fuel pump injection system:



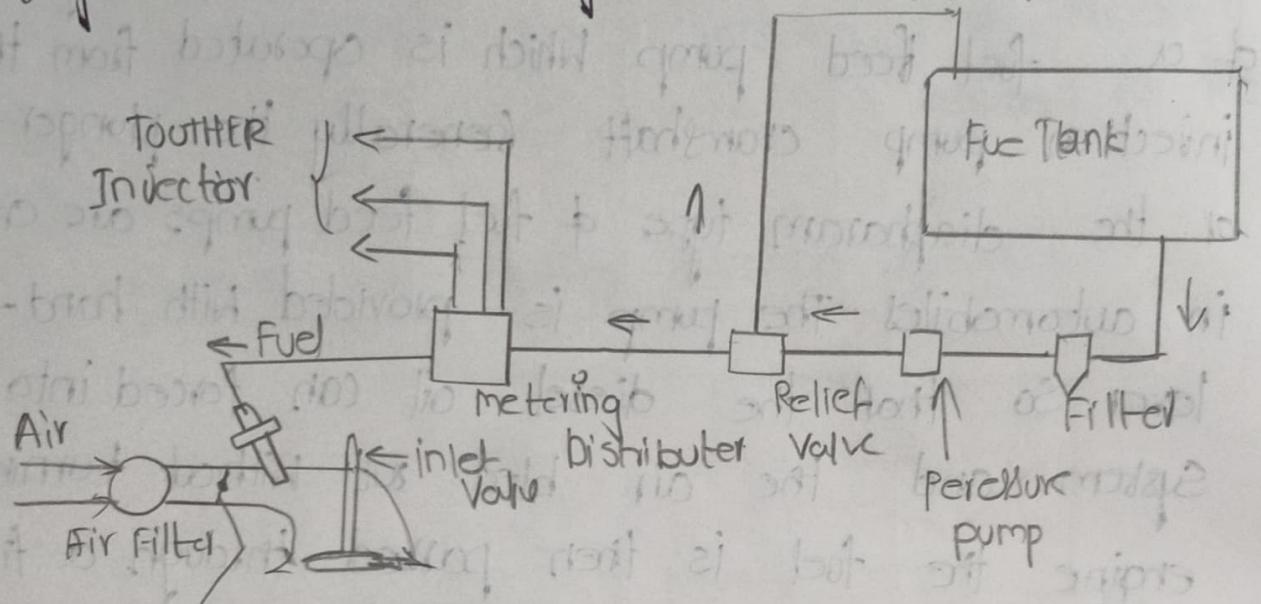
individual pump fuel injection system using in line pump is shown. Fuel is drawn from the fuel tank by means of a fuel feed pump which is operated from the injection pump crankshaft generally the plunger type or the diaphragm type of fuel feed pumps are employed in automobiles. The pump is provided with hand-priming lever so that the diesel oil can forced into the system and the air bled out without turning the engine the fuel is then passed through a filter and hence to the fuel injection pump. Without the filter or with a poor quality filter, abrasive matter would reach the fuel injection pump and injection resulting in poor starting, irregular idling and deterioration in performance due to decreased fuel delivery from the injection pump.

(no briquet making machine) (A)

(no briquet making machine - stop work
of briquet both because - NO. 1000 no briquet
(so no sand becomes available) (no equipment

5

Explain the fuel injection system of petrol engine with line diagram.

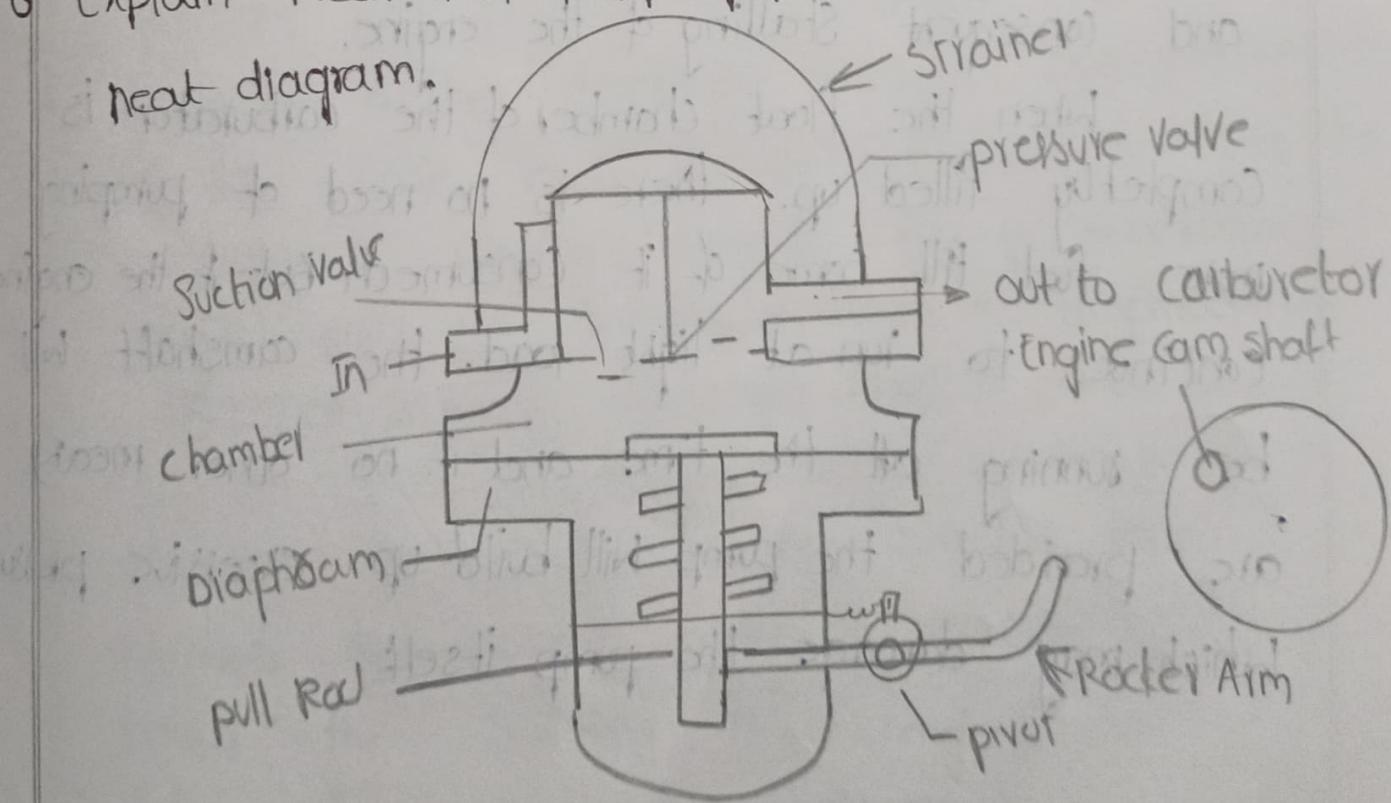


Fuel injection is the introduction of fuel in an internal combustion engine, most commonly automotive engines, by the means of an injector. This article focuses on fuel injection in reciprocating piston and Wankel rotary engines.

All compression ignition engines and many spark-ignition engines use fuel injection of one kind or another. Most produced diesel engines for passenger cars (such as Mercedes-Benz OM 138)

The term "fuel injection" is vague and comprised various distinct systems with fundamentally different functional principles. Typically the only thing in common all fuel injection systems have is a lack of carburetion. There are two main functional principles of mixture formation: one called a manifold injection system. There exist two types of manifold injection systems: multi-point injection and single point injection. Internal mixture formation system can be separated into direct and indirect injection systems.

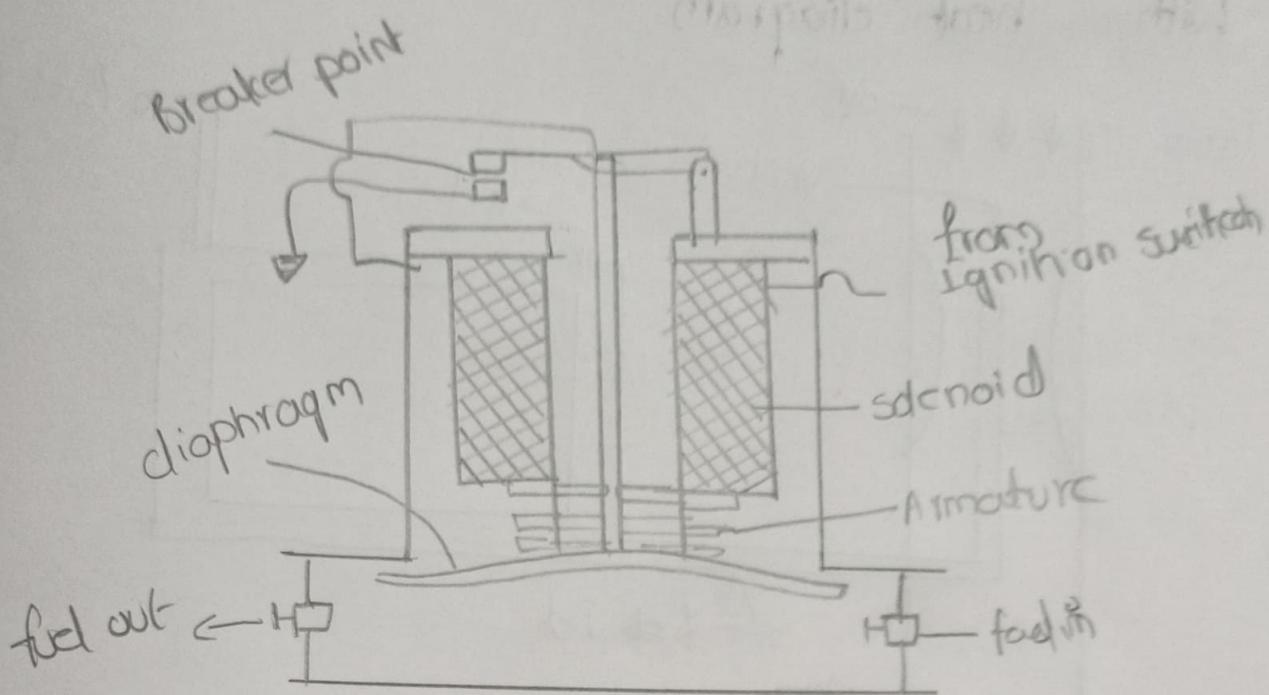
- 6 Explain mechanical fuel pump, Electrical fuel pump with neat diagram.



The pressure in the petrel pipeline between the fuel pump and the carburetor is kept under pressure at about 26 and 35 kpa; the exact pressure range being determined by the stiffness of the diaphragm return spring. The controlled pressure range being in the petrel supply line is very important to be maintained if the pressure is low, the petrel supply will not be able to keep pace with the demand under high speed or high load conditions. On the other hand if the pressure is excessive the needle valve of the carburetor float chamber may be forced open causing the flooding of the carburetor and consequent stalling of the engine.

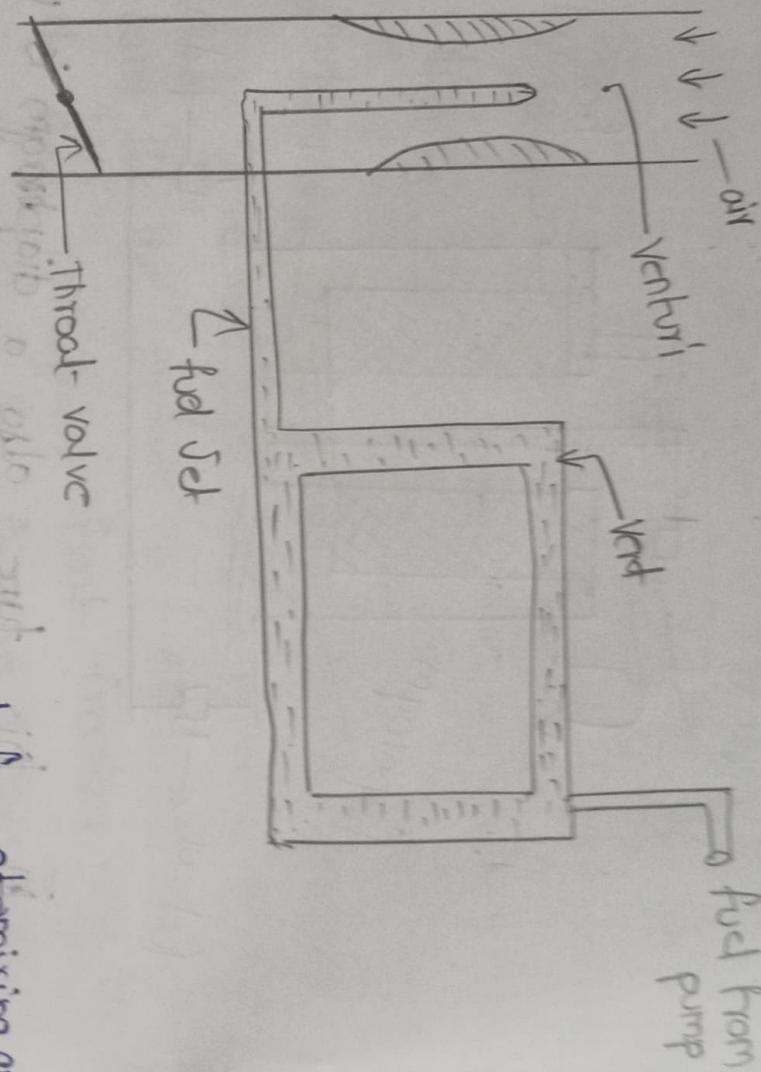
When the float chamber of the carburetor is completely filled up there is no need of pumping more fuel till some of it consumed, but if the engine continues to run at light load, the camshaft will be running all the time and if no other means are provided the pump will build up excessive pressure which may damage the pump itself.

Electrical Fuel pump:



In this type also a diaphragm is used alternate vacuum and pressure are produced due to the movement of the diaphragm which is caused electrically in this case. Closing the ignition switch energizes the solenoid winding, magnetic flux is generated which pulls the armature to which the diaphragm is attached. Thus the diaphragm moves to cause suction in the pump chamber and the fuel is drawn into the chamber. As soon as the armature moves it interrupts the electric supply by disconnecting the breaker points. The solenoid is de-energized and the armature falls back causing the diaphragm to move create pressure in the pump chamber.

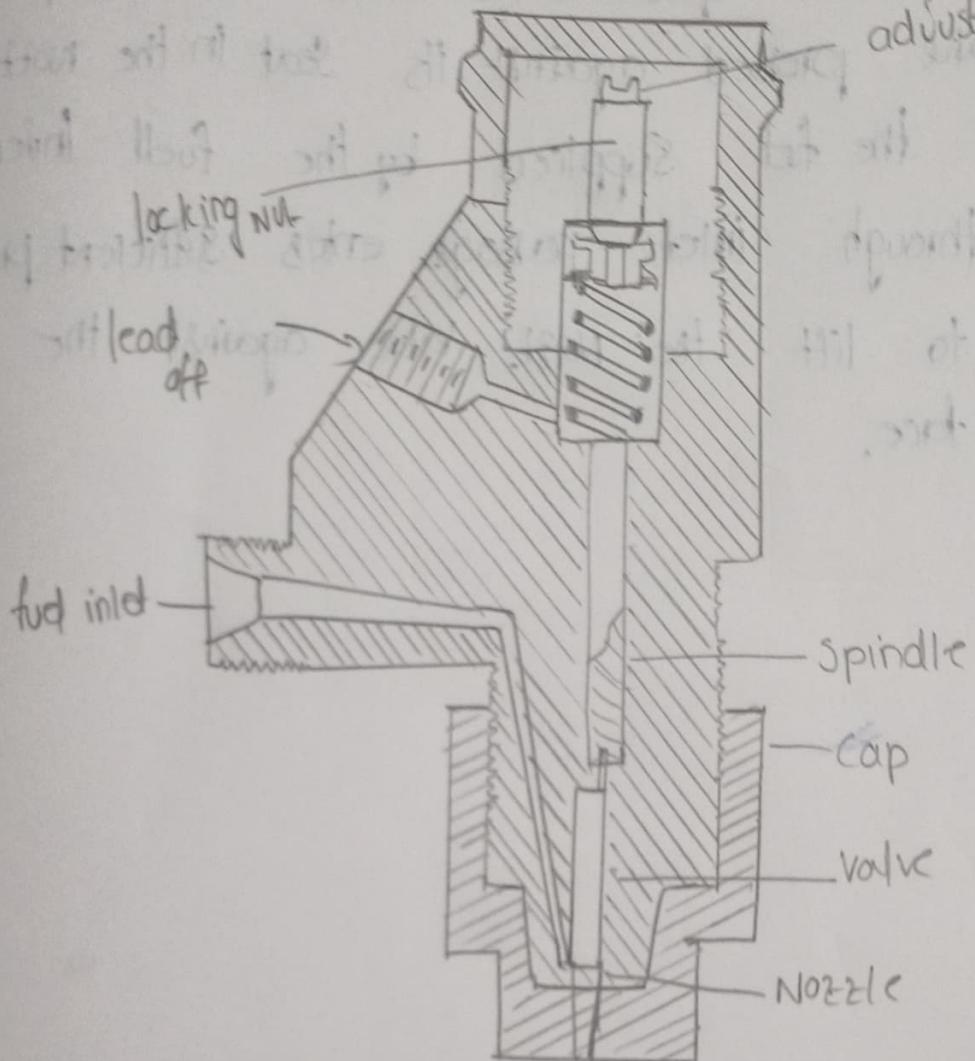
Explain the construction of carburetor and fuel injector with neat diagram



Carburetor is a device used for atomizing and vaporizing the fuel and moving it with the air in varying proportions to suit for changing the operating conditions of engine. The process of breaking up and moving the fuel with the air is called carburation.

The carburetor is supposed to supply the fuel air mixture in correct proportion under different conditions of temperature, speed and load on engine.

Fuel injector:



It is also known as nozzle, atomizer or fuel valve. Its function is to inject the fuel in the cylinder in properly atomised form and in proper quantity in aero engine both type fuel injection is shown in fig

If consists of mainly two parts, i.e. the Nozzle and the Nozzle holder, the former being connected to the latter by means of a service cap. This facilitates the change of nozzle valve whenever required. A spring-loaded spindle is the

Nipple valve

Roaded Spindle is the Nipple holder keeps the Nipple valve pressed against its seat in the nozzle body till the fuel supplied by the fuel injection pump through inlet passage enters sufficient pressure so as to lift the nozzle valve against the spring force.