

SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.



- Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

DEPARTMENT OF AUTOMOBILE ENGINEERING

23AUT202 – AUTOMOTIVE ENGINES AND EMISSION CONTROL

II YEAR / III SEMESTER

Topic – **Diesel injection system, Jerk Pumps**



Introduction

- The purpose of the fuel injection system is to deliver fuel into the engine cylinders, while precisely controlling the injection timing, fuel atomization, and other parameters.
- In Diesel engine fuel injection system is implemented to inject a definite quantity of fuel at the desired time and a definite rate into the combustion chamber.



Requirements of diesel injection system



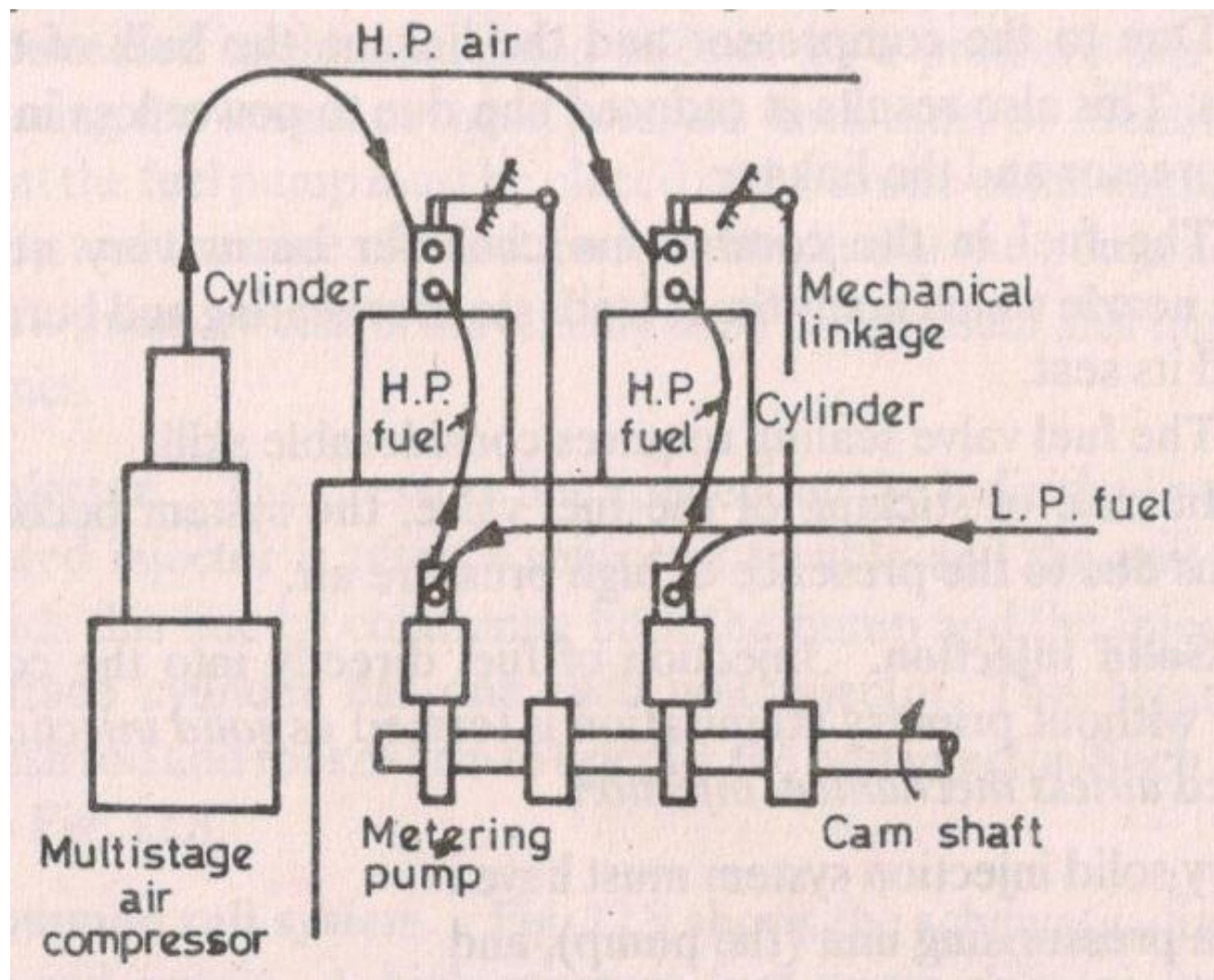
- Fuel must introduce precisely defined period of cycle
- Good atomization of fuel
- Good spray pattern for rapid mixing of fuel and air
- Distribution of fuel in multi-cylinder should uniform
- No dribbling and after injection of fuel i.e. Sharp injection
- Rate of injection meet desired heat release pattern
- Quantities of fuel meet changing speed and load condition
- Injection timing suits the speed and load requirements



Types of diesel injection System



- Air injection system
- Injecting air along with liquid fuel.
- Fuel supplied through camshaft driven fuel pump
- Fuel valve is also connected with high pressure airline to inject into cylinder
- Multi-stage compressor which supply air at a pressure of about 60 to 70 bar
- Blast air sweeps the fuel along with it
- Good atomization results in good mixture formation and hence high mean effective pressure
- Heavy and viscous fuels are used
- Fuel pump require small pressure
- Complicated due to compressor arrangement and expensive
- Bulky engine and low bhp
- Overheating and burning of valve seat





Solid Injection System



- Fuel directly injected to combustion chamber without primary atomization termed as solid injection and also known as airless mechanical injection

Type

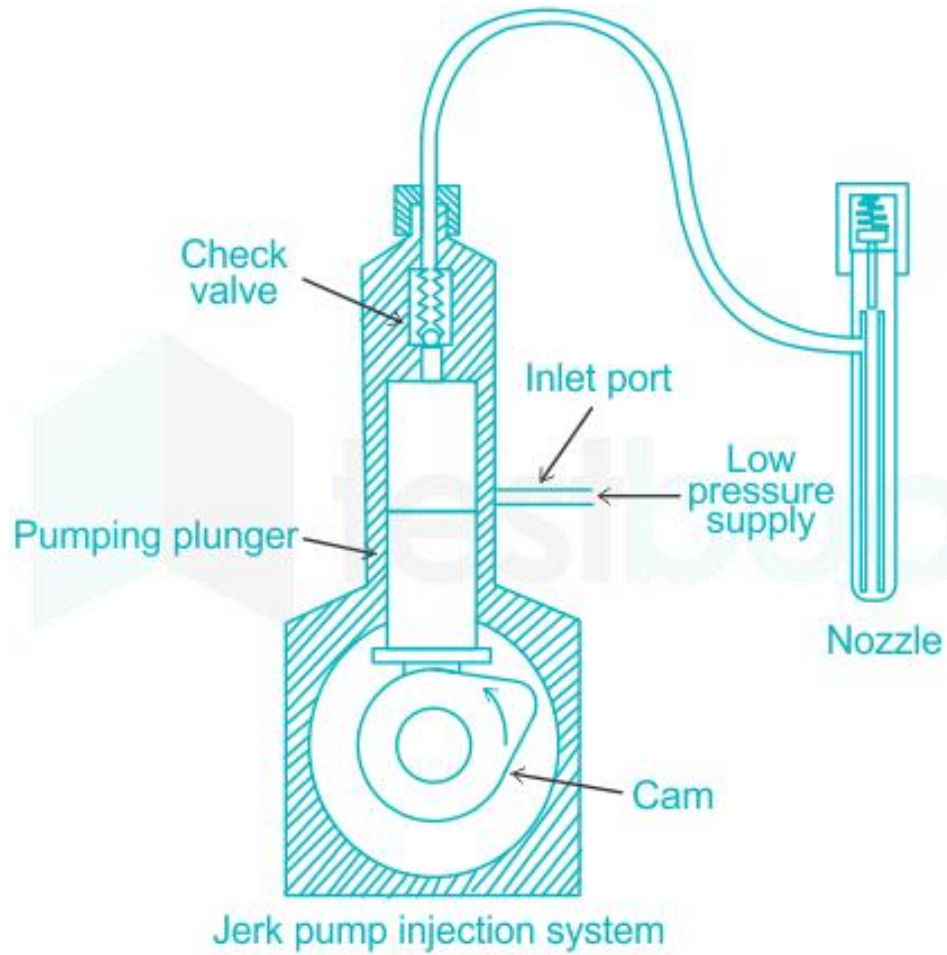
- Individual pump and injector or jerk pump system
- Common Rail System
- Distributor System



Individual pump and injector or jerk pump system



- Separate metering and compression pump is used for each cylinder
- reciprocating fuel pump is used to meter and set the injection pressure of the fuel
- heavy gear arrangements which gives jerking noise, hence name is given is jerk pump
- jerk pump is used for medium and high speed diesel engines





Thank You !