

UNIT-II

DIESEL POWER PLANT

PREPARED BY

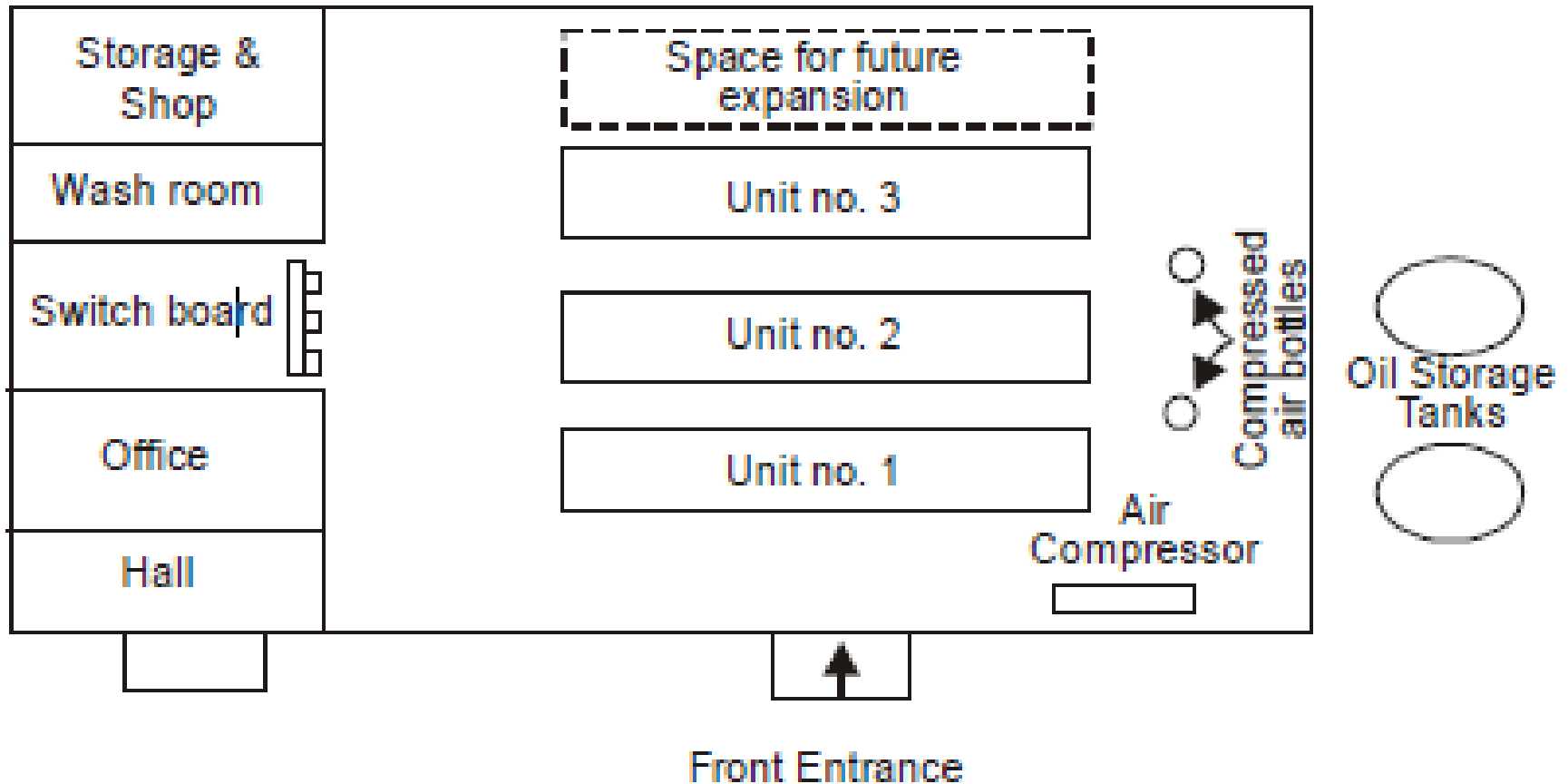
K.TAMILSELVI

ASSISTANT PROFESSOR-EEE

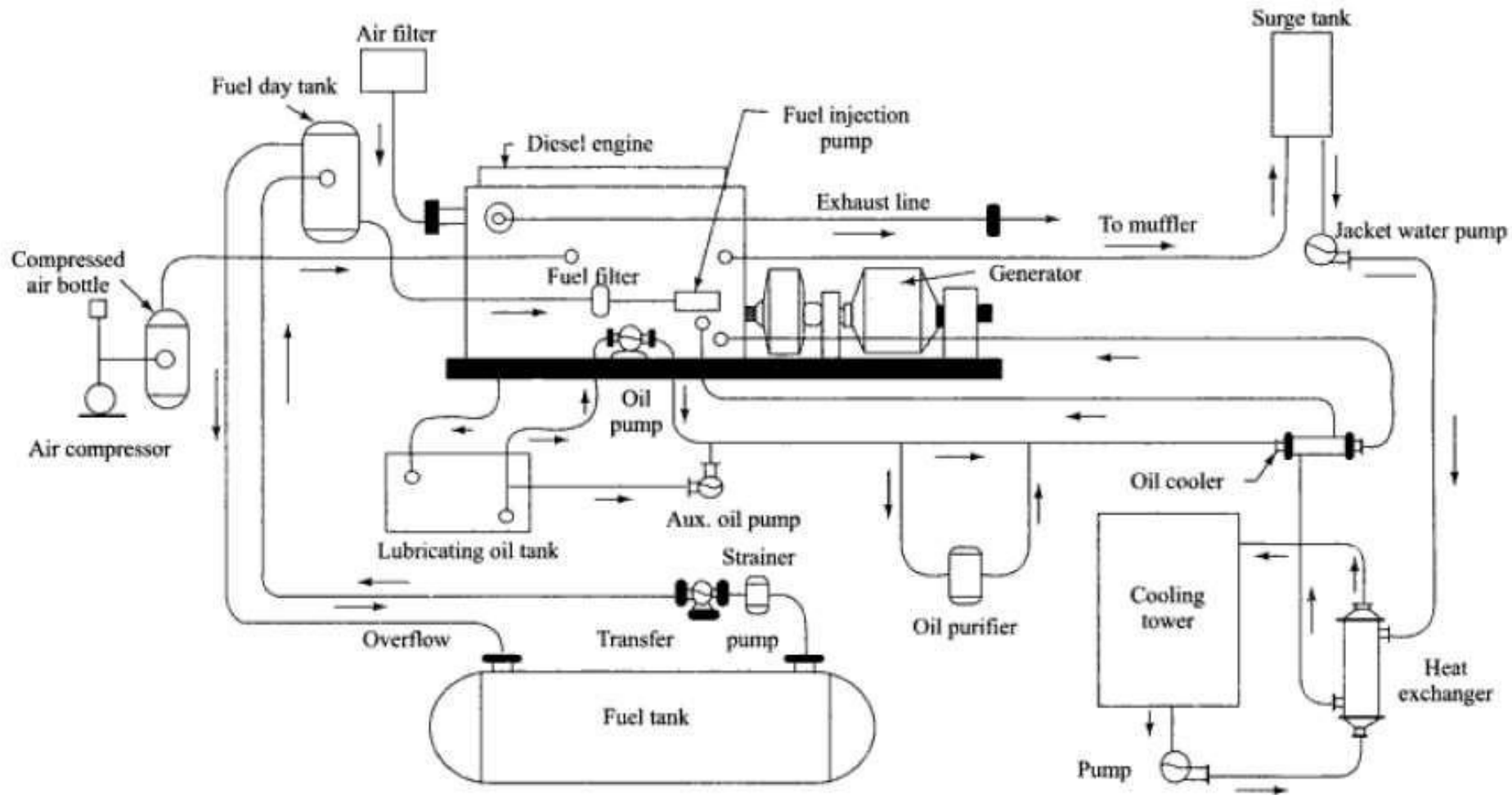
NPR COLLEGE OF ENGG & TECH



Layout of Diesel Power Plant



Layout of Diesel Power Plant



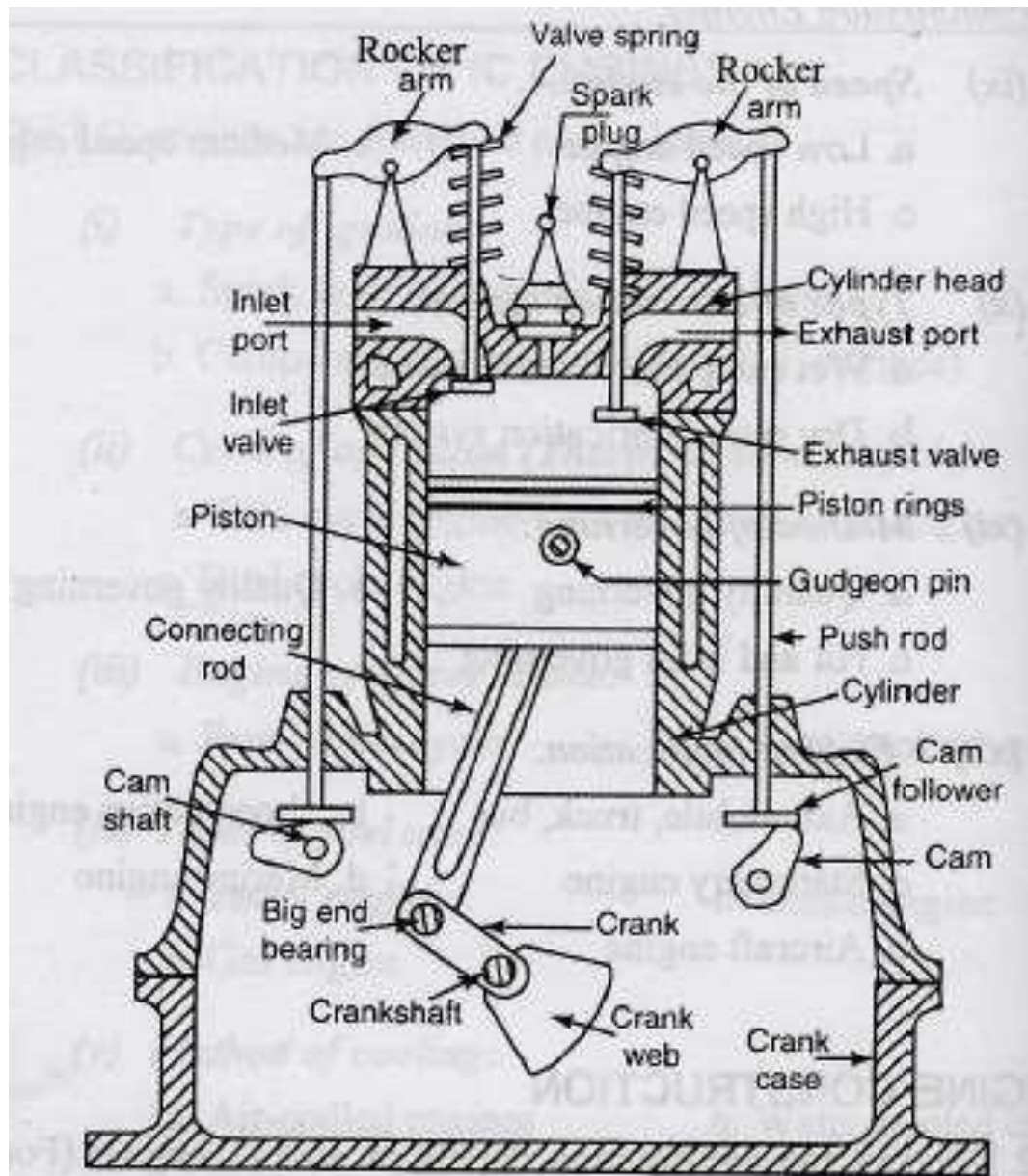
Components of Diesel

Power

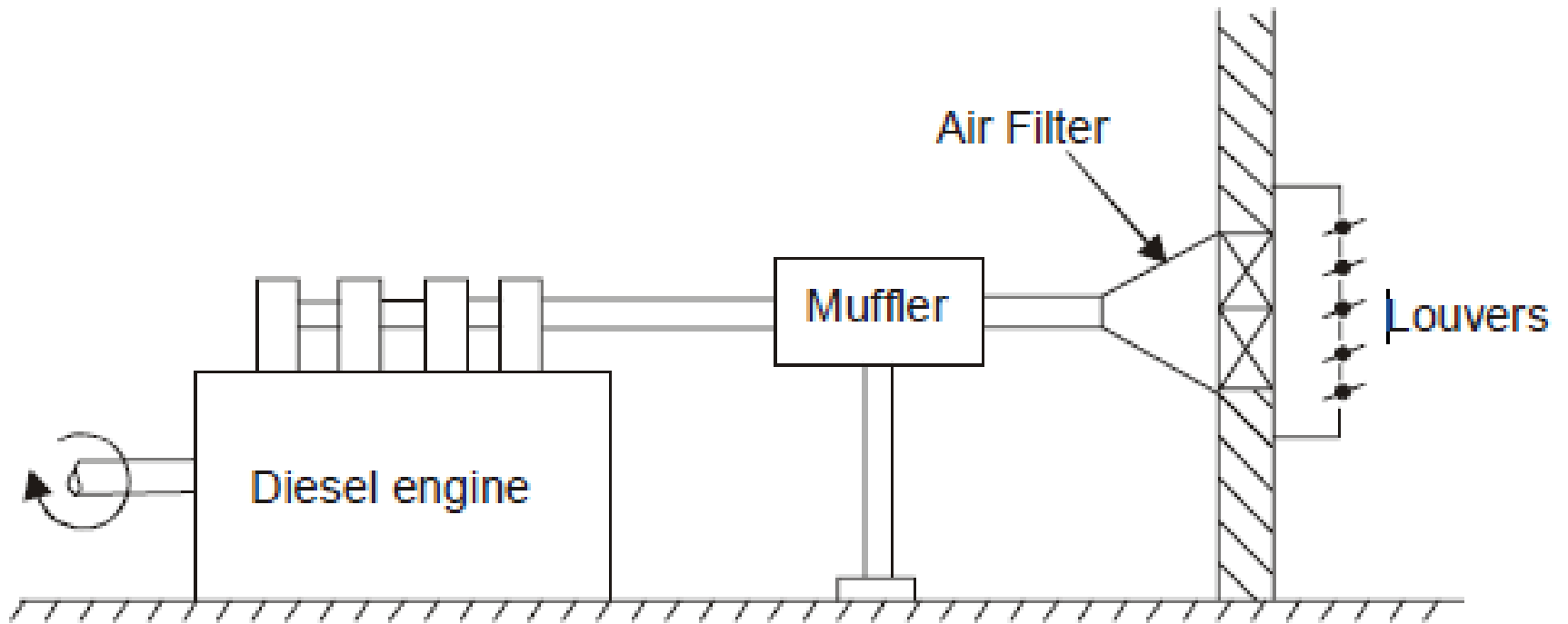
Plant

- Engine
- Air intake system
- Exhaust system
- Fuel system
- Cooling system
- Lubrication System

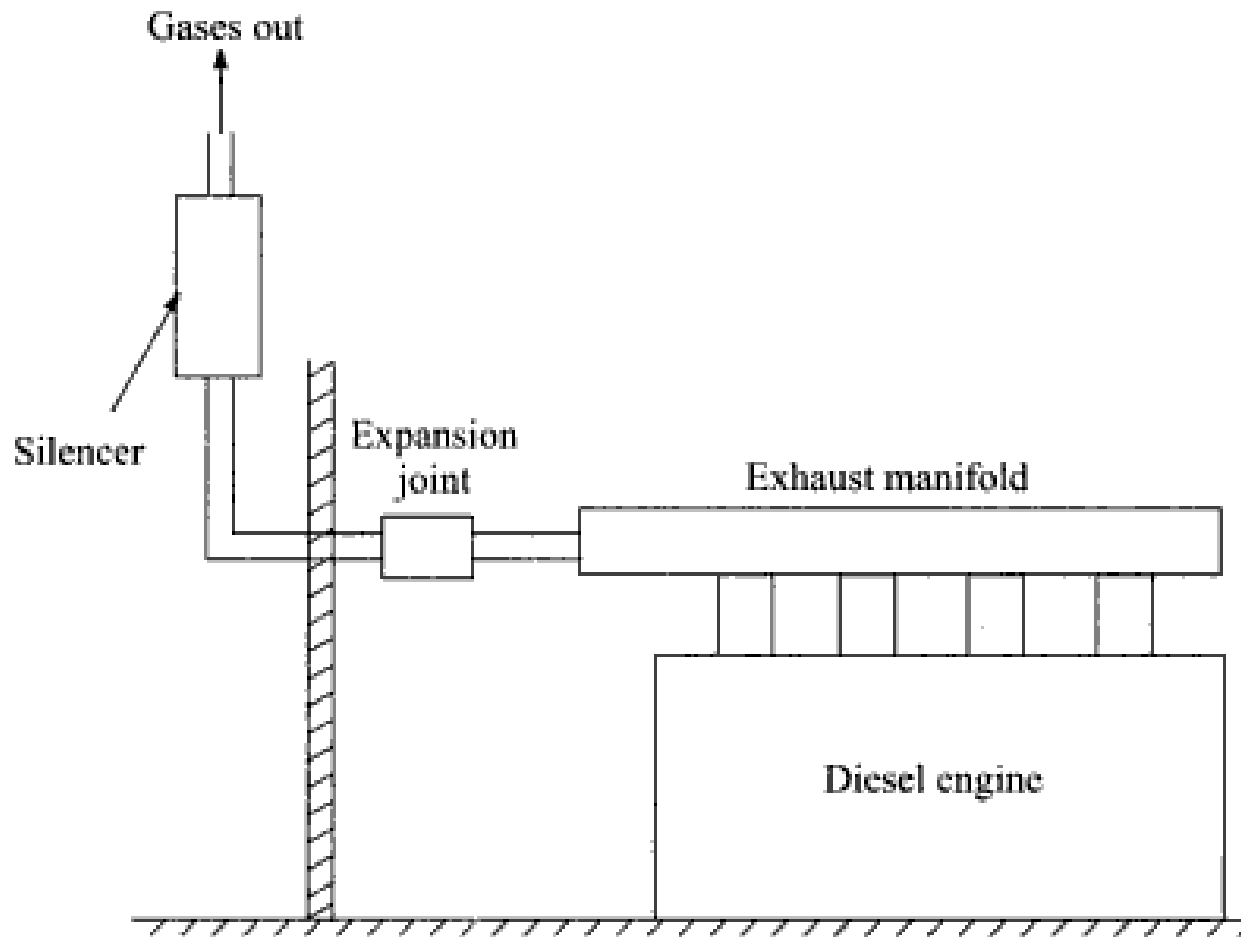
Engine



Air intake system



Exhaust system



Fuel system

➤ Fuel Storage

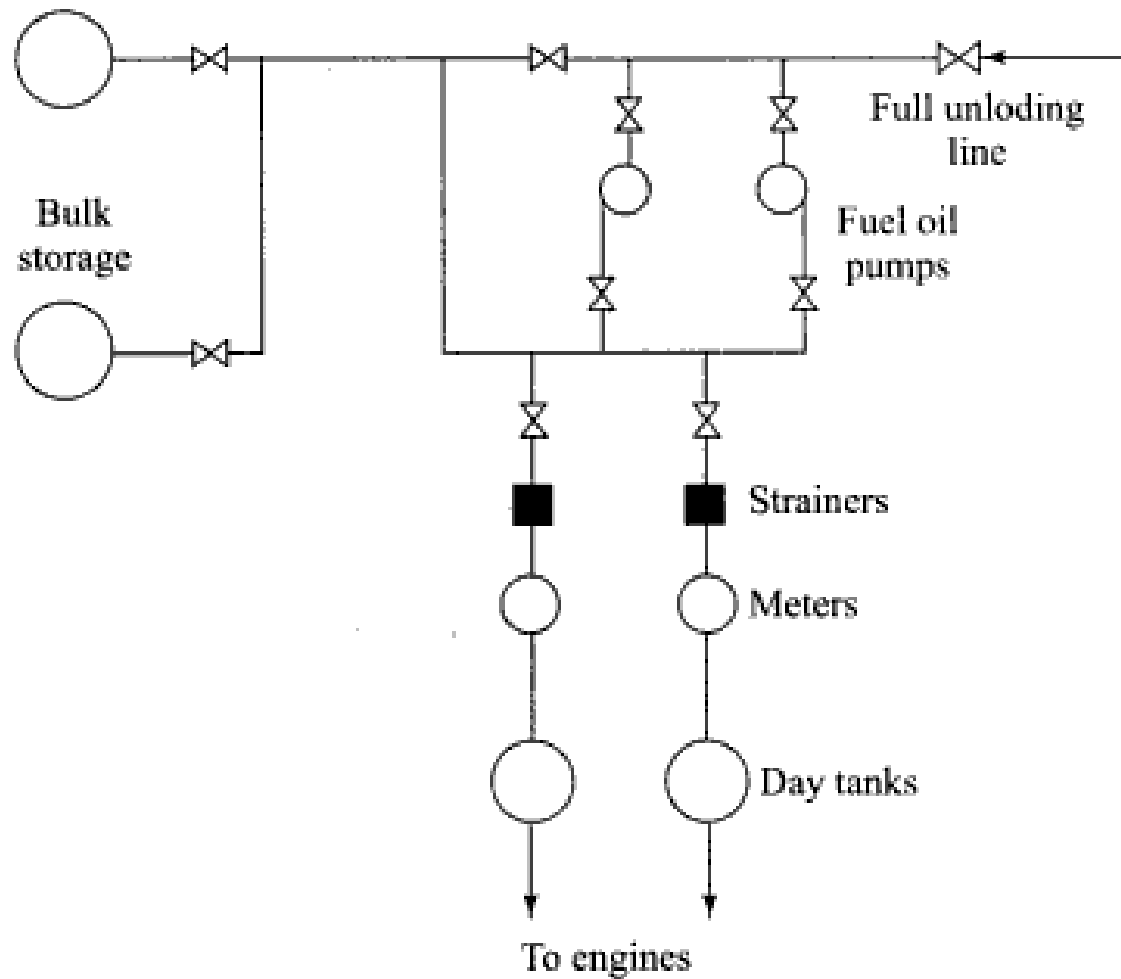
➤ Fuel Injection System

- Common Rail
- Individual Pump Injection
- Distributor

➤ Fuel Pump

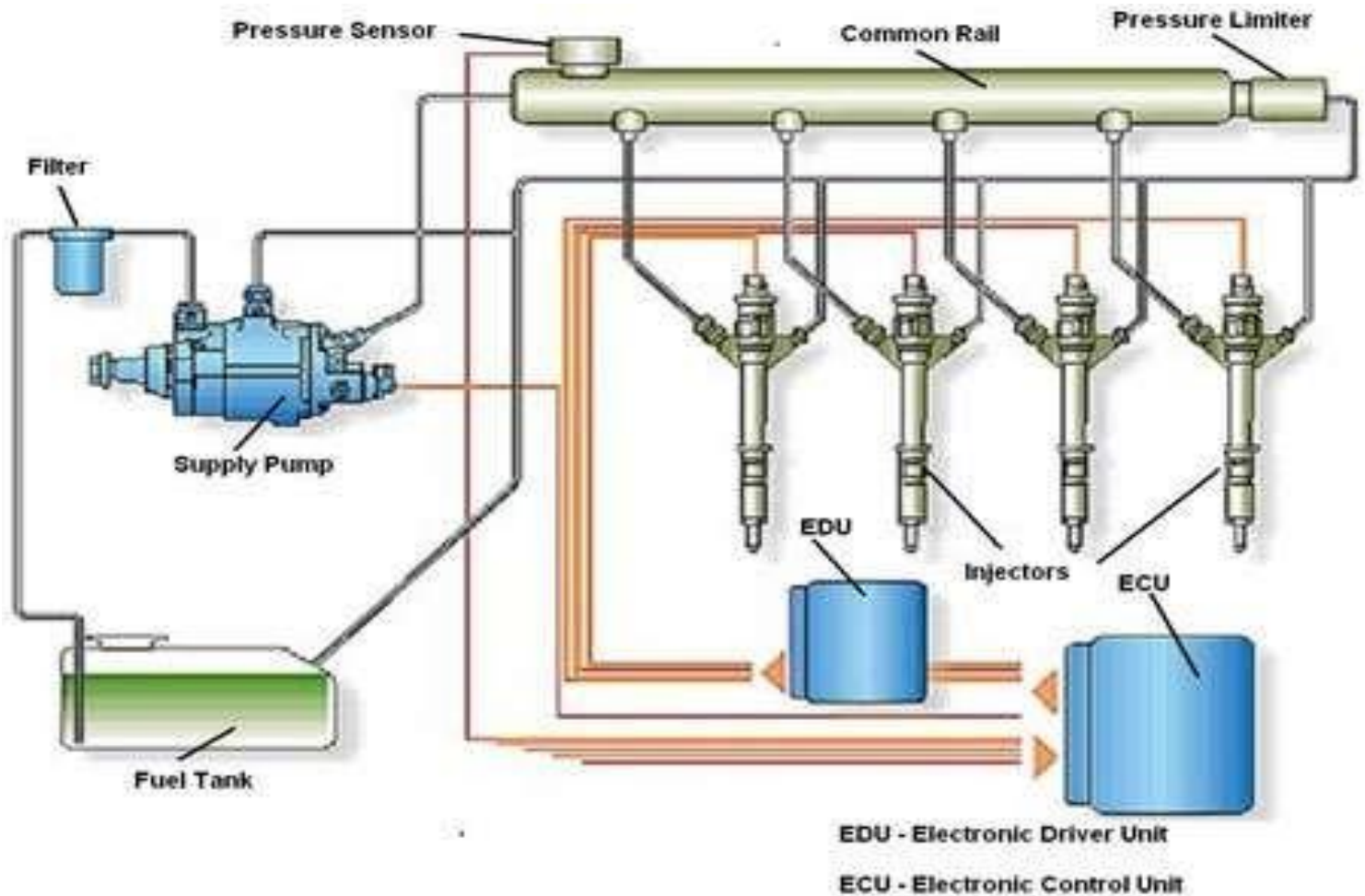
➤ Fuel Injector

Fuel Storage



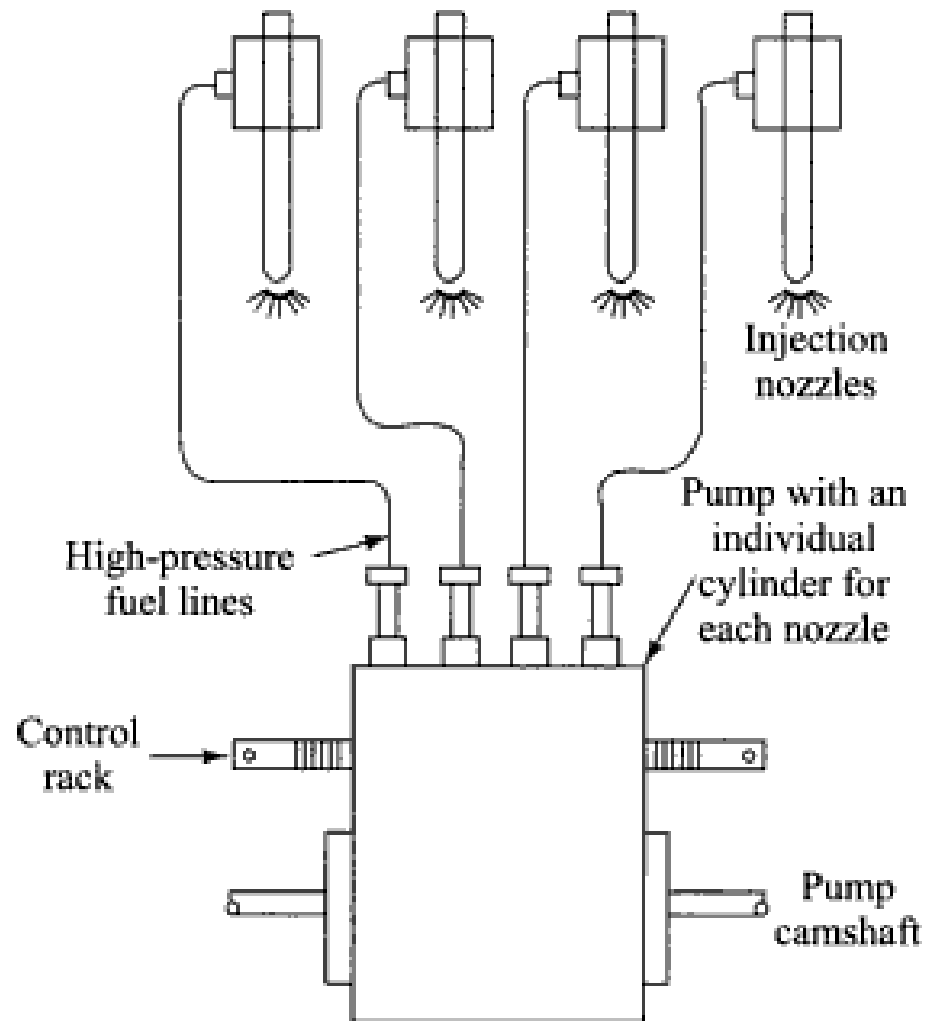
Fuel Injection System

- Common Rail



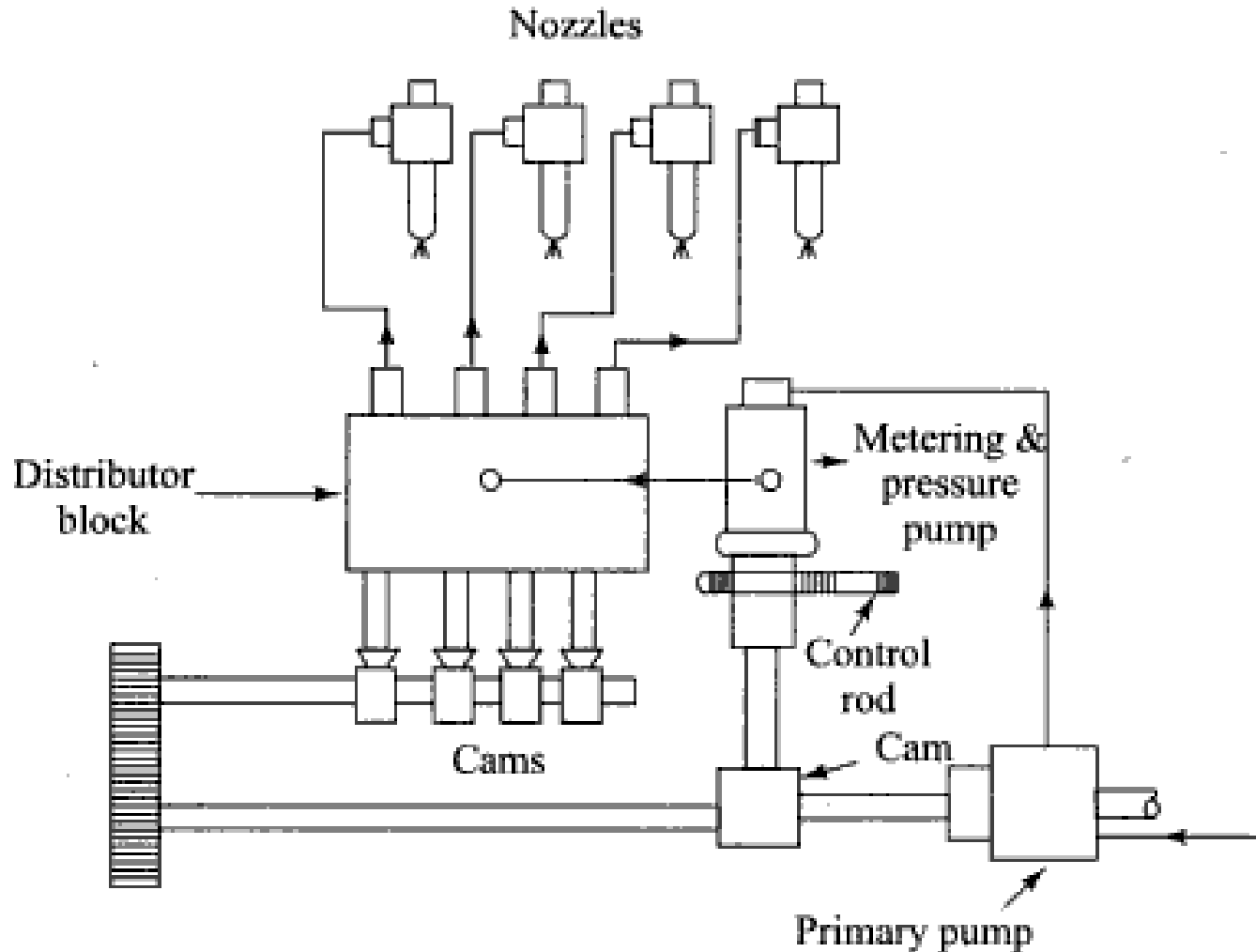
Fuel Injection System

- Individual Pump Injection

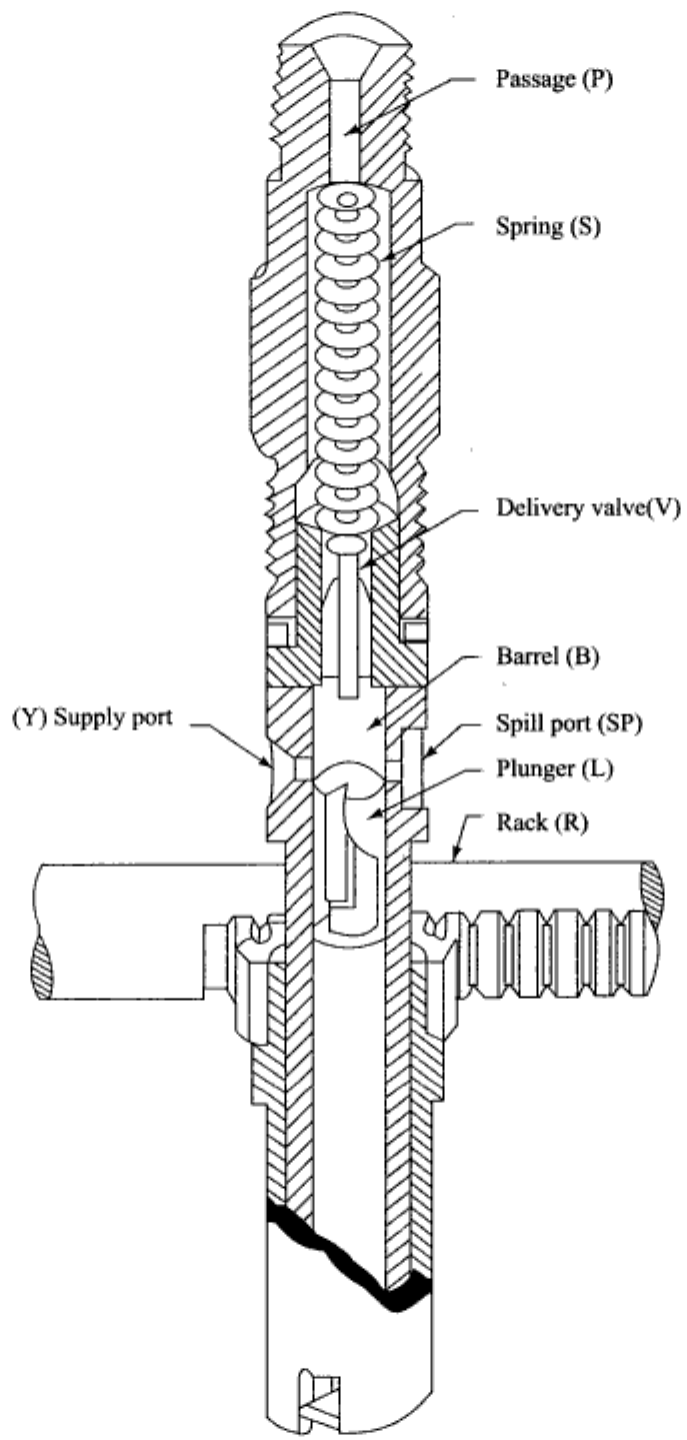


Fuel Injection System

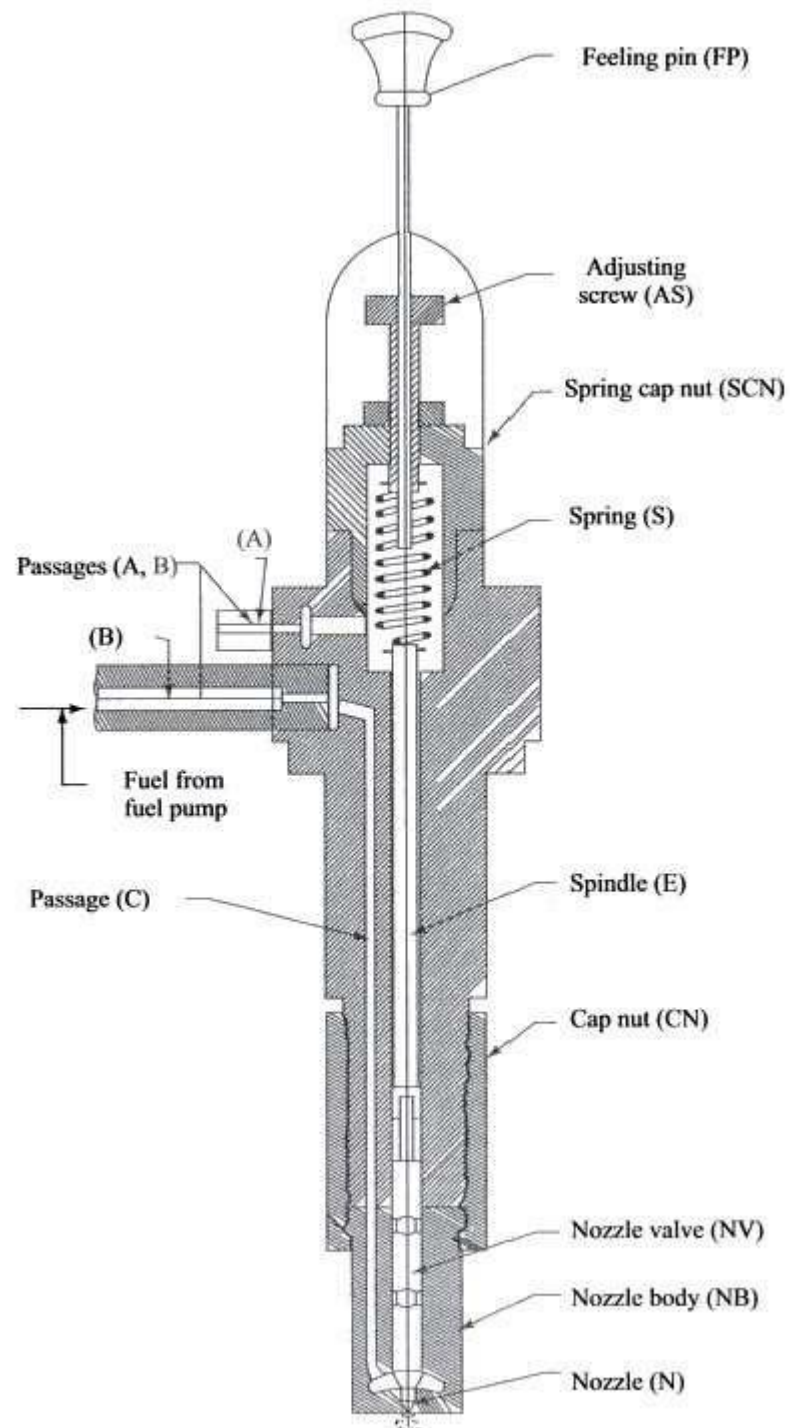
- Distributor



Fuel Pump



Fuel Injector



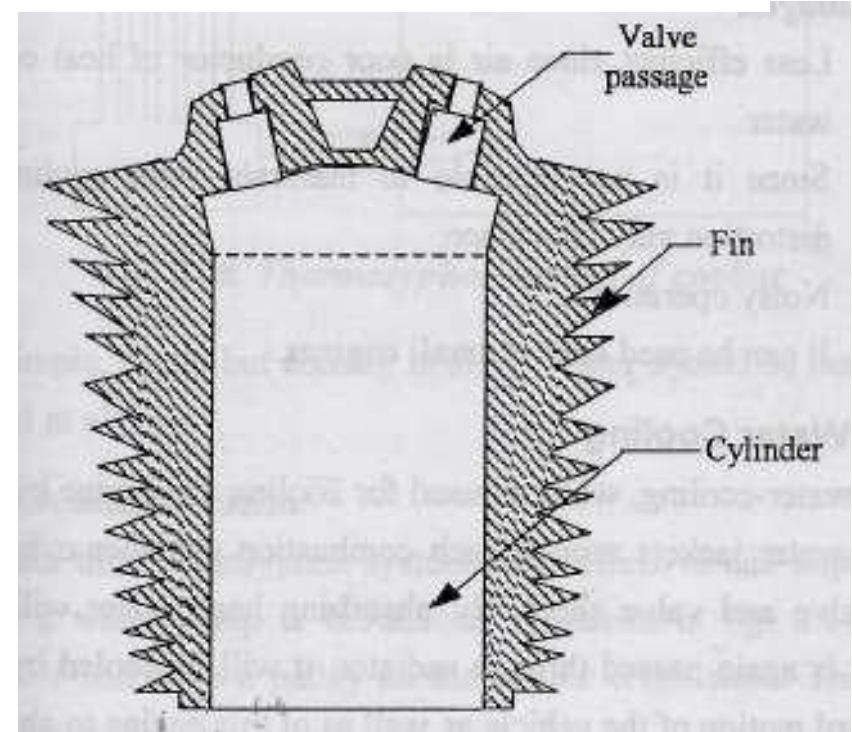
Cooling system

➤ Air Cooling

Air cooling is used in small engines, where fins are provided to increase heat transfer surface area.

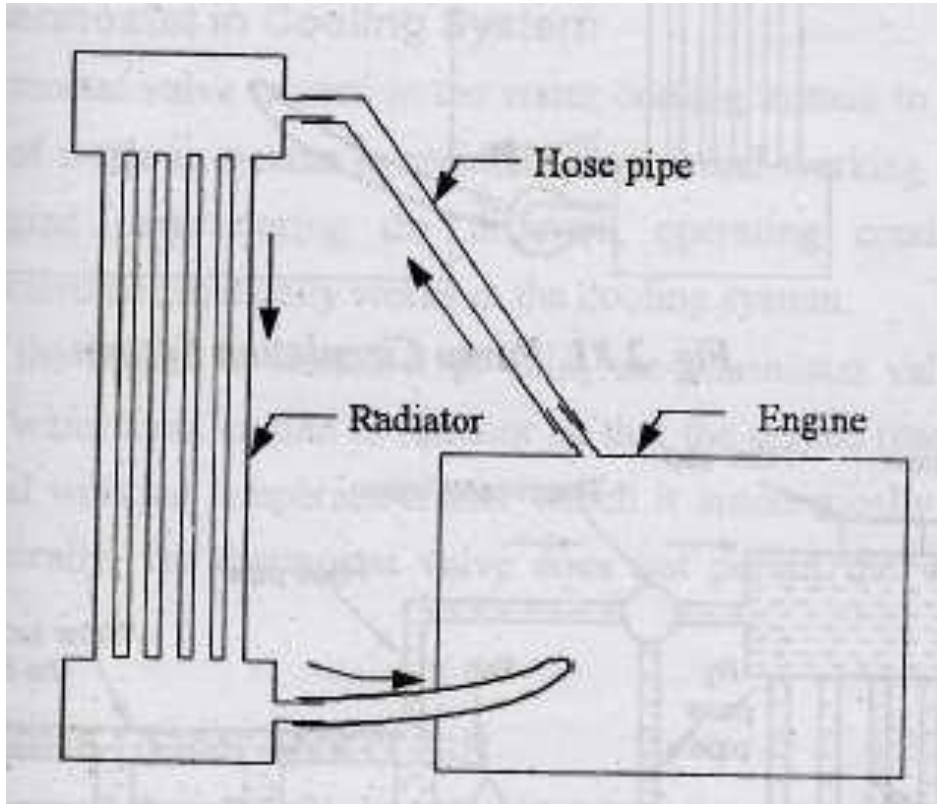
➤ Liquid Cooling

- Thermosyphon Cooling
- Forced or Pump Cooling
- Cooling with thermostatic regulator
- Pressurized Water Cooling
- Evaporative Cooling

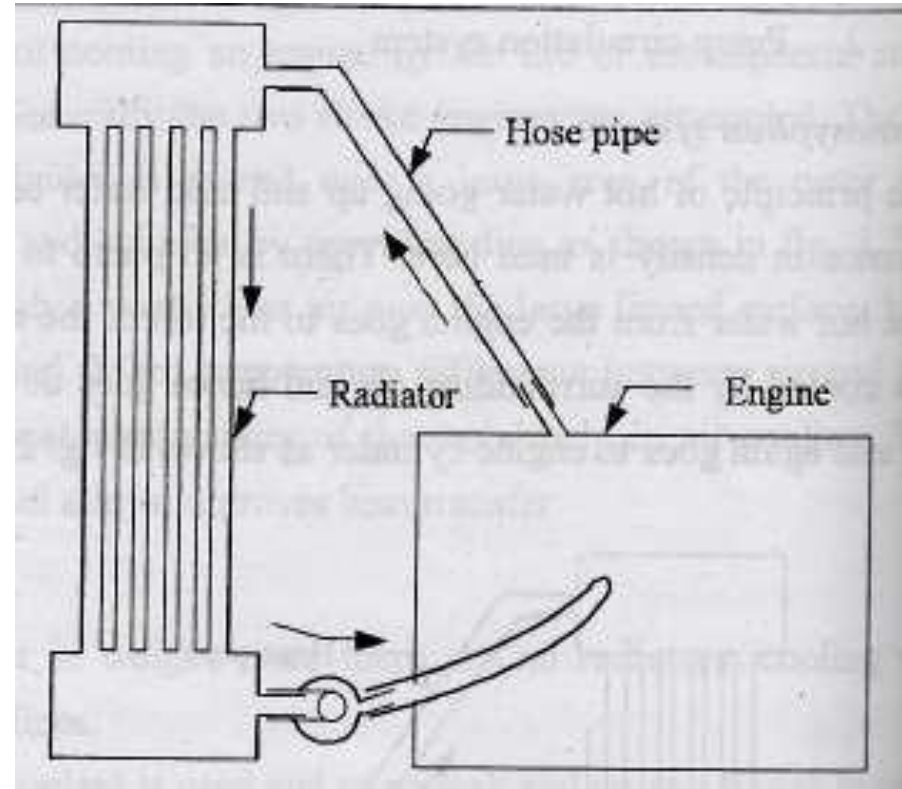


Liquid Cooling

- Thermosyphon Cooling

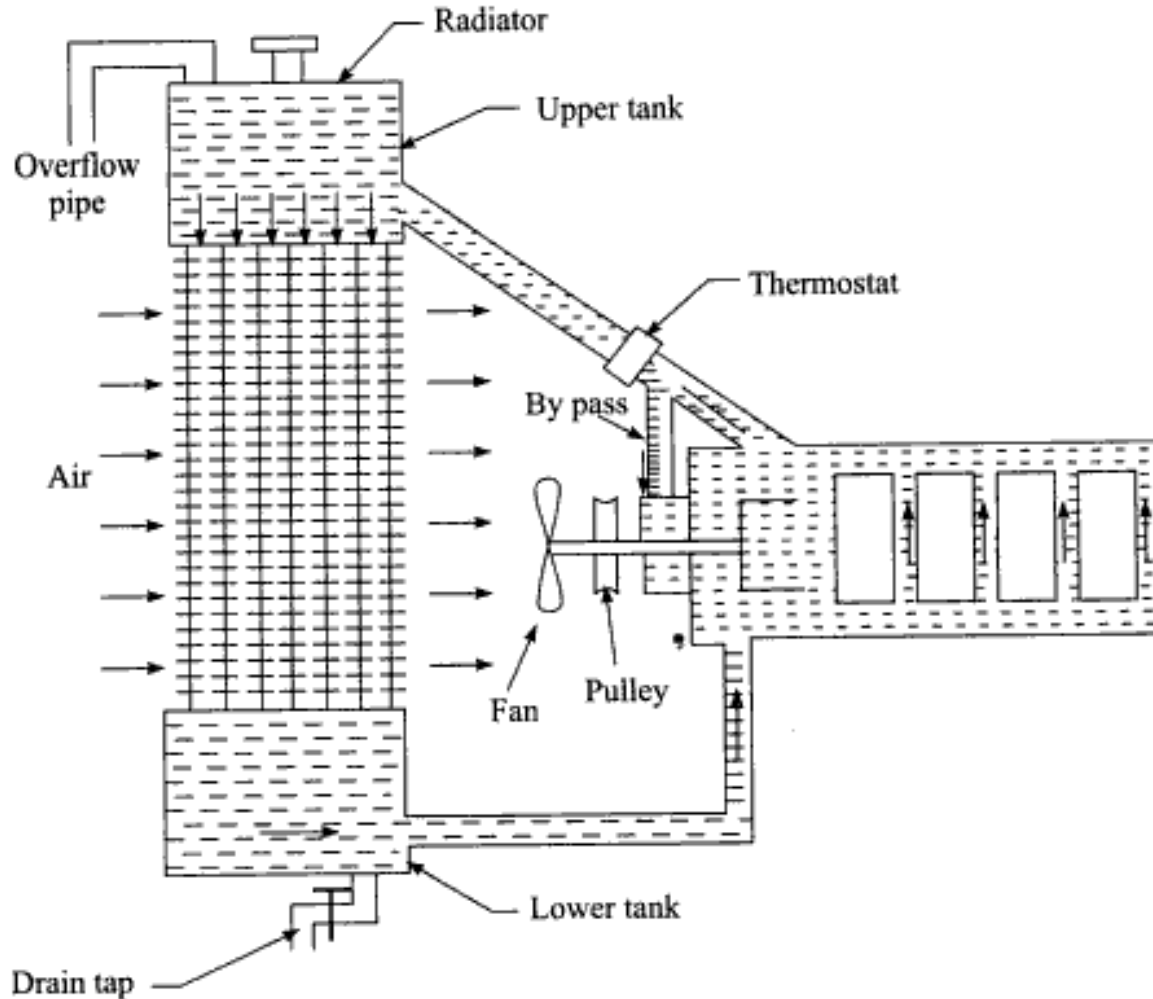


- Forced or Pump Cooling



Liquid Cooling

- Cooling with thermostatic regulator



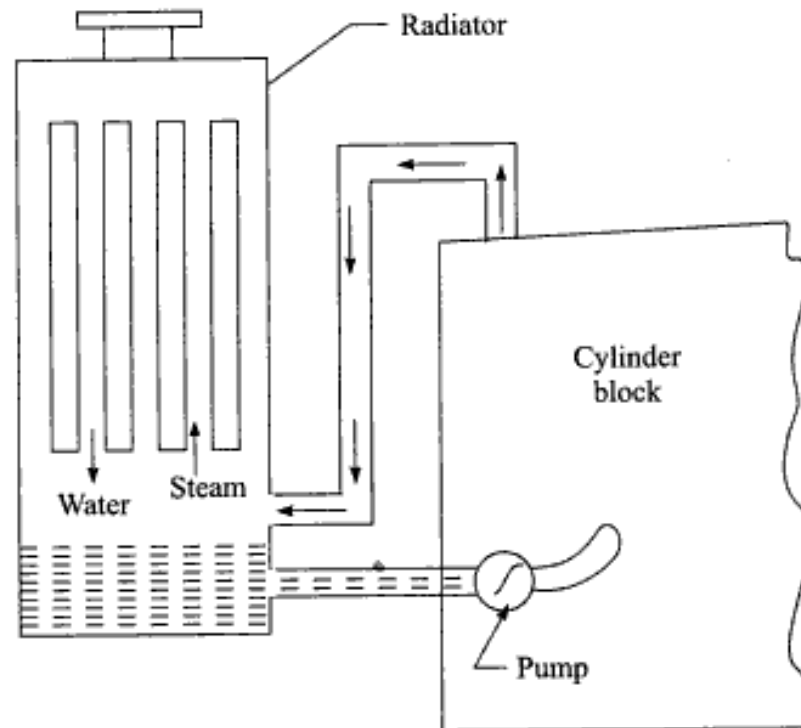
A thermostat valve is used in the water cooling system to regulate the circulation of water in system to maintain the normal working temperature of the engine parts during the operating conditions.

Liquid Cooling

- **Pressurized Water Cooling**

Pressurized water cooling In this method a higher water pressure, 1.5 to 2 bar, is maintained to increase heat transfer in the radiator. A pressure relief valve is provided against any pressure drop or vacuum.

- **Evaporative Cooling**



Lubrication system

➤ Mist Lubrication System

About 3 to 6% of lubricating oil is mixed with petrol in the fuel tank.

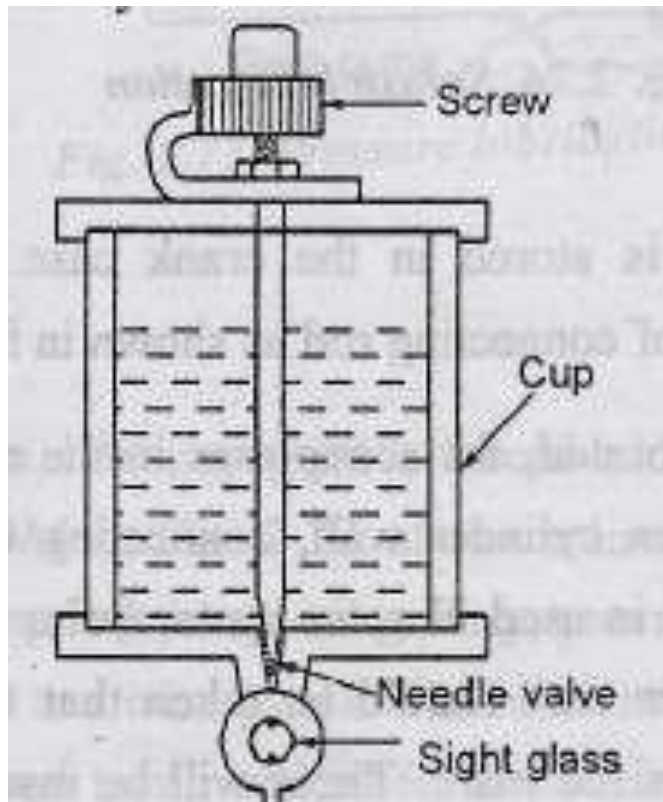
➤ Wet Sump Lubrication System

- Gravity System
- Splash System
- Semi Pressure System
- Full Pressure System

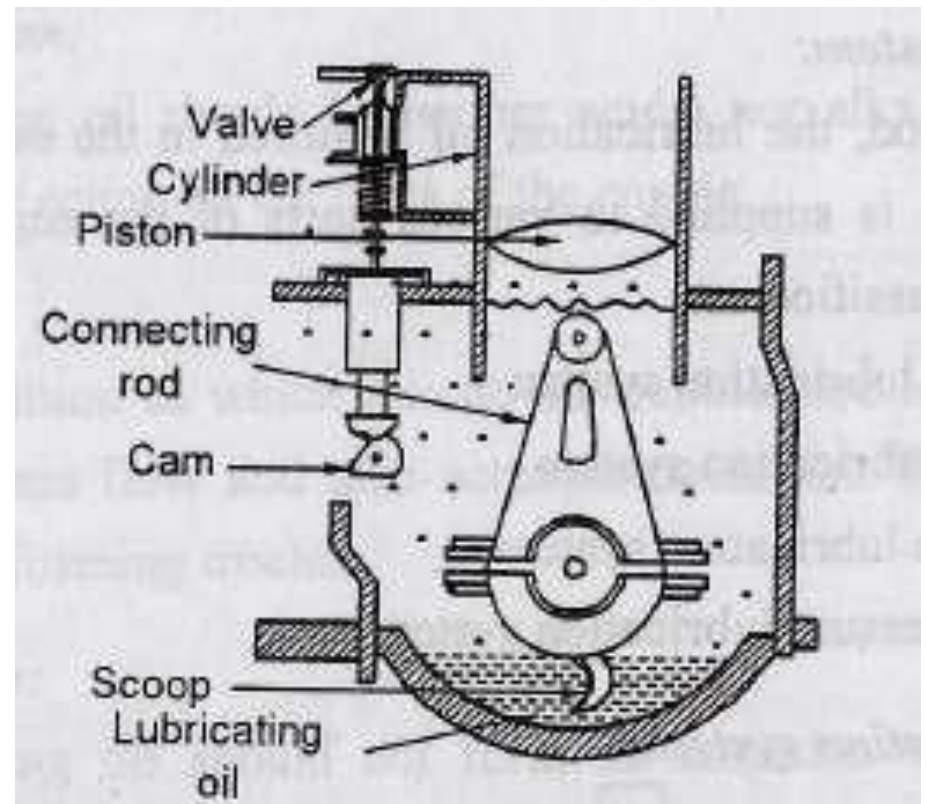
➤ Dry Sump Lubrication System

Wet Sump Lubrication System

- Gravity System

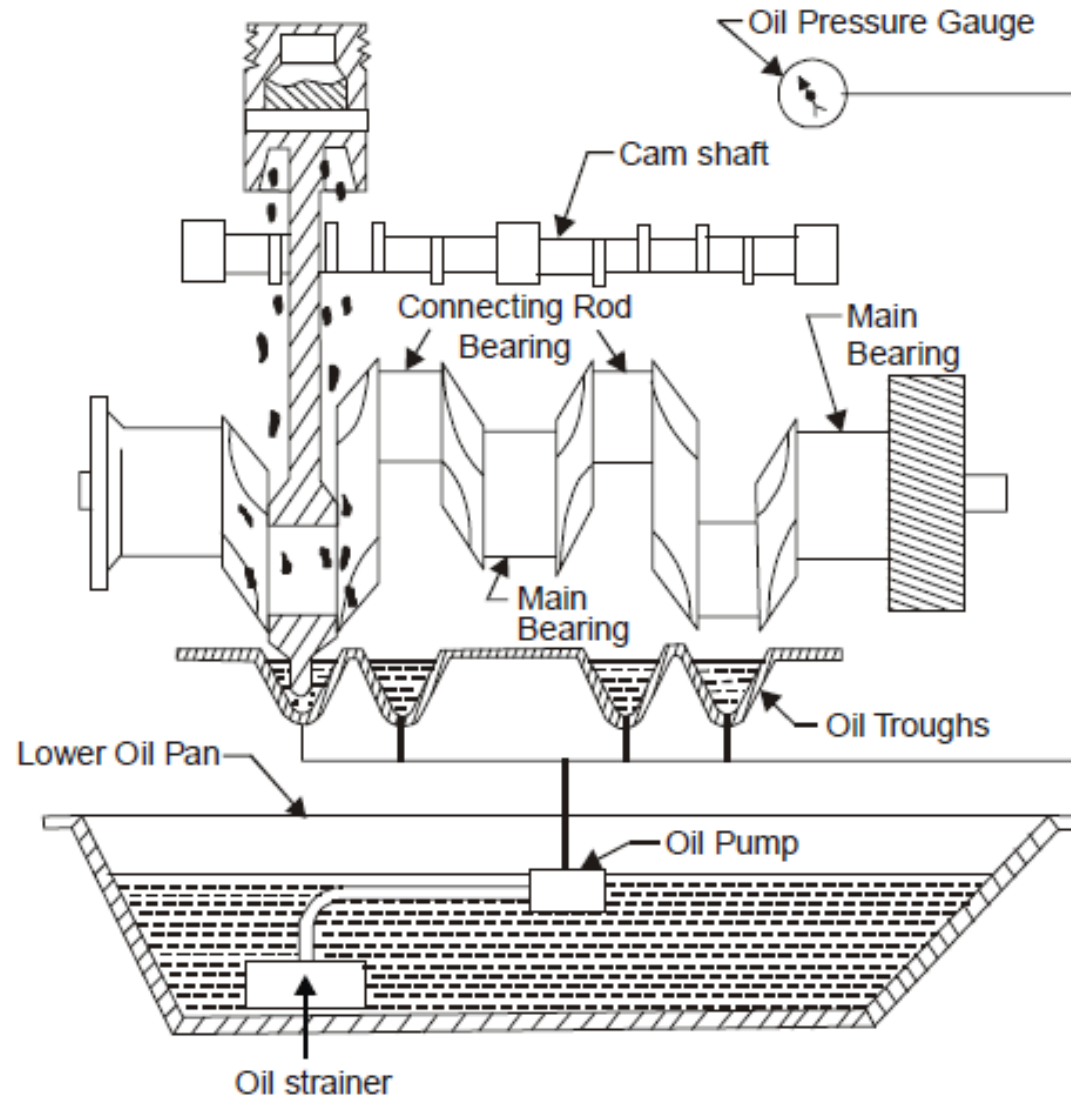


- Splash System



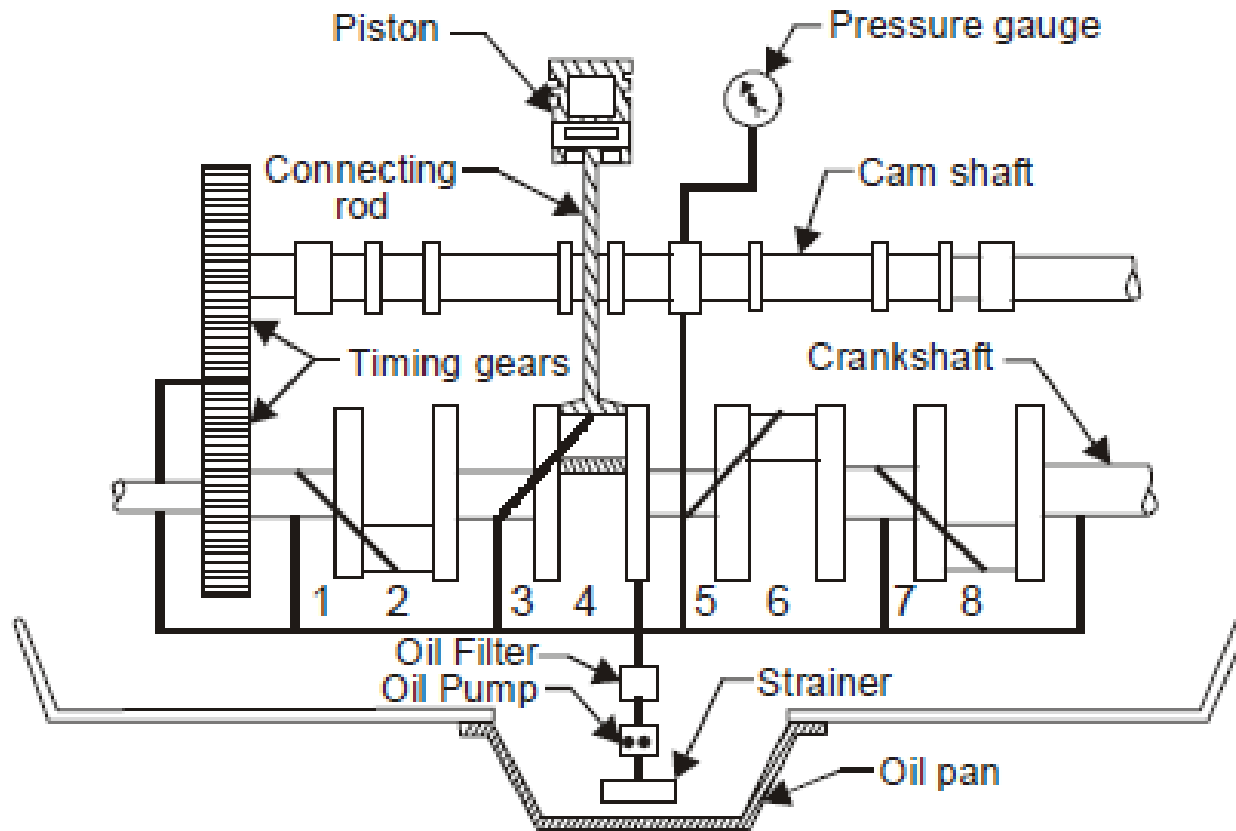
Wet Sump Lubrication System

- Semi pressure system

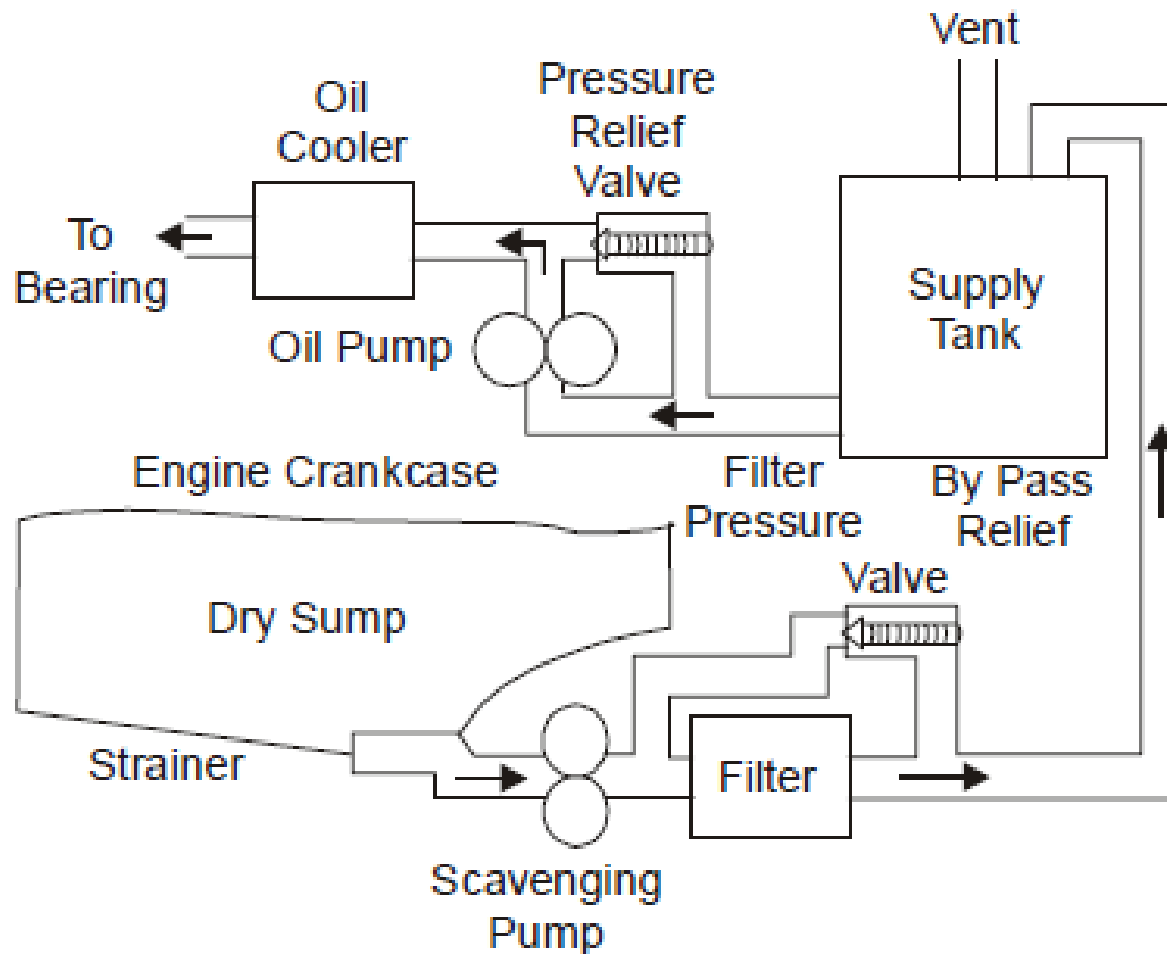


Wet Sump Lubrication System

- Full pressure system



Dry Sump Lubrication System



GAS TURBINE POWER PLANT



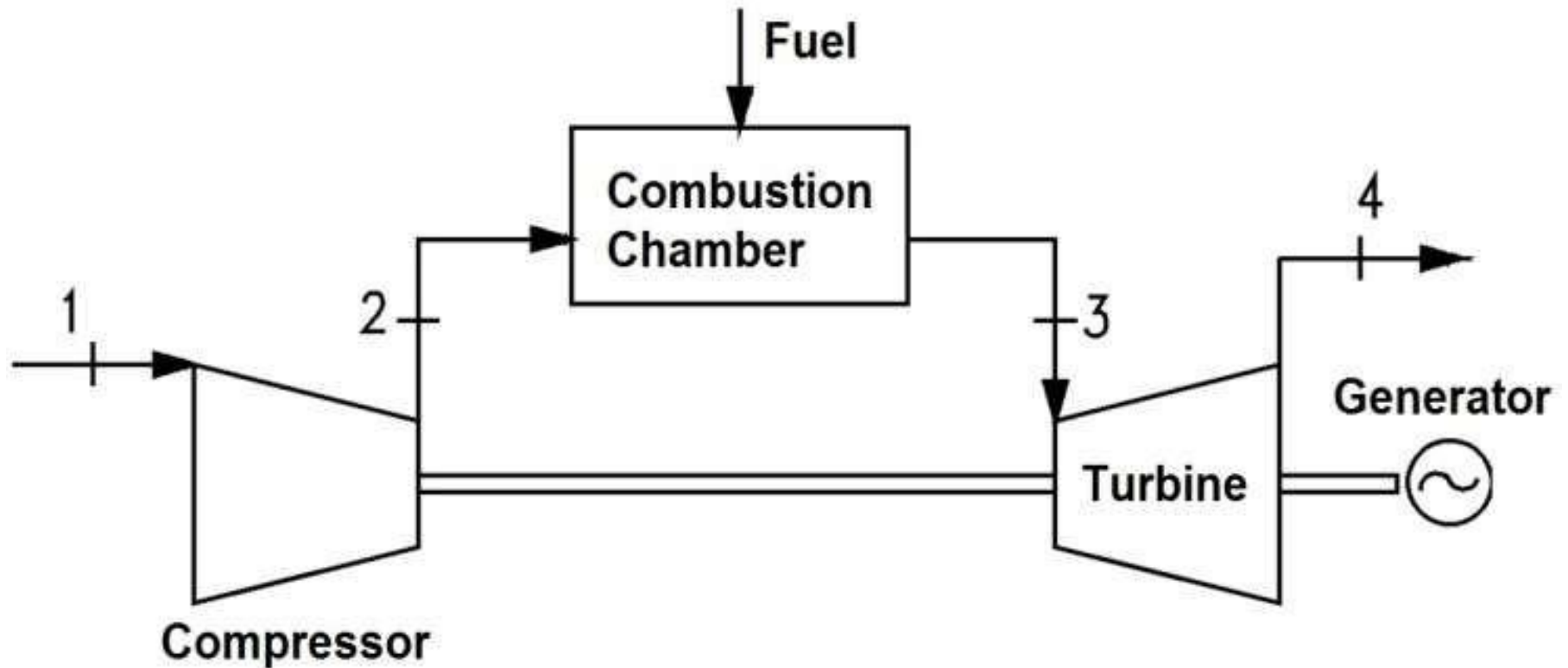
INTRODUCTION

- Hot gas is used to run the turbine.
- Mainly used in aircraft engines, electric power generation etc

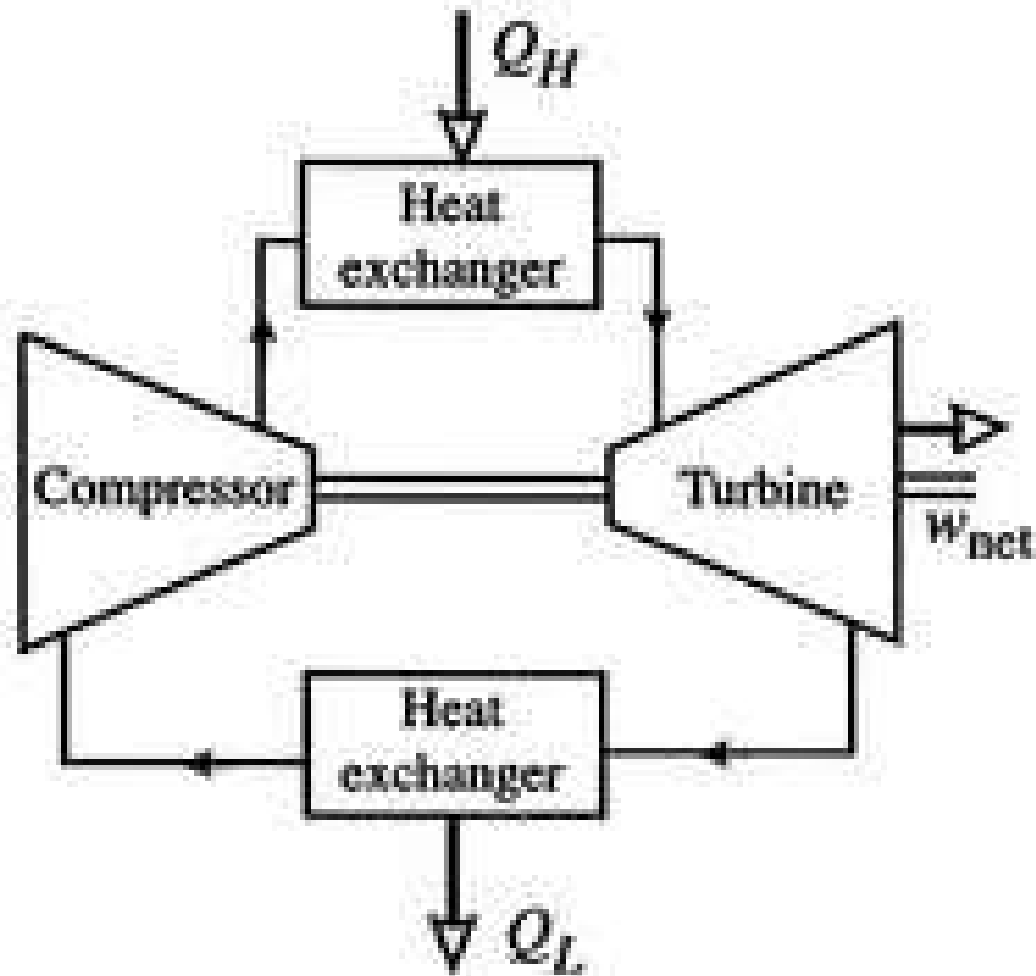
CLASSIFICATION OF GAS TURBINES

- According to cycle of operation
- According to the process
- According to the use
- According to the type of load
- According to the application

Open Cycle Gas Turbine Power Plant



Closed Cycle Gas Turbine Power Plant



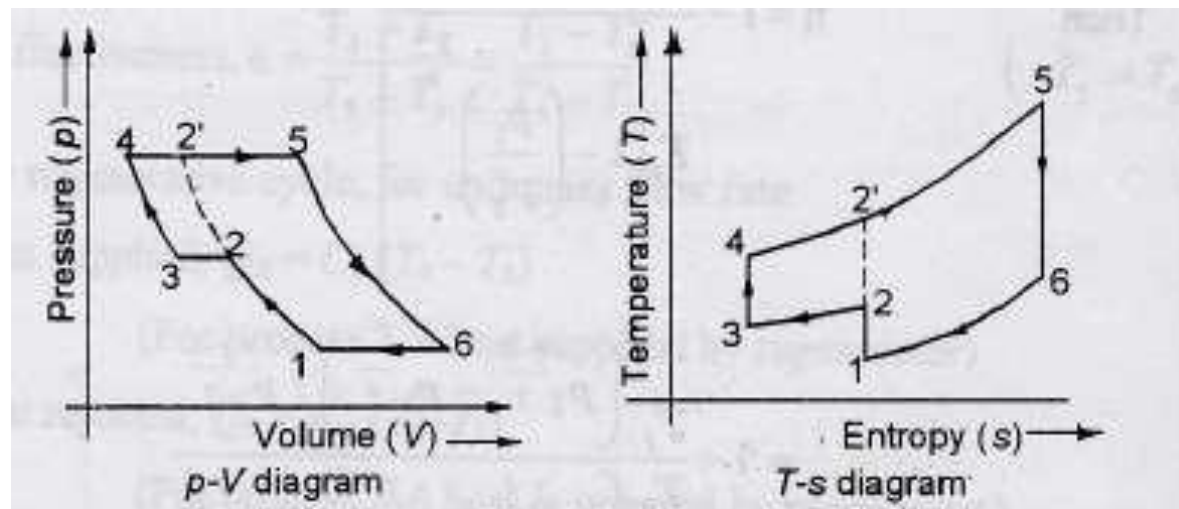
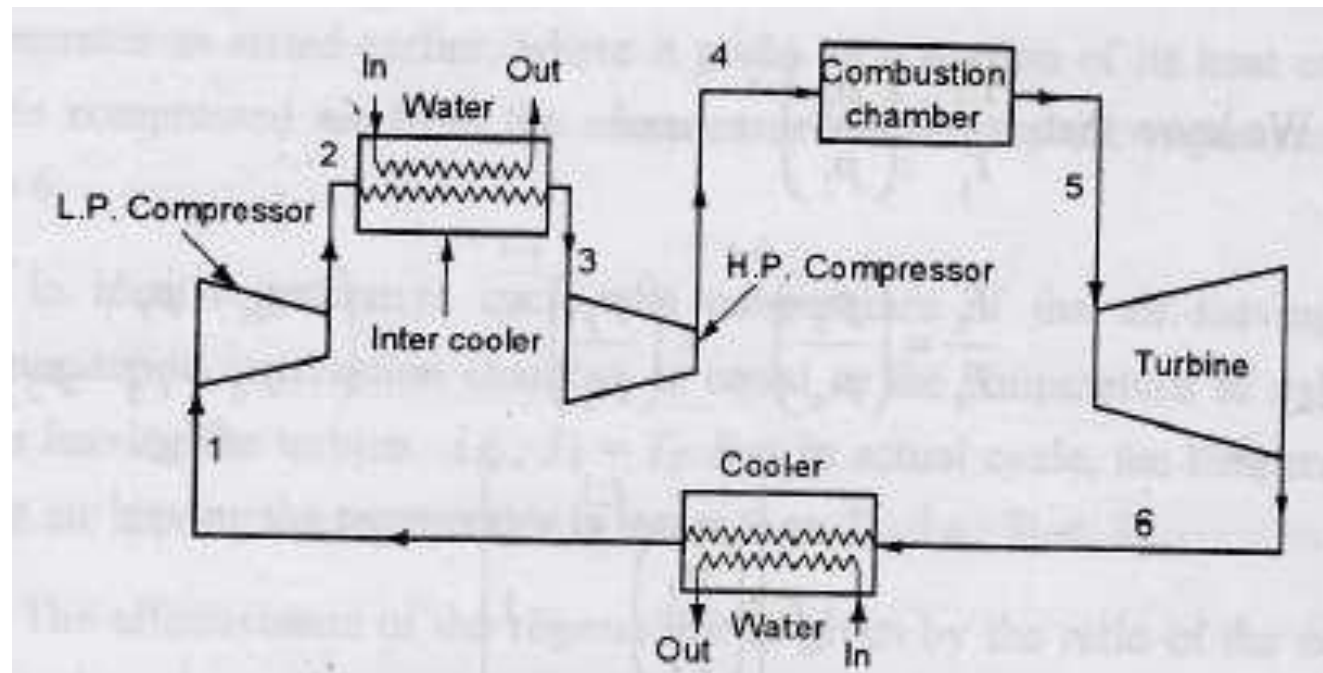
Improvisation of gas turbine power plant

➤ **Intercooler**

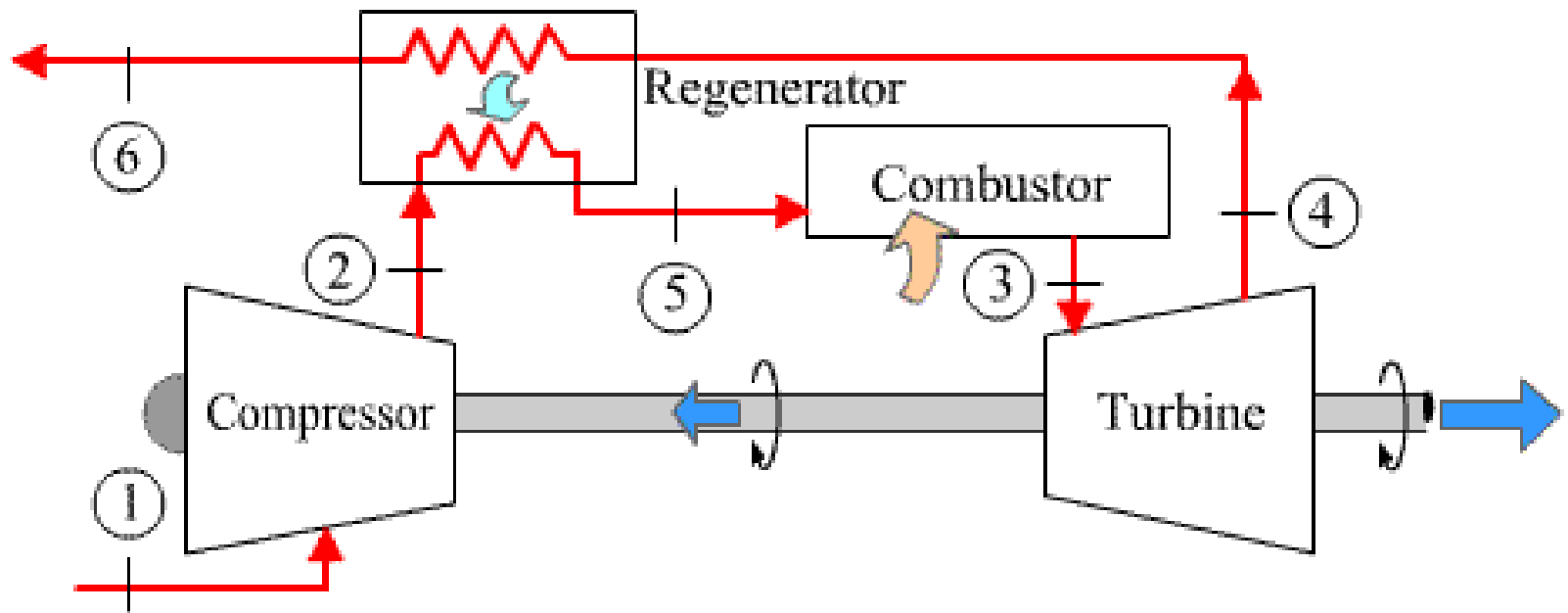
➤ **Regenerator**

➤ **Re-heater**

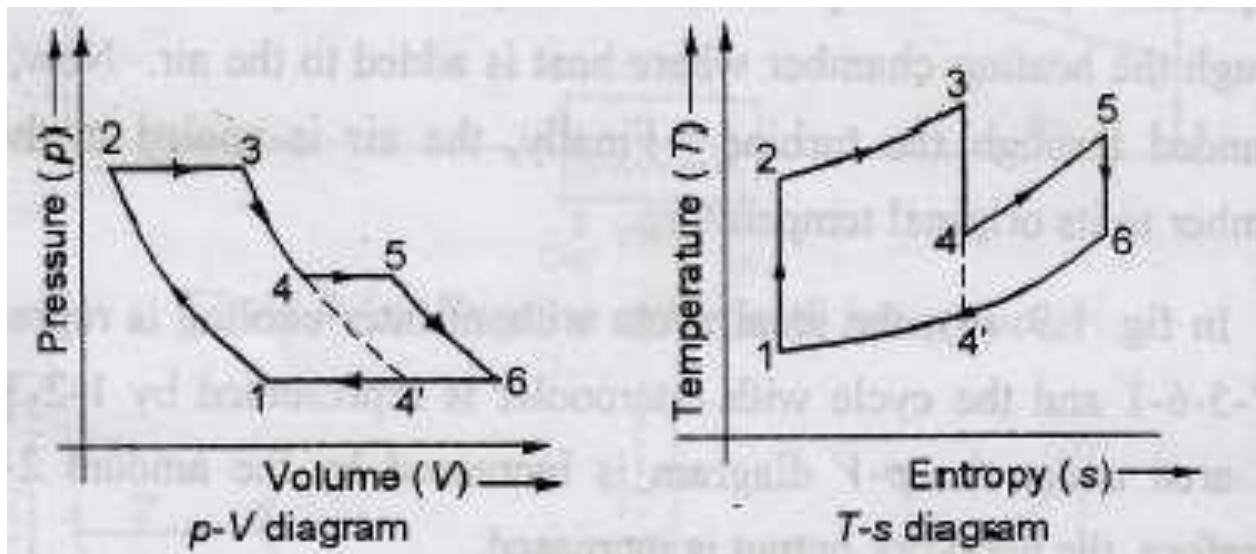
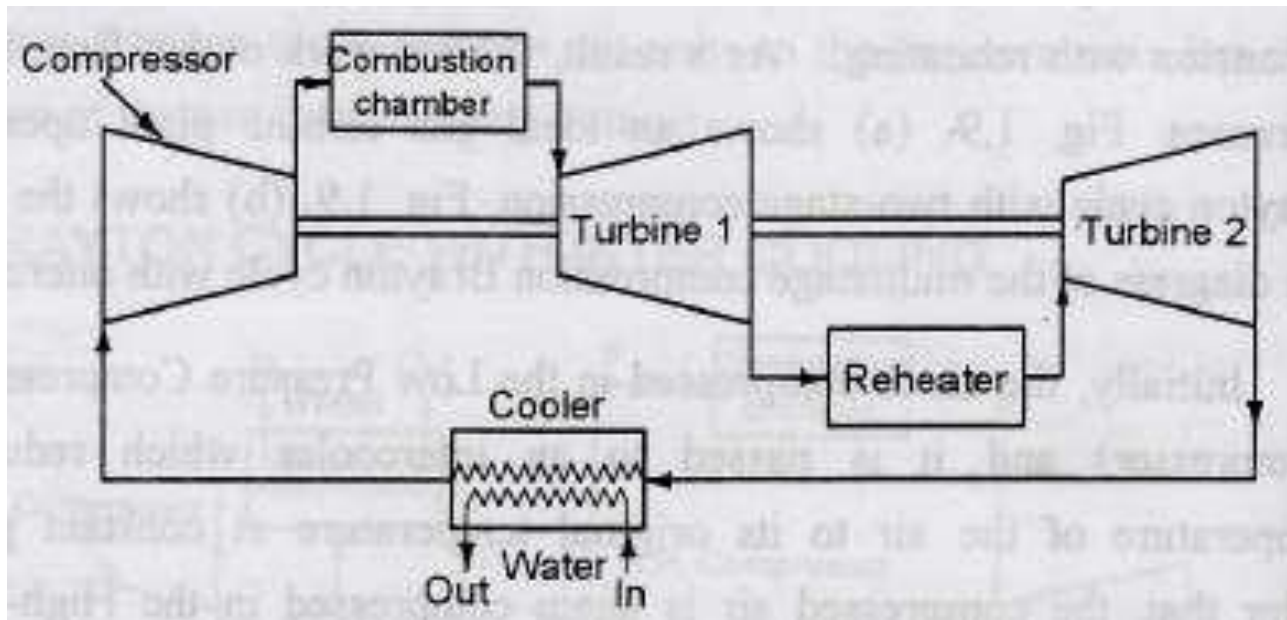
GAS TURBINE WITH INTER COOLING



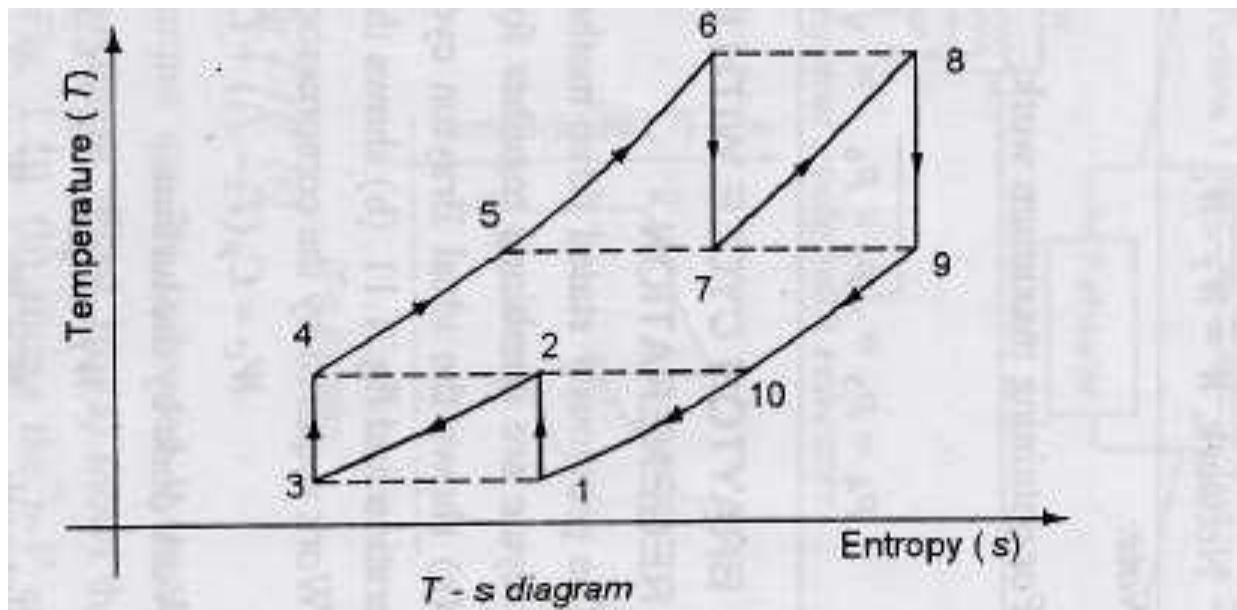
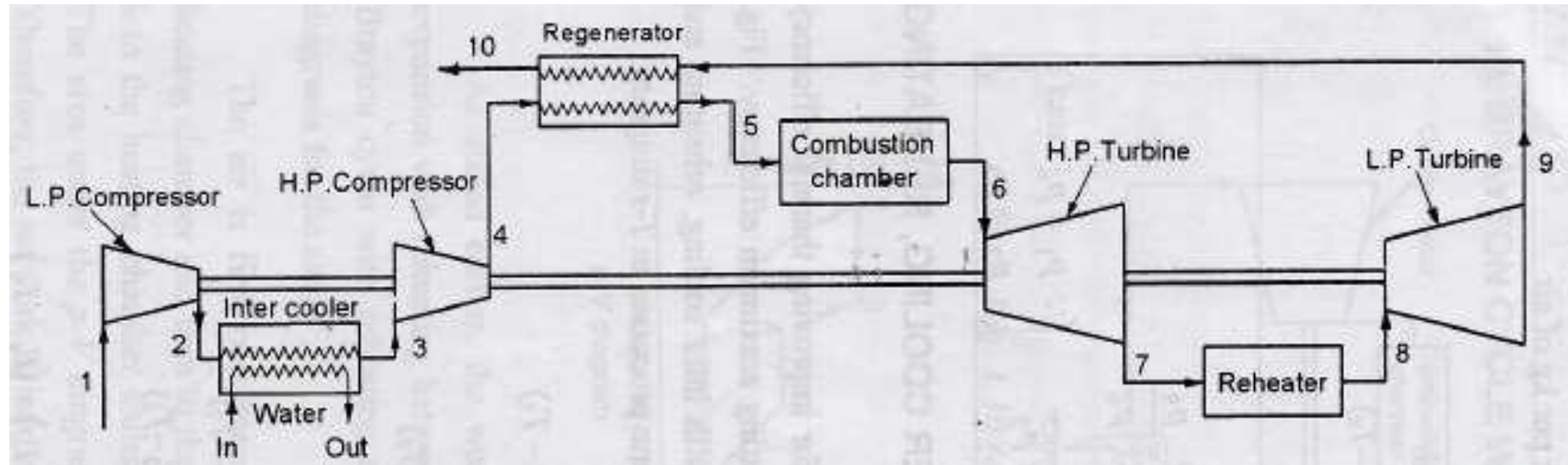
GAS TURBINE WITH REGENERATION



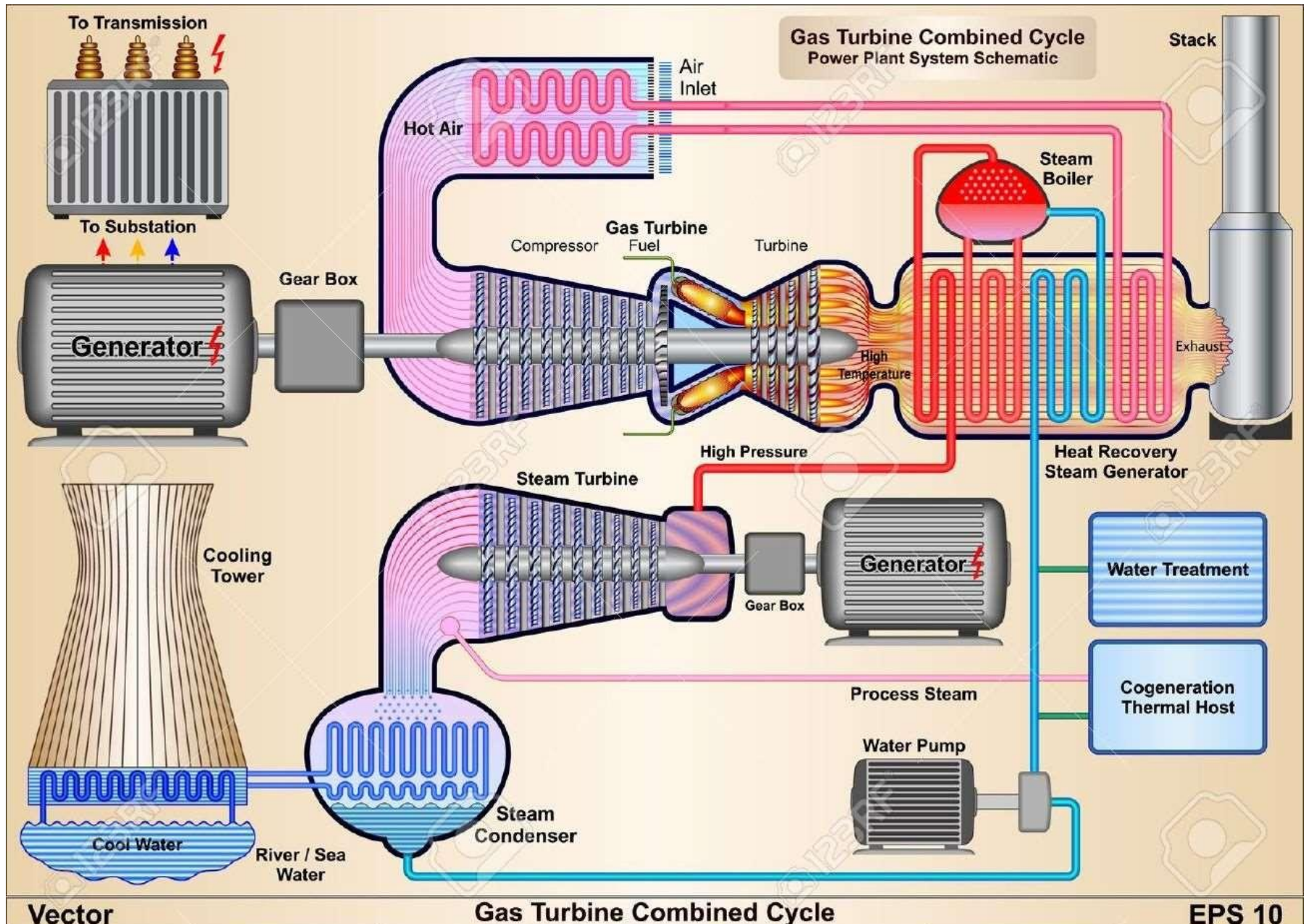
GAS TURBINE WITH REHEATER



GAS TURBINE WITH INTER COOLER, REHEATER & REGENERATION



COMBINED POWER PLANT

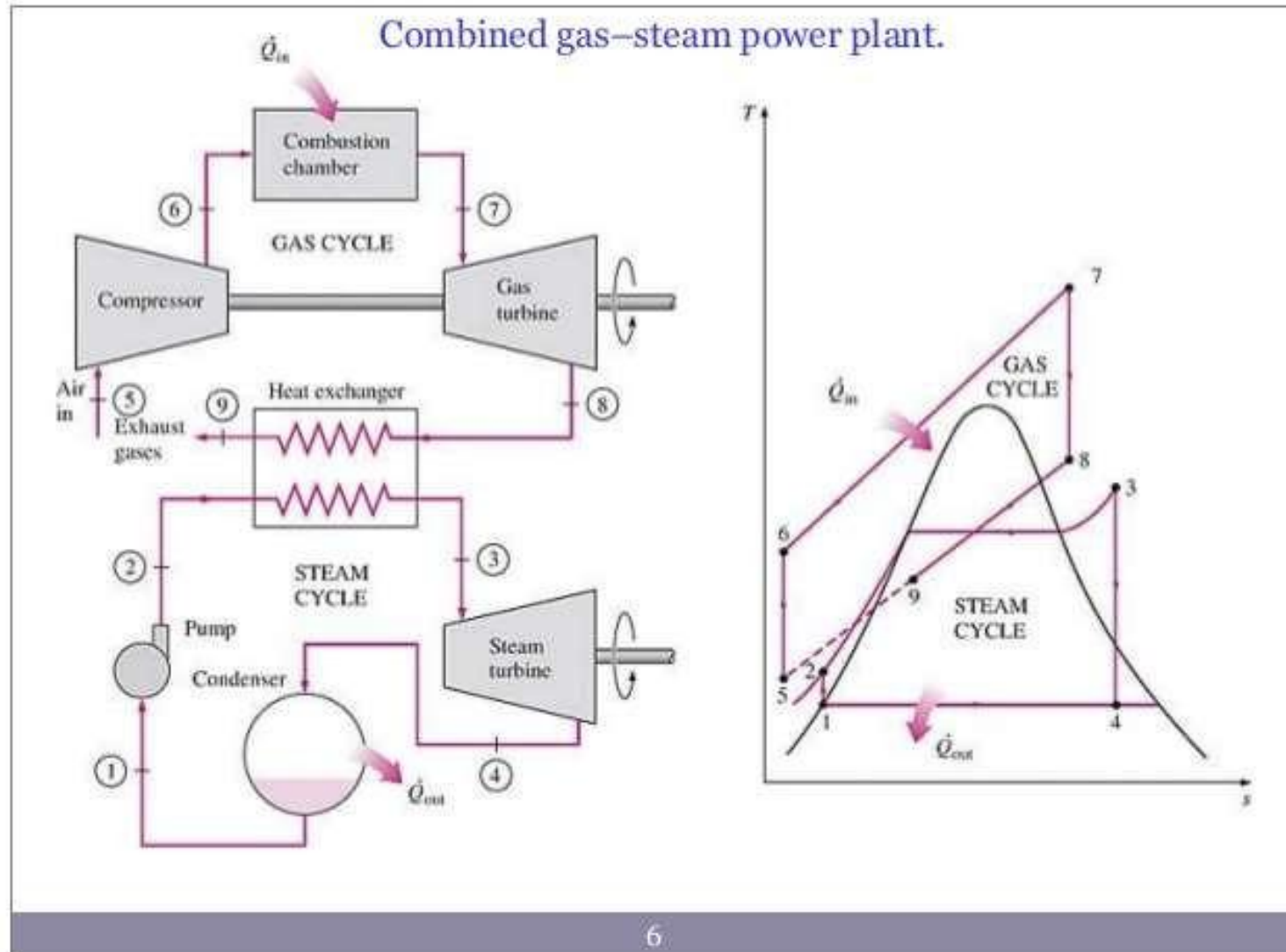


Types of Combined Power

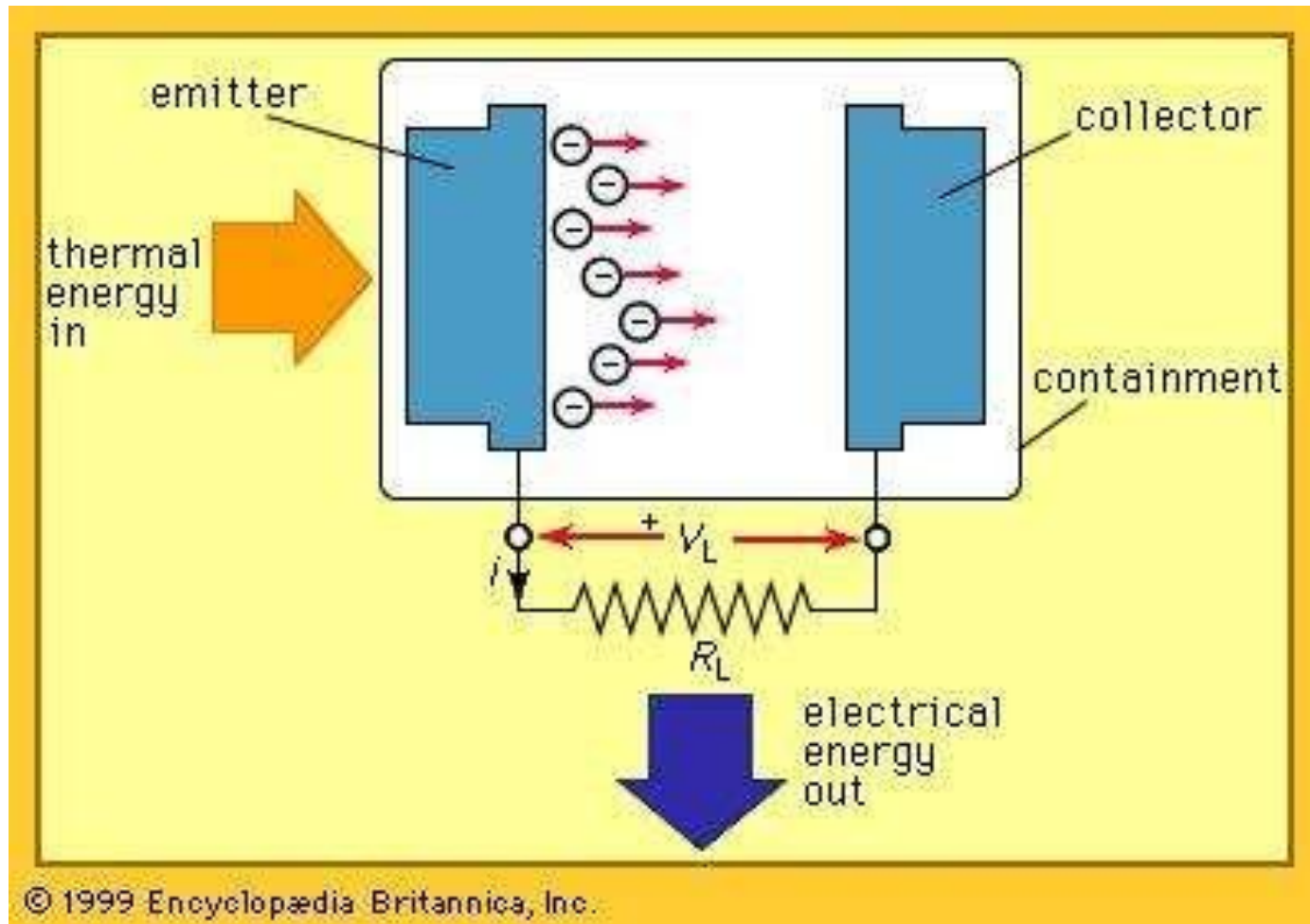
Cycles

- Gas Turbine – Steam Turbine
- Thermionic – Steam Power Plant
- Thermo Electric – Steam Power Plant
- M.H.D – Steam Power Plant
- Nuclear – Steam Combined Power Plant

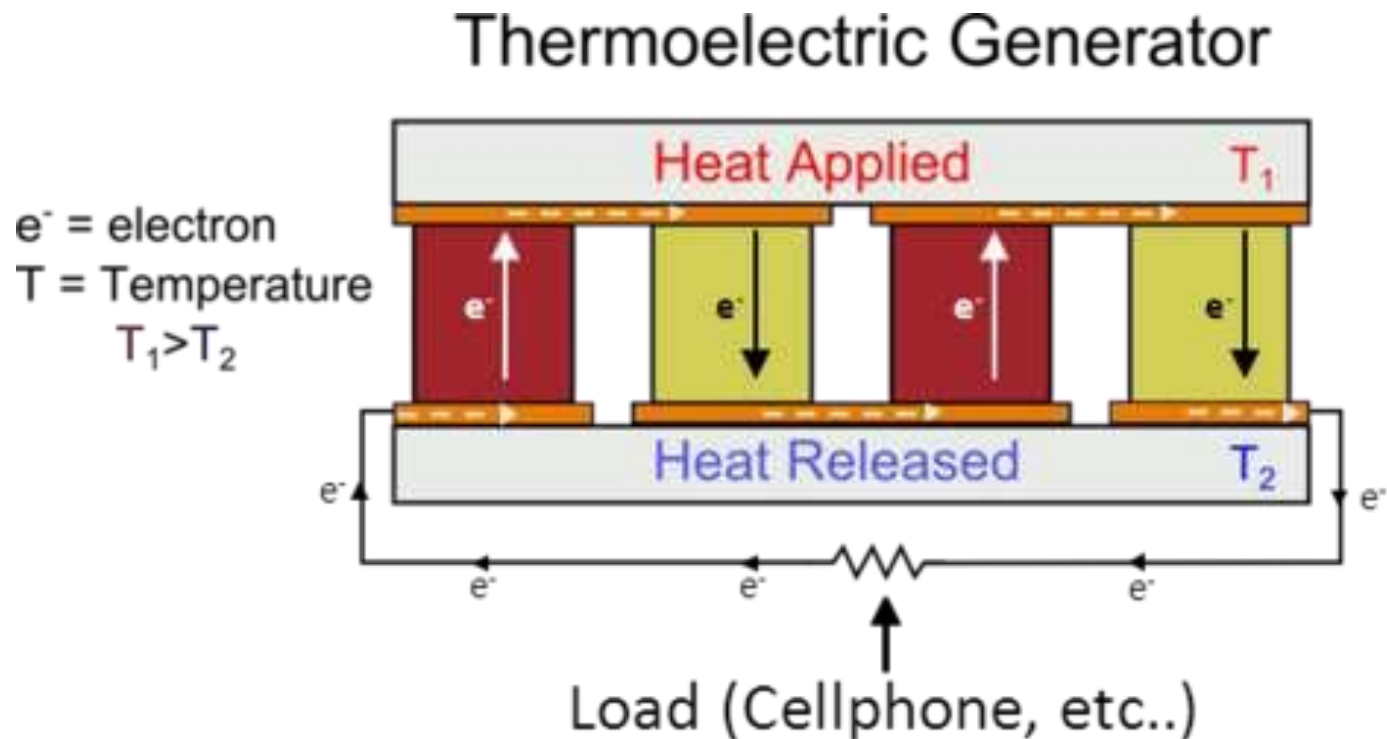
Gas Turbine – Steam Turbine Plant



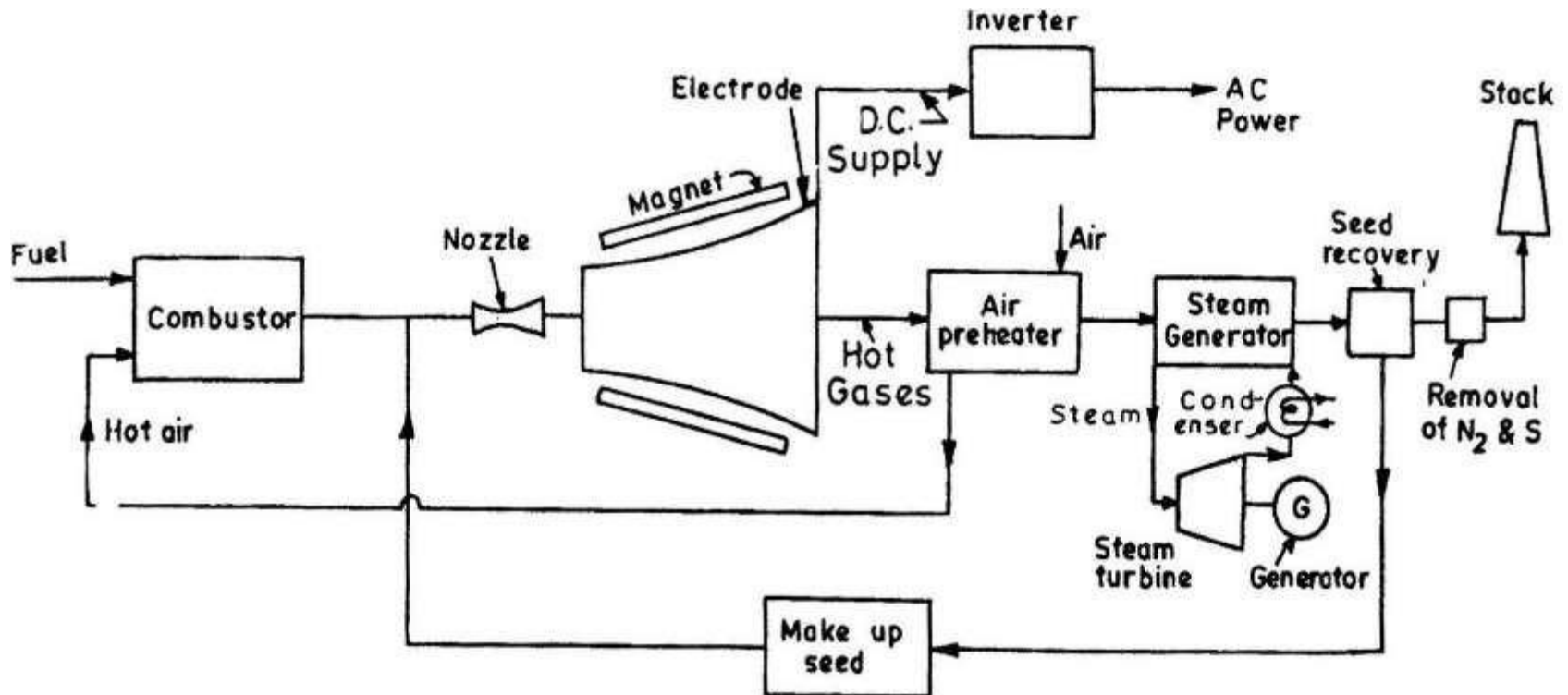
Thermionic – Steam Power Plant



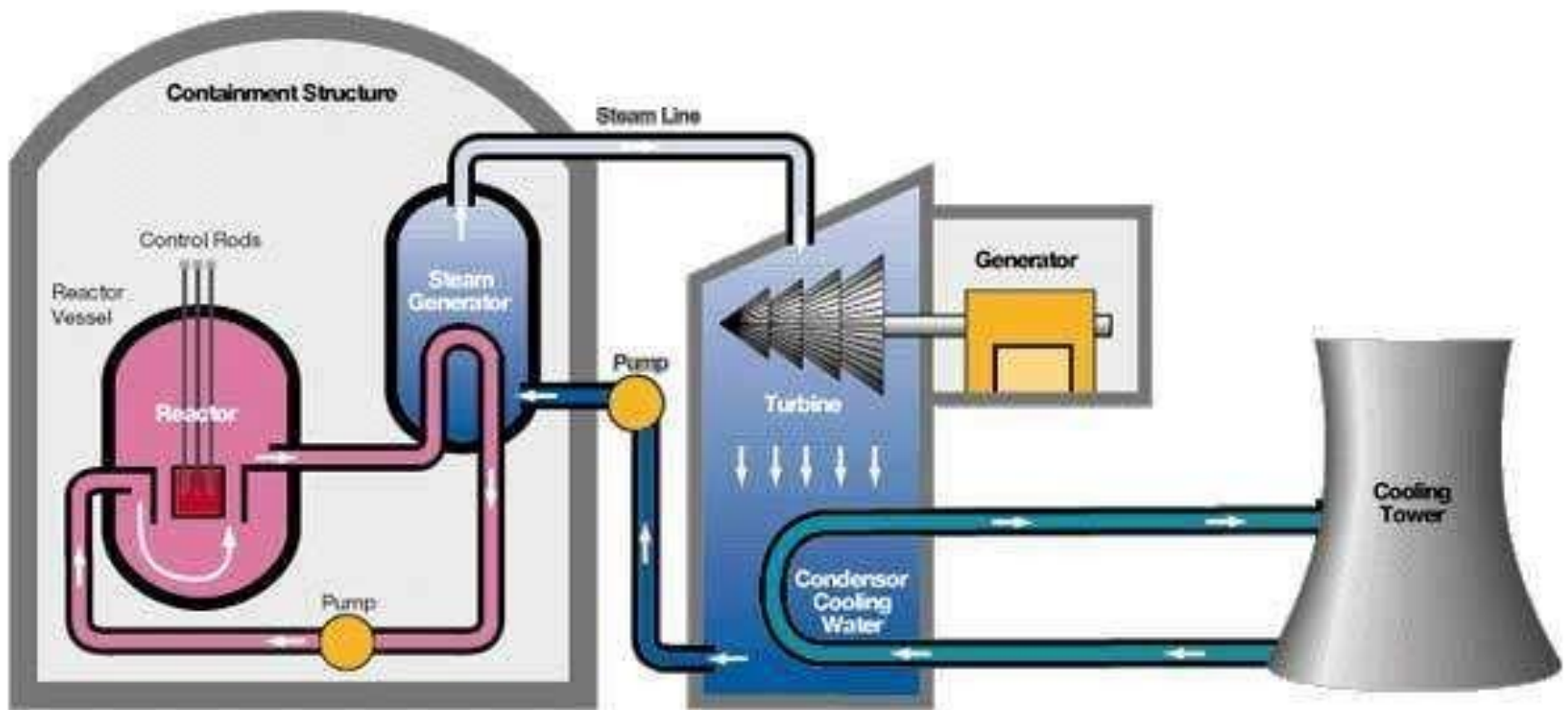
Thermo Electric – Steam Power Plant



MHD– Steam Combined Power Plant



Nuclear – Steam Combined Power Plant



Integrated Gasification Combined cycle power plant

