
# Heat Engine

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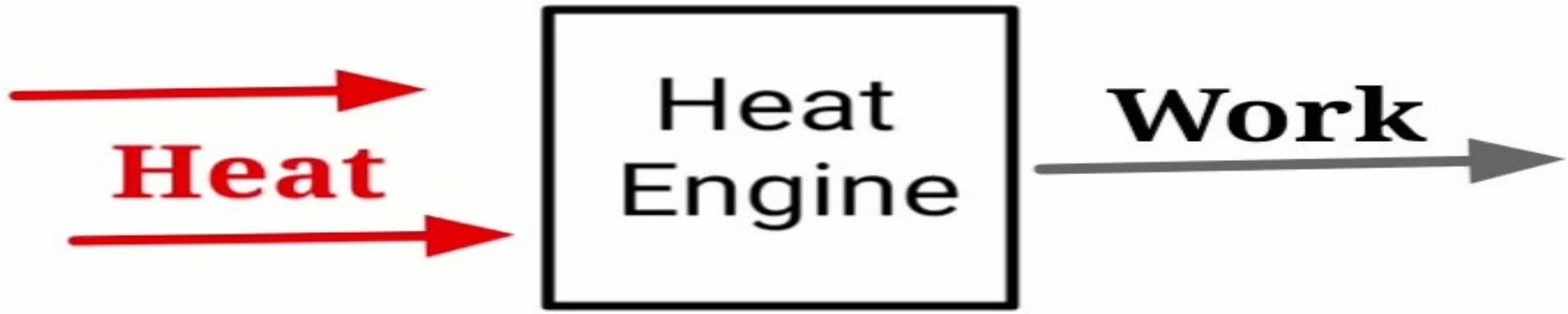
# Heat Engine

Que1. What is Heat Engine?

Heat Engine is a device which converts heat into work through Cyclic Process.

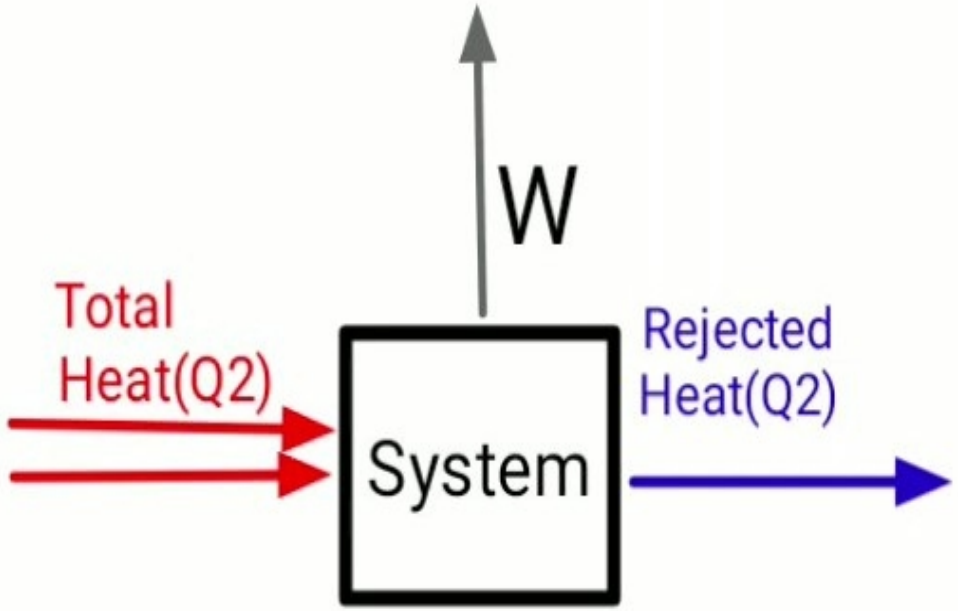


# • Principle of Heat Engine

1. A system converts heat into thermal or chemical energy which is used to do mechanical work through cyclic process.

2. It always goes from here temperature to low temperature.

3. Some amount of energy(Q2) which is unused, get rejected.



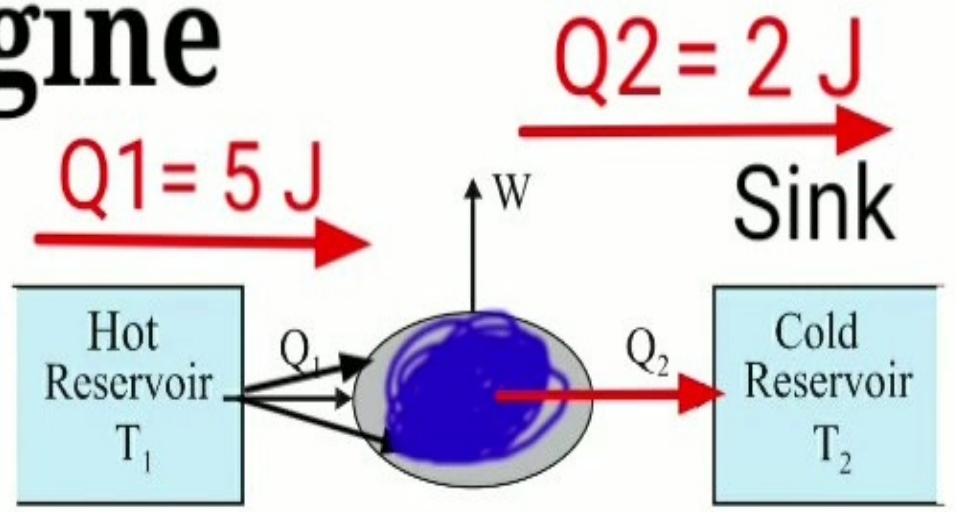
- **Work done in Heat Engine**

Heat

Given Heat = Q1

Rejected Heat = Q2

$$W = Q1 - Q2$$




Reservoir = Heat Source

- **Efficiency of Heat Engine**

$$\eta = \frac{W}{Q1}$$

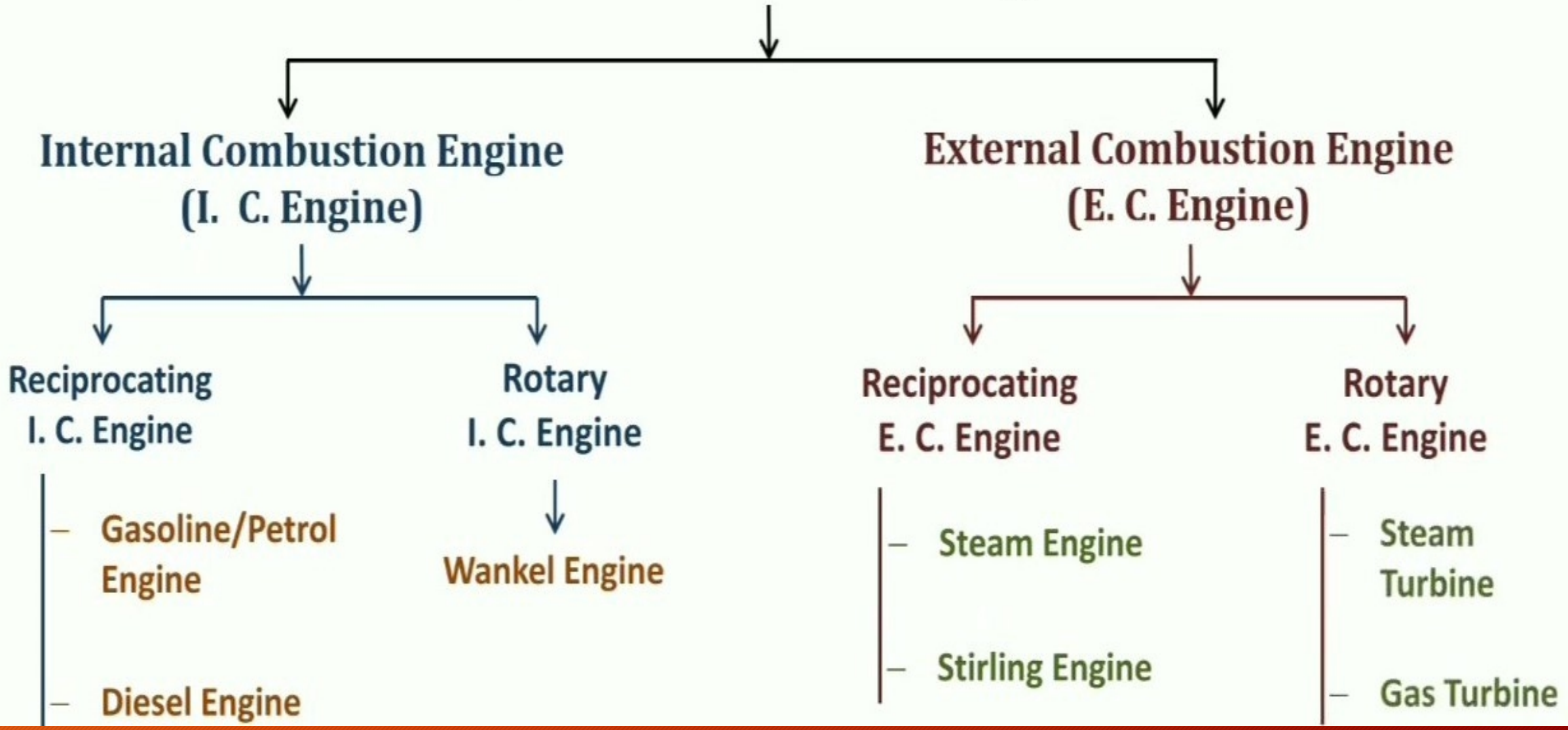
3/5 = 0.60 or 60%

$$\eta = \frac{Q1 - Q2}{Q1}$$

$$\eta = 1 - \frac{Q2}{Q1}$$

$$\eta = 1 - \frac{T2}{T1}$$

# Classifications of Heat Engine



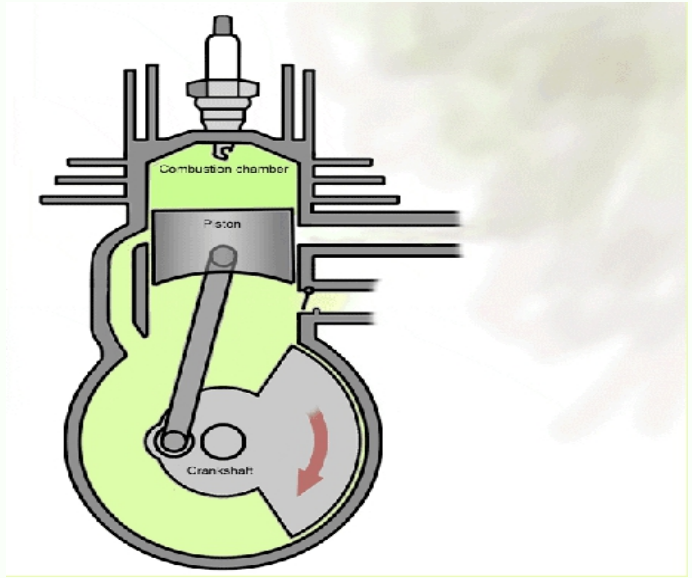
# INTERNAL COMBUSTION ENGINE

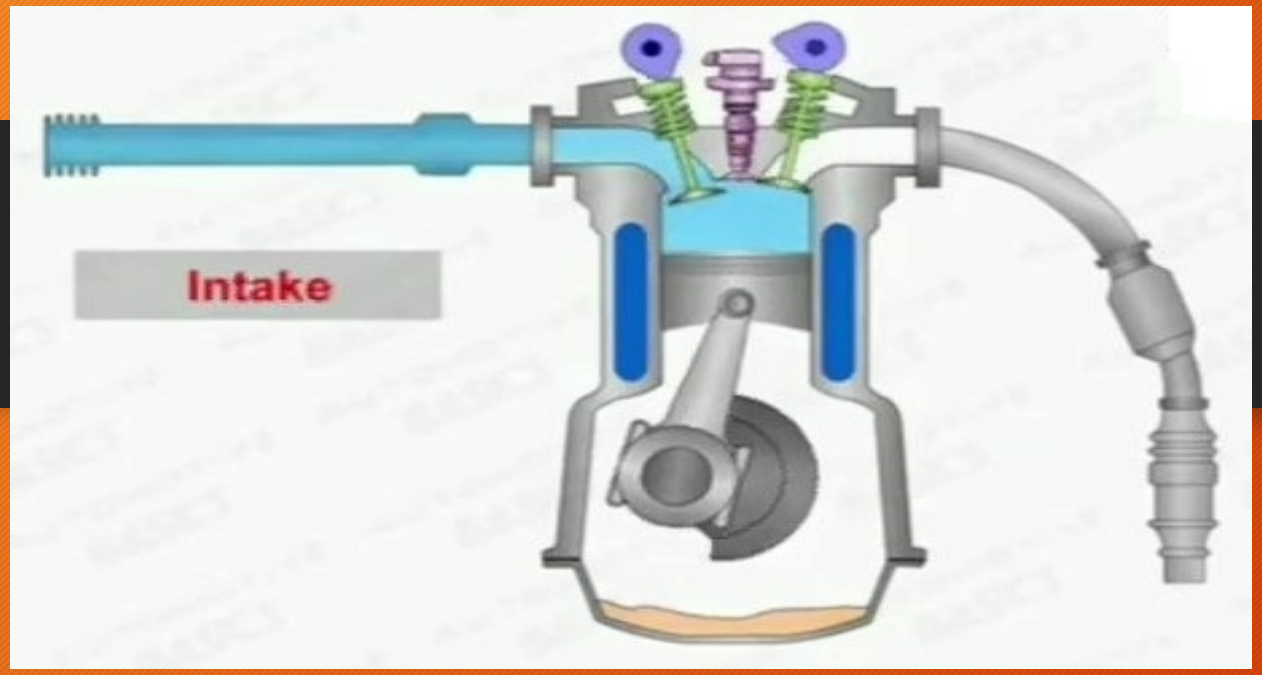
**Inside** — **Burning of Fuel**

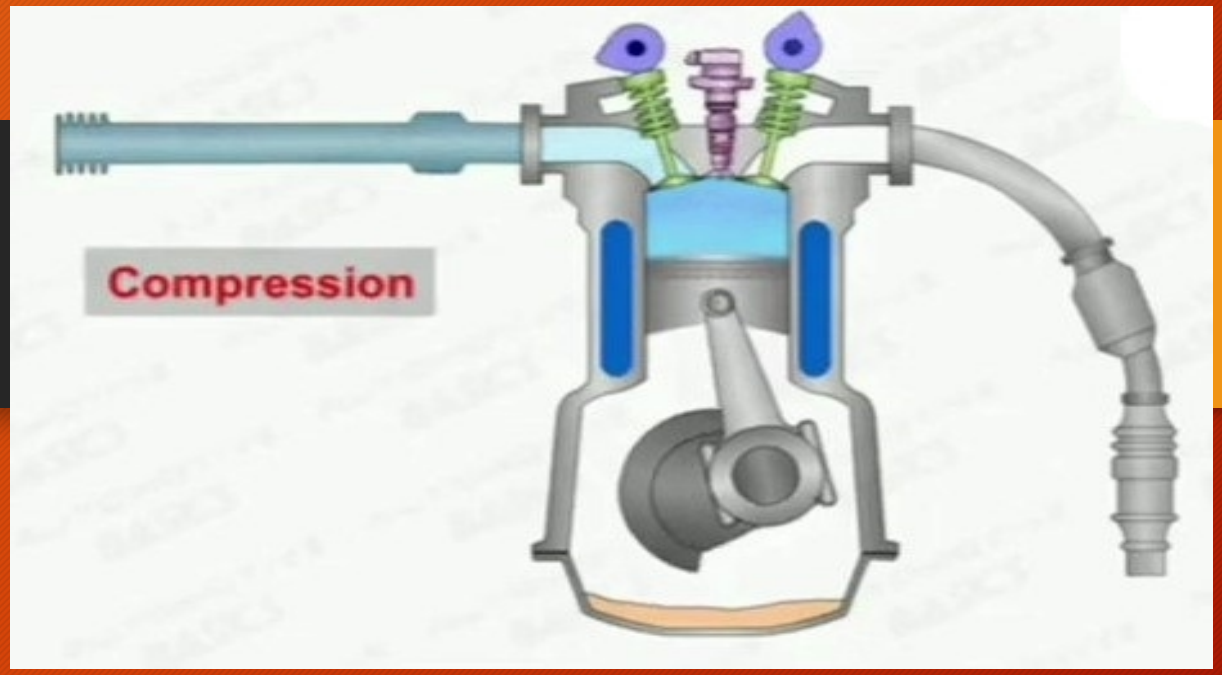
– Those Engine, in which combustion of fuel takes place inside the Engine, is known as I. C. Engine.

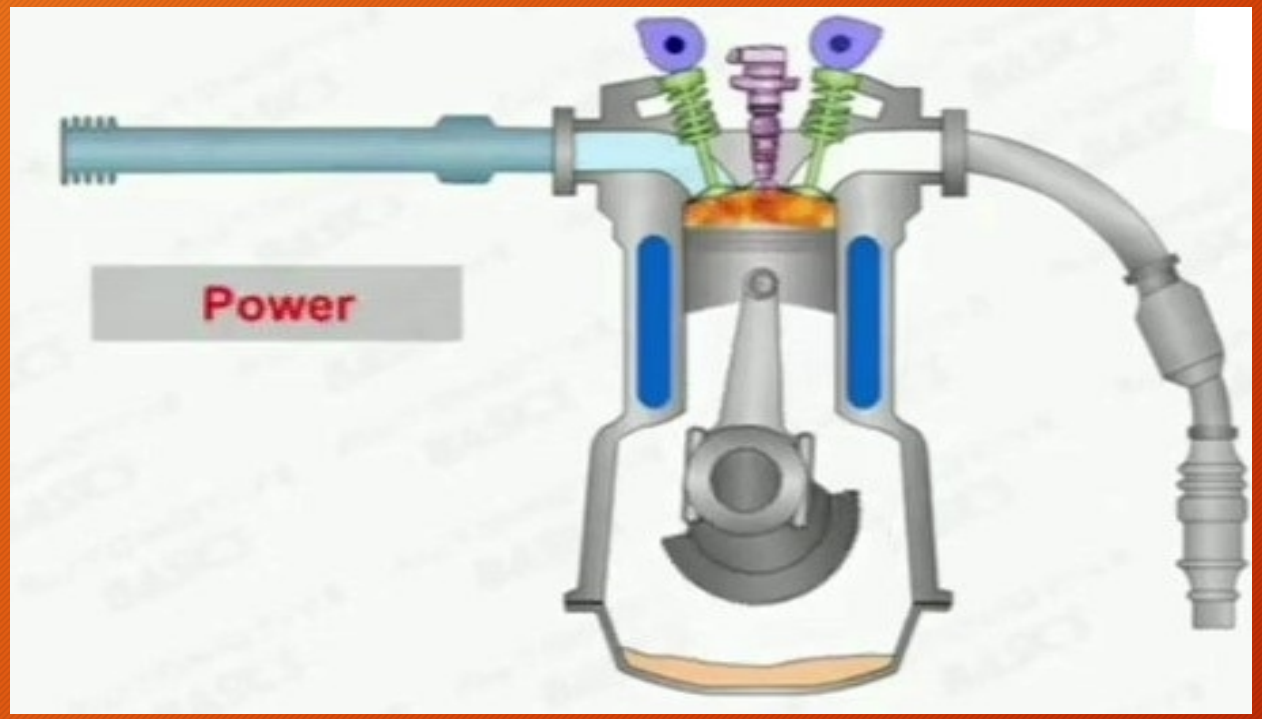
**Example: - Petrol Engine,**

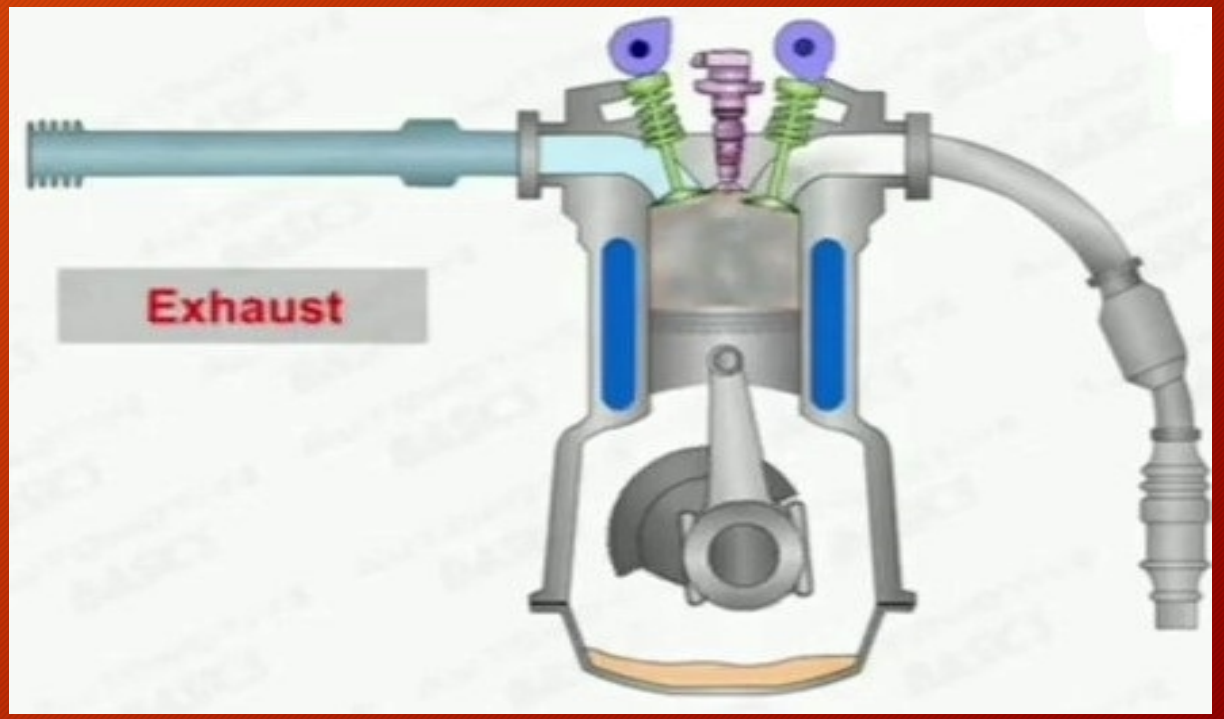
**Diesel Engine.**




Intake


Compression


Power


Exhaust

# EXTERNAL COMBUSTION ENGINE

Out side

Burning of Fuel

– Those Engine, in which combustion of fuel takes place outside of the Engine, is known as External Combustion Engine.

**Example: - Steam Engine,**

**Steam Turbine,**

**Open Cycle Gas Turbine Engine.**

# Comparison between I.C. and E.C. Engine

| I. C. ENGINE | E. C. ENGINE |
| --- | --- |
| – Combustion of fuel takes place inside the Engine. | – Combustion of fuel takes place out side of the Engine. |
| **Example: - Petrol Engine, Diesel Engine** | **Example: - Steam Engine.** |
| – Working Fluid may be petrol, diesel or Gases (CNG). | – Working Fluid may be steam or Gas. |
| – Power developed per unit weight of these engine is High. | – Power developed per unit weight of these engine is Low. |
| – Thermal efficiency is High. | – Thermal efficiency is Low. |
| – It require less space. | – It require Large floor area. |
| – Capital cost is relatively Low. | – Capital cost is relatively High. |
| – Fuel cost is relatively very High. | – Fuel cost is relatively very Low. |