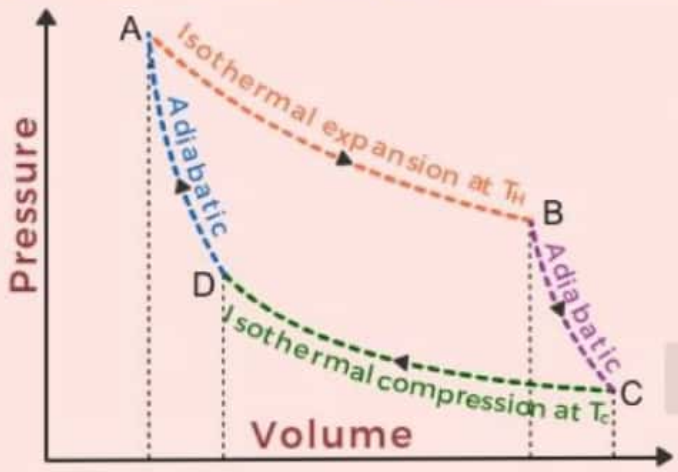
CARNOT CYCLE

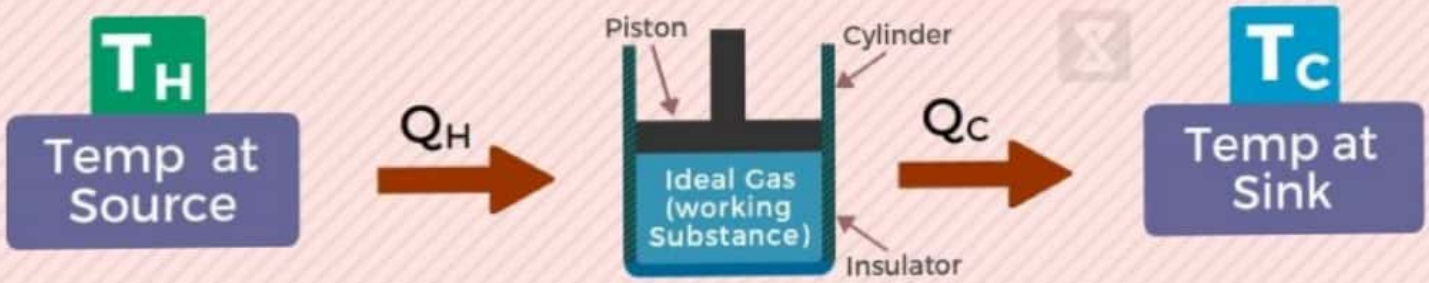


A Carnot heat engine is an engine that operates on the **reversible Carnot cycle**. The basic model for this engine was developed by **Nicolas Léonard Sadi Carnot** in 1824.

It is an ideal **heat engine** whose efficiency is less than 100%.

$$\text{Efficiency of Carnot Engine} = \frac{T_H - T_C}{T_H} \times 100\%$$

PARTS OF CARNOT ENGINE



Carnot engine diagram shows that an amount of heat 'Q_H' flows from a **high temperature** 'T_H' furnace through the fluid of the **"working body"** (ideal gas) and the remaining heat 'Q_C' flow into the cold sink 'T_C', thus forcing the working substance to do mechanical work 'W' on the surroundings, via cycles of contractions and expansions.

CYLINDER

It is a hollow cylinder whose walls are bad conductors of heat, and its base is a good conductor of heat.

PISTON

It is a movable piston which is fixed in a hollow cylinder. We neglect the friction force between the piston and walls of the cylinder.

SINK

It is a low-temperature reservoir; system rejects heat to the sink during iso-thermal compression. The thermal capacity of the sink is infinity.

SOURCE

It is a perfect insulator in which thermal conductivity is zero. System is placed on an insulator during adiabatic expansion and adiabatic compression.

INSULATOR

It is a high-temperature reservoir; system absorbs heat from the source during iso-thermal expansion. The thermal capacity of the source is infinity.