Introduction

Engine :-

Engine is a device which converts one form of energy into the other useful form.

(4)

Heat Engines → CE → HE. → mech. work

Engines are broadly classified as external combustion engines & Internal combustion engines.

1. External Combustion Engine

2. Internal combustion Engine

In External combustion engines the produc of combustion transfer heat to working fluid whereas in IC engine the produc of combustion produce power directly in the same cylinder.

Advantages of I.C. Engines:-

1. Mechanical simplicity.
2. Higher power to weight ratio.
3. Low initial cost due to the absence of boiler, condensor etc.
4. Higher efficiency.

Engine Nomenclature :-

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Top Dead centre (TDC)

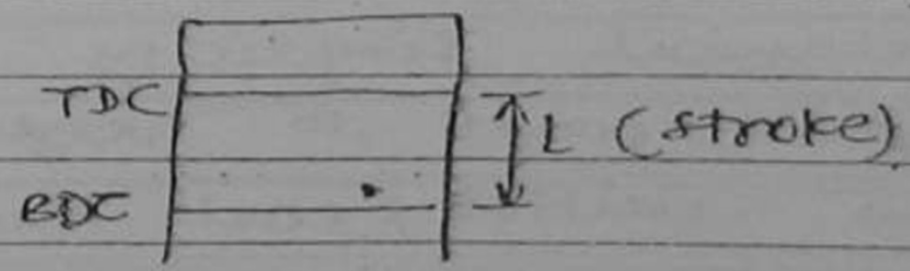
It is the dead centre when piston is ~~nearest~~ farthest from the crankshaft (It is equal to I.D.C. in case of horizontal engines)

Bottom dead centre (BDC)

It is the dead centre when piston is nearest from the crankshaft (it is equal to O.D.C. in case of horizontal engines)

Stroke (L)

The distance b/w two dead centres is known as stroke.



Displacement Volume (or) Swept volume (V_s)

Swept volume $V_s = \frac{\pi}{4} D^2 \times L$

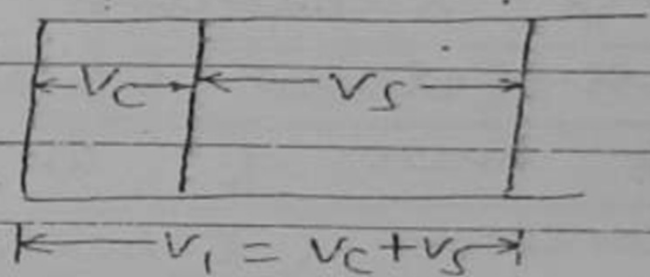
D = Bore (or) inner dia of cylinder

Clearance volume (V_c)

It is the volume of the cylinder when the piston at TDC or IDC.

Compression ratio (CR or r)

It is define a volume before compression to the volum after compression.



$$r = \frac{V_1}{V_2} = \frac{V_c + V_s}{V_c} = 1 + \frac{V_s}{V_c}$$

$$\boxed{r = 1 + \frac{V_s}{V_c}}$$