

Important relations for CFR Lab

To compute the volume in the cylinder for a given crank angle degree (θ):

$$V = V_{CL} + \left\{ 2.25(1 - \cos \theta) + 0.13(1 - \cos(2\theta)) \right\} A_c$$

\uparrow clearance volume \uparrow cross sectional area of cylinder

and

$$r = \frac{V_{BDC}}{V_{TDC}} = \frac{V_{DISP} + V_{CL}}{V_{CL}} = \frac{V_{DISP}}{V_{CL}} + 1$$

(use this to compute the clearance volume at a given compression ratio)

To compute indicated power from indicated work:
→ engine speed = 900 rpm

$$\dot{W}_i = \frac{n}{(\# \text{ revolutions/cycle})} W_i$$

\uparrow \uparrow indicated work

= 2 for a 4-stroke
= 1 for a 2-stroke

and

$$\dot{W}_i = (\text{IMEP}) V_{DISP}$$