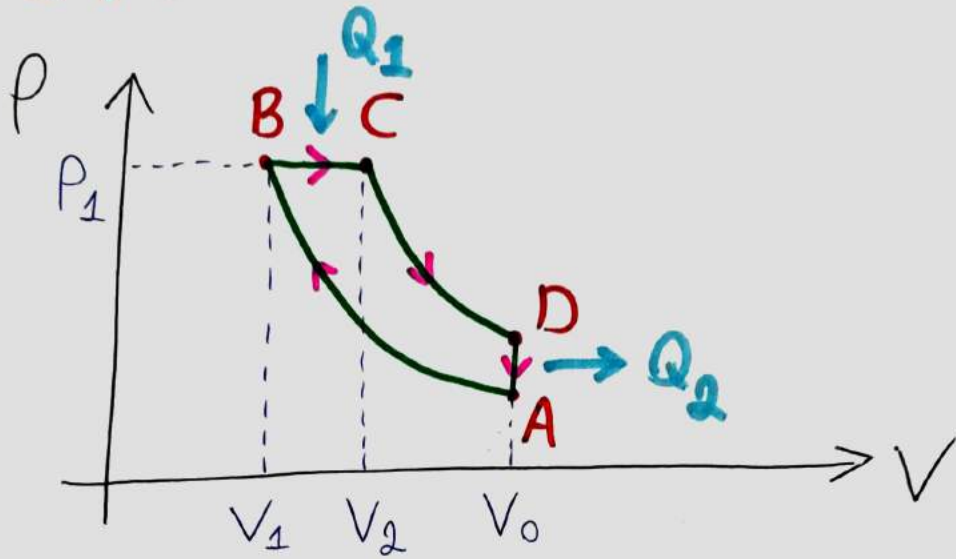


# CICLO DIESEL



$$r_E \equiv \frac{V_0}{V_2}, \text{ "TAXA DE EXPANSÃO"}$$

$$r_C \equiv \frac{V_0}{V_1}, \text{ "TAXA DE COMPRESSÃO"}$$

$$\eta: \text{ RENDIMENTO}; \quad \eta = \frac{W}{Q_1} = \frac{Q_1 - Q_2}{Q_1} \\ = 1 - \frac{Q_2}{Q_1}$$

- B → C: ISOBÁRICO

$$Q_1 = C_p \cdot (T_C - T_B)$$

- D → A: ISOCÓRICO

$$-Q_2 = U_A - U_D = C_v \cdot (T_A - T_D)$$

**DIESEL 01**

$$\eta = 1 - \frac{Q_2}{Q_1} = 1 - \frac{C_v}{C_p} \cdot \frac{T_D - T_A}{T_C - T_B}$$

$$\therefore \eta = 1 - \frac{1}{\gamma} \cdot \frac{T_D - T_A}{T_C - T_B}$$

EM TERMOS APENAS DE  $r_E$ ,  $r_C$  E  $\gamma$ :

$$\frac{T_D - T_A}{T_C - T_B} = \frac{P_D \cdot V_D - P_A \cdot V_A}{P_C \cdot V_C - P_B \cdot V_B} = \frac{P_D V_0 - P_A V_0}{P_1 V_2 - P_1 V_1} =$$

$$= \frac{P_D - P_A}{P_1 \left( \frac{V_2}{V_0} \right) - P_1 \left( \frac{V_1}{V_0} \right)} = \frac{P_D - P_A}{\frac{P_1}{r_E} - \frac{P_1}{r_C}} \quad (1)$$

$$\text{MAS } P_1 \cdot V_2^\gamma = P_D \cdot V_0^\gamma \Rightarrow P_D = P_1 / r_E^\gamma \quad (2)$$

$$\text{E } P_1 \cdot V_1^\gamma = P_A \cdot V_0^\gamma \Rightarrow P_A = P_1 / r_C^\gamma \quad (3)$$

$$(3) \text{ E } (2) \text{ EM } (1): \frac{T_D - T_A}{T_C - T_B} = \frac{\left( \frac{1}{r_E^\gamma} \right) - \left( \frac{1}{r_C^\gamma} \right)}{\frac{1}{r_E} - \frac{1}{r_C}}$$

$$\therefore \eta = 1 - \frac{1}{\gamma} \cdot \frac{r_E^{-\gamma} - r_C^{-\gamma}}{r_E^{-1} - r_C^{-1}}$$

DIESEL 02