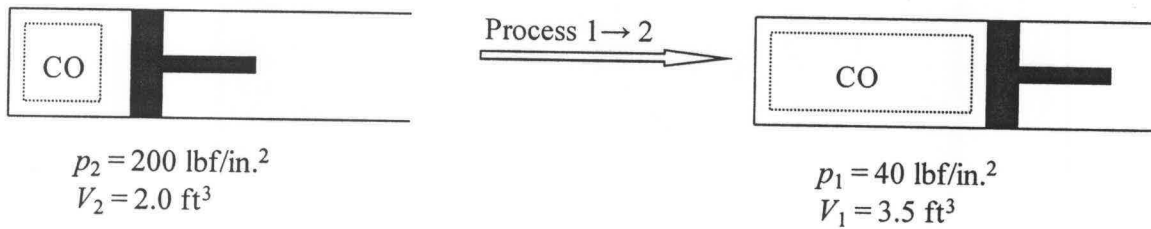


PROBLEM 1.29



The pressure-volume relation is linear during the process. Therefore,

$$\frac{p - p_1}{V - V_1} = \frac{p_2 - p_1}{V_2 - V_1} \quad \text{and} \quad V = \frac{p - p_1}{p_2 - p_1}(V_2 - V_1) + V_1$$

Using given data where $p = 150 \text{ lbf/in.}^2$

$$V = \frac{(150 - 200) \frac{\text{lbf}}{\text{in.}^2}}{(40 - 200) \frac{\text{lbf}}{\text{in.}^2}} (3.5 - 2.0) \text{ ft}^3 + 2.0 \text{ ft}^3 = \frac{-50}{-160} (1.5) \text{ ft}^3 + 2.0 \text{ ft}^3 = 2.5 \text{ ft}^3 \quad \leftarrow$$

