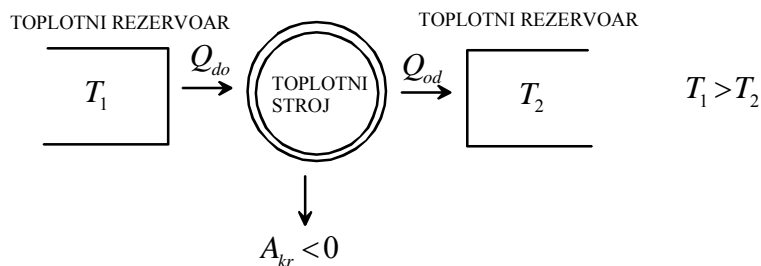


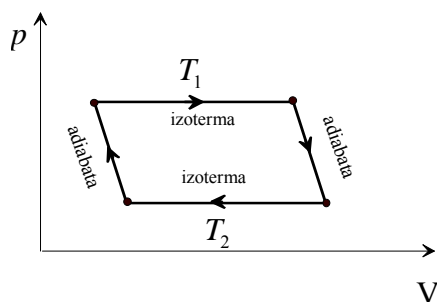
# TOPLOTNI IN HLADILNI STROJI

## 1. IDEALNI TOPLOTNI STROJ:

- krožna sprememba je reverzibilna
- stroj ponavlja Carnotovo krožno spremembo



$A_{kr} \equiv$  delo pri krožni spremembi



Stroj prejema in oddaja delo in pri tem ponavlja krožno spremembo:

$$\Delta W_n = A_{kr} + Q_{do} - |Q_{od}| = 0 \quad (1)$$

$$\Delta S = \frac{Q_{do}}{T_1} - \frac{|Q_{od}|}{T_2} = 0 \quad (2)$$

$$(1) \Rightarrow |A_{kr}| = -A_{kr} = Q_{do} - |Q_{od}|$$

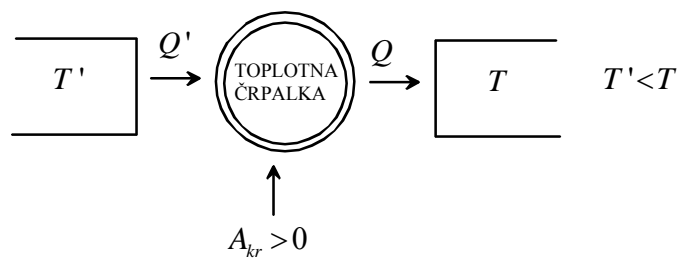
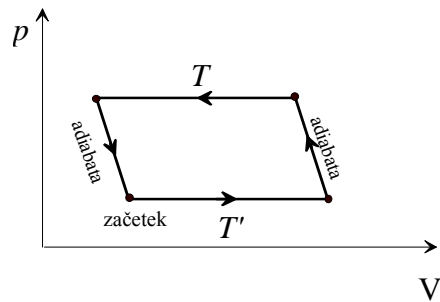
$$(2) \Rightarrow \frac{|Q_{od}|}{Q_{do}} = \frac{T_2}{T_1}$$

$$\text{izkoristek} \equiv \eta = \frac{|A_{kr}|}{Q_{do}} = \frac{Q_{do} - |Q_{od}|}{Q_{do}} = 1 - \frac{|Q_{od}|}{Q_{do}} = 1 - \frac{T_2}{T_1},$$

$$\text{oziroma: } |A_{kr}| = Q_{do} \left( 1 - \frac{T_2}{T_1} \right).$$

Če  $T_2 = T_1 \Rightarrow |A_{kr}| = 0 \Rightarrow$  **izotermenga toplotnega stroja ni**

## 2. IDEALNI HLADILNI STROJ:



$$\Delta W_n = A_{kr} + Q' - |Q| = 0 \Rightarrow A_{kr} = |Q| - Q'$$

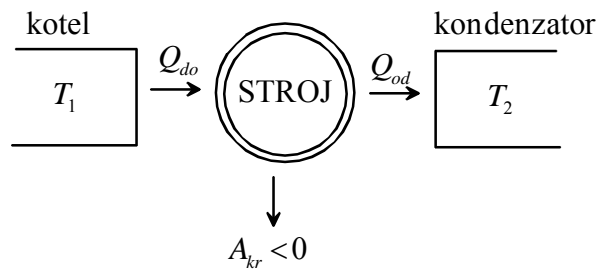
$$\Delta S = \frac{Q'}{T'} - \frac{|Q|}{T} = 0 \Rightarrow \frac{|Q|}{Q'} = \frac{T}{T'}$$

$$\frac{A_{kr}}{Q'} = \frac{|Q| - Q'}{Q'} = \frac{|Q|}{Q'} - 1 = \left( \frac{T}{T'} - 1 \right)$$

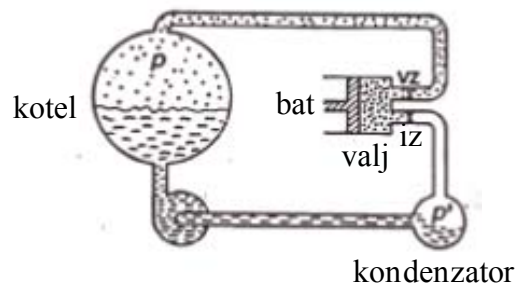
$$Q' = \frac{A_{kr}}{\left( \frac{T}{T'} - 1 \right)}$$

## Primer: parni stroj

- Idealni parni stroj:



- Realni parni stroj:



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