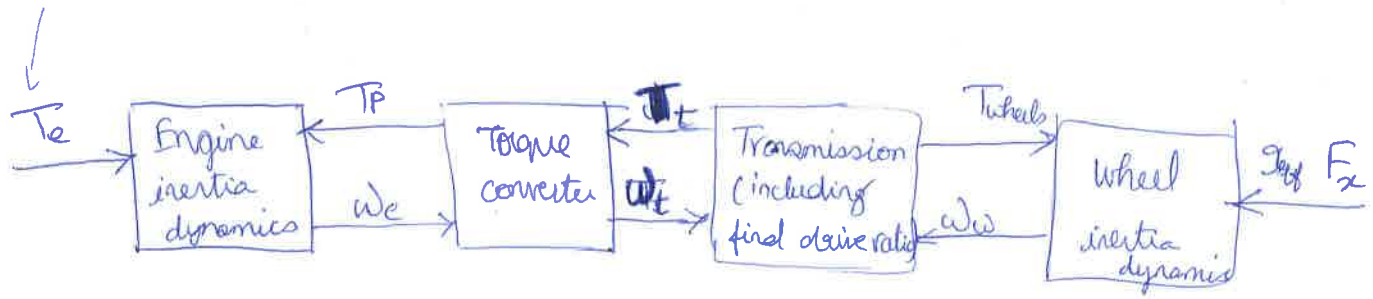


"net combustion torque"



$T_p$  - pump torque  $\approx T_{flywheel}$

$T_t$  - Turbine torque

$\omega_p = \omega_e$  - engine rpm  
 $\omega_t$  - turbine rpm  
 $\omega_w$  - wheel rpm

$T_p = T_t$  only when lock-up clutch engaged.

$$\textcircled{1} \quad \frac{\omega_t}{\omega_p} < 0.9 \quad (\text{usual}) \quad \text{or} \quad \frac{\omega_t}{\omega_p} \geq 0.9 \quad (\text{lock-up})$$

$$\textcircled{2} \quad T_{wheel} = \frac{1}{R} T_t$$

$$\omega_t = \frac{1}{R} \omega_w$$

$$\textcircled{3} \quad I_e \dot{\omega}_e = T_e - T_p$$

↓  
"net combustion torque"

$$\textcircled{4} \quad I_w \dot{\omega}_w = T_{wheel} - r_{eff} F_x$$