

DERIVATION OF LONG EQUATIONS

$$P = \rho \cdot Q_{AV} \cdot \dot{m}_f$$

$$P = \rho_m \left(1 + \rho_c \right) Q_{AV} \dot{m}_f$$

$$P = \rho_m \left(1 + \rho_c \right) Q_{AV} F/A \cdot \dot{m}_w$$

$$P = \rho_m \left(1 + \rho_c \right) Q_{AV} F/A \cdot \dot{m}_w \cdot N/\rho_r$$

$$P = \rho_m \left(1 + \rho_c \right) Q_{AV} F/A \cdot \rho_v \rho_i \dot{V}_d \cdot N/\rho_r$$

$$P = \rho_m \left(1 + \rho_c \right) Q_{AV} F/A \cdot \frac{\rho_v \rho_i \dot{V}_d \cdot N}{R T, \rho_r}$$

$$P = \left[\rho_m \left(1 + \rho_c \right) Q_{AV} F/A \right] \left[\frac{\rho_v \rho_i}{R T, \rho_r} \right] \left[\frac{\pi B^2 L \rho_{oil}}{4 \rho_r} \right]$$

THERMOCHEMISTRY
FLUID MECHANICS
KINEMATICS

$$T = P / 2 \dot{W}, \text{ so}$$

$$T = \left[\rho_m \left(1 + \rho_c \right) Q_{AV} F/A \right] \left[\frac{\rho_v \rho_i}{R T, \rho_r} \right] \left[\frac{\pi B^2 L \rho_{oil}}{8 \rho_r} \right]$$

$$BSFC = \dot{m}_f / P = 1 / \left(\rho_m \left(1 + \rho_c \right) Q_{AV} \right)$$