



$$\frac{d\Omega_T}{dt} = \frac{1}{J} \tau_T$$

$$\Omega_T = \Omega_2$$

$$\tau_T = -\tau_2$$

$$\frac{d\Omega_2}{dt} = -\frac{1}{J} \tau_2$$

$$\begin{bmatrix} \Omega_1 \\ \tau_1 \end{bmatrix} = \begin{bmatrix} -\frac{1}{N} & 0 \\ 0 & N \end{bmatrix} \begin{bmatrix} \Omega_2 \\ \tau_2 \end{bmatrix}$$

$$-N \frac{d\Omega_1}{dt} = \frac{-1}{NJ} \tau_1$$

$$\Omega_1 = -\frac{1}{N} \Omega_2$$

$$\Omega_2 = -N \Omega_1$$

$$\frac{d\Omega_1}{dt} = \frac{1}{N^2 J} \tau_1$$

$$\tau_1 = N \tau_2$$

$$\tau_2 = \frac{1}{N} \tau_1$$

$$\frac{d\Omega_{T_{eq}}}{dt} = \frac{1}{J_{eq}} \tau_{T_{eq}}$$

$$J_{eq} = N^2 J$$

$$= 100 J$$

$$N = 10$$