$$2\tau_r\tau_c = \tau_\lambda + \tau_r$$

$$\boxed{\tau_c = \frac{\tau_\lambda + \tau_r}{2\tau_r}}$$

then

$$\tau_t = 1 - \frac{\tau_r}{\tau_\lambda}(\tau_c - 1) = 1 - \frac{\tau_r}{\tau_\lambda}\left(\frac{\tau_\lambda + \tau_r - 2\tau_r}{2\tau_r}\right)$$

$$\tau_t = 1 - \frac{\tau_\lambda - \tau_r}{2\tau_\lambda} = \frac{2\tau_\lambda - \tau_\lambda + \tau_r}{2\tau_\lambda}$$

$$\boxed{\tau_t = \frac{\tau_\lambda + \tau_r}{2\tau_\lambda}}$$

Specific thrust

$$\frac{F}{\dot{m}} = a_0\left\{\left[\frac{2}{\gamma-1}\frac{\tau_{\lambda AB}}{\tau_r\tau_c\tau_t}\left(\tau_r\tau_c\tau_t - 1\right)\right]^{\frac{1}{2}} - M_0\right\}$$

$$\frac{F}{\dot{m}} = a_0\left\{\left[\frac{2\tau_{\lambda AB}}{\gamma-1}\left(1 - \frac{1}{\tau_r\tau_c\tau_t}\right)\right]^{\frac{1}{2}} - M_0\right\}$$

$$\tau_r\tau_c\tau_t = \tau_r\left(\frac{\tau_\lambda + \tau_r}{2\tau_r}\right)\left(\frac{\tau_\lambda + \tau_r}{2\tau_\lambda}\right) = \frac{(\tau_\lambda + \tau_r)^2}{4\tau_\lambda}$$