$$P = T\omega \Rightarrow T = \frac{P}{\omega} = \frac{5\ \text{hp}\cdot\text{min}}{175\ \text{rpt}} \cdot \frac{550\ \text{ft}\cdot\text{lb/s}}{1\ \text{hp}} \cdot \frac{60\ \text{s}}{\text{min}} \cdot \frac{1\ \text{rpt}}{2\pi\ \text{rad}}$$

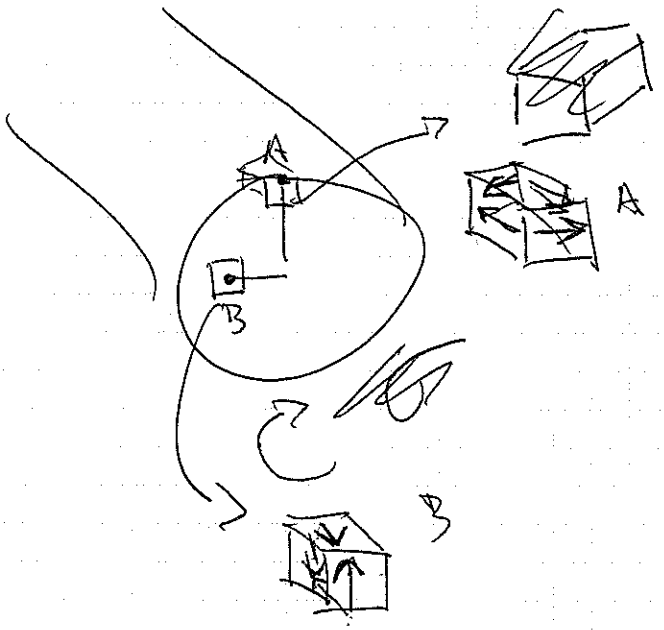
$$= 150.1\ \text{ft}\cdot\text{lb}$$

$$\tau_{MAX} = \frac{Tc}{J} = \frac{Tc}{\frac{\pi}{2}c^4} = \frac{T}{\frac{\pi}{2}c^3} \Rightarrow \quad c^3 = \frac{T}{\frac{\pi}{2}\tau}$$

$$\hookrightarrow c^3 = \frac{150.1\ \text{ft}\cdot\text{lb}\ \text{in}^2}{(\pi/2)(14.5\ \text{ksi}\cdot\text{in})} \cdot \frac{\text{ksi}}{1000} \cdot \frac{12\ \text{in}}{1\ \text{ft}} = .0729$$

$c = 0.858$ $\quad .758$

$7/8" = .875$



$$\tau_A = \frac{Tc}{J}$$

$$\tau_B = \frac{Tc}{J}$$