

$$RPM := 2000 \text{ rpm} \quad \omega := \frac{RPM \cdot 2 \pi}{60} = 21.932 \frac{1}{s}$$

$$r_1 := 30 \text{ mm} \quad r := r_1$$

$$v := r \cdot \omega = 0.658 \frac{m}{s}$$

Height is assumed from the video and density is of steel as I have no idea, which material it is supposed to be

$$h := 3 \text{ cm} \quad r := r_1$$

$$\rho := 8050 \frac{kg}{m^3}$$

$$V := \pi \cdot r^2 \cdot h$$

$$m := \rho \cdot V = 0.683 \text{ kg}$$

$$I := \frac{1}{2} \cdot m \cdot r^2 = (307.27 \cdot 10^{-6}) \text{ kg} \cdot m^2$$

$$t := 4 \text{ s} \quad \text{Not sure what time to use, so I used the one specified for motor startup}$$

$$\alpha := \frac{\omega}{t} = 5.483 \frac{1}{s^2}$$

$$T := I \cdot \alpha = 0.002 \text{ J}$$

$$P := T \cdot \omega = 0.037 \text{ W}$$

$$n_1 := 26$$

$$P_{1_out} := n_1 \cdot P = 0.961 \text{ W}$$

Assumed efficiency

$$\mu_1 := .85$$

$$P_{1_in} := \frac{P_{1_out}}{\mu_1} = 1.13 \text{ W}$$