

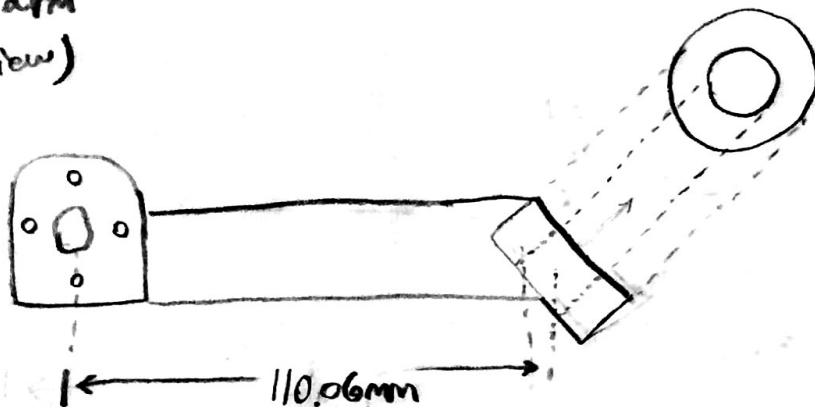
Assumptions

- static loading
- $\mu_s = 0.3$
- Neglecting mass of arm

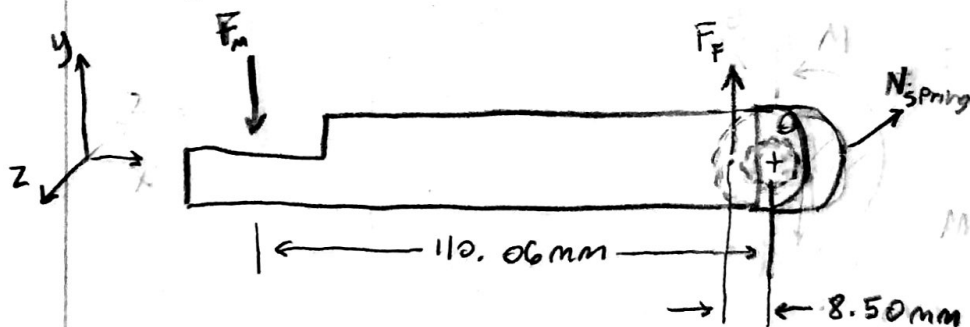
(Top view)

Equations

- $F_f = \mu_s N$
- $\sum M$



FBD (side view)



$$F_M = 529 \\ = .51 N$$

$$F_f = \mu_s N_{spring}$$

$$\sum M_o = 0; F_M (110.06 \text{ mm}) - F_F (8.50 \text{ mm}) = 0$$

$$\sum F_y = m a_y = 0; -F_M + F_F = m a_y = 0 \rightarrow F_M = F_F$$

$$.51 N (110.06 \text{ mm}) = F_F (8.50 \text{ mm})$$

$$\rightarrow F_F = 6.60515 N$$

$$N_{spring} = \frac{F_F}{\mu_s}$$

$$\rightarrow N_{spring} = 22.0172 N \approx 5 \text{ lbs spring force}$$

Spring compression length

$$23.20 \text{ lbs/in}$$

$$\frac{5 \text{ lbs}}{23.20 \text{ lbs/in}} \rightarrow .22 \text{ in}$$