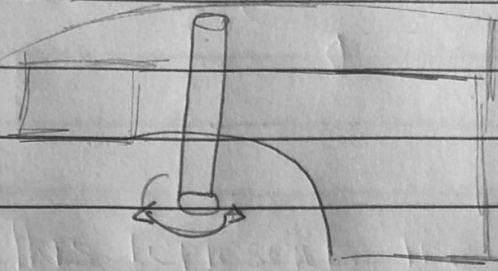


Module 1: Pivot Joint / Connection Shaft + Can rotate in hole

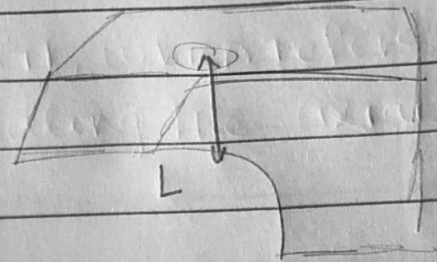
(not to scale)



exploded
view



Shaft can move up and down



+ $M = \text{maximum load}$

that can be withstood -

$$M = 5 \text{ lbs}$$

$$+ F = mg = 5 \text{ lbs} \times 9.8 \text{ m/s}^2 = 49 \text{ N}$$

$$L = \text{depth of hole} = 2.3 \text{ m}$$

$$+ T = F \times L = (49)(2.3) = 112.8 \text{ N}$$

+ Lever arm will be connected to shaft, therefore allowing for movement freely

+ 1 degree of freedom.

$$+ \mu = 0.11$$

$$f = \mu \cdot N = (0.11)(49 \text{ N}) = 5.39 \text{ N}$$

$$+ \sigma = \frac{F}{A} = \frac{49 \text{ N}}{0.00126 \text{ m}^2} = 39238 \text{ N/m}^2$$

$$d = 0.04 \text{ m}$$

$$A = \pi r^2 = \pi (0.02)^2 = 0.00126 \text{ m}^2$$