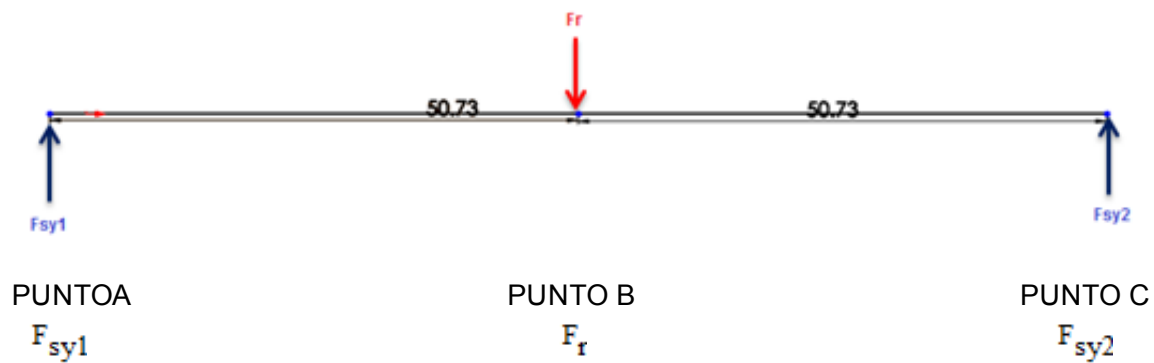


## DISEÑO DE EJE PARA RODAMIENTO DE BOLAS LINEAL

Fuerzas presentes en el eje Y



$$F_r = 27.5826$$

$$\sum_i F_y = 0$$

$$F_{sy1} = \frac{F_r}{2} \rightarrow 13.7913$$

$$F_{sy1} = F_{sy2}$$

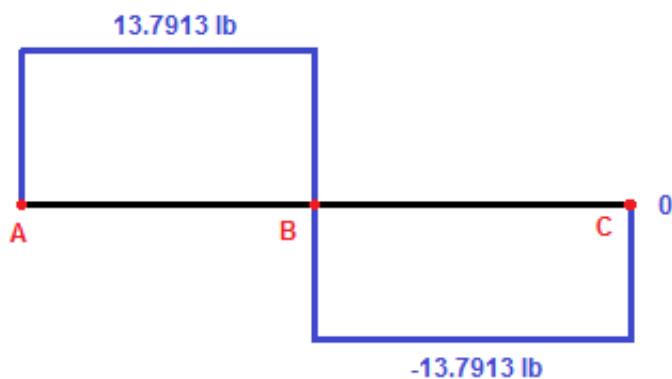
$$F_{sy2} = 13.7913$$

Fuerza cortante en el eje Y

$$F_{cory1} = F_{sy1} \rightarrow 13.7913$$

$$F_{cory2} = F_{cory1} - F_r \rightarrow -13.7913$$

$$F_{cory3} = F_{cory2} + F_{sy2} \rightarrow 0.0$$

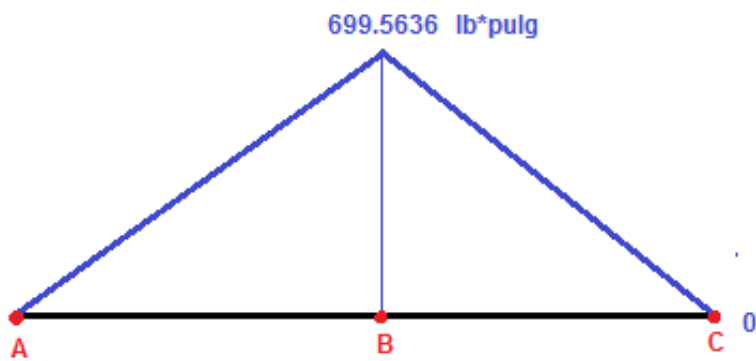


Momento flexionante en el eje Y

$$M_{Ay} := 0$$

$$M_{By} := M_{Ay} + F_{cory1} \cdot 50.725 \rightarrow 699.5636925$$

$$M_{Cy} := M_{By} + F_{cory2} \cdot 50.725 \rightarrow 1.292469707114105742e-26$$



Inercia de la barra

$$I := \frac{\pi \cdot r^2}{4} \quad M_{\max} := M_{By}$$

$$S_y := 45000 \quad M_{\min} := 0$$

$$N_{\text{factor}} := 2.5 \quad K_t := 1$$

$$\sigma_d := \frac{S_y}{N_{\text{factor}}} \rightarrow 18000.0$$

$$S_1 := \frac{M_{\max}}{\sigma_d} \rightarrow 0.038864649583333333333333333$$

$$D := \sqrt[3]{\frac{S_1 \cdot 32}{\pi}} \rightarrow 0.7342629598880475203439$$

### Diámetro con base a esfuerzo fluctuante

Momento medio

$$M_{\text{medio}} := \frac{M_{\max} + M_{\min}}{2} \rightarrow 349.78184625$$

Momento alterno

$$M_{\text{alterno}} := \frac{M_{\max} - M_{\min}}{2} \rightarrow 349.78184625$$

$$r := 0.49 \quad C_1 := 0.49$$

$$I := \frac{\pi \cdot r^2}{4} \rightarrow 0.18857409903172733914$$

ACERO 1045 laminado en frío

$$S_{y2} := 77000$$

$$S'_n := 20769.21$$

$$\sigma_{\text{alterno}} := \frac{M_{\text{medio}} \cdot C_1}{I} \rightarrow 908.889956481580962557$$

$$S_2 := 2 \cdot \left( \frac{K_t \cdot \sigma_{\text{alterno}}}{S_n} + \frac{\sigma_{\text{medio}}}{S_y} \right) \rightarrow 0.127917933249861393558$$

$$D_2 := \sqrt[3]{\frac{S_2 \cdot 32}{\pi}} \rightarrow 1.0922209768389263536$$