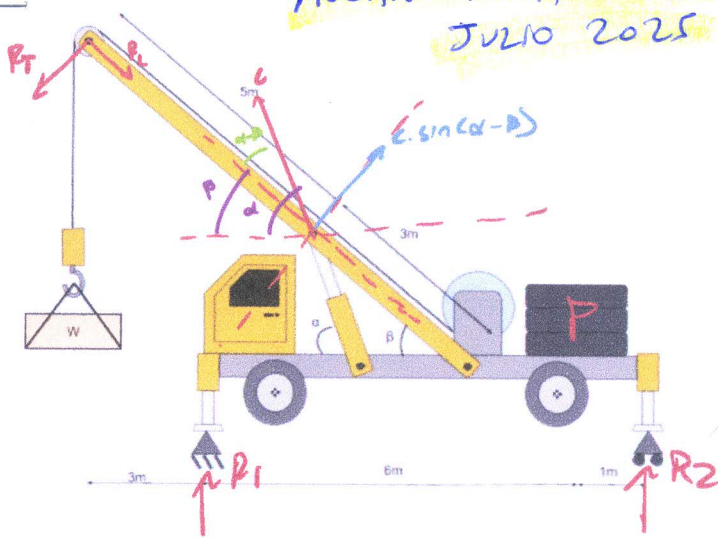




$$\sum F_y = R_1 + R_2 - W - P$$

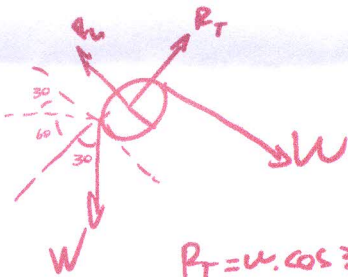
$$\sum M = 0 = 3R_1 - 9P + 10R_2$$

$$W = 2000 \text{ kg}$$

$$P = 1600 \text{ kg}$$

$$R_1 = 3041 \text{ kg}$$

$$R_2 = 429 \text{ kg}$$



$$R_T = W \cos 30$$

$$R_L = W + W \sin 30$$

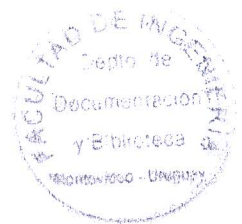
$$C \sin(\alpha - \beta) \cdot 3 = R_T \cdot 8 = W \cos \beta \cdot 8$$

$$C = W \cdot \frac{8}{3} \cdot \frac{\cos \beta}{\sin(\alpha - \beta)}$$

$$C = 13504 \text{ kg}$$



$$T = W \cdot \frac{9.75}{2} = 850 \text{ kgm.}$$



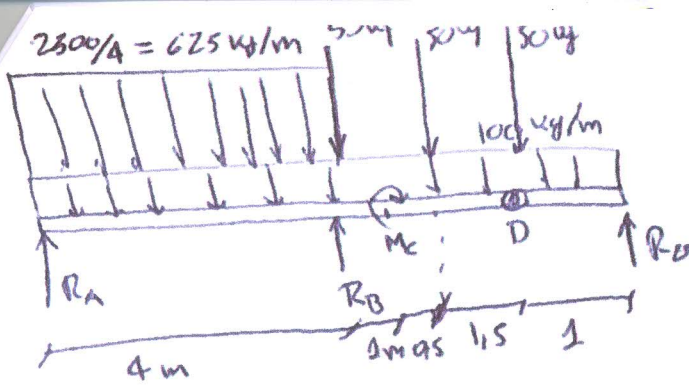
c)

$$\sum F_y = R_1 + R_2 - W - P$$

$$\sum M = 0 = 3R_1 - 9P + 10R_2$$

$$W_{\text{max}} = 3000 \text{ kg}$$

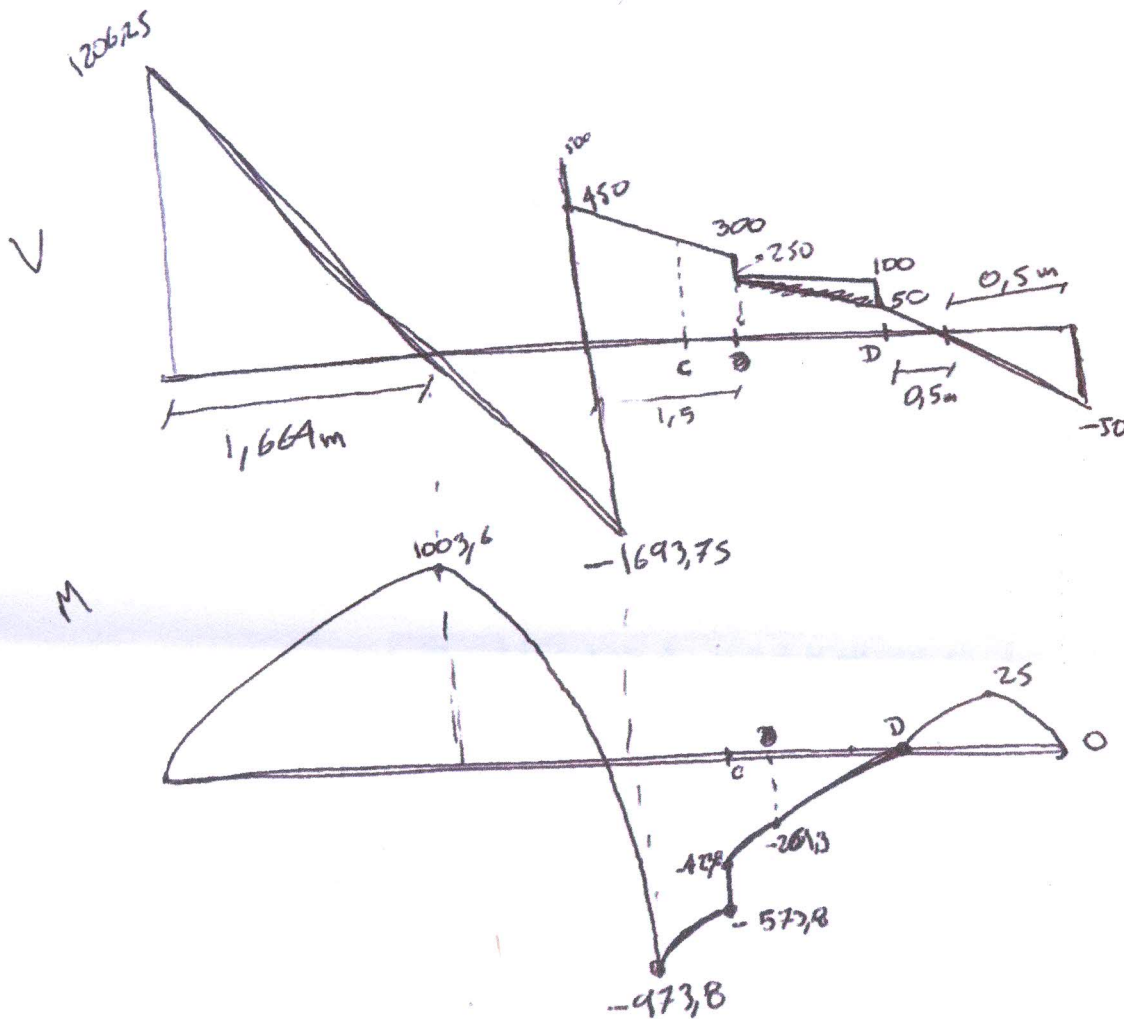
$$b = \frac{3000}{2.5} = 1200 \frac{\text{kg}}{\text{cm}^2}$$



$$\sum F_y = 0 \Rightarrow 2500 + 100 \cdot 8 + 150 = R_A + R_D + R_B \Rightarrow [R_B = 2143,25 \text{ kg}]$$

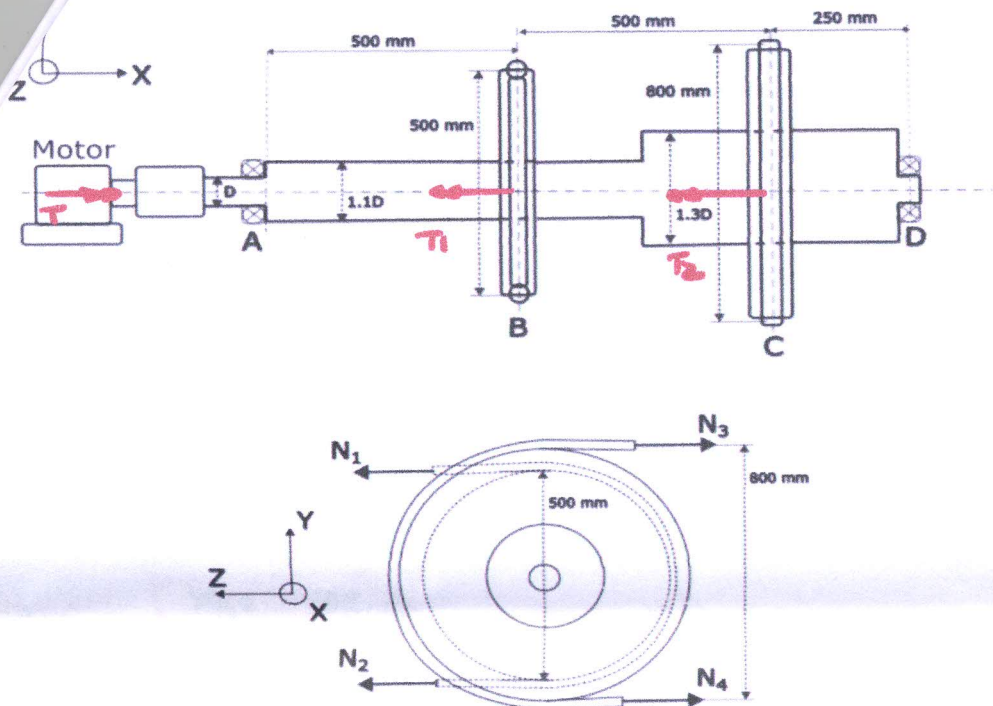
$$\sum M_B = 0 \Rightarrow 2500 \cdot 2 - 50 \cdot 1,5 - 50 \cdot 3 - 150 + R_D - R_A \cdot 4 = 0 \Rightarrow [R_A = 1206,25 \text{ kg}]$$

$$D-E \quad \sum M_D = 0 \Rightarrow 100 \cdot 1 \cdot 0,5 = [R_E = 50 \text{ kg}]$$



$$\sigma = \frac{M}{W} \leq \frac{S_y}{F_s}$$

... $M_{FS} = 171 \text{ cm}^3 \rightarrow$ como son las vigas selecciono con $\frac{W}{2} = 855 \text{ cm}^3$



$$N_2 = 3N_1$$

$$N_3 = 2N_4$$

$$P = T\omega \quad - \quad P = 746 = 5215 \text{ W} \quad \left. \begin{array}{l} \\ \end{array} \right\} T = 142.5 \text{ Nm}$$

$$\omega = \frac{2\pi \cdot n}{60} = 36.65 \text{ rad/s}$$

$$T_1 = 47.43 \text{ Nm}$$

$$T_2 = 94.87 \text{ Nm}$$

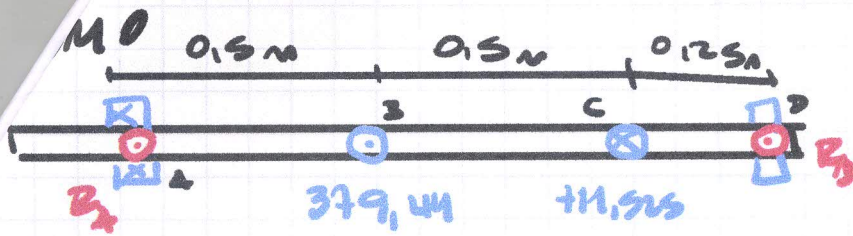
$$T_1 = 0.25(N_2 - N_1) = 0.25(3N_1 - N_1) = 47.43$$

$$N_1 = 94.86 \text{ N} \quad N_2 = 284.58 \text{ N}$$

$$T_2 = 0.4(N_3 - N_4) = 0.4(2N_4 - N_4) = 94.87$$

$$N_4 = 237.175 \text{ N} \quad N_3 = 474.35 \text{ N}$$





$$\sum M_A = 0 \rightarrow -379.44 \cdot 0.5 + 11.525 \cdot 1 - R_D \cdot 1.25 = 0$$

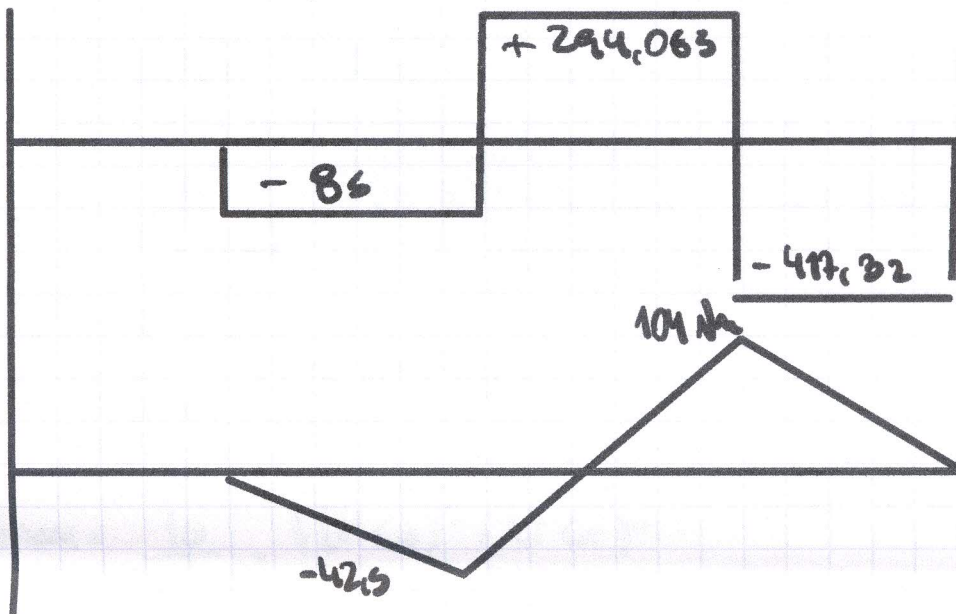
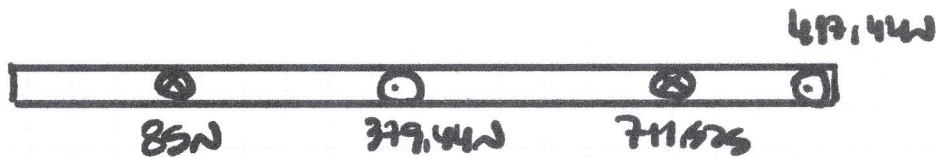
$$R_D = 417.44 \text{ N}$$

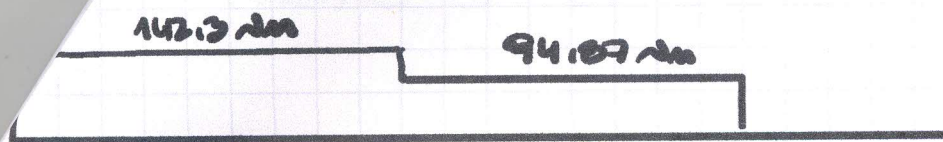
$$\sum F = 0 \rightarrow -R_A - 379.44 + 11.525 + 417.44 = 0$$

$$R_A = 11.525 - 379.44 + 417.44 = 0$$

DCL

$$R_A = -85 \text{ N}$$





MOMENTO MÁXIMO EN ③ pero la sección en B es menor por lo que estudiaré otros puntos

PUNTO ③

$$M = 42.9 \text{ Nm}$$

$$T = 142.3 \text{ Nm}$$

$$\tau_{adm} = \min(0.354, 0.1854) = 54.9$$

$$\text{por CHAVETA } \tau_{adm} = 54.9 \cdot 0.75 = 41.175 \text{ MPa}$$

$$\tau_{adm} = \frac{16}{\pi (1.1d)^3} \cdot \sqrt{(M \cdot C_1)^2 + (T \cdot C_1)^2} \rightarrow d \geq 24.3 \text{ mm}$$

PUNTO C

$$M = 104 \text{ Nm}$$

$$T = 94.87 \text{ Nm}$$

$$\tau_{adm} = \frac{16}{\pi (1.3d)^3} \cdot \sqrt{(M \cdot C_1)^2 + (T \cdot C_1)^2} \rightarrow d \geq 21.6 \text{ mm}$$



la MÚLTIPLO DE SM

5 mm

REDARILLOS

$$L_{00} = 3000 \quad - \quad L_0 = \frac{3000 \cdot 60 \cdot 350}{100} = 105$$

$$P = 417 \text{ N}$$

$$P_0 = 417 \text{ N}$$

$$L_0 = \left(\frac{C}{417} \right)^3 \quad - \quad C = 105^{1/3} \cdot 417 = 1,96 \text{ kW}$$

7000

$$\begin{array}{l} C = 7,15 \text{ kW} \\ C_0 = 4,95 \text{ kW} \end{array} \quad \left\{ \begin{array}{l} S_0 = \frac{4,95}{0,417} = 11,9 \quad \checkmark \end{array} \right.$$

