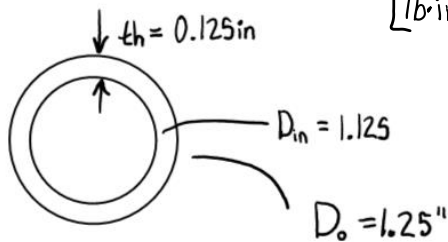


$$\sigma = \frac{My}{I}$$



Where Maximum moment occurs at  $x = l/2 = 14.175 \text{ in}$

$y$  is  $D_o/2 = 0.625 \text{ in}$

$I$  is Moment of inertia about cross section

$$I = \frac{\pi}{64} (D_o^4 - D_{in}^4) = 0.0412 \text{ in}^4$$

Let  $F = 100 \text{ lb}$

$$\sigma = \frac{\frac{F}{2} \cdot \frac{D_o}{2} (x^2 - x)}{I}$$

$$\sigma = \frac{F \cdot D_o \left( \frac{l^2}{4} - \frac{l}{2} \right)}{4I} = \frac{(150 \text{ lb})(1.25 \text{ in}) \left( \frac{(28.35 \text{ in})^2}{4} - \frac{28.35}{2} \right)}{4(0.0412 \text{ in}^4)}$$

$$\sigma = 23.5 \text{ ksi}$$

$\sigma_{\text{yield}}$  for Al 2014-T6 = 60 ksi

Aluminum won't yield