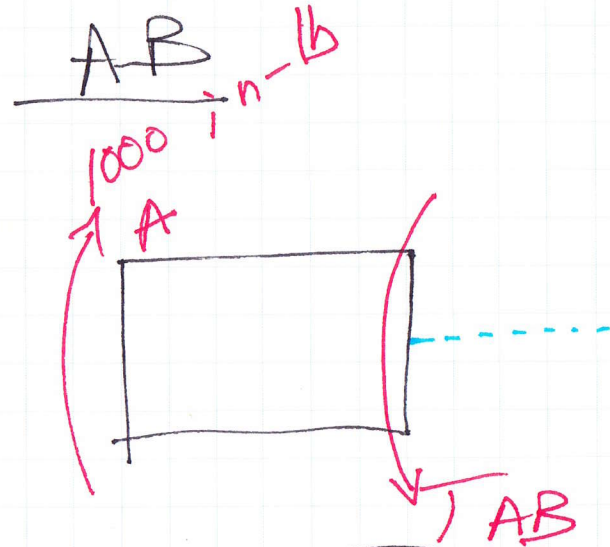


$G = 12 \times 10^6 \text{ psi}$   
 $\tau_{max} = ?$   
 $\phi_{AC} = ?$

$\sum T_{x\text{-axis}} = 0$   
 $-T_A + 2000 - 1000 = 0$   
 $T_A = 1000 \text{ in-lb}$   
as shown

$J_{AB} = \frac{\pi}{2} (1)^4$   
 $J_{AB} = \frac{\pi}{2} = 1.571 \text{ in}^4$   
 $J_{BC} = \frac{\pi}{2} (.5)^4$   
 $J_{BC} = 98.17 \times 10^{-3} \text{ in}^4$



$$\sum T_{x\text{-axis}} = 0$$

$$-1000 + T_{AB} = 0$$

$$T_{AB} = 1000 \text{ in-lb}$$

$$\phi_{AB} = \frac{T_{AB} L_{AB}}{J_{AB} G_{AB}}$$

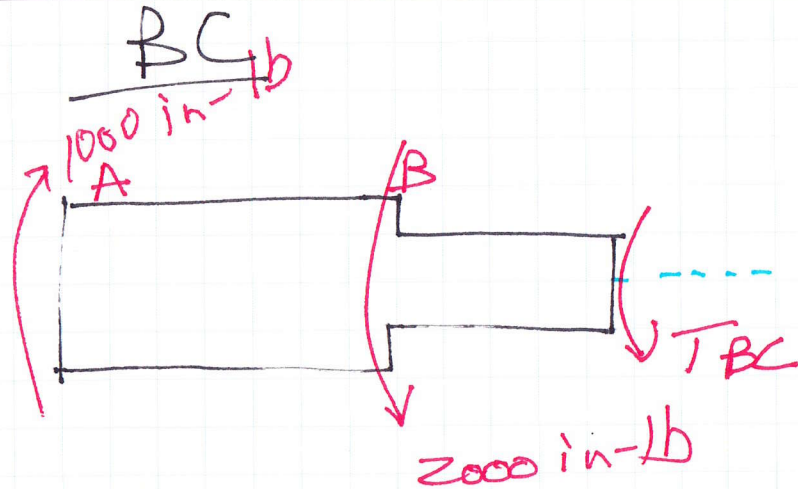
$$\phi_{AB} = \frac{(1000)(10)}{(1.571)(12 \times 10^6)}$$

$$\phi_{AB} = 530.4 \times 10^{-6} \text{ rad}$$

$$\tau_{AB} = \frac{T_{AB} C_{AB}}{J_{AB}}$$

$$\tau_{AB} = \frac{(1000)(1)}{1.571}$$

$$\tau_{AB \text{ max}} = 636.5 \frac{\text{lb}}{\text{in}^2}$$



$$\sum T_{x\text{-axis}} = 0$$

$$-1000 + 2000 + T_{BC} = 0$$

$$T_{BC} = -1000 \text{ in-lb}$$

$$\phi_{BC} = \frac{T_{BC} L_{BC}}{J_{BC} G_{BC}}$$

$$\phi_{BC} = \frac{(-1000)(12)}{(98.17 \times 10^{-3})(12 \times 10^6)}$$

$$\phi_{BC} = -10.19 \times 10^{-3} \text{ rad}$$

$$T_{BC \text{ Max}} = \frac{T_{BC} C_{BC}}{J_{BC}}$$

$$T_{BC \text{ Max}} = \frac{(-1000)(.5)}{98.17 \times 10^{-3}}$$

$$T_{BC \text{ Max}} = -5093 \frac{\text{lb}}{\text{in}^2}$$

$$\tau_{AB \text{ Max}} = 636.5 \frac{\text{lb}}{\text{in}^2}$$

$$\tau_{BC \text{ Max}} = -5093 \frac{\text{lb}}{\text{in}^2}$$

$$\tau_{\text{max}} = 5093 \frac{\text{lb}}{\text{in}^2}$$

$$\phi_{AC} = \phi_{AB} + \phi_{BC}$$

$$\phi_{AC} = 530.4 \times 10^{-6} \text{ rad} - 10.19 \times 10^{-3} \text{ rad}$$

$$\phi_{AC} = -9.66 \times 10^{-3} \text{ rad}$$

