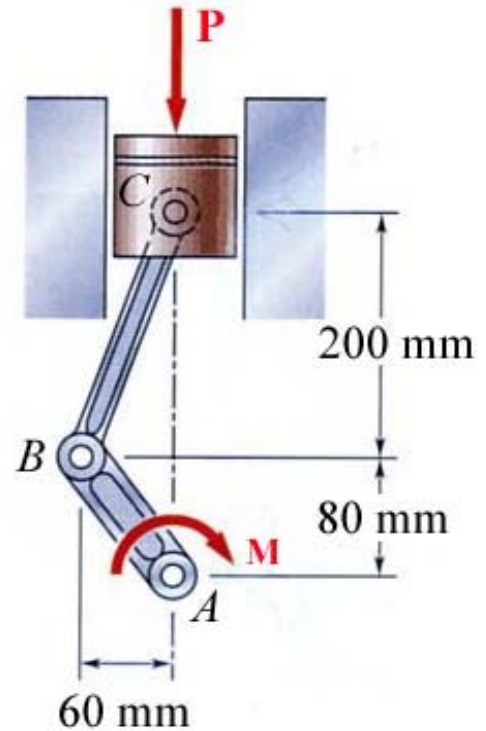


MEEG 3013

Quiz #1.m03.113

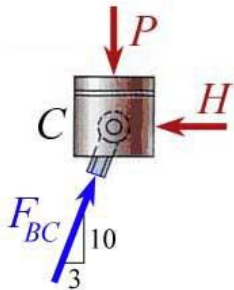
1. A moment \mathbf{M} is applied to the crank of an engine. If $\mathbf{P} = 8 \text{ kN} \downarrow$ and the system is in equilibrium, determine (a) the magnitude of \mathbf{M} , (b) the average normal stress σ_{BC} in the connecting rod BC , which has a uniform cross section of 600 mm^2 . ⑦



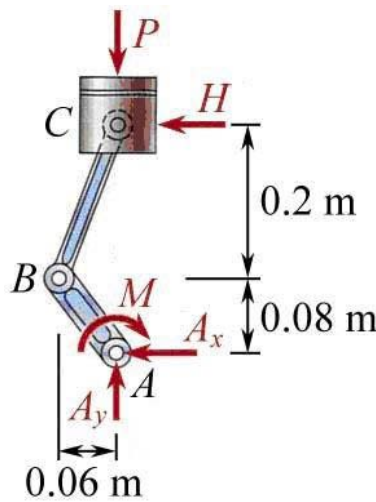
2. Define (a) shearing stress, (b) factor of safety. ②

3. You have been advised to learn your basics in mechanics from *two teachers*. Who are they? ①

1.



①



①

$$+\circlearrowleft \sum M_A = 0:$$

$$M = 672 \text{ N}\cdot\text{m} \quad \text{①}$$

$$A_{BC} = 6 \times 10^{-4} \text{ m}^2$$

$$\sigma_{BC} = F_{BC} / A_{BC} = 13.9204 \times 10^6 \text{ Pa (C)}$$

$$\sigma_{BC} = 13.92 \text{ MPa (C)} \quad \text{②}$$

$$P = 8000 \text{ N}$$

$$H = 2400 \text{ N} \quad \text{①}$$

$$F_{BC} = 800\sqrt{109} \text{ N (C)} \quad \text{①}$$

2. (a) *Shearing stress* is the component of stress that is parallel to the surface on which it acts. ① (b) *Factor of safety* is the ratio of ultimate stress to allowable stress. ①

3. They are the *Speaking Teacher* in the class and the *Silent Teacher* on the pages of the books and the Internet. ①