



In order to unscrew a bolt at O , a mechanic needs to apply a moment with magnitude M_B . If the wrench has a length of d , find the minimum force F_{min} that needs to be applied to unscrew the bolt as well as the distance from the bolt, d_F , where the force is applied.

Moment is proportional to distance so to minimize F , d_F should be maximized.

$$\Rightarrow d_F = d$$

$$M = Fd$$

$$\Rightarrow F_{min} = \frac{M_B}{d_F}$$