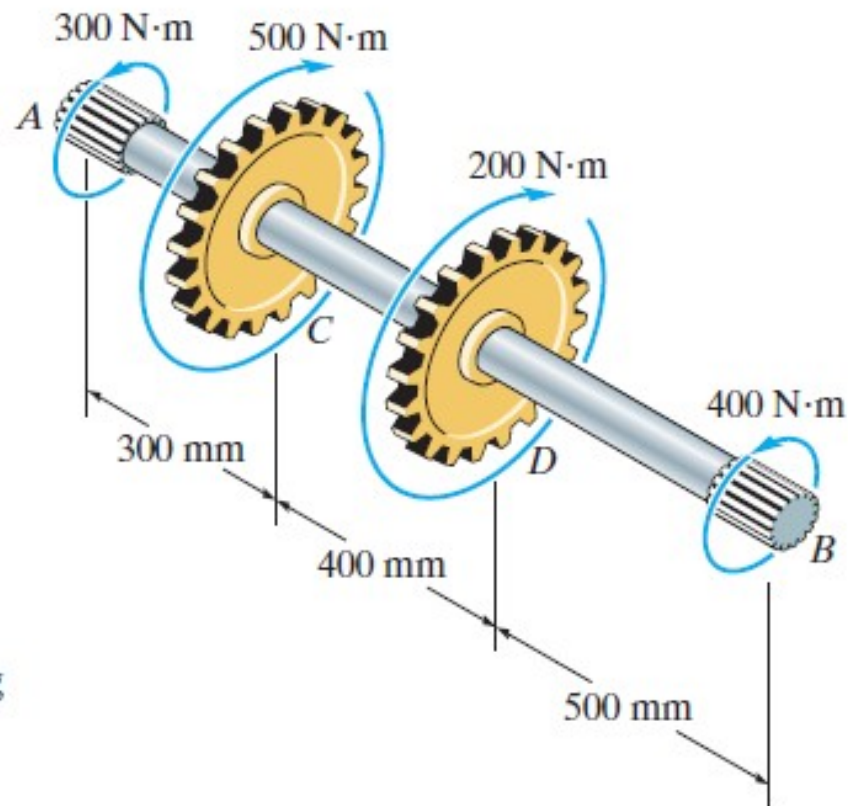
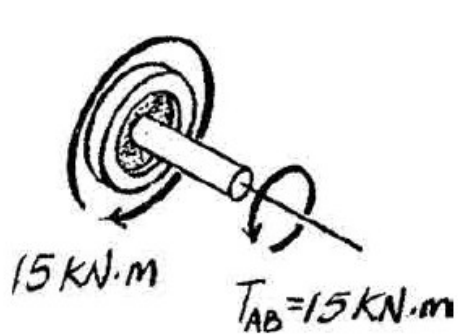
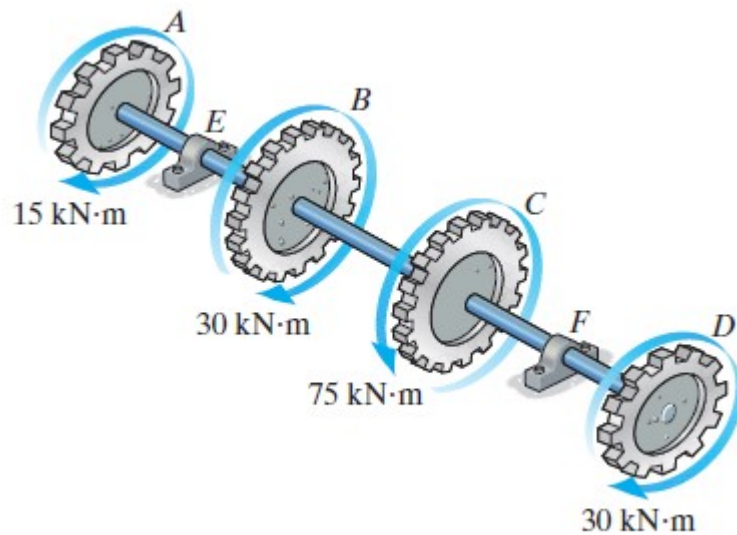


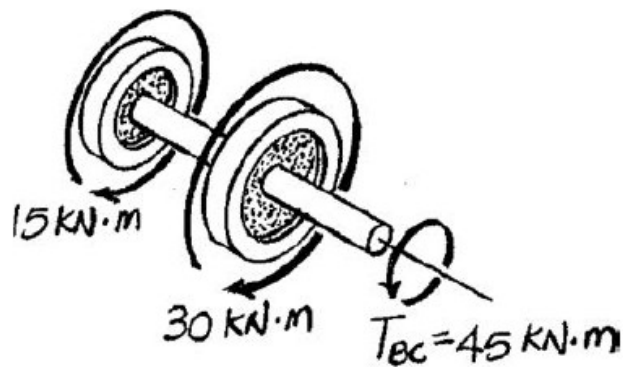
*5–8. The solid 30-mm-diameter shaft is used to transmit the torques applied to the gears. Determine the absolute maximum shear stress on the shaft.



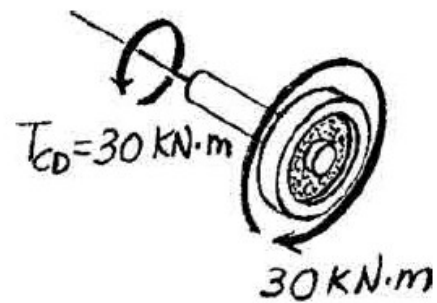
5–13. If the tubular shaft is made from material having an allowable shear stress of $\tau_{\text{allow}} = 85 \text{ MPa}$, determine the required minimum wall thickness of the shaft to the nearest millimeter. The shaft has an outer diameter of 150 mm.



(a)

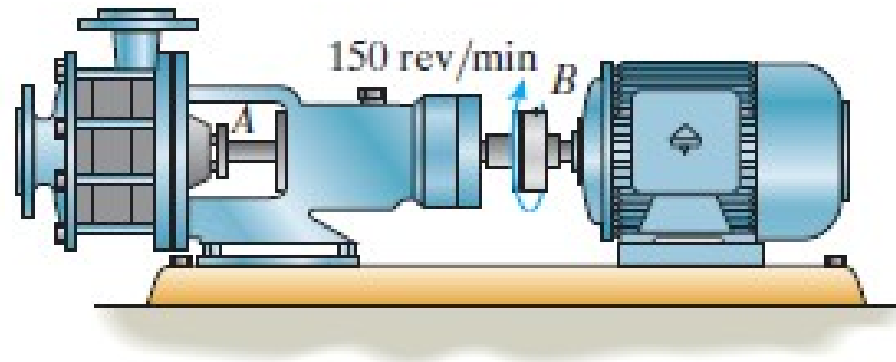


(b)

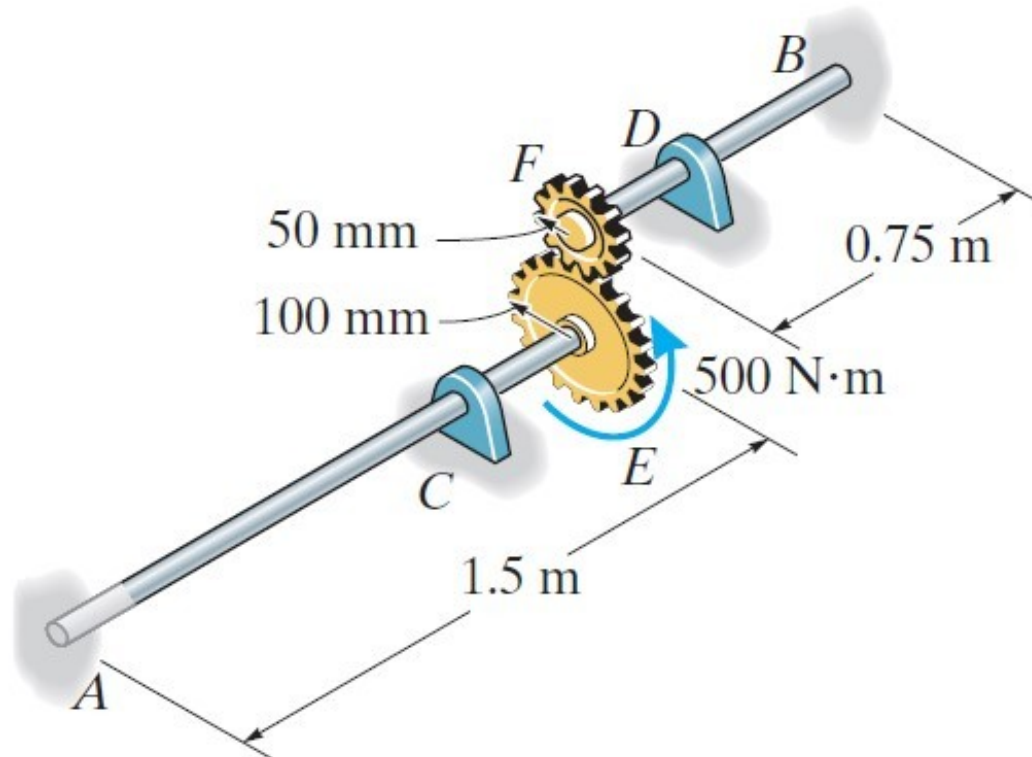


(c)

*5–32. The pump operates using the motor that has a power of 85 W. If the impeller at B is turning at 150 rev/min, determine the maximum shear stress developed in the 20-mm-diameter transmission shaft at A .



5–86. The two shafts are made of A-36 steel. Each has a diameter of 25 mm and they are connected using the gears fixed to their ends. Their other ends are attached to fixed supports at *A* and *B*. They are also supported by journal bearings at *C* and *D*, which allow free rotation of the shafts along their axes. If a torque of $500 \text{ N}\cdot\text{m}$ is applied to the gear at *E* as shown, determine the reactions at *A* and *B*.



5-87. Determine the rotation of the gear at E in Prob. 5-86.

