

Fig. P4.101

4.101 Two forces P can be applied separately or at the same time to a plate that is welded to a solid circular bar of radius r . Determine the largest compressive stress in the circular bar, (a) when both forces are applied, (b) when only one of the forces is applied.

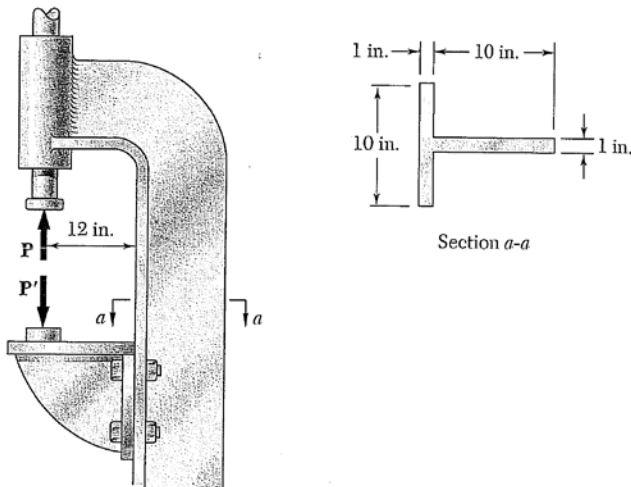


Fig. P4.116

4.116 Knowing that the allowable stress in section $a-a$ of the hydraulic press shown is 6 ksi in tension and 12 ksi in compression, determine the largest force P that can be exerted by the press.

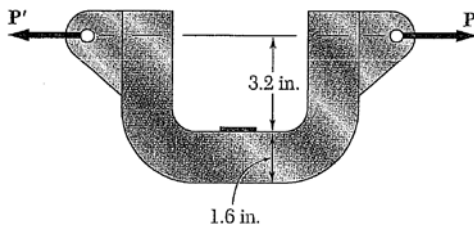


Fig. P4.120

4.120 The C-shaped steel bar is used as a dynamometer to determine the magnitude P of the forces shown. Knowing that the cross section of the bar is a square of side 1.6 in. and the strain on the inner edge was measured and found to be 450μ , determine the magnitude P of the forces. Use $E = 29 \times 10^6$ psi.

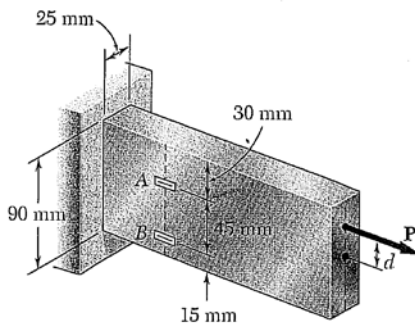


Fig. P4.122

4.123 Solve Prob. 4.122, assuming that the measured strains are

$$\epsilon_A = +600 \mu \quad \epsilon_B = +420 \mu$$

4.122 An eccentric force P is applied as shown to a steel bar of 25×90 -mm cross section. The strains at A and B have been measured and found to be

$$\epsilon_A = +350 \mu \quad \epsilon_B = -70 \mu$$

Knowing that $E = 200$ GPa, determine (a) the distance d , (b) the magnitude of the force P .

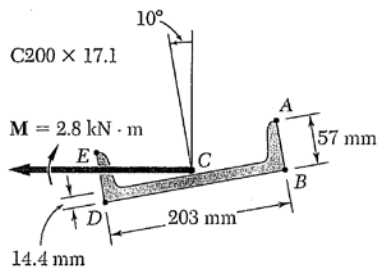


Fig. P4.133

4.133 The couple M acts in a vertical plane and is applied to a beam oriented as shown. Determine (a) the angle that the neutral axis forms with the horizontal, (b) the maximum tensile stress in the beam.

4.144 An axial load P of magnitude 50 kN is applied as shown to a short section of a W150 × 24 rolled-steel member. Determine the largest distance a for which the maximum compressive stress does not exceed 90 MPa.

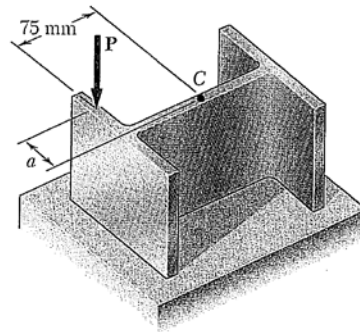


Fig. P4.144