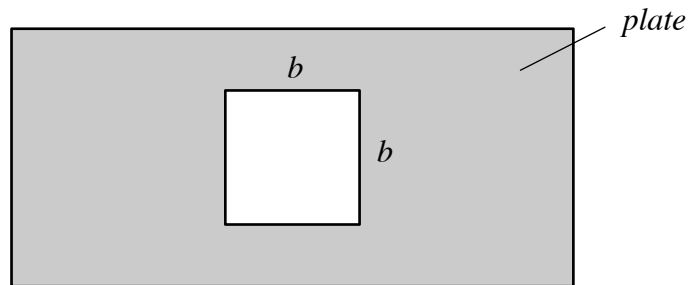


Homework Problem H11.A

Given: It is desired to punch of hole in a sheet of metal, with the metal having a thickness of t . The desired hole is square with dimensions of $b \times b$, as shown below. The punching force is given by P .

Find: Determine the shear stress in the plate as a result of the punching force P .

For this problem, use the following parameters: $t = 0.1$ in, $b = 1$ in and $P = 20$ ksi.

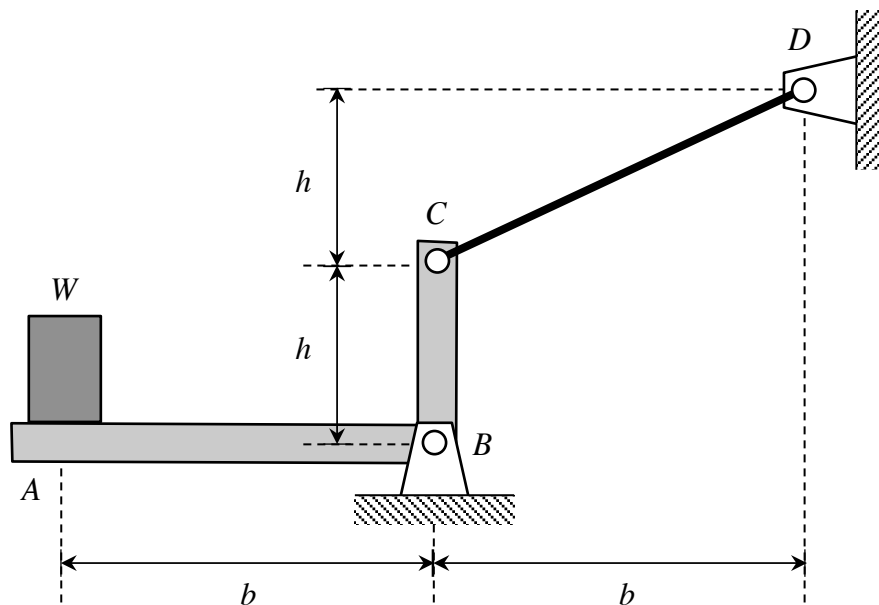


Homework Problem H11.B

Given: An L-shaped bracket is pinned to ground at B with a double-shear pin connection, with the pin at B having a diameter of D . The bracket is held in position by wire CD having a diameter d as it supports a crate. The crate has a weight of W . The weight of the bracket can be assumed to be negligible as compared to the weight of the crate.

Find: Determine the tensile stress in wire CD and the shear stress in the pin at B.

For this problem, use the following parameters: $b = 0.3$ m, $h = 0.4$ m, $d = 10$ mm and $W = 2$ kN.



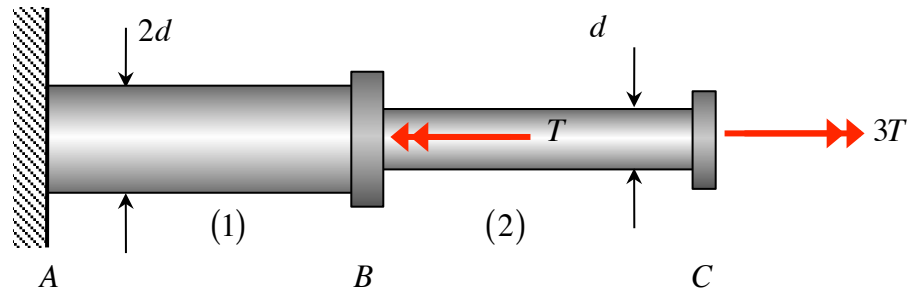
Homework Problem H11.C

Given: A circular cross-sectioned shaft is made up of solid shaft components (1) and (2), having diameters of $2d$ and d , respectively. (1) and (2) are joined with the rigid connector B, and (1) is attached to a fixed wall at its left end. A rigid connector is attached to the right end of (2). Torques T and $3T$ act on connectors B and C, as shown.

Find: For this problem:

- Determine the torque load on each of the components as a result of the applied torques.
- What is the maximum shear stress in the shaft? At what location(s) does this maximum stress exist?

Leave your answers in terms of T and d .



Homework Problem H11.D

Given: A circular cross-sectioned shaft is made up of components (1), (2) and (3). Components (1) and (2) have a tubular cross sections, with inner and outer diameters as shown in the figure. Component (3) has a solid cross section with a diameter of $2d$. Components (1) and (2) are joined by a rigid connector at B, components (2) and (3) are joined by rigid connector C, with (1) being attached to a fixed wall at end A. Rigid connector D is attached to end D of component (3). Torques T , $2T$ and $2T$ act on connectors B, C and D, respectively, as shown.

Find: For this problem:

- Determine the torque load on each of the components as a result of the applied torques.
- What is the maximum shear stress in the shaft? At what location(s) does this maximum stress exist?

Leave your answers in terms of T and d .

