Homework H31.A

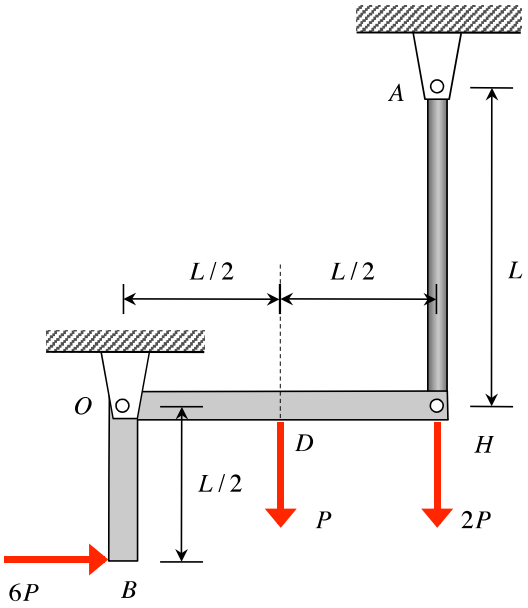
GIVEN: The frame shown below is made up of the L-shaped member BH that is pinned to ground at O.. AB is also supported by the rod AH that has a cross-sectional area of A. Member BH carries loads at locations B, D and H, as shown. Rod AH is made up of an aluminum alloy 6061-T6.

FIND: For this problem:

a) Determine the stress in rod AH.

b) Has the material in rod AH failed due to yielding? If not, what is the factor of safety for this loading against yielding?

For this problem, use the following parameters: $P = 80$ kN, $L = 4$ m and $A = 400$ mm^2 .



Homework H31.B

GIVEN: A rod is made up of members (1) and (2) with these members having diameters of d_1 and d_2, respectively, and are made of a material having a Young's modulus of E.. The members are connected by the rigid connector C. Both members are made of a material having a Young's modulus of E and a yield strength of σ_{YP}.

FIND: For this problem:

a) Determine the stress in each member of the rod.

b) Has the material in either member failed? If not, what is the factor of safety for the rod for this loading?

For this problem, use the following parameters: $d_1 = 2$ in, $d_2 = 3$ in, $P = 12$ kips, $E = 15 \times 10^3$ ksi and $\sigma_{YP} = 36$ ksi.