

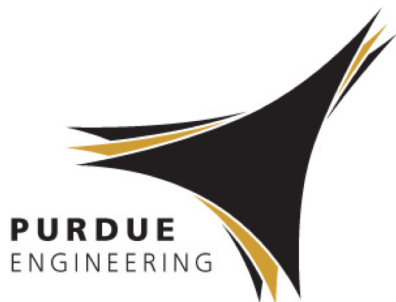
Fall, 2019

ME 323 –Mechanics of Materials

Lecture 9 – Axial deformation (cont.)

Reading assignment: 3.1–3.10

News: ____

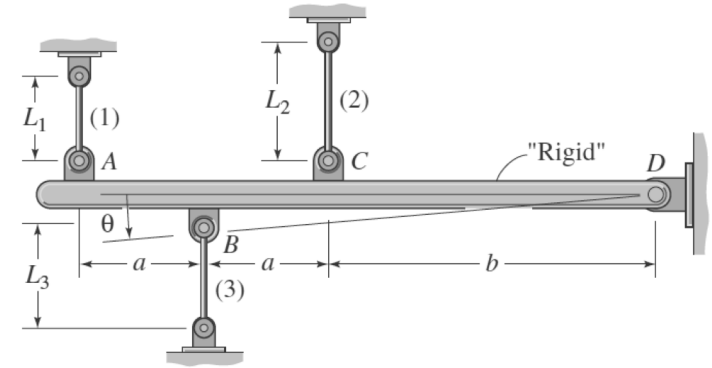
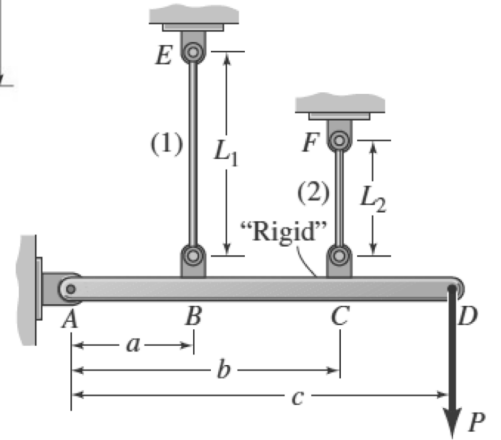
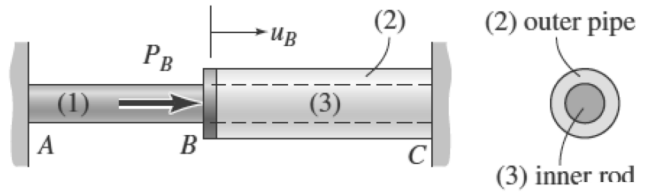
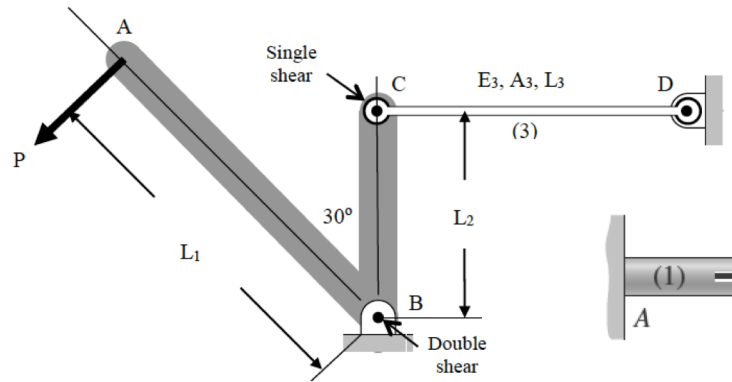
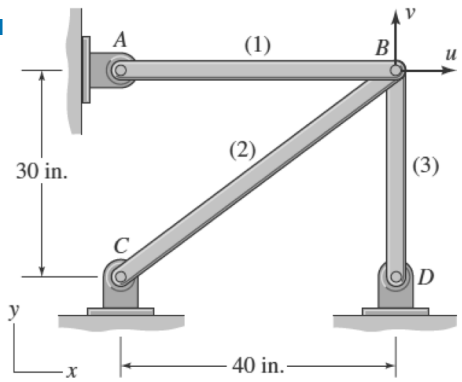
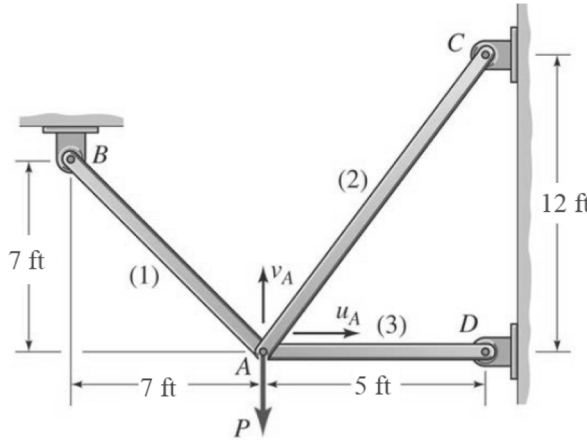
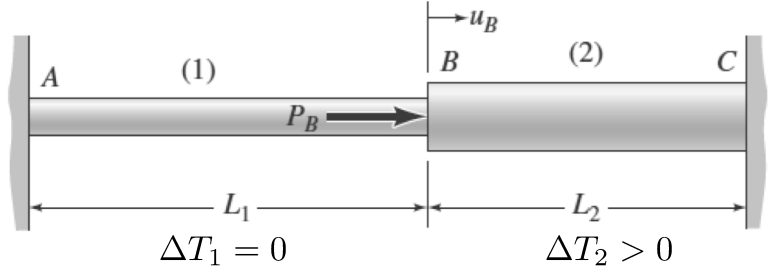


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Axial deformation – Statically indeterminate

Examples 7-13:



**statically
indeterminate
structures**

- 1) Free body diagram
- 2) Equilibrium equations
- 3) Force-displacement behavior
- 4) Compatibility conditions, Geometry of deformations
- 5) Solve for unknowns

Axial deformation – Statically indeterminate

Example 12

Member (2) is incorrectly manufactured and its length is 49.9 in. (as opposed to 50 in.)

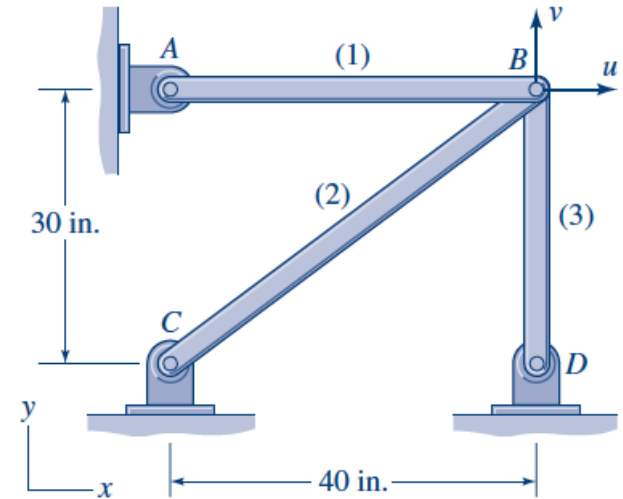
(a) Determine the displacement at B.

(b) Determine the resulting stresses.

$$\theta_1 = 0$$

$$\theta_2 = \arctan(3/4)$$

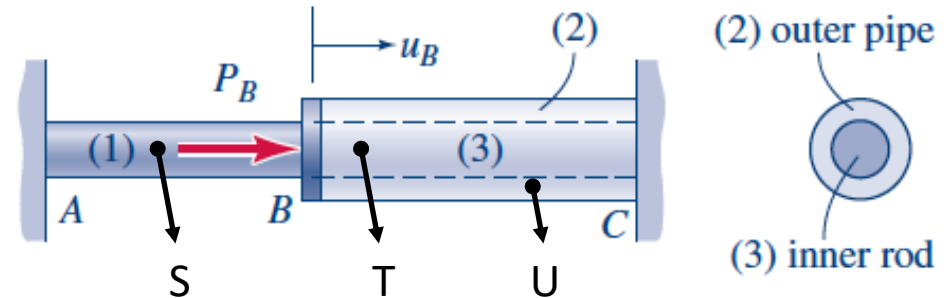
$$\theta_3 = \pi/2$$



Axial deformation – Statically indeterminate

Example 13

- Determine the reactions at ends A and C.
- Determine the state of stress and strain at points S, T and U; and represent them in stress elements.



Axial deformation – Statically indeterminate

Any questions?