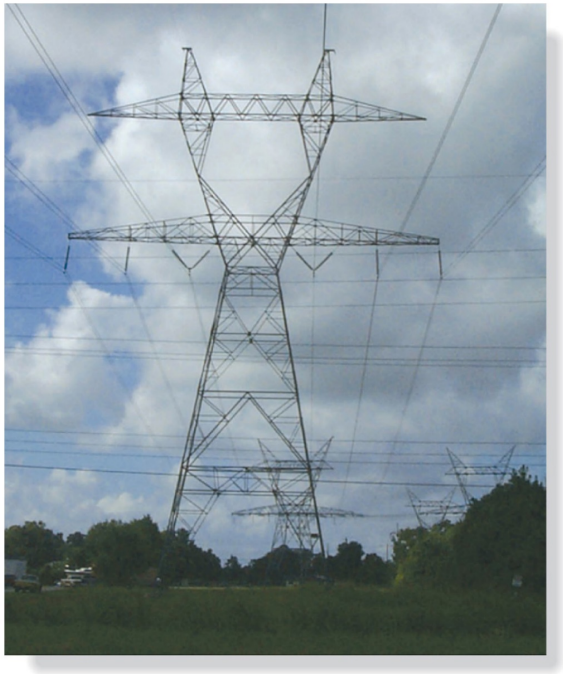
Announcements

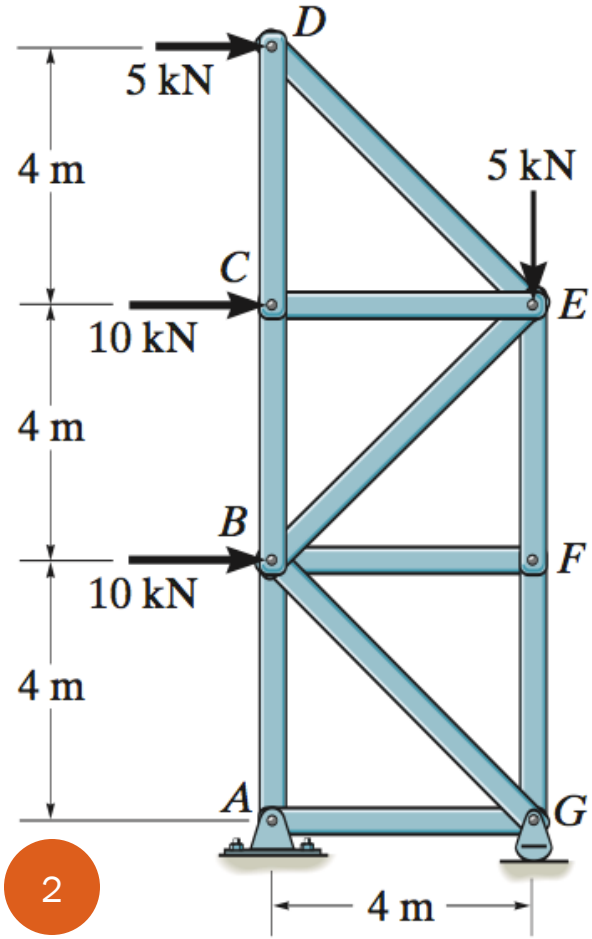
- CBTF Quiz 4 next week (10/17-20)
- Go to your discussion sessions

- Upcoming deadlines:
- Thursday (10/12)
  - ME HW13
- Friday (10/13)
  - WA #2

Recap

- Truss Analysis





Frames and machines

Frames and machines are two common types of structures that have at least **one multi-force member** (Recall that trusses have nothing but two-force members).

Frames are generally **stationary** and used to support various external loads.

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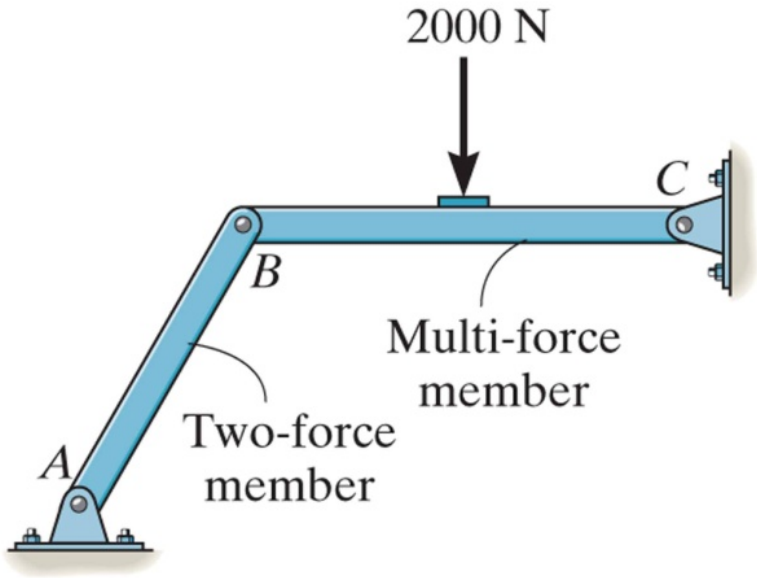
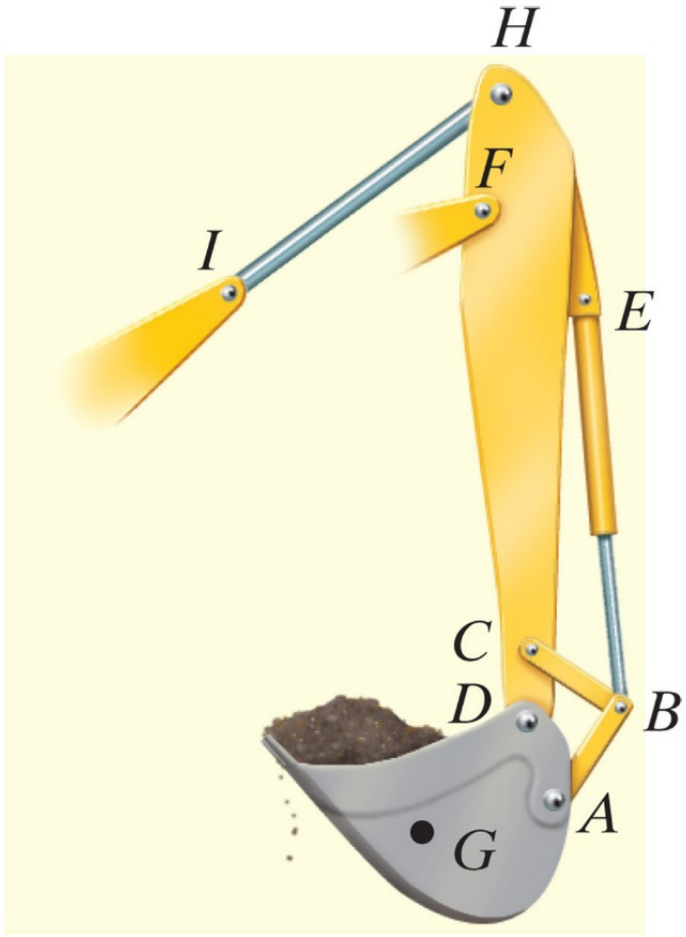
Machines contain **moving parts** and are designed to alter the effect of forces.

Frames and machines

The members can be truss elements, beams, pulleys, cables, and other components. The general solution method is similar to rigid body at equilibrium analysis:

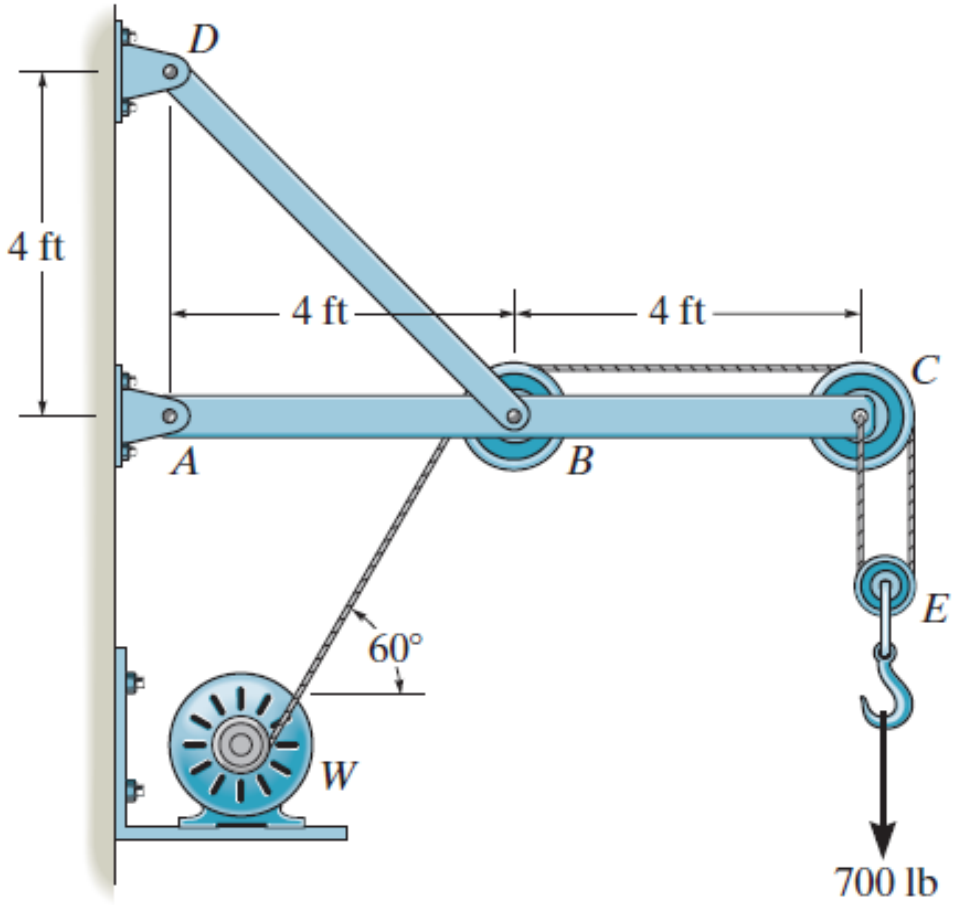


Draw the FBD of the members of the backhoe. The bucket and its contents have a weight W.



Given: The wall crane supports an external load of 700 lb.

Find: The force in the cable at winch motor W and the horizontal and vertical components of pin reactions at *A*, *B*, *C*, and *D*.



Given: The pumping unit used to recover oil has force **F** acting in the wireline at the well head. The pitman, *AD*, is pin connected at its ends and has negligible weight.

Find: the torque **M** which must be exerted by the motor in order to overcome this load.