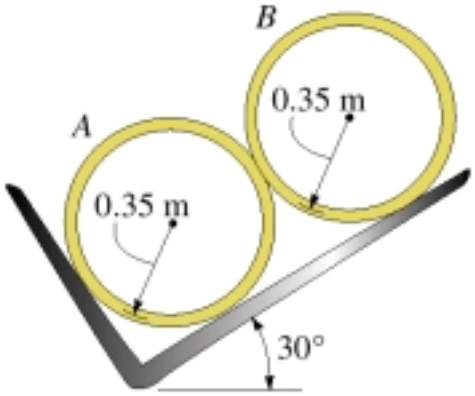
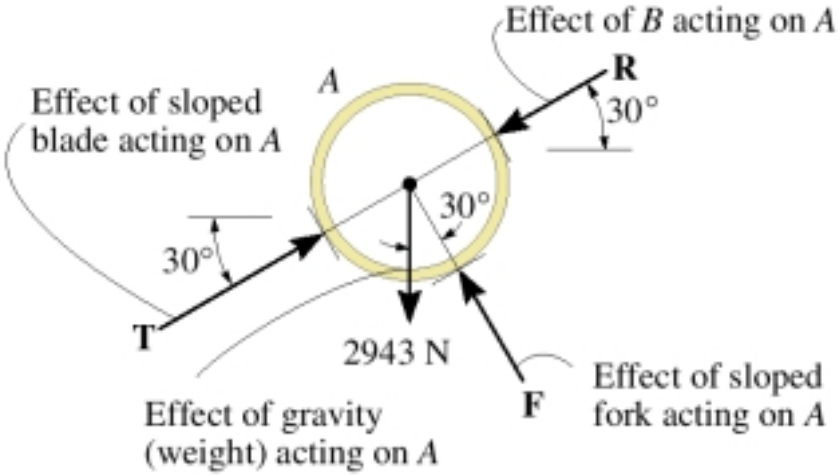
Problem 1:

Two smooth pipes each having a mass of 300 kg, are supported by the forks of the tractor, as shown. Draw the free-body diagrams for each pipe and both pipes together.
[Remember to check the first, second and third Newton's laws]

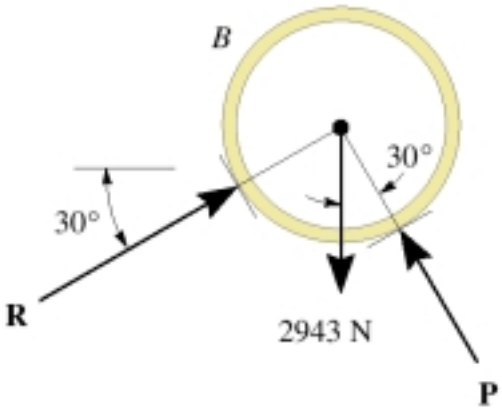
Solution:
Isolate the object from its surroundings,
Draw the outline of the object; consider all dimensions and angles,



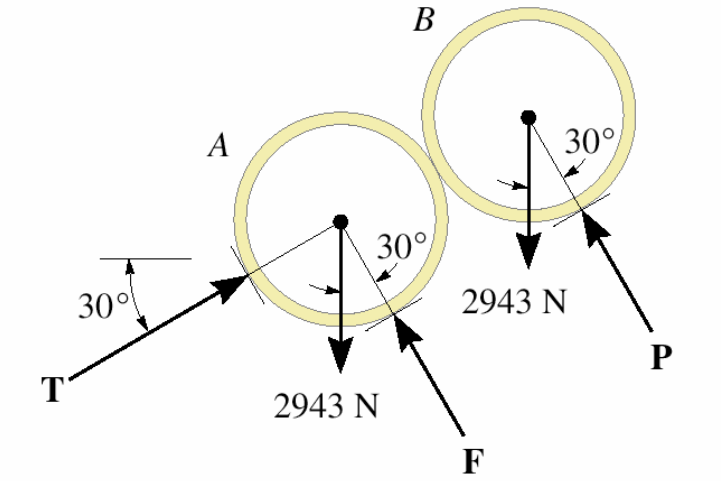
Include all forces and couple moments,
Label known forces and moments with their proper *magnitudes* and *directions*,
Unknown forces and moments should be represented with *letters*.
For pipe A:



For pipe B:



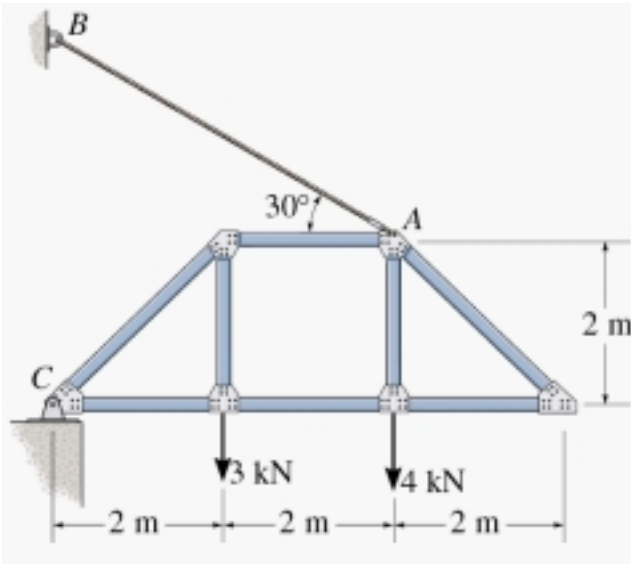
For both pipes:



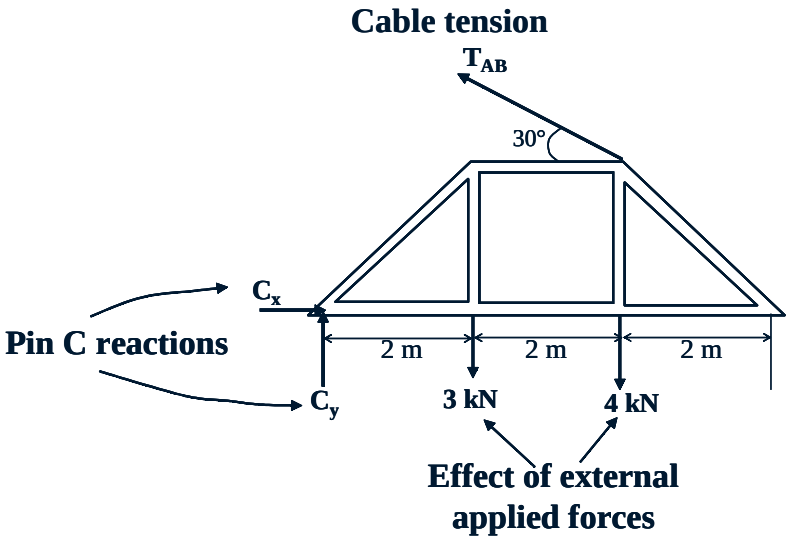
When pipes A and B are considered as one object, you neglect the reaction forces between them.

Problem 2:

Draw the free-body diagram of the truss that is supported by the cable AB and pin C. Explain the significance of each force acting on the diagram.

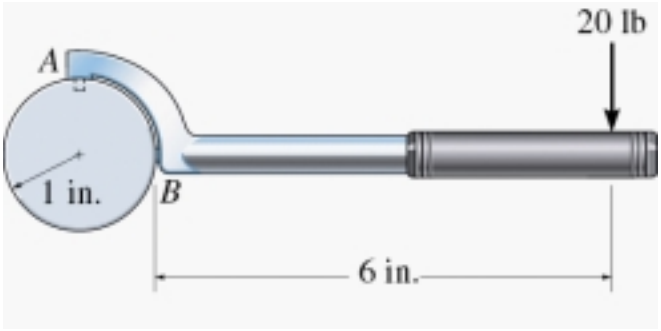


Solution:
The FBD is:



Problem 3:

Draw the free-body diagram of the "spanner wrench" subjected to the 20-lb force. The support at A can be considered a pin, and the surface of contact at B is smooth. Explain the significance of each force on the diagram.



Solution: