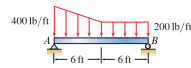
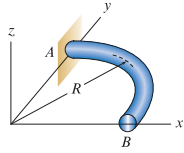


Determine the support reactions for the loading shown.

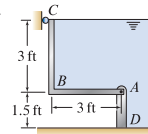


In Fig. P7.118, replace the pin and roller supports with a built-in support at  $A$ , and determine the support reactions.

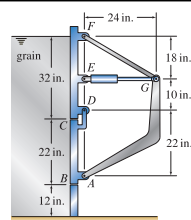
A uniform curved beam with circular shape and weight  $W$  has a built-in support at  $A$ . Determine the support reactions. Express your answers in terms of parameters such as  $W$  and  $R$ .



Water in a channel is retained by a gate with 0.5 ft width (into the plane of the figure). The gate is supported by a pin at  $A$  and a roller at  $C$ . The vertical wall  $AD$  is built into the bottom of the channel. If the gate has negligible weight, determine the support reactions.



Grain is contained in a silo. The walls of the silo are fixed, and the door  $ABCD$  can be opened to allow the grain to pour out. Door  $ABCD$  is flat, with 8 in. depth (into the plane of the figure). Idealize the grain to be a fluid with  $0.025 \text{ lb/in.}^3$  specific weight. In the position shown, the hydraulic cylinder  $EG$  is horizontal. Neglect the weights of the individual members. Determine the force the hydraulic cylinder  $EG$  must support to keep the door in equilibrium. Report your answer, using a positive value for tension in the hydraulic cylinder and a negative value for compression.



The cross section through the valve of a fuel injector for an engine is shown, where the tip of the valve has conical shape. If the fuel is at  $500 \text{ kN/m}^2$  pressure, determine the force  $F$  that must be applied to keep the valve closed. *Hint:* The pressure due to weight of the fuel is negligible compared to  $500 \text{ kN/m}^2$ .

