PROBLEM 1.34

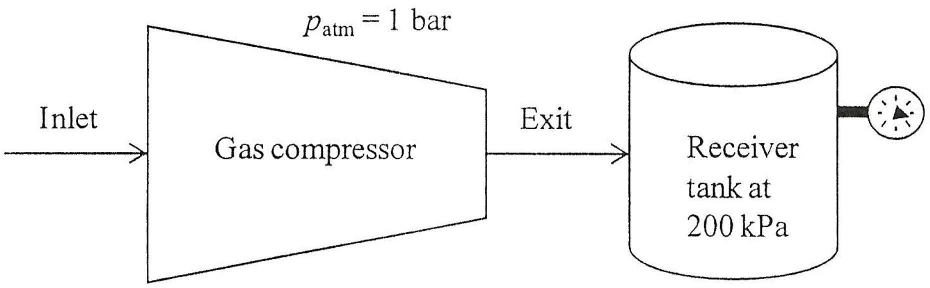

Fig. P1.34

Converting the local atmospheric pressure to kPa, we get p_{atm} = 100 kPa. Since the pressure in the tank, 200 kPa, is greater than the atmospheric pressure, the Bourdon reading is a *gage* pressure. Using the following relationship, $p_{gage} = p_{abs} - p_{atm}$ the Bourdon reading is 100 kPa. ←

PROBLEM 1.35

See Fig. P 1.35. Applying the principles discussed in Sec. 1.6.1, the atmospheric pressure is

$$p_{atm} = \rho_m g L \Rightarrow L = \frac{p_{atm}}{\rho g} = \frac{100 \times 10^3 \text{ N/m}^2}{\left(13.59 \frac{\text{g}}{\text{cm}^3}\right)\left|\frac{1 \text{ kg}}{10^3 \text{ g}}\right|\left|\frac{10^2 \text{ cm}}{1 \text{ m}}\right|^3 \left(9.81 \frac{\text{m}}{\text{s}^2}\right)}\left|\frac{1 \text{ kg}\cdot\text{m/s}^2}{1 \text{ N}}\right|$$

$$= 0.75 \text{ m} \left|\frac{10^3 \text{ mm}}{1 \text{ m}}\right|$$

$$= 750 \text{ mm Hg} \quad \leftarrow$$

Converting to in. Hg,

$$L = 750 \text{ mm Hg}\left|\frac{1 \text{ cm}}{10 \text{ mm}}\right|\left|\frac{1 \text{ in.}}{2.54 \text{ cm}}\right| = 29.53 \text{ in. Hg} \quad \leftarrow$$