

ENVE 2061

BASIC FLUID MECHANICS

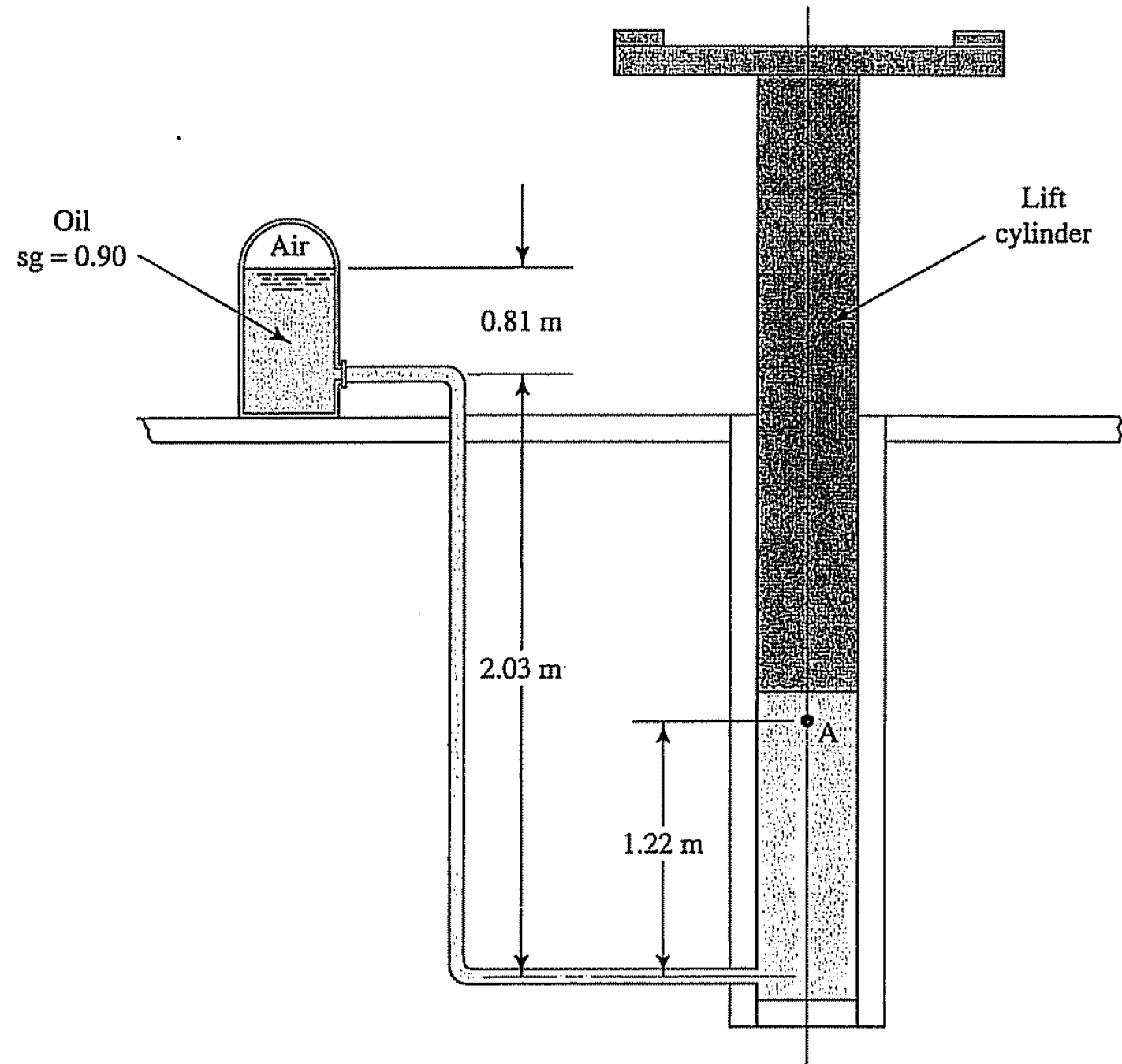
Practice Problems
(Pressure elevation relationship, Manometers)

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Pressure–Elevation Relationship

- 3.24 If milk has a specific gravity of 1.08, what is the pressure at the bottom of a milk can 550 mm deep?
- 3.26 The pressure at the bottom of a tank of propyl alcohol at 25°C must be maintained at 52.75 kPa(gage). What depth of alcohol should be maintained?
- 3.31 Figure 3.20 shows a diagram of the hydraulic system for a vehicle lift. An air compressor maintains pressure above the oil in the reservoir. What must the air pressure be if the pressure at point A must be at least 1240 kPa(gage)?

FIGURE 3.20 Vehicle lift for Problem 3.31.



- 3.34 For the tank shown in Fig. 3.22, determine the reading of the bottom pressure gage in kPa(gage) if the top of the tank is vented to the atmosphere and the depth of the oil h is 8.7 m.

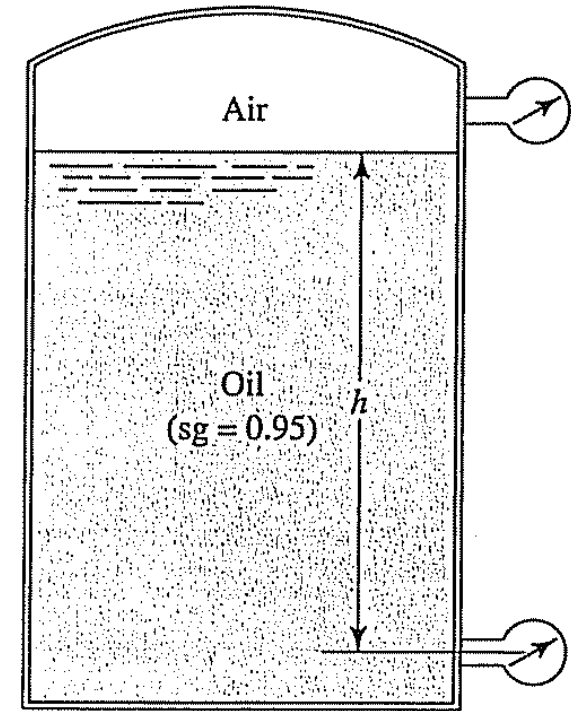


FIGURE 3.22 Problems 3.34–3.37.

- 3.36 For the tank shown in Fig. 3.22, determine the reading of the bottom pressure gage in kPa(gage) if the top of the tank is sealed, the top gage reads -74.5 kPa(gage), and the depth of the oil h is 1.91 m.

3.40 Figure 3.23 represents an oil storage drum that is open to the atmosphere at the top. Some water was accidentally pumped into the tank and settled to the bottom as shown in the figure. Calculate the depth of the water h_2 if the pressure gage at the bottom reads 158 kPa(gage). The total depth $h_T = 18.0$ m.

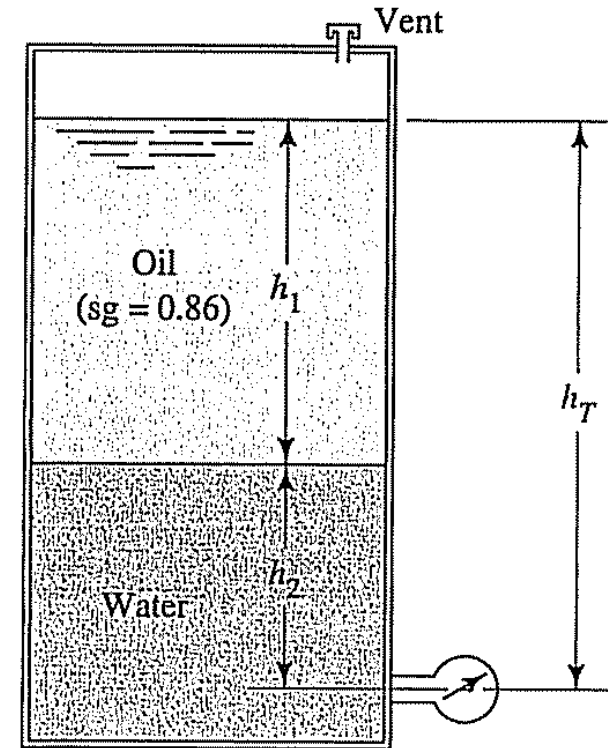


FIGURE 3.23 Problems 3.38–3.40.

3.46 Determine the pressure at the bottom of the tank in Fig. 3.26.

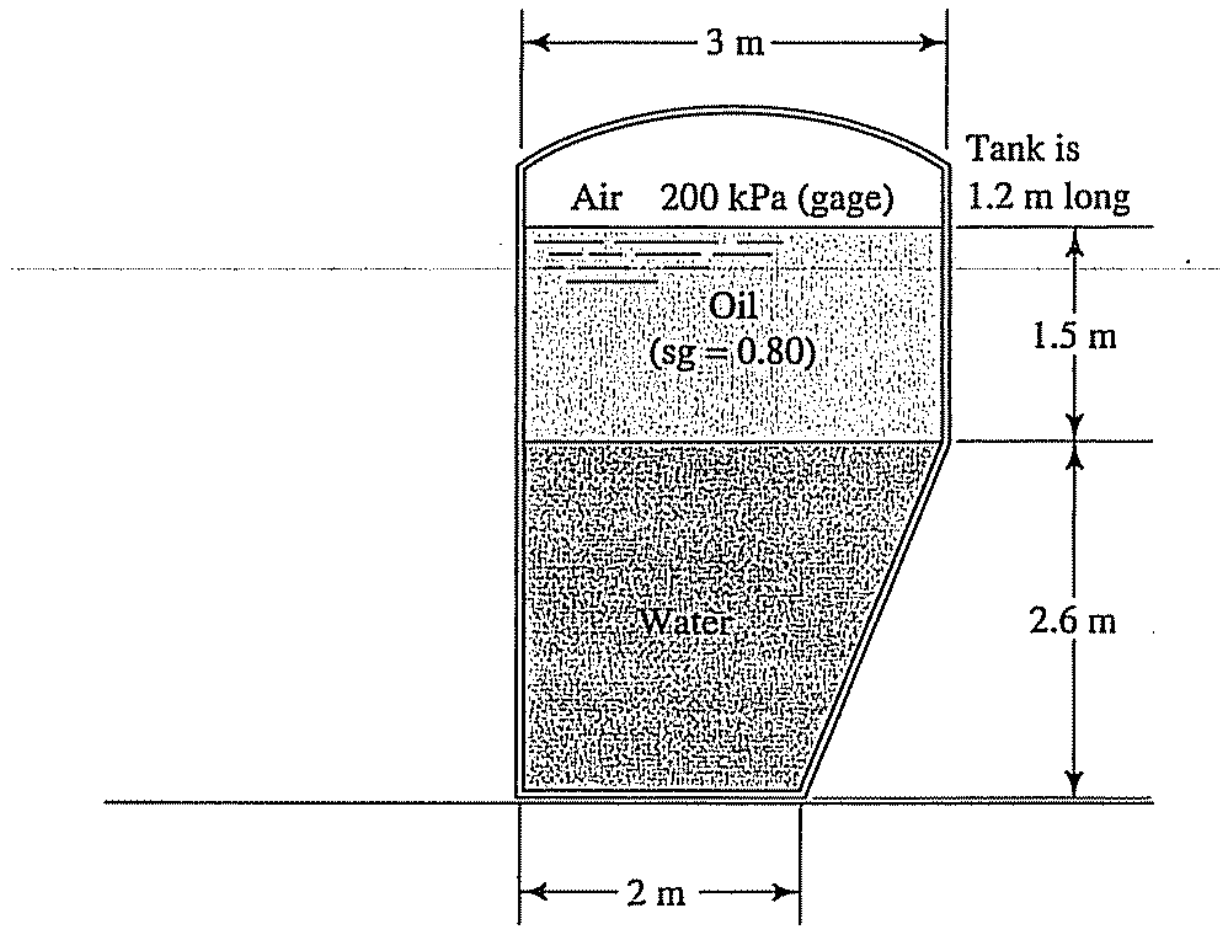


FIGURE 3.26 Problem 3.46.

3.52 Water is in the pipe shown in Fig. 3.27. Calculate the pressure at point A in kPa(gage).

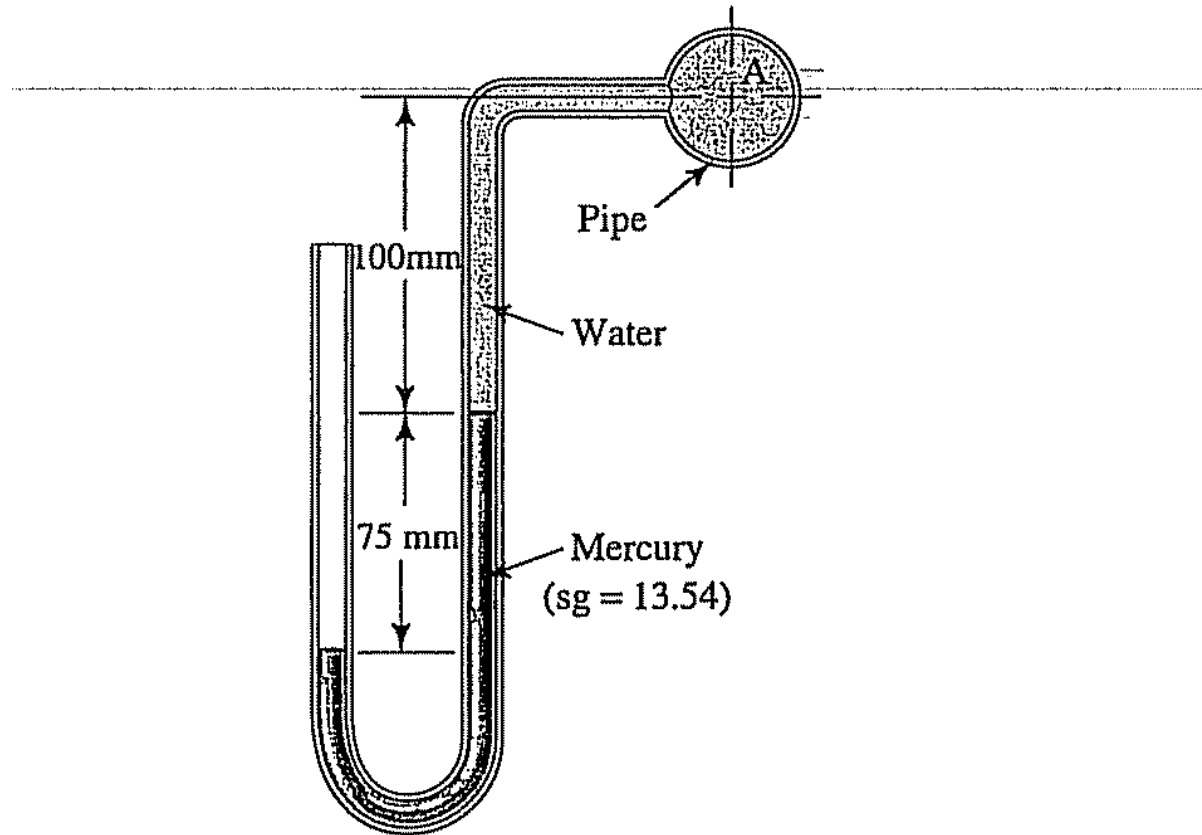


FIGURE 3.27 Problem 3.52.

3.56 For the manometer shown in Fig. 3.31, calculate $(p_A - p_B)$.

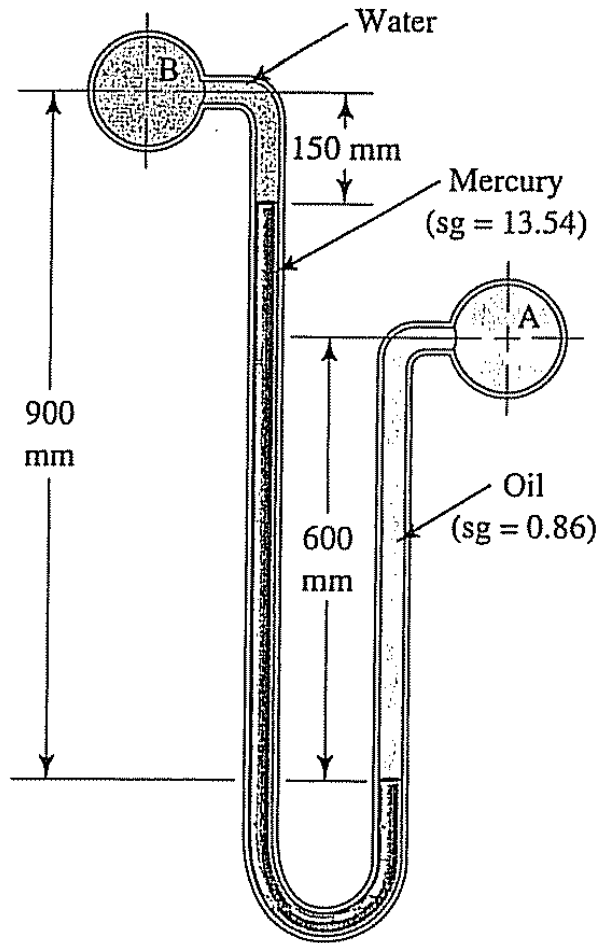


FIGURE 3.31 Problem 3.56.

3.57 For the compound manometer shown in Fig. 3.32, calculate the pressure at point A.

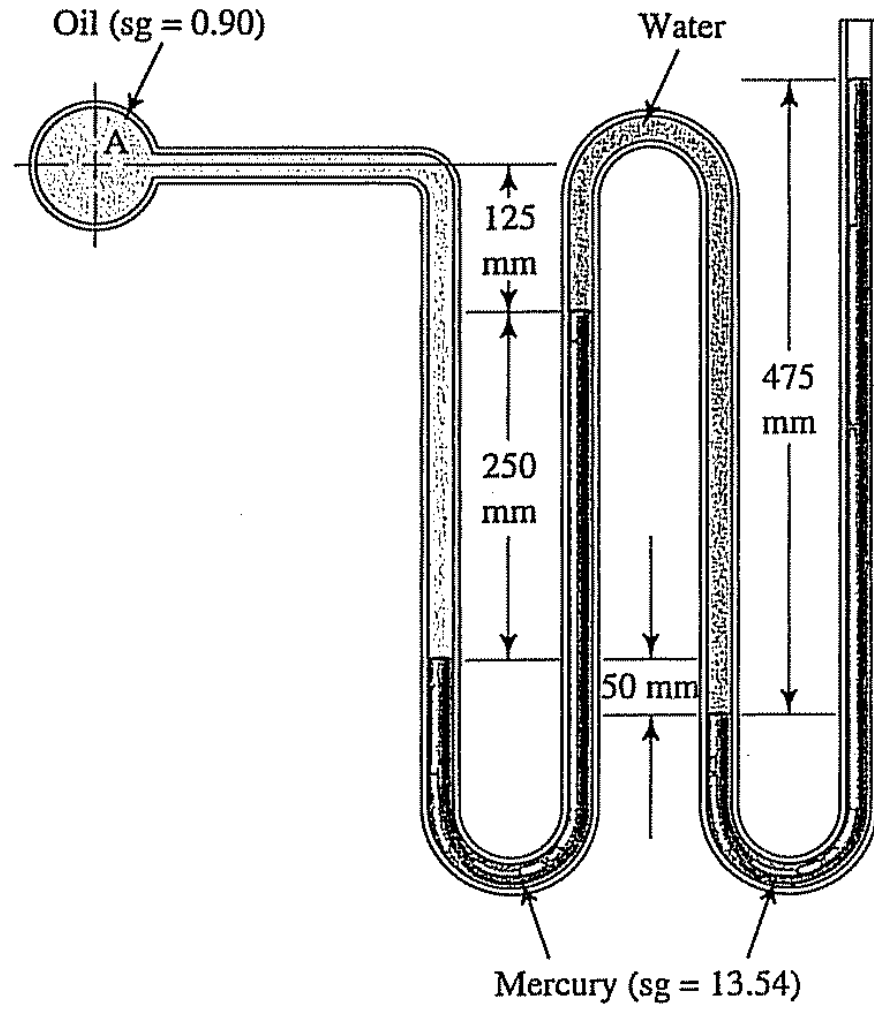


FIGURE 3.32 Problem 3.57.