

Problem 2 3.11

4000' above sea level
atmospheric pressure?

$$\Delta P = \gamma h$$

$$(4000') (0.0764) = 305.6 \frac{\text{lb}}{\text{ft}^2}$$

$$\frac{305.6 \frac{\text{lb}}{\text{ft}^2}}{\left(\frac{12''}{144}\right)^2} = 2 \text{ PSI}$$

less pressure 1 atm

$$14.7 - 2 = 12.7 \text{ PSI}$$

3.13

Page w/ width of glass at min

Surface = oil

3.41

$$\text{Pressure} \geq 180 \text{ PSI} \quad \gamma_{\text{oil}} = (0.90) \quad (48'')$$

$$\Delta P = \gamma h \quad \gamma = \frac{\gamma_s}{\gamma_{\text{water}}} \quad (80'')$$

$$\gamma = \frac{\gamma_s}{1.54}$$

$$(0.9) (62.4 \frac{\text{lb}}{\text{ft}^3}) = \frac{56.16 \frac{\text{lb}}{\text{ft}^3}}{12^3} = \gamma_{\text{oil}} = .0325 \frac{\text{lb}}{\text{in}^3}$$

$$P_{\text{air}} + (.0325) (32'') + (.0325) (80'') - (.0325) (48'')$$

$$= 180$$

$$P_{\text{air}} = 180 - 2.68 = 177.3 \frac{\text{lb}}{\text{in}^2}$$