



$$F = 0.2 \text{ lb}$$

$$\vec{r} = 0\hat{i} + 2\hat{j} - 8\hat{k}$$

$$\hat{e}_s = 0\hat{i} + 0.2425\hat{j} - 0.9701\hat{k}$$

$$\vec{r}_{AB} = -5\hat{i} + 5\hat{j} - 4\hat{k}$$

$$\hat{e}_{AB} = -0.6155\hat{i} + 0.6155\hat{j} - 0.4923\hat{k}$$

$$\vec{F} = F\hat{e}_{AB} = -0.1231\hat{i} + 0.1231\hat{j} - 0.09847\hat{k}$$

$$F_{\text{parallel}} = (\hat{e}_s \cdot \vec{F}) \hat{e}_s$$

$$= [(0\hat{i} + 0.2425\hat{j} - 0.9701\hat{k}) \cdot (-0.1231\hat{i} + 0.1231\hat{j} - 0.09847\hat{k})] (0\hat{i} + 0.2425\hat{j} - 0.9701\hat{k})$$

$$\vec{F}_{\text{parallel}} = 0\hat{i} - 0.03040\hat{j} - 0.1216\hat{k} \quad \text{lb}$$

$$\vec{F}_{\text{normal}} = \vec{F} - \vec{F}_{\text{parallel}}$$

$$= (-0.1231\hat{i} + 0.1231\hat{j} - 0.09847\hat{k}) - (0\hat{i} - 0.03040\hat{j} - 0.1216\hat{k})$$

$$= -0.1231\hat{i} + 0.09270\hat{j} + 0.02310\hat{k} \quad \text{lb}$$