

PROB. 13-120

$$W = (40,000 \text{ TON}) \left(\frac{2000 \text{ LB}}{\text{TON}} \right) = 8 \times 10^7 \text{ LB}$$

$$U_1 = (2.5 \frac{\text{mi}}{\text{hr}}) \left(\frac{\text{hr}}{3600 \text{ s}} \right) \left(\frac{5280 \text{ ft}}{\text{mi}} \right) = 3.667 \frac{\text{ft}}{\text{s}}$$

$$F = (35 \text{ kip}) \left(\frac{1000 \text{ LB}}{\text{kip}} \right) = 3.5 \times 10^4 \text{ LB}$$

$$U_2 = 0$$

FIND Δt

$$m \vec{U}_1 + \sum \vec{\text{Imp}}_{1-2} = m \vec{U}_2$$

$$\boxed{\text{ }} \xrightarrow{mU_1} + \boxed{\text{ }} \xleftarrow{F \cdot \Delta t} = \boxed{\text{ }} \xrightarrow{mU_2 = 0}$$

$$mU_1 - F \cdot \Delta t = 0$$

$$\Delta t = \frac{mU_1}{F} = \frac{WU_1}{gF}$$

$$\Delta t = \frac{(8 \times 10^7 \text{ LB}) \left(3.667 \frac{\text{ft}}{\text{s}} \right)}{(32.2 \frac{\text{ft}}{\text{s}^2}) (3.5 \times 10^4 \text{ LB})} = 260.3^{\text{s}} = 4^{\text{min}} 20.3^{\text{s}}$$