**Problem 2.21**

**Known:** The force associated with travelling resistance of the tires of a truck is known as a function of the truck weight.

**Find:** Determine the power required by the truck to overcome rolling resistance.

**Schematic & Given Data:**

\[ f = 0.0069 \]

**Engg. Model:** The truck is the system.

**Analysis:** Applying Eq. 2.13, the power required to overcome rolling resistance is

\[ W_r = F_r \cdot V = (fW)V \]

\[ = (0.0069)(3225 \text{ kN})(110 \text{ km}) \left( \frac{10^3 \text{ m}}{1 \text{ km}} \right) \left( \frac{1 \text{ h}}{3600 \text{ s}} \right) \left( \frac{1 \text{ J}}{10^3 \text{ Nm}} \right) \left( \frac{1 \text{ kW}}{10^3 \text{ J/s}} \right) \]

\[ = 68 \text{ kW} \]

\[ \Rightarrow W_r \]