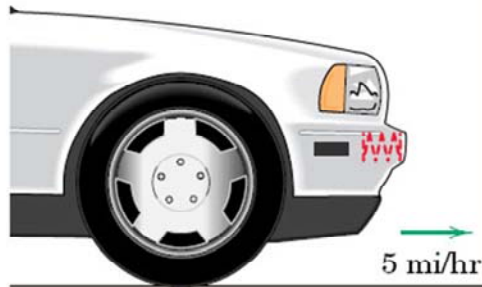


Work and Kinetic Energy: Exercise 2



The design of a spring bumper for a **3500-lb** car must stop the car from a **speed of 5 mph** in a **distance of 6 in** of **spring deformation**.

Determine the **stiffness k** for each of two springs behind the bumper.

ME 231: Dynamics

3/111 $U_{1-2} = \Delta T; 2\left(\frac{1}{2}kx^2\right) = \frac{1}{2}mv^2 - 0$

$$k = \frac{1}{2} \frac{mv^2}{x^2} = \frac{1}{2} \frac{3500 \left(\frac{5}{30} \cdot 44\right)^2}{\left(\frac{6}{12}\right)^2} \frac{1}{12} = \underline{974 \text{ lb/in.}}$$