

Given: Mass (m): 201.5 lb
 Max velocity (v): 25 mph
 max stopping distance (s): 40 ft

S.F.

$$m = 226.796 \text{ kg}$$

$$V = 11.176 \text{ m/s}$$

$$S = 12.192 \text{ m}$$

Find: Straight Line stopping force needed

assume: motion in one plane

Total mass of Vehicle + Driver

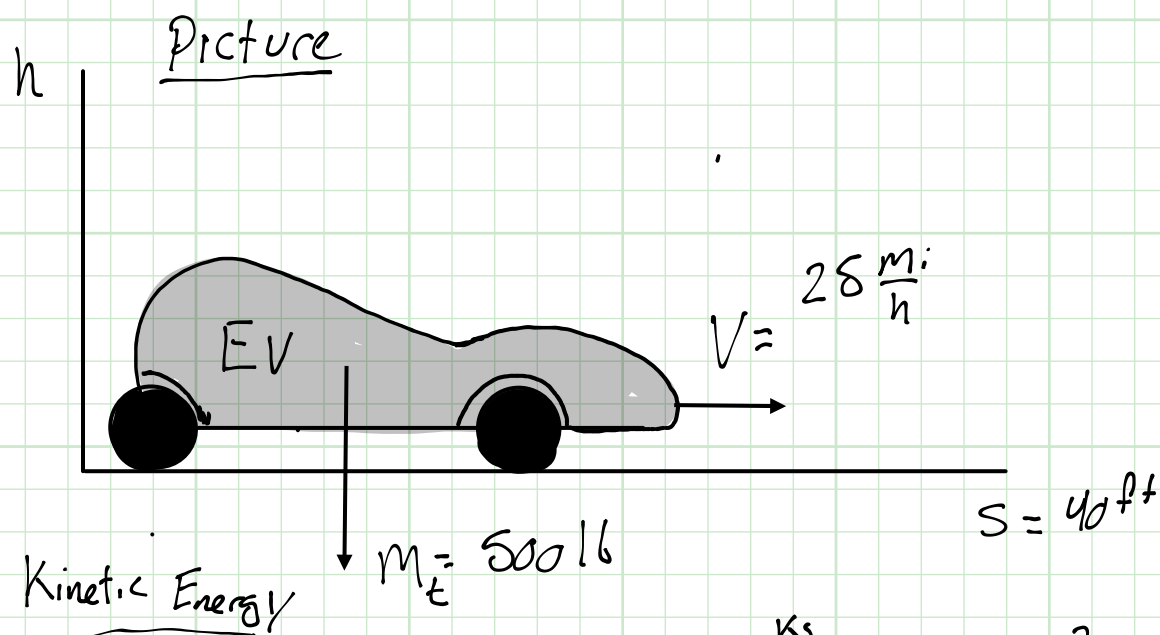
$$M_t = 500 \text{ lb} \approx 226.796 \text{ kg}$$

neglect friction

method:

Energy + Work Eqs

Solution: in metric



$$KE = \frac{1}{2} m v^2 = \frac{1}{2} (226.79) \left(11.176 \frac{\text{m}}{\text{s}} \right)^2 = 14163.373 \frac{\text{kg m}^2}{\text{s}^2} (\text{J})$$

Work

$$W = F D \rightarrow F = \frac{W}{D} = \frac{14163.373 \frac{\text{kg m}^2}{\text{s}^2}}{12.192 \text{ m}} = \boxed{1161.69 \frac{\text{kg m}}{\text{s}^2} (\text{N})}$$

for reference: 261.09 Lbf

