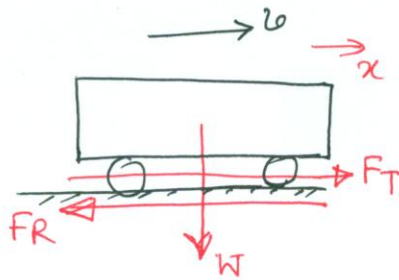


1494/P.426



$W = 8.05 \text{ Ton}$
 $v_0 = 10 \text{ mph}$
 $v_f = 45 \text{ mph}$
 $S = 2000 \text{ ft}$
 $F_R = 500 \text{ lb}$

- (a) Max^m h.p. = ?
- (b) h.p. for 10 mph = ?
- (c) $F_T = ?$

$F_T \rightarrow$ Tractive force
 $F_R \rightarrow$ Resistive force

Solⁿ

$$v_f^2 = v_0^2 + 2as$$

here, $v_0 = \frac{10 \times 1760 \times 3}{60 \times 60} = 14.67 \text{ fps}$

$v_f = \frac{45 \times 1760 \times 3}{60 \times 60} = 66 \text{ fps}$

$\therefore 66^2 = 14.67^2 + 2 \times a \times 2000 \Rightarrow a = 1.035 \text{ fps}^2$

$$\Sigma F_x = ma$$

$$\Rightarrow F_T - F_R = \frac{W}{g} \cdot a$$

$$\Rightarrow F_T - 500 = \frac{8.05 \times 2000}{32.2} \times 1.035$$

$\therefore F_T = \boxed{1017.5 \text{ lb}}$

Max^m h.p. = $\frac{1017.5 \times 66}{550} = \boxed{122.14}$

$\boxed{1 \text{ hp.} = 550 \text{ ft-lb/s}}$

h.p. for 10 mph = $\frac{1017.5 \times 14.67}{550} = \boxed{27.13}$