Answer on Question 64159, Physics, Other

Question:

An elevator is moving upward at 0.96 m/s when it experiences an acceleration 0.35 m/s^2 downward, over a distance of 0.71 m. What will its final velocity be?

Solution:

We can find the final velocity of an elevator from the kinematic equation:

$$v_f^2 = v_i^2 + 2as,$$

here, v_f is the final velocity of the elevator, v_i is the initial velocity of the elevator, a is the acceleration of the elevator (acceleration will be with sign minus because it directed downward), s is the distance travelled by elevator.

From this formula we can find v_f :

$$v_f = \sqrt{v_i^2 - 2as} = \sqrt{\left(0.96 \ \frac{m}{s}\right)^2 - 2 \cdot 0.35 \ \frac{m}{s^2} \cdot 0.71 \ m} = 0.65 \ \frac{m}{s}$$

Answer:

 $v_f = 0.65 \ \frac{m}{s}.$

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