

Answer on Question #79714 - Physics - Mechanics | Relativity

A freight car of mass m starts moving to the right due to constant horizontal force F . Sand spills on the car on a stationary hooper. The velocity of loading is constant equal to X km/sec. Find the time dependence of the velocity and the acceleration of the car in process of loading

$$F = m \cdot a;$$

$$a = F/m = F/(m_0 + X \cdot t)$$

$$v = \int_0^t a dt = \int_0^t \frac{F}{m_0 + X \cdot t} dt = \frac{F}{X} \ln \frac{m_0 + X \cdot t}{m_0}$$

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