

## 21.2: Translational Equation of Motion

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We shall think about the system of particles as follows. We treat the whole system as a single point-like particle of mass  $m_T$  located at the center of mass moving with the velocity of the center of mass  $\vec{V}_{cm}$ . The external force acting on the system acts at the center of mass and from our earlier result (Equation 10.4.9) we have that

$$\vec{F}^{\text{ext}} = \frac{d\vec{p}_{\text{sys}}}{dt} = \frac{d}{dt} \left( m_T \vec{V}_{cm} \right)$$

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