$$\mathbf{m = constant}$$

$$\vec{F} = k\frac{d(m\vec{V})}{dt}$$

$$\Delta U = Q + \frac{W}{J}$$

$$\Sigma(\dot{m})_{in} = \Sigma(\dot{m})_{out}$$

$$\frac{dm}{dt} = \varrho VA \equiv \dot{m} = \mathbf{constant}$$

$$\mathbf{VA = constant}$$

$$\vec{F} = \Sigma(\dot{m}\vec{V})_{out} - \Sigma(\dot{m}\vec{V})_{in}$$

$$\vec{F} = \dot{m}(\vec{V}_{out} - \vec{V}_{in})$$

$$\Sigma F_x = \dot{m}(V_{out_x} - V_{in_x})$$

$$\Sigma F_y = \dot{m}(V_{out_y} - V_{in_y})$$

$$\Sigma F_z = \dot{m}(V_{out_z} - V_{in_z})$$