Bernoulli's Equation





$$\frac{d}{dt} \int_{CV} \rho dV = 0$$

$$\int_{CS} (\rho \mathbf{u}_{rel} \cdot d\mathbf{A}) = \rho (V + \frac{1}{2} dV) (A + \frac{1}{2} dA)$$

$$-\rho (V - \frac{1}{2} dV) (A - \frac{1}{2} dA)$$

$$= \rho V dA + \rho A dV + H.O.T.$$

 $\therefore V dA = -A dV$