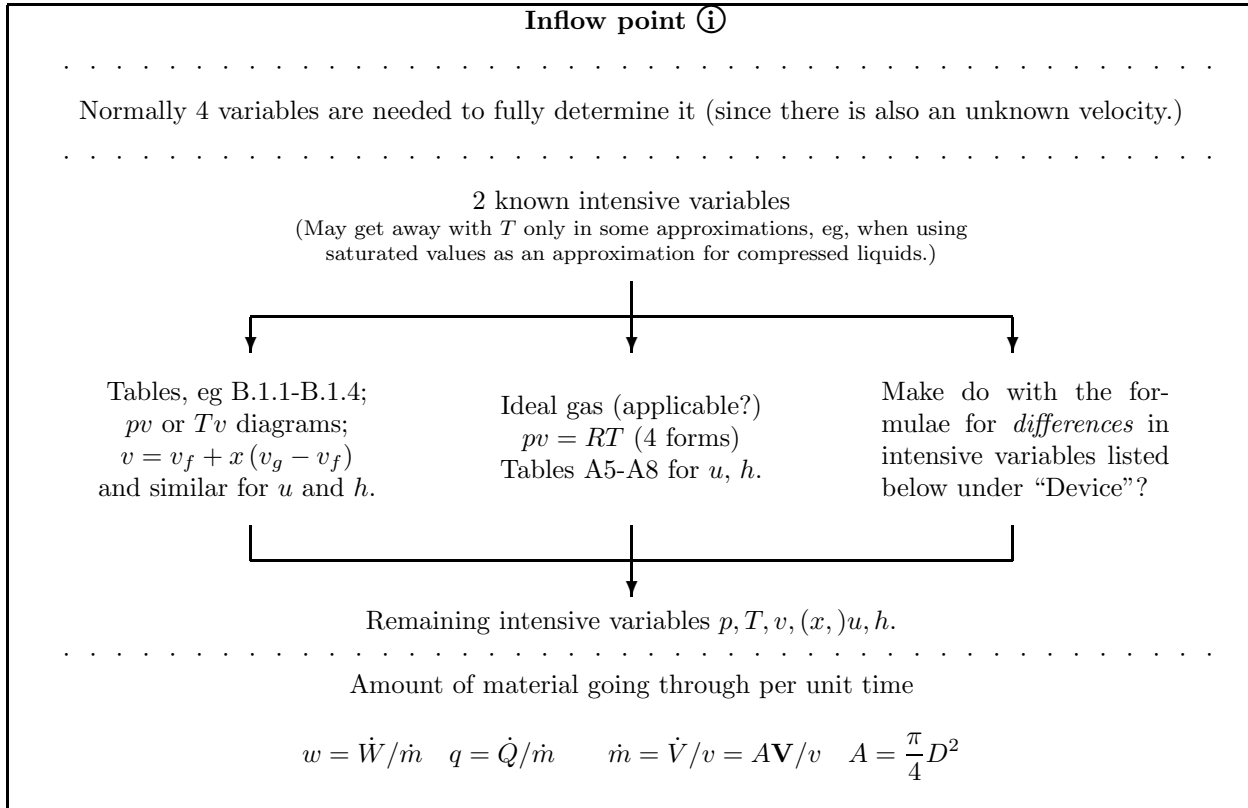


# Typical Steady State Control Volume Problem Chart

(Not complete material coverage)



## Device or Control Volume

**C1:** Type of Device? Given that  $\dot{Q} = 0$ ?

Do the given device characteristics add info about ① or ② ?

**C2:** Mass:

$$\sum \dot{m}_i = \sum \dot{m}_e$$

Adds info about ① or ② ?

Energy:  $\dot{Q} + \sum \dot{m}_i (h_i + \frac{1}{2}\mathbf{V}_i^2? + gZ_i?) = \sum \dot{m}_e (h_e + \frac{1}{2}\mathbf{V}_e^2? + gZ_e?) + \dot{W}$

Adds info about ① or ② ?

**C3:** Device has  $\dot{W} = 0$ ?

For ideal gasses:

$$h_2 - h_1 = \int_1^2 C_p dT \approx C_{p,ave} (T_2 - T_1)$$

For compressed liquids, *by approximation*, best at constant pressure:

$$h_2 - h_1 \approx C_{(p),ave} (T_2 - T_1)$$

## Exit point ②

Same procedures as entrance point ①