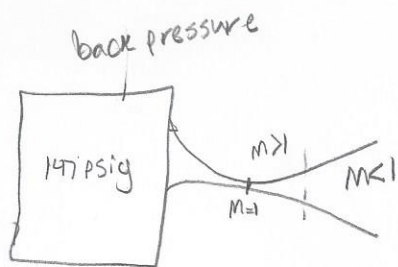


2



$$T = 160^\circ\text{F}$$

$$P = 147 \text{ psig}$$

$$\text{Shock at } S = 1.44 S_{\text{throat}}$$

$$Q = 0$$

$$\Delta S = 0$$

$$\frac{S}{S^*} = \frac{1}{N_{Ma}} \left[\frac{2 + (\gamma - 1) N_{Ma}^2}{\gamma + 1} \right]^{\frac{\gamma + 1}{2(\gamma - 1)}}$$

$$\frac{1.448}{S} = \frac{1}{N_{Ma}} \left[\frac{2 + (1.4 - 1) N_{Ma}^2}{2.4} \right]^3$$

$$1.44 N_{Ma} = \frac{(2 + 0.4 N_{Ma}^2)}{(2.4)^3}$$

$$N_{Ma} = 1.80$$

$$2.71 N_{Ma}^{1/3} = 2 + 0.4 N_{Ma}^2$$

$$0.4 N_{Ma}^2 - 2.71 N_{Ma}^{1/3} + 2 = 0$$

$$\cancel{N_{Ma} = 0.453} \quad \text{divergent section is supersonic}$$

$$N_{Ma} = 1.800$$