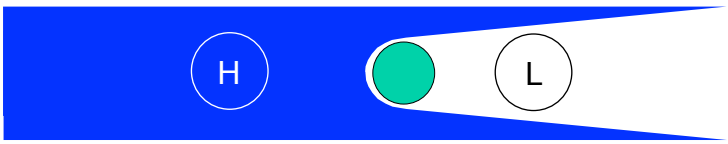
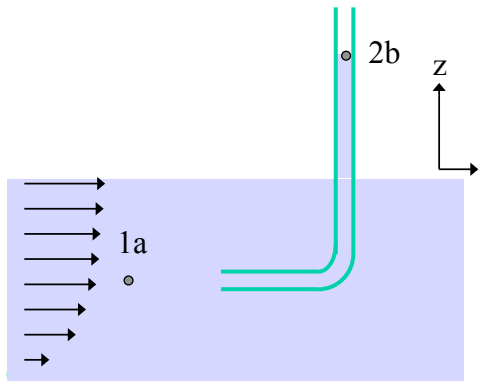
Viscosity - μ

- Highly viscous fluids have difficulty getting around objects creating large drag due to high pressure in front and low pressure behind



Viscosity - μ

Stagnation Tube Experiment



Bernoulli's Law
Conservation of Energy

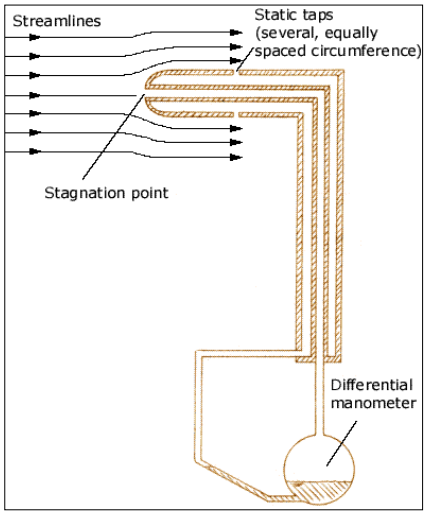
*Along a fluid streamline

$$\frac{1}{2}\rho v^2 + \rho g h + p = \text{Constant}^*$$

Directed Kinetic Energy | Gravitational Potential Energy | Random Kinetic Energy | (Per Volume)

- **Knowing, Pressures and ρ**
- **We can find speed V ?**

Pitot Probe/Total Pressure



Answer

$$p_0 = p_{stat} + \frac{1}{2}\rho V^2, Bernoulli$$

$$V = \sqrt{2(p_0 - p_{stat})/\rho}$$

Newton's Law

F=ma

(F= ?, m=?, a=?, x=? t=? C=? D=?)

F/m=a =dv/dt

dv = F/m dt

v= F/m t + C

v = F/m t + C

v= dx/dt

dx = (F/m t + C)dt

x = F/m t^2/2 + Ct + D

Modify F with Drag and Friction loss to make it simple

F_{net}= Thrust –Drag-Friction (direction ?)

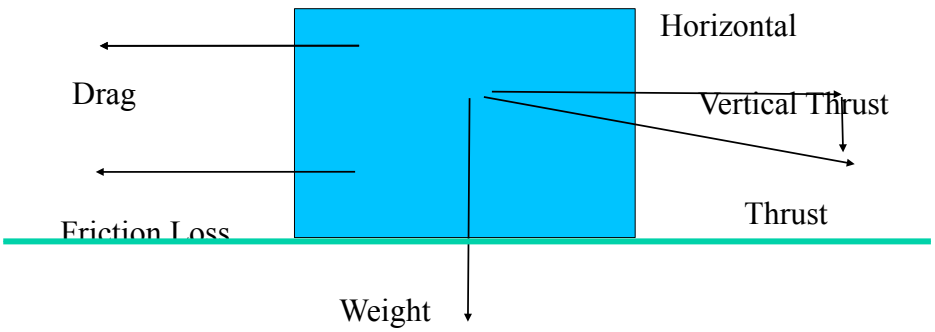
where:

$$C_d \frac{1}{2} \rho v^2 \quad Area \quad = \quad \text{Drag (Force)}$$

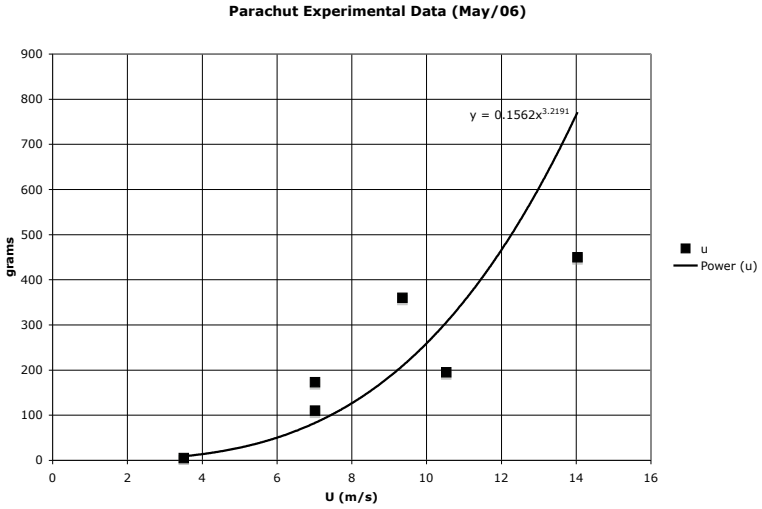
$$\mu \ * Weight \quad = \quad \text{Friction Force}$$

rho=?, Coeff=? V=?, A=?

Free Body Diagram



Raw Data



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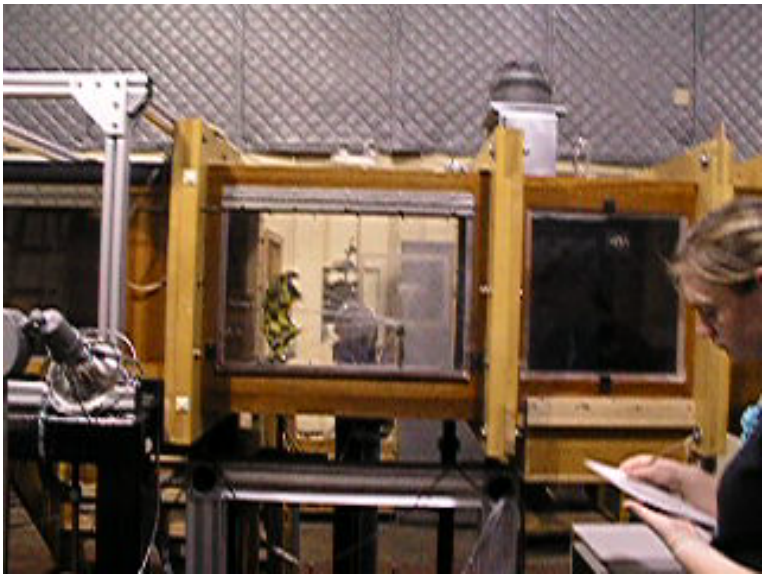

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