Project: P20250
Document: Motor Thrust vs Input Voltage
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Test ID: T1

Objective:
To determine the relationship between motor input voltage and thrust in water.

Experimental Apparatus:

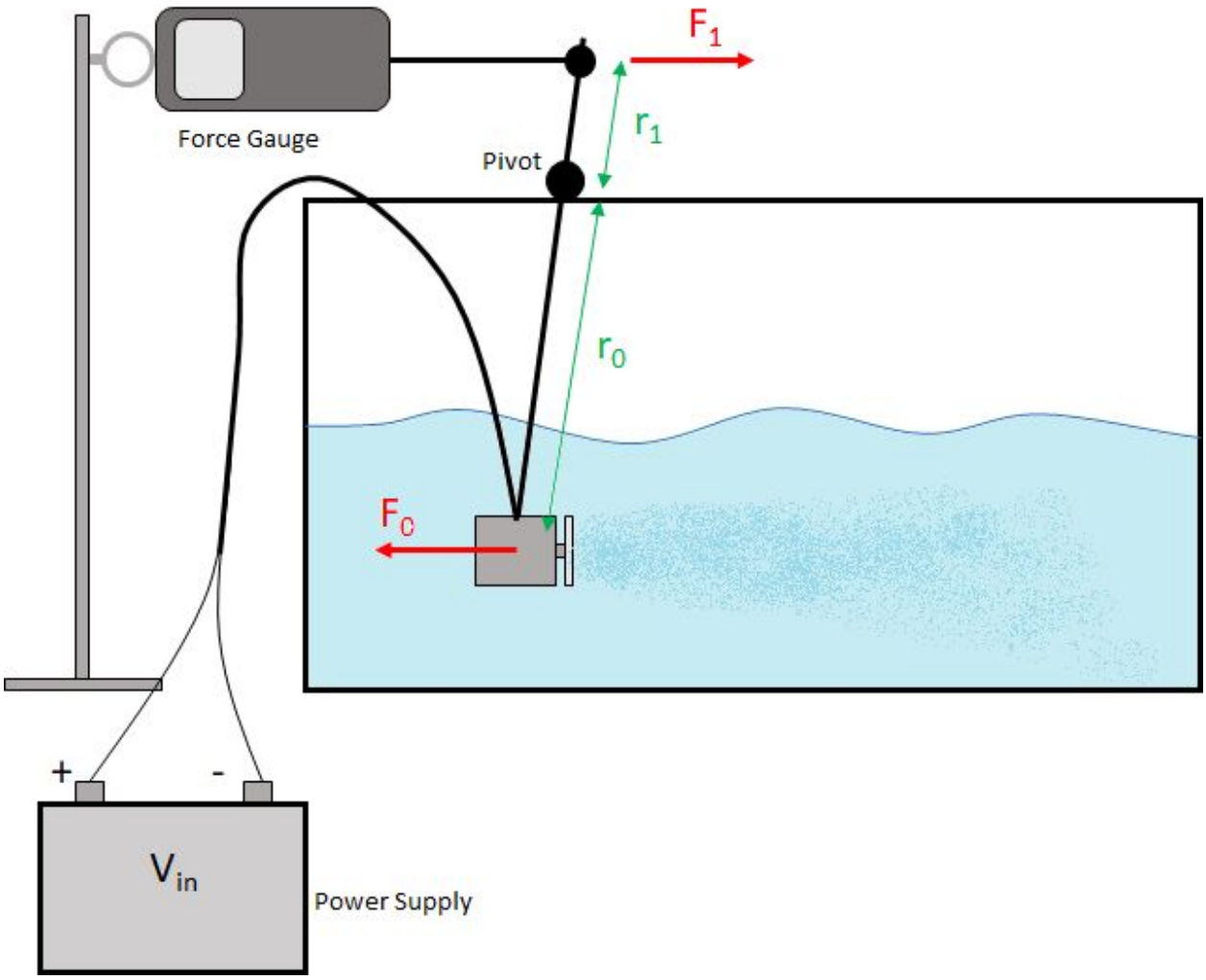

Figure 1: Test set-up schematic

Assumptions:

1. Rigid rod
2. Displacement is small enough for small angle approximation (choose the right force gauge stiffness to ensure)
3. Tank will not significantly impact the flow of water available to the motor

Analysis:

1. Balancing the moments around the pivot, it can be found that:

   $F_0 r_o = F_1 r_1$

2. Solving for F0, we get:

   $F_0 = \frac{r_1}{r_0} F_1$

Test Location:

Test Procedure:

1. Set up apparatus
2. Zero force gauge
3. Set input voltage to desired set-point
4. Read force measurement
5. Convert to F0
6. Adjust desired set-point, repeat 3-5 over a range of input voltages

Data:

- R0 =
- R1 =

Input voltage [V]	Current Draw [A]	Motor Thrust [N]

Table 1: test results

Conclusions:

Reference: https://www.youtube.com/watch?v=Ca2WIb6lR7g