**Weight/Torque calculation of Robot**

**Purpose of Documentation:**  
Calculation for the predicted new weight of V1 and required amount of torque to start the robot moving.

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| --- | --- | --- |
|  | OLD | V1 (29/09/2022)(w/o new body) |
| Weight | Body + Gimbal + 12 AX-12A motors = 2.2kg    Body + Gimbal + 12x(0.0546) = 2.2kg    Body + Gimbal = 1.5448kg | Body + Gimbal = 1.5448kg    Body + Gimbal + 8AX-12A motors + 4MX-64T=  Body + Gimbal + 8x(0.0546) + 4x(0.126) = 2.4856    DVS Camera= 0.112kg  Camera Case= 0.077kg  Camera Lens=52.5kg    Total Weight of Entire Camera attached= 0.2415    Weight of Entire Body + Camera attached=  2.4856 + 0.2415= 2.7271kg |
| Calculated Torque From Motors | 0.15kgf x 12= 1.8kgf max for stall Torque | 0.15kgf x 8 = 1.2kgf    0.6116kgf x 4 = 2.4464kgf    2.4464kgf + 1.2kgf =3.6464kgf |
| Required torque | 2.2kg minimum. Existing torque only outputs 1.8kgf, 0.4kgf lesser | 2.8kg minimum. Existing torque outputs 3.6464kgf. By theory it should be able to move the robot. |

\*Calculations do not include how much torque to overcome stiction? (needed: Info on mechanics, as kind of wheels, surface, style of movement)

Areas of concern: New parts/resized parts to accommodate the new motors should not weigh over 800grams

References:

Stiction Explanation:

<https://en.wikipedia.org/wiki/Stiction>

Friction Explanation:

<https://en.wikipedia.org/wiki/Friction>

Analytical Dynamics Explanation:

<https://en.wikipedia.org/wiki/Analytical_dynamics>

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