# Calculation For Torque Required

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## Purpose of Documentation:

Calculation for the required amount of torque to start the robot moving.

| | OLD | NEW |
|---|---|---|
| Weight | Body + Gimbal + 12 AX-12A motors = 2.2kg<br><br>Body + Gimbal + 12x(0.0546) = 2.2kg<br><br>Body + Gimbal = 1.5448kg | Body + Gimbal = 1.5448kg<br><br>Body + Gimbal + 8AX-12A motors + 4MX-64T:=<br><br>Body + Gimbal + 8x(0.0546) + 4x(0.126) = 2.4856<br><br>2.4856 + DVS cam= 2.7456kg |
| Calculated Torque From Motors | 0.15kgf x 12= 1.8kgf max for stall Torque | 0.15kgf x 8 = 1.2kgf<br><br>0.6116kgf x 4 = 2.4464kgf<br><br>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