

<----From Andrew

$$\tau = \int d\tau = \frac{L\rho\omega^2}{2} \int_{-c/4}^{3c/4} r^3 dr = \frac{L\rho\omega^2 r^4}{8} \Big|_0^{3c/4} + \frac{L\rho\omega^2 r^4}{8} \Big|_0^{c/4} = \frac{L\rho\omega^2 r^4}{8} \left(\frac{81c^4}{256} + \frac{c^4}{256} \right) = \frac{41L\rho\omega^2 c^4}{1024}$$

L	ρ	ω (max by servo)	c
14" = .3556 m	998 kg/m ³	13.1 rad/s	2.8" = .0711 m

L foil=	0.6096 m	density h20=	998 kg/m ³	flip speed=	10 rad/sec	L cord=	0.183 m
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Torque=	2.731893	n-m
	386.8687	oz - in

572.9578	deg/sec
~ 0.3141593	secs per 180

60/.15 deg/sec

400 deg/sec

6.981317 rad/sec

Possible Servo

http://servocity.com/html/hs-7950th_servo.html

Detailed Specifications

Control System: +Pulse Width Control 1500usec Neutral
 Required Pulse: 4.8-7.4 Volt Peak to Peak Square Wave
 Operating Voltage Range: 4.8-7.4 Volts
 Operating Temperature Range: -20 to +60 Degree C (-68F to +140F)
 Operating Speed (4.8V): 0.18 sec/60° at no load
 Operating Speed (6.0V): 0.15 sec/60° at no load
 Operating Speed (7.4V): 0.13 sec/60° at no load
 Stall Torque (4.8V): 344oz/in. (22kg.cm)
 Stall Torque (6.0V): 402oz/in. (29kg.cm)
 Stall Torque (7.4V): 486oz/in. (35kg.cm)
 Operating Angle: 45 Deg. one side pulse traveling 400usec
 360 Modifiable: Yes
 Direction: Clockwise/Pulse Traveling 1500 to 1900usec
 Idle Current Drain (4.8V): 9mA at stop
 Idle Current Drain (6.0V): 9mA at stop
 Current Drain (4.8V): 220mA/Idle and 3.8 amps at lock/stall
 Current Drain (6.0V): 300mA/Idle and 4.8 amps at lock/stall
 Dead Band Width: 1usec
 Motor Type: Coreless Carbon Brush
 Potentiometer Drive: 6 Slider Indirect Drive
 Bearing Type: Dual Ball Bearing MR106
 Gear Type: Titanium Gears
 Connector Wire Length: 11.81" (300mm)
 Dimensions: 1.57" x 0.79" x 1.50" (40 x 20 x 38mm)
 Weight: 2.40oz (68g)

