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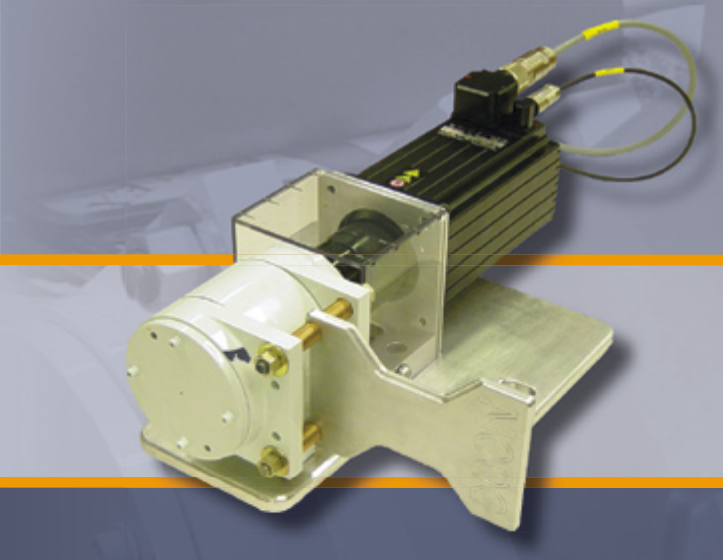
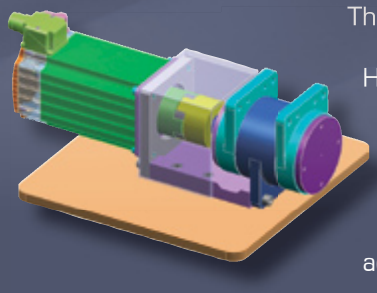


MaxTorq Hinge Actuator

Moog's MaxTorq Hinge Actuator has been designed to produce reliable, precise motion control for applications requiring rugged hardware and low maintenance. The power hinge is best suited for applications requiring lots of torque in a small, robust package and is highly resistant to the harsh environments found in high security applications. The MaxTorq Hinge Actuator consists of a low-clearance gear package connecting to a brushless DC servomotor for exact positioning at programmed speeds. Since the power hinge is a servo-system, a nearly infinite number of velocity profiles can be applied.

Probably the most attractive feature of the MaxTorq Hinge Actuator is the ease with which it can be accommodated physically into a system requiring high torques with very little space. Its cylindrical geometry allows the MaxTorq Hinge Actuator to fit into a very small envelope or even in between other components and become the hinge centerline.

A standard NEMA motor is mounted to the side of the unit, creating a uniform cylindrical geometry. A motor can be modified to allow for manual-override features.



The Moog MaxTorq Hinge Actuator design evolved from a rich heritage of aerospace applications ranging from leading edge flaps to wing fold hinges. These designs encompass a torque range of 21,000 to 850,000 in-lbs. The designs incorporate the number of 'pivots' or 'slices' from one to nine segments.

Performance Specifications

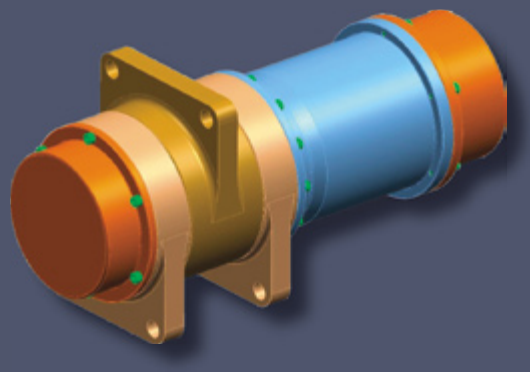
The final hinge configuration involves iterating parameters, which are optimized by our computer simulation for weight and cost:

PARAMETERS

- Gear Ratio
- Number of Actuators
- Actuator Location
- Actuator Dimension
- Actuator Material
- Actuator Attachment
- Motor Type
- Motor Speed
- Motor Size
- Failure Protection Location

CONSTRAINTS

- Performance Requirement



Fielded Hinge Actuators

Model Number	Application	Body Diam (In)	Body Length (In)	Weight (In)	Modules	Attachment Type	Output Planetary Type	Limit Load (k In-bl)	Output Stage Gear Ratio	Overall Gear Ratio	Eff. (%)
2022536 2048150	Cargo Door	4.71 4.75	5.17 5.04	12.1 14.3	1	Lug	Compound	46	–	60:1	70
544646-1	Side Door	4.64	3.83	8.8	1	Lug	Simple	33	4:5:1	250:1	77
256W2110 256W2210	Leading Edge Flap	5.59 3.88	3.32 3.27	13.7 6.8	1	Flange	Simple	66 21.5	–	38:1 21:1	90
2740250 2740252	Weapons Bay Door	4.28 3.38	3.82 3.43	13.2 5.7	1	Lug/Base Lug	Compound	85 40	–	63:1	67
2021502-5 2021502-6	Weapons Bay Door	5.02	3.28 6.05	9.3 17.7	1 2	Lug	Compound	57 94	–	129:1	45
2048342 2048344	Leading Edge Flap	3.77 2.50	7.38 7.26	19.0 10.8	2 3	Flange	Compound	104 46	50:1	294:1	67
2740012 2740014 2740016	Leading Edge Flap	3.77 3.77 2.50	11.67 8.42 8.58	28.6 20.3 9.7	3 2 3	Lug	Compound	138 104 47	50:1	294:1	67
2740496 2740498	Leading Edge Flap	3.77 2.50	8.40 8.60	21.0 10.0	2 3	Flange	Compound	104 47	50:1	294:1	67
2022306 2022814	Leading Edge Flap	3.75 2.60	14.00 14.90	23.0 11.8	3 4	Flange	Compound	165 70	57:1	294:1	60
2022638 2022636	Leading Edge Flap	2.45 4.47	16.50 23.00	17.3 56.3	6 4	Lug	Compound	107 436	50:1	974:1	67
2741152 2741160	Leading Edge Flap	5.02 3.15	21.60 24.20	78.7 35.0	4 7	Lug	Compound	395 140	50:1	974:1	67
2022308	Wingfold	4.00	33.00	80.0	9	Lug	Compound	633	146:1	438:1	45
2741390	Wingfold	5.25	39.00	113.0	7	Lug	Compound	850	146:1	472:1	45
2741380 2741382 2741384	Leading Edge Flap	4.14 3.77 2.50	13.28 11.98 10.99	38.5 28.5 12.8	3 3 4	Lug	Compound	213 147 75.5	50:1	294:1	67

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