Linear Exploration - Requirement #11

Linear Actuator Options for Braking System

SKU	Stroke	Retracted Length	Extended Length	Thrust	Speed	Price
HDA12-2	12"	17.7"	29.5"	25 lbs	2.0"/sec	$129.99
HDA10-2	10"	15.7"	25.7"	25 lbs	2.0"/sec	$129.99
HDA8-2	8"	13.7"	21.6"	25 lbs	2.0"/sec	$129.99
HDA6-2	6"	11.7"	17.6"	25 lbs	2.0"/sec	$129.99
HDA4-2	4"	9.7"	13.6"	25 lbs	2.0"/sec	$129.99
HDA2-2	2"	7.7"	9.6"	25 lbs	2.0"/sec	$129.99
HDA12-50	12"	17.7"	29.5"	115 lbs	0.5"/sec	$129.99
HDA10-50	10"	15.7"	25.7"	115 lbs	0.5"/sec	$129.99
HDA8-50	8"	13.7"	21.6"	115 lbs	0.5"/sec	$129.99
HDA6-50	6"	11.7"	17.6"	115 lbs	0.5"/sec	$129.99
HDA4-50	4"	9.7"	13.6"	115 lbs	0.5"/sec	$129.99
HDA2-50	2"	7.7"	9.6"	115 lbs	0.5"/sec	$129.99
HDA12-30	12"	17.7"	29.5"	180 lbs	0.3"/sec	$129.99
HDA10-30	10"	15.7"	25.7"	180 lbs	0.3"/sec	$129.99
HDA8-30	8"	13.7"	21.6"	180 lbs	0.3"/sec	$129.99
HDA6-30	6"	11.7"	17.6"	180 lbs	0.3"/sec	$129.99
HDA4-30	4"	9.7"	13.6"	180 lbs	0.3"/sec	$129.99
HDA2-30	2"	7.7"	9.6"	180 lbs	0.3"/sec	$129.99

Figure 1

There are quite a few viable options for the linear actuator for the brake system. Upon research completed during Sprint 2, we have come to the conclusion that, out of the actuators listed in figure one, any of the actuators with a thrust of 115 lb and above should prove viable. The next important factor in choosing an actuator for our purposes was the speed of the extension and retraction. Although 0.5"/sec is very similar to 0.3"/sec, we believe that the extra 0.2"/sec speed that the 115 lbs actuators provide is more useful than the extra 65 lbs that 180 lbs actuators provide. Therefore we have decided that the actuators highlighted in figure 1 are the best to implement the braking system.

Linear Actuator Options for Steering System

SKU	Stroke	Retracted Length	Extended Length	Thrust	Speed	Price
SDA4-263	4"	15.7"	19.7"	560 lbs	2.6"/sec	$399.99
SDA4-67	4"	15.7"	19.7"	1010 lbs	0.8"/sec	$399.99
SDA4-30	4"	15.7"	19.7"	1570 lbs	0.3"/sec	$399.99
SDA6-263	6"	17.7"	23.7"	560 lbs	2.6"/sec	$399.99
SDA6-67	6"	17.7"	23.7"	1010 lbs	0.7"/sec	$399.99
SDA6-30	6"	17.7"	23.7"	1570 lbs	0.3"/sec	$399.99
SDA8-263	8"	19.7"	27.7"	560 lbs	2.6"/sec	$399.99
SDA8-67	8"	19.7"	27.7"	1010 lbs	0.7"/sec	$399.99
SDA8-30	8"	19.7"	27.7"	1570 lbs	0.3"/sec	$399.99
SDA12-263	12"	26.8"	37.8"	560 lbs	2.6"/sec	$399.99
SDA12-67	12"	26.8"	37.8"	1010 lbs	0.8"/sec	$399.99
SDA12-30	12"	26.8"	37.8"	1570 lbs	0.3"/sec	$399.99
SDA18-263	18"	32.8"	50.8"	560 lbs	2.6"/sec	$399.99
SDA18-67	18"	32.8"	50.8"	1010 lbs	0.8"/sec	$399.99
SDA18-30	18"	32.8"	50.8"	1570 lbs	0.3"/sec	$399.99
SDA24-263	24"	38.8"	62.8"	560 lbs	2.6"/sec	$399.99
SDA24-67	24"	38.8"	62.8"	1010 lbs	0.7"/sec	$399.99
SDA24-30	24"	38.8"	62.8"	1570 lbs	0.3"/sec	$399.99

Figure 2

The emphasis for the linear actuator for the steering system is the speed, thrust, and the stroke size. From our research, we have concluded that we require a thrust of at least 500 lbs to move the wheels properly as well as a stroke of at least 8" to provide full motion. One of the most important parts of the steering system is the speed in which the wheels can turn. If we aren't able to make fast enough turns the steering system could prove to be very dangerous. Therefore, opting for the fastest linear actuator that meets all of the other parameters is the optimal route forward.