

Criterion			BR1: Hydraulic Braking System		BR2: Disk Braking System		BR3: Electro-magnetic Braking	
#	Description	Weight	Rating	Motivation	Rating	Motivation	Rating	Motivation
1	Speed Control	3	-1	Due to manual flow control, it is impossible to control the speed in any repeatable manner. Speed will also change as oil heats up and different weighted climbers use the device.	0	Automatic brake calliper speed control is untested and will not be nearly as smooth and accurate as an electric motor.	1	Electric servo motor with built in encoder will have extremely high accuracy and precise control.
2	Cost	3	-1	Hydraulic system cost came to over R35,000 which would bring it out of budget.	1	Mountain bike disk brakes are inherently cheap. Servo actuators are also rather inexpensive.	0	Servo motor and driver cost less than R10,000 which is within acceptable budget range.
3	Complexity	2	-1	Hydraulic systems are inherently complex. Having to deal with hydraulic fluid and possible leaks adds to the complexity.	0	Simple mechanical system, complex software control implementation.	1	Simple, off the shelf parts with simple software implementation.
4	Safety Mechanisms	2	1	Will immediately stop rotation if person takes weight off wall.	-1	Possibility for brake failure which could lead to safety concerns.	1	E stop button can be implemented as well as software assisted fault detection for immediate system halt.
5	Reliability	1	0	System should be faulty reliable but with the possibility of leaks etc.	-1	The concern for brake fade due to overheating is prevalent.	1	Electric servo motors are very reliable, with very little maintenance requirements.
6	Control Ability	1	-1	Manual knob used to control flow rate leads to very low control ability. No automatic speed control available.	0	PID controlled calliper clamping force leads to decent control ability.	1	Extremely high, automatic control ability.
7	Active Cooling Requirement	1	0	Hydraulic fluid may heat up over time, leading to a change in braking behavior if not actively cooled.	-1	Disk brakes heat up to very high temperatures very quickly, which can lead to brake fade if not cooled.	1	Makes use of a braking resistor, which can safely heat up without causing issues and does not require active cooling.
Number of plus ratings			1		2		4	
Number of minus ratings			3		3		0	
Overall total			-2		-1		4	
Weighted total			-7		-1		10	