Project: 13261

Revision #: A

Spec. #	Importance	Source	Function	Specification (metric)	Unit of Measure	Ideal Value	Comments/Status	Test Results	Opportunities for future work
S1	5	CN2, CN10	Performance Limits	Amount of front wheel lift allowed (Suspension travel sensor)	(mm above limit)	0	Unable to demonstrate wheel life due to no resistance circuit. Sensors work in simulation	No Testing completed.	Accelerometer needs to be set up and wired to controller, code needs to be implemented to monitor accelerometer signal. Resistance circuit and additional for travel sensors etc.
S2	4	CN2, CN10	Performance Limits	Allowable difference between font wheel and rear wheel RPM (Straight line)	%	1%	Able to demonstrate wheel slip on test bench, algorithm unable to properly control sheel slip due to excessive noise in the signal.	Rear wheel slip demonstrated, signal too noisy for practical testing of traction control algorithm.	Signal Processing project. Limit noise, increase controlability, and clarity of signal.
S3	4	CN2, CN10	Performance Limit	Allowable difference between font wheel and rear wheel RPM (While cornering)	%	0.50%	Incomplete, did not incorporate varying values into algorithm, though did make the acceptable value easy to change which should allow for easy integration of multiple values	No Testing completed.	Incorporate additional sensors and multiple slip differences to account for cornering, vs. straight line acceleration
S4	5	CN6, CN7	Simulation Goal	Total Time of race spent in high efficiency ranges	%	75	Removed from project as race motor, batteries and parts are still unknown	N/A	Simulation and prompts project
S5	4	CN6, CN7	Simulation Goal	Minimize Energy Consumption	KWh	11	Removed from project as race motor, batteries and parts are still unknown	N/A	Simulation and prompts project
S6	3	CN6, CN7	Simulation Goal	Energy Remaining End of Race	%	10	Removed from project as race motor, batteries and parts are still unknown	N/A	Simulation and prompts project
S7	3	CN6, CN10	Simulation Goal	Difference to fastest track lap time	sec	0	Removed from project as race motor, batteries and parts are still unknown	N/A	Statistic analysis and testing analysis on performance, efficiency and minimizing completion time once traction control and power train are fully functional
S8	4	CN4, CN10	Test Motor	Power Output	kW	>=85	Provided by Club	N/A	Integration of future motor and parts
S9	4	CN4, CN10	Test Motor	Torque Output	Nm	>=115	Provided By Club	N/A	Integration of future motor and parts
S10	4	CN2, CN4, CN9	Controller	# Inputs & Outputs	#	8inputs 4outputs	Provided by Club	N/A	Integration of future motor and parts
S11	1	CN4	Simulation Constants	Wheel Base	mm	1450	Taken From Brammo benchmark	N/A	
S12	4	CN3, CN6	Simulation Constant	Total Powertrain System weight allowed	Weight ratio	~1/3 of bike weight	Removed from project as race motor, batteries and parts are still unknown	N/A	Integration of future motor and parts
S13	1	CN3	Simulation Constant	Race Length	mi	20	Not Completed due to insufficient testing time and incompletion of earlier parts.	No Testing completed.	Statistic analysis and testing analysis on performance, efficiency and minimizing completion time once traction control and power train are fully functional
S14	4	CN3, CN6	Race Regulation	Total Bike Weight Allowed	Kg	100 (min) 300 (max)	Removed from project as race motor, batteries and parts are still unknown	N/A	
ES15	5	CN2, CN10	Performance Limits (4.1)	Amount of front wheel lift allowed by hard stop	in	8	Able to perform 20 tests with no failures	Successful implementation, successful forced lift testing, no true run time tests due to inability to create wheel lift.	
ES16		CN6, CN7	Testing Goal (2.3)	Traction Control System run time on 12 V power supply	min	30	Able to perform 20 tests with no failures	Successful demonstration of run time. Performed far more than 30 minutes of run time and demonstration time without recharging the batteries.	
ES21	4	CN2, CN4, CN9	Rolling Road	Shaft Size	in	1.125	speced for infinte life	Successfully implemented	
ES22	3	CN10	Rolling Road	Bearing Life	N	infinte life	Able to perform 20 tests with no failures	More than 20 tests performed, speced for infinite life for given load and speeds	
ES23	4	CN3, CN6	Rolling Road	A-frame vertical Adjustment	in	5		Successfully tested. Provides sufficient lift force to decrease the maximum tractive force sufficiently to create rear wheel slip.	