Propulsion - Requirements

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I. Document overview

This paper defines the requirements for propulsion in the solar sustained vehicle developed by Mälardalen University Solar Team (MUST).

II. Purpose of this document

The purpose of this document is to state all of the requirements that the propulsion system needs to fulfill.

III. Requirement specification

The following list contains the requirements of the Propulsion system.

A. BWSC Regulations

- The fully laden solar car must be able to start from rest on a 7% gradient.
- The solar car must be able to be driven backwards under its own power with the driver seated in the normal position.
- Any cruise control function must automatically deactivate when the brake is operated, or the car is turned off.
- Any automatic driving function must deactivate on manual input.
- The cruise control and automatic driving function must not resume automatically.
- The connections to the high-voltage terminals must be protected against direct contact by double insulation, enclosures or barriers. (Ingress protection rating IPXXD inside drivers compartment and IPXXB otherwise.)
- The protection must not be possible to remove without the use of tools.

B. System Requirements

- The power from the motor(s) should be at least 2 KW.
- The system shall send the speed on the CAN bus.
- The system shall provide a cruise control.
- The system shall provide a way for the driver to control the throttle and regenerative braking.
- Operating the regenerative braking shall not risk the safety of the driver or vehicle.
- The system shall provide a way for the driver to control the direction of the motors.
- The system shall provide a way for the driver to switch between power and economy mode.
- The motor controller must be mounted in such way that it is not exposed to water.
- The motor controller(s) requires cooling equivalent of at least 250W.