

Master's thesis review

Thesis title:

Service Board Design for a Traction Battery of a Battery Electric Vehicle

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The work is oriented on Traction Battery module of a Battery Electric Vehicle design. The main discussed problem is, how to balance voltage differences on serially connected battery cells. It is one of critical problems of electric vehicle energy accumulators.

Cell voltage balancing is nowadays solved by means of several ways. Therefore author shortly presents overview of several passive and active methods usable for battery cells voltage balancing.

With respect to energy efficiency active balancing systems are more detailed analysed. From several types of active balancing circuits detailed analysis and construction design of "step by step" cell balancing system is realized.

The basis of this system is relay matrix, enabling single cell to charge source connecting. By means of accurate measuring system the charging of single battery cell is cutting, when desired cell voltage is achieved.

All charging and switching system by means of software in Lab View environment is controlled. Special software enable to select critical cells needed priority charging and voltage balancing.

All the work represents relatively large task with practical impact in the electro-mobility branch.

After work study I have some questions:

1. Single battery cells are switched by means of electro-mechanical relays. In case, when software mistake will occur, all relays go to the „off“ position.

How switching system is protected in case when relay contact will be welded?

2. Single cells during balancing operation from the 12 V accumulator are charged. Is galvanic connection between 12 V board mains and „high voltage“ drive mains from the point of safety acceptable?

Master's thesis complies from the global requirements with all formal and unformal parameters concerning to this type of qualification works.

Therefore it is possible to recommend the master's thesis „Service Board Design for a Traction Battery of a Battery Electric Vehicle., to defence.

Proposal classification: Excellent

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Doc. Ing. Pavel Mindl, CSc.
reviewer