

## I. IDENTIFICATION DATA

<b>Thesis name:</b>	Electric and Hybrid Vehicle Powertrain Comparison
<b>Author's name:</b>	<b>Parminder Singh Pannu</b>
<b>Type of thesis :</b>	master
<b>Faculty/Institute:</b>	Faculty of Electrical Engineering (FEE)
<b>Department:</b>	Department of Electric Drives and Traction
<b>Thesis reviewer:</b>	Ing. Jindřich Sadil, Ph.D.
<b>Reviewer's department:</b>	Department of Transport Telematics, Faculty of Transportation Sciences

## II. EVALUATION OF INDIVIDUAL CRITERIA

<b>Assignment</b> <i>Evaluation of thesis difficulty of assignment.</i>	<b>ordinarily challenging</b>
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<b>Satisfaction of assignment</b> <i>Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.</i>	<b>fulfilled</b>
A Life Cycle Assessment has been performed beyond the assignment.	

<b>Method of conception</b> <i>Assess that student has chosen correct approach or solution methods.</i>	<b>correct</b>
Conception is correct, but sometimes the author states details beyond the topic, which makes the text not compact.	

<b>Technical level</b> <i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	<b>Choose an item.</b>
There are some technical mistakes, see the list below.	

<b>Formal and language level, scope of thesis</b> <i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	<b>D - satisfactory.</b>
Formal level is very good at all, but there are some shortcomings (page 8: "40Km/hr", page 43: axes labels of a graph missing). Language level: the meaning is understandable, but individual words and sentences are not correct (page 2: "it is also depend on the share...", page 3: "Excellent off the line acceleration,", page 12: "There is a just only the change of power source and propulsion.", page 21: "the used energy sources play and important role", etc.)	

<b>Selection of sources, citation correctness</b> <i>Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.</i>	<b>Choose an item.</b>
Citations are presented correctly at all, but sometimes they are missing, e.g. on page 15 (electricity cost of 4 EUR / 100 km is stated without any reference).	

<b>Additional commentary and evaluation</b> <i>Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.</i>
The text is not much compact, which can be partly caused by foreign origin of the student.

### III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

*Summarize thesis aspects that swayed your final evaluation. Please present apt questions which student should answer during defense.*

Overall evaluation:

Although the reviewed master thesis is very good concerning technical issues at all, there are some technical mistakes in the text:

- page 12: „In Figure 4.1 and 4.2 it is illustrated that the lithium ions move from anode to cathode when being used in a circuit“. Electrons are used in a circuit, not ions.
- page 3: „the battery pack should have higher voltage than the Safety Integrity Level (SIL) automotive 12 V.“

There are several formal and language shortcomings as stated above.

In my opinion, the author's main own contribution (performed experiment and computation) is not sufficiently concluded and discussed.

Questions for defense:

1. Please discuss the result value of the overall efficiency (page 60) for different operational modes of the hybrid drive.
2. Please discuss the influence of connected super-capacitor (Figure 6.4, page 51) on the results stated in the Table 6.1 on page 54.

I evaluate handed thesis with classification grade **B - very good**.

Date: **28.8.2017**

Signature: