

I. IDENTIFICATION DATA

Thesis name:	Design of rear wheel suspension for a city car sharing vehicle
Author's name:	Bc. Petr Vácha
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Automobiles, IC Engines and Railway Vehicles
Thesis supervisor:	Ing. Václav Jirovský, Ph.D.
Supervisor's department:	Department of Automobiles, IC Engines and Railway Vehicles

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	ordinarily challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
The thesis assignment aims to the area of lightweight LE category vehicle's rear suspension design. The vehicle itself is assigned as two-seater with storage focused on small package delivery service. The challenging part is the foldable rear of the vehicle, thus the parking space occupation could be minimized.	

Satisfaction of assignment	fulfilled
<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>	
The assignment was fulfilled.	

Activity and independence when creating final thesis	D - satisfactory.
<i>Assess that student had positive approach, time limits were met, conception was regularly consulted and was well prepared for consultations. Assess student's ability to work independently.</i>	
The student has proved the ability to work independently and to consult the ambiguous points in his work. Unfortunately, he showed less creative and critical thinking approach that would be expected from a future engineer.	

Technical level	D - satisfactory.
<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>	
<p>Unfortunately, the overall quality of the thesis does not provide the expected outcome. Majority of the thesis are of literature research nature, which are sometimes repeated from chapter to chapter (i.e. wheel angles in chapters 5.1 and 6.2). Furthermore, the sources are often directly cited instead of compared and then applied in own decision or design. This is especially remarkable in the chapter 5.1, where student uses two different sources for definition of camber angle, where each of them describes positive and negative orientation of the angle differently, thus it is not clear, how are the suspension kinematics designed later.</p> <p>Chapter 5.4 presents a final 3D model of the suspension created in CATIA (it is also delivered in its electronic form). It was expected, that some of the preliminary parts will be designed on more or less schematic level, but the final model barely fulfills the requirements of Project & 3D CAD subject of the first year of EMAE program (and student was repeatedly informed about this imperfection). The model and its manufacturing process are both described in lesser detail, than would be expected (ca. 1/3 of page plus seven figures overviewing the global design).</p> <p>Chapter 6 is focused on dynamic simulations performed in IPG CarMaker software. The student has performed 9 relevant dynamic tests, including so called moose test (ISO 3888-1). However, the results presented in graphs are usually related to time, thus not providing required overview of the vehicle behavior needed for further vehicle design improvement.</p> <p>The thesis conclusion (chapter 7) only describes the work done throughout the thesis. It does not provide any conclusion related to further enhancements, even though there is still a space to plenty of them (i.e. optimization of wheelbase/wheeltrack ratio with regards to dynamic stability).</p>	

Formal and language level, scope of thesis
C - good.
Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.

The thesis, especially its research part, is written on a relatively good level of English. However, it is quite easy to distinguish between the parts adopted from original sources and paragraphs written by the author. Actual content is spread over 98 pages and it could be considered long. Sometimes it is hard to keep track of the work progress, as some topics are being repeated or widely explained when not necessary and vice versa. Additionally, a picture description is often placed on another page than the picture itself (extreme example is a link to figure n. 28 from page 46 to page 24, where the figure is a copy of table). In majority, the thesis looks more like a description of what the student has learned or read rather than a technical report of the approaches taken to achieve the goal of the thesis.

Selection of sources, citation correctness
C - good.
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.

Even though the student was provided with a list of four high quality vehicle dynamics oriented literature sources, he has not used them. The literature sources cover 7 sources of scientific or technically more or less valuable nature, rest counting 50 other sources point to two other theses, several standards and lots of internet sources used primarily for the research part of the thesis.

Additional commentary and evaluation
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.

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III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation.

During the work on the thesis, student has realized very good literature research in the field of design of production and concept ultra-compact passenger vehicles. However, this research has not been adequately transformed to the results of final thesis. As a thesis supervisor, I would expect more enthusiastic creative engineering approach and much faster progress. Though the student started at a relatively slow pace and at several occasions he has not been able to identify the next step in his work, at the end he reached an acceptable level of work process. Therefore, I recommend the thesis for defense with classification grade **D - satisfactory**.

Date: **26.8.2019**

Signature: