

## I. IDENTIFICATION DATA

<b>Thesis name:</b>	<b>Rear suspension sensitivity study &amp; optimization</b>
<b>Author's name:</b>	<b>Nisant M Sethia</b>
<b>Type of thesis :</b>	master
<b>Faculty/Institute:</b>	Faculty of Mechanical Engineering (FME)
<b>Department:</b>	Department of Automobiles, Internal Combustion Engines and Railway Vehicles
<b>Thesis supervisor:</b>	Ing. Václav Jirovský, Ph.D.
<b>Supervisor's department:</b>	Department of Automobiles, Internal Combustion Engines and Railway Vehicles

## II. EVALUATION OF INDIVIDUAL CRITERIA

<b>Assignment</b>	<b>ordinarily challenging</b>
<i>Evaluation of thesis difficulty of assignment.</i>	
The assignment focuses on suspension kinematics optimization resulting in development of optimization of suspension hardpoints location with regards to desired kinematic characteristics.	

<b>Satisfaction of assignment</b>	<b>fulfilled with minor objections</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>	
Supervisor would expect extensive selection process for optimization methods and more precisely realized sensitivity study. The quality of sensitivity study directly influenced the optimization process in selecting the number of design performance factors, thus the result validity might be disputable.	

<b>Activity and independence when creating final thesis</b>	<b>C - good.</b>
<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>	
Student has pursued the task primarily by himself and consulted the work during his internship with responsible persons in Ricardo.	

<b>Technical level</b>	<b>D - satisfactory.</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>	
Student has done a good literature research in all the necessary fields of the thesis goals. Unfortunately, the synthesis of gained knowledge was rather manual work, than an extensive engineering approach. The work deals with optimization of a multi-link rear suspension based on Ford's so called integral link suspension, but the work contains no description of the design specifics of such suspension type, even though the term is used throughout the work. The sensitivity study is performed only by individual shifting of three different hardpoints to two other locations disregarding the influence of the mutual position of other connecting points and lengths of control arms of the assigned double wishbone suspension. Final results obtained by optimization does not fully comply with desired design constraints (i.e. caster gradient differs the most significantly: $-29,1^{\circ}/m$ instead of $-5^{\circ}/m$ ), but the work does not contain proposal how to get values closer to the desired goal.	

<b>Formal and language level, scope of thesis</b>	<b>B - very good.</b>
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
The thesis is presented on 52 pages printed in 12pt sans-serif font with large spacing, which makes the thesis longer, than it actually is and lowers its formal quality. Thesis loses its readability in high usage of abbreviations (which are well defined) for many better not to be abbreviated terms (i.e. upper control arm, short-long arm etc.).	

**Selection of sources, citation correctness****B - very 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.*

The list of sources contains 26 references to primarily technical or scientific papers and books, which are all relevant to the scope of the work. Hence, application of the extensive knowledge included in the sources is rather marginal.

**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.*

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

*The proposed thesis deals with sensitivity study and kinematic optimization of a rear multi-link suspension on a very basic engineering level, but fulfills all the requirements of the thesis assignment.*

I evaluate handed thesis with classification grade **C - good**.

Date: **31.1.2019**

Signature: