

I. IDENTIFICATION DATA

Thesis title:	Automated optimization of parameters of a gas spark ignition engine
Author's name:	Ashwin Srinivasa Raghavan
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Automotive, Combustion Engine, and Railway Engineering
Thesis reviewer:	Ing. Zbyněk Syrovátka, Ph.D.
Reviewer's department:	Centre of Vehicles for Sustainable Mobility

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	ordinarily challenging
<i>How demanding was the assigned project?</i>	
Please insert your comments here.	

Fulfilment of assignment	fulfilled with major objections
<i>How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.</i>	
The introduction part of the thesis and a description of the simulation model of the engine in the GT-POWER is clearly elaborated. However, this work was mainly to deal with automated optimization systems usable on an engine test bed. This part of the assignment is not processed very well, as well as the procedure for evaluation of the optimum engine settings in the program Cameo. The evaluated optimal engine settings (Ignition timing respectively CA50, EGR, throttle position, etc.) for full load performance are not presented. The author also did not prepare the documentation for the necessary steps and modifications of the current test setup for the application of an automated optimization system on an engine test-bed.	

Methodology	partially applicable
<i>Comment on the correctness of the approach and/or the solution methods.</i>	
The presentation of results is not transparent; the reviewer could not verify the results.	

Technical level	D - satisfactory.
<i>Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?</i>	
The author's own contribution is not clear. For example: What part of the simulation model of the engine in GT-POWER did the student by himself. Neither the description of the use of a Cameo software nor its application on engine test bed was sufficiently presented in the thesis.	

Formal and language level, scope of thesis	C - good.
<i>Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?</i>	
The language is clear and understandable.	

Selection of sources, citation correctness	C - good.
<i>Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?</i>	
The sources selection was adequate to fulfill the assignment. The thesis includes several nonfunctional references to figures and literature.	

Additional commentary and evaluation (optional)

Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.

The graphical form of presentation should be improved for better grading.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

The student designed optimal full load curves for two variants of the SI engines with respect to thermal and mechanical limits. One for the engine with a common mixer and the second for the engine with PFI.

The results should have been presented in a more transparent way. The student didn't show any sensitivity studies and did not prove the plausibility of the optimal settings.

This work should be focused on automated optimization systems usable on an engine test bed. Neither the description of the use of a Cameo software nor its application was sufficiently presented in the thesis. Any Cameo parameter files, and data files were not attached to the thesis for review. From mentioned reasons, the reviewer could not verify the final thesis results.

The grade that I award for the thesis is **D - satisfactory**.

Questions:

- 1) Show and comment the values of optimal operational parameters for full load curves of both engine variants.
- 2) What are the necessary steps and modifications of the current test setup for the application of an automated optimization system on an engine test bed?

Date: **30.8.2021**

Signature: Syrovátka