THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Testing of Anode Recirculation System Components for Hydrogen Fuel Cell**
Author's name:	**Bc. David Červinka**
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Automotive, Combustion Engine and Railway Engineering
Thesis reviewer:	Ing. Petr Kohout
Reviewer's department:	Eaton European Innovation Center

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment **challenging**

How demanding was the assigned project?

The assignment of the master thesis was challenging in a way that student was facing test stand concept that is rather new and many unusual phenomena (condensation, working medium H2+N2+H2O, multiphase) compared to combustion engines had to be considered. Furthermore student was able to perform analytical cal

Fulfilment of assignment **fulfilled**

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.

Student fulfilled the assignment completely. Thorough research of the anode recirculation systems and possible ways for testing was performed. Furthermore, student was able to perform analytical calculation of condensation and compared to GT-Suite results. In the end the solution for water management was proposed and designed considering accuracy and cost, which made it a good source of information for future production and assembly.

Methodology **correct**

Comment on the correctness of the approach and/or the solution methods.

Approach that student chose was logical and correct. Starting from diligent definition of the function and conditions that solution has to be able to manage up to justification of chosen components and design of the solution and its performance. Operating conditions were calculated analytically and in simulation to verify the correctness of the results.

Technical level **A - excellent.**

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?

Student was able to proof that he can use theoretical knowledge gained during the studies in practice and can use those knowledge on new unique systems where different phenomena than in combustion engines appear. Description of the process and way to the outcomes is very well described thus it is easy for reader to follow the process and reproduce the results.

Formal and language level, scope of thesis **B - very good.**

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?

Level of English is very high and reading of the thesis is without any struggle. Work is well and logically organized. Length of the thesis is sufficient and describes in detail what was performed. There were only some missing scales on y-axis in some plots thus it was not obvious how different are the values in the plot

Selection of sources, citation correctness **A - excellent.**
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?
The quality and amount of sources is very high and ensures that student was able cover a lot of sources of information and build on those. It is clearly distinguished what is the reference and what is students original work. Citation of the sources is excellent.

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.
Please insert your comments here.

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.

Overall the quality of the work is very high and is adequate or even above to student who went through the masters study program. Level of knowledge, its use in practice, ability to express the idea in English and ability to choose and properly cite the reference are excellent.

Question 1: There is a Roots blower map in figure 16. It is somehow idealized representation of a compressor map. How does the real map differ and why?

Question 2: What kind of water will be used in the testing system (regular, distilled, deionized)? Is there any danger while draining deionized or distilled water?

The grade that I award for the thesis is **A - excellent.**

Date: **27.8.2024** Signature:

Kohout