SUPERVISOR'S OPINION OF FINAL THESIS

I. IDENTIFICATION DATA

Thesis name:	**Potential for improving passenger car emissions through analysis of real driving emissions data**
Author's name:	Marek Fencl
Type of thesis :	
Faculty/Institute:	
Department:	Institute for Automotive, Combustion Engine and Railway Engineering
Thesis supervisor:	Doc. Michal Vojtíšek, M.S., Ph.D.
Supervisor's department:	Institute for Automotive, Combustion Engine and Railway Engineering

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment

Evaluation of thesis difficulty of assignment.

The assignment to evaluate a larger set of emissions data obtained through testing of an automobile in the laboratory and on the road, with a vision to identify periods with high emissions and to suggest possible improvements in engine design and calibration, can be considered challenging for bachelor's thesis as it is a specialty interdisciplinary topic.

Satisfaction of assignment

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.

Prior to the assignment, we have discussed the availability, extent and format of the experimental data, the timeline, and the open gaps in the current state of knowledge; this has helped considerably in later stages of the work. The assignment was fulfilled to its entirety, with the extent and quality of work going beyond typical bachelor's thesis.

Activity and independence when creating final thesis

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.

Mr. Fencl has shown professional approach throughout his work on the thesis. His personal commitment and interest was apparent to me from the initial discussions about the scope of the thesis, which was crafted to fit his interests, while respecting the characteristics of the data set available. We have consulted on a regular basis. Mr. Fencl communicated exceptionally well, was always prepared for consultations, and from gradual progress between the consultations I have observed his ability to work independently and to maintain the timeline, resulting in the thesis being submitted well before the deadline.

Technical level

Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.

The technical level corresponds to a good quality engineering report. Overview of the relevant knowledge and technology is given, methodology (data set, software, tools) description is comprehensible and complete, analysis of data is logical and well documented, conclusions are sound. In order to achieve this, Mr. Fencl had to learn a considerable amount about engine controls, exhaust emissions, and exhaust aftertreatment. There are open questions and more analysis could be done, however, this would be far beyond the scope of the thesis, which is already commendable.

Formal and language level, scope of thesis	

Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.

The thesis is well structured. The language and formal notation are appropriate and correct. The graphics (43 figures) are relevant and easy to read. The formatting is professional.

Selection of sources, citation correctness	

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 student has made a reasonable choice of 26 relevant references, most of which he has identified and obtained on his own, which are appropriately mentioned in the thesis. The current state of knowledge is well summarized.

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.
Please insert your commentary (voluntary evaluation).

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation.

The thesis represents, in my opinion, good academic and engineering practice. Mr. Fencl has started early, discussed the assignment in detail, consulted frequently, worked diligently on the thesis since the assignment, and used the additional time to take the work a considerable step further. The result is an excellent account of the work done – well structured, well written, technically correct, with good choice, and proper use of, references. Mr. Fencl has proven his engineering skills, and I recommend the thesis for defense in front of the state examination committee.

I evaluate handed thesis with classification grade

Questions:

1. In the comparison of the WLTC cycles at 23 C and at -7 C, why are the engine rpm different?

2. If a driver wants to operate the car to keep their emissions minimal, based on the measurement results, how would you recommend them to proceed during the initial phase of the trip, i.e., starting a cold engine and driving from a residential neighborhood?

Date: **June** 24, 2020   Signature: