THESIS REVIEWER'S REPORT

CTU
CZECH TECHNICAL
UNIVERSITY
IN PRAGUE

I. IDENTIFICATION DATA

Thesis title:	**Variance in nanoparticle emissions over WLTP Brake wear testing procedure**
Author's name:	**Praneet Ayyagari**
Type of thesis :	Master's thesis
Faculty/Institute:	Faculty of Mechanical Engineering
Department:	Department of Automotive, Combustion Engine and Railway Engineering
Thesis reviewer:	Martin Pechout
Reviewer's department:	Department of Vehicles and Ground Transport, Czech University of Life Sciences

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment <div align="center">A</div>

How demanding was the assigned project?

The assignment is up to date concerning an actual topic of particles generated by braking passenger vehicle at representative conditions concerning variety of particulate matter size distribution possibly ranging from size of several nanometers to micrometers.

Fulfilment of assignment <div align="center">B</div>

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 by analysing obtained experimental data, background concentration addressing and removal and individual runs comparison. Unfortunately, there is no direct comparison of total particle production and its size spectra distributions among the tested samples.

Methodology <div align="center">B</div>

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

The basic approach of the student was correct. Student was successfully able to process vast volume of data and tackled with instrumentation and test bed limitations (addressing instruments noise a particle concentrations in circulating air. On other hand, obtained data allow simple comparison of particulate matter production comparison, but this completely omitted. Such comparison would significantly increase informative value of the thesis.

Technical level <div align="center">C</div>

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?

The experiments conduction, which the student assisted, is generally correct. Also the quality of data processing (time alignment, air pertaining particulate matter effect) exhibits reasonable quality. The obtained data is not, after brief a description of cumulative production and size spectra distribution, fully exploited. Detection and addressing of significant braking events responsible for the majority of particulate matter production (e.g. including their size spectra distributions) would be also very useful.

Formal and language level, scope of thesis <div align="center">C</div>

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?

The theses is organised in a logical way and the extent is also appropriate. The topic is clearly presented, but graphical expression exhibits remarkable weaknesses. Resolution of many provided pictures (e.g. Fig.2 and 3) is fairly low (text uneasy to read), in many graphs a minor axis is used despite it is not beneficiary and makes the reported data more difficult to comprehend. There is also unlabeled minor axis in Fig. 40 which prevents from assign individual cumulative emissions. The graph name on Fig. 52 refers to sample 2 despite it is probably reporting data for sample 3 (sample 2 data present few pages before). EEPS size distribution is reported using bar graph while a line graph is much more suitable (used for ELPI data); many values are reported with unreasonable high number of decimal places (size channels for EEPS, some columns in Table 16).

The table 16 is good when included as Appendix, but for clear data presentation and samples comparison a graphical way would be significantly better.

Selection of sources, citation correctness	C

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?

Student has managed to find correct topic related sources despite the topic of brakes particulate matter production including ultrafine particles is quite novel. Unfortunately, provided information about larger portion of references (especially on-line available sources) are insufficient – name of the source, name of author, year of publication, are often missing.

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 skilfulness, etc.

This thesis is dedicated to novel and actual topic and student has shown appropriate level for some skills (e.g. data processing), but the way of data utilization and presentations strongly reduces the merit of the thesis.

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.

Thesis is attempting to report on a useful and up to date field of particulate matter including ultrafine particles. Due to significant shortage of data comparison and analysis and formal aspects of presentation are resulting value and overall level of thesis significantly reduced resulting in final grade C.

Which interval has been used for Limit of detection determination? That one for CPC seems to be excessively high (it looks like the interval contains braking events too).

The grade that I award for the thesis is **C.**

Date: **17.8.2022**   Signature: