I. IDENTIFICATION DATA

Thesis title:	**Pneumatic system for Gear and Clutch Engagement**
Author's name:	**Sai Kalyan Achanta**
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Automotive, Combustion Engine and Railway Engineering
Thesis reviewer:	Gabriela Achtenová
Reviewer's department:	Automotive, Combustion Engine and Railway Engineering

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment   **ordinarily challenging**

How demanding was the assigned project?

The assignment can nicely prove the acquired knowledge during studies.

Fulfilment of assignment   **fulfilled with major objections**

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.

The assignment is written on relative general way. It seems the student fulfilled all the points, but the level is generally on very low base of elaboration using high amount of simplification and not clear description. In the chapter 3.4 is not clear which models of which components were really prepared by the student, and which were given from the company.

Methodology   **partially applicable**

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

The steps how student proceed are correct. Anyhow the thesis is written in such a way, that I do not believe someone can really follow his work to continue with the project.

Technical level   **F - failed.**

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?

Already the first chapter 2.1.1 contains very bad description of clutch functional principles. What is really meant with friction, when is stated, that friction is influenced by contact area and applied pressure? In description with a term "contact plates", which is not standard term in clutch terminology, and it does not appear in any Figure. The introductory part comprises several figures of different clutch types (even obsolete ones), but no one really appoints/describes the type which should be automatized.

Clutch clamp force calculations. In first paragraph is stated that clutch diameter = 184 mm. In calculations he uses external diameter of 186,8 mm (no idea why he does not keep the value of 184 mm). Anyhow the diameter he denotes with symbol R (symbol generally used for radius), and indeed in the following text he calculates with this value as with radius. Thus, the calculated clamp force is one half of the value what it should be. For all the remaining calculations he just uses the wrong value, even in the simulation model – see Fig. 65, page 57.

Pneumatic circuit: I appreciate the scheme of the pneumatic system. Anyhow it is surprising, that no reduction valve is present. Really all solenoid valves are operated with the same pressure?

Simulink model: The student uses in the thesis the print screens from Sïmulink environment with very short description. As the references are missing everywhere, it's hard to define, which block (model) are work of the student, and which ones were given by the company. The upshift and down shift curves of 4 speeds gearbox are represented with 4 lines, for 2 speeds gearbox with 2 lines. Which parameters of dog clutch were introduced in the model – see 2nd row page 60.

Formal and language level, scope of thesis	D - satisfactory.
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 English level is correct. The nomenclature is not in alphabetical order. The formatting is on ordinary level. The figures mainly describing the model do not contain the important information.	

Selection of sources, citation correctness	E - sufficient.
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 author uses many non-original figures. Just 3 Figures have reference to bibliographic source. Also in the text is rare to see the bibliographic source. In the thesis is very hard to distinguish what part really is original work from Sai Kalyan and what was earlier prepared by the company, of is earlier work in the field.	

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.
None

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 probably did a lot of work, but this does not appear in the master thesis. This is also the reason of the awarded grade.
I will have following questions for the defence:
1. Please explain the graphs on Fig 75 till 78.
2. Please explain what is difference between graphs depicted on Fig. 85, Fig. 89 and Fig. 93?
3. Please explain how is possible that during simulation running with ICE (P = 1800 HP) needs to use full-throttle position to drive WLTP cycle, while for electric motor (P = 470 HP) mainly in the first part of the WLTP cycle is sufficient just 0,3 % of the "full gas pedal position.

The grade that I award for the thesis is **E - sufficient.**

Date: **10.2.2022**   Signature: