

I. IDENTIFICATION DATA

Thesis name:	Design of a four-stroke single-cylinder motocross engine
Author's name:	Adam Bureš
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Automotive, Combustion Engine and Railway Engineering
Thesis supervisor:	Ing. Jindřich Hořenín.
Supervisor's department:	Department of Automotive, Combustion Engine and Railway Engineering.

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
The work is very complex and extensive. The assignment corresponds to the assignment used in engineering practice.	

Satisfaction of assignment	fulfilled
<i>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.</i>	
The student fulfilled the assignment of the diploma thesis very well.	

Activity and independence when creating final thesis	B - very good.
<i>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.</i>	
The student regularly consulted his work, which he did independently.	

Technical level	C - good.
<i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	
The assigned topic is very extensive and complex to solve. The work deals with a complete design of a motorcycle engine and strength control of the crank mechanism. Unfortunately, unclear and inconsistent definitions of materials are used in the work.	

Formal and language level, scope of thesis	B - very good.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
The text of the thesis has a good formal and linguistic level. Sometimes non-technical terms are used. E.g. page 41 clearance volume compression volume page 51 Radial lash correct is radial play or clearance	

Selection of sources, citation correctness	A - excellent.
<i>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.</i>	
The list of sources in scope and processing corresponds to the diploma thesis.	

Additional commentary and evaluation
<i>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.</i>

The student was very well acquainted with the design process of a 1-cylinder motocross engine. He worked on a selected topic with high quality and comprehensive help with the help of various tools used in the construction of internal combustion engines.

There are the following shortcomings in the work

page 42 error in formula (9)

page 45 Thermodynamic model - the model cannot be assessed because the student does not attach it to the work

page 46 problematic comparison with competing engines, because the graphs have different units (SI-units - U.S. units)

page 49 unclear specification of piston material standard

page 60 bronze connecting rod bearing cannot withstand high loads

page 63 unclear calculation of rotational masses

page 74 unclear specification of head material standard

Obvious errors in 3D models

The piston has sharp edges in the combustion chamber

Piston non-manufactured ring lock bores

There is no play between the sides of the connecting rod and the crank

The crank bearings are supported in radii of crank

Head:

Non-producible lubrication bores

Non-manufactural cooling space

Non-compliance with design principles of castings - large clusters of materials non-uniform thickness of casting walls

The water space cannot be vented.

Undefined position of the head relative to the block

Undefined position of the head seal

Engine cases

undefined mutual position of cases - centering pins are missing

Lack of material around the thread of the head bolts in the left case

Non-compliance with design principles of castings - non-uniform wall thickness

Unclear lubrication system

The head seal does not fit the block - collision with bolts

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation.

The student was very well acquainted with the design process of a 1-cylinder motocross engine. He worked on a selected topic with high quality and comprehensive help with the help of various tools used in the construction of internal combustion engines.

I evaluate handed thesis with classification grade **C - good**.

Date: **26.1.2021**

Signature: