

UNIVERSITI TEKNOLOGI MARA

**EFFECT OF MOISTURE CONTAMINATION IN GEAR
OIL LUBRICANT ON YAMAHA OUTBOARD ENGINE
PERFORMANCE**

MUHAMMAD HAZIQ HILMY BIN ISMAIL

Diploma

March 2022

ACKNOWLEDGEMENT

Alhamdulillah, first we would like to thank God as finally we were able to finish our final year project that have been given by lecturer to me. This task had been done with all afford by group members even though a little bit problem were happened among us while doing this project. Luckily, all the problems can be settled down and we were able to adapt properly and wisely. Besides that, big thank we address to our supervisor Madam Norhanifah Binti Abdul Rahman and supervisor Matzaini Bin Katon because without them guide our project cannot be done properly like this. Them always give us supports and guide to us how to do our project in purpose to produce a good outcome from research that been studied. The project to analyse the effect of moisture contamination on the outboard engine performance. Finally, thank to our beloved friend that always stick together and work hard to produce a good project with all afford and responsibility. Hope that all the afford will give a lot of benefits to us and also to our group project. They always give us ideas and comments on our project so that we can improve our project in many ways.

ABSTRACT

The moisture content in lubrication oil refers to the amount of water in the oil. Moisture content has a negative impact on lubricating oil and engine surface. The study was conducted to evaluate the methodologies used and the most effective approach for determining moisture content. The Fourier Transform Infrared (FTIR) analysis are the methods used. The techniques will be used to figure out the best way to measure moisture. The FTIR analysis result will be displayed on the machine we used. As a result of the findings, I believe I now know the best and easiest method for evaluating moisture content in lubricant oil. The methods used each have their own set of benefits and disadvantages.

TABLE OF CONTENTS

	Page
CONFIRMATION BY SUPERVISOR	Error! Bookmark not defined.
AUTHOR'S DECLARATION	Error! Bookmark not defined.
ABSTRACT	iv
ACKNOWLEDGEMENT	Error! Bookmark not defined.
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	x
CHAPTER ONE : INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Objectives	3
1.4 Scope of Work	3
1.5 Significance of Study	3
CHAPTER TWO : LITERATURE REVIEW	4
2.1 Engine	4
2.1.1 Outboard Engine	5
2.1.2 Gearbox	6
2.1.3 Yamaha 115HP Four-Stroke	7
2.2 Lubricant	8
2.2.1 Function of Lubricant	8
2.2.2 Yamaha Yamalube SAE90 GL-4 gear oil	9
2.3 Moisture Content	10
2.3.1 The Effects of Moisture Content in Lubricant	12
2.4 FTIR Method	13

CHAPTER THREE : METHODOLOGY	14
3.1 Introduction	14
3.2 Sample Preparation	14
3.3 Flow Chart	18
CHAPTER FOUR : RESULTS AND DISCUSSION	19
4.1 Introduction	19
4.2 Result	19
4.3 Discussion	20
CHAPTER FIVE : CONCLUSION AND RECOMMENDATIONS	21
5.1 Conclusions	21
5.2 Recommendations	21
REFERENCES	22
APPENDICES	24