

**UNIVERSITI TEKNOLOGI MARA**

**DESIGN, ANALYSIS, AND FABRICATION OF  
MONOSHOCK COMPRESSOR**

**OTHMAN AL AFFAN BIN ABD RASHID**

**DIPLOMA**

**Feb 2023**

## **ABSTRACT**

In 1972, Yamaha introduce the Mono-shock single shock absorber rear suspension system on their motorcycles competing in the Motocross World Championships (1). The objective of this project is to make a user-friendly device for assemble and dissemble spring from monoshock system. Next, monoshock is very important in any vehicle to get the best comfort and safety on the road. This research is about creating device to compress monoshock spring. This system is support with big spring. To dissemble it, user should remove the spring. So, this device will help user to use less human energy and improve safety precaution while remove the spring and avoid any injuries. In this research, all the fabricated steps already been applied to make the real prototype. After completing the project of monoshock compressor, it finally can function as it should be which can compress the monoshock spring safely and the objective been achieved.

## **ACKNOWLEDGEMENT**

First and foremost, I would like to give a biggest thank to my parents for always supporting me through this journey. I made until this level because of them. They support me for financially and trust whatever decision I made and all I hope next is a better grade so they will believe that I make right decision. Next, I would like to thank my sibling for also supporting me. They also provide me money when I needed. In this project money is really important to make my project happen so as a student, it will be hard if I don't have enough money to buy everything I need. Finally, big thanks to myself for complete this process alone. I went to supplier factory, hardware shop, survey cheapest place that sell item I need, all alone. Even when doing this project I am alone and this really make me proud of myself. I know I can stand by myself, and I found easier to work alone because it saves my time.

## **TABLE OF CONTENTS**

	<b>Page</b>
<b>CONFIRMATION BY SUPERVISOR</b>	<b>iii</b>
<b>AUTHOR'S DECLARATION</b>	<b>iv</b>
<b>ABSTRACT</b>	<b>v</b>
<b>ACKNOWLEDGEMENT</b>	<b>vi</b>
<b>TABLE OF CONTENTS</b>	<b>1</b>
<b>LIST OF TABLES</b>	<b>3</b>
<b>LIST OF FIGURES</b>	<b>4</b>
<b>LIST OF ABBREVIATIONS</b>	<b>5</b>
<b>CHAPTER ONE : INTRODUCTION</b>	
1.1 Background of Study	6
1.2 Problem Statement	7
1.3 Objectives	7
1.4 Scope of Work	7
1.5 Significance of Project	8
1.6 Expected Result	8
<b>CHAPTER TWO : LITERATURE REVIEW</b>	
2.1 Benchmarking/Comparison with Available Products	10
2.2 Industry Related Item	11
2.3 Available Patents	12
2.4 Sustainability/Ergonomic Related Item/Cost Consideration	15
<b>CHAPTER THREE : METHODOLOGY</b>	
3.1 Concept Generation and Evaluation	17
3.2 Embodiment of Calculation	26

# INTRODUCTION

## 1.1 Background of Study

As general information, mono-shock were created to absorb force to make safer and comfortable riding experience. This technology is important in motorcycle industry. The monoshock technology were created from several main part which is one of them is spring. This research will focus on creating a device that can remove the spring. The main idea of 'Mono-shock Compressor' is to help foreman or professional technician to change component in mono-shock. To make this possible, the first process is to study another design that some company already produce.

Secondly, to create monoshock compressor, it needs some metal sheet, old brake disc, one set of car jack, and some bearing to use as adjustment component. All the material to produce this device is from reusable item to cut cost. This also will benefit our environment by make good of waste to become useable again. Estimate cost for this project is below Rm250 for the material only. This issue will be depending by availability of the product in market now. The cost might change time by time.

Furthermore, some process will be used to produce this device. For example, Lathe, Milling, Fitting, Sheet Metal and Welding will be applied. All process will be conduct in UiTM Pasir Gudang Workshop and the estimate time to complete it is 14 weeks and all the tests will also be held to follow the S.O.P.

Otherwise, after completing the device's prototype and confirm achieving target for user such as safe, user friendly and compact, the design will focus on detailing such as paint the monoshock compressor. This will attract trust for user to get this device because it contains look that tells it's a finish and complete product. Some manufacturer does not care about this issue but it's actually very important for marketing the product.