

**POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ
SHAH**

DUAL EZ ABSORBER REMOVER

NAME

MATRIX NO.

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MECHANICAL ENGINEERING DEPARTMENT

DECEMBER 2019

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**This report is submitted to the Department of Mechanical
Engineering in partial fulfilment of the requirements for Diploma in
Mechanical Engineering**

**MECHANICAL ENGINEERING DEPARTMENT
DECEMBER 2019**

DECLARATION OF ORIGINAL WORK AND INTELLECTUAL PROPERTIES

TITLE : TITLE

SESSION : DECEMBER 2019

1. I, MOHAMAD ZICKREE IRFAN BIN MOHAMAD ZUKI (08DKM19F1123.) , NICK CHAN JIA XING (08DKM19F1122) is a final year student in Diploma in Mechanical Engineering, Mechanical Engineering Department, Politeknik Sultan Salahuddin Abdul Aziz Shah, of Persiaran Usahawan, 40150 Shah Alam, Selangor. (Hereafter referred to as “the Polytechnic”).

2. I acknowledge that the ‘Project above’ and its intellectual property are the original work/copy of our work without taking or imitating any intellectual property from others.

3. I agree to give up the intellectual property ownership of 'The Project' to the Polytechnic in order to meet the requirements for awarding us Diploma in Mechanical Engineering.

Made and truly recognized by _____)

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In front of me, Puan Salhana Binti Sahidin@Salehudin

(LECTURER IC) as the project supervisor on the date:)

ACKNOWLEDGEMENT

Grateful to the Divine presence and blessings on our great master, the Prophet Muhammad SAW, we were able to complete the final project with excellence within the stipulated period of 2 years without facing any difficult problems as a condition for awarding the Diploma in Mechanical Engineering for the June 2021 session. We would like to express our appreciation to all parties involved directly or indirectly, especially our supervisor Puan Salhana binti Sahidin@Salehudin who has given us a lot of guidance, advice, encouragement, and constructive criticism so that we successfully completed this final project report. Not forgetting also to the friends and family members who helped a lot in terms of views and finances in completing this final project assignment.

With this, we are grateful to Allah SWT, so this final project is ready. We hope that this report can be used as an example and guide to the relevant parties in the future.

ABSTRACT

This project is applied from observation based on the manual method used now which is to change car absorbers .The objective of this project is to design a tool capable of lifting a car up to change the car's absorbers in a easier way.

All of these are set to solve some of the problems that arise with the use of existing methods such as, the difficulty of changing absorber in a bad posture and a lot of using hands and less safety factors because injuries can be caused by the absorber or sharp parts from the car.The material for this project must also have special characteristics that is not rusty and can handle heavy weight , based on the literature review below cast iron and steel is the most suitable material for this project.While for the component formation process, methodological study is used to plan the project production process by using flow charts as a guide for production planning and project testing. Based on these results, the analysis and discussions that have been conducted, it can be concluded that this tool has also been proven to save time compared to traditional methods.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Dual EZ absorber remover is a absorber remover that is design to increase the work rate of removing a absorber .This is because traditional absorber only able to remove one absorber at a time while this Dual EZ absorber can remove two absorber at a time , therefore this absorber is design to cut down the time of removing absorber and provide a more safety removal compare to traditional way

1.2 Research Background

Absorber is well know in the world but the process of removing its quite complicates as it requires amount of skills therefore there is not much modern design about absorber remover .Absorber removal is basically a design to remove car absorber in a easier way .Usually mechanics will remove car absorber when the car is detected with damage in the absorber or wheel area to ensure the car is save to drive and protect the safety of driver and passenger

Among the things that can be submitted are as follow:

- i. current engineering market is lacking experienced engineers therefore improvement of equipment can be use to replace skills of fresh graduated
- ii. This research is to show that the important of mechanics and the use of technology

1.3 Problem Statement

- Traditional absorber requires a long amount of time to disassemble
- Absorber disassembly or installation is a challenging task that requires experience and skills if not it could cause serious injuries

1.4 Research Gap

• Implementing this project there are some key that is set to be achieved. This is to ensure that this project follows the desired criteria. Objectives that have been studied are as follows:

- i. To design an ergonomic and friendly Absorber remover
- ii. To develop and fabricate the absorber remover
- iii. To increase the work rate of removing car absorber

1.5 Research Objectives

- To design an absorber disassembly time that is easy to use
- To develop and fabricate a opening tool and installation spring on absorber
- To minimize absorber disassembly and installation time

1.6 Significance of study

- Making it easier for mechanics to do work easily and ergonomically
- Saves working time

1.7 Scope and limitations

- Can be used in huge or small mechanical workshop and automobile service center

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Opening the absorber manually was take a long time , besides being very dangerous for beginners . This Dual Ez Absorber Remover is able to solve the problem in a short period of time and less risk of injury to the mechanic .

2.2 Theory/Concept

An absorber is a device used to absorb shock on wheeled vehicle . Absorber is divided into several types including spring type. Inautomotive industry this type of spring absorber is not something that is easy to install or remove. The spring has a strong pressure due to using a coil. For the Proride Standard Absorber, it has a normal stroke , of the gas type and is more durable than the OEM Absorber and comfortness; 15% ~ 20% stronger than OEM type oil absorber. The comfort level is almost 100% like an OEM absorber. For the Proride Sport Absorber, it has a Short Stroke Performance/racing suspension; very responsive/aggressive ride; 30% ~ 35% stronger than standard absorber.

To open it manually takes about 30 minutes for it but with Dual Ez Absorber Remover can reduce almost half that time with a height of 100cm and a width of 150 cm that can hold two absorbers at one time. this can help make every day easier working for a mechanics or automotive student to get the job done faster

2.3 Existing concepts

The construction of an automatic absorber opener is one of the best alternatives to reduce problems for car mechanics. Automatic absorber remover is a car maintenance system used in order to facilitate the work of car mechanics who have problems when opening the car absorber. In particular, the function of this tool is as follows:

Save capital for workshop operators in Malaysia who have just started their business , saves car absorber opening time to car mechanic . saves car mechanic energy during changing the absorber .

2.3.1 Concept 1

Figure 2.1 shows the car absorber remover devices available in the market. This design shows that this tool is dangerous because the surface is less wide and it makes this tool less stable . It also only opens one absorber at a time



Figure 2.1 Hydraulic Automatic Absorber Remover

2.3.2 Concept 2

Figure 2.2 shows that it is difficult to use for those who have no experience disassemble the absorber. it is also dangerous because it has no safety element and also takes a long time to disassmble the absorber .



Figure 2.2 Manual Method For Remove Absorber

2.3.3 Concept 3

Figure 2.3 shows the car absorber remover devices that always mechanics used . This design shows that this tool is only opens one absorber at a time .



Figure 2.3 Semi Manual Absorber Remover

CHAPTER 3

METHODOLOGY

3.1 Introduction

This absorber remover can be used on a small scale in areas in the automotive industry. These absorber remover are targeted at small -scale workshop operators to get the best results by saving time and cost.

It can also be used in larger automotive industries such as branded car service centers, but they should emphasize on cost because large funds can produce better quality absorber openers, it is because the larger automotive industry mostly services more cars and will make it easier for these absorber openers to become less durable if used at low cost. reasons for choosing a smaller one industry because usually workshop mechanics and automotive students use manual methods that consume time and energy but with this product they just need to twist the car jack rod on the product and it will work. In addition, this product can open two absorbers at once so that the time taken is less than that required by a manual absorber opener. This Dual Ez Absorber remover can make it more ergonomic than a manual absorber opener

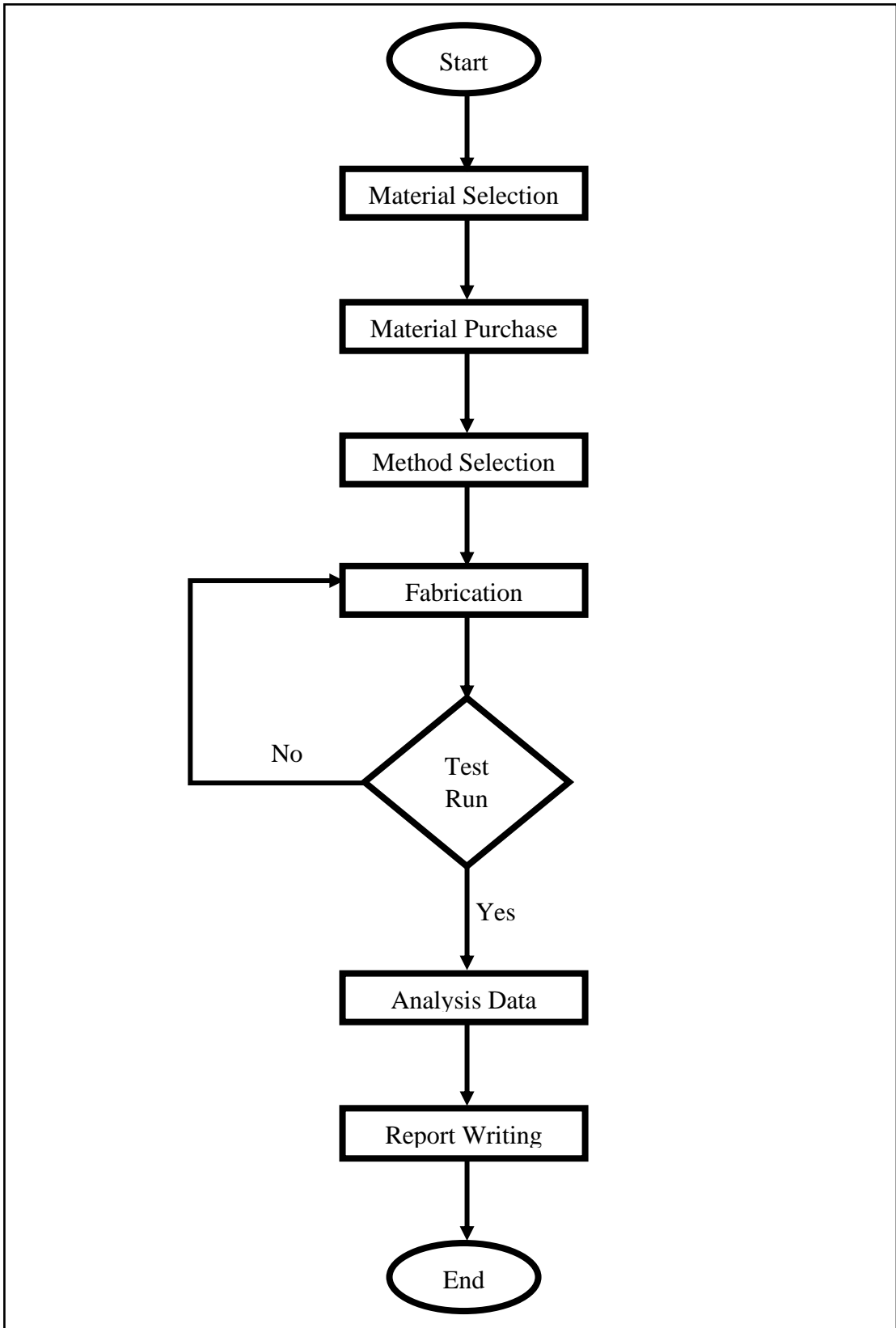


Figure 3.1 Research methodology

3.2 Product design

Before an absorber remover was implemented, the design was designed to find out the stable characteristics to accommodate the load of the absorber on it. In fact, this design is intended so that before the implementation is done, it can be described before the project is implemented and even this design will provide more detailed information to build an absorber remover that allows it to work

3.2.1 Design 1

First design had been created by using all of material selection with addition hydraulic . this design suitable for the expectation that reduce the time by opening the absorber .

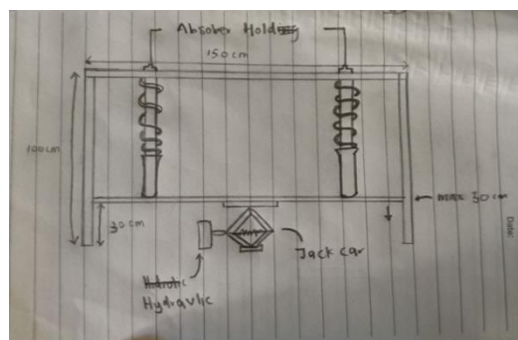


Figure 3.2

3.2.2 Design 2

Second design was created by using all materials selection without using hydraulic . it is cause reduce a cost by buying a hydraulic but the same time it is also saving a time by opening the absorber .

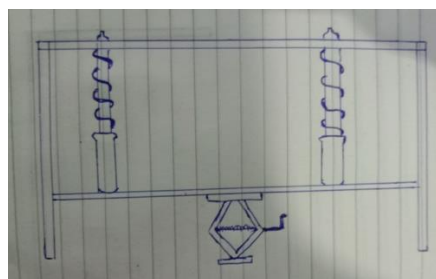


Figure 3.3

2.2.3 Design 3

Figure 3.4 is the third design that was created with addition 4 wheel at the bottom of this product. But the problem is this product can't move because of its weight. so it is a waste .

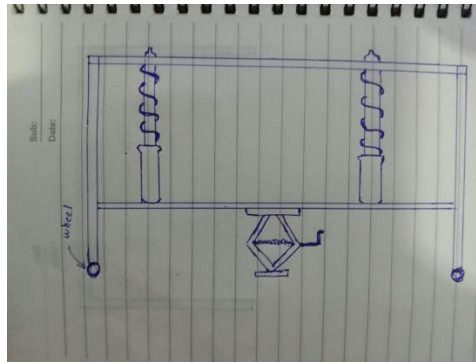


Figure 3.4

3.2.4 Material Selection

1. Metal
2. Car Jack

3.3 Analysis

In this project , need a lot of work manufacture to be applied to make sure this project done well as planned . This project need uses MIG because it is easy welding process compare to other welding process . MIG also produce the product at good and sastifying condition because it have good weld surface and clean .

3.4 Prototype

This design was chosen because it has a design that fits the original idea of this group which is to save time and energy for mechanics .

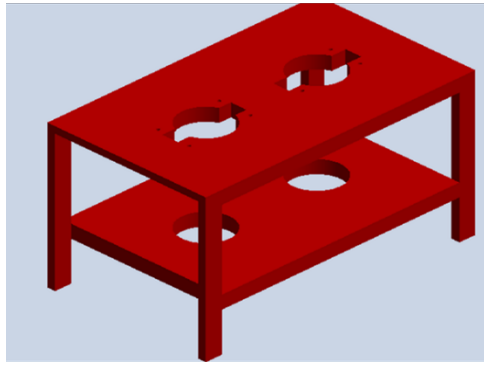


Figure 3.4 Isometric view

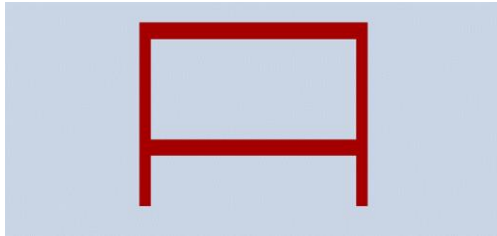


Figure 3.5 Isometric infront view

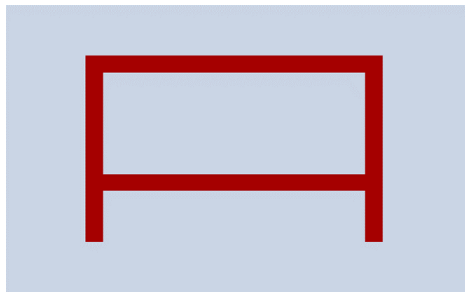


Figure 3.6 Isometric side view

CHAPTER 4

PRELIMINARY FINDINGS OF THE RESEARCH

4.1 Introduction

The result of the project is to produce a machine that is acceptable to users and society . The project is aimed at an absorber opening job in a car workshop workshop. In addition, the project also aims to reduce the problem of such consumer injuries as a part of the human body during or after opening the absorber .

4.2 Preliminary investigation

Preliminary research studies were conducted to gather information or opinions from the surrounding community on problems when opening the absorber .

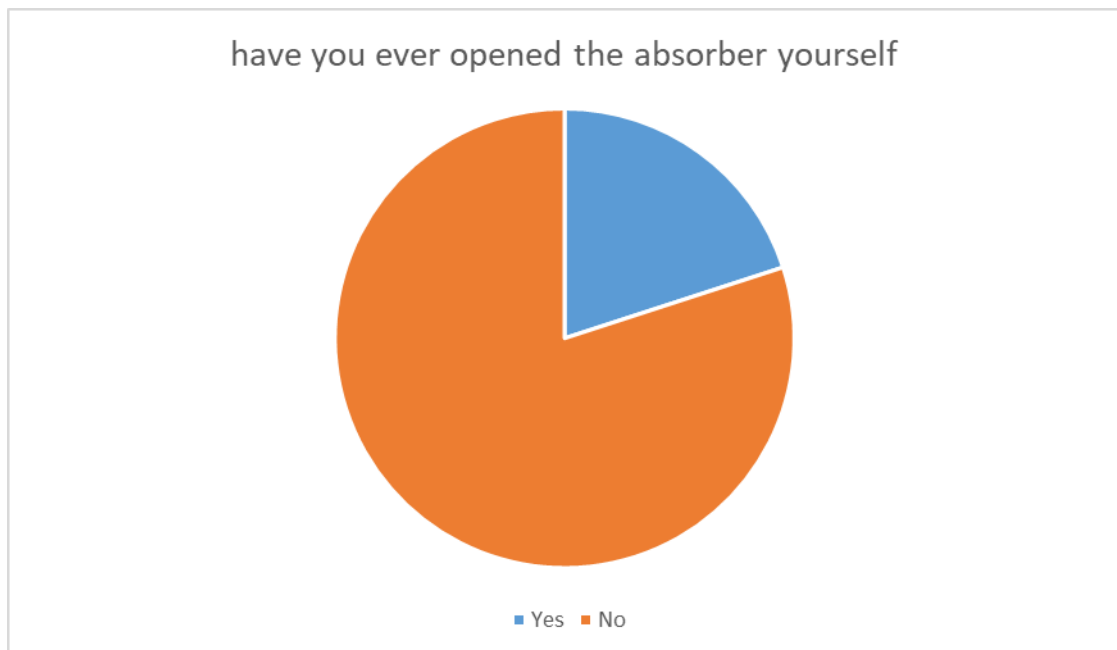


Figure 4.2.1 Question 1

Are you interested in an absorber opener machine that
can save time and energy
12 responses

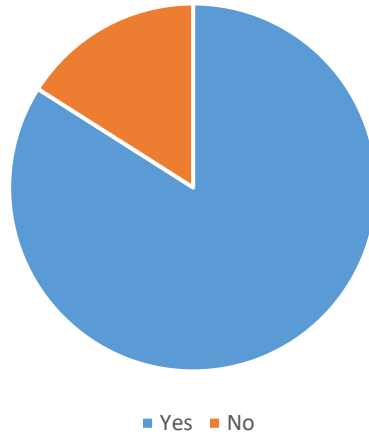


Figure 4.2.2 Question 2

if you were given a choice would you buy an absorber
opener machine that saves time and energy?
12 responses

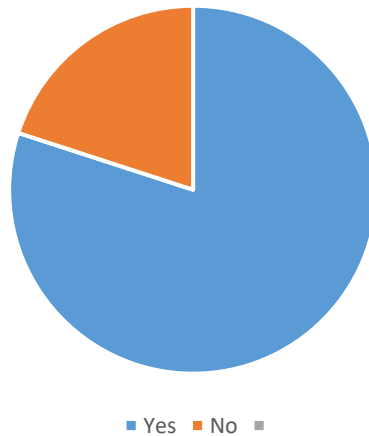


Figure 4.4.3 Question 3

4.3 Recommendation

The improvement in this project for the future is by adding a motorized lifter . Due to tight budget . This current project is using a normal car jack to save our cost . In additional , could make it to be portable by making it foldable and more lightweight by changing the material to a more light metal such as aluminium .

4.4 Conclusion

In Conclusion , design of the Dual EZ Absorber is successful as we have achieved objective 1 , which is to design an easy to use absorber. After that , objective 2 is yet to be completed due to the pandemic our progress has been drag back and its expecting to be completed by the next semester when we get back Politeknik . Finally , objective 3 its expected to minimize the disassembly and installation time for the absorber remover .

In conclusion, comparable to this era of advanced devices such must be produced human labor able to limit to a minimum .

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