



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

PORTABLE 3-IN-1 EMERGENCY KITS

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electrical Engineering Technology (Industrial Automation & Robotics) with Honours.

by

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BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

Tajuk: **PORTABLE 3-IN-1 EMERGENCY KITS**

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APPROVAL

This report is submitted to the Faculty Of Electrical And Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electrical Engineering Technology (Industrial Automation & Robotics) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Kenderaan menjadi sebuah pengangkutan yang utama dalam kehidupan seharian sama ada mahu ke tempat kerja atau ke mana-mana sahaja. Biasanya, masalah asas kereta adalah tayar pancit atau bateri kereta mati. Projek ini adalah untuk mencipta kit kecemasan 3 dalam 1, yang mempunyai jek kuasa, pemampat udara, dan bateri. Seterusnya, penyesuai 12 volt perlu disambungkan ke pengecas kereta dan dengan menggunakan aplikasi mudah alih yang dibuat menggunakan pencipta aplikasi MIT dengan mudah dapat menaikkan sebahagian daripada kereta dengan mengawal butang. Selain itu, sebagai pemampat udara, ia dapat menentukan tekanan sambil mengawal butang untuk meningkatkan dan menurunkan tahap tekanan udara dan boleh memantau pada aplikasi mudah alih. Oleh itu, projek ini boleh digunakan di mana saja dan pada bila-bila masa yang diperlukan.

ABSTRACT

The vehicle became the main transportation in daily life either going to work or any destinations. Usually, the basic problem of the car is a flat tire or having a dead battery. This project is to develop emergency kit 3 in 1, which has a power jack, air compressor, and battery. Next, adapter 12 volts need to connect to the car charger and by using mobile applications created using MIT apps inventor can easily jack up part of the car with control of the button. As the air compressor, it can determine the pressure while control a single button to increase and decrease the air pressure level and can be monitor at mobile applications. Therefore, this project can be use anywhere and anytime when needed the most.

DEDICATION

Special dedication to my beloved parents, Ahmat Bin Epi, Saadiah Binti Mohd Yusuf, Hanifah Binti Mat Som and Noraida Binti Yaacob. Their encouragement and guidance has always be an inspiration to me along this journey of education.

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TABLE OF CONTENTS

	PAGE
TABLE OF CONTENTS	x
LIST OF TABLES	xiv
LIST OF FIGURES	xv
LIST OF APPENDICES	xviii
LIST OF SYMBOLS	xix
LIST OF ABBREVIATIONS	xx
LIST OF PUBLICATIONS	xxi
CHAPTER 1 INTRODUCTION	22
1.1 Introduction of project	22
1.2 Problem Statement	23
1.3 Objective	23
1.4 Scope of Project	23
1.5 Thesis Layout	24
CHAPTER 2 LITERATURE REVIEWS	26
2.1 Introduction	26
2.2 Emergency Kits	26
2.3 Power Jack	28

2.4	DC Motor	29
2.4.1	Brushed Motor	30
2.4.2	Power window	31
2.4.3	Stepper Motor	32
2.4.4	Servo Motor	32
2.5	Comparison between DC Motor	33
2.6	Air Compressor	34
2.6.1	Rotary Air Compressor	35
2.7	Battery	36
2.7.1	Vehicle Battery	36
2.7.2	Lithium Ion Battery	38
2.7.3	Nickel-Cadmium Battery	38
2.7.4	Lithium-Ion (LI) or Lithium Polymer (LP) Battery	39
2.8	Comparison between Wet Cell and Dry Cell	39
CHAPTER 3 METHODOLOGY		41
3.1	Introduction	41
3.2	Operation of the Project	41
3.3	Project Requirement	42
3.3.1	Software Implementation	42
3.3.1.1	Design using SolidWork	42

3.3.1.2	Design Circuit using Proteus	44
3.3.1.3	Design Applications using MIT App Inventor and Arduino	45
3.3.2	Hardware Implementation	46
3.3.2.1	DC Motor	46
3.3.2.2	Air Compressor	47
3.3.2.3	Battery Lithium Ion	47
3.3.2.4	Arduino Mega 2560	47
3.3.2.5	Bluetooth Module	47
3.3.2.6	Pressure Sensor	48
3.3.2.7	Relay	48
3.4	Project Testing	49
3.5	Project Analysis	49
CHAPTER 4	RESULTS AND DISCUSSION	50
4.1	Introduction	50
4.2	Results for Air Pressure tested using Portable 3-in-1 Emergency Kits	50
4.2.1	Results for Air Pressure tested using Pressure Pump at Petronas MITC	52
4.2.2	Results for Air Pressure tested using Pressure Pump at Shell Ayer Keroh	54
4.2.3	Results for Air Pressure tested using Pressure Pump at Petron Ayer	

Keroh	56
4.2.4 Comparison Results	58
4.2.4.1 Results for Time (s) of Air Pressure 180 Kpa Tested to 220 Kpa using Portable 3-in-1 Emergency Kits and Pressure Pump at Petron Ayer Keroh	58
4.2.4.2 Results for Time (s) of Air Pressure 180 Kpa Tested to 230 Kpa using Portable 3-in-1 Emergency Kits and Pressure Pump at Petron Ayer Keroh	59
4.2.4.3 Results for Time (s) of Air Pressure 180 Kpa Tested to 240 Kpa using Portable 3-in-1 Emergency Kits and Pressure Pump at Petron Ayer Keroh	60
4.2.4.4 Results for Time (s) of Air Pressure 180 Kpa Tested to 250 Kpa using Portable 3-in-1 Emergency Kits and Pressure Pump at Petron Ayer Keroh	61
4.3 Result for Electric Power Jack tested using Portable 3-in-1 Emergency kits	62
4.4 Results for Battery Jumper tested using Portable 3-in-1 Emergency Kits	65
CHAPTER 5 CONCLUSION AND FUTURE WORKS	66
REFERENCES	68
APPENDIX	70

LIST OF TABLES

TABLE	TITLE	PAGE
Table 2.1:	The comparison of DC motor	33
Table 2.2:	Comparisons between dry cell and wet cell batteries	39
Table 4.1:	Air Pressure Measurements Data using Pressure Pump at Petronas MITC	53
Table 4.2:	Air Pressure Measurements Data using Pressure Pump at Shell Ayer Keroh	55
Table 4.3:	Air Pressure Measurements Data using Pressure Pump at Petron Ayer Keroh	57

LIST OF FIGURES

FIGURE	TITLE	PAGE
Figure 2.1:	Design of the flag	27
Figure 2.2:	Places that the flag is put	27
Figure 2.3:	The invention of flag	28
Figure 2.4:	The placed of invention	28
Figure 2.5:	Jackscrew	29
Figure 2.6:	Type of motor	30
Figure 2.7:	Power window	31
Figure 2.8:	Application of stepper motor	32
Figure 2.9:	Application of servo motor	33
Figure 2.10:	Type of compressor	34
Figure 2.11:	Operation of rolling air compressor	35
Figure 2.12:	Rolling air compressor inflates vehicle tires	36
Figure 2.13:	Vehicle battery	37
Figure 2.14:	Lithium ion battery	38
Figure 2.15:	Nickel-Cadmium (Ni-Cad) Battery	39
Figure 2.16:	Lithium-Ion (LI) or Lithium-Polymer (LP) Battery	39

Figure 3.1: Flow chart of portable 3-in-1 emergency kits	42
Figure 3.2: Power windows	43
Figure 3.3: Air compressors	43
Figure 3.4: Battery	43
Figure 3.5: Combination of entire parts	44
Figure 3.6: Circuit for roject using Proteus software	45
Figure 3.7: Project Prototype	45
Figure 3.8: Design of the nut	46
Figure 3.9: Pressure sensor	48
Figure 4.1: Smartphone Application	51
Figure 4.2: Tested air pressure control using Apps	52
Figure 4.3: Graph shows Time (s) of Air Pressure 180 Kpa Tested from 220 Kpa to 250 Kpa versus Number of Taken using Portable 3-in-1 Emergency Kits	52
Figure 4.4: Analog Pump Pressure at Petronas MITC	53
Figure 4.5: Graph shows Time (s) of Air Pressure 180 Kpa Tested from 220 Kpa to 250 Kpa versus Number of Taken using Pressure Pump at Petronas MITC	54
Figure 4.6: Digital Pump Pressure at Shell Ayer Keroh	55
Figure 4.7: Graph shows Time (s) of Air Pressure 180 Kpa Tested from 220 Kpa to 250 Kpa versus Number of Taken using Pressure Pump at Shell Ayer Keroh	56
Figure 4.8: Digital Pump Pressure at Petron Ayer Keroh	57
Figure 4.9: Graph shows Time (s) of Air Pressure 180 Kpa Tested from 220 Kpa to 250 Kpa versus Number of Taken using Pressure Pump at Petron Ayer Keroh	58

Figure 4.10: Graph shows Time (s) of Air Pressure 180 Kpa Tested to 220 Kpa using Portable 3-in-1 Emergency Kits versus using Pressure Pump at Petron Ayer Keroh	59
Figure 4.11: Graph shows Time (s) of Air Pressure 180 Kpa Tested to 230 Kpa using Portable 3-in-1 Emergency Kits versus using Pressure Pump at Petron Ayer Keroh	60
Figure 4.12: Graph shows Time (s) of Air Pressure 180 Kpa Tested to 240 Kpa using Portable 3-in-1 Emergency Kits versus using Pressure Pump at Petron Ayer Keroh	61
Figure 4.13: Graph shows Time (s) of Air Pressure 180 Kpa Tested to 250 Kpa using Portable 3-in-1 Emergency Kits versus using Pressure Pump at Petron Ayer Keroh	62
Figure 4.14: Power jack on vehicle type Axia	63
Figure 4.15: Graph shows Time (s) of Electric Power Jack for Vehicles type Myvi and Axia Tested Down-lifted by 2cm versus Number of Taken	64
Figure 4.16: Graph shows Time (s) of Electric Power Jack for Vehicles type Myvi and Axia Tested Up-lifted by 2cm versus Number of Taken	64
Figure 4.17: Battery jumper on vehicle type Axia	65

LIST OF APPENDICES

APPENDIX	TITLE	PAGE
Appendix A:	Air Pressure Measurements Data using Portable 3-in-1 Emergency Kits	70
Appendix B:	Power Jack Measurements Data using Portable 3-in-1 Emergency Kits	77

LIST OF SYMBOLS

LIST OF ABBREVIATIONS

LIST OF PUBLICATIONS

CHAPTER 1

INTRODUCTION

1.1 Introduction of project

In this modern era, vehicles functions as a very important roles to facilitate us. In spite of modern transportations technology, usually equipment tools for troubleshooting vehicles still using non-advance tools to change a flat tires and jump a dead battery for a quick jumpstart. So, to enhance the problems in troubleshooting vehicles, Portable 3-in-1 emergency kits is design as prototype for this project, which include power window to jack a car, battery jumper to start up a dead battery and air compressor which can inflate tires. Basically, the design of scissor jack that has same function tools which is used of mechanical energy or human energy to lift up parts of car give complexity to user especially for uneducated user for car troubleshooting equipment [1].

Furthermore, when flat tires suddenly occurs, air supply is limited to access and only available at pump station or car workshop that have an air supply[2]. As for the dead battery car, it required car jumper cable and another vehicle to start up the car.

This chapter introduces the subject matter and problems being studied, and indicates its importance and validity. Introduction is the first part of a thesis and allows the readers to get the general idea of what your thesis is about. It also acquaints the readers with the thesis topic, explaining the basic points of the research and pointing the direction of your research. Introduction sets out the hypotheses to be tested (if applicable) and research objectives to be attained. It is important to remember that the

research objectives stated in the thesis should match the findings of the study. Failing to do so could result a recommendation by the examiners to conduct additional studies so that the stated objectives are met.

1.2 Problem Statement

Despite the development of advance technology in vehicles manufacturing, society should alert in solving some basic problems to troubleshoot their own vehicles even without mechanics but require user have some skills and tools experiences or follow the guidance that usually given such as changes flat tires and start up a dead battery car. As a flat tire, air supply is required but there only have a limited access when outside the city or in the middle of highway and as a dead battery also required another vehicle to jump a dead battery.

1.3 Objective

The objective of this project is:

- 1) To develop a portable emergency kits with electric power jack, battery, and air compressor.
- 2) To design a compact size and light weight emergency kits.
- 3) To analyze time performance emergency kits.

1.4 Scope of Project

The scope of this project is designing prototype of portable 3-in-1 emergency kits. As needed to change tires, power window is used to lifting up the normal jack. As

the screw nut is manual open then the jack can be lift or down by using button or mobile app and if the spare tires did not have enough air, then air compressor will inflate tires by using 12-volt adapter and can be remotely control using apps with Bluetooth. Some cases occur, the car battery will end it life but with a new design of battery car, it will have a great advantage to start up a car.

Hence, the problem statement that resulting to the outcome of project's idea is:

- i. Design compact design for portable 3-in-1 emergency kits.
- ii. Design the prototype using Solidwork software with dimension of 37cm x 24cm x24cm.
- iii. Minimize the human work for lifting a portion of a car using electrical power jack.
- iv. Design the prototype that can only used for sedan car with 2000 cc and below.
- v. Design an electrical power jack for vehicle with scissor jack only.
- vi. Design an air compressor with pressure of 300 psi and below.

1.5 Thesis Layout

This thesis consists of five chapters. Chapter 1 is about the project overview which is objectives of project, problem statement, scopes of project, methodology and report outlines. This chapter will briefly discussed which purposely to provide the reader an understanding of the project introduction.

Chapter 2 will discuss more on literature review on current approach and method in designing portable 3-in-1 emergency kits. This section also contains the limitations of