UNIVERSITI TEKNOLOGI MARA

DESIGN AND FABRICATION OF TRANSMISSION SYSTEM FOR STUDENT FORMULA RACING CAR

MITCHELLE HANSLEY ANAK FREDDY SHIRO

Dissertation submitted in partial fulfillment
of the requirements for the degree of
Diploma
(Mechanical Engineering)

College of Engineering

Feb 2024

ABSTRACT

This project will be a focal point in the world of custom automotive industry. It helps drivers of the Formula Student Racing car to shift gears with ease. Most students are facing troubles regarding the mechanism of the gear shifter as it may deem as complicated. So this project will be able to help future automotive engineers figure out the basic concept of a gear shifter mechanism. This project will be using a few types of metals, depending on the usage. Various points are taken into consideration when choosing the type of metal such as the bending ability, how easy it is to handle and weld the metal. This project involves fabrication processes such as measuring and marking, cutting, and welding process. The results are to create a functioning transmission shifter for the student formula racing car which are recorded and presented by the end of this semester. The hope for this project is that the mechanism can be used to generate ideas for the transmission part for many other upcoming races, helping all the students that are taking part in the Student Formula Racing Competition.

ACKNOWLEDGEMENT

First and foremost, thanks to both of my parents, Freddy Shiro anak Deri and Marina anak William for raising me ever since I took my first breath. I would also love to give thanks to my grandmother, Nempris anak Mijong who has been an important figure in my life. Thanks to all my friends whom I've grown up with, I really appreciate every single one of you. Thank you to my family for the moral support that they gave me throughout this painful college life. I would also giveall my praise to the Lord Almighty for guiding throughout this life.

Lastly, a big thanks to Mitchelle Hansley himself, for making this happen. Without him, this dissertation wouldn't even exist.

TABLE OF CONTENTS

CHAPTER ONE
INTRODUCTION

1.1 Background of Study

The history of transmission systems in race cars has seen significant advancements, driven by pursuit of faster lap times and improved performance. In the early 1900s to the 1940s, race cars primarily utilized manual transmission with a simple sliding gear mechanism. Drivers had to manually shift gears, demanding precise timing and skill.

In the fiercely competitive scene of the automotive industry, the study of gear shifter mechanisms plays an important role. With numbers of car manufacturers competing for market domination, the design and functionality of these mechanisms has become the game changer.

A well-crafted gear shifter not only enhances the driving experience, but also influences the vehicle performance, safety, and fuel efficiency. Manufacturers push themselves to create an optimized gear shifter mechanism to gain competitive advantage, offering smoother and more responsive gear shifts to the user. With all that's said, it is also conducted while prioritizing user-friendly designs and ergonomics considerations.

This project aims to create a gear shifter mechanism where appointed driver for the Formula Student Race Car can shift gear in smooth and precise manner, and not worrying about applying significant force to the gear shifter while also being on a comfortable position to conduct the transmission system. The gear shifter will be an excellent device for a self-made car or kart, where users are able to experiment with their own project.