

UNIVERSITI TEKNOLOGI MARA

**DESIGN AND FABRICATION OF
STEERING SYSTEM FOR STUDENT
FORMULA RACE CAR**

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ABSTRACT

The steering system plays an integral role in determining the car's handling, reactivity, and driver control. This project seeks to create a dependable and effective steering mechanism that boosts the overall performance of the race car. Elements like weight, strength, ergonomics and manufacturability must be considered in the design process. Examination of new ideas and technologies through extensive research improves the performance of the steering system. Precise 3D models are produced using the computer aided design, CAD program SolidWorks 2021. The fabrication process involves choosing materials of high quality. In order to guarantee accuracy and dependability, the steering system's components undergoes precise machining and welding processes. It aims to improve the handling, responsiveness, and general competitiveness of the car in racing events. An effective steering system design and production leads to successful achievement.

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

A steering system is a part of steering control that allows the driver to turn the vehicle in the desired direction while ensuring a perfect speed range control for safety. It can also be defined as the system that provides runs with the automobile in the required direction by turning the front wheels usually [1]. The steering system is a critical component of any vehicle, as it directly affects the handling and maneuverability of the car. In the case of a racing car, the steering system must be able to provide precise and responsive steering, as well as handle the high speeds and forces encountered on the racetrack.

A common problem with formula racing cars is loose steering, which can be caused by wear and damage to the steering linkage components. This can have an impact on other parts attached to the linkage components, such as the steering wheel, and develop excessive play when rotating the wheels. Another issue with the steering mechanism is its complexity. A sophisticated steering system can be difficult to maintain and repair, increasing costs and downtime. Furthermore, a complex steering system increases the likelihood of failure, which can be dangerous to the driver.

There are several options for dealing with these issues. Inspection of the steering components, steering column, and steering shaft, as well as checking if there are any loose fasteners, is a potential remedy. Tighten any fasteners applied, such as bolts and nuts, as these might contribute to steering play. Plus, inspect the linkage components and repair any that are worn or damaged, as this might contribute to excessive play. Another alternative is to design a simple and dependable steering system. This is possible by decreasing the amount of system components and utilizing tried-and-true technologies and architectures. A simple and dependable steering system can save maintenance and repair costs while simultaneously boosting the safety and performance of the race car.