

**UNIVERSITI TEKNOLOGI MARA**

**DESIGN AND FABRICATION OF  
EXHAUST AND FUEL SYSTEMS FOR  
A FORMULA STUDENT RACE CAR**

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## **ABSTRACT**

The Formula Student race car's exhaust system play a crucial role in engine performance and overall speed. For fuel system, it ensure`s driver`s safety, comfort, and fuel delivery. The current system is not efficient, leading to high backpressure in the exhaust and danger for driver. To address these issue, the project aims to design and fabricate an optimized exhaust and fuel systems using Computer-Aided Design (CAD) software and metal fabrication techniques. The optimized system is expected to reduce backpressure, and improve engine performance, resulting in a faster race car. Also, ensures driver`s safety, efficient fuel delivery and efficient throttle control for the race car. The project involves analyzing the current system, designing the optimized system, and fabricating it to match specifications. The efficient exhaust and fuel systems are essential for the performance of a Formula Student race car and can enhance engine performance and speed.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of Study

The design and fabrication of the fuel and exhaust system in a Formula Student race car are crucial for achieving optimal performance, efficiency, managing weight and compliance with regulations. These subsystems directly impact engine power, throttle response, fuel line, and vehicle dynamics. Therefore, conducting a thorough study on the design and fabrication of the fuel and exhaust system is essential to enhance the performance of the Formula race car.

### 1.2 Problem Statement

The fuel and exhaust systems of a Formula Student race car face several challenges that affect the car's performance and competitiveness. For exhaust system, the challenges include suboptimal exhaust gas flow, non-compliance with noise regulations, weight and packaging constraints. For fuel system, the challenges are weight and space constraints, safety and compliance, and user interface and control.

The exhaust system design may impede the smooth flow of exhaust gases, leading to increased back pressure and reduced engine performance. To address this, the exhaust system needs optimization to improve gas flow and minimize back pressure, resulting in enhanced engine performance [3].