CHAPTER 1

INTRODUCTION

1.0 Background of Project

Now day, road vehicle tends to develop lift thrust on the body. Base on the Proton Persona design, the upper aerodynamics shape will provide smooth to let air flow moving faster through the body. During high speed, pressure distribution at upper and underneath vehicle is different. The lift force occur when air pressure at underneath is greater than upper air pressure. It does depend to the velocity of air flow surround the vehicle. According to Bernoulli principle, when increase velocity the pressure will decrease and decrease velocity will increase pressure.

This project will focus on study underneath air flow for Proton Persona. An air dam was design to improve car performance by blocking air from to underneath and change the air direction around the body. With proper design air dam will generate negative down force to the vehicle body. The air dams create to fix lift thrust at the front Proton Persona and improve vehicle handling.
1.2 Problem Statement

Proton Persona is the most successful model in Malaysia produce by Proton. During moving in high speed, the vehicle tends to develop a partial vacuum on the upper contoured surface relative to underside pressure (Tsutomu, 1980). The air flow splits up into the upper stream which move over the upper surface of the vehicle and the lower stream which moves below the bottom of the Proton Persona. The velocity of the stream upper and below the Proton Persona also difference. The result to the vehicle is having lift force or thrust upward. It will cause the front tire lose grip to the ground and affect to stability of the vehicle. All of this will contribute to poor driving performance.

An air dam was design to control the lift force at the front Proton Persona. However, there is many type of design in the market. This project will come out the air dam design that suitable for Proton Persona and improve the aerodynamic flow.

1.3 Project Objectives

Basically the main purpose in accomplishing this task are stated below

i. Design the aerodynamics front air dam for Proton Persona.

ii. Simulation of aerodynamics for Proton Persona with and without air dam.
1.4 **Scopes of Project**

The scope of this project is focusing on the criteria that stated below

a. Literature study on the vehicle air flow system.
b. 3D scanning of the existing Proton Persona.
c. Design of air dam for Proton Persona.
d. Boundary condition setting.
e. Simulation of air flow for new design of air dam.
f. Analysis on the simulation result.
g. Report preparation.