CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Bumper is a part of an automotive designed that had at a vehicle. Bumper comprised an elongated support which can be attached to the front and rear of the vehicle body and which spans the width of the vehicle body, a shock absorber extending along the support part and extending towards the front and rear of the vehicle body in a substantially convex manner, and an elastic exterior shell which can be connected to the support part and which encompasses the front and rear of the vehicle in an approximate U shape, covering the side of the support part opposite the side facing the front and rear of the vehicle body where in the support part has a middle section that can be firmly supported on the vehicle body.

Bumper is divided in two types, they are front bumper and rear bumper. Main function both of them are for absorbing impact by reducing damage and to the potential for bodily injury during an accident. For this project, it is focused on the rear car bumper system. Rear car bumper system has three main components. They are the fascia, beam, attachment brackets and sometimes energy absorber. The fascia is the outer cover. It is attaches to the quarter panels and rear end panel. The energy absorber attaches to the beam. The beam is mounted directly to the vehicle body. These components were reviewed for differences in shape and construction prior to being assembled to the vehicles.

In this project, it is more to the improvement of rear bumper. The improvement is based on design, material used, attachment and impact testing. It's had two types of impact testing. It's are using barrier impact test and using Finite Element Analysis (FEA) Software that is ALGOR Software. Analysis using software was selected to test the design in this project.

1.2 PROBLEM STATEMENT

Rear car bumper system is one of the safety components in a car. But some people regarded that rear car bumper is just for accessory to a car. The current rear bumper is very difficult to install to the vehicle body. That why the rear bumper repairing cost quite expensive. It's difficult to install and remove because it's had many attachments. Another is average car users did not know how to repair or replace rear bumper when it's broken. Usually, car users just send their car to the workshop for repairing or changing the rear bumper.

Nowadays, rear car bumper is quite expensive in aftermarket although it depends on types of rear car bumper and car. Broken rear car bumper also quite expensive to replace. When thinking about the price, some people prefer to buy a non-original bumper because it cheaper than original without thinking about their safety. It's dangerous not only to the driver but also to the passengers.

1.3 OBJECTIVE

The main objective of this project is to improve rear bumper design. It will be designed using Solidwork software. Another main objective is to analyze the improvement design using Finite Element Analysis Software. The design will be analyzed in ALGOR software. This project is also to emphasize on the attachment and installation aspects of rear bumper to the vehicle body. It is designed for easier assembly steps as well as modifying the attachment design. It also will be designed for reduce of repairing cost.

Another objective is to design it more effective for a protection. It will be designed to increase impact absorbing behavior and to decrease car body deformation.

1.4 LIMITATION

During this project, some limitations were occurred. One of them is no books and journals about the bumper system in Knowledge Management Center (KMC) of University Malaysia Pahang (UMP). This gave difficulty to make project references. So, another alternative is by searching the journals from internet. Other, Three Dimension (3D) Scanner had problem and under maintenance. So, for continue this project, manual dimensional was using.