CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In this chapter introduction is made of some general information about the national car’s seat belt, research study in this project and the essential information of the seat belt design and part involved.

1.2 PROJECT BACKGROUND

Seat belt is a safety harness designed to secure the occupant of a vehicle against harmful movement that may result from a collision or a sudden stop. Seat belt start invented by Benjamin Foulois in 1911 and implemented in aircraft seat for the main purpose is to make pilot hold and firmly in the seat for the better control of aircraft. In automotive, implemented by Nash in 1949 and Ford in 1995 as options for the reason is mainly for safety. In 1970, the world’s first seat belt law was put in place at Victoria, Australia making the wearing of seat belts is compulsory for driver and passenger.

There are many types of seat belt such as 2 points seat belt (lap type), a lap belt is strap that goes over the waist and deliver the impact force to pelvis area, usually found in aeroplane. Besides, 3 points seat belt, a Y-shaped arrangement that spread out the energy of the moving body over the chest, pelvis and shoulder. 4,5,6 points seat belt,
the lap portion is connected to a belt between the legs (3 points) and shoulder belts (2 points). Typically found in child safety seat and in racing cars.

Seat belt is designed to hold person in place in the prevent of a motor vehicle accident, that is why choosing the best seat belt design is important to stay safe on the road, especially for user that may have special needs such as small size driver that need more specific or special design to make sure the comfort and safety of the driver.

Besides that, seat design also plays an important role in the perception of a vehicle’s overall quality. More effective ways have been seeking from car makers to improve car seats to make sure the comfort of driver. Flexible is one of the most important factors that must be considered to design a car seat. So that, it can be adjusted to fit the driver’s body size to make sure the driver feel comfortable when driving.

Ergonomic is one of the important factors that need to be considered in the design process. Ergonomics is a scientific discipline, which is concerned with improving the productivity, health, safety and comfort of people, as well as promoting effective interaction between people, technology they are using and the environment in which both must operate. A product may be ergonomically designed for a specific application. The product selected must be matched the characteristics of the required operations and the characteristics of the people who use the products. Some products are designed to specifically reduce risk factor. The importance of ergonomic and safety had grown significantly.

Thus, anthropometry data plays a main role in the design development. Anthropometry refers to the measurement of humans. Anthropometry has been considered as the very basic core of ergonomics in an attempt to resolve the dilemma of “fitting people to machine”. Bridger and Chou & Hsiao S.W. 2005. *International Journal of Industrial*, believed anthropometry is a research area ergonomics dealing with the measurement of human body dimensions and certain physical characteristics. Anthropometry can be used in ergonomics to specify the physical dimensions of workspaces, workstations and equipment as well as applied to product design.
1.3 PROBLEM STATEMENT

From the previous project background, there are many considerations that should be taken in designing and producing a national car’s seat belt that have ergonomics and more safety characteristics. Today, seat belt failure due to malfunction is not common. However, there are some very real problems with seatbelt design, and seat belt problems that could put driver and passengers at risk.

Seat belt injuries can occur when a defective seat belt fails to adequately protect a vehicle passenger in the collision phase of an automobile accident. Seat belt injuries also occur when there is a seat belt design, production, or installation can be suspected under the defect. Most of the seatbelt design today is the three-point design, which has a conjoined sash and lap belt. However, some people, especially small drivers, like to pull the sash part behind their backs or wearing a loose fitting seat belt because they feel not comfortable. Not wearing the seat belt properly is extremely dangerous with the sash going from the center of the shoulder and across the chest to the waist, because the seat belt is too big to be worn that way. That is why, this project will focused on evaluation of the design of a national car’s seat belt for comfort of small size driver.

Many people, especially those who are short, know how annoying it can be to have a seatbelt rubbing against their neck. Car manufacturers and safety organizations recommend adjusting the seatbelt to "rest across the middle of the shoulder" for safety, but for many shorter people, there has been no way to safely do this.

The thing about seatbelts is that they weren’t designed to fit all people. Even in many cars where the belt attachment at the door pillar is adjustable, the seat belt can’t be adjusted enough to move it away from the neck of a shorter driver or passenger.