CHAPTER I

INTRODUCTION

1.1 Background of The Study

Nowadays, many demands from consumers to have a car with powerful engine and low of gasoline so vehicle manufactures think how to make engine like that. Vehicle manufactures develop technology which can increase of engine performance and the engine can have a great power and torque.

Basically the existing system on automobile combustion is complex. To generate maximum power at low RPM is required a different setting with if we want to generate maximum power at high RPM. This is because the properties of the mixture of air and fuel during combustion. How big the valve should be opened, how long the valve should be opened, when the valve should be opened all different. The setting of the low RPM will cause the engine's performance while in high RPM and power output disturbed is reduce. Otherwise the setting of the high RPM will cause poor engine performance while in low RPM. Variable Valve Timing (VVT) can be used to problem solve above because variable valve timing can control timing valve. VVT can increase fuel mixture into gasoline engine that can make the gasoline engine will increase engine performance.

Variable valve timing is a generalized term used to describe any mechanism or method that can change the timing of valve lift event within

an internal combustion engine. Vehicle manufacture have special name for his VVT technology. For examples: VVT-i, VTEC and VANOS.

Variable Valve Timing with intelligence (VVT-i) is an automobile variable valve timing technology developed by Toyota. VVT-i introduced in 1996, varies the timing of the intake valves by adjusting the relationship between the camshaft drive (belt, scissor-gear or chain) and intake camshaft. Engine oil pressure is applied to an actuator to adjust the camshaft position. Adjustments in the overlap time between the exhaust valve closing and intake valve opening result in improved engine efficiency.

Through this engine test will analyze the effect of VVT-i technology on Daihatsu Xenia with performance of gasoline engine. The result of this engine test will give us brief explanation whether this device is efficient or not.

1.2 Problem Statement

Problems statement that can be drawn from the problem above is how does the effect of VVT-i to the gasoline engines in engine performance.

1.3 Objectives

The objectives of the engine test are as follow:

a. To investigate the torque that resulted by the engine use VVT-i with the torque that resulted by engine without VVT-i.
b. To investigate the power that resulted by the engine use VVT-i with the power that resulted by engine without VVT-i.

1.4 Benefit of The study

Two kinds of benefits which can be gained from the study are as follows:

1. Theoretical Benefit

   The study is expected to give additional information and knowledge about effect of VVT-i on engine Performance.

2. Practical Benefit

   The study is expected to enrich the knowledge of researcher and reader about principles and mechanisms of VVT-i system.

1.5 Problem Limitations

Problem limitation on the engine test is used to adjust the tools which available and also for issues to be discussed or analyzed is not too widespread. Limitations are as follows:

- **a.** The fuel which is used in the experiment is gasoline with the number octane of 98.
- **b.** Machine that used is Daihatsu Xenia K3–VE VVT–i 1298cc.
- **c.** The discussion is about the torque and power on engine use VVT-I and engine without VVT-i.
- **d.** The dynamometer used to know the power and torque from the engine.