

CHAPTER I

INTRODUCTION

1.1 Background of Study

Two-wheeled vehicles are one of the transportation tools that are needed to help with daily movements, starting from the education sector, the economy, health, etc. because more efficient than other transportation which is an energy conversion system from heat energy into mechanical energy. Heat energy can produce by burning a fuel-air mixed in the combustion chamber.

Two-wheeled vehicles are vehicles that still use fossil fuels such as premium, pertalite, pertamax, or pertamax plus whose ignition system uses electric sparks which can be obtained from two electrodes on the spark plug. We know that fossil fuels/gasoline is a non-renewable natural resource, therefore saving gasoline is highly recommended by the government until renewable natural resources are found and efficient to replace gasoline. Therefore, combustion in the combustion chamber must take place perfectly in order to produce a large power and torque as well as environmentally friendly combustion gases. Many factors affect, one of them is the mixing of fuel and air. A petrol engine is an internal combustion engine with spark ignition. In petrol engine, the fuel and air are always mixed by a carburetor or fuel injection before come into the combustion chamber for compression. The air-fuel mixture affected to the engine efficiency and power output. A petrol engine such as four-stroke engines is widely used in scooter, motor bike, car, and small three-wheeled vehicle, cause their cheapness, compact sized, and lightweight.

Handoyo & Wicaksono (2002) frequently air supply delays because the time to enter the air is too short when the high acceleration or rotation, the amount of air supply on combustion chamber is less, so the combustion process

takes place more imperfectly. One of the efforts to overcome this problem is by adding a supercharger, turbo charger, cyclone or something else to the vehicle.

The tool added in this study is a mini air compressor with the method of supplying air to an air filter with adjustable hole and directly supplied to the intake manifold so that more air supply during high rotation.

1.2 Problem Statement

1. What is the effect of adding fresh air using Secondary Air Injection (SAI) System on engine torque?
2. What is the effect of adding fresh air using Secondary Air Injection (SAI) System on engine power?

1.3 Problem Limitations

The study focused on the following description:

1. Petrol engine using Yamaha Jupiter Z New 115 cc 4-stroke engine two valve.
2. Air injection source using mini air compressor 12-volt 300 psi, 20.7 Bar, 2,069KPa.
3. Data collection using dyno test (electric dynamometer) when the engine running with loading at third gear.
4. Engine rotation that used is from 4,500 rpm until 9,000 rpm.
5. Engine performance analysis on torque and power.

1.4 Research Objectives

1. Investigating the effect of adding fresh air using Secondary Air Injection (SAI) System on engine torque.
2. Investigating the effect of adding fresh air using Secondary Air Injection (SAI) System on engine power.

1.5 Research Benefit

This research is expected to be able to help improve engine performance especially for engine used at high speeds or for long periods, engines get a lot of air supply, fuel-air mixture become more stable, and the use of fuel is more efficient, so that the engine power and torque will be more stable and even increase