CHAPTER I

INTRODUCTION

1.1 Background

Indonesia is a country that has many companies engaged in the automotive sector so that the growth in the number of motorized vehicles in Indonesia is growing rapidly. Data from the Central Statistics Agency (BPS) per 2018 the number of motorized vehicles reached 146,858,769 units. And in 2019, according to data from the Association of Indonesian Automotive Industries (GAIKINDO), the number of cars that reached consumers was 1,043,017 units.

With so many vehicles, Pertamina said that fuel consumption in Indonesia reaches 134 million liters per day, while Indonesia's petroleum reserves refer to the Ministry of Energy and Mineral Resources data in 2019 reaching 3,775 billion barrels and only 9.22 years away.

The rapid development of motorized vehicles in Indonesia results in increased air pollution or exhaust gases resulting from the combustion process. The combustion process produces toxic and dangerous gases such as carbon monoxide (CO), hydrocarbons (HC), carbon dioxide (CO2), sulfur dioxide (SO2) and other types of pollutants, and also contributes to global warming

Of the various problems caused by the rapid development of motorized vehicles, everyone tries to create an innovation to reduce the negative effects of these problems while still providing comfort without neglecting the safety factor and the ability to generate large power. One of the simplest attempts to do is to choose a fuel that is of better quality, for example, has a higher octane value.

Another innovation to improve fuel efficiency is by adding an air nozzle system. The air nozzle system here is by adding a funnel-shaped tool

into the air filter box which will lead to the throttle body so that the air flow from the air filter box to the combustion chamber becomes more leverage.

Sei Y Kim (1988) through his invention called the Turbo Cyclone. Turbo Cyclone is a tool made of stainless steel which has several fins / blades with a certain tilt angle to its vertical axis. This additional tool is used on the internal combustion engine which functions to make the air flow that will enter the carburetor and combustion chamber cylinder to rotate or rotate (twist). This occurs as a result of forced deflection of air by the inclined blades at a certain angle when passing through the turbo cyclone. The installation of a turbo cyclone causes a change in air flow characteristics, namely the emergence of a pressure drop in the combustion chamber and the air entering the intake manifold leading to the combustion chamber will form turbulently.

Therefore, the author wants to conduct further research on the effect of installing air nozzle and turbo cyclone on the performance of Honda brio cars. In this research, the engine performance will be tested on a car dyno test engine with the first variation using Pertamax fuel with the installation of air nozzle and turbo cyclone. Second, use Pertamax in standard car conditions. The third is using Pertamax fuel plus additives.

1.2 Problem Formulation

To facilitate research, the following formulation is taken as the problem:

1. How is the ratio of torque generated between turbo cyclone and air nozzle with standard conditions?
2. How is the comparison of the car power value in the installation of air nozzle and turbo cyclone with standard conditions?
3. How is the effect of additive additives on Pertamax fuel?

1.3 Research Purpose

The objectives to be achieved in this research are:

1. Knowing the performance of the combustion engine before adding air nozzle and turbo cyclone.
2. Knowing the performance of the combustion engine with the addition of additives which include torque and power.
3. Knowing the performance comparison of the combustion engine with the addition of a turbo cyclone, air nozzle and eco racing.

1.4 Problem Limitation

In order to make the research easier, the following restrictions are made:

1. Using turbo cyclone with diameter 46.78 mm in throttle body and 30mm in intake manifold
2. Using air nozzle with an outer diameter of 106mm and an inner diameter of 56mm
3. Using a Honda Brio car with automatic transmission.
4. Increasing car performance in the form of torque and power as an object of research.
5. The tool used to determine the performance of a car engine is Dynotest.

1.5 Benefits

The benefits of this research are:

1. For science, namely adding references to knowledge about the further development of air nozzle as a tool to increase the efficiency of motorized vehicles.
2. For the public, namely providing information and knowledge about air nozzle technology as an innovation to

increase the efficiency of a car engine by saving fuel and reducing exhaust emissions.

3. For the State, namely as a form of citizen participation in finding solutions to problems of energy availability and technological innovation in the field of combustion motors.

1.6 Writing Systematic

The systematics in writing this Final Project Report are as follows:

CHAPTER I INTRODUCTION

This chapter describes the background, problem formulation, research objectives, problem boundaries, research benefits and writing systematics.

CHAPTER II LITERATURE REVIEW

This chapter contains a review of several studies that have been carried out, the theoretical basis and some supporting literature in the discussion of research topics.

CHAPTER III RESEARCH METHOD

This chapter contains flowcharts, research tools and materials, as well as the testing steps carried out in the research.

CHAPTER IV RESULTS AND DISCUSSION

This chapter contains the results of research that has been carried out according to the procedures in Chapter III as well as an analysis of the research results that have been obtained from the testing process.

CHAPTER V CONCLUSION

This chapter contains conclusions and suggestions about the research being carried out.

REFERENCES

ATTACHMENT