

CHAPTER 1

1. PRELIMINARY

1.1 Background

In the development of automotive technology in Indonesia in recent years has increased so rapidly, various types of automotive technology are widely used in everyday life. The depletion of supplies and rising fuel prices have made many people try to find innovative fuel and increase combustion efficiency in motorcycle. Automotive technology is an interesting thing to be developed because of the increasingly advanced science of combustion engines about the effect on the performance of the combustion engine. Efforts to improve the efficiency of the fuel motor by improving the combustion process that occurs in the combustion chamber are also carried out by Sei Y Kim through his discovery tool called *Turbo Cyclone*.

One of the automotive technologies that has developed until now is the use of turbo cyclone on motorcycles. *Turbo cyclone* is one of the compressing technologies of the air, by means of air passing through the *turbo cyclone*, a more focused vortex is made. This additional tool is used on the *internal combustion engine* which functions to make the air flow that will enter the carburetor and the combustion chamber cylinder to rotate or *swirling*. *Turbo cyclone* is like a *swirl fan* whose blades do not rotate and are placed in the intake air or intake manifold. (Ping Wang, 2005)

So that the results of compressing the air can be compressed according to the number of *turbo cyclone* blades produced. *Turbo cyclone* installation

causes a change in air flow characteristics, namely the emergence of a *pressure drops* in the combustion chamber and the air entering the *intake manifold* towards the combustion chamber will be formed turbulently.

1.2 Problem Formulation

The formulation of the problem from this study is as follows:

1. How do you make a *turbo cyclone* in the number of 6 blades with a 40° slope that is effective for improving the performance and fuel efficiency of motorcycles?
2. How does the use of the *turbo cyclone* affect the number of 6 blades with a slope of 40° on motorcycles?
3. What is the result of the comparison of the differences in the use of Pertamina and Pertalite fuels in motorcycles that use the *turbo cyclone* with a number of 6 blades with a slope of 40°?
4. What causes a drop in power, torque and acceleration as observed in the graphs at a certain rpm?

1.3 Limitation of Problems

Limitations - limitations of the problems given by the authors of this study are as follows:

1. Turbo cyclone used is using plate material *stainless steel* forms like a fan with six (6) number of blades at a slope of 40°, a *turbo cyclone* modeling is simplified by ignoring the gap in the middle and the shape of the blade is considered to be truly uniform.

2. The flow pattern observed is in the air ducts with hollow *elbow pipes* with a diameter of 35 mm found on the Kawasaki ninja 250cc motorcycle.

3. The material used is premium and pertamax with the same amount of volume both in testing.

4. There are 2 *Turbo cyclones* used in a test with 6 blades with an angle of 40 ° to compare the work of the combustion motor.

5. *Turbo cyclone* uses a *stainless-steel* metal plate 0.3 mm thick and no discussion of material properties is carried out.

6. *The Spiller setting* at the time of testing was made on the *standard* Kawasaki manufacturer.

7. At the time of testing the entry gear on the motor, the gear enters 2 where the speed is between 5400 - 13000 Rpm.

8. The increase in the performance of the fuel motor in the form of torque, power, and acceleration before and after the installation of the *turbo cyclone* using pertalite and pertamax fuels on the system became one of the research objects.

1.4 Research Objectives

The objectives of this study are as follows:

1. Design a *turbo cyclone* device with 6 blades on a slope of 40 °.

2. Know the results the performance of the 4-stroke motorbike engine with the addition of a *turbo cyclone* with pertamax and pertalite fuel.

3.Determining the reason why the curve for power, torque and acceleration falls at a certain rpm.

1.5 Benefits of Research

The benefits of this study are as follows:

- 1.Providing information that the use of a *turbo cyclone* on a motor can affect the performance of a 4-stroke motorbike.
- 2.As an input for academic practitioners in testing the application of *turbo cyclone*, it affects the performance of 4 stroke engines.
- 3.Increase insight and knowledge for researchers especially in the field of Automotive.

1.6 Systematics of Writing

The systematics of writing this research report is organized as follows:

CHAPTER I INTRODUCTION

In this chapter contains the background, formulation of the problem, goals, benefits, limitations of the problem and the systematic writing that underlies the holding of this research.

CHAPTER II LITERATURE REVIEW

Contains a literature review and basic theories relating to this research.

CHAPTER III RESEARCH METHOD

This chapter contains information about the methodology and the stages of research from the beginning, starting from the process of tool design, tool making, to the installation stage of the equipment during testing.

CHAPTER IV DISCUSSION

In this chapter contains the results of the research that has been carried out according to the procedures in chapter III and analysis of the results of the research that has been obtained from the testing process.

CHAPTER V CONCLUSIONS AND SUGGESTIONS

Contains the overall summary and conclusions from the research carried out and converged on the results of the research obtained.