



Comparative Analysis of Performance of Honda Vario 125 Cc Motorcycle in 2022 Fueled by Pertalite, Pertamax, and Pertamax Turbo

Arnes Wildan Wahyudi ¹, Moh Syaiful Anwar ²

¹ Universitas Sunan Giri Surabaya, Indonesia

² Universitas Sunan Giri Surabaya, Indonesia

Corresponding Author: Arnes Wildan Wahyudi E-mail: arneslusi@gmail.com

Received: June 24, 2024	Revised: July 14, 2024	Accepted: July 14, 2024	Online: August 06, 2024
ABSTRACT This report presents a comparative analysis of Honda motorcycle performance using Pertalite, Pertamax and Pertamax Turbo fuels. The research was conducted through testing motorcycle performance under various conditions, including maximum speed, fuel consumption. The results show the performance differences between the two fuel types, providing valuable insights for consumers and Honda motorcycle manufacturers. The implications of these findings may influence the selection of fuels that suit the needs of everyday users and sustainable environmental policies. Keywords: <i>Fuel Consumption, Motor Performance, Torque Power</i>			

Journal Homepage <https://journal.vpidathu.or.id/index.php/ijnis>

This is an open access article under the CC BY SA license

<https://creativecommons.org/licenses/by-sa/4.0/>

How to cite: Wahyudi, W, A & Anwar, S, M. (2024). Comparative Analysis of Performance of Honda Vario 125 Cc Motorcycle in 2022 Fueled by Pertalite, Pertamax, and Pertamax Turbo. *Journal of Moeslim Research Teknik*, 1(4), 176-182.
<https://doi.org/10.55849/technik.v1i1.172>

Published by: Yayasan Pedidikan Islam Daarut Thufulah

INTRODUCTION

The use of motorcycles as a means of transportation has become an integral part of daily life in many parts of the world. In recent years, motorcycle population growth has been rapid, especially in developing countries. In addition, the increasing awareness of environmental impacts has encouraged the automotive industry to continue to innovate, including in the selection of fuel used. One important aspect of motorcycle operations is the fuel used.

Various types of fuels have been introduced and used by riders, including gasoline, diesel, natural gas, and even electric energy. Fuel availability and price, energy efficiency, and environmental impact are some of the factors that influence a rider's choice of fuel type for their motorcycle.

It is important to understand how different fuels affect motorcycle performance in terms of efficiency, performance and environmental impact. Through this research, we aim

to identify and analyze differences in motorcycle fuel use and understand the associated consequences. This information is expected to provide guidance for consumers, manufacturers, and regulators to make better decisions related to fuel selection in the context of motorcycles. In this study, we will evaluate several types of fuels commonly used for motorcycles, including gasoline, diesel, and natural gas. Measurements will include aspects such as fuel efficiency, and its effect on motorcycle performance.

The results of this study are expected to provide deeper insight into the impact of using different fuels on motorcycles, with the ultimate goal of improving the sustainability and overall performance of motor vehicles. Based on the description above, the researcher would like to propose a study with the title "Comparative Analysis of the Performance of Honda Vario 125 CC Motorcycle Year 2022 Fueled by Peralite, Pertamina, and Pertamina Turbo Motorbike".

RESEARCH METHODOLOGY

The method that will be used in this research is the experimental method. In the research, the treatment is in the form of rpm variations of motorxyg fueled by pertalite 90, pertamax 92 and pertamax turbo 98, then the results are seen in the form of power and torque in each variationxrpm using pertalite 90, pertamax 92 and pertamaxturbo 98.

The data analysis technique used inxthis research technique using descriptive r esearch technique using soft excell by processing observation data in the formance of torque and power including motors using permanent fuel 90, first 92 and first turbo 98. Then from the data used to find differences, and the data is depicted free of charge in the form of a graph to see the difference produced between power and torque including: HC,CO,CO₂,O₂ motors that use pertalite 90, pertamax 92 and pertamax turbo fuel.

Untuk mencari torsi ($T = F \times R$)

$$\text{Untuk mencari daya } P = \frac{2\pi n t}{60.000} \times 1.34$$

Keterangan : 1kW = 1,34 (hp)

Variable is the object of research, or what is the focus of attention in a research (Arikunto, 2006: 118). In this study there are two variables, namely

1. Variation rpm (independent variable).
2. Powerxand torque (dependent variable).

There are two stages that were performed in this research, namely the steps of Preparation and testing.

Preparation and inspection of the motorcycle engine:

- 1)Checking the condition of the test engine which includes the condition of the engine lubricating oil, spark plugs, ECU cables, coil cables, and other electrical system cables.

2) Perform service and tune up on the test engine which includes adjusting the

Throttle body, valve gap (intake valve and outlet valve) and others.

Preparation and inspection of test equipment:

- a) Checking the installation of test equipment and test equipment devices.
- b) Prepare and check measuring instruments and other auxiliary tools.
- c) Checking hoses and connections to make sure there are no leaks or other things that can hinder the testing process.
- d) Ensuring all instruments can work properly to get optimal results and avoid accidents.

The steps for testing engine performance are as follows:

- a) Performing rpm variations. The research will use 6 rpm variations. At the beginning of the research using a low rpm rotation.
- b) Installing a drip carburetor on the fuel inlet hole on the throttle body. Then fill the carburetor drops with pertalite 90, pertamax 92 and pertamax turbo 98 to see the results of the difference in fuel.
- c) Install the gas analyzer hose on the motor exhaust.
- d) Turn on the motorcycle.
- e) Record data on power, torque and fuel consumption.
- f) The rpm variation starts from 4500-7500 rpm.
- g) Testing was carried out by repeating the steps of the initial test using rpm variations.

RESULT AND DISCUSSION

Data obtained from experiments in the form of torque results from motorcycle engines tested on a dynamometer and gas analyzer, then further processed into power and exhaust emissions. The data obtained is still in the form of :

- a. Torque in units of Newton meters (Nm)
- b. Engine rotation in units of revolution per minute (rpm)

The reason for using motorcycle vehicles in this study is because researchers want to know how the difference in motor performance using pertalite 90, pertamax 92, and pertamax turbo 98 besides that using a motorcycle is more efficient than using a car and cost-effective. The conclusion of this study is to find out the difference in performance both power and torque of motors that use pertalite 90, pertamax 92, and pertamax turbo 98 Can be seen from the following table.

Description:

- a. The data from the table above only shows the average results of research conducted during 2 studies.
 - b. Testing was carried out at the HKU Racing Motor Sports emission test workshop.
 - c. The results of the 4-stroke 128.8 cc motorcycle engine performance test using pertalite 90, pertamax 92, and pertamax turbo 98, from various variations of 4500 rpm, 5000 rpm, 5500 rpm, 6000 rpm, 6500 rpm, 7000 rpm and 7500 rpm.
-

Tabel 1 : analysis test results Torque

No.	Engine Speed (rpm)	Fuel Testing		
		Pertalite Torque (N-m)	Pertamax Torque (N-m)	Pertamax Turbo Torque (N-m)
1	4500	5,3	5,3	5,8
2	5000	6,5	6,3	6,5
3	5500	7,2	7,3	7
4	6000	7,3	7,6	7,3
5	6500	6,5	6,9	6,5
6	7000	6,2	6,4	6,2
7	7500	5,9	6,2	6

Tabel 2 : analysis test results Power

No.	Engine Speed (rpm)	Fuel Testing		
		Pertalite Power (kW)	Pertamax Power (kW)	Pertamax Turbo Power (kW)
1	4500	2,5	2,5	2,7
2	5000	3,4	3,3	3,4
3	5500	4,1	4,2	4
4	6000	4,6	4,8	4,6
5	6500	4,4	4,7	4,4
6	7000	4,5	4,7	4,5
7	7500	4,6	4,9	4,7

Difference in torque against engine speed on engines using Pertalite, Pertamax and Pertamax Turbo fuels

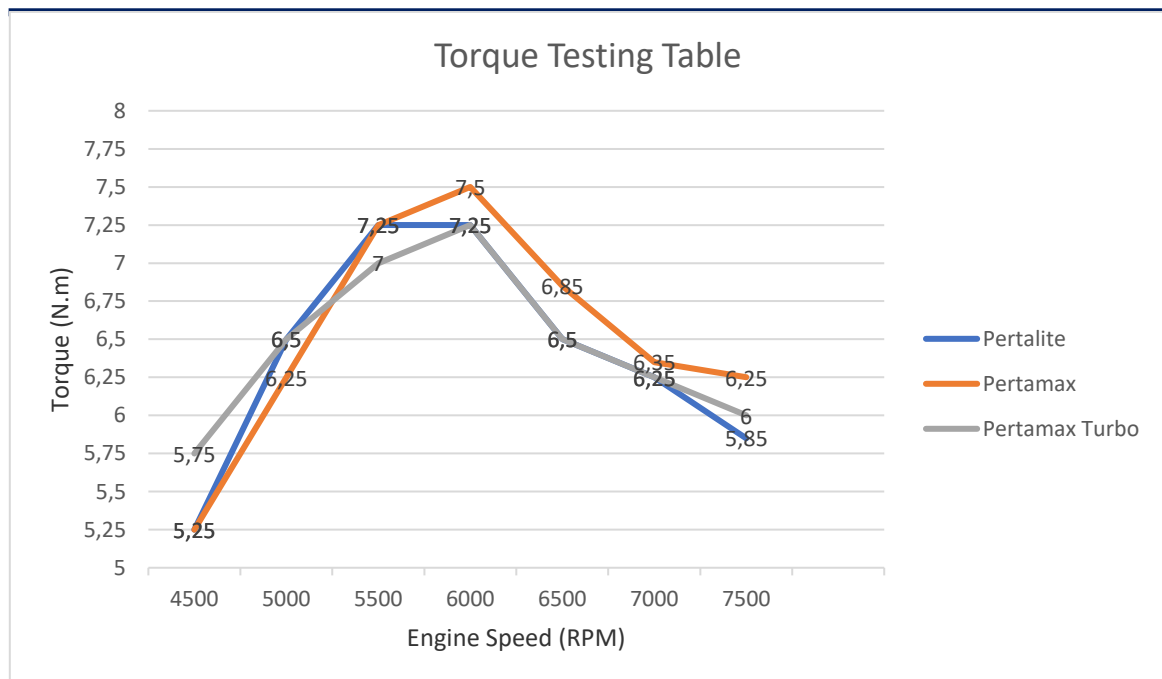
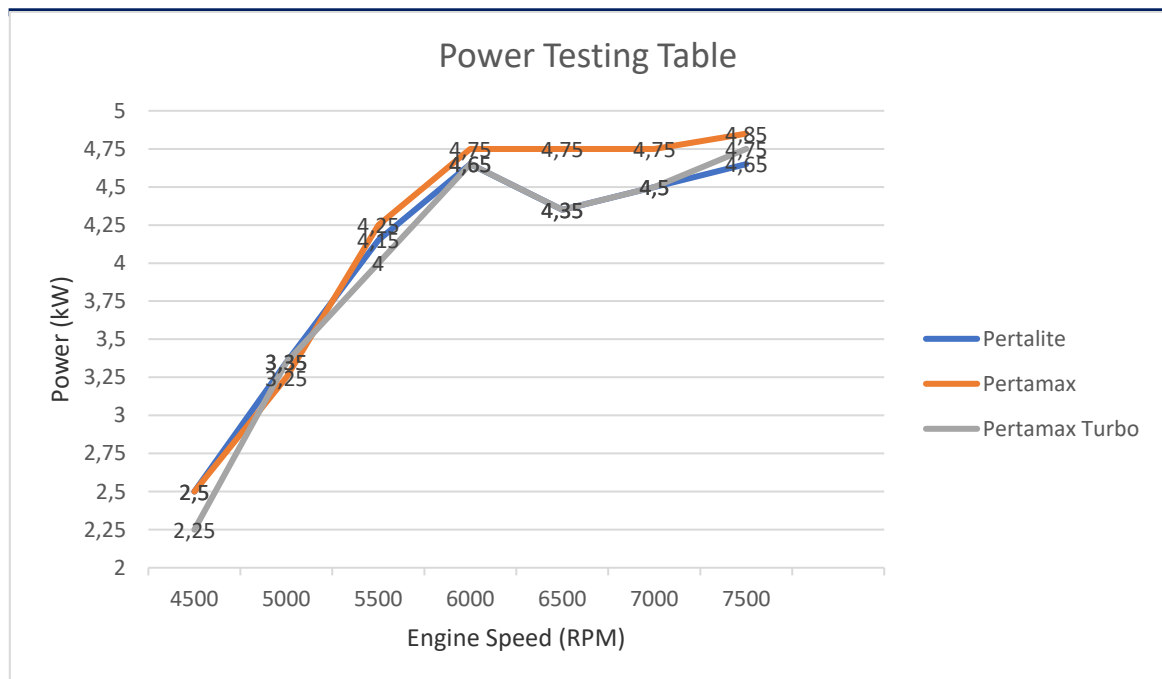


Table 1 shows that at 4,500 rpm the torque produced for peralite fuel type is 4.3 kW, first fuel is 5 N-m, and firstx turbo fuel is 4.5 N-m, the torque value increases along with the increase in engine speed, namely at 6,000 rpm the torque value becomes 7.3 N-m for peralite, 7.6 N-m for firstx, and 7.3 for firstx turbo.

Then it drops at 7,500 rpm, the torque value is 5.9 N-m for peralite fuel, 6.2 N-m for firstx fuel and 6 N-m for firstx turbo fuel. The variation in torque value is due to the difference in octane value content in the three types of fuel. This means that the higher the octane value, the fuel will be more resistant to temperature caused by pressure in the combustion chamber so that it does not burn itself (detonation) before being exposed to sparks from the spark plug.

Power difference using Peralite 90, Pertamina 92, and Pertamina Turbo 98



From table 2, it can be seen that at 4,500 rpm the power generated for pertalite fuel type is 2.5 kW, firstx fuel is 2.5kW, and firstx turbo fuel is 2.7kW, the power value increases as the rotation (rpm) increases, namely at 6,000 rpm the power value becomes 4.6 kW for pertalite, 4.8 kW for firstx, and 4.6 kW for firstx turbo. Then the value drops at 6,500 - 7,000 rpm and rises again at 7500 rpm which has a power value of 4.6 kW for pertalite fuel, 4.9 kW for firstx fuel, and for firstx turbo fuel the value is 4.7 kW.

CONCLUSION

Based on the analysis of the research results and discussion, it can be concluded the following: The difference in the octane value of a fuel will significantly affect the characteristics of power and torque produced to the environment. Engine rotation (rpm) ranging from 4500, 5000, 5500, 6000, 6500, 7000, and 7500 rpm variations with different octane values, namely between Pertalite 90, Pertamina 92, and Pertamina turbo 98.

At 4500 rpm the highest torque is obtained, the highest power at 5000 rpm is for power 4.3 kW (pertalite), 4.7 kW (pertamax), and 4.8 kW (pertamax turbo), while the torque is 16.5 Nm (pertalite), 16.8 Nm (pertamax), and 17.0 Nm (pertamax turbo).

Fuels such as Pertamina 92 and Pertamina turbo should be used in high-compression engines such as Bore-Up or Racing motors with motor performance that matches the characteristics of fuels that have high octane levels.

ACKNOWLEDGEMENT

Praise and gratitude to God Almighty, because with His blessings and grace, I can complete this paper.

REFERENCES

- Arends, BPM, Berenschot H. 1980. Gasoline Motor. PT. Erlangga: Jakarta
- Arikunto, Suharsimi. 2006. Research Procedures A Practical Approach. Jakarta: Rineka Cipta
- Arismunandar, 2002. Torak Fuel Motor Starter. Publisher of ITB: Bandung
- Haryono, G. 1997. Getting to know the combustion motor. PT Pabelan: Solo.
- Jama, Jalius et al. 2008. Motorcycle Engineering. Semarang: Aneka Ilmu.
- Negara, I.P.S., I.W.B. Suyasa, and I.W Suarna. 2009. Effect of Octane Value Fuel and Engine Speed in Motorized Vehicles Toward Characteristics of Exhaust Gas Emissions Ecotrophic, 4 (2): No. 106-111
- Surbhakty, 1978. Fuel Motor. Technology Secondary Education Diktat: Jakarta
- Winarno, 2001. Experimental study of the effect of bioethanol addition to firstx fuel firstx fuel on the performance of gasoline motor. Engineering Journal. Vol, No: 33-39

Copyright Holder :

© Arnes Wildan Wahyudi et al. (2024).

First Publication Right :

© Journal of Moeslim Research Teknik

This article is under:

