

# **Analysis of Torque and Power Testing on 4-Stroke Motorcycles Using Pertamax Fuel with Cassava-Based Bioethanol Mixture**

Commision Guide, Aditya Wahyu Pratama, S.T., M.T.

by

**Erifal Rahmawan Hakim**

Study Program of Automotive Engineering, Department of Engineering  
Politeknik Negeri Jember

## **ABSTRACT**

Currently, many sources of fuel energy from natural sources have been developed, namely bioethanol. Indonesia is a country with abundant natural wealth and a large area which certainly has great opportunities for the development of bioethanol to replace fossil fuels which are increasingly running out. This research aims to determine the effect of varying the percentage of cassava bioethanol added to Pertamax fuel on vehicle engine performance. The process of making bioethanol is carried out by distillation. This research starts from April 2024 to June 2024. The method used is an experimental method with variations of PBS 0, PBS 5, PBS 10, PBS 15, PBS 20 and PBS 25. The results of the research show that the addition of cassava bioethanol to Pertamax fuel can increases the performance of the engine, but there are certain limiting conditions where when excessive additions are made, the performance will actually decrease. The results of the research show that the highest torque value was obtained by the PBS 10 variation with a value of 10,91 Nm. The decrease in engine torque occurred when the PBS 15, PBS 20 and PBS 25 variations were added at 10.53 Nm, 8.7 Nm and 8.67 Nm at rotation. 5000 rpm engine. The highest power value was obtained by the PBS 10 variation with a value of 8.1 hp. The decrease in engine power occurred when the PBS 15, PBS 20 and PBS 25 variations were added at 7.9 hp, 7.6 hp and 7.3 hp at an engine speed of 6000 rpm.

**Keywords:** *Bioethanol, Cassava, Torque, Power.*