

THE EFFECT OF PERTALITE FUEL MIXED WITH CLOVE LEAF ESSENTIAL OIL ON THE PERFORMANCE OF AUTOMATIC MOTORBIKES

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

Muhammad Luthfi Fadhlurrahman
Study Program of Automotive Engineering
Majoring of Engineering

ABSTRACT

This study aims to determine the effect of adding clove leaf essential oil (MADC) as a bio-additive to Pertalite fuel on the performance of a 125cc automatic motorcycle engine. The fuel mixtures used consist of pure Pertalite (100%) and Pertalite mixed with MADC at concentrations of 6%, 8%, and 10%. The testing was carried out using a BRT-type Chassis Dynamometer at engine speeds ranging from 4,000 to 9,000 RPM in the Automotive Maintenance Workshop Laboratory of Politeknik Negeri Jember. The results show that the addition of clove leaf essential oil significantly improves engine performance. The 90% Pertalite + 10% MADC mixture produced a maximum torque of **9.85 Nm at 6,970 RPM**, an increase of approximately **0.38 Nm** compared to pure Pertalite. The maximum power also increased from **9.35 Hp (pure Pertalite)** to **10.30 Hp at 7,890 RPM** with the 10% mixture. This performance improvement is attributed to the oxygenative properties of eugenol contained in clove oil, which enhances combustion efficiency within the combustion chamber. It can be concluded that the use of clove leaf essential oil as a Pertalite fuel additive effectively increases the torque and power of automatic motorcycle engines. The 10% mixture composition provided the most optimal results. Clove leaf essential oil has the potential to be developed as an environmentally friendly bio-additive for motor vehicle fuels in Indonesia.

Keywords: Pertalite, clove leaf essential oil, eugenol, torque, power, engine performance.