ABSTRAK

Penelitian ini bertujuan untuk mengevaluasi pengaruh penggunaan bahan bakar RON 90 (Pertalite) dan campurannya dengan RON 92 (Pertamax) terhadap performa mesin dan konsumsi bahan bakar spesifik pada sepeda motor 110 cc. Komposisi bahan bakar yang diuji meliputi 100% RON 90, campuran 90% RON 90 + 10% RON 92, 80% RON 90 + 20% RON 92, dan 70% RON 90 + 30% RON 92. Pengujian dilakukan berdasarkan tiga pola perilaku berkendara: agresif, normal, dan lambat. Parameter yang dianalisis meliputi *brake torque*, *brake power*, *Brake Specific Fuel Consumption* (BSFC), dan *Brake Thermal Efficiency* (BTE) menggunakan *dynamometer*. Hasil menunjukkan bahwa pada pola berkendara agresif, campuran 80% RON 90 + 20% RON 92 menghasilkan nilai brake torque tertinggi sebesar 27,5 N.m. Nilai brake power awal mencapai 6,3 kW pada campuran 90% RON 90 + 10% RON 92 pada pola berkendara agresif. Pada campuran 80% RON 90 + 20% RON 92 dengan pola berkendara normal menunjukkan nilai BSFC paling rendah pada 0,3 kg/kW.h serta nilai *Brake Thermal Efficiency* (BTE) tertinggi di 28%. 100% RON 90 menghasilkan performa cukup stabil pada akselerasi lambat, menunjukkan efisiensi termal yang tinggi hingga 27,3%, menandakan bahwa bahan bakar RON rendah lebih sesuai untuk kondisi beban ringan. Secara keseluruhan, campuran bahan bakar dengan kandungan RON 92 20–30% memberikan keseimbangan terbaik antara efisiensi pembakaran dan kestabilan performa, terutama pada kondisi akselerasi agresif dan normal. Penelitian ini diharapkan menjadi referensi dalam optimasi penggunaan bahan bakar campuran untuk efisiensi energi dan kinerja mesin yang lebih baik.

Kata kunci: bahan bakar campuran, konsumsi bahan bakar spesifik, performa mesin, RON 90, RON 92, sepeda motor 110 cc.

ABSTRACT

This study aims to evaluate the impact of using RON 90 fuel (Pertalite) and its blends with RON 92 (Pertamax) on engine performance and specific fuel consumption in a 110 cc motorcycle. The tested fuel compositions include 100% RON 90, 90% RON 90 + 10% RON 92, 80% RON 90 + 20% RON 92, and 70% RON 90 + 30% RON 92. The tests were conducted based on three riding behavior patterns: aggressive, normal, and slow. The analyzed parameters include brake torque, brake power, Brake Specific Fuel Consumption (BSFC), and Brake Thermal Efficiency (BTE), using a dynamometer. The results show that under aggressive riding conditions, the 80% RON 90 + 20% RON 92 blend produced the highest brake torque of 27.5 N.m. The initial brake power reached 6.3 kW with the 90% RON 90 + 10% RON 92 blend during aggressive riding. The 80% RON 90 + 20% RON 92 blend under normal riding conditions demonstrated the lowest BSFC at approximately 0.3 kg/kW.h and the highest Brake Thermal Efficiency (BTE) at 28%. The 100% RON 90 fuel showed stable performance under slow acceleration, achieving a high thermal efficiency of up to 27.3%, indicating that lower RON fuel is more suitable for light-load conditions. Overall, fuel blends containing 20–30% RON 92 provided the best balance between combustion efficiency and performance stability, especially under aggressive and normal acceleration conditions. This study is expected to serve as a reference for optimizing mixed fuel usage to improve energy efficiency and engine performance.

Keywords: blended fuel, RON 90, RON 92, specific fuel consumption, thermal efficiency, 110 cc motorcycle.