ABSTRAK

Peningkatan jumlah kendaraan bermotor di Indonesia berdampak langsung pada tingginya konsumsi bahan bakar minyak (BBM), khususnya di sektor transportasi roda dua. Salah satu upaya untuk meningkatkan efisiensi penggunaan BBM adalah dengan memanfaatkan bahan bakar beroktan tinggi, seperti Pertamax (RON 92) dan Pertamax Turbo (RON 98), serta memahami pengaruh perilaku berkendara terhadap performa mesin. Penelitian ini bertujuan untuk menganalisis pengaruh kombinasi berbagai campuran bahan bakar dan perilaku akselerasi berkendara (agresif, normal, dan lambat) terhadap performa dan efisiensi mesin sepeda motor injeksi 110 cc. Pengujian dilakukan dengan menggunakan dynamometer untuk mengukur parameter Brake Torque, Brake Power, BSFC (Brake Specific Fuel Consumption), dan BTE (Brake Thermal Efficiency) pada empat jenis campuran bahan bakar. Hasil penelitian menunjukkan bahwa campuran 90% Pertamax Turbo + 10% Pertamax menghasilkan torsi tertinggi (±16 N.m), campuran 80% + 20% menghasilkan daya maksimum tertinggi (±5,2 kW), sedangkan penggunaan 100% Pertamax Turbo memberikan hasil paling efisien dengan BSFC terendah (±0,32 kg/kW.h) dan BTE tertinggi (±26%). Kesimpulannya, semakin tinggi kadar oktan dan semakin agresif perilaku berkendara, maka performa dan efisiensi mesin cenderung meningkat, dengan 100% Pertamax Turbo menjadi pilihan bahan bakar paling optimal untuk efisiensi energi dan daya.

Kata kunci: Konsumsi bahan bakar, perilaku berkendara, pertamax turbo, sepeda motor 110 cc

ABSTRACT

The increasing number of motor vehicles in Indonesia has led to a significant rise in fuel consumption, especially in the two-wheeled transportation sector. One way to improve fuel efficiency is by using high-octane fuels such as Pertamax (RON 92) and Pertamax Turbo (RON 98), as well as by understanding the influence of driving behavior on engine performance. This study aims to analyze the impact of various fuel mixtures and driving acceleration behaviors (aggressive, normal, and slow) on the performance and fuel efficiency of a 110cc fuel-injected motorcycle engine. Tests were conducted using a dynamometer to measure Brake Torque, Brake Power, Brake Specific Fuel Consumption (BSFC), and Brake Thermal Efficiency (BTE) across four fuel mixture variations. The results showed that the 90% Pertamax Turbo + 10% Pertamax mixture produced the highest torque (±16 N.m), while the 80% + 20% mixture achieved the maximum brake power (±5.2 kW). The 100% Pertamax Turbo fuel delivered the most efficient results, with the lowest BSFC (±0.32 kg/kW.h) and the highest BTE (±26%). In conclusion, higher-octane fuels combined with aggressive driving behavior tend to increase both performance and engine efficiency, with 100% Pertamax Turbo being the most optimal fuel for energy efficiency and power output.

Keywords: Fuel consumption, driving behavior, Pertamax Turbo, 110 cc motorcycle