ABSTRAK

Penelitian ini bertujuan untuk membandingkan unjuk kerja mesin motor bakar dua langkah berkapasitas 150 cc antara penggunaan koil standar (OEM) dan koil aftermarket melalui tujuh parameter pengujian, yaitu torsi, daya, rasio akselerasi, putaran idle, suhu kerja mesin, konsumsi bahan bakar, serta emisi gas buang. Metode penelitian yang digunakan adalah eksperimen kuantitatif, dengan melakukan pengujian langsung menggunakan motor Vespa 150 cc dua langkah yang dilengkapi dengan alat bantu seperti dynamometer, tachometer, gas analyzer, termometer inframerah, dan buret kaca. Setiap variabel diuji sebanyak tiga kali pengulangan untuk memperoleh hasil yang akurat dan reliabel. Hasil penelitian menunjukkan bahwa penggunaan koil aftermarket hanya memberikan peningkatan torsi pada gigi transmisi ke-2. Peningkatan daya dan akselerasi juga terjadi pada gigi ke-2 dan ke-3, disertai dengan laju konsumsi bahan bakar yang lebih efisien dibandingkan koil standar. Dari sisi emisi, kadar hidrokarbon (HC) menurun, sedangkan karbon monoksida (CO) meningkat, dan suhu kerja mesin tercatat sekitar 5 °C lebih rendah dibandingkan dengan penggunaan koil standar. Secara keseluruhan, koil aftermarket memberikan keunggulan terbatas pada beberapa aspek performa, namun tidak secara signifikan meningkatkan kinerja mesin secara menyeluruh.

Kata Kunci: koil *aftermarket*, koil standar, mesin dua langkah, performa mesin

ABSTRACT

This study aims to compare the performance of a 150 cc two-stroke internal combustion engine using standard (OEM) and aftermarket ignition coils through seven testing parameters: torque, power, acceleration ratio, idle speed, engine operating temperature, fuel consumption rate, and exhaust gas emissions. The research employed an experimental quantitative method, in which performance tests were conducted directly on a two-stroke Vespa 150 cc engine using instruments such as a dynamometer, tachometer, gas analyzer, infrared thermometer, and glass burette. Each variable was tested three times to obtain accurate and reliable data. The results show that the use of the aftermarket ignition coil increased torque only at the second transmission gear. Improvements in power and acceleration were observed at the second and third gears, accompanied by a more efficient fuel consumption rate. In terms of emissions, hydrocarbon (HC) levels decreased, while carbon monoxide (CO) levels increased, and the engine operating temperature was approximately 5 °C lower compared to the standard coil. Overall, the aftermarket ignition coil provided limited advantages in specific performance aspects but did not significantly improve the overall engine performance.

Keywords: *aftermarket coil, OEM coil, two-stroke engine, engine performance*