

ANALISIS PENGARUH VARIASI *IGNITION COIL* TERHADAP PERFORMA SEPEDA MOTOR BEBEK 100CC

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ABSTRAK

Melalui pendekatan kuantitatif bermetode eksperimental, riset ini mengevaluasi dampak perbedaan rasio hambatan koil pengapian (*ignition coil*) terhadap luaran tenaga, momen puntir, serta efisiensi bahan bakar pada sepeda motor Honda Astrea Grand 100 cc. Pengujian melibatkan tiga spesifikasi rasio: bawaan pabrik (1:10.354), ubahan pertama (1:10.236), dan ubahan kedua (1:11.250). Pengukuran torsi dan daya menggunakan mesin *dynotest* pada rentang putaran 3,000 hingga 7,000 rpm dengan sepuluh kali repetisi, sementara efisiensi bahan bakar dihitung berdasarkan durasi habisnya bahan bakar di setiap spesifikasi. Data pengujian memperlihatkan adanya pergeseran performa mesin akibat perbedaan rasio hambatan tersebut. Pada putaran 7,000 rpm, daya puncak tercatat sebesar 5,82 HP untuk spesifikasi standar, 5,97 HP untuk ubahan pertama (meningkat 2,58%), dan 6,00 HP untuk ubahan kedua (naik 3,09%). Sementara itu, titik torsi tertinggi tercapai pada 5,000 rpm dengan nilai 7,150 N·m (standar), 7,360 N·m (ubahan pertama), serta 7,364 N·m (ubahan kedua). Berkaitan dengan tingkat keborosan bahan bakar pada 7,000 rpm, spesifikasi standar menghabiskan 0,7174 kg/jam, ubahan pertama mencatatkan angka 0,7024 kg/jam (lebih hemat 2,09%), dan ubahan kedua membutuhkan 0,7981 kg/jam (lebih boros 11,25%). Secara keseluruhan, variasi rasio hambatan koil terbukti memberikan pengaruh signifikan terhadap daya, torsi, dan tingkat konsumsi bahan bakar mesin.

Kata Kunci: ignition coil, rasio tahanan, performa mesin, daya, torsi, konsumsi bahan bakar, Honda Astrea Grand 100 cc.

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ABSTRACT

This study aims to examine the effect of varying the ignition coil resistance ratio on the performance of a 100cc Honda Astrea Grand motorcycle, specifically focusing on power, torque, and fuel consumption. The research employs an experimental method with a quantitative approach, utilizing three resistance ratio variations: standard at 1:10,354, modification 1 at 1:10,236, and modification 2 at 1:11,250. Power and torque testing were conducted using a dynotest at engine speeds of 3,000, 4,000, 5,000, 6,000, and 7,000 rpm with ten repetitions. Fuel consumption was measured based on the time required to consume a set amount of fuel for each variation. The results indicate that varying the ignition coil resistance ratio affects engine performance. At 7,000 rpm, the maximum power output reached 5.82 HP for the standard ratio, 5.97 HP for modification 1, and 6.00 HP for modification 2, representing power increases of 2.58% and 3.09% for modifications 1 and 2, respectively, compared to the standard. The maximum torque at 5,000 rpm was recorded at 7.15 N·m for the standard, 7.36 N·m for modification 1, and 7.364 N·m for modification 2. At 7,000 rpm, fuel consumption was 0.7174 kg/hour for the standard setup, 0.7024 kg/hour for modification 1, and 0.7981 kg/hour for modification 2. Modification 1 reduced fuel consumption by 2.09%, whereas modification 2 increased it by 11.25%. Consequently, variations in the ignition coil resistance ratio significantly impact engine power, torque, and fuel consumption.

Keywords: *ignition coil, resistance ratio, engine performance, power, torque, fuel consumption, Honda Astrea Grand 100 cc.*