

**ANALISIS KOMPARATIF MASSA ROLLER 7G, 8G, DAN 13G
TERHADAP PENINGKATAN TORSI TRANSMISI SEPEDA MOTOR
MATIC KAPASITAS MESIN 155 CC**

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ABSTRAK

Performa sepeda motor matic sangat dipengaruhi oleh sistem transmisi otomatis, khususnya pada bagian *Continuously Variable Transmission* (CVT) yang menggunakan komponen *roller*. Variasi massa *roller* dapat mengubah karakteristik perpindahan tenaga mesin, sehingga berdampak pada akselerasi, torsi, dan daya yang dihasilkan. Oleh karena itu, penelitian ini dilakukan untuk mengetahui pengaruh variasi massa *roller* terhadap performa sepeda motor matic 155 cc. Metode penelitian yang digunakan adalah eksperimen dengan pendekatan kuantitatif, di mana hasil pengujian dianalisis menggunakan statistik deskriptif untuk menghitung nilai rata-rata dan standar deviasi, serta uji beda (*independent sample t-test*) untuk melihat signifikansi perbedaan antar *roller*. Hasil pengujian menunjukkan bahwa variasi massa *roller* berpengaruh nyata terhadap performa mesin. *Roller* 7 gram menghasilkan rata-rata torsi maksimum sebesar 21,70 Nm dengan akselerasi awal yang cepat, namun performanya menurun pada putaran tinggi. *Roller* 13 gram menghasilkan torsi rata-rata tertinggi yaitu 23,15 Nm dan stabil pada rpm menengah hingga tinggi, namun akselerasi awalnya lebih lambat. *Roller* 8 gram memberikan hasil seimbang dengan rata-rata torsi 22,53 Nm, akselerasi cukup baik, serta kestabilan daya yang relatif konstan. Hasil analisis komparatif, *roller* 7 gram lebih sesuai untuk kebutuhan akselerasi awal, *roller* 13 gram cocok untuk perjalanan jarak jauh dengan kecepatan konstan, sementara *roller* 8 gram dinyatakan paling optimal untuk penggunaan harian karena memberikan kombinasi terbaik antara akselerasi awal dan kestabilan torsi.

Kata Kunci: *Roller*, Torsi, Daya, CVT, Sepeda Motor Matic 155 cc

**COMPARATIVE ANALYSIS OF 7G, 8G, AND 13G ROLLER MASS ON THE
INCREASE IN TRANSMISSION TORQUE OF A 155 CC AUTOMATIC
MOTORCYCLE**

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ABSTRACT

The performance of a matic motorcycle is greatly influenced by its automatic transmission system, particularly the Continuously Variable Transmission (CVT) which uses roller components, where variations in roller mass can change the characteristics of engine power transfer and affect acceleration, torque, and overall output. This study was conducted to determine the effect of roller mass variations on the performance of a 155 cc matic motorcycle using an experimental quantitative method, with test results analyzed through descriptive statistics to calculate the mean and standard deviation, as well as an independent sample t-test to evaluate the significance of differences between roller types. The findings show that roller mass significantly affects engine performance, with the 7-gram roller producing an average maximum torque of 21.70 Nm and offering fast initial acceleration but reduced performance at high RPM, while the 13-gram roller generated the highest average torque of 23.15 Nm and performed more stably at medium to high RPM although its initial acceleration was slower; meanwhile, the 8-gram roller provided balanced characteristics with an average torque of 22.53 Nm, good acceleration, and relatively consistent power stability. Based on the comparative analysis, the 7-gram roller is best suited for strong initial acceleration, the 13-gram roller is more appropriate for long-distance riding at constant speeds, and the 8-gram roller is considered the most optimal for daily use because it offers the best combination of initial acceleration and torque stability.

Keywords: Roller, Torque, Power, CVT, 155 cc Matic Motorcycle