

**THE EFFECT OF CLUTCH SHOE MATERIAL VARIATIONS AND
CENTRIFUGAL SPRING CONSTANTS ON THE PERFORMANCE
OF A 150 CC AUTOMATIC MOTORCYCLE**

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ABSTRACT

The Continuously Variable Transmission (CVT) system in automatic motorcycles plays an important role in transmitting engine power to the rear wheel. One of the components that affect CVT performance is the clutch shoe and centrifugal spring. This study aims to analyze the effect of clutch shoe material variations and centrifugal spring constants on the power and torque of a 150 CC automatic motorcycle, as well as to compare the performance of standard components with aftermarket components. This research employed a quantitative experimental method using a Honda Vario 150 CC as the research object. The clutch shoe variations used were BRT made of composite ceramic material, Jangeby made of composite aramid material, and Kawahara made of composite carbon material, which were combined with 26 N/m and 83 N/m centrifugal springs. Testing was conducted using a chassis dynamometer to obtain power (HP) and torque (Nm) data. The results showed that the combination of the Kawahara clutch shoe and the 26 N/m centrifugal spring produced the best performance, with a maximum power output of 11.94 HP and a maximum torque of 12.51 Nm. Compared to the standard components, which produced 10.46 HP of power and 11.79 Nm of torque, this combination increased power by 14.15% and torque by 6.11%. The findings indicate that the characteristics of the clutch shoe material and the centrifugal spring constant significantly influence the effectiveness of power transmission in the CVT system. The better the friction capability and thermal stability of the clutch shoe material, along with the suitability of the centrifugal spring characteristics, the more optimal the resulting power and torque performance.

Keywords: CVT, clutch shoe, centrifugal spring, power, torque, Honda Vario 150 CC.