"Analysis of the Variation in Turning Depth of Knurled Clutch housing in the Continuously Variable Transmission (CVT) System on the Performance and Acceleration of a 150 cc Four-Stroke Engine."

Wendy Triadji Nugroho, S.T., M. T., M.Sc., Ph.D. *Chief Conselor*

Mokhamad Yusron Indi Aslakhah

Study Program Of Automotive Engineering

Departement Of Engineering

ABSTRACK

This study aims to analyze the effect of clutch housing modification using the knurling method on engine performance in motorcycles equipped with a Continuously Variable Transmission (CVT) system. The modification was carried out by creating diagonal grooves (diamond knurling) on the inner surface of the clutch housing with depth variations of 1 mm and 1.5 mm. The main objective of this modification is to increase the friction force between the clutch shoes and the clutch housing, thereby reducing slip and improving power transmission. The research method used is an experimental approach by conducting engine performance tests using a dynamometer. The independent variable in this study is the knurling depth, while the dependent variables include torque, power, and acceleration. The tests were conducted within a certain engine speed range while maintaining other components in standard condition. The results show that clutch housing modification using knurling has a significant effect on improving engine performance. The 1 mm depth variation produces the best performance, resulting in higher torque and power compared to both the standard condition and the 1.5 mm variation. Meanwhile, the 1.5 mm variation produces greater friction but tends to reduce efficiency at higher engine speeds due to excessive friction. Based on the results, it can be concluded that knurling on the clutch housing significantly affects engine performance, and the 1 mm groove depth is the most optimal condition for improving CVT system performance without causing significant losses.

Keywords: *Clutch housing, knurling, groove depth, CVT system, torque, power, acceleration, engine performance.*