

***The Effect of Hole Injector and Mapping Variations Using ECU Programmable  
on The Performance of an Automatic Motorcycle 128 CC***

Supervisor Dicky Adi Tyagita, S.T., M.T

**Andhika Wahyu Hidayat**

*Study Program of Automotive Engineering, Departement of Engineering  
Politeknik Negeri Jember*

**ABSTRACT**

*This research aims to determine changes in torque and power in a 4-stroke gasoline engine by modifying it to increase cylinder capacity (Bore Up) with varieties of injector holes and mapping using ECU programmable. This research uses the descriptive analysis method to determine differences in torque, and power variations in hole injectors mapping ECU programmable on bore-up motorbikes. This research was conducted at the Maximus workshop as a place to bore up mapping ECU programmable; for testing and collecting motorcycle performance data it was carried out in the ASM Yamaha Arjasa workshop. In this research, there were 4 variations which included: 2 injectors (8 and 10 holes) and 2 mapping variations. The results of this research were that the torque test increased by 8.3% in the 2-injector 8-hole mapping variation. Whereas in the power test there was an increase of 22.8% in the mapping variations 1 and 2 of the 8-hole injectors. With an increase in cylinder capacity of 18.5%, motorbikes do not need to replace injectors with larger capacities because standard injectors can still be used by adjusting the discharge of the fuel correction ECU programmable.*

**Keywords:** *Ecu Programmable, Hole Injector, Torque, Power*