

FUEL INJECTION PERFORMANCE ON THE PERFORMANCE CHARACTERISTICS OF A 200cc MOTORBIKE

Faruq Averro Azhar, S.ST.,M.Eng As *Chief Conselor*

Dicky Setiawan

Study Program of Automotive Engineering
Department of Engineering

ABSTRACT

This study aims to analyze the effect of converting a conventional carburetor fuel system into an Electronic Fuel Injection (EFI) system on the performance characteristics and exhaust emissions of a 200 cc four-stroke gasoline engine. The research employed an experimental method by conducting performance tests using a dynamometer and emission measurements using a gas analyzer. The parameters analyzed included torque, power, and exhaust emissions, namely CO, HC, CO₂, O₂, and the lambda (λ) value. All tests were carried out under controlled conditions using Pertamina RON 92 fuel in 4th gear, both before and after the conversion process.

The results indicate that the implementation of the EFI system significantly improves engine performance, as evidenced by an increase in torque from 16.96 Nm to 17.97 Nm and power from 19.5 HP to 20.15 HP. In terms of emissions, CO levels decreased from 7.51% to 6.77%, while the lambda value increased from 1.054 to 1.225, indicating a combustion process closer to stoichiometric conditions. However, HC emissions increased, suggesting the presence of incomplete combustion under certain conditions. Overall, the EFI system demonstrates superior performance compared to the carburetor system due to its ability to precisely control the air-fuel mixture, resulting in more efficient combustion and more stable engine operation.

Keywords: *electronic fuel injection, torque, power, exhaust emissions, gasoline engine.*