

PERFORMANCE CHARACTERISTICS OF 4 STROKE MOTORS WITH ETHANOL FUEL INJECTION SYSTEM

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ABSTRACT

This study aims to: 1) Determine the effect of adding ethanol injection in gasoline to the motor power of a 4 stroke motorcycle engine and 2) Knowing the effect of adding an injection of ethanol in gasoline to motor vehicle exhaust emissions on a 4 stroke motorcycle engine.

This research is an experimental study using a Yamaha Vega Force 115cc Fi engine with a compression pressure change of 13.5:1 and a fuel injection system. The fuel variants used are 70% ethanol with 30% gasoline (E70), 85% ethanol with 15% gasoline (E85) and 100% ethanol (E100) with a purity level of 96%. The research data obtained were in the form of engine power measured using a dyno test and exhaust gas emissions in the form of Hydrocarbon (HC) and carbon monoxide (CO) using Four gas analyzers available at the automotive workshop of FT UNY.

The results showed an increase in the maximum power of the engine at 8000 rpm by 23% on the E70, 7% on the E85 and 4% on the E100, when compared to the standard gasoline engine. Meanwhile, the maximum torque decreases on average by 5% for all mixtures at 5000 rpm engine speed. Average exposure to HC emissions increased by 915% for the E70, 633% for the E85 and 767% for the E100. The average CO emission exposure also increased by 827% at E70, 749% at E85 and 602% at E100. The increase in emissions can be caused by changes in the Reid Vapor Pressure in the fuel, which is supported by an increase in fuel consumption in the entire mixture composition.

Kata Kunci: *ethanol, engine power, emissions, hydrocarbons and carbon monoxide*