

Thesis Title	Effects on Spark Ignition Engine in using Ethanol as a Fuel
Thesis Credits	12
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Degree of Study	Master of Engineering
Department	Energy Technology
Academic Year	2001

Abstract

The objective of this study was to use 95% ethanol as a spark ignition engine fuel. The engine wear and its performance wear also assessed. Test results were compared with those fueled with gasoline. Two testing engines were the HONDA models GX160K1QT small gasoline engine. The first engine used gasoline without modification and the second one used ethanol with little modification i.e. to change main jet size in carburetor from No. 72 to No. 75 and adjust air choke to 25% open. A fluid dynamometer was used to measure engine power in the performance test. The engine speed variation was in a range of 1500-4000 rpm at full load. The engine wear was examined at a speed of 3000 rpm, a load of 1.2 kW, which was a half of the maximum power and 100-hours running period. The engine wear could be evaluated by examining the dimension of the engine components before and after the wear test and recording quantity of metallic particles collected in the circulating oil.

The final results showed that powers and torque of the engine using pure ethanol was slightly reduced about 3-4%. The brake thermal efficiency increased 10-20% while brake specific fuel consumption was increased 30-50% due to the heating value of ethanol, which is lower than that of the gasoline. Results of engine wear test showed that there was no significant difference for both engines. In conclusion, ethanol can be a substitute of gasoline with a little modification of the engine.

Keywords : Gasoline Engine/Ethanol Fuel/Engine Performance/Wear