ABSTRAK

Peningkatan kebutuhan bahan bakar minyak sebagai sumber energi utama alat transportasi yang berdampak meningkatnya polusi gas buang hasil dari pembakaran bahan bakar. Polusi udara mempunyai dampak negatif terhadap kesehatan manusia dan lingkungan. Cara untuk mengurangi polusi udara dengan menambahkan *ethanol* pada *gasoline* yang mampu menghasilkan pembakaran yang lebih sempurna dengan penurunan nilai emisi karbon monoksida (CO) dan peningkatan karbon dioksida (CO_2)

Tujuan penelitian ini untuk mengetahui karakteristik performa *gasoline engine* dengan menggunakan campuran bahan bakar pertamax dan *ethanol*. Pengujian dilakukan dengan memvariasikan pembebanan 25%, 50%, 75%, 100%, dengan menggunakan variasi *gasoline fuel 95%* dan *ethanol* 5%, *gasoline fuel* 90% dan *ethanol* 10%, *gasoline fuel* 85% dan *ethanol* 15%, dan pada putaran mesin 2000 rpm, 3000 rpm, 4000 rpm, 5000 rpm, dan 6000 rpm.

Hasil penelitian menunjukan bahwa nilai *brake torque* tertinggi 1,37 N.m pada *mixing gasoline* 5%, nilai *brake power* tertinggi 0,28 kW pada *mixing gasoline* 5%, nilai *brake spesific fuel consumption* terendah 0,97 kg/kW.h pada *mixing gasoline* 5%, dan nilai *brake thermal efficiency* tertinggi 30% pada *mixing gasoline* 10%.

ABSTRACT

The increasing need for fuel oil as the main energy source for transportation has an impact on increasing exhaust gas pollution resulting from fuel combustion. Air pollution has a negative impact on human health and the environment. The way to reduce air pollution is by adding ethanol to gasoline which can produce more complete combustion by reducing the value of carbon monoxide (CO) emissions and increasing carbon dioxide (CO_2)

The purpose of this study was to determine the performance characteristics of the gasoline engine by using a fuel mixture of Pertamax and ethanol. The test was carried out by varying the loading of 25%, 50%, 75%, 100%, using variations of 95% gasoline and 5% ethanol, 90% gasoline and 10% ethanol, 85% gasoline and 15% ethanol, and on rotation engine 2000 rpm, 3000 rpm, 4000 rpm, 5000 rpm, and 6000 rpm.

The results showed that the highest brake torque value was 1.37 Nm for 5% gasoline mixing, the highest brake power value was 0.28 kW for 5% gasoline mixing, the lowest specific brake fuel consumption value was 0.97 kg / kW.h for 5% gasoline mixing, and the thermal brake value. highest efficiency of 30% on 10% gasoline mixing.