

ABSTRAK

Pada pembakaran *gasoline engine* menghasilkan emisi gas buang berupa NO_x yang berbahaya bagi lingkungan. Emisi NO_x dihasilkan dari reaksi pembakaran kendaraan akibat temperatur dan konsentrasi oksigen. Cara untuk mengurangi emisi NO_x dengan menggunakan *Exhaust Gas Recirculation* (EGR). Dengan cara mensirkulasikan gas buang kembali ke dalam ruang bakar.

Tujuan penelitian ini untuk mengetahui karakteristik variasi EGR *valve* terhadap performa *gasoline engine*. Pengujian dilakukan dengan memvariasikan pembebanan 25%, 50%, 75%, 100%, dengan menggunakan variasi EGR *valve* 0%, 25%, 50%, 75%, 100% dan pada putaran mesin 2000 rpm, 3000 rpm, 4000 rpm, 5000 rpm, dan 6000 rpm.

Hasil penelitian menunjukkan bahwa peningkatan *brake torque* tertinggi sebesar 7.5% pada EGR *valve* 50%, peningkatan *brake power* tertinggi sebesar 7.5% pada EGR *valve* 75%, penurunan *brake specific fuel consumption* terendah sebesar 14.6% pada EGR *valve* 50%, dan peningkatan *brake thermal efficiency* tertinggi sebesar 11.2% pada EGR *valve* 75%.

Kata kunci : *gasoline*, *exhaust gas recirculation* (EGR), emisi, performa

ABSTRACT

Gasoline internal combustion engine produces NO_x emissions which are harmful to the environment. NO_x emissions are generated from vehicle combustion reactions due to the temperature and the oxygen concentration. NO_x emissions can be reduced by using Exhaust Gas Recirculation (EGR). EGR works by recirculating the exhaust gas into the combustion chamber.

The purpose of this study was to study the characteristics of EGR valve variations on the gasoline engine performance. The test was done by varying the loads of 25%, 50%, 75%, 100% and using EGR valve variations 0%, 25%, 50%, 75%, 100% at engine speeds 2000 rpm, 3000 rpm, 4000 rpm, 5000 rpm, and 6000 rpm.

The results showed the highest increase in brake torque was 7.5% at 50% EGR valve, the highest increased in brake power was 7.5% at 75% EGR valve, the lowest decrease in specific brake fuel consumption was 14.6% at 50% EGR valve, and the highest increase of thermal brake efficiency was 11.2% on the 75% EGR valve.

Keywords : gasoline, exhaust gas recirculation (EGR), emissions, performance.