ABSTRAK

Kendaraan bermotor khususnya roda dua banyak digemari masyarakat karena performa mesin yang mumpuni serta dengan ditunjang oleh mengkonsumsi bahan bakar yang efisien. Salah satu *engine* yang biasa digunakan merupakan *gasoline engine*. Pembakaran *gasoline engine* disebabkan dari proses reaksi kimia dari bahan bakar dengan udara yang dikompresikan di dalam ruang bakar, diberi percikan api pada busi (*spark plug*) supaya terjadi ledakan pada ruang bakar untuk mendorong piston dari TMA (titik mati atas) ke TMB (titik mati bawah). Proses pembakaran yang tidak sempurna mengakibatkan polusi udara oleh emisi gas polutan semacam HC, CO, serta NOx yang dikeluarkan lewat saluran buang kendaraan bermotor.

Tujuan penelitian ini yaitu mengetahui pengaruh penggunaan *Exhaust Gas Recirculation* dengan mengetahui dari segi *brake torque, brake power, brake specific comsumption,* dan *brake thermal efficiency*. Serta menggunakan variasi EGR *hot* dan *cold* dengan opening valve sebesar 0%, 25%, 50%, 75%, dan 100% terhadap performa *engine*. Penelitian menggunakan variasi pembebanan sebesar 25%, 50%, 75%, dan 100% pada putaran mesin 5000 rpm.

Hasil pengujian menunjukkan adanya peningkatan *brake torque* dan sebesar 35% dengan laju aliran EGR hot 100% temperatur B dan terjadi peningkatan pada *brake power* sebesar 35% dengan laju aliran EGR *hot* 100% temperatur B, penurunan *brake specific fuel consumption* terendah sebesar 28% dengan laju aliran EGR *hot* 100% temperatur B, sementara itu peningkatan *brake thermal efficiency* tertinggi sebesar 39% dengan laju aliran EGR *hot* 75% temperatur B.

Kata kunci : *Engine, Exhaust Gas Recirculation,* dan Pertamax Turbo.

ABSTRACT

Motor vehicles, especially two-wheelers, are very popular with the public because of their capable engine performance and supported by efficient fuel consumption. One of the engines commonly used is the gasoline engine. Gasoline engine combustion is caused by the chemical reaction process of fuel with compressed air in the combustion chamber, given a spark at the spark plug (spark plug) so that an explosion occurs in the combustion chamber to push the piston from TDC (top dead center) to TMB (top dead center). bottom dead point). The incomplete combustion process causes air pollution by emission of pollutant gases such as HC, CO, and NOx which are released through the exhaust ducts of motorized vehicles.

The purpose of this study is to determine the effect of using Exhaust Gas Recirculation by knowing in terms of brake torque, brake power, brake specific consumption, and brake thermal efficiency. And using variations of EGR hot and cold with valve opening of 0%, 25%, 50%, 75%, and 100% on engine performance. The study used variations in loading of 25%, 50%, 75%, and 100% at 5000 rpm engine speed.

The test results show an increase in brake torque and 35% with a flow rate of EGR hot 100% temperature B and an increase in brake power of 35% with a flow rate of EGR hot 100% temperature B, the lowest decrease in brake specific fuel consumption of 28% with EGR hot flow is 100% temperature B, meanwhile the highest brake thermal efficiency increase is 39% with EGR hot flow rate is 75% temperature B.

Keywords : Engine, Exhaust Gas Recirculation, Pertamax Turbo.