عنوان مقاله:

Performance Evaluation and Emissions improving of Turbocharged DI Diesel Engine with Exhaust Gas Recirculation ((EGR

محل انتشار:

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خلاصه مقاله:

Nitrogen oxides (NOx) contribute to a wide range of environmental effects including the formation of acid rain and destroy ozone layer. In-cylinder high temperature flame and high oxygen concentration are the parameters which affect the NOx emissions. The EGR system is a very effective way for reducing NOx emission from a diesel engine (via reduction of these parameters), particularly at the high load of engine operation condition. In this study, the influence of EGR on diesel engine combustion, NOx/PM emissions, brake specific fuel consumption (BSFC), engine thermal efficiency, cylinder pressure and heat release rate (HRR) are analyzed and presented. The experiments have been conducted on a turbocharged DI diesel engine under full load condition at two different injection timings in order to distinguish and quantify some effects of Hot and Cooled EGR with various rates on the engine parameters. Experimental results showed that increase of EGR rate has a negative effect on air-fuel ratio. For a premixed combustion at constant boost pressure, ignition delay is increased leading to retardation of all combustion process, a low HRR peak and reduce of in-cylinder peak temperature. Using of Hot EGR reduces NOX emissions whereas PM emissions are increased. The advance of injection timing resulted in the reduction PM while both NOX emissions and fuel consumption were increased. The use of cooled EGR was more effective compared to the hot EGR. As a result, the EGR temperature has no significant impact on NOx emissions. With increasing EGR rate, unequal EGR distribution was increased in inlet port of cylinders while the reducing EGR temperature (cooled EGR) improved its .distribution among the engine cylinders and decreased the EGR cylinder-to-cylinder variations

کلمات کلیدی:

Diesel Engine, Exhaust Gas Recirculation, EGR temperature, Injection timing, Combustion, Emissions