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EMISSION CHARACTERISTICS OF DOUBLE SWIRL COMBUSTION SYSTEM FOR A DIESEL ENGINE

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Abstract

Experimental research focus on the emission characteristics of a diesel engine employed a new combustion system-double swirl combustion system (DSCS) is carried out. The influence of spray angle on diesel emission characteristics with DSCS is analyzed by experimental and numerical method. Main emissions such as particulate matters (PM) and nitrogen oxidants (NOx) are measured in diesel engine with DSCS and the original engine. Also, fuel consumption, combustion pressure, heat release rate are compared between two systems. The tests results indicate that employing DSCS can acquire a remarkable reduction of PM (within the range of 7~47%) with lowered fuel consumption (0.75~3.05%). The reason of which is accounted via analyzing the in-cylinder combustion course. Furthermore, the experimental research shows that the spray angle is a significant factor for performance of DSCS since it determined the ratio of fuel distributed between inner and outer chamber. The related particulars are analyzed by numerical method.

Key words: emission characteristics, diesel engine, DSCS, simulation research, test research

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