Numerical Modeling of a Jet Ignition Direct Injection (JI DI) LPG Engine

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Abstract

The paper presents simulations of the operation of a liquefied petroleum gas (LPG) engine fitted with Direct Injection (DI) and Jet Ignition (JI). The liquid propane rapidly evaporates and mixes with the air after injection in the main chamber (MC). The mixture in the MC may be much closer to stoichiometry than a diesel. Combustion within the MC is limited by the turbulent mixing rather than the vaporization and diffusion processes of the injected fuel of the diesel. The engine may have diesel like efficiencies and load control by quantity of fuel injected. The engine may also have a better specific power at the low engine speeds typical of the diesel. This design also works at the high engine speeds impossible for the diesel.

Keywords: internal combustion engines, direct injection, jet ignition, liquefied petroleum gas

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