

عنوان مقاله:

A Predictive Model for the Combustion Process in Dual Fuel Engines at Part Loads Using a Quasi Dimensional Multi Zone Model and Detailed Chemical Kinetics Mechanism

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خلاصه مقاله:

This work is carried out to investigate combustion characteristics of a dual fuel (diesel-gas) engine at part loads, using a quasi-dimensional multi zone combustion model (MZCM) for the combustion of diesel fuel and a single zone model with detailed chemical kinetics for the combustion of natural gas fuel. Chemical kinetic mechanisms consist of ۱۸۴ reactions with ۵۰ species. This combustion model is able to establish the development of the combustion process with time and the associated important operating parameters, such as pressure, temperature and heat release rate (H.R.R). The dual fuel engines at part loads inevitably suffer from lower thermal efficiency and higher carbon monoxide and unburned hydrocarbons. Therefore this paper is an attempt to investigate the combustion phenomena at part loads and using methods such as injection timing advance, increasing pilot fuel quantity, and intake air throttling to improve the mentioned problems. It was found that the advancing of diesel injection timing gave little improvement in combustion parameters but other proposed methods promoted better combustion. Predicted values show good agreement with corresponding experimental values over a whole range of engine operating conditions.

.Implications will be discussed in details

کلمات کلیدی:

Multi Zone Combustion Model, chemical kinetics, Natural gas, Dual Fuel Engines

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