

عنوان مقاله:

A New Strategy for Reduction of Emissions and Enhancement of Performance Characteristics of Dual Fuel Engines at Part Loads

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خلاصه مقاله:

Increasingly restrictive emission regulations and renewed focus on energy efficiency drive the current researches to find alternative fuels and their related better combustion strategies. In this regard, dual fuel engines, in which natural gas fuel is used as a main fuel and diesel fuel is employed as a pilot fuel, have received considerable attention. However, poor fuel utilization efficiencies and high emissions of HC and CO may be encountered at light loads. This study focuses on improving the aforementioned drawbacks. Exhaust gas recirculation (EGR) and its inherent thermal energy can be used as an effective way to improve the performance and emission parameters of these engines at part load conditions. Therefore, in the laboratory of authors, an experimental work was conducted on an IDI Lister (λ-۱) dual fuel engine to investigate the effects of different levels of EGR temperature on combustion process, performance and emissions of these engines. The amount of EGR conducted into the engine was altered but its temperature level was considered constant at ۱۰ and ۵۰ percents of full load of engine. Results of this work show that the ignition delay and combustion durations shorten sufficiently by increasing EGR percentage and its temperature to a specified level. Also, CO and UHC emissions reduce whereas NO<sub>x</sub> emission increases but not too much for low percentage of EGR. Moreover, by employing low percentage of EGR, performance and emission parameters show better behavior in comparison with high percentage of EGR at a constant temperature.

کلمات کلیدی:

Dual fuel engine, Combustion, Natural gas, Pilot Fuel, Hot EGR

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