

Accepted Manuscript

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PII: S1359-4311(16)31192-9

DOI: <http://dx.doi.org/10.1016/j.applthermaleng.2016.07.061>

Reference: ATE 8659

To appear in: *Applied Thermal Engineering*

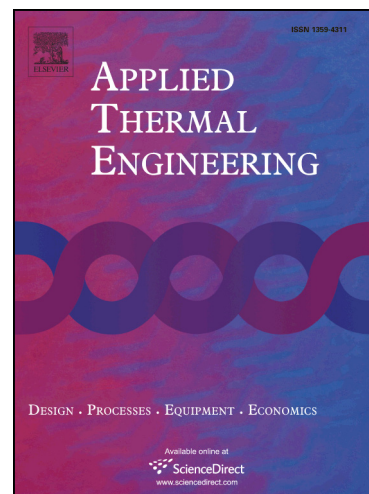
Received Date: 23 May 2016

Revised Date: 27 June 2016

Accepted Date: 9 July 2016

Please cite this article as: A. Ibrahim, Investigating the effect of using diethyl ether as a fuel additive on diesel engine performance and combustion, *Applied Thermal Engineering* (2016), doi: <http://dx.doi.org/10.1016/j.applthermaleng.2016.07.061>

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Investigating the effect of using diethyl ether as a fuel additive on diesel engine performance and combustion

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Abstract

The diethyl ether (DEE) is a renewable oxygenated fuel, which has favorable characteristics to be used as a fuel additive for the diesel engines. The aim of this study was to experimentally investigate the effect of blending the DEE with the diesel fuel in different proportions up to 15% by volume on diesel engine performance, combustion characteristics, and engine stability. All the tests were conducted using a single-cylinder direct-injection diesel engine without modification at a fixed engine speed of 1500 rpm and variable load conditions. It was found that using the DEE as a fuel additive improved the engine performance significantly for the most of engine load conditions. The engine maximum brake thermal efficiency increased by 7.2% and the lowest brake specific fuel consumption decreased by 6.7% when 15% of DEE was used in the fuel blend compared to the diesel fuel. In addition, using the DEE increased the maximum cylinder pressure and maximum net heat release rate compared to the diesel fuel for the most of engine load conditions. Engine stability and combustion duration slightly reduced while the start of

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