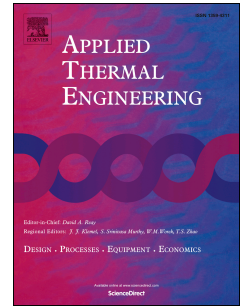


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Comparative Study of Different Exhaust Heat Exchangers Effect on the Performance and Exergy Analysis of a Diesel Engine

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Abstract

In this research, the effect of three designed heat exchangers on the performance of an OM314 diesel engine and its exergy balance is investigated. Vortex generator heat exchanger (HEX), optimized finned-tube HEX and non-optimized HEX are considered and mounted on the exhaust of diesel engine. Experiments are done for five engine loads (0, 20, 40, 60 and 80 % of full load) and four water mass flow rate (50, 40, 30 and 20 g/s) to find the most suitable HEX case for exhaust exergy recovery which has the least effect on the engine performance. Brake specific fuel consumption (BSFC), volumetric efficiency, fuel conversion efficiency and engine exergy balance are discussed parameters in this study.

Keywords: Exergy Analysis; Irreversibility; Finned-tube heat exchanger; Vortex generator Heat exchanger; Diesel exhaust.

1. Introduction

Researchers show that even with advanced engine technologies, around 30–40% of the fuel energy is still lost through the exhaust system. Thus, energy recovery from the exhaust is a promising technology allowing a 4–5% increase in the engine efficiency [1].

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