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Contribution of Ignition Timing Variation to the Greenhouse Gas Emission and Coolant Performance in Spark Ignition Engine

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Abstract

The ignition timing in a Spark Ignition Engine plays a prominent role in achieving high efficiency. However, ignition occurrence varies with the type of the engine and the type of the fuel in use. Ignition timing is different between engines, not only because of the thermal behavior of the combustion process, but also due to the morphology of the fuel. In the present study, the impact of ignition timing on greenhouse gas emission and the coolant performance are experimentally investigated. Four camshaft angles are selected and implemented for the study. Observation of the experiments' outcome demonstrated that the larger the camshaft angle is, the lower the fuel consumption would be. In contrast, a substantial contribution to the enlargement of NO_x and carbon monoxide production is observed. Data obtained from the coolant's temperature sensors conclude that a slight improvement of the heat transfer process occurs when advancing the ignition timing. © Published under licence by IOP Publishing Ltd.

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