

CYCLIC PRESSURE VARIATIONS IN A SINGLE-CYLINDER DIESEL ENGINE FUELED WITH BIODIESEL AND ANTIOXIDANT BLENDS

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Abstract:

Biodiesel fuel is considered as one of the most competence sustainable replacement for fossil fuel due to their superior combustion characteristics and possesses higher oxygen content. However, the combustion characteristics for biodiesel and biodiesel blends are not thoroughly examined and need additional research works to study how the biodiesel behaviour and characterise. Thus, the objective of this paper is to investigate the cyclic variations of the cylinder pressure in a small diesel engine running with biodiesel with antioxidant (B2HA1.0 and B2HT 1.0) blends with diesel-palm oil methyl ester (B2) and mineral diesel (B0) as the baseline fuels. These test fuels were tested at a constant engine speed of 1800 rpm at full engine load condition. The engine combustion characteristics were studied by utilising the indicated mean effective pressure (IMEP) and cyclic variations of combustion pressure at 200 consecutive cycles. Combustion characteristics of engine diesel have been studied by using statistical analysis. The results revealed that the engine running with biodiesel-antioxidants have higher cyclic variations of combustion from B2 and B0, which B2HA1.0 possessed the highest cyclic variations. It can be summarised from the study that biodiesel-antioxidants fuels produce a significant effect on the cyclic variation, which linked to engine combustion characteristics.

Keywords : Cylinder Pressure; Cyclic Variations; Diesel Engine; Antioxidant; Palm Methyl Ester (PME)

ACKNOWLEDGMENT

Special thanks and appreciation belong to Universiti Malaysia Pahang for providing financial assistance towards completing this research work. This paper has been supported under the short-term grant of RDU1603100.