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Original Citation

Wei, Nasha, Ball, Andrew and Gu, Fengshou (2013) A Study of Alternative Fuels Potential Effects on the Combustion Engines using acoustic emission. In: Proceedings of Computing and Engineering Annual Researchers' Conference 2013 : CEARC'13. University of Huddersfield, Huddersfield, p. 239. ISBN 9781862181212

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A Study of Alternative Fuels Potential Effects on the Combustion Engines using acoustic emission

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ABSTRACT

The increasing interest in alternative fuels for CI engines continues has led to many different alternative fuels which are claimed to be more economical and cleaner. However, the impacts of long-term use of the alternative fuels on the reliability and service life of CI engine have not yet been fully understood. AE technology is now becoming a widely accepted practice in the field of engine. AE signals can be used to obtain information on machine performance, offering the potential to monitor operating conditions such as fuel efficiency, combustion conditions, and lubrication, and also to detect faults.

In this paper, the potential impacts of alternative fuels (Fischer-Tropsch fuel, methanol-diesel blended fuel, emulsified diesel and standard diesel) on acoustic emission signals of cylinder have been investigated. The impacts of the different fuels on the wear condition of cylinder were compared and analysed using the acoustic emission monitoring at the cylinder. The results provide real-time evaluation method and effective data support for the development and application of alternative fuels.

Keywords: Alternative fuels, CI engine, Acoustic emission.