

Performance, Efficiency, and Emissions Evaluation of a Supercharged, Hydrogen-Powered, 4-Cylinder Engine

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Abstract

This paper presents the results of efficiency, emissions, and performance testing of a supercharged, hydrogen-powered, four-cylinder engine. Tests were run at various speeds, loads, and air/fuel ratios in order to identify advantageous operating regimes. The tests revealed that a maximum thermal brake efficiency of 37% could be achieved and that certain operating regimes could achieve NO_x emissions as low as 1 ppm without aftertreatment. Measurement of cylinder pressure traces in all four cylinders allowed a detailed assessment of cylinder-cylinder deviation. Several measures to further increase hydrogen engine performance in order to reach the goals set by the U.S. Department of Energy are being discussed.

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