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The Effect of Combustion Chamber Deposits (CCD) on Homogeneous Change Compression Ignition (HCCI)

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Abstract : The goal of this work is to understand how the thermal influence of combustion chamber deposits can be utilized to expand the operating range of HCCI combustion. In order to do this, two main objectives must first be met; tracking deposit formation trends in an HCCI engine and determining the sensitivity of HCCI combustion to CCD. This requires testing that demonstrates the differences in combustion between a clean engine and one with deposits coating the chamber. This will involve a long-term test that tracks the effects of CCD on combustion. The test will start with a clean engine. One baseline HCCI operating point is maintained for the duration of the test during which gradual combustion chamber deposit formation will occur. Combustion parameters, including heat release rates and emissions will be tracked for the duration and compared to the case of a clean engine. This work will begin by detailing the specifics of the test procedure and measurements taken throughout the test. Then a review of the effects of the gradual formation of deposits in the engine will be given.

Keywords : fuels, fuel atomization, pattern factor, alternate fuels combustion, efficiency gas turbine combustion, lean blow out, exhaust and liner wall temperature
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