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Effect of Injection Strategy on the Performance and Emission of E85 in a Heavy-Duty Engine under Partially Premixed Combustion

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Abstract : Partially Premixed Combustion (PPC) is a combustion concept which aims to simultaneously achieve high efficiency and low engine-out emissions. Extending the ignition delay to promote the premixing, has been recognized as one of the key factor to achieve PPC. Fuels with high octane number have been proven to be a good candidates to extend the ignition delay. In this work, E85 (85% ethanol) has been used as a PPC fuel. The aim of this work was to investigate a suitable injection strategy for PPC combustion fueled with E85 in a single-cylinder heavy-duty engine. Single and double injection strategy were applied with different injection timing and the ratio between different injection pulses was varied. The performance and emission were investigated at low load. The results show that the double injection strategy should be preferred for PPC fueled with E85 due to low emissions and high efficiency, while keeping the pressure raise rate at very low levels.

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