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HCCI COMBUSTION MODELLING: DEFINING THE EFFECTIVE EGR OPERATING RANGE⁶

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Abstract: *This study focuses on combustion modeling of HCCI combustion by means of single zone model using skeletal reaction mechanism of C7H16(n-heptane). A direct injection engine is used for simulation which also allows mixture preparation in intake manifold leading to premixed combustion. The numerical analysis was conducted by means of an engine model developed in advanced simulation software AVL Boost. The effective EGR operating range was defined at three engine speeds - 1600, 2000 and 2500 rpm. At each speed the EGR rate was varied within the range of 0% to 60%. It was observed that effective EGR rate highly depends on engine speed. At lower engine speed the optimal EGR rate is higher as the optimal value is 60% at 1600 rpm. Higher engine speed lead to lower effective EGR operating range and lower optimal EGR rate as it accounts to 20% at 2500 rpm.*

Keywords: HCCI, Combustion, EGR, Modelling

INTRODUCTION

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