

103\_Compacted biogas fuel performance enhancement under variable compression ratio accompanied with variable ignition location spark ignition engine

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Recent Trends in Thermal and Fluid Sciences pp 147-158

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## Compressed Biogas Fuel Performance Enhancement Under Variable Compression Ratio Accompanied with Variable Ignition Location Spark Ignition Engine

Ashish J. Chaudhan, Vinay D. Patel & Uday V. Aswalekar

Conference paper | First Online: 05 November 2022

141 Accesses

Part of the Lecture Notes in Mechanical Engineering book series (LNME)

### Abstract

Compression ratio of engines indicates the ability of that engine to harness the energy available in the fuel. Variation in compression ratio is a novel approach toward engine to work efficient at all different road conditions and provides an exceptional degree of control over engine performance. Conventional SI engine has a fixed compression ratio, a lower minimum value for starting the engine in cold start conditions or to avoid stalling of engine at full load condition. Conventional engines have maximum efficiency at full load condition and give exceptional self-ignition in cold start due to lower compression ratio, but while running on continuous fluctuating speed and torque requirement engine performances compromises between fluctuating requirement and losses its efficiency. In SI engines, automatic variable compression ratio improves cold start ability and low load operation, enabling the multi-fuel capability, increase of fuel economy and reduction of emissions. Automatic VCR differs from conventional VCR on the basis of changing the compression ratio according to requirement of speed and torque by using gear lever position as input signal to vary the compression ratio. The technique of variable spark location is added feature with variable compression ratio which enhance the charge combustion with maximum flame velocity post ignition. This automatic variable compression ratio with variable spark plug location under variable load and speed condition with compressed biogas fuel shows the substantial increase in efficiency with reduction of fuel consumption.

### Keywords

Compression ratio   SI engine   VCR engine   Automatic VCR engine

Compressed biogas

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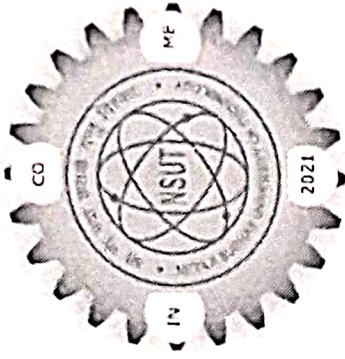
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