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INFLUENCE OF VARIABLE COMPRESSION RATIO ON CHARACTERISTICS OF DIESEL ENGINE

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Abstract

The compression ratio strongly affects the cylinder process and provides an exceptional degree of control over engine performance. At conventional internal combustion engines, the compression ratio is fixed and their performance is therefore a compromise between conflicting requirements.

One fundamental problem is that drive units in the vehicles must successfully run at variable regimes in different ambient conditions. If a diesel engine has a fixed compression ratio, a minimal value must be chosen that can achieve a reliable self ignition when starting engines in cold start conditions.

In diesel engines, variable compression ratio provides a control of peak cylinder pressure, improves cold start ability, lightens load operation, enabling the multi-fuel capability, increases fuel economy and reduces the exhaust emissions.

This paper contains theoretical and experimental results on the impact automatic variable compression ratios have on the working process parameters of experimental diesel engine. Alternative methods of implementing variable compression ratio are illustrated and critically examined.

Keywords

Combustion process, diesel engine, emission, variable compression ratio