

# Variable Compression Ratio: An Overview

Prabir Kumar\*

*Department of Engineering, Utkal University, Bhubaneswar, Odisha, India*

## EDITORIAL

Variable compression ratio is a technology that allows an internal combustion engine's compression ratio to be adjusted while the engine is running. This is done to improve fuel efficiency while driving at different speeds. Variable compression engines allow you to vary the volume above the piston at top dead centre. Lower ratios are required for larger loads to enhance power, while higher ratios are required for lower loads to increase efficiency, i.e. to reduce fuel consumption. This must be done while the engine is operating in response to the load and driving demands of an automobile. The maximum pressure allowed in gasoline engines during the compression stroke is limited, after which the fuel/air mixture detonates rather than burns. More fuel must be consumed to create larger power outputs at the same speed, which necessitates the use of more air.

Turbochargers or superchargers are used to boost the inlet pressure to achieve this. Unless the compression ratio was reduced, i.e. the volume above the piston was increased; the fuel/air mixture would detonate. This can be done to varying degrees, with significant power increases being achievable. The disadvantage is that the engine may lack power and torque while under light load. The answer is to be able to modify the compression ratio based on the inlet pressure. This provides you the best of both worlds: a compact, efficient engine that can deliver a lot of power when you need it. It

is somewhat easier to apply in two-stroke engines due to the relative simplicity of cylinder head design (lack of intake valves).

Models that build on this concept, such as those from Yamaha, have been available since the late 1990s and dynamically adjust the size of the combustion chamber. Due to its ability to burn a wide range of fuels, this technology has recently received renewed interest (in the 2000s). The Lohmann engine, created in the early 1950s as a retrofit engine for bicycles, was a far earlier commercialised two-stroke engine, but it was relatively small (18 cc) and not powerful enough to be highly successful. A jackscrew actuated by cables from a twist grip on the handlebar altered the distance between the cylinder head and the crankshaft on this engine.

Pressure change was vital for the activity of this motor since it utilized pressure start of a fuel blend which was acquainted earlier with the pressure stroke and which thusly touched off at whatever point the pressure carried it to an adequate temperature. This implied that the pressure required would change with air temperature, motor temperature, and fuel type: with a lot of pressure the motor would experience untimely start and with too little it would neglect to touch off by any means. Along these lines the administrator needed to change the pressure constantly as working conditions differed. The Lohmann motor was delivered for just around five years on the grounds that the control of pressure (at the same time with fuel stream) required significant practice, and in light of the fact that even at ideal change it gave no more force than a respectably fit rider could give without help.

**Correspondence to:** Prabir Kumar, Department of Engineering, Utkal University, Bhubaneswar, Odisha, India, E-mail: prabir.k@gmail.com

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