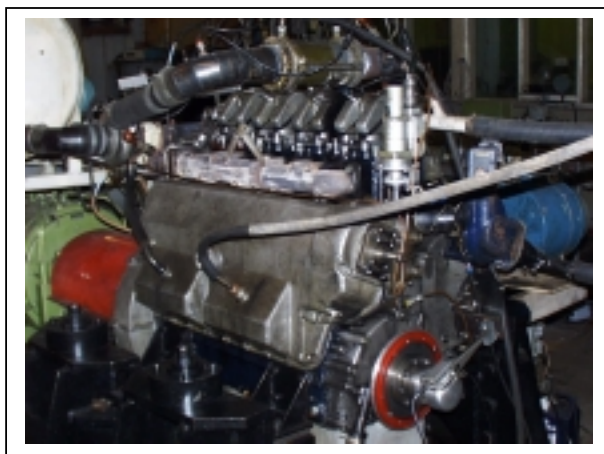


Fundamental Research in Russia on Development of Engines with Variable Compression Ratio

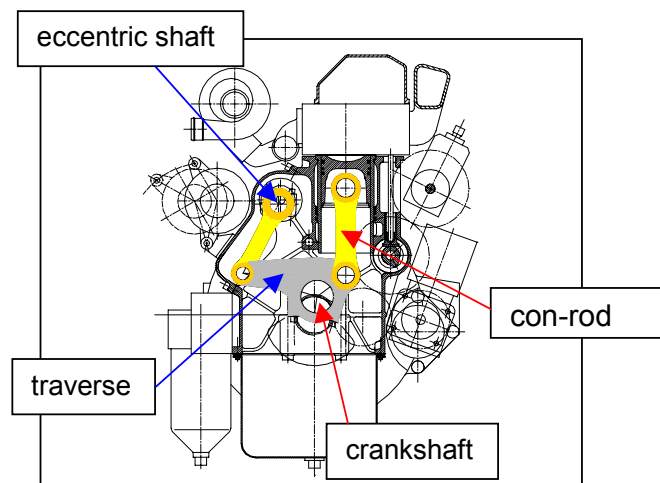
Ever increasing requirements to provide for manufacturing of economy and ecology friendly vehicles have resulted in using the most complicated and intellectual means of internal combustion engine development. Nowadays new ideas, which couldn't be discussed 10-20 years ago, are considered by automotive manufacturers. In particular, many leading automotive companies have approached practically the very complicated idea, i.e. to vary the engine compression ratio depending on load. Specialists were always interested in this trend, but successful experience of «SAAB» which in 2001 demonstrated its version of automotive engine with variable compression ratio increased this interest. The value of this experience is in the fact that practically for the first time were shown possibilities of drastic increase of engine power density, maintaining its economy and providing minimum fuel consumption while engine running on low and average loads. Engineering decisions and ways of regulation for engine compression ratio can be different, however it's undoubtedly, that this trend can really improve fuel economy and exhaust emission by 20 – 30%.

In Russia research activity of engines with variable compression ratio initiated in 1988. In 1989 the first sample of diesel engine with variable compression ratio in the range 17 – 10 was built (slide №1). Control of compression ratio is provided with the new kinematic scheme and new type of power mechanism – traverse type (slide №2). The regulation of compression ratio is put into practice by turn of the eccentric shaft. The given mechanism helps to control compression ratio in a wide range of operation and provides for extremely high engine balance – by 5-6 times better in comparison with conventional engine. Petrol versions of traverse engines were developed and built also. Nowadays experimental research of these engines was performed to provide for reliability and durability. The total time of some samples equals to 300 – 600 hours. Research data show, that nowadays shortcomings of experimental engines (including SAAB engine type) principally can be overcome.

Therefore the availability of engines with variable compression ratio in the market of automotive equipment can be expected by 2005-2007.



Slide№1 Traverse diesel engine T-01
on the test bench



Slide№2 The scheme of traverse engine with
variable compression ratio