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Challenges for Increased Efficiency through Gasoline Engine Downsizing

Michael Bassett, Neil Fraser, Hugh Blaxill, Grant Lumsden
MAHLE Powertrain Ltd.

ABSTRACT

In order to achieve the required future CO₂ reduction targets significant further development of both gasoline and diesel engines is required. One of the main methods to achieve this with the gasoline engine in the short to medium term is through the application of engine downsizing, which has resulted in numerous downsized engines already being brought to production. It is, however, considered that there is still significant further CO₂ reduction potential through continued development of this technology.

This paper considers the future development of gasoline engine downsizing in the short to medium term and the various technologies that can be applied to further increase the efficiency of operation. As such this paper covers, among other areas, fundamental engine layout and design, alternative boosting systems, methods of increasing part load efficiency and vehicle modelling, and uses analysis tools and engine test results to show the benefits achievable.