

Advanced technologies for downsized direct injection gasoline engines

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Abstract

Gasoline engine downsizing has been demonstrated to give significant reductions in vehicle fuel consumption and CO₂ emission levels by effectively moving the engine operating points for any given drive cycle to a more efficient region of the BSFC map. As with the Diesel engine in the past, the combination of direct injection and turbo charging as baseline technologies has enabled gasoline engines to fulfil performance and fuel economy expectations. However, it is only through a number of complementary advanced technologies, that the full potential of these baseline technologies can be exploited; e.g. thermal management, bio-fuels with increased octane numbers, EGR,

This paper discusses these concepts, shows results and draws conclusions from a range of advanced technologies tested on MAHLE's own three cylinder 1.2l demonstrator engine and vehicle, and other research work undertaken at MAHLE Powertrain to further improve gasoline engine efficiency.