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Title: The MAHLE Modular Hybrid Engine Family

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Abstract

All engine and vehicle manufactures are facing increasing pressure by legislation and economics to reduce vehicle emissions and deliver improved fuel economy. By 2025 significant reductions in carbon dioxide (CO₂) emissions will need to be realised to meet these requirement whilst at the same time satisfying the more stringent forthcoming Euro7 emissions regulations. This focus on techniques to reduce the tailpipe CO₂ is increasing the interest in hybrid and electric vehicle technologies. Pure electric vehicles require bulky, heavy, and expensive battery packs to enable an acceptable driving range.

Range Extended Electric Vehicles (REEVs) partly overcome the limitations of current battery technology by having a range extender (REx) unit that allows a reduction of the traction battery storage capacity, whilst still maintaining an acceptable vehicle driving range.

Building on the previous research projects, focussed on REx, heavily downsized ICE and lean combustion system developments, MAHLE are developing a family of powertrains optimised for the future automotive market. The powertrain features an electric traction motor able to deliver the full dynamic performance capability of the vehicle. This is coupled to a small high-efficiency internal combustion engine and optimised transmission. This highly integrated modular powertrain is targeted for meeting vehicle emissions and CO₂ targets for 2030 and beyond.