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Title: The MAHLE Range Extender Engine

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Abstract

Current focus on techniques to reduce the tailpipe carbon dioxide (CO₂) emissions of road vehicles 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.

MAHLE have developed a family of range extender (REx) units specifically for passenger car applications. Key attributes for the engine were identified as being minimum package volume, low weight, low cost, and good noise, vibration and harshness (NVH) performance. In order to showcase the resulting REx unit a current production gasoline fuelled compact-class car has been converted into a REEV. The integration of REx, along with considerations for the operating strategy, including a GPS based strategy, and results showing the measured fuel efficiency are presented.