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## Design of a dedicated Range Extender Engine

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### ABSTRACT

Current focus on techniques to reduce the tailpipe CO<sub>2</sub> 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 drive-able range to be achieved. Extended-range electric vehicles (E-REV) partly overcome the limitations of current battery technology by having a 'range extender' unit, which consists of an onboard fuel converter that converts a liquid fuel, such as gasoline, into electrical energy whilst the vehicle is driving. This enables the traction battery storage capacity to be reduced, whilst still maintaining an acceptable vehicle driving range.

In a previous paper the power requirement of a range extender for a typical C segment passenger car was investigated using drive-cycle modelling over real world cycles. This paper presents the detailed design of the range extender engine. Key attributes for the engine have been identified, these being minimum package volume, low weight, low cost, and good NVH. The selection of the appropriate engine technology to enable the final design to fulfil these attributes is described. The resulting design highlights are presented and the final design is presented.