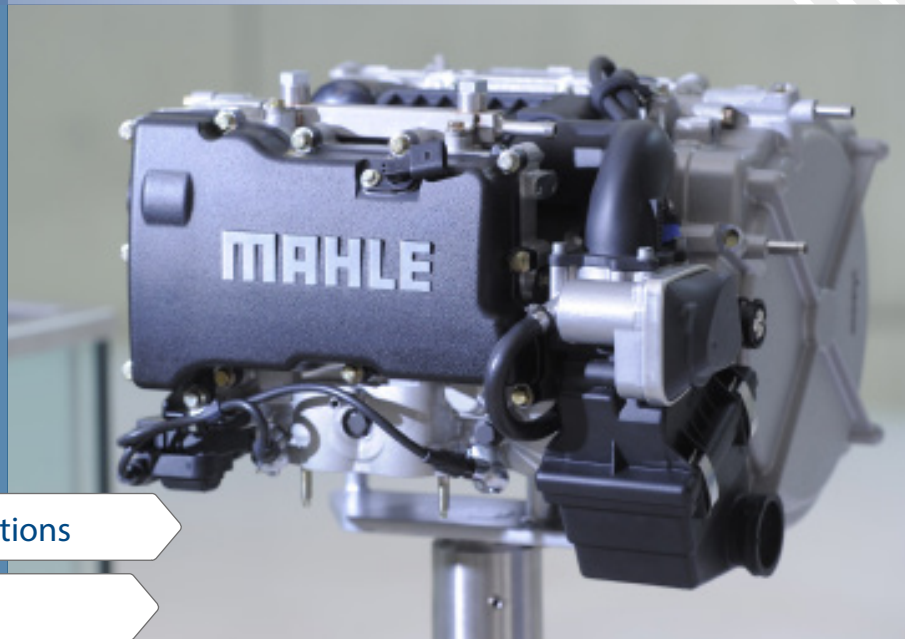


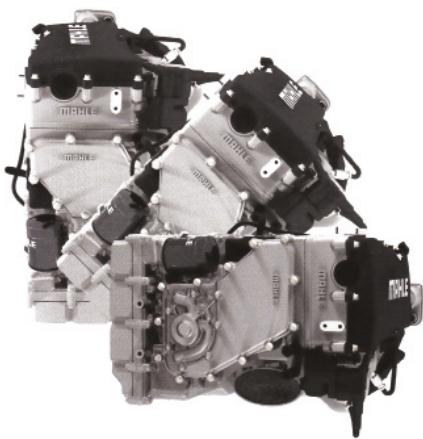
MAHLE Powertrain Compact Range Extender Engine



Specifically designed for EV applications

Compact and lightweight

Flexible installation options



>> Flexible installation & orientation

Compact Range Extender Engine

Extended-range electric vehicles (E-REVs) partly overcome the limitations of current battery technology by enabling reduced battery storage capacity to be used, whilst still maintaining an acceptable vehicle range.

The E-REV is essentially a vehicle that functions as a fullperformance electric vehicle when energy is available from an on board rechargeable energy storage system, typically a battery, and having an auxiliary energy supply that is only engaged when battery energy is depleted. It is desirable that for the majority of time the vehicle will operate in a purely electric-only mode and that the user recharges the vehicle (by connecting to an external supply) when it is not in use, e.g. over-night. Thus, the battery should be sized to cope with the majority of daily usage that the vehicle will encounter, and only rely on the range extender for infrequent, longer journeys.

- 4-stroke gasoline engine
- 900 cc twin cylinder
- 30 kW or 40 kW output
- With electric supercharger 50 kW output
- Horizontal or vertical installation capability
- Weight 50 kg (70 kg with generator)
- Compact design

Contact Us:
Powertrain@mahle.com

MAHLE Powertrain Ltd
Costin House, St James Mill Road
Northampton, NN5 5TZ, UK
Tel. +44 (0)1604 738 000

MAHLE ZG Transmissions
Georg-Kollmannsberger-Straße 3
85386 Eching, Germany
Tel. +49 89 18 94 169-0

MAHLE Powertrain LLC
14900 Galleon Court
Plymouth, MI 48170 USA
Tel. +1 734 738-52 01

www.mahle-powertrain.com

MAHLE Compact Range Extender Engine

Benefits

- Overcomes future engine requirements & challenges
- Sized to be suitable for typical C-segment passenger car
- Analysis of fleet vehicle drive data using drive style analysis toolset
 - › Identifies typical daily usage pattern of passenger cars
 - › Enabled requirements for electrical components & Range extender to be determined
- Key attributes of range extender:
 - › Low cost
 - › Small package volume
 - › Good NVH attributes
 - › Reasonable fuel efficiency
- Design incorporates fully integrated axial flux generator
 - › Housed within the crankcase of the engine
 - › Small & lightweight
 - › Cost-effective solution
- Oil system enables engine to be installed vertically or horizontally for increased package flexibility



>> Range extender engine in demonstrator vehicle

Technical Specifications

Technical specifications

| | |
|----------------------|---------------------------------|
| Engine displacement: | 900 cc |
| No. of cylinders: | 2 in-line, 4-stroke, gasoline |
| Bore/Stroke: | 83.0 / 83.0 mm |
| Compression ratio: | 9,8 : 1 |
| Fuel injection: | Port fuel injection |
| Installation angle: | Verticle or horizontal |
| Engine Control: | MAHLE Flexible ECU |
| Maximum power: | 30 kW [4000 min ⁻¹] |
| Dimensions: | 327 x 416 x 481 mm |
| Engine dry weight: | 50 kg (70 kg with generator) |
| Fuel consumption: | 240 g/kWh minimum |
| Emissions target: | Euro 6 |

Summary

The range extender engine is specifically designed for EV applications with flexibility when it comes to installation options. This compact and lightweight engine is a cost-effective solution that is built to meet requirements for the future.



>> MAHLE range extender demonstrator vehicle

Contact Us:
Powertrain@mahle.com

MAHLE Powertrain Ltd. 2021

MAHLE Powertrain GmbH
Einsteinring 5
85609 Aschheim, Germany
Tel. +49 89 962915-0

MAHLE Powertrain Ltd
13.210-877
Jundiaí / São Paulo, Brazil
Tel. +55 11 4589-0400

MAHLE Automotive Technologies
No. 1299 Huan Cheng Bei Road, Fengpu Industrial Park
201 401 Shanghai, Fengxian District, China
Tel. +86 21 5136-0595