

MAHLE Powertrain Verification Capabilities

DVP derivation for new and unique systems and powertrains

Vast experience of engine and system development testing

Bespoke rig manufacture and operation



A complete service for powertrain mechanical development and validation.

MAHLE Powertrain's experienced Mechanical Systems team have a wealth of experience in the field of functional testing, durability testing and problem solving. Playing a key role within the design process, our work starts with helping to identify potential failure modes and how they may be avoided before the design leaves the CAD screen. We are then able to derive and deliver an optimised Design Validation Plan, utilising our own or our client's test procedures, to validate the powertrain and peripheral systems on the test bed and in vehicle to ensure that they meet customer reliability demands.

When a failure occurs, we utilise an industry standard 8D approach to carry out in-depth investigations. Drawing on our expertise, we are able to provide insights and understanding into complex system interactions, utilising advanced instrumentation, visualisation techniques, novel test procedures and in-house manufactured rigs, to facilitate the development of design solutions.

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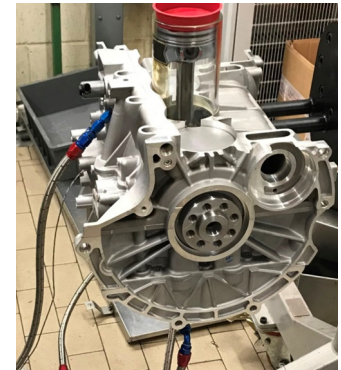
MAHLE Product Information 08/2019

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In addition to our verification activities, we relish the opportunity to produce prototype and concept vehicles to allow our customers to experience a new powertrain configuration at a very early stage of the development process. We can perform relatively straight forward engine modification and substitutions to complete hybrid powertrain installations with representative drivability characteristics to enable assessment at the highest level.

Our Facilities and Services:

- Design Validation Plan derivation and management
- Dynamometer and vehicle testing
- Bespoke rig design, manufacture and test delivery
- Design improvement recommendations based on functional test results
- 8D failure investigation and problem resolution
- Durability and validation tests with measured build
- Specialists in cooling and lubrication system validation and development
- Crankcase ventilation system assessment and development
- Engine friction measurement
- Prototype vehicle manufacture and testing, utilising the MAHLE Flexible ECU to enable full integration with existing vehicle systems (ICE and Hybrid powertrains)
- High speed video capture
- Valvetrain testing
- Structural deformation measurement
- In-house instrumentation capabilities
- Front End Ancillary Drive (FEAD) assessment



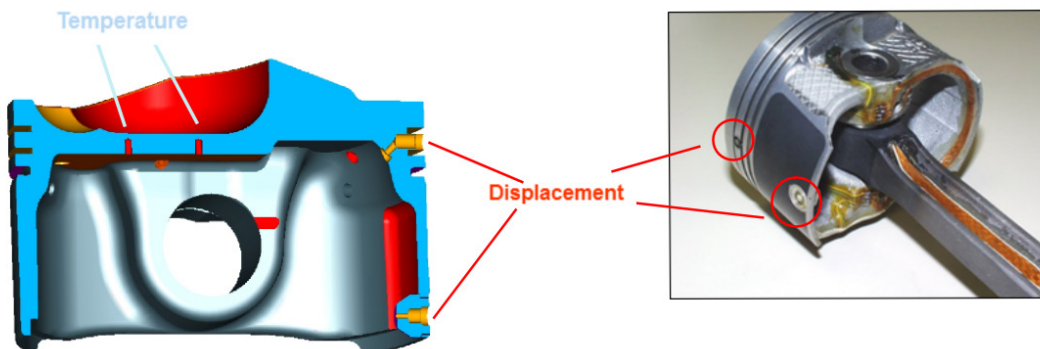
Climatic / Altitude

Temp range, deg C	-40 /+60
Temp constancy, K	+/- 1.2
Humidity, g/kg air	5.5/12.2 +/- 5%
Pressure range, mbar	540/1050
Max altitude simulation, m	5,000

Test Specifications

Emissions	Euro 6c, US SULEV, China National 6
Max speed, km/h	250
Max force, N	6,400 (12,500) ¹
Max power, kW per axle	230/230 (400/400) ¹
Mass limit per axle, kg	2,500

¹Overload 30 secs every 5 minutes



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