

MAHLE Powertrain RDE Process



Comprehensive Development Process

From Initial Concept to Certified Vehicle

Fully Optimised Emissions Compliance

Real Driving Emissions Process



>> End-to-end RDE development process

MAHLE Powertrain has introduced a new end-to-end test and development process that helps vehicle manufacturers achieve the optimal powertrain configuration for any given application. The development process, which has been designed to help meet the challenges posed by new real-world emissions testing targets, is broken down into five key stages: steady state powertrain testing; transient powertrain testing; four-wheel drive dyno testing; and on-road RDE testing all linked via vehicle simulation.

The initial simulation phase allows early understanding of powertrain operation requirements over RDE cycles and enables optimisation of transmission and hybrid control strategies before physical hardware is available. This phase involves an early assessment of RDE boundary conditions based on three key factors: vehicle performance, driving style and test route characteristics. MAHLE applies advanced analysis techniques to generate a test programme for implementation throughout the complete development process. Hundreds of digitised RDE routes are used to simulate the varying traffic conditions, road layouts and topographies that are experienced in real-world driving scenarios.

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

Steady State Powertrain Testing

- Initial testing of prototype powertrain hardware
- Steady state dyno with constant speed and load values
- Optimised base engine mapping
 - Advanced DoE tools
 - Automated testbed running
- RDE vehicle simulation feedback loop
 - Increased model accuracy
 - Performance assessment without physical hardware
- Reduced project cost and prototype hardware reliance



>> Vehicle in test chamber



>> High specification 4WD chassis dyno

Powertrain System Simulation

- Transient testing phase at higher levels of maturity
- Simulation of complete drive cycles
 - › In line with specific territory regulations
 - › Precise recording of emissions
- Conduction of analysis correlation
- Validation of powertrain performance

PEMS System

- Certified real-world drives on VCA approved RDE routes
- Test vehicles fitted with PEMS (Powertrain's Portable Emissions Measurement System)
 - › Measures tailpipe emissions
- Systems capable of achieving emissions compliance



>> PEMS testing in vehicle

Contact Us:
Powertrain@mahle.com

MAHLE Powertrain Ltd. 2020

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