



Performance, Calibration & Development



High Output Powertrain Optimisation

MAHLE Powertrain believe that creating exciting and dynamic vehicles that delight modern drivers remains the most effective way of getting clean and fuel-efficient technologies into the marketplace.

With a rich heritage and wealth of experience in developing high performance powertrains from concept through to production, MAHLE challenges the view that performance and economy are competing objectives. Instead, MAHLE take a 'no-compromise' approach, delivering the maximum performance, highest efficiency and best durability for the lowest emissions and at the lowest cost.

By drawing on our involvement with many modern powertrains currently in the marketplace, MAHLE Powertrain are able to combine a deep understanding of each component; with a holistic, whole-system engineering approach that recognises the complex interactions that can occur between them.

Through honing our skills and extending our knowledge, MAHLE Powertrain is able to extract the full potential from every component and control system, leading to us becoming recognised throughout the industry as experts in engine development and calibration providing the foundation for our ability to deliver the optimum solutions for vehicle performance, emissions and driveability.



Downsizing engine



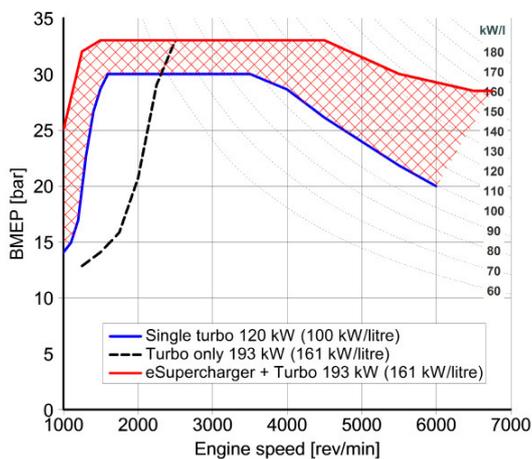
Performance calibration expertise
Efficient combustion systems

Vehicle Performance Development

- Performance development is a core competence
- All vehicle powertrain configurations
 - › Conventional IC Engine
 - › Mild hybrid
 - › Full hybrid
 - › Plug-in Hybrid Electric Vehicle (PHEV)
- Experienced & skilled engineers and technicians across multiple departments
- Combined & utilised to deliver optimum solutions for our customers



eSupercharged DI-3 vehicle



Torque curve for MAHLE eSupercharged

Key Highlights

- Powertrain hardware selection
- Powertrain concept lay out
- Combustion system development
- Port flow & valve motion testing
- Charge motion optimisation
- Advanced downsizing & boosting technologies
- Lambda 1 optimisation & system selection
- Base engine emissions & performance optimisation
- Emissions & OBD development for all markets
- Robustness analysis & fleet driveability development
- Steady state & transient particulate optimisation
- Particulate source identification
- Advanced engine modelling with DoE approach to understand & optimise complex systems
- Comprehensive testing & validation support
- Industry database, competitor benchmarking & target setting

Summary

MAHLE Powertrain offers high output powertrain design, development and optimisation. We provide a broad spectrum of capabilities and experience to ensure that all high performance engines achieve or exceed our customers targets for vehicle dynamic behaviour, fuel economy and emissions compliance.

Our engineer's knowledge extends to all possible configurations of hybrid powertrains and our test and development facilities are designed to accommodate a wide range of hybrid vehicles.