

### MAHLE Powertrain Performance & Calibration Development



High output powertrain optimisation

Performance calibration expertise

Efficient combustion systems



MAHLE eSupercharged  
DI-3 engine

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.

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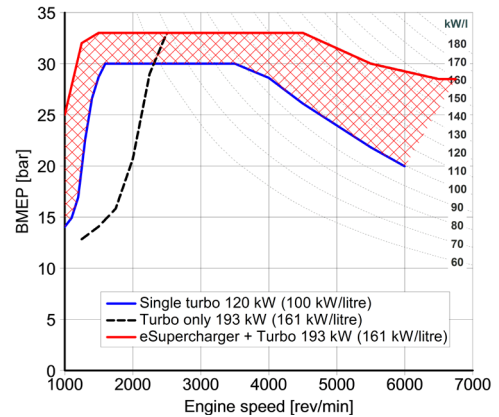
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#### Key capabilities:

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

Vehicle performance development represents a core competence at MAHLE Powertrain whether conventional ICE, mild / full hybrid or PHEV. The extensive experience and skills of our engineers and technicians across multiple departments are combined and utilised to deliver optimum solutions for our customers.



Torque curve for MAHLE eSupercharged DI-3



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