



Contact

Ronald Penzinger
Key Account Manager

Engineering Center Steyr GmbH & Co KG
Steyrer Straße 32
4300 St. Valentin
Austria

Office +43/7435/501-2420
Email ronald.penzinger@magna.com
Web engineering.mpt.magna.com

Disclaimer: Engineering Center Steyr GmbH & Co KG, Engine and Hybrid Calibration - v.1.0

Ressources Engine Testing

High Altitude & Climate Test Bench

- Max. Altitude: 5000m
- Performance: 550kW
- Torque: 2600Nm / 3100Nm Peak
- Max. Speed: 7500 U/min
- Humidity: +5% - 95% (@ 20°C)
- Temperature: -30°C / +50°C

Dynamic Engine Test Bench

- 18 dynamic test benches
- NVH Test Cell
- Up to 580 kW / 4000 Nm / 10000rpm
- Eu6d Emission measure equipment

Ressources Vehicle Testing

Chassis Dyn

- CVS Emission measurement
- 4 Single wheel drives: 4 x 250 KW
- Temperature condition -20°C to 50°C

Proving Ground / Test Track

- 850m straight line
- Dynamic cornering
- Outside noise surface



Engine and Hybrid Calibration



Calibration and Functional Development

- RDE Measurement Service
- Emissions, Aftertreatment, Driveability and NVH
- Hybridization

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Calibration Services

Emissions & Aftertreatment

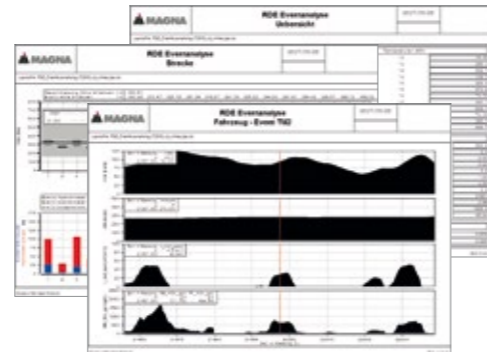
- Performance (Fuel economy, component protection)
- Models (NOx, Temperature ...)
- Operation Strategies (GPF, DPF, SCR, ...)
- Controller (Turbocharger ...)
- Thermomanagement & Coldstart
- Certification- & real driving emission

Driveability and NVH

- Torque management
- Driveability calibration
- Vehicle functions
- NVH Optimization

OBD

- OBD I (electrical)
- OBD II (emission related)
- Scan tool communication
- Fault path management



RDE

RDE measurement service

- Different track profiles
- Testing Infrastructure

RDE evaluation/analyses

- Evaluation of RDE cycles according to the latest legislation
- Breakdown of critical emission sections & Evaluation of boundary conditions
- Identification of worst cases scenarios - robustness check

RDE calibration optimization

- Track to dyno and track to bench methods
- Transfer of reference cycles considering boundary conditions

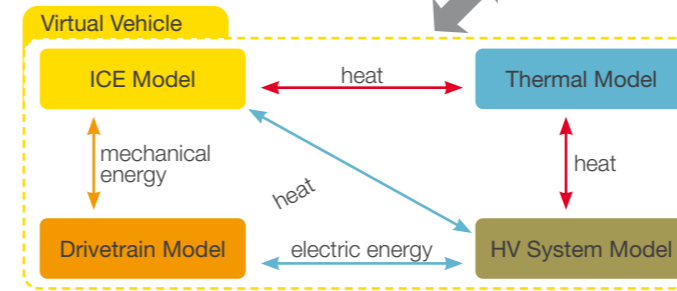
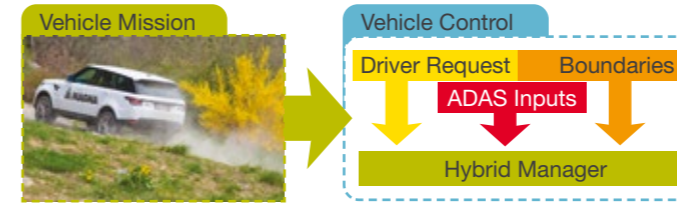
RDE concept validation

- Prediction of borderline/worst-case cycles
- RDE hardware dependencies

Hybridization

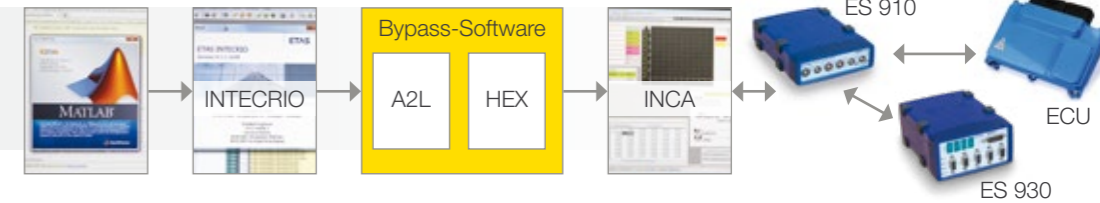
Modular Hybrid Strategy Manager

- Virtual development environment for emissions and RDE
- CO2 and emission optimized operation strategies



Function Development

- Development in MATLAB/Simulink
- Rapid Prototyping with INTECRIO



Calibration Support Environment

Data Analyses

- Customized data handling
- Multiple graphical data visualization

Modelbased Cal. Tool

- Databased simulation and optimization tool
- Simulink interface for function implementation
- Processing of multiple measurements

Failure Path Analyzer

- Fault path management in accordance with the applicable national law
- P-code and SPN-code checker
- Inhibition matrix and error class calibration management

Map Tool

- Map generation from measurement data
- Various fitting algorithmic procedures

Magnificent Statistics

- Validation and robustness checks
- Operation point based statistical evaluation

