AVL

REAL DRIVING EMISSIONS ON AVL ENGINE TESTBEDS

Deploy RDE development quickly and efficiently

AVL Engine Testbed

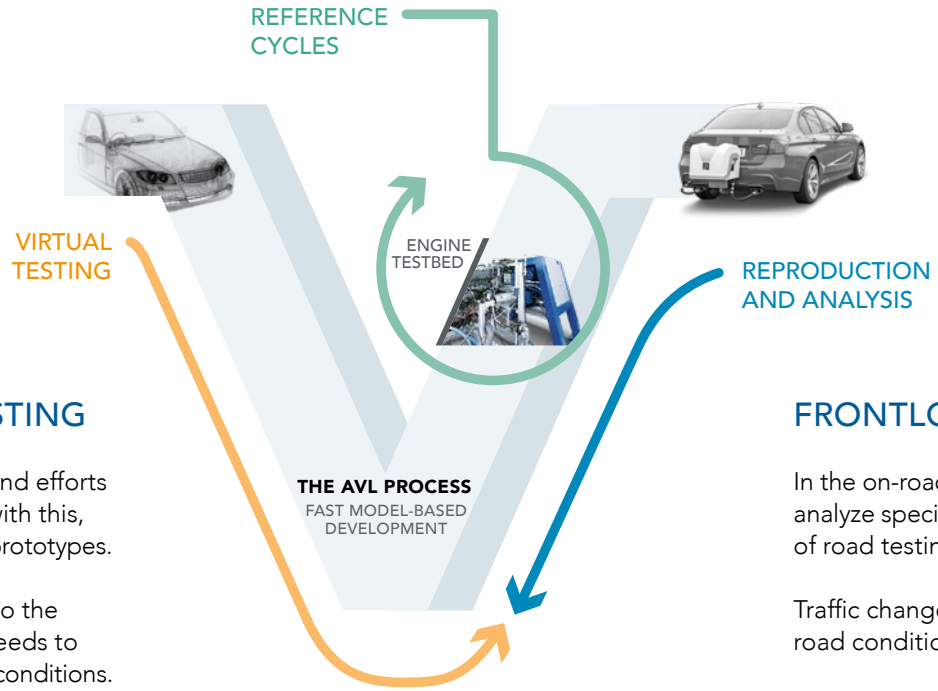
MARKET DEMAND

Real Driving Emissions (RDE), according to UN-ECE legislation, lead to new challenges in engine and powertrain development. To achieve RDE conformity, working processes and existing development environments are required to be changed. Reproducible and comparable testing results are key.

YOUR BENEFITS

- Optimize vehicle emissions in a reproducible Engine Testbed Environment
- Easy transfer of road data to the Engine Testbed
- Fewer prototypes by deploying AVL Simulation Framework
- Increased development efficiency due to AVL RDE Tools

Efficient engine test methodologies help achieve RDE conformity



SIMULATION-SUPPORTED TESTING

RDE development increases testing time and efforts on the road and on chassis dynos. Along with this, there comes a rising number of expensive prototypes.

This can only be rectified by shifting tests to the engine testbed, whereby the test object needs to be operated under realistic simulated road conditions. This saves development time and reduces prototypes.

This is achieved with the AVL Simulation Framework and RDE Testing Methodology.

- In early development stages, full-vehicle real road emission prediction is supported by AVL Virtual Testing Solutions
- Component and System Testbeds utilize comparable Reference Cycles to validate calibration work

FRONTLOADING APPROACH

In the on-road vehicle calibration phase it's difficult to analyze specific problems due to the unpredictability of road testing.

Traffic changes, weather, climate and other varying road conditions constantly change testing scenarios.

Therefore, lab testing is the solution, with reproducibility, freely-definable parameter variation and highly-accurate measurement systems guaranteed to solve these problems.

- Reproduction of road trips to perform specific driving and result analysis

VIRTUAL TESTING

By connecting the concept development with the system integration phase, development time and effort can be continuously reduced. Using this approach, it's important to reuse various software models that have been engineered in an early concept phase.

These models are partly replaced with real items, such as the combustion engine, on the Engine Testbed. AVL Vehicle Simulation Model – AVL VSM™ offers the possibility to create virtual tracks out of maps. This supports engineers when developing low-emission strategies in real road trips.

PACKAGE HIGHLIGHTS

- Simulation package to enable optimized real time performance
- AVL VSM™ enhances real and artificial tracks with traffic and driving characteristics

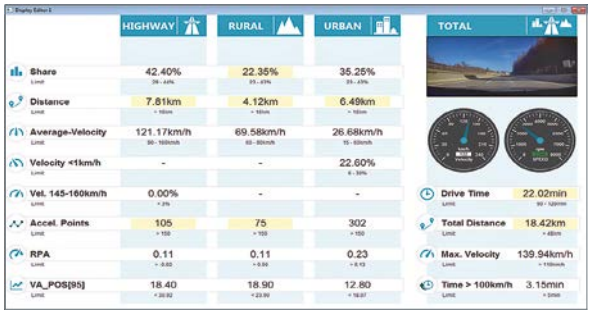
REFERENCE CYCLES

AVL Engine Testbeds are the ideal environment to calibrate combustion engine-driven powertrains. To validate application work reference cycles such as WLTC, ARTEMIS, RTC95 or transient tests, maneuver-based test cycles are engaged on the Engine Testbed.

In addition to the validation of calibration work, simulating vehicle and powertrain variants with AVL ISAC™ raises confidence in early stages of development.

PACKAGE HIGHLIGHTS

- Create velocity-based test cycles from road or map data
- AVL RDE Test Cycle Package including WLTC, ARTEMIS and RTC95



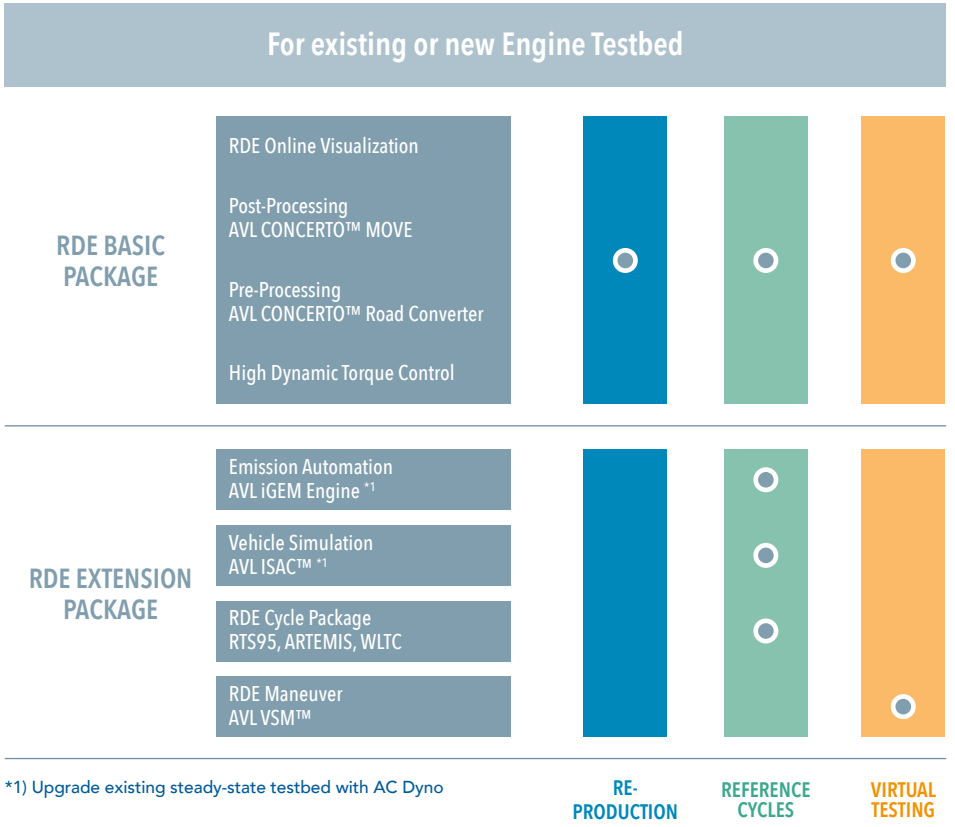
REPRODUCTION AND ANALYSIS

During the RDE road trip, data is measured and stored according to type approval demands. Such recorded data can be filtered and processed with fixing routines to suit demand values for the engine testbed actuator (dyno, pedal, media conditioning). This enables an accurate analysis of specific sequences or occurrences during a RDE trip under reproducible and, most importantly, repeatable circumstances.

PACKAGE HIGHLIGHTS

- Smart road data conversion to transient step sequences
- Automatic selection of best suitable control mode
- AVL High Dynamic Torque Control for an optimal representation of real engine behavior

MODULAR RDE PACKAGES



*1) Upgrade existing steady-state testbed with AC Dyno

THE AVL SOLUTION

AVL Engine Testbeds empower engineers to set specific road load conditions within realistic boundary conditions commanded by real road trips. In early development stages, new engine technologies can be developed and tested according to these demands. Exhaust emissions are analyzed with high precision and with highest repeatability.

Simulation models extend the available powertrain component to a full vehicle in a virtual driving environment. Quick and easy simulation model handling is guaranteed by a consistent data backbone between AVL Test and Development environment.

It's possible to upgrade new and existing Engine Testbeds to meet the requirements for RDE development. AVL software packages support the development workflow for RDE, bridging the gap between road and testbed.

Specifically, the online RDE calculation gives you a real-time trip distribution share for urban, rural and highway at any time. An additional embedded dashboard cam video enables effective collaboration between vehicle and testbed engineers. Identical data handling with AVL CONCERTO™, as used for vehicle and engine testing, brings maximum efficiency to your development workflow.

FOR FURTHER INFORMATION PLEASE CONTACT:

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