



OPTIMIZED QUALITY  
AND EFFICIENCY IN  
TESTING AND  
DEVELOPMENT

## AVL CUSTOMER SERVICES

# APPLICATION SERVICES

METHODOLOGY AND PROCESS SUPPORT FOR DOING THE RIGHT THINGS IN THE RIGHT WAY

To fulfill today's demands and future targets regarding efficiency in calibration and Powertrain Vehicle testing OEMs have to adopt the latest methodologies and tools. Use of these new methods and tools can deliver the following advantages:

- A decrease in development time through reduction in test and measuring effort, e.g. through high test bed automation rate
- An increase in development process quality through consistent, standardized processes
- Higher quality of results, e.g. through use of online data plausibility checks, statistical raw data evaluation and model based approaches

To realize these advantages an organization has to have:

- Correctly specified, reliable facilities regarding test beds, instrumentation and tools
- People with the appropriate skills to achieve the best from the available tools and methodologies

Considering all these topics AVL provides APPLICATION SERVICES for high testing efficiency and high data quality. For these services an AVL expert is available on site to discuss development and testing targets with engineers out of multiple departments (see Fig. 1). He supports with the focus on application of test systems for engine-, powertrain- and vehicle development as well as data evaluation and information management. The primary target is application knowledge transfer for intelligent automation of test beds and the realization of customer specific calibration and testing tasks using state of the art tools and methodologies. The customer gets task oriented advice on the best utilization

of the system functions to enable him to handle all the development and test tasks with the highest efficiency. The AVL application engineer acts as an interface between the customer and AVL and has the accompanying back office support.

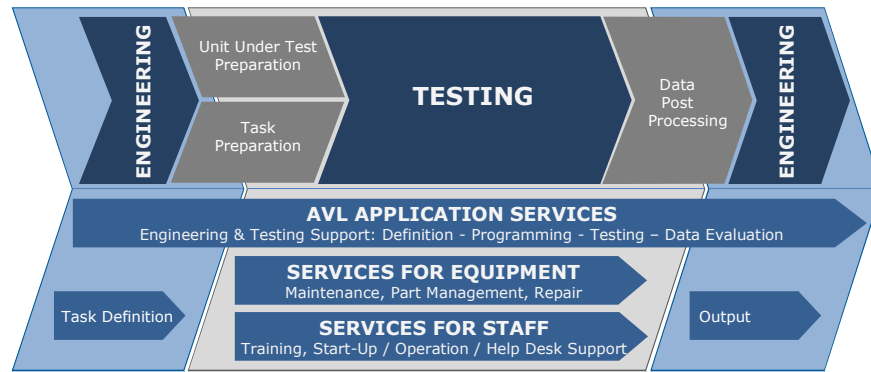


Fig. 1: Interaction between Engineering and Testing supported by AVL Application Services

Some examples for APPLICATION SERVICES:

- APPLICATION SERVICES for engine test beds:

An AVL application expert with a solid background in ECU calibration and engine testing is temporarily or permanently on site and works at the customer's facility together with the customer's personnel for optimal utilization of the AVL tool chain in ECU-calibration. The expert provides deep knowledge, e.g. in usage of AVL CAMEO and AVL PUMA OPEN in XCU diesel or gasoline calibration tasks. Post processing, e.g. in form of model based approaches can also be part of these services. APPLICATION SERVICES leads into productive usage of new methodologies, e.g. "Design of Experiment" (DoE) and tools in ECU calibration.

- APPLICATION SERVICES for powertrain test beds:

For powertrain test beds there are many combinations of different configurations and testing targets to cover. It can be a transmission only with electrical input or a complete hybrid powertrain with 4WD. It makes a big difference whether the efficiency has to be evaluated, the correct fatigue needs to be reached according to defined load spectra or the shifting behavior of an automatic transmission needs to be tested and the control module pre-calibrated. How to get a specific test from the road into the test cell, what are the opportunities and limitations?

The customer can discuss all his needs for testing and evaluation with an AVL application expert. After evaluation of the possibilities with the customers existing systems the expert will advise on optimal utilization of these for a specific task.

**Benefits**

- Reliable and optimized application of test systems
- Efficient implementation of new testing tasks and new testing methodologies, e.g. model based calibration or maneuver based testing
- Systematic build-up of competence
- Know-How transfer from AVL to customer
- Maximum return on any investment in people, test equipment and software

**Financial Aspects**

As described above, correctly specified and reliable testing facilities, instrumentation, tools and people with the appropriate skills are a prerequisite for the successful introduction of new approaches in engineering and testing. As these new approaches are in itself the basis for an efficient product development in regard to cost and time the customer has to ensure a successful and sustainable introduction and application of these new tools and methods. By using AVL APPLICATION SERVICES the customer gets faster into reliable engineering and will experience an earlier return of any investment made on new systems and methodologies. He will immediately realize an increase in efficiency in his daily operation.

**References**

A number of AVL customers using state of the art engineering and testing technologies have implemented customized APPLICATION SERVICES for reliable application of systems and methodologies.

Following this link you will find a case study regarding Application Services at Ford Motor Company:

<https://www.avl.com/Application-Services>

**Customer statements**

AVL's Application experts are highly skilled and develop good relationships with both customer personnel and the local AVL support organization. Their understanding of the on-site situation is excellent and response times short which improves development and testing efficiency.