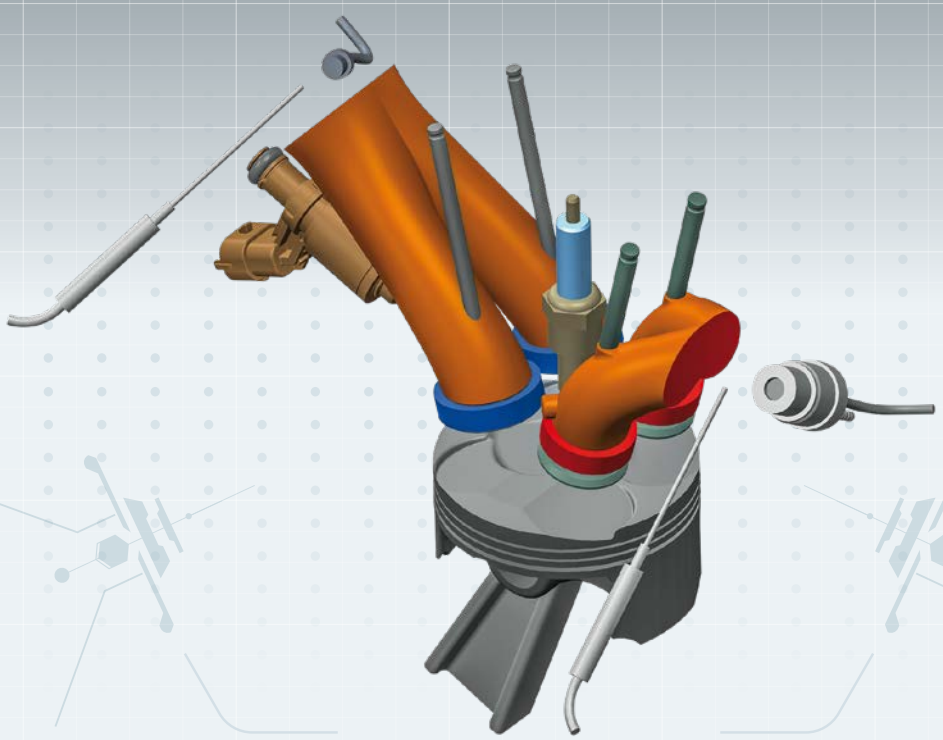


GAS EXCHANGE AND COMBUSTION ANALYSIS (GCA)

The Virtual Sensor

Accurate combustion analysis can help on engine design, efficiency improvements or pollutants reduction by providing instantaneous feedback on the combustion process. It can also convey detailed combustion information to help speed up the engine calibration process.

AVL GCA is a thermodynamic analysis tool based on measured data. The engine's intake, cylinder and exhaust are considered in detail. GCA calculates the complete cycle in an iterative matter, firstly "combustion" then "gas exchange". By using the measured pressure traces, values can be determined that otherwise can only be acquired with a lot of effort, or even not at all e.g. residual gas content or volumetric efficiency or wall heat transfer.

Calibration of a simulation model by measurement is mandatory in case high accuracy is required. The calibration process requires data exchange between BOOST and GCA, therefore the consistency of these two calculation programs is necessary. Boost's calculation kernal is integrated into GCA, therefore consistency is guaranteed.

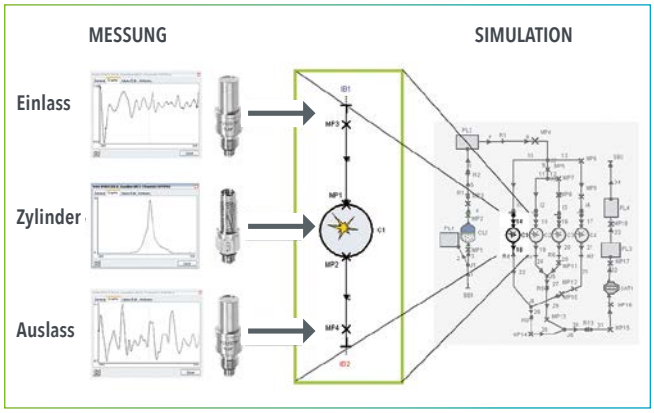
YOUR BENEFITS AT A GLANCE

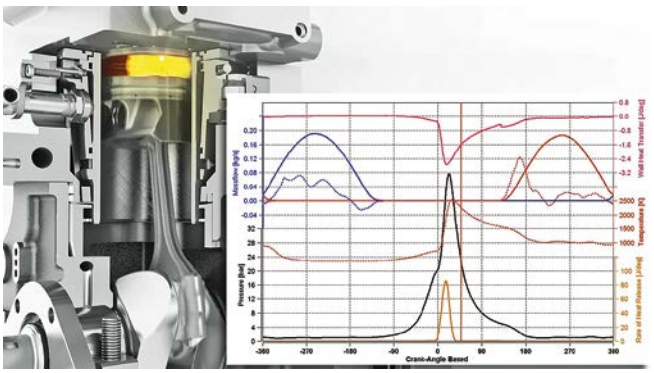
- Deep insight into the phenomena connected with the combustion chamber provides much better understanding of the combustion process
- Acquisition of values that cannot be measured
- Verified results by plausibility checks
- Full integration into AVL indicating software and also into post-processing software CONCERTO leads to reduction of interfaces

Gasoline engines use a broad range of different technologies such as the highly flexible valve-train system. This requires detailed knowledge of the thermodynamic processes in the combustion chamber – especially regarding the relationship between mixture preparation, charge motion, combustion stability and wall heat loss as it is crucial for reducing fuel consumption.

The measurement equipment at many test cells is set up with a low pressure sensor in the intake manifold and another in the exhaust. GCA provides a complete gas dynamics evaluation considering not only gas mass propagation, but also effects like natural charging.

AVL GCA is the result of continuous effort by a development team involving AVL's three main column ITS, PTE and AST.





Services

- Quantitative assessment of thermodynamic proficiency of current combustion system design including comparison with relevant AVL pattern
- Troubleshooting of process anomalies
- Performance improvement
- Measurement execution, application support
- Technical AVL GCA Support

Article number to order a GCA license to existing CONCERTO license: TI0GCAADDB.01

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