

SINGLE CYLINDER RESEARCH ENGINE

AVL 514

TRANSPARENT RESEARCH ENGINE

The constantly increasing complexity of modern engine technologies involves increased demand concerning the match of mixture formation and charge motion. Convenient tools and techniques, tailored to the problem at hand, such as AVL's transparent research engine, are now available to visualize the charging of the combustion chamber and combustion itself.

The benefits:

Long before the concept is translated to the full engine, its prospects of success are tested under realistic engine conditions.

Whether naturally aspirated or supercharged, mixture formation in modern engines is ever more linked to the interaction of fuel injection and in-cylinder flow. The transparent single cylinder engine reveals at once how and to what extent the development potential of a combustion process can still be optimized.

Special window techniques allow fully visible access to the pent roof areas e.g. on gasoline direct injected engines.

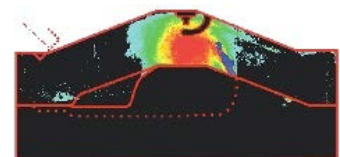
Camera based visualization systems and laser supported diagnostic techniques, such as LIF, PIV, PDA or others, can be applied.

Area of Usage

Flow field analysis (e.g.: PIV, LDA ...)

Spray visualization

- Flame visualization
- Flame spectroscopy

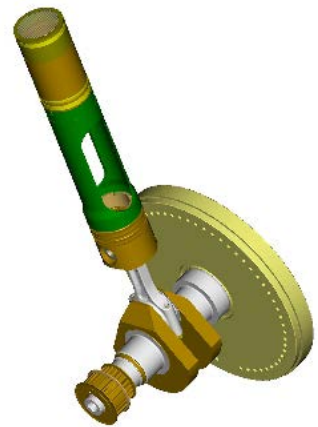




- Gasoline direct injected engines: identification of fuel injection and mixture transport phenomena (LIF). Optimization of injector selection, injection strategies for homogeneous and lean stratified operation, piston and cylinder head geometry for stratified charge operation modes, oil dilution, wall wetting etc....
- Ignition and combustion fundamentals research as well as experimental combustion research

Your Benefits at a Glance

- Robust design for highest demands under fired conditions
- Modular design principle for assembling cylinder head variants for conventional and experimental combustion processes
- Compression ratio up to real multi-cylinder engine values
- Glass cylinder liners with different heights up to full stroke
- Quick and easy cleaning of all glass components
- Optimized access for optical measurement systems
- Intensive combustion R&D projects and measurement services on own AVL internal transparent engine laboratory
- Application support via AVL specialists



Technical Features

Bore	up to 95 mm
Stroke	up to 100 mm
Speed standard solution customized version	up to 3000 U/min above 4000 U/min
Max. peak firing pressure	60 bar (higher pressures on request)
Glass cylinder liner height	part to full stroke

Options

- Cylinder head variants for conventional as well as for experimental combustion processes
- Open, free programmable engine control unit - AVL ETU 427
- Precise mirror unit for imaging through piston window
- External supercharging of transparent engine
- Complete test bed system: AVL Single Cylinder Compact Test Bed for efficient functions tests

