



SINGLE CYLINDER RESEARCH ENGINE

AVL SINGLE CYLINDER RESEARCH ENGINES

Single cylinder versions of multi-cylinder production engines are used world-wide to reduce testing costs, minimize testing times and carry out high performance quality research.

- Strongly improved transferability to multi-cylinder engines
- Exact tailoring to customer requirements
- High structural integrity / modular based systems

Area of Usage

AVL has specialized in designing customer specific single cylinder engines by incorporating individual requirements in the design with the goal to fully replicate multi-cylinder engines. This leads to extremely good transferability of test results so that most of the predevelopment work can be carried out reliably on the single cylinder in shorter time.

For flow studies and combustion research AVL Single Cylinder Engines can be converted into transparent engines with optical access through piston and liner. Quartz glass allows the application of UV laser systems. With the Engine Timing Unit this sophisticated measuring technique can be precisely synchronized with the single cylinder engine.

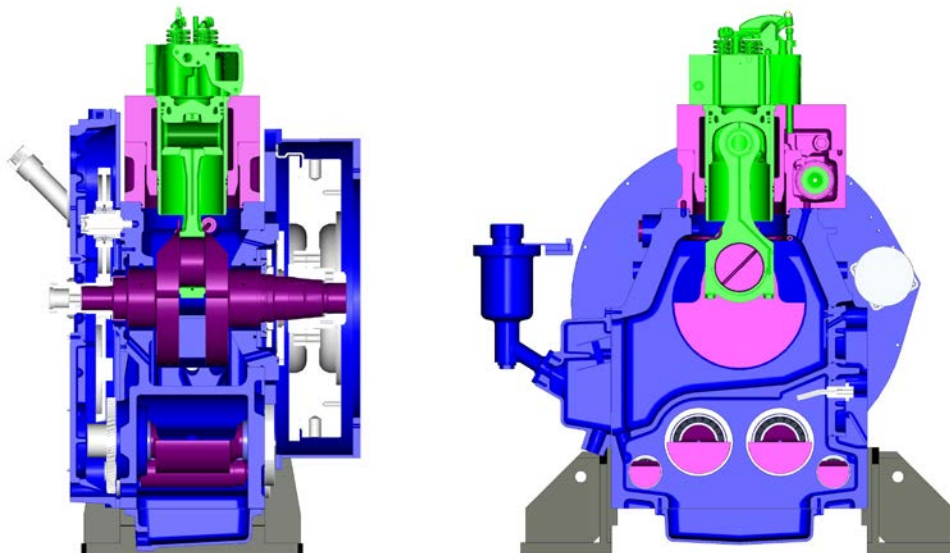
In the fuel and lube oil industry single cylinder engines are currently being used for intake valve deposits and combustion chamber deposits tests. Here single cylinder engines offer the ability to test future engine design features without having to wait for the production unit. A variety of single cylinder engine versions are used as screener engines for piston deposit tests with excellent correlation to multi-cylinder tests.

Your Benefits at a Glance:

- Engine versions from small passenger car engines to heavy duty truck engine sizes
- GDI version with high flexibility in swirl / tumble intake ports and injector installation positions comprising side injection as well as narrow close position
- Heavy duty truck size engines for maximum peak firing pressures higher than 300 bar
- Engines can be equipped with state-of-the-art or even future engine technology
- Any current or future fuel injection equipment can be utilized
- Well proven optical top-works allow the application of modern laser supported measuring techniques for e.g. verifying root causes for oil dilution, wall wetting etc.
- Exact replication of customer specific multi-cylinder engines ensure excellent correlation to the production engine
- The inherent structural ability allows more severe operating conditions and consequently shortens the test time e.g. on lube oil tests
- Complete single cylinder compact test bed available as cost effective turn-key solution

Technical Features:

- Modular design concept allows easy conversions into customer specific engine versions
- Conversion kits enable to change from diesel to gasoline operation and vice versa
- All engine are equipped with mass balancing system for compensating the oscillating forces – this keeps vibrations low
- Proven design for optical access to the combustion chamber through piston, cylinder liner and cylinder-head
- High repeatability of measuring results due to the mechanical stability of the engine
- Preparation of the engine for installing measuring sensors such as in cylinder pressure transducer, crank angle encoder or optical access via endoscope technique to the combustion chamber





Technical Data

540 Series (Passenger Car)

Engine no#	Bore&Stroke (mm)	Engine Specification	TopWorks
5401	86 x 86	MPFI gasoline 4V DOHC	Opel C20X
5402	85 x 90	CR Diesel 4V DOHC	AVL Leader
5403	86 x 86	Gasoline DI 4V DOHC	AVL GDI
5404	85 x 90	CR Diesel 4V DOHC	AVL split port cylinder head / VVT
5405	82 x 86	Gasoline DI 4V DOHC	AVL versatile cylinder head / VVT

580 Series (Light Duty)

Engine no#	Bore&Stroke (mm)	Engine Specification	TopWorks
5804	85 x 90	CR Diesel 4V DOHC	AVL Leader

530 Series (Heavy Duty)

Engine no#	Bore&Stroke (mm)	Engine Specification	TopWorks	Test Procedure
5305 LEF / MAN	128 x 155	2 valves, push rods, inline pump	MAN D 2866	CEC PL-50
5308 LEF / MACK	123.8 x 165.1	4 valves, push rods, inline pump	MACK EM	ASTM T8/T9 screening
5309 MACK	123.8 x 165.1	4 valves, push rods, inline pump	MACK EM	Research
5311 LEF / MB	128 x 142	2 valves, push rods, inline pump	MercedesBenz OM441LA	CEC L-52-X-95
5312 VOLVO	131 x 150	4 valves, OHC, unit injector	VOLVO D12	Research
5313 HEDE	130 x 150	4 valves UI / PLD or CR 250 bar PFP	AVL	Research

Options

- Optical top-works
- Oil and Coolant Supply Systems 575 / 576 / 577
- Single Cylinder Compact Test Bed New Generation
- Engine Mounting Frame 579
- Supercharging Unit 515X