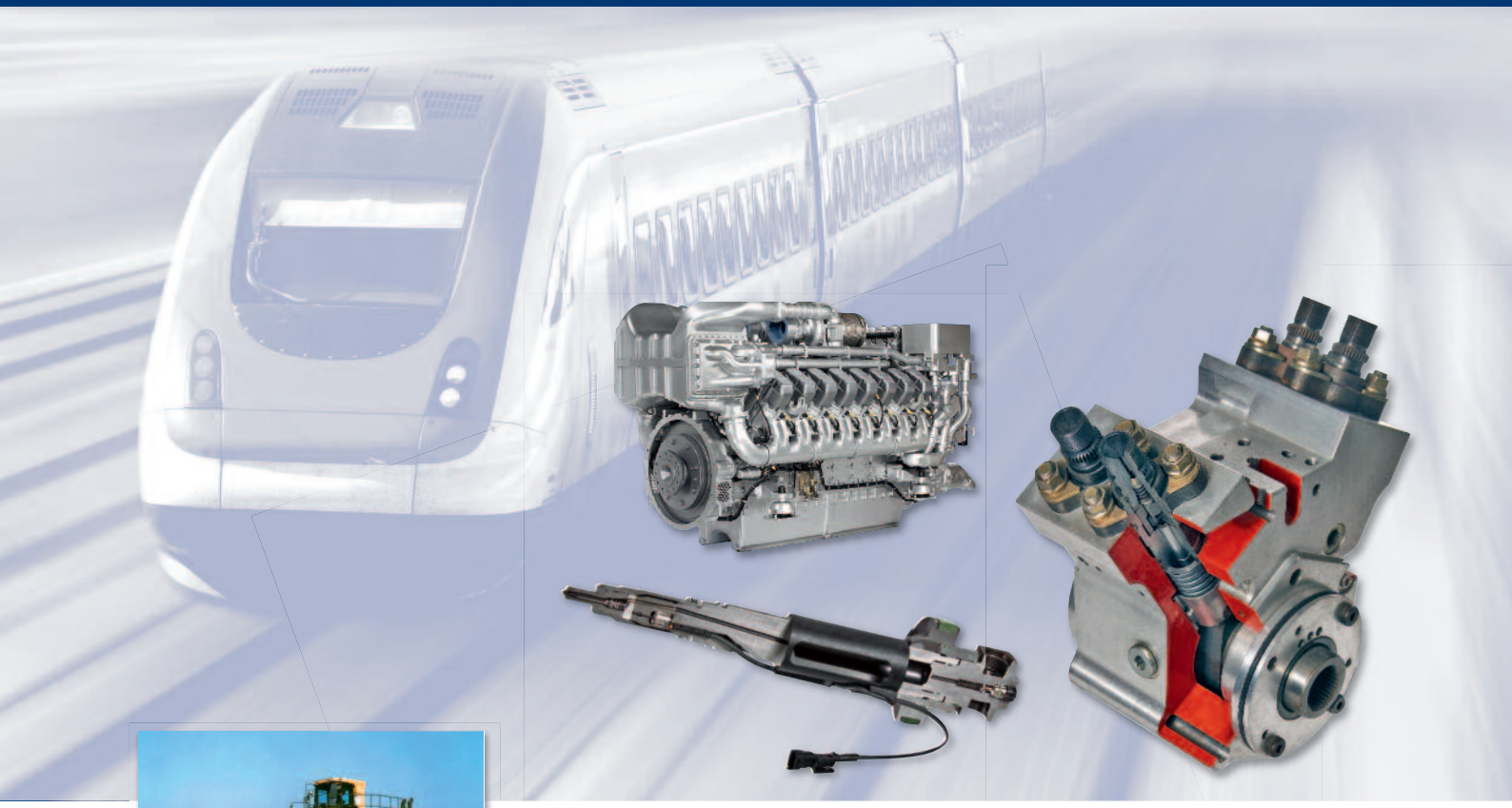
Heavy duty diesel testing



best testing – best quality

Besides the normal diesel applications for truck and passenger car we also produce test benches for heavy duty injection systems and their components. Our test benches for research/development, production, quality assurance, service and remanufacturing are used for injection systems of a variety of engines.

These engines are used in the following applications:

- Marine (ship and boats)
- Railway
- Agricultural machinery
- Construction machinery
- Military vehicle
- Emergency power supplies

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Heavy duty diesel testing

Pump and application test benches

The heavy duty test benches PB 4000-HD and CA 4000-HD are designed for testing heavy duty diesel injection systems and their components. Possible systems to be tested are:

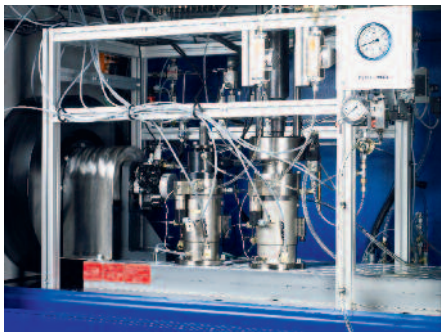
- Large inline pump systems
- Single cylinder pump systems like PF or UP pumps
- Common rail systems

Hereby tests with the complete systems and/or components (pump, injector, ECU, pressure control valve, pressure limiting valve, ...) can be done.

Pump- and application test bench CA 4000-HD for common rail systems with sound protection

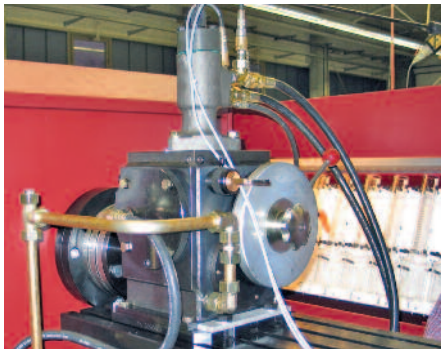
Technical data PB 4000-HD test bench

Test medium	according to ISO 4113 (e.g. Shell V1404) or diesel
Drive power	70 kW (35 kW to 120 kW)
Rated torque	600 Nm (optional up to 1000 Nm)
Peak torque	over 1000 Nm
Speed regulation range	0 to ± 3750 rpm
Flywheel	7,5 kgm² (optional 15 kgm² or 25 kgm²)
Integrated hydraulic unit	
Test oil supply	80 liter tank capacity with double pump 15 + 30 l/min tank temperature control 25 – 65 °C (with cooling water < 20 °C) inlet pressure regulator 2 to 10 bar
Lubricating oil unit	40 liter tank capacity with double pump 6 + 10 l/min tank temperature control 25 – 75 °C (with cooling water < 20 °C) inlet pressure regulator 2 to 10 bar
Pump measurement	flow gear flow meter or coriolis mass flow meter up to 30 l/min
Torque measurement	torque flange 2000 Nm (optinal up to 10000 Nm)
Injection measurement	
Optical flow measuring system	12 cylinder glas measurement system
Continuous flow measuring system	PLU with 0,1 – 45 l/h or 0,5 – 300 l/h
Shot-to-shot injection measuring system	EMI 21-600, EMI 21-1500, EMI 21-5000, EMI 21-10000



Common rail system with two EMI 21-5000

Pump and application test bench PB 4000-HD for mechanical injection systems



Single cylinder pump with cam box

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Heavy duty diesel testing

Injector, nozzle and nozzle holder assembly test benches

The test benches CRI 4000 and CGI 4000 are designed for testing large diesel common rail injectors up to 5000 mm³/injection.
Single shot as well as continous injector measurements can be integrated. Also test benches for flow and opening pressure of nozzle holder assemblies as well as flow of nozzles or orifices are scope of our portfolio.

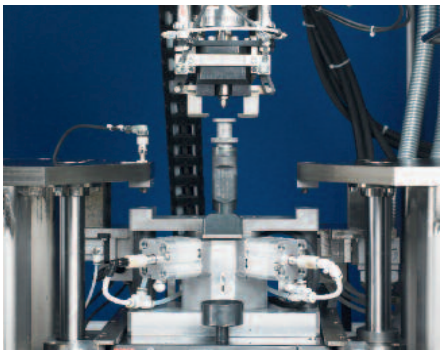
Test bench CRI 4000 for common-rail injectors R&D and series testing (medium and heavy duty)

Technical data CRI 4000 test bench

Test medium	according to ISO 4113 (e.g. Shell V1404) or diesel
Drive power of the integrated high-pressure unit	15 kW
Nominal engine speed	3000 rpm
Pressure range	500 – 2200 bar
Maximum volume flow	2,5 l/min
Integrated test oil supply	80 liter tank capacity inlet heating and cooling system tank temperature control 40 °C ± 2°C inlet filtering system
Shot-to-shot injection measuring system	EMI 21-600, EMI 21-1500, EMI 21-5000, EMI 21-10000
Continuous flow measuring system	PLU with 0,1 – 45 l/h or 0,5 – 300 l/h
ECU and/or test control device	Bosch, ETAS, Heinzmann, ...

CRI 4000 injector testing with EMI 21-5000 and manually injector clamping

Flexible single production and development test bench CGI 4000 for common rail injectors



CGI 4000 injector testing with EMI and automatic injector clamping for conveyor systems

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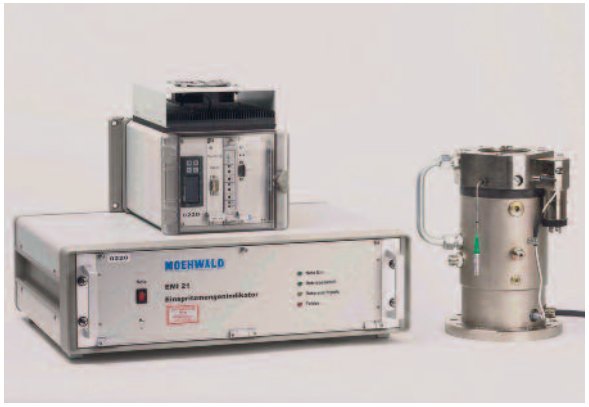
Heavy duty diesel testing

Measurement systems for heavy duty injection systems

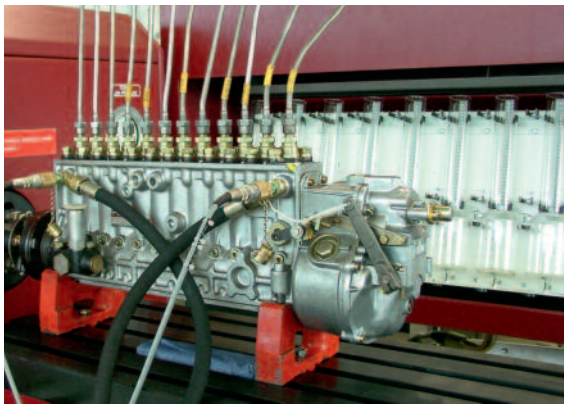
Application EMI 21-5000 with common rail injector



EMI 21 injector quantity indicator system up to 10.000 mm³/Inj.

Application EMI 21-5000 with mechanical injector (NHA)

KMM 4000 continuous measuring system



12 cylinder glass measuring system for manual inspection

Technical data of measuring systems

System	Typ	Range	Accuracy
Shot-to-shot injection measuring system	EMI 21-600	0,2 – 600 mm³/ stroke	± 0,1% at 50 – 600 mm³/Inj.
	EMI 21-1500	1 – 1500 mm³/ stroke	± 0,2% at 200 – 1500 mm³/Inj.
	EMI 21-5000	5 – 5000 mm³/ stroke	± 0,2% at 500 – 5000 mm³/Inj.
	EMI 21-10000	10 – 10000 mm³/ stroke	± 0,5% at 1000 – 10000 mm³/Inj.
Continuous flow measuring system	PLU 112B	0,1 – 45 l/h	± 1% at 1 – 45 l/h
	PLU 112B-300	0,5 – 300 l/h	± 1% at 5 – 300 l/h
Optical flow measuring system	glass measuring system MGT 824	12 x 155 ml and 12 x 600 ml	
	glass measuring system MGT 4000	12 x 300 ml and 12 x 800 ml	

Contact:
Stefan Klesen · Phone +49 6841 707 111
E-Mail: s.klesen@moehwald.de
www.moehwald.de

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