moehwald
Bosch Group

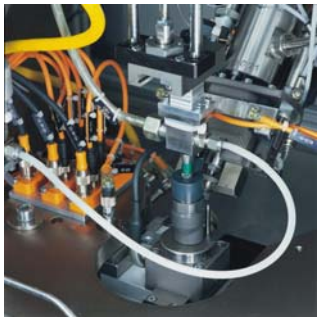
Test Bench for Common Rail Injectors

CRI 2000

Special Features:

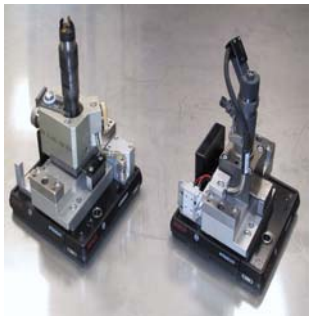
- **Independent and easy to operate test stand**
- **Used for diesel common rail injectors in passenger cars and commercial vehicles**
- **Same basic test equipment like Bosch plant measurement technology**
- **Testing of common rail injectors in accordance with Bosch TKU and test requirements**
- **By means of the flexible Prisma NT software, testing is also possible for product development**
- **Easy conversion to other types by means of work piece holders and simple settings/conversions on the test stand**
- **The automatic contacting of the test units results in optimum clamping conditions on the test unit**
- **Core measuring device is the injector quantity indicator EMI 2**
- **Safety devices**
- **Test stand control with MOEHWALD Prisma NT software packet including conversion of process and results data into Bosch plant format**
- **Compact design with integrated test oil and hydraulics supply**
- **High reliability**
- **Suitable for use in harsh production environments**

General
The CRI 2000 provides a way to test Bosch common rail injectors (solenoid valve generations 1 and 2 for cars and commercial vehicles) with very high accuracy and 100% compatibility to Bosch plant measurement technology. Due to its comparability, it is mainly used in quality assurance. Thanks to the flexibility in creating test procedures, the CRI 2000 is excellently suited for product development work (performance map, etc.).


Automatic contacting

Measurement Principle
Common rail injectors are charged with high pressure using a high-pressure generator (CP3 pump). The counter pressure of the leakage flow is kept constant by means of a pressure regulator.

Setup
The CRI 2000 is an independent, compact test stand that - in its standard version - is equipped for injectors of the 1st generation for both cars as well as commercial vehicles.


Work piece carrier

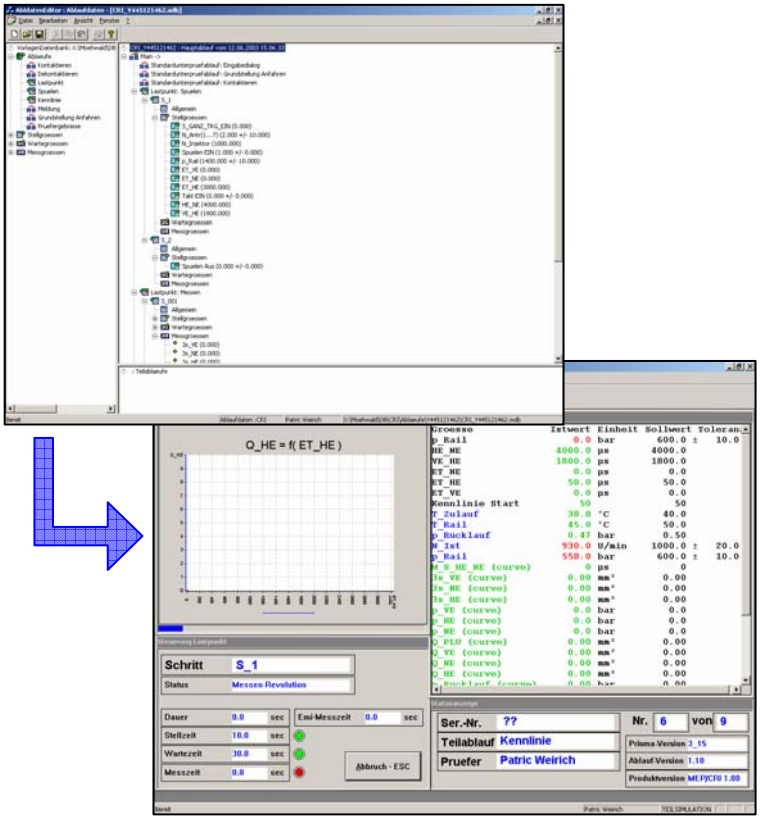
It is comprised of the following essential elements:

- Lower frame with test oil and hydraulics unit
- The test area is covered with clear panes as spray protection for safety purposes
- The pillar construction with a pivoting arrangement in the upper section makes it possible to very flexibly clamp different types of test units.
- The EMI 2 injector quantity indicator is used as the core element of quantity measurement
- Attached electronics in a 19” cabinet
- Swivelling operator console (with monitor and keyboard)
- The power electronics are placed in an attached electrical cabinet
- Safety devices (such as spray protection, noise protection, rupture disc, pressure control valve, etc.)
- Computer equipped with Prisma NT software for test stand control

The following add-ons can be optionally integrated:

- Upgrade for car and commercial vehicle injectors of the 2nd generation of solenoid valve
- Vacuum flushing/venting
- Test equipment for EMI 2
- Additional work piece carrier
- Pressure relay valve for 10 bar

Pillar frame



Test Procedure with Prisma NT:

Commensurate with our other licensed products, the software is designed to run the CRI 2000. The core components are the model data and process data editors (see right). With these editors, it is possible to generate a test procedure in a very easy and flexible way. Here, you can create as many “load points” as you want with as many steps and specific measurements as you want and in any order. To make sure that data conversions are possible and that trial runs coincide with plant measurements, there is a conversion programme for model data, process data, and results data.

Analysis:

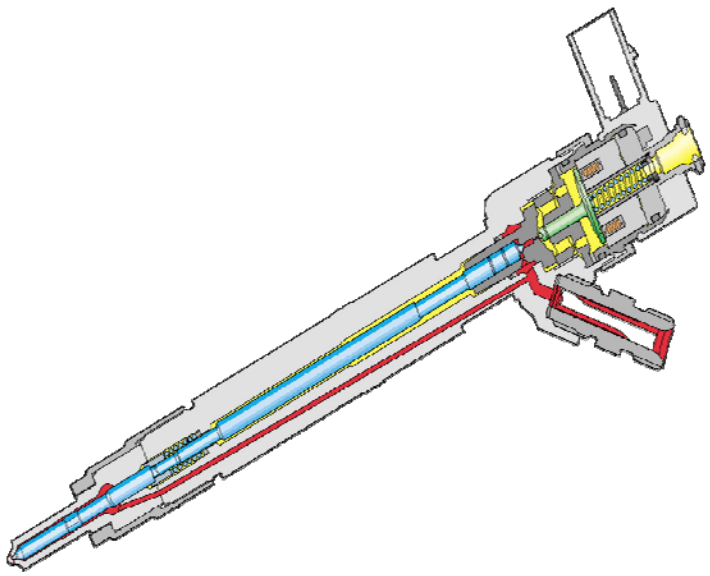
All results data is available in an Access database or alternatively ASCII files. It is no problem to further process the data using Excel or other analysis programmes.

Test Procedure with OpCon:

If you want to use the test bench CRI 2000 only for quality comparisons with Bosch, the test bench should be equipped with the OpCon software. OpCon is the software which is used at the production test technology. With it fixed sequences are given.

Technical Data:

Test samples:	Bosch CR- Injector solenoid valve – models (Gen. 1 and 2). The measurement results are absolutely comparable to Bosch plant testing technology. (injectors from other manufacturers on request)
Test medium	according to ISO 4113, or Shell 1404
High-pressure generator	Bosch CP3
Adjustable rail pressure range	150 – 1600 bar
Rail pressure regulator rating while injecting	+/- 5 bar
Pressure measurement	TECSIS sensor incl. temp. compensation 0-2500 bar (+/- 0.1% F.S.)
Injector control	Common Rail End Stage (CREST), 3 sub injections (Pre-Injection, Main-Injection Post-Injection), 100 – 4000 µs freely selectable
Return pressure setting (injector leakage)	0.1 – 0.6 bar (fine pressure regulator; +/- 0.1 bar)
Injection quantity measurement	EMI2 (2 - 600 mm³, +/- 0.1 FS; counter pressure 6.5 bar compressed air)
Return quantity measurement	PLU- measuring cell (0.2 – 10 l/min; +/- 0.14 l/min; temp. compensated measurement)
Return temperature measurement	20°C – 60°C, +/- 0.6 °C (PT100)
Automation/software	Computer controlled test bench with operator console CPS21, fully automatic contacting of the test unit and execution of test procedures, Prisma NT software, an unlimited number of test points can be parameterised . alternatively OpCon
Dimensions (H/W/D in mm)	2200/2000/1200
Connectors:	Electric: 400V / 50 Hz (country specific on request) Nominal power: 20 kVA Max. backup fuse: 3 x 50 A Cooling water: G1/2“; approx. 10-15 l/min; max. 25°C Compressed air: G1/2“;6 bar / G1/4“; 10 bar



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