




CATALOG 2018 | 2019



EUROPE'S BEST
FULL SOLUTION FOR
BOSCH, DELPHI, DENSO
AND VDO DIESEL WORKSHOPS

Test benches for diesel systems, special tools, repair sets,
electronic devices, all for CR Common Rail and
UIS-,UPS unit injector systems.

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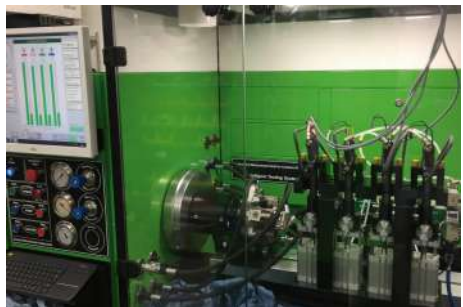
Dieselland's Dieseltest line of diagnostics benches and repair tools form a complete solution for diesel injector maintenance cycle. Dieseltest diagnostic benches are newly developed, state of the art, multipurpose testers that can diagnose deviations in injector work from factory standards and recode correction codes simultaneously on one bench for Bosch, Delphi, Denso and Siemens/VDO solenoid and piezo injectors. When combined with dieseltest repair tools, workshops can deliver factory repair level service for all the supported injector types on one bench.

For ensuring best possible user experience the development of Dieselland benches is based on more than two decades long experience in both developing and usage of diesel diagnostic tools. User interface and automation procedures of the diagnostic benches are designed for speed and simplicity so that the learning curve for bench usage is minimized as well as cost of ownership for the workshops. Many of the test done on Dieselland benches deliver results faster than official testbenches and procedures. The electronic and mechanical components of the bench are carefully designed to support maximum expendability and upgradeability for future-proofing the investment for the bench owners. The software part of the benches is regularly upgraded by our developers in order to ensure up-to-date functionality and support for the constantly growing number of diesel injectors on the market.

Factory



Special orders



Training



CRUIS

Diagnostic test bench
for testing Common Rail injectors

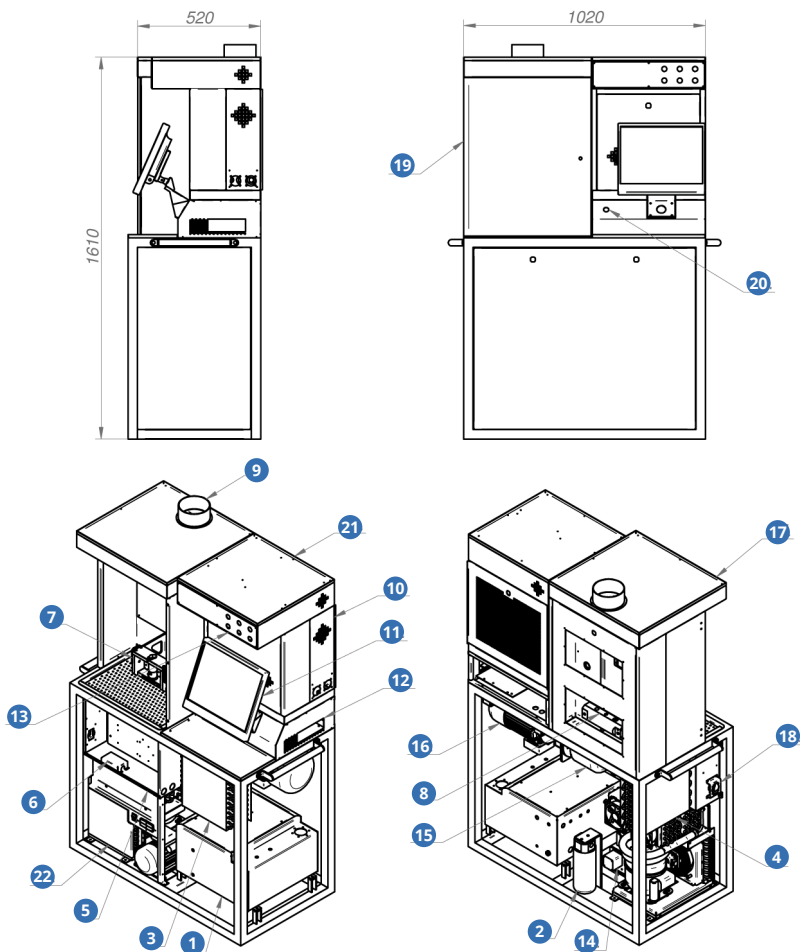


The single-channel test bench **CRUIS** allows performing procedures related to testing Common Rail injectors of different manufacturers (Bosch, Denso, Delphi, VDO (Siemens) Cummins, Caterpillar, AZPI)).

Test bench CRUIS is manufactured with the possibility of retrofitting with a software-hardware complex for encoding Bosch, Delphi, Denso injectors. The test bench has a low noise level. When the high-pressure pump is on, its smooth spinning is ensured due to the use of the Shneider frequency inverter in the test bench.

The software with test plans is included in the set of delivery. Software updates including new test plans are provided free of charge.

Scheme of test bench CRUIS



- | | |
|--|---------------------------------|
| 1. Test liquid tank | 12. Personal computer |
| 2. The filter for fine cleaning of the test liquid | 13. Control panel |
| 3. Heat exchanger № 1 | 14. Vacuum installation |
| 4. Heat exchanger № 2 | 15. Fuel pump |
| 5. Electric box | 16. Electric motor 4kW. |
| 6. Terminal box | 17. Top of the test compartment |
| 7. Injector holder | 18. Main switch |
| 8. Pressure distributive valve | 19. Protective glass |
| 9. Flange of the exhaust system | 20. Throttle valve |
| 10. Electronic measuring unit | 21. Block of electronics |
| 11. The monitor | 22. Cooler |

TRIUMF

Diagnostic test bench TRIUMF
for testing CR injectors



Diagnostic test bench **TRIUMF** is designed to test Common Rail injectors manufactured by Bosch, Delphi, Denso, VDO Siemens at a system pressure of up to 1800 bar. The measurement takes place in the electronic measuring system. The program with test plans is included.

Test benches of the TRIUMF series are made in the following modifications:

- Stand TRIUMF with the possibility of retrofitting with a software-hardware complex for encoding injectors Bosch, Delphi, Denso, where the device creating a vacuum is installed on a high-pressure pump. The vacuum in this set is not adjustable.

- Test bench TRIUMF with the possibility of retrofitting with the software-hardware complex for encoding of Bosch, Delphi, Denso VDO Siemens injectors, where the device creating the vacuum is installed on a separate pump. The vacuum in this kit is regulated by a throttle valve.
- Stand TRIUMF with the ability to retrofit a kit for accurate and high-quality measurement of component sizes and mounting gaps of electromagnetic injectors of the Common Rail system. The kit allows you to perform sequential operations with full visualization of the process and the formation of the necessary mounting dimensions required for assembly.

Technical data

| | |
|---|---|
| Rotation speed | 1500 min ⁻¹ |
| Engine capacity (nom.) | 4k W |
| Number of simultaneously tested injectors | 4 |
| Tank capacity | 30 dM ³ |
| Supply voltage | 3x400V/230V~50Hz |
| Valve supply for electronic system | 24V |
| Number of measuring sensors | 2 |
| Cooling compressor capacity | 800 W |
| Maximum current | 11 A |
| Power of the test fluid heater | 1000 W |
| Pulsing frequency of the injectors opening | 60 – 2400 min ⁻¹ |
| Pulsing duration of the injectors opening | 100 – 3000 mcs |
| Test fluid pressure setting of the test liquid in a range | 0 – 100 ± 10 °C |
| Rail pressure setting in range | 0 – 2400 ± 5 bar |
| Electronic pressure measurement in Rail in a range | 0 – 2400 bar |
| Test fluid overflow temperature control | on each injector |
| Protective screen | polycarbonate (h=10 mm) |
| Dimensions | width 1010 mm, height 1504 mm, depth |
| Weight | 365 kg |

CR-Test-4E

Test bench for Common-Rail pumps and injectors

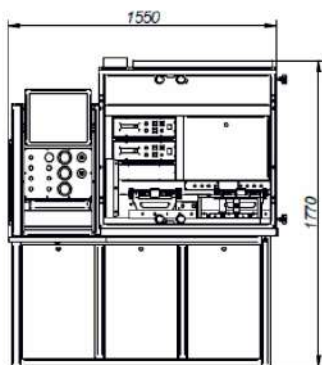


The test bench **CR-Test-4E** allows checking the following equipment of the COMMON RAIL system: BOSCH, DENSO, DELPHI nozzles, (SIEMENS optional), BOSCH, DENSO, DELPHI, SIEMENS pumps (CP1, CP2, CP3, HP2, HP3, DFP1, DFP3, DFP6, HP3, HP4), regulators and pressure sensors. The operating pressure of the test is up to 1800 bar. At the request of the customer, there is possibility to increase the working pressure to 2200 bar. Test bench is equipped with an electronic measuring system. Test bench includes a software with built-in test plans.

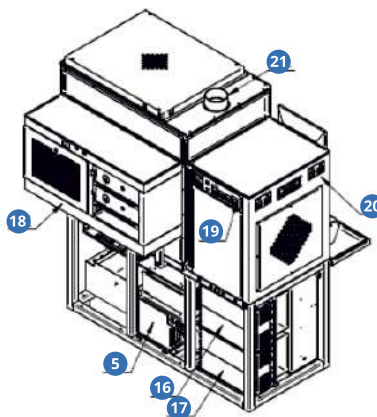
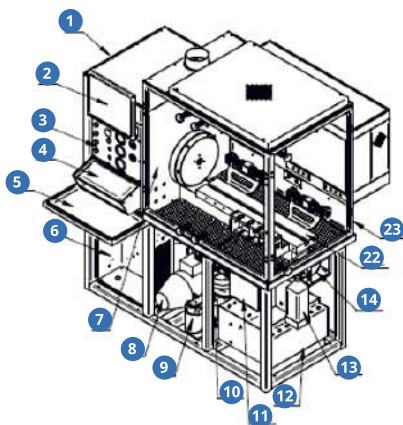
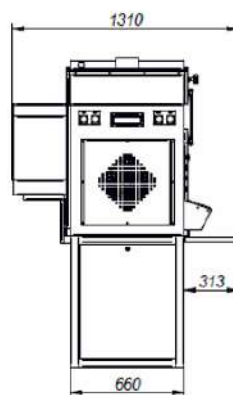
Technical data

| | |
|---|--------------------------------|
| Rotation speed | 50 – 3500 min ⁻¹ |
| Main engine power | 11 kW |
| Number of simultaneously tested injectors | 4 |
| Number of simultaneously tested pumps | 1 |
| Tank capacity | 30 dm ³ |
| Supply voltage | 3x400 V / 230 V ~ 50 Hz |
| Supply of valves in the measuring unit of injectors | 24 V |
| Pulsing frequency of the injectors opening | (60 – 2400 min ⁻¹) |
| Pulsing duration of the injectors opening | (100 – 3000 mcs) |
| Test fluid temperature control in a range | 0 – 100±1 degree °C |
| Test fluid temperature control for injectors | on each injector |
| Calibration fluid pressure electronic measurement inside Rail in a range 0 – 1800±5 bar | 0÷0,16 MPa |
| Test fluid pressure setting of the test liquid in a range | 0 – 1800±5 bar |
| ** System pressure measurement in a range | 0 – 2400±5 bar |
| Number of measuring sensors inside the injector measuring unit | 2 |
| Measuring speed of injector measuring unit | 0,01 l/min – 0,5 l/min |
| Measurement tolerance (cars) 0.15 mm ³ – 85 mm ³ | no more 1 % |
| Measurement tolerance (trucks) 0.15 mm ³ – 400 mm ³ | no more 1.5 % |
| Resolution of the measuring unit of injectors | |
| Test fluid temperature control for pumps | on each channel |
| Test fluid temperature control for flowmeters | -20 – +90 °C |
| Flow temperature measurement tolerance, no more than | +/-2 °C |
| Measuring speed range of the pump measuring unit | 0,1 l/min – 20 l/min |

Scheme of CR-Test-4E



Set of delivery



1. Upper electrical enclosure
2. Monitor
3. Control panel
4. Shelf for keyboard
5. Shelf for tools
6. Lower electrical enclosure
7. Front control panel
8. Feed pump
9. Final calibration fluid filter №1
10. Final calibration fluid filter №1
11. Upper radiator with compulsory air cooling
12. Main tank for calibration fluid
13. Container for discharge of oil and calibration fluid

14. Vacuum appliance
15. Refrigerator
16. Upper radiator with compulsory air cooling
17. Lower radiator with compulsory air cooling
18. Block of controllers
19. Power supply panel
20. Back side of the test bench
21. Exhaust system flange
22. Operating zone for testing diesel fuel equipment
23. Frame with polycarbonate protection screen

CR-Test-2P

Test bench for high pressure fuel pumps of Common-Rail

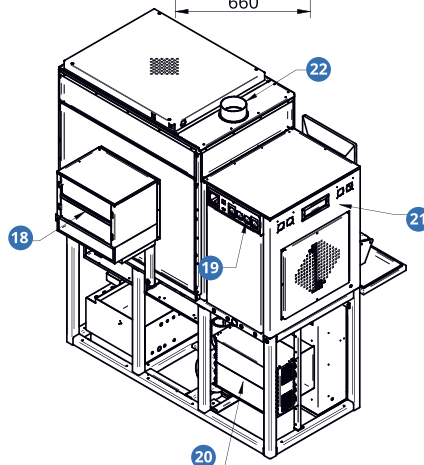
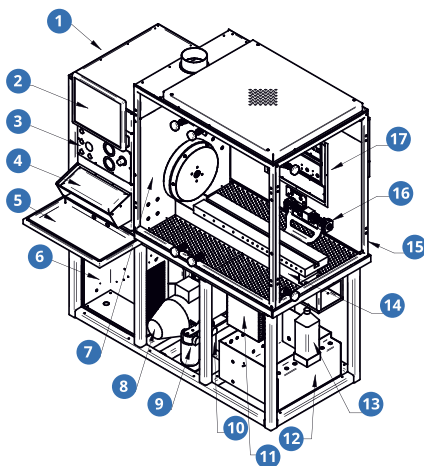
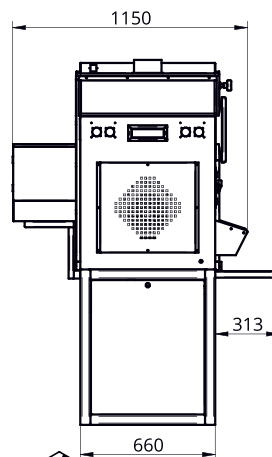
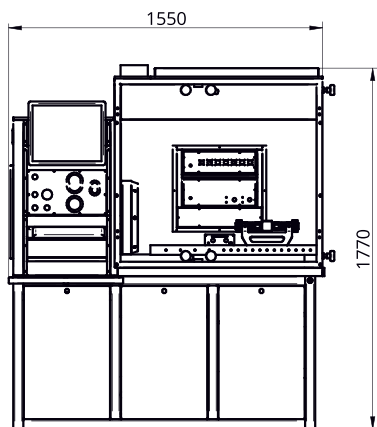


The **CR-TEST-2P** test bench allows you to perform procedures related to the testing of high-pressure fuel pumps of the Common Rail system of various manufacturers (Bosch, Denso, Delphi, VDO (Siemens)). The design of the test stand CR-TEST-2P and the elements of its equipment meet the requirements of international standards in terms of static and dynamic parameters – ISO 4008/1 and ISO 4008/2.

Technical data

| | |
|---|-----------------------------|
| Rotation speed | 50 – 3500 min ⁻¹ |
| Engine power | 11 kW |
| Tank capacity | 30 dm ³ |
| Power supply | 3x400 V / 230 V ~ 50 Hz |
| Test fluid temperature control | 0 – 100±1°C |
| Test fluid pressure setting | 0 – 1800±5 bar |
| System pressure measurement in a range | 2400 bar |
| Pump flow measuring speed | 0,1 l/min – 20 l/min |
| Temperature range for measurement | -20 – +90°C |
| Number of sensors in the flowmeter | 3 |
| Feed pump capacity | 6 l/min |
| Manometer for measuring supply pressure | 0÷0,16 MPa |
| Manometer after the feed pump | 0÷0,16 MPa |
| Maximum current | 30 A |
| Calibration oil heater capacity | 1000 W |
| Safety screen | polycarbonate 8 mm |
| Dimensions (width x height x depth) | 1110 x 1610 x 1210 mm |
| Total weight | netto 780 kg, brutto 840 kg |

Scheme of CR-Test-2P



- | | |
|-----------------------------------|---|
| 1. Upper box for electrics | 12. Main tank fluid |
| 2. Monitor | 13. Drain fluid tank |
| 3. Front panel | 14. Work zone |
| 4. Shelf for keyboard | 15. Safety frame |
| 5. Shelf for tools | 16. Pressure accumulator (Rail) |
| 6. Lower box for electrics | 17. Controllers unit front panel |
| 7. Front control panel | 18. Controllers unit |
| 8. Feed pump | 19. Power panel |
| 9. Fine filter for test fluid №1 | 20. Radiator with forced air cooling, two-piece |
| 10. Fine filter for test fluid №2 | 21. Back wall |
| 11. Radiator | 22. Flange |

DORPAT Multi-Cam

Diagnostic test bench for testing of unit injectors and unit pumps



Diagnostic test-bench **DORPAT Multi-Cam** is suitable for fuel system of all diesel engines of low and middle power rate including hi-speed car engines and engines for buses, trucks and agricultural machines. Test-bench can examine components of UIS (unit injector system) and UPS (unit pump system).

All measurements are made electronically.

Capacity and user-friendliness make testing with Dorpat convenient and reliable. Cam Box is designed to have precise test results. Due to a variable stroke height, it is possible to test all unit injectors.

Test bench DORPAT Multi-Cam allows you to test the following types of unit injectors and pumps:

- Bosch UIS PDE – unit injector of trucks Scania, Iveco, Volvo, as well as marine, industrial and other engines of these manufacturers.
- Bosch UIS PDE – unit injector of cars Audi, VW, Land Rover.
- Delphi EUI E1 – unit injector of Volvo truck, Renault, as well as marine, industrial and other engines of these manufacturers.
- Delphi EUI E3 – unit injector of Volvo truck, Renault, as well as marine, industrial and other engines of these manufacturers.
- Delphi EUP – unit injector of DAF truck.
- Lucas A-type – unit injector (H-shaped) Volvo truck and marine, industrial and other engines Volvo.
- You can check the unit injectors of American manufacturers such as Cummins, Caterpillar, Detroit and injection system HPI.

SPF-708

Universal test bench
for diesel systems



The bench **SPF-708** is intended for testing and adjusting the devices of the power system of diesel engines during their repairs and maintenance.

Technical data

| | |
|-------------------------------------|-----------------------------------|
| Rotational speed | 30 – 3500 min-1 |
| Direction of rotation | Left / right |
| Torque | 1050 – 3000 min-1: 68,2 – 24,2 Nm |
| Tank capacity | ≈ 30 dm ³ |
| Supply voltage | 3x400 V / 230 V ~ 50 Hz |
| Maximum current | 27A |
| Dimensions (width x height x depth) | 1500 x 800 x 1800 mm |
| Total weight | ≈ 700 kg |

Package contents

| | |
|----------------------------------|-------|
| Flexible piping 3/8" L-105 cm | 2 pc. |
| Tips for 14 mm | 2 pc. |
| Tips for 12 mm | 2 pc. |
| Connecting hose Ø 8 mm L-150 cm | 1 pc. |
| Connecting hose Ø 10 mm L-150 cm | 1 pc. |
| Door key | 4 pc. |
| Legs | 4 pc. |

Cristina

Complex for repair and adjustment of electromagnetic injectors of Common Rail



The **Cristina** complex is designed to assemble the injectors of the COMMON RAIL system: BOSCH, DELPHI, DENSO by the technology that allows to calculate and select all necessary adjusting elements.

Set of delivery

| | |
|--|-------|
| Holder for measuring and adjusting the parameters of injectors | 1 set |
| Digital measuring indicator | 1 pc. |
| Adapter with cable for communication with PC | 1 pc. |
| Set of measuring probes and adapters | 1 set |
| Set of 4 adapters for BOSCH, DENSO injectors | 1 set |
| The signal generator of the injector control "Valve stroke actuator" with a set of cables. | 1 set |

CRistina-PIEZO

Device for testing
piezo injectors and piezo-package



The **CRistina-PIEZO** was developed for the assembly of Siemens injectors, but it also works with Bosch injectors.

The device can be used separately and together with the DL-UNI20050 kit for repair of Siemens VDO injectors, which includes special equipment and all the necessary tools for adjustment and repair of all types of Siemens VDO injectors.

Features of the device:

- Signal feed for activating the injector on the hand press
- Measuring the resistance of a piezo pack
- Check of breakdown on the case
- Measuring the capacity of a piezo pack
- Measurement of the smooth running of the piezo pack

CR-Active

The CR injector valve actuator



The **CR-Active** actuator is designed to provide a control signal to the Common-Rail injector solenoid valve. Used to measure valve stroke when measuring the magnetic gap of Common-Rail electromagnetic injectors.

Set of delivery

| | |
|--|-------|
| Actuator "CR-ACTIVE" | 1 pc. |
| Power cable 220V | 1 pc. |
| Main connection cable to electromagnet | 1 pc. |
| Cable for car injectors | 1 ps. |
| Cable for truck injectors | 1 pc. |
| Manual | 1 pc. |

Technical data

| | |
|--|-------------------|
| Power supply voltage | ~220 B ± 15 % |
| Power consumption | up to 150 Wt |
| Four values of the current level of the control signal | |
| The duration of the control signal is | 1.5 s |
| The number of operations per minute | no more than 12 |
| Short circuit protection | |
| Dimensions of the activator (depth x width x height) | 240 x 230 x 72 mm |
| Unit weight | netto 4 kg |

**FLAGMAN CRT-5040
(CR-Tester)**Common Rail Fuel
System Controller

The device **FLAGMAN "CR-Tester CRT-5040"** is designed to diagnose Common Rail injectors manufactured by Bosch, Denso, Delphi, Siemens VDO on the test bench. Injectors testing is provided by feeding the control signal from the controller to the tested injectors and maintaining the required pressure in the system according to the selected test plan.

The device provides:

- simultaneous control of 1-4 injectors;
- Pressure control in the system in manual and automatic mode;
- control of electromagnetic injectors of the passenger car with a voltage of 14V;
- management of electromagnetic injectors of cargo series with voltage 28V;
- control of piezoelectric injectors;
- control of the measuring unit shutter;
- shutdown of control in the absence of a safety screen in the test area;
- Control of stopping the drive of injection pump after the end of the test;
- temperature measurement in the tank;
- measurement of the backflow temperature of the injectors;
- measuring the timing of the injection;
- control of the cooler and heater;
- control of the measurement of the feed and backflow of the injectors;
- * Common Rail high pressure fuel pump control of the CP1, CP3 systems

** Functions are additional options and are not included in the basic version of the device!*

Set of delivery

| | |
|--|-------|
| Manual (technical description, operating instructions) | 1 pc. |
| Controller FLAGMAN (CR-Tester CRT-5040) | 1 pc. |
| Extension cable for injector cables: Injector socket – 1.5 m | 1 pc. |
| Adapter cable for injectors | 1 pc. |
| Adapter cable for high pressure regulators | 1 pc. |
| Adapter cable for low pressure regulators | 1 pc. |
| Adapter cable for pressure sensor | 1 pc. |
| Power cable 220 V | 1 pc. |
| Connectors for self-made cables in the sockets: "Protection", "Tank t C", "Reg t C", "Cycle", "Pump", "Invertor", "Rpm" | 1 pc. |
| Temperature sensor for monitoring the temperature of the liquid in the tank: nest "Tank t C" | 1 pc. |
| Reed switch for connecting the protective screen: socket "Protection" | 1 pc. |
| Fuse 3 A | 1 pc. |

Additional delivery set

| | |
|---|--------|
| Temperature sensors for test fluid backflow temperature measuring | 4 pcs. |
|---|--------|

Compatible equipment and accessories

| | |
|---|------------|
| Response time sensor 1 pc. | 1 pc. |
| Electronic measuring unit MUFI-CR 1 pc. | 1 pc. |
| Pressure accumulator for 1-3 regulators 1 pc. | 1 pc. |
| Pressure regulator 1-3 pcs. | 1 – 3 pcs. |
| Pressure sensor 1 pc. | 1 pc. |

FLAGMAN Code

A set for testing
CR injectors with coding



The **FLAGMAN Code** is designed to diagnose the injectors of the Common Rail system of Bosch, Denso, Delphi, Siemens VDO on the test bench. Testing the injectors is provided by feeding the control signal from the controller to the tested injectors and maintaining the required pressure in the system according to the chosen test plan.

This complex can be made available for any test bench for testing of injection pumps of any manufacturer.

The complex consists of a MUFI-CR measuring unit and a Flagman CRT-5040 controller. Also, the complex is equipped with a vacuum system for coding the Delphi C2i, C3i injectors.

The **measuring unit** is divided into 2 sections, intended for measuring the flow of the test liquid through the injectors in the "flow" and "backflow" lines, respectively. Each section can measure the flow in 4 channels. On the input in each meter is installed a sensor for the temperature of the incoming liquid. This temperature is displayed in the "CASCADE" software. The connection to the measuring unit is carried out with the help of teflon tubes included in the delivery set.

The complex provides:

- simultaneous control of 1-4 injectors;
- the possibility of assigning a correction code to the BOSCH injectors ;
- * the possibility of assigning a correction code to the DELPHI injectors;
- * the possibility of assigning a correction code to the Denso injectors;
- Pressure control in the system in manual and automatic mode;
- control of electromagnetic injectors of the passenger car with a voltage of 14 V;
- management of electromagnetic injectors of the cargo series with a voltage of 28 V;
- control of piezoelectric injectors;
- shutdown of control in the absence of a protective screen in the test area;
- shutdown control of the injection pump after the end of the test;
- temperature measurement in the tank;
- measurement of the injector backflow temperature;
- measuring the timing of the injection;
- control of the cooler and heater;
- control the measurement of flow and backflow of the injectors.

** Functions are additional options and are not included in the basic version of the complex!*

Specifications

| | |
|--|---|
| Number of simultaneously tested injectors | 4 |
| Valve power in the injector measuring unit | 24 V |
| Pulse frequency of injector opening | 60 to 1500 rpm |
| The duration of the injector opening pulse | 100 – 3000 μ s |
| Test liquid temperature control | on each injector |
| Number of meas. sensors in injector measuring unit | 2 |
| Measuring speed of the injector measuring unit | 0,01 l / min - 0,5 l / min |
| Accuracy of measurement (passenger cars) 0.15 mm ³ – 85 mm ³ | not more than 1 % |
| Measurement error (trucks) 0.15 mm ³ – 400 mm ³ | not more than 1,5 % |
| Resolution of injector measuring unit | ~ 0.1 mm ³ / 1 cycle (injection) |

the management of the complex is carried out with the help of the software "CASCADE" and a personal computer. The software "CASCADE" allows to carry out control of the test bench.



Using Flagman-Code with the basic set of equipment CR10030 and the universal stand SPF-708

PTC-2520

Common Rail Pump Control Module



The controller **“PTC-2520”** is intended for the supply of programmable user control signals for the pressure regulators of the test system and the Common Rail injection pumps to verify their operability.

The controller **“PTC-2520”** allows performing procedures related to testing of the CR fuel injection pumps of various manufacturers (Bosch, Denso, Delphi, VDO (Siemens)).

Contents of delivery

| | |
|--|-------|
| Controller “PTC-2520” | 1 pc. |
| Set of cables to the signal actuator “PTC-2520” | 1 pc. |
| Power cable 220V | 1 pc. |
| Cable for connection of pressure regulator HP-3 | 1 pc. |
| Cable for connecting a pressure regulator LP-2 | 1 pc. |
| Cable for connecting the pressure sensor | 1 pc. |
| Software | 1 pc. |
| Manual (technical description, operating instructions) | 1 pc. |

FMDE-500

Digital two-channel flowmeter



The device **“FMDE-500”** is designed for testing the production of high-pressure diesel fuel pumps of the Common Rail system.

The LCD displays information about the flow rate of the test liquid and its temperature. The device has two channels for measuring the flow. The first channel has a two-stage measurement of the flow of liquid to provide a larger measuring range for the fluid flow. In each measuring channel of the flow there is a temperature sensor measuring the temperature of the incoming fluid flow.

Contents of delivery

| | |
|------------------------------|-------|
| Controller FMDE-500 | 1 pc. |
| Power cable 220 V | 1 pc. |
| USB Cable | 1 pc. |
| External filter (50 microns) | 1 pc. |
| Software “DieselTest” | 1 pc. |
| Manual FMDE-500 | 1 pc. |

FMDE-520

Digital two-channel flowmeter



The device **“FMDE-520”** is designed for testing the performance of diesel fuel injection pumps of high pressure (HP injection) of the Common Rail system.

The device has two channels for measuring the flow. The first channel has a two-step measurement of the fluid flow to provide a larger measuring range for the fluid flow. In each measuring channel of the flow there is a temperature sensor that measures the temperature of the incoming fluid flow.

Contents of delivery

| | |
|------------------------------|--------|
| Controller FMDE-520 | 1 pc. |
| Power cable 220 V | 1 pc. |
| USB Cable | 1 pc. |
| External filter (50 microns) | 2 pcs. |
| Software “DieselTest” | 1 pc. |
| Manual FMDE-520 | 1 pc. |

Technical data for FMDE-500 and FMDE-520
Measured flow range:

| | |
|----------------------|------------------------------------|
| Channel 1. Sensor 1. | 0.1 - 2.5 l / min. 6 - 150 l / h |
| Channel 1. Sensor 2. | 0.5 - 8.33 l / min. 30 - 500 l / h |

Flow measurement error:

| | |
|----------------------|--|
| Channel 1. Sensor 1. | 3 % |
| Channel 2. Sensor 2. | 6 - 150 l / h no more than +/- 2 l / h |
| Channel 2. Sensor 2. | more than 150 l / h: not more than 1 % |

| | |
|---|-----------------|
| Repeatability | 0.5 % |
| Permissible range of temperature of the measured flow | -20 - +90 °C |
| Error of flow temperature measurement, not more | +/- 2 °C |
| Supply voltage | ~ 220 V ± 15 % |
| Device weight | 6 kg |
| Dimensions (length x width x height) | 365 x 322 x 110 |
| Power consumption, not more than | 24 W |

UIS Tester Multi-CAM

Device for diagnosis and
testing of unit injectors



UIS-Tester is designed to test and verify the performance of UIS-Unit Injector System and individual high-pressure fuel pumps with high-pressure solenoid valves (UPS-Unit Pump System).

With the help of the **UIS-Tester** device it is possible to measure the response time of the electric valve, as the device has the possibility of automatic control of the electric drive of the measuring unit, and additional possibilities for self-updating the firmware and adapting to various versions of the CAM-BOX.

The device allows:

- set the control signal for the high-pressure solenoid valve;
- measure the rotational speed of the drive shaft of the pressure cam;
- set the required number of cycles;
- preset mode, for 5-mode solenoid valve control;
- set any value of the advance angle in the electro magnetic valve.

Cristina

Complex for repair of
Common Rail injectors

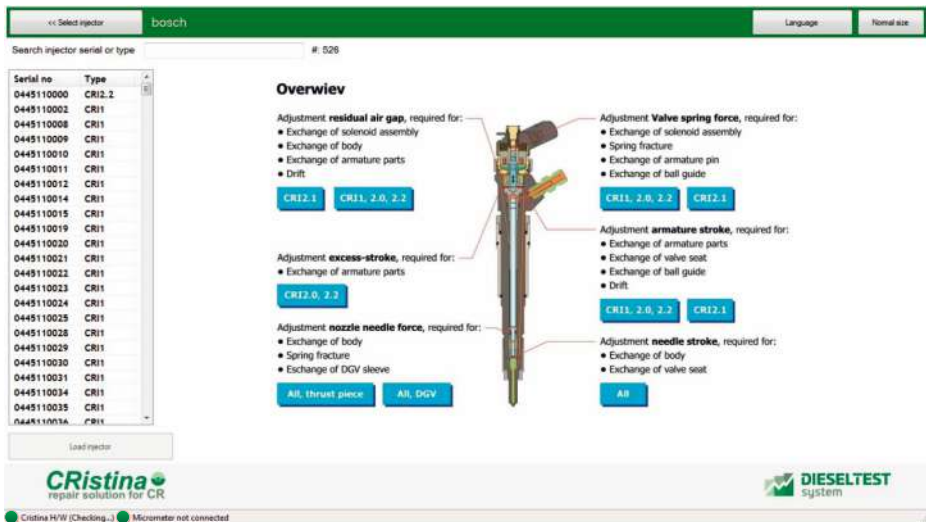


Cristina repair- and testing complex is dedicated to assembling and disassembling Bosch, Denso and Delphi Common-Rail injectors according to manufacturer specified steps and mechanical tolerances. The complex offers the ability to measure relevant mechanical tolerances of the injector parts and electrical characteristics of the electromagnet. The assembly/disassembly steps and critical measurement points are presented by convenient step-by-step instructions descriptions and relevant images of the work process itself.

Software

The **Cristina** complex allows to produce accurate and qualitative assembly of Common Rail electromagnetic injectors, using the software database, developed by our company.

For convenient usage in the software main menu there is a choice of language and sections of the injector manufacturers: BOSCH, DENSO, DELPHI.



DL-UNI20050CR Injector Repair Kit
for Siemens VDO

The signal actuator **“CRistina-PIEZO”** is intended for feeding the control signal to the piezo pack of CR injectors, for measuring and analyzing the electrical and mechanical parameters of the injector when it is being tested or repaired.

Features of the device:

- Input control of piezo injectors with a voltage of 30-150 V and a current of not more than 16 A. (Creation of the required signal for activation of the piezo injector and its operation on the hand press).
- Determination of the injector parameters for subsequent correct assembly of piezo injector SIEMENS:
 - Measuring the resistance of the piezo pack within 10kOm - 2MOM.
 - Measurement of piezo pack capacity within 0.5 - 9 pF.
 - Measurement of the insulation resistance within the limits...
 - Measurement of the smooth running of the piezo pack.

Set of delivery

| | |
|---|-------|
| Controller CRistina-Piezo | 1 pc. |
| Piezo ST-04 injector holder | 1 pc. |
| Bracket mount holder | 1 pc. |
| Air meter | 1 pc. |
| Air filter | 1 pc. |
| Distributive air valve | 1 pc. |
| Reducer for air | 1 pc. |
| Electronic manometer | 1 pc. |
| Set of tubes | 1 set |
| Quick coupler 6 mm | 1 pc. |
| Set of 2 nozzles for the backflow of Siemens VDO injectors | 1 set |
| Set of adapters for measuring valve stroke of injector CR VDO Siemens. DL-CR50165 | 1 set |

Additionally!

- **DL-UNI30545** Wrench for mounting / dismantling the SIEMENS injector multiplier nut
- **DL-CR50163** The key for mounting / dismantling the piezo pack of CR injectors VDO Siemens 25 mm
- **DL-CR50164** The key for mounting / dismantling the piezo pack of CR injectors VDO Siemens 27 mm

DL-CR10030

Basic injector test set for Common Rail injectors



The set is intended for testing of Common Rail injectors from different manufacturers (Bosch, Denso, Delphi, VDO (Siemens) Cummins, Caterpillar, AZPI).

Sets of basic equipment for testing the CR injectors with a classical measuring unit

| | |
|--|------------|
| A set of basic equipment for testing CR injectors without a controller CR-tester | DL-CR10020 |
| A set of basic equipment for testing CR injectors without a controller CR-tester and CP3 injection pump kit DL-CR00088 | DL-CR10021 |
| A set of basic equipment for testing CR injectors CR with the FLAGMAN CRT-5000 controller | DL-CR10030 |
| A set of basic equipment for testing the CR injectors with the FLAGMAN CRT-5000 controller without the CP3 injection pump kit DL-CR00088 | DL-CR10031 |

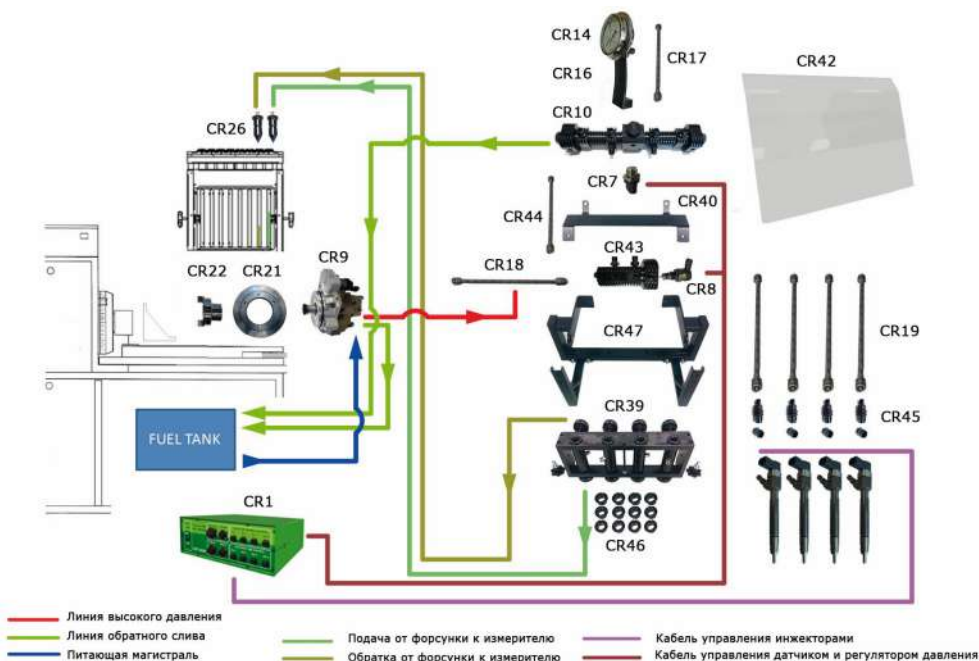
Complete sets of basic equipment for testing the CR injectors with the classical measuring unit, and also with the possibility of connection to the electronic measuring unit FLAGMAN-MUFI-CR and retrofitting with the FLAGMAN Code encoding system.

| | |
|---|------------|
| A set of basic equipment for testing CR injectors with the FLAGMAN CRT-5040 controller | DL-CR10040 |
| A set of basic equipment for testing the CR injectors with the FLAGMAN CRT-5040 controller without the CP3 HP fuel pump kit of the DL-CR00088 | DL-CR10041 |

The injection pump set **DL-CR00088** is used with a working pressure of **1800 bar**.

The injection pump set **DL-CR00139** is used with a working pressure of **2400 bar** and is available on request. Also, when installing DL-CR00139 in the basic equipment set, the sensor and pressure regulator must be replaced by 2400 Bar and 2200 Bar, respectively.

Schematic diagram of the installation of the basic equipment set



GR-7300

Nozzle needle grinding machine



The **GR-7300** is used to sharpen the needles of a nozzle and other rotating bodies. The machine is controlled by a processor. The rotation speed of the spindle and the honed body is displayed.

The maximum spindle rotation speed is 7300 rpm. The maximum rotation speed of the sharpened body is 1200 rpm. A grinding wheel is a fine-grained electrocorundum.

The grinding machine is used with the DL-UNI20025 kit, which includes: an electronic industrial microscope, a holder, a backlight and a monitor.

GR-7500

Nozzle needle grinding machine



The **GR-7500** is used to sharpen the needles of a nozzle and other rotating bodies. The machine is controlled by PWM regulators. The rotation speed of the spindle and the honed body is displayed.

The maximum spindle rotation speed is 7500 rpm. The maximum rotation speed of the sharpened body is 1200 rpm. A grinding wheel is a fine-grained electrocorundum.

The grinding machine is used with the DL-UNI20025 kit, which includes: an electronic industrial microscope, a holder, a backlight and a monitor.

MP-250 SASH

Lapping machine for CR injector valves



Lapping machine for injector valves (multiplexors).

Available in two versions:

- MP-250 SASH-Z complete with collet;
- MP-250 SASH-S complete with self-locking chuck.

- Vibromachines in a protective casing
- Table height adjustment with the screw
- Compact design

Technical data

| | |
|--|--------------------|
| The greatest axial movement of the collet – 18 mm | 18 mm |
| Collet range – 36 mm | 36 mm |
| The greatest vertical movement of a table – 175 mm | 175 mm |
| Width of a working surface of a table – 90 mm | 90 mm |
| Length of a working surface of a table – 150 mm | 150 mm |
| Electric power supply: ~220 V±15% | ~220 V±15% |
| Motor power – 0,25 kw | 0,25 kw |
| Machine dimensions (length x width x height) | 280 x 270 x 480 mm |
| Weight of machine 28 kg | 28 kg |
| Revolutions per minute on the engine | 2760 |
| Revolutions per minute on the drive shaft | 5500 |

TOM2 CP-230

Grinding machine



TOM2 CP-230 is designed for sharpening rotational bodies (drills, mills, cores, lapping, etc.) with an angle in the range from 82 to 124 degrees. Also the device is intended for sharpening drills, mills, cores, chisels, knives, bits and other cutting and locksmith tools by hand. As a working tool in a sharpening machine, grinding wheels are used.

Set of delivery

- Grinding machine TOM2 CP-230
- Lamp
- Magnifying glass
- Abrasive wheel straightening pencil holder
- Abrasive wheel straightening pencil
- The key for tightening the collet chuck

Basic specifics

| | |
|---|--------------------|
| The greatest transverse movement | 100 mm |
| The greatest longitudinal movement | 70 mm |
| Width of a working surface of a table | 200 mm |
| Length of a working surface of a table | 90 mm |
| Power supply | ~220 B±15% |
| Engin power | - 0,23 kWt |
| Dimensions (length x width x height) | 400 x 280 x 260 mm |
| Weight | 21 kg |
| Revolutions per minute on the engine | 2760 |
| Revolutions per minute on the drive shaft | 200 |

DL-ST01

Clamping stand for assembling and disassembling CR injectors



Clamping stand for assembling and disassembling CR injectors allows the installation and fixation of the following types of injectors and producers:

- Injectors CR BOSCH CRI/CRIN;
- Injectors CR DENSO;
- Injectors CR DELPHI;
- Injectors Smart;
- Injectors CR SIEMENS, Continental VDO.

Clamping stand **DL-ST-01** allows working with normal conventional nozzles, and also with 2x spring and stepped injectors.

Set of delivery

| | | | |
|---------------------------|-------|-----------------------------------|-------|
| Foot STD50115 | 1 pc. | Fixator STD30468 | 3 pc. |
| Clip, big STD50116 | 1 pc. | Screw M4 x 8 Din012 | 4 pc. |
| Clamping jaws STD30498 | 2 pc. | Screw M4 x 16 Din012 | 1 pc. |
| Shaft STD30540 | 1 pc. | Screw M4 x 20 Din012 | 2 pc. |
| Clip , small STD50117 | 1 pc. | Nut M20 Din034 | 2 pc. |
| Shaft Ø 7 mm STD30148 | 1 pc. | Washer 21 x 37 x 3 Din0125 | 2 pc. |
| shaft Ø 9 mm STD30147 | 1 pc. | Stopper 20 Din127 | 2 pc. |
| Clamping jaws STD30752 | 2 pc. | Bolt M10 x 30 Din033 | 4 pc. |
| Bracket STD30610 | 1 pc. | Nut M10 Din034 | 4 pc. |
| Handle STD30811 | 3 pc. | Washer 10,5 x 20 x 2 Din01253 | 3 pc. |
| Adjustment screw STD30810 | 1 pc. | Stopper 10 Din127 | 4 pc. |
| Holder STD30813 | 1 pc. | Cursor for protractor DL-STD30874 | 1 pc. |
| Schaft STD30812 | 1 pc. | Holder for the cursor DL-STD30873 | 1 pc. |

DL-PNP08

Pneumatic press



Pneumatic press for pressing the restrictor sleeve of the adjusting shim for the magnetic gap of Common Rail Bosch injectors with a pressure range of 0 – 8 bar.

Set of delivery

- Pneumatic press;
- Adapter DL-CRN30914;
- Pusher DL-CRN30921;
- Adapter DL-CRN30915;
- Pusher DL-CRN30920.

Pneumatic press with pressure range 0 – 8 bar.

DL-CRNRLS02

A set of adapters for replacing the washer of the electromagnet



The set for crimping the restrictor sleeve of the adjusting washer of the magnetic gap of Common Rail injectors Bosch:

- DL-CRN30915 adapter;
- DL-CRN30920 pusher for pneumatic press.

Set for pressing the restrictor sleeve of the adjusting washer for the magnetic gap of Common Rail injectors Bosch:

- DL-CRN30914 adapter;
- DL-CRN30921 pusher for pneumatic press.

DL-CRN50091

Set of adapters with
digital indicators



Adapter set with digital dial indicators for assembly gaps measurement and nozzle valve and needle stroke measurement.

Set of delivery

- | | |
|--|--|
| <p>1. DL-CRI 2.1-RLS-N, CRN 30031 1.1 CRN 30032 Magnetic gap adaptor for BOSCH injectors CR1 2.1</p> | <p>7. DL-CRI 2.1-AHE 2, CRN30707 7.1 CRN50007 Injector valve stroke adapter BOSCH CRI 2.1 direct measurement</p> |
| <p>2. DL-CRI 1-AHE, CRN50089 2.1 CRN30708 Injector valve stroke adapter for BOSCH injectors BOSCH CR1, CRI2.0/2.2, CRIN 1/1.6</p> | <p>8. DL-VFK-DFK, CRN30709 8.1 CRN30710 Nozzle spring and injector anchor spring adapter BOSCH</p> |
| <p>3. DL-DENSO 016-N, CRN30033 3.1 CRN30034 Excessive stroke adapter for Denso injectors</p> | <p>9. DL-CRIN 2/3 AHE, CRN50090 BOSCH injector valve stroke and excessive stroke adapter CRIN 2, CRIN3</p> |
| <p>4. DL-CRI-DNH-N, CRN30027 4.1 CRN30028 Needle stroke adapter for BOSCH nozzle, BOSCH CRI 2.0/2.2</p> | <p>10. Digital dial indicator 0 - 12.7 mm, 0,001 mm</p> |
| <p>5. DL-CRI-RLS-N, CRN30029 5.1 CRN30030 Magnetic gap adaptor for BOSCH CRI 1, CRI 2.0/2.2, CRIN 1/1.6, excessive stroke adapter BOSCH CRI2.0/2.2</p> | <p>11. Digital dial indicator 0 - 25.4 mm, 0,001 mm</p> |
| <p>6. DL-CRI 2.1-AHE1 CRN30705 6.1 CRN30706 Injector valve stroke adapter BOSCH CRI 2.1 indirect measurement</p> | <p>12. Allen key 2.5 mm</p> |

DL-USN0021

Universal holder for disassembly
and assembly of Common Rail pumps



Rotating stand 1 pc.
Set of flanges for fixing CR pumps 6 pcs.
Set of plate-holders for pumps 4 pcs.

DL-USN0021

Plunger fixator of inline high pressure
fuel pumps (BOSCH)



DL-RD30676

27 mm hexagonal wrench
for mechanical injectors



DL-RD30675

28 mm hexagonal wrench
for mechanical injectors



DL-VW10SMFULL

Set of keys detaching /
mounting of unit-injectors AUDI / VW



Set of keys for detaching /
mounting of unit-injectors
AUDI/VW

1. DL-UIS30667

29 mm hexagonal key for detaching / mounting of body nut of unit-injectors AUDI/VW 2.0, PDE-P2. Suitable for: 0414720400, 0414720401, 0414720402, 0414720403, 0414720453, 0414720454.

2. DL-UIS30668

30 mm octagonal key for detaching / mounting of body nut of VW SIEMENS unit-injectors

3. DL-UIS50100

Key for detaching / mounting and adjustment of solenoid nut of Bosch unit-injector Audi/VW 1.9 – 5.0 while testing on a test-bench. Suitable for: 0414720029 – 0414720215

4. DL-UIS30726

Key for detaching / mounting of solenoid nut of Bosch unit-injector Audi/VW 2.0
Suitable for: 0414720403, 0414720404

5. DL-UIS30725

Octagonal key for detaching / mounting of nozzle nut of unit-injectors Audi/VW 1.9-5.0, PDE-P1.5. Suitable for: 0414720309-2.5 l. 0414720359-2.5 l. 0414720310-2.5 l. 0414720360-2.5 l. 0414720305-5.0 l. 0414720301-5.0 l. 0414720311-5.0 l. 0414720361-5.0 l. 0414720306-2.0 l. 0414720302-2.0 l. 0414720312-2.0 l. 0414720362-2.0 l. 0414720307-1.9 l. 0414720303-1.9 l. 0414720313-1.9 l. 0414720363-1.9 l. 0414720308-1.9 l. 0414720304-1.9 l. 0414720314-1.9 l. 0414720364-1.9 l.

6. DL-UIS30693

Hexagonal key for detaching / mounting of nozzle nut of unit-injectors Audi/ VW 1.9, PDE-P1, PDE-P1.1, PDE-P1.3 PDE-P1.4

7. DL-UIS50101

Key for adjustment of solenoid nut of unit-pump Audi/VW 2.0

8. DL-UIS30733

Key for detaching / mounting of solenoid nut of Bosch unit-injector Audi/VW 1.9 TDI
Suitable for: 0414720029-0414720215

9. DL-UIS30724

Key for detaching / mounting of nozzle nut of Bosch unit-injectors Audi/VW 2.0,
Suitable for: 0414720403, 0414720404

10. DL-UIS30751

17 mm octagonal key for nozzle nut of unit-injector of Audi/VW Siemens VDO (PIEZO)

DL-TRUKE-07BR

Set of adapters for injector test of
unit-injectors for European trucks



DL-TRUKE-07BR Set of adapters
for injector test of unit-injectors
for European trucks

Set of delivery**Set includes 7 adapters:**

- DL-UIS30590 for unit injectors of BOSCH (Scania, Volvo, Iveco Cursor);
- DL-UIS30591 for unit injectors of BOSCH (Volvo);
- DL-UIS30594 for unit injectors (Volvo 520CV);
- DL-UIS30597 for unit injectors of DELPHI (Volvo Tape A);
- DL-UIS30627 for unit injectors (Volvo 460 Tape 2, Scania);
- DL-UIS30635 for unit injectors of DELPHI (Volvo 4 Pin);
- DL-UIS30643 for unit injectors (Iveco Stralis 500HP).

All adapters can be purchased separately.

DL-ST-02

Clamping device for unit-injectors assembling-disassembling, with two supports for injectors's nozzle (\varnothing 7 mm, \varnothing 9 mm)



Clamping device allows

DL-ST-02 helps to perform the measurement of the magnetic gap and the valve stroke of unit injectors and pump sections. Clamping device DL-ST-02 allows you to conveniently and properly fix the unit injector, so that all measurements can be made correctly and accurately. When disassembling the unit-injector on this device, pins will not be broken and on the case there will not be any scratches.

Clamping device for unit-injectors assembling-disassembling, with two supports for injector's nozzle (\varnothing 7 mm, \varnothing 9 mm)

Device allows to instal and mount unit injectors and pump section in any position required for the disassembly and assembly of the following groups:

- Unit-injector Bosch, Delphi, Caterpillar for trucks;
- The unit-injector Bosch, Siemens, Continental for passenger cars;
- Pump Section and single Bosch and Delphi pumps for trucks.



- holder AT STD-50077
- holder AC STD-50078
- strap STD-30671
- bar STD-30672
- stopper STD-30673
- fixing bolt M10 2 pcs.



- clip STD-50009 VW 2.0
- clip STD-50010 VW 1.9
- strap STD-30656
- bar STD-30657 2 pcs.
- stopper STD-30678
- bolt STD-30658

CAM-BOX2 MECHANIC | is a mechanical device for testing pump injectors (UIS) and unit pumps (UPS)



CAM-BOX2 MECHANIC can be used with a classical benches from any manufacturer and installed to a standard, 125 mm, benches. For other benches there should be adaptive plate, which is not included in the set .

Basic equipment of Cam Box 2 allows to test unit-injectors of Volvo and some Iveco models. For testing other pump injectors types, it is necessary to order additional, different adaptors.

CAM-BOX2 MECHANIC allows you to test the following types of unit injectors and pumps:

- Bosch UIS PDE - unit injector of trucks Scania, Iveco, Volvo, as well as marine, industrial and other engines of these manufacturers;
- Bosch UIS PDE - unit injector of cars Audi, VW, Land Rover;
- Delphi EUI E1 - unit injector of Volvo truck, Renault, as well as marine, industrial and other engines of these manufacturers;
- Delphi EUI E3 - unit injector of Volvo truck, Renault, as well as marine, industrial and other engines of these manufacturers;
- Delphi EUP - unit injector of DAF truck;
- Lucas A-type - unit injector (H-shaped) Volvo truck and marine, industrial and other engines Volvo;
- You can check the unit injectors of American manufacturers such as Cummins, Caterpillar, Detroit and and injection system HPI.

Set of delivery

| | |
|--|--------|
| CamBox2 CB20001 | 1 pc. |
| DL-CB20124 Clamp № 0124 for unit-injectors Volvo FH12, Iveco, Bosch | 1 pc. |
| DL-CB20123 Clamp № 0123 for unit-injectors № 0129, 133, 144 | 1 pc. |
| DL-CB20100 Clamp № 0100 for installing indicator | 1 pc. |
| DL-CB230010 Bracket for nozzle tip | 1 pc. |
| Bolt M10, L=106 mm, bolt M10, L=56 mm for bracke | 1 set. |
| DL-CB230012 Nozzle tip Ø 9 mm | 1 pc. |
| DL-CB2 30022 Fixator | 1 pc. |
| DL-CB230046, CB230047, CB230048, CB230049 nozzle shims | 1 set. |
| DL-CB230013 Fixator of the position of the cam stroke | 3 pcs. |
| DL-CB230084 Socket H=7 Ø 20 | 2 pcs. |
| DL-CB230109 Spherical screw for the unit-injectors | 1 pc. |
| DL-CB230134 Spherical screw for the pump-sections | 1 pc. |
| DL-CB230135 Inner screw for the pump-sections | 1 pc. |
| DL-CB230043 Screw with washer for the pump sections M12 x 1,25 | 1 pc. |
| Rubber-metal washer Ø M14 | 4 pcs. |
| DL-CB250001 Adjustable caliber to install the preload of unit-injector | 1 pc. |
| Pressure supply hose Ø 10 x 100 mm | 1 pc. |
| Backleak hose Ø 10 x 100 mm | 1 pc. |
| Fitting Banjo M14 x 1,5 | 2 pc. |
| Bolt Banjo M14 x 1,5 | 2 pc. |
| Rubber-metal washer Ø M14 | 4 pcs. |
| DL-34-RWN06x04 Teflon line Ø 6 mm x 1500 mm | 1 pc. |
| DL-PG Defoamer | 1 pc. |
| DL-34-RL020602 Fitting for defoamer (quick adapter) Ø 6 mm x 1/4" | 1 pc. |
| Software with test-plans | 1 pc. |
| Spring (red L=76 mm) 10 -12 mm | 1 pc. |
| DL-CB230169 Pusher to the spring (red L=76 mm) | 1 pc. |

Additional equipment for the mechanical device CAM-BOX2 MECHANIC

- MU Connecting adapter to the bench
- DL-CB2 50036KIT Injection sensor
- D-1680750120 Testing injector for PLD section testing
- D-1688901118 Pipe to the testing injector
- DL-CB230016 flange to CAM BOX2 with 4 holes M10x1
- DL-CB20125KIT Kit for testing unit-injectors Caterpillar C12
- DL-CB20126KIT Kit for testing unit-injectors Caterpillar C15
- DL-CB20127 Clamp for PLD Detroit (Bosch)
- DL-CB20128 Clamp for unit-injectors Iveco 7,8 L (0414700002, 0414700003, 0414700004, 0414700005, 0414700006)
- DL-CB20129 Clamp for unit-injectors MB Actros
- DL-CB20130 Clamp for unit-injectors Bosch 0414700002, 0414703005, 0414703007
- DL-CB20131 Clamp for unit-injectors Bosch UD Nissan (0414700002, 0414701023, 0414701024, 0414701033, 0414701034)
- DL-CB20133 Clamp for unit-injector MB Atego
- DL-CB20136 Clamp for unit-injector Land Rover-Discovery (Delphi)
- DL-CB20137 Clamp for unit-injector Caterpillar L10
- DL-CB20138KIT for testing unit-injectors Detroit 5234770-5235580
- DL-CB20139KIT for testing unit-injectors Cummins 4DEC01L 4061851
- DL-CB20144 Clamp for unit-injector DAF, MAK, Renault
- DL-CB20145 Clamp for unit-injector Delphi
- DL-CB20146 Clamp for unit-injector Caterpillar L15
- DL-CB20140 Clamp for unit-injector Scania
- DL-CB20148 Clamp for unit-injector Volvo FH12, Delphi E3
- DL-CB20149 Clamp for unit-injector Bosch (0414703004, 0414703007, 0414703008, 0414703009, 0414703013)
- DL-CB20151 Clamp for unit-injector Audi/VW 1.9
- DL-CB20152 Clamp for unit-injector Audi/VW 2.0
- DL-CB20153KIT Kit for testing unit-injectors Bosch 0414703003
- DL-CB20154KIT Kit for testing unit-injectors Cummins HPI
- DL-CB20155 Clamp for unit-injector John Deere Delphi E1
- DL-CB250037 Injection sensor for unit-injectors Cummins HPI
- Fitting for clamp M14 x 1,5 x 1/4" UNI30035
- Quick connector 1/4" Ø D-25-FN72-04
- 34-K2-212D Quick connector Ø 1/4"
- Rubber-metal washer Ø M14
- Rubber-metal washer Ø 1/4"



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