



**Controller CR- tester UNI  
Checking Common Rail Injectors  
“Diesel tester OS.112/V8”**

*Passport.  
Technical description.  
User manual.  
Warranty card.*

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## **Introduction**

This passport is a document certifying the basic parameters and technical characteristics of the Diesel tester OS.112 / V8 controller guaranteed by the manufacturer for testing and verifying the performance of common rail diesel injectors. This passport allows you to get acquainted with the device, the procedure and rules for its operation, compliance with which will ensure the correct operation of the controller.

### **1. General information**

The Diesel tester OS.112 / V8 controller is an electronic unit that controls the electrical elements of the Common rail fuel system. It is used as a part of test bench and manual equipment.

### **2. The purpose**

The “Diesel tester OS.112 / V8” device is intended for diagnosing Common Rail injectors manufactured by Bosch, Denso, Delphi, Siemens VDO on the test bench.

The device provides:

- simultaneous control of 1 injector;
- control of electromagnetic injectors of a passenger series with a voltage of 14V;
- control of electromagnetic injectors of a cargo series;
- control of piezoelectric injectors;
- control of common rail fuel injection pumps of the CP1, CP3 systems;
- control of the measuring unit shutter;
- control of the electrovalve of the electromagnetic injectors COMMON RAIL manufactured by BOSCH, to measure the stroke of the valve when measuring the magnetic gap.

### **3. The basic technical data and specifications**

- Supply voltage, V -  $\sim 220 \text{ V} \pm 15\%$ ;
- Power consumption, W, no more - 350 W.
- Load of the shutter control relay - 5A 250V AC, 5A 24V DC;
- Mass of the device: 2 kg;
- Dimensions (length x width x height) - 240x287x70;

#### 4. The design of device



Figure 1. Front view

The Diesel tester OS.112 / V8 device is structurally made in the form of a block. The appearance is shown in Figure 1. On the front panel of the device are: control buttons, a connector for connecting to the injector (X1), a power toggle switch.



Figure 2. Back view

On the back of the device are the connectors:

- USB - for connecting to a personal computer;
- X2 - to connect the injection sensor;
- X18 - for connecting the regulator and pressure sensor;
- X5 - for connecting to the shutter relay;
- "Power" for connecting mains power ~ 220 V.

The "Power" connector is structurally made in one housing with a fuse.

## 5. Instructions for use

Environmental Requirements:

- Operating temperature: +5 °C to +40 °C
- Temperature during transportation: -20 °C to +60 °C
- Relative humidity (non-condensing): working 8% - 80%, storage 5% - 95%.
- Dustiness of air: no more than 75 mcg / m<sup>3</sup>

Before turning on the device, it is necessary to check visually or with the help of devices, the condition of the connectors-adapters, the power cable 220 volts.

If the device was transferred from a cold to a warm room, it is strictly forbidden to turn it on within 1-1.5 hours.

After switching on, let the device run for 2-4 minutes, then proceed to work.

### **Strongly forbidden:**

- turn on the device with faulty power cables;
- connect and disconnect the adapter sockets from the injector, sensor or pressure regulator when the device is turned on;
- connect the device to a network that does not have a grounding loop;
- connect the device to the network with a cable that does not have a grounding contact;
- use the Diesel tester OS.112 / V8 device in conjunction with electrical equipment not connected to the ground loop.

**Failure to comply with the last three points may result in electric shock.**

**In addition to health risks, the lack of grounding, in most cases, leads to failure of the pressure sensor, since the device uses a switching power supply, according to the circuitry of which, in the absence of grounding, there will be a voltage equal to half the supply voltage of the device and becomes 110V.**

## 6. Limitations of liability

The manufacturer is not liable to the buyer of this product or a third party for damage or loss suffered by customers or a third party as a result of improper use of the product, including inept or erroneous actions of personnel, as well as for losses caused by the action or inaction of this device.

Under no circumstances will the Manufacturer Company be liable for loss of profits, lost savings, losses caused by an accident, or other subsequent economic losses, even if the company was notified of the possibility of such losses. The manufacturer is not liable for losses incurred by you on the basis of claims of a third party, or caused by failure to fulfill your obligations.

The manufacturer is not responsible for any malfunctions and losses resulting from the use of additional devices recommended for use with this device, as well as its modification, repair or modification to its design, not provided for by the operating instructions, including when using a self-made adapter connector.

## **7. Preparation for work**

Before using the Diesel tester OS.112 / V8 device, carefully read the operating instructions.

When preparing the device for operation, the following steps must be taken:

Perform an external inspection of the device and connecting cables. External inspection of the device and connecting cables is carried out with the power off and consists in identifying mechanical damage to the device and connecting cables.

## **8. Work with the device**

The Diesel tester OS.112 / V8 allows testing diesel electric injectors of the Common Rail system, giving the user-specified control signals and fuel pressure by controlling the control valve to the injectors.

The device can be controlled manually using the control buttons on the front panel and automatically, using software (hereinafter referred to as software) on a personal computer (hereinafter referred to as PC).

In manual mode, injector control functions are available to check volumetric performance, visually evaluate the shape and intensity of the spray pattern, and the function of measuring the stroke of the anchor (Stroke mode) for electromagnetic injectors manufactured by Bosch.

In automatic mode, an additional control of the pressure regulator is available to maintain the set pressure in the system, control various actuators (for example, turning on / off the booster pump, controlling the meter shutter), measuring Response time for checking and coding Delphi nozzles.

## The Manual mode

1. Connect the injector using the appropriate adapter cable to the connection cable and to connector X1.
2. Connect the power cable to the power connector and to the AC 220V / 50Hz.
3. Turn on the device with the power toggle switch (see paragraph 4).

On the front panel by means of light indication the mode and parameters of work are displayed. Depending on the color and light mode, they have different meanings.

Table 1 - Description of light indication

Button	Color	Description
Bosch	Green	Signal selected Bosch.
Bosch	Red	Signal selected Bosch. Work errors.
Denso	Green	Signal selected Denso.
Denso	Red	Signal selected Denso. Work errors
Delphi	Green	Signal selected Delphi.
Delphi	Red	Signal selected Delphi. Work errors.
Piezo	Green	Signal selected Piezo.
Piezo	Red	Signal selected Piezo. Work errors
Bosch Denso Delphi Piezo	Red / Green	For Piezo signal voltage selection: 100, 120, 140, 160B. For Stroke mode, current selection: 10, 12, 13, 15A.
Frq	Green	Frequency selected 0.5 Гц.
Frq	Red	Frequency selected 1 Гц.
Lat	Green	Duration selected 1 мс.
Lat	Red	Duration selected 3 мс.
Run	No	Stop.
Run	Red	Start.
Run	Flashing Red	The device is in pause mode.

Changing operating modes and parameters is carried out using the buttons on the front panel.

«Diesel tester OS.112/V8» – Passport. Technical description.

Table 2 – Buttons description

Button	Push	Description
Bosch	Long	Bosch signal selection. Long press again - switch to Stroke mode.
Denso	Long	Signal selection Denso.
Delphi	Long	Signal selection Delphi.
Piezo	Long	Signal selection Piezo.
Bosch Denso Delphi Piezo	Short	For Piezo signal voltage selection: 100, 120, 140, 160V. For Stroke signal, current selection: 10, 12, 13, 15A.
Frq	Short	Frequency switching.
Lat	Short	Duration switching.
Run	Short	Start/Stop

Pressing the control buttons is accompanied by a sound signal.

Table 3 – Description of sound indication

Duration	Description
Short	The confirmation.
Three short	Bosch Button - Switch to Serial Mode Frq button - frequency switching: rare - 0.5 Hz frequent - 1 Hz
Short/long	Lat Button - Switch Duration: short - 1 ms long - 3 ms



Serial mode is used to test injector operation under pressure. It is recommended to use a hydraulic press as a source of pressure (a manual pump for checking diesel injectors). In this mode, a series of pulses is continuously applied to the injector and real injection occurs, which makes it possible to evaluate the nozzle operability and also to make some measurements of the fillings.

To work in this mode, you should:

1. Select the Signal Type by long pressing (1 s) the corresponding button (Bosch, Denso, Delphi, Piezo). When working with electromagnetic injectors, the signal type is selected according to the injector manufacturer, in case of piezoelectric injector, select the Piezo signal type regardless of the manufacturer. When you select a signal type, the corresponding button lights up in green, a short-term signal sounds.

2. Select the signal frequency by briefly pressing the Frq button.

3. Select the duration of the signal by briefly pressing the Lat button.

4. To start, briefly press the Run button.

The device will start issuing a signal to the injector. During operation, you can change the frequency and duration, **switch the signal type is not allowed.**

If during operation errors occur such as an open or short circuit in the control circuit, the button for the selected signal type will light up in red.

To stop, briefly press the Run button again.

For the Piezo signal, the voltage of the control signal is changed using the Bosch, Denso, Delphi, Piezo buttons.

- When you press the Bosch button - 100 V (the Bosch button lights in green).
- When you press the Denso button - 120 V (the Bosch and Denso buttons light green).
- When you press the Delphi button - 140 V (the Bosch, Denso and Delphi buttons light green).
- When you press the Piezo button - 160 V (the Bosch, Denso, Delphi and Piezo buttons light green).

The pulse frequency and pulse duration can also be set by pressing the Frq and Lat buttons.

Stroke mode is used to generate a single long pulse to measure the course of the anchor in Bosch electromagnetic injectors.

The stroke measurement is carried out by a mechanical (or electronic) indicator (THE INDICATOR IS NOT INCLUDED IN THE DELIVERY SET).

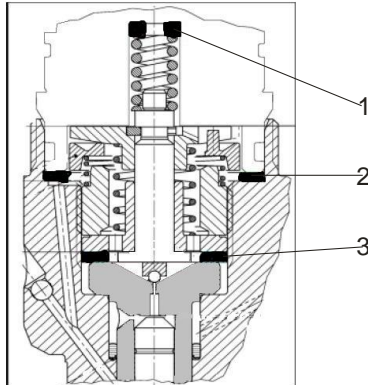


Figure 3. Electrohydraulic injectors assembly Common rail Bosch

Adjusting washers (shims) of the electromagnetic injector COMMON RAIL BOSCH have the following purposes:

- an increase in the No. 1 washer will increase the pressure of the ball on the valve seat and reverse;
- an increase in washer No. 2 will lead to a decrease in the ball pressure on the valve seat and an increase in the magnetic gap between the armature and the electromagnet and reverse;
- Increasing the No. 3 washer will decrease the ball pressure on the valve seat and increase the ball travel and reverse.

When repairing the injector, it is necessary to restore the value of the ball stroke and the magnitude of the magnetic gap between the armature and the electromagnet caused by the ball sagging during operation and the subsequent mechanical processing of the valve seat; the ball dropped.

To switch to Stroke mode, you must press the Bosch button (1 s) for a long time, the device will emit a single beep, and all buttons except Bosch will go out.

The pulse is triggered by pressing the Run button. At the same time, a pulse lasts 1.5 s, and a sound signal sounds.

After the pulse, there is a pause of 8 s, during which it is impossible to give repeated pulses. A pause is necessary to avoid overheating of the injector coil. During pause, the Run button flashes.

In Stroke mode, you can select the current strength:

- When you press the Bosch button - 10 A (the Bosch button lights in red)

- When you press the Denso button - 11 A (the Bosch and Denso buttons light in red)
- When you press the Delphi button - 13 A (the Bosch, Denso and Delphi buttons light red)
- When you press the Piezo button - 15 A (the Bosch, Denso, Delphi and Piezo buttons light red).

The frequency and duration in Stroke mode does not change.

To return to Serial mode, you must repeatedly press the Bosch button (1 c) for a long time, the device will emit a series of three sound signals.

### **Automatic mode**

1. Connect the injector using the appropriate adapter cable to the connection cable and to connector X1.

2. The sensor and pressure regulator through the connecting cable to the connector X18.

When working with injectors as part of bench equipment, pressure control is carried out only by a regular high-pressure regulator mounted on a rail or on a pump of the CP1 system.

When using a CP3 system pump, it is necessary to install a rail with a high pressure regulator from the CP1 system.

The Diesel tester OS.112 / V8 device does not automatically control the low pressure regulator of the CP3 pump in automatic mode.

3. Connect the injection sensor (the device is designed to work exclusively with the injection sensor OS.60-01) to connector X2.

4. When using the control of external actuators (pump, shutter of the measuring unit), connect them to connector X5.

5. Connect the USB communication cable to the device connector and connect it to the USB port of the PC.

6. Connect the power cable to the power connector and to the AC 220V / 50Hz.

7. Turn on the device with the power toggle switch (see point 4).

8. Start the PC and software for working with the Diesel tester OS.112 / V8 device.

**In automatic mode, the device buttons are INACTIVE.**

## 9. The firmware update

To update the device firmware, do the following:

1. Connect the USB communication cable to the device connector and connect it to the USB port of the PC.

2. Connect the network cable to the power connector and to the AC 220V / 50Hz.

3. Turn on the device with the power toggle switch (see paragraph 4).

4. Start the PC and software to update the device. You will see the update program window:

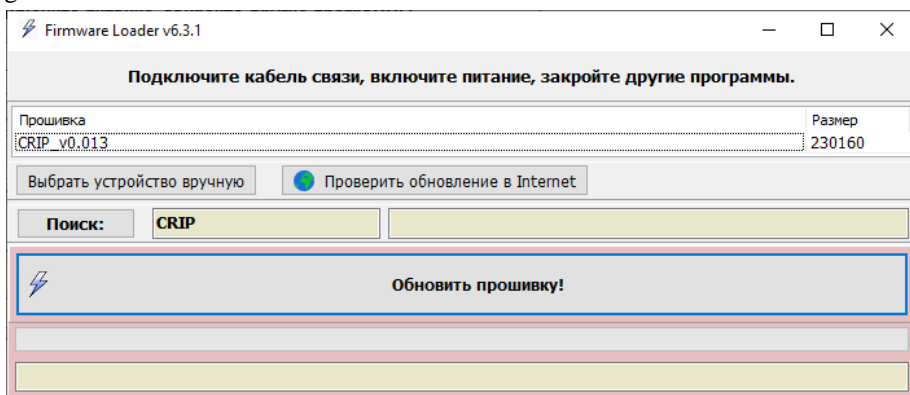


Figure 4. Firmware update

1. Click the “Update Firmware!” Button.
2. Wait for the update process to complete.
3. Close the updater window.

## **10. The set of delivery**

Passport (Technical description, instruction manual) - 1 pc.

Controller "Diesel tester OS.112 / V8" - 1 pc.

Connecting cable for injectors - 1 pc.

Adapter cable for injectors - 4 pcs.

Cable for regulators and pressure sensor - 1 pc.

X5 connector for connecting to the shutter control unit - 1 pc.

Power cable 220V - 1 pc.

Fuse 5A - 1 pc.

Communication cable with PC - 2 pcs.

## **11. Warranty**

The manufacturer guarantees the stable operation of the Diesel tester OS.112 / V8 device, subject to the owner observing the storage and operation rules set forth in this passport.

The warranty period is established by the manufacturer - 18 months from the date of receipt of the product, unless otherwise specified by the manufacturer and the buyer by an additional contract.

The manufacturer notes in the warranty card the year, month, day of sale, legal address, telephone number of the company performing the warranty repair (the warranty card is in the appendix to the passport for the Diesel tester OS.112 / V8 device).

During the warranty period, the owner is entitled to free repair upon presentation of this passport and warranty card. After repairs are carried out, a list of troubleshooting steps is entered in the warranty card.

Not a ground for complaint: violation of the integrity of the connecting wires (adapter cables).

The manufacturer has the right to refuse warranty repair of the Diesel tester OS.112 / V8 device in the following cases:

- presence of traces of opening the device case;
- the presence of traces of mechanical damage on the body or electronic circuit board of the device;
- the presence of foreign objects and liquids in the housing or on the electronic board of the device;
- in case of non-observance of the rules of storage and operation of the device.

Without presenting a warranty card and in case of violation of the safety of seals on the product, claims to the quality of work and warranty repairs are not made.

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During the warranty period of operation installed on the product, repairs are carried out at the expense of the owner if he does not use it in accordance with these operating instructions.

The manufacturer provides further repair of the Diesel tester OS.112 / V8 device, after the end of the warranty period under a separate contract.

## Appendix №1 Connector pinout X1

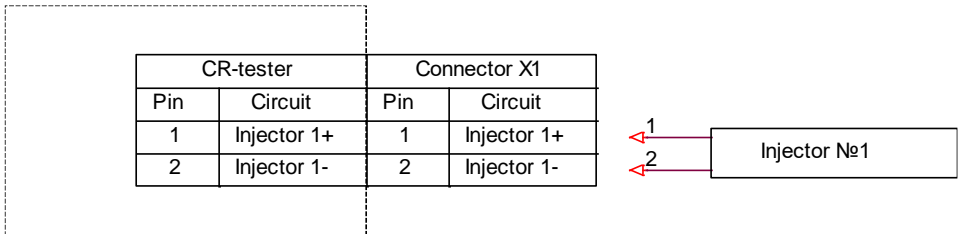


Figure 5. Injector Connector

## Appendix №2 Connector pinout X2

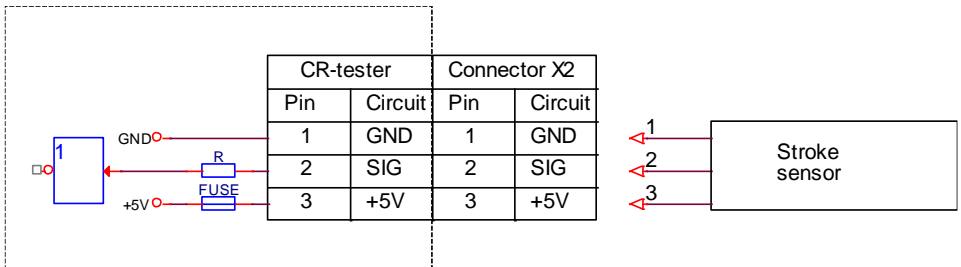


Figure 6. Injection sensor connector

## Appendix №3 Connector pinout X18

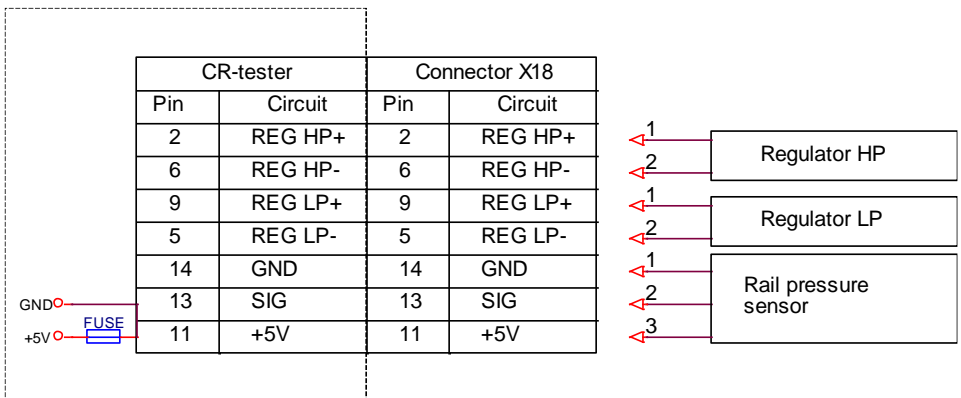


Figure 7. Connector for rail pressure sensor and pressure regulators

**Appendix №4 Connector pinout X5**

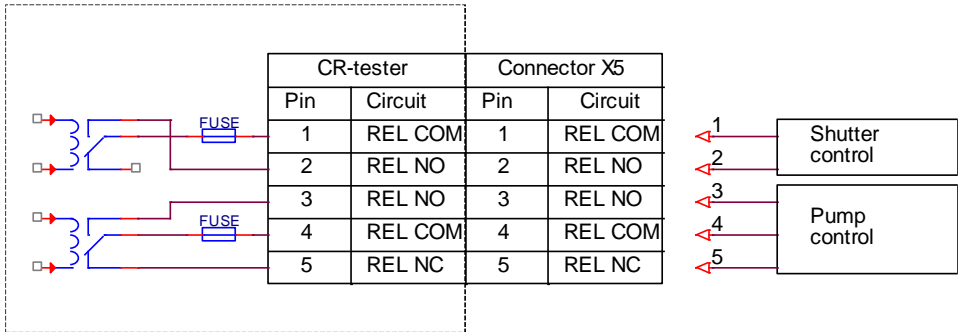


Figure 8. Socket for connecting to the shutter control relay

In series with the common relay contact, a 5A fuse is installed in the device. If the consumption current is higher, an intermediate relay should be installed.



## Appendix №5 Warranty

Warranty card № \_\_\_\_\_

Device Diesel tester OS.112/V8 for testing and verifying the performance of diesel injectors of the Common Rail system.

Warranty repair and maintenance of the Diesel tester OS.112/V8 controller is carried out by the enterprise \_\_\_\_\_.

Address \_\_\_\_\_

Phone. \_\_\_\_\_

Date of sale " \_\_\_\_ " \_\_\_\_\_ \_\_\_\_\_

