Diag Center

Figure 1

Diag Center is a suite of applications for operating your diagnostic device **TSPro** or **Troodon**. We recommend launching the applications through the main **Diag Center** application (Figure 1).

1. Diagnostics (Starter application)
2. Oscilloscope (optional module, only for TSPro devices)
3. Archive - management of recorded data
4. Workshop - access to predefined websites
5. E-OBD Diagnostics
6. Settings - diagnostic configuration and other options
7. Update - software updates

Starter

Starter is an application for serial diagnostics for TSPro and Troodon devices. It is part of the main Diag Center software package for PC and the operating system in TSPro 10.

This chapter will gradually describe individual diagnostic procedures performed using the Starter program, such as reading and clearing fault memory, reading parameters, actuator tests, and many others. For each diagnostic function, differences typical for certain manufacturers will also be described. The greatest differences in performing diagnostic functions compared to other manufacturers are found in VW Group vehicles, on which we will focus in more detail.

Introduction

After launching the application, the initial window appears on the computer screen (Figure 2). Select the type of connected vehicle. The program will display a list of available brands (based on the diagnostic package you purchased) from the selected category (Figure 3).

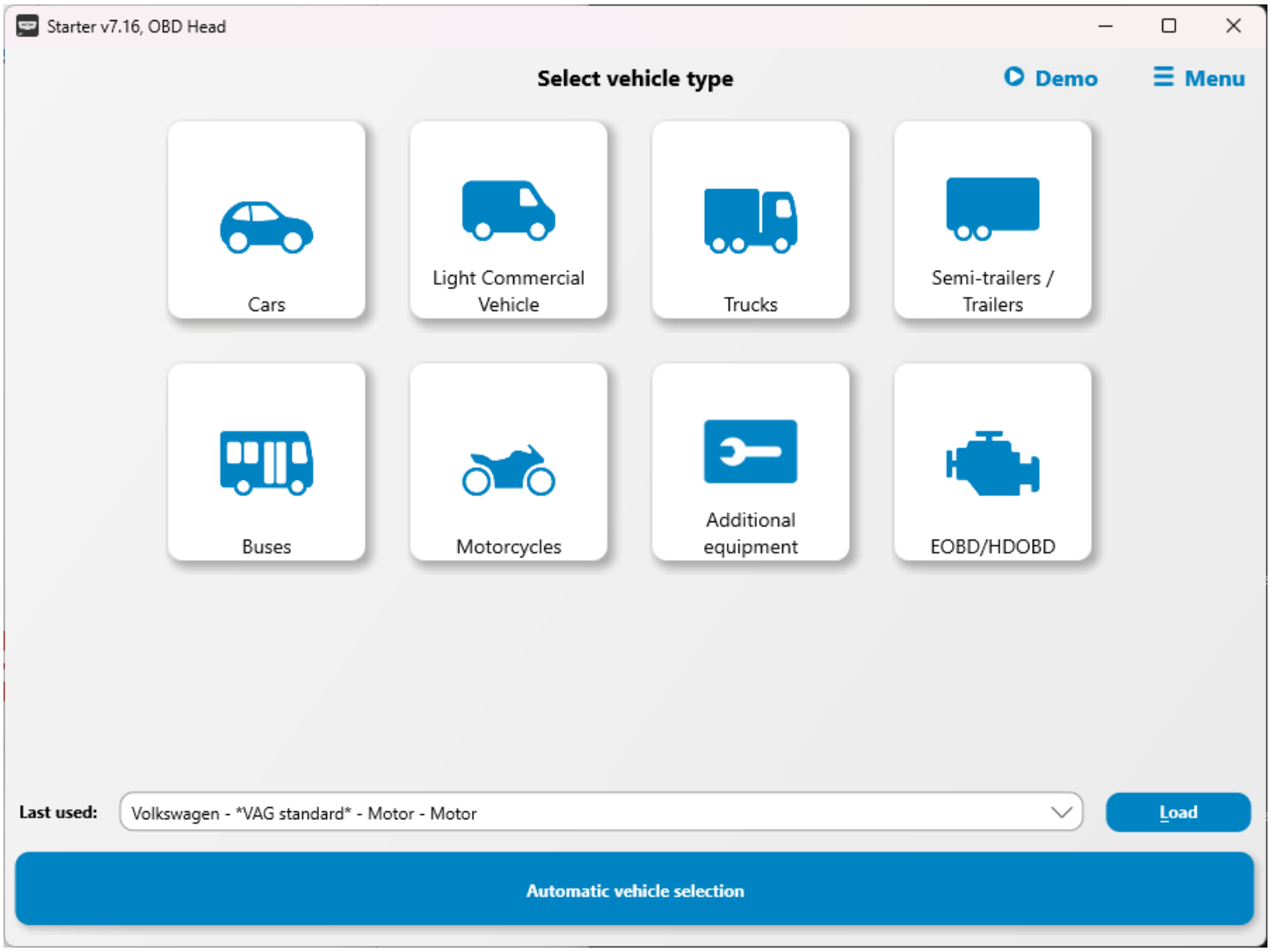

Figure 2

Select the manufacturer of the vehicle being diagnosed. If you choose the EOBD / OBD2 option, the program will switch to basic measurement mode.

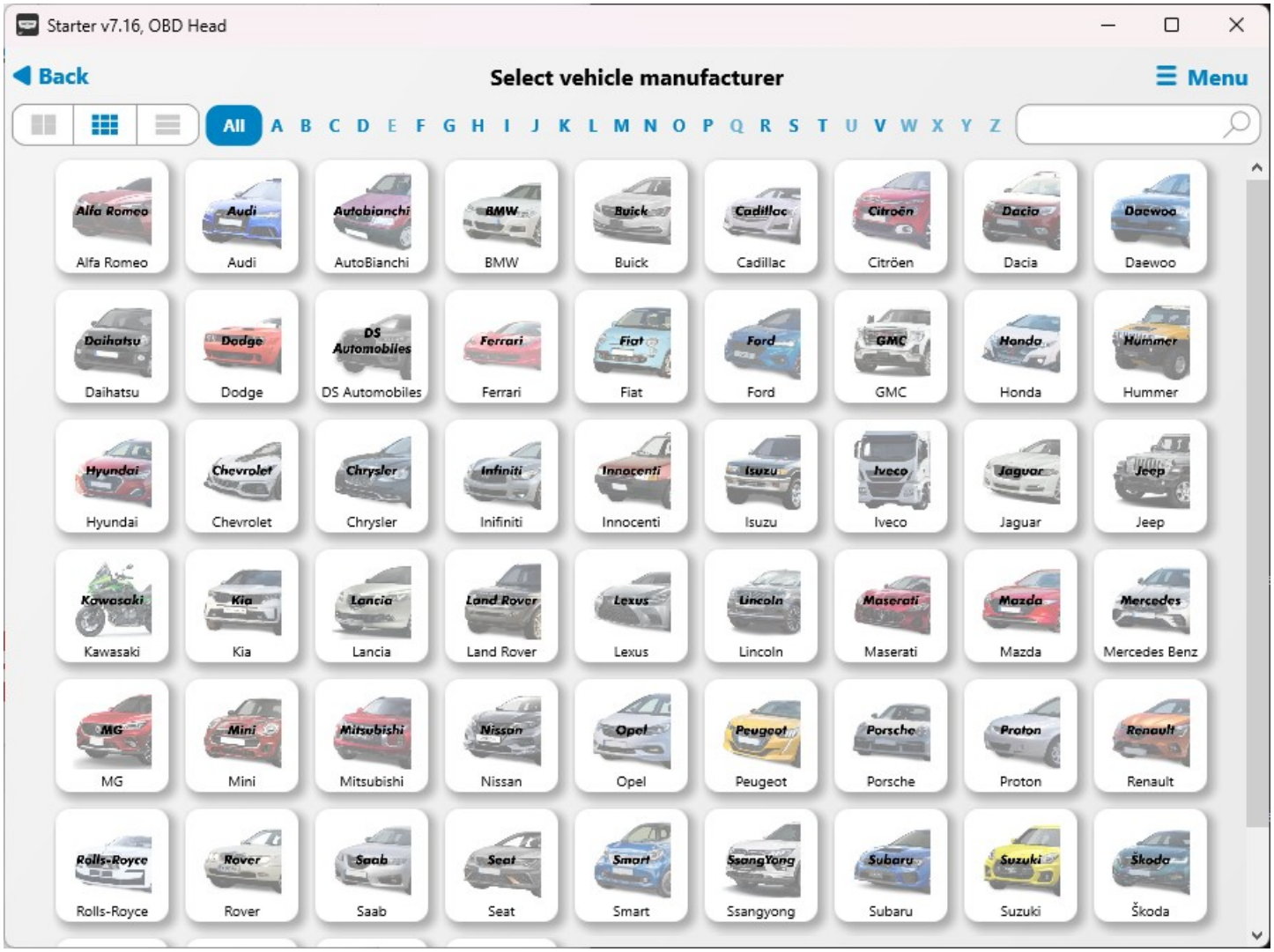

Figure 3

Connection to the vehicle

After selecting the vehicle manufacturer, the program will display a choice of model, type, and specific control unit (Figure 4). Proceed from left to right and select the vehicle model, control unit type, and specific unit. Then click the Start button at the bottom under the selected unit.

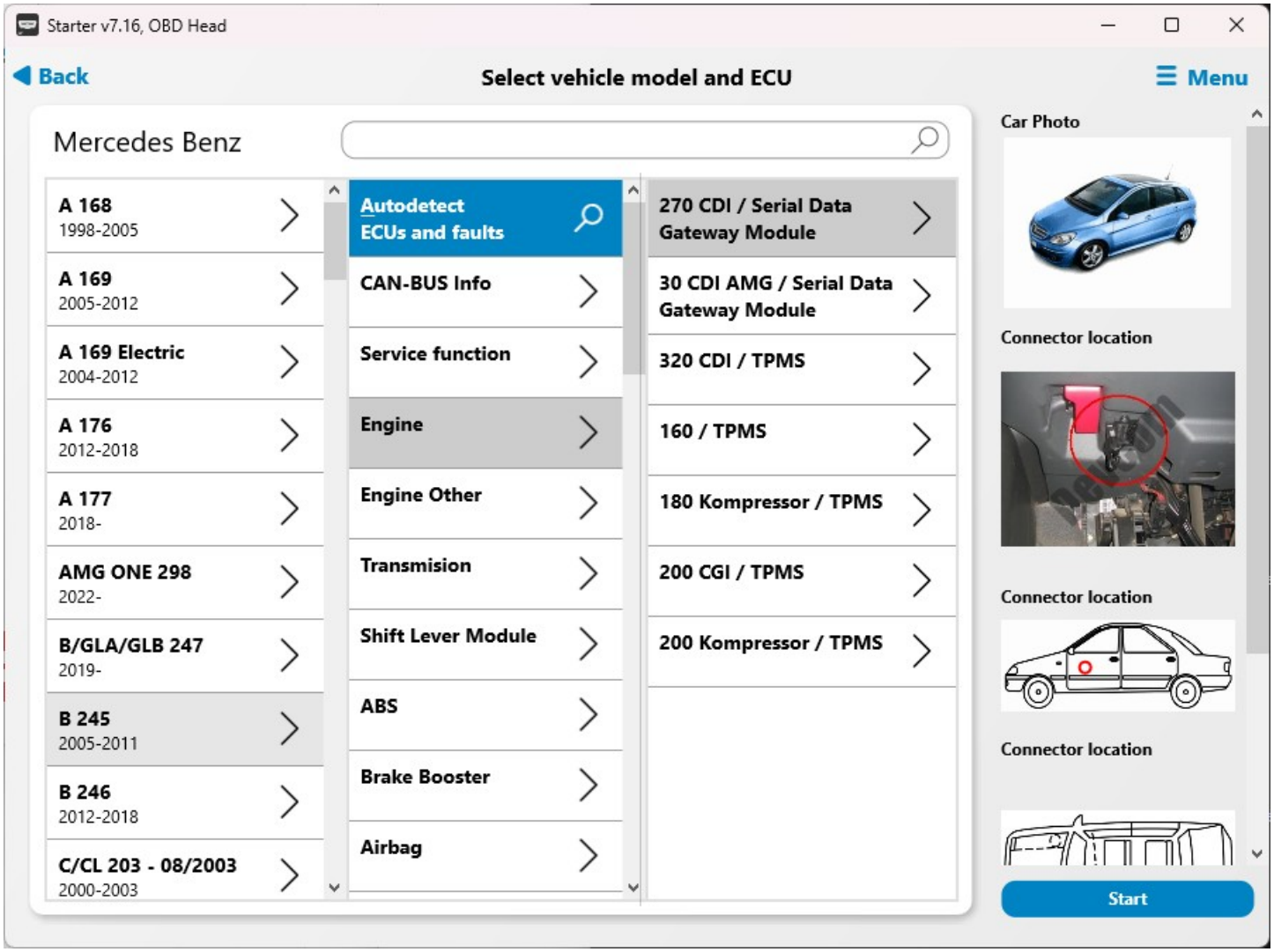

Figure 4

For the selected vehicle model, the right side of the window displays the location of the diagnostic connector and the required adapter cable for this type of diagnostic socket.

Once the desired type and control unit system are selected and confirmed by pressing the Start button, a dialog window appears (Figure 5), prompting you to switch on the vehicle's ignition. At the top of the window, information about the selected control unit is displayed.

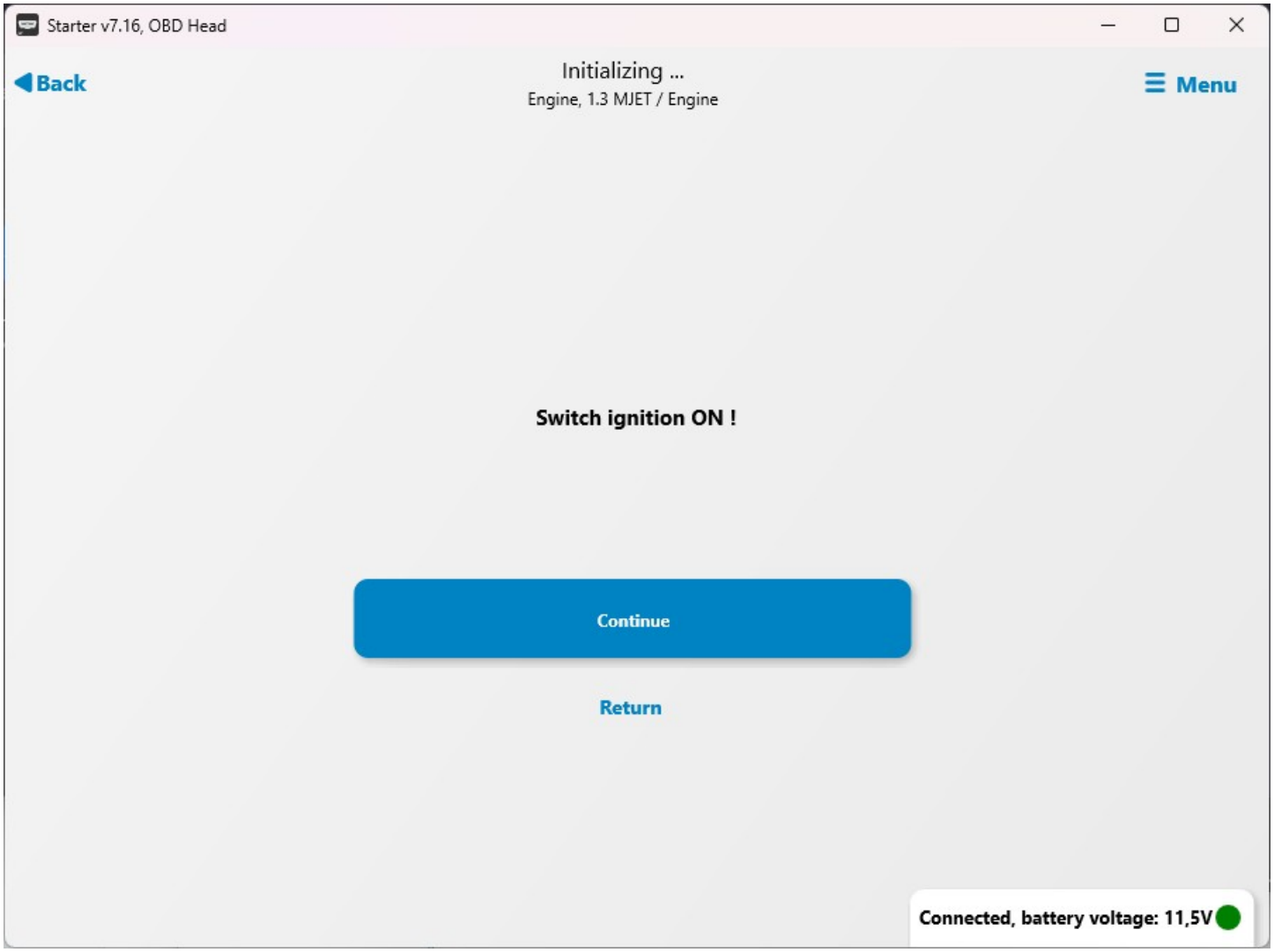

Figure 5

After switching on the ignition and clicking the corresponding OK button, the procedure for establishing communication with the control unit will start. Once the connection is successfully established, the Diagnostics menu will appear on the screen(Figure 6).

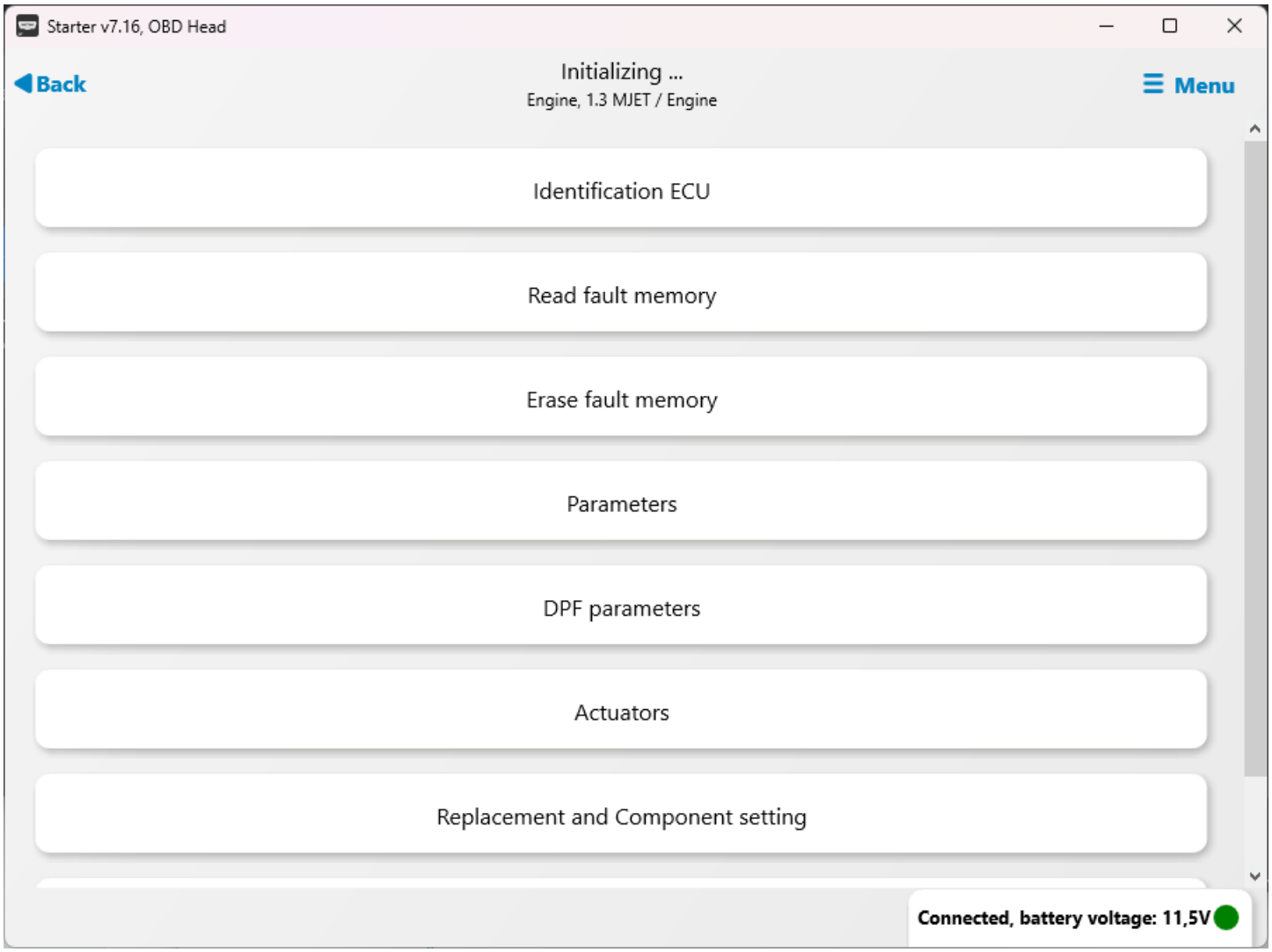

Figure 6

Diagnostické funkce

The displayed Diagnostics menu may vary in the number of items and the structure of the available diagnostic functions, depending on the system type, manufacturer, or production year of the control unit. The following sections describe the individual diagnostic functions that may appear in the Diagnostics menu.

The basic control elements of the diagnostic functions are located at the top of the window. At the bottom, you will find logging options, and in the lower right corner, information about the connection status and the vehicle's battery voltage. These elements are common to most diagnostic sections.

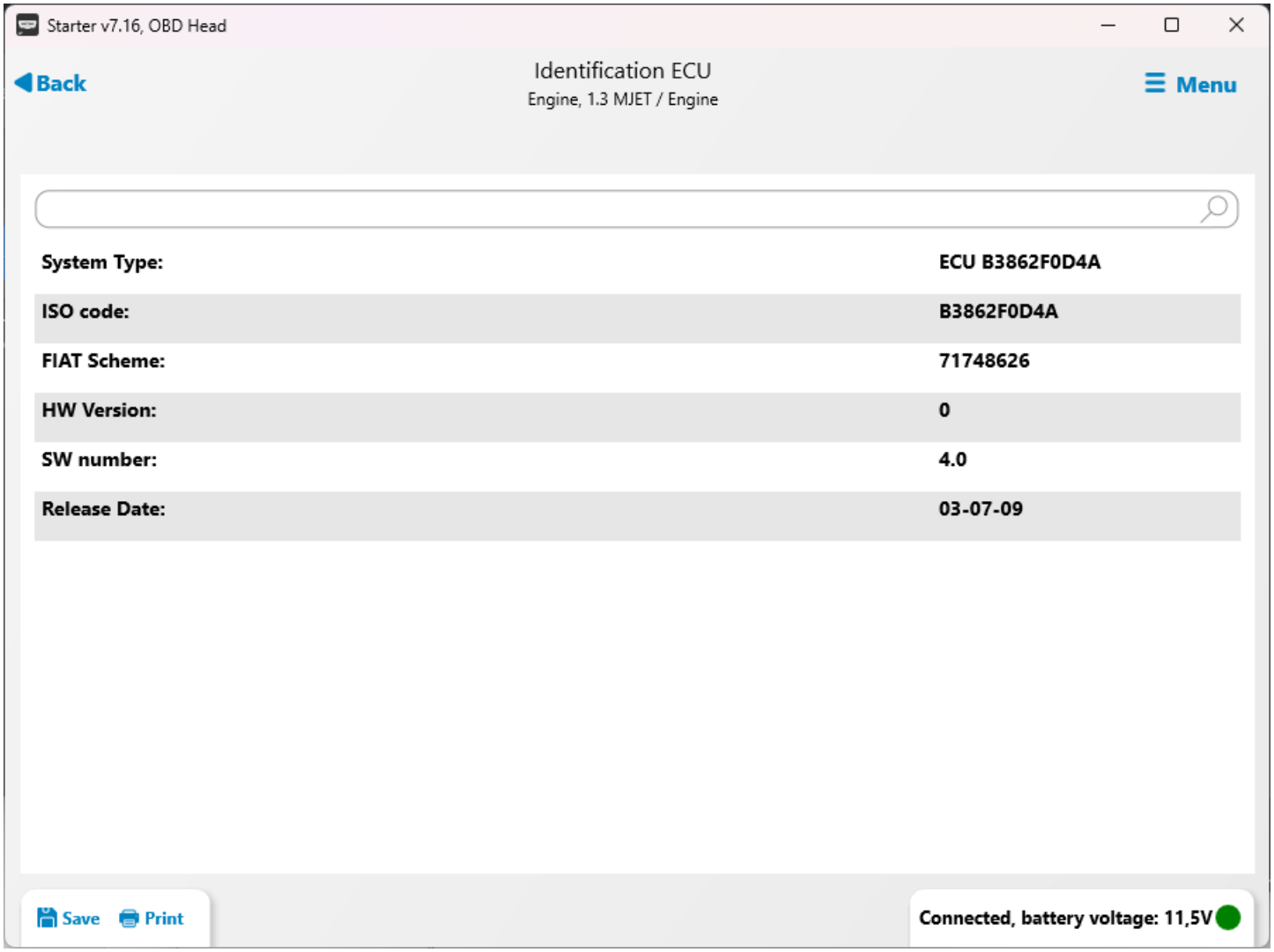

Figure 7

Control unit identification

This menu displays basic information about the control unit, such as control unit type, serial number, manufacturer, software versions, VIN, and more. The list of displayed items may vary depending on the type of control unit(Figure 7)

Reading fault memory

After confirming this option, the faults stored in the control unit's memory are read out. If any faults are stored, their list will appear on the device screen (Figure 8).

Note that in real cases, the number of faults may vary. Each item contains the item's sequence number / total number of faults, the fault code, and the fault description.

After reading the faults, the list can be saved, printed, or copied to the clipboard. All these options are available in the box in the upper left part of the window. A saved record can be supplemented with a note for easier identification. To save the note, click the OK button.

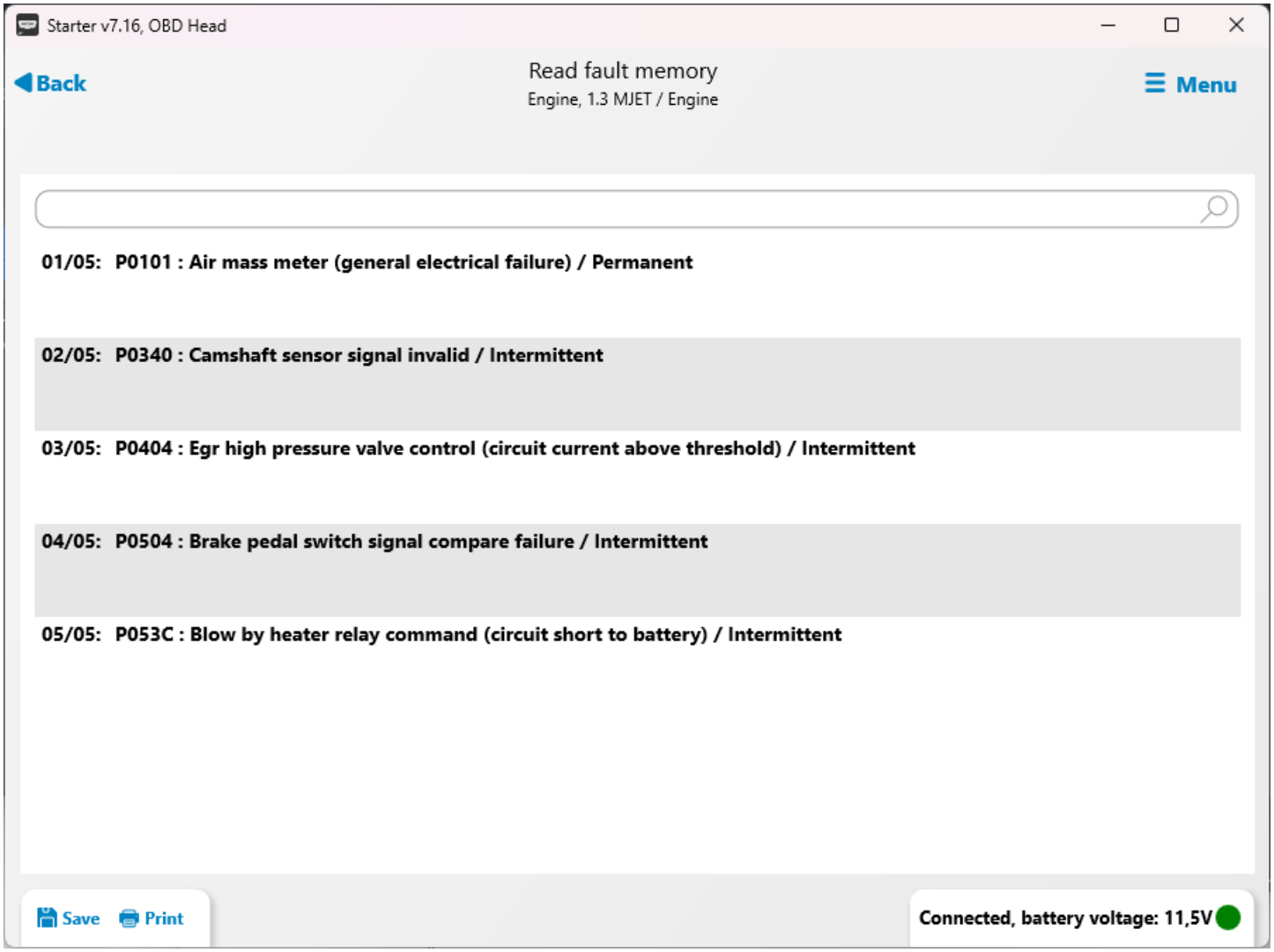

Figure 8

Clearing fault memory

In the previous section, we showed how to read the contents of the fault memory. Now we will show how to clear this memory. It is important to note that the fault memory can only be cleared if it has been read beforehand. After selecting the corresponding item in the Diagnostics menu, a dialog window will appear asking for confirmation to clear the memory (Figure 9).

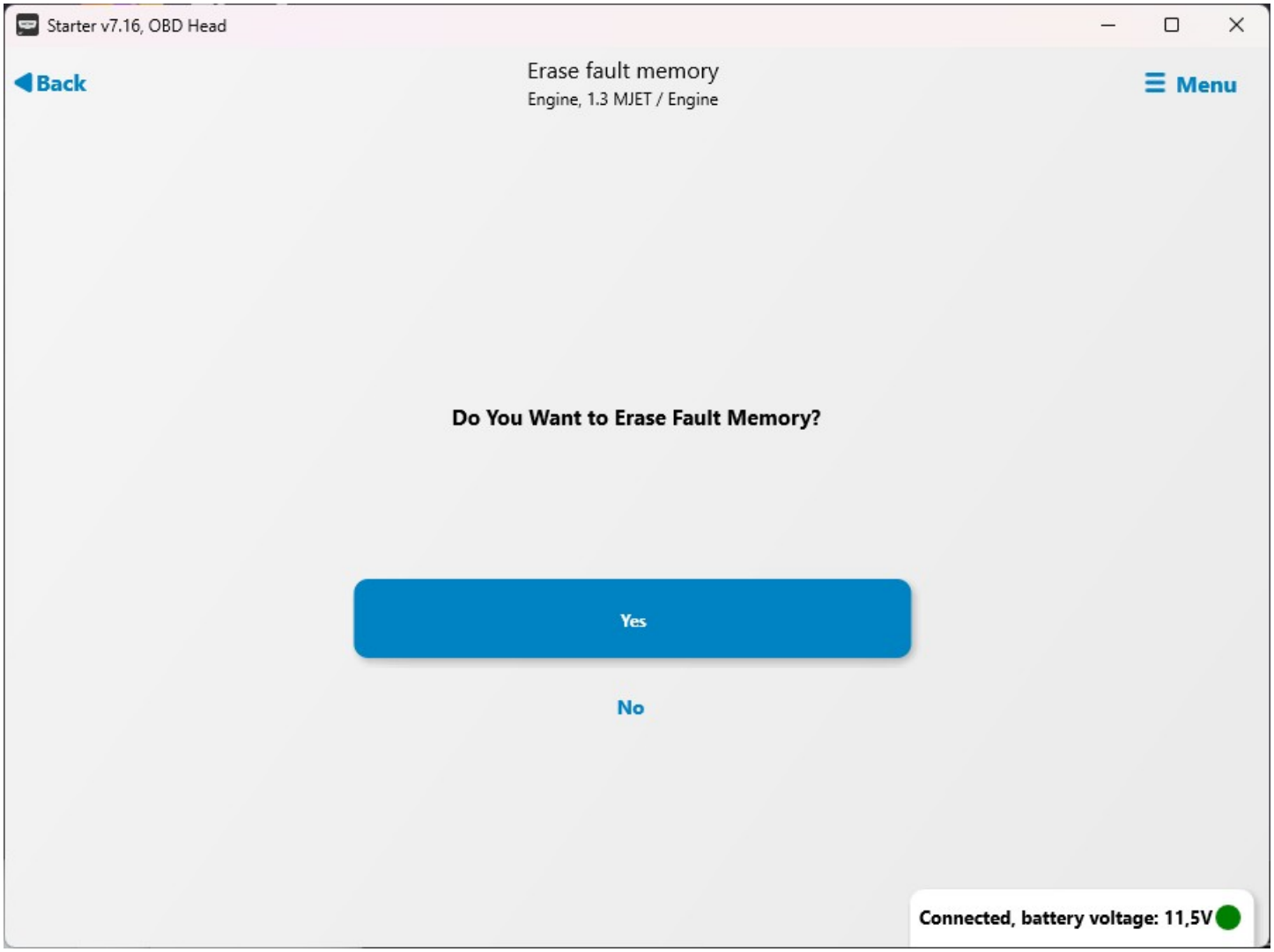

Figure 9

Clicking the YES button will clear the memory, while clicking the NO button will return you to the Diagnostics menu. If the memory has been successfully cleared, an information window will appear. Clicking the Next button will return you to the Diagnostics menu.

System parameters

n the System Parameters menu (Figure 10), you can browse the measured parameters supported by the control unit. For example, for an engine control unit, values such as battery voltage, vehicle speed, intake air temperature, engine RPM, throttle position, and accelerator pedal position are displayed. For a detailed explanation of each item, consult the control unit documentation or the service documentation of the diagnosed vehicle. For diesel engine vehicles, a special DPF Parameters menu may be available in the main menu.

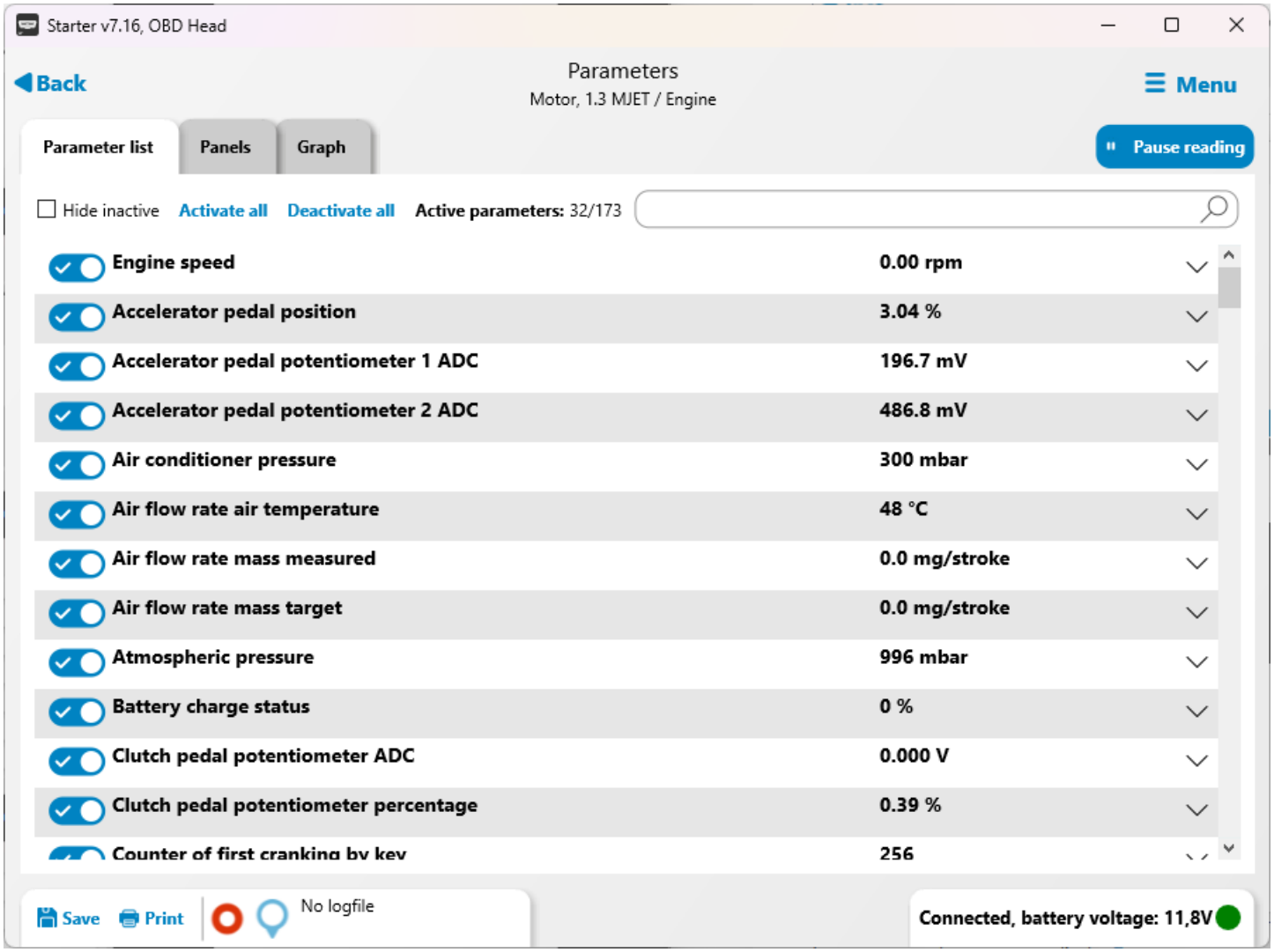

Figure 10

When the System Parameters function is launched, the window (Figure 10) displays all parameters supported by the selected control unit. You can scroll through the parameter list using the scrollbar on the right side of the window or the mouse wheel. Using the switches on the left, you can select individual parameters for saving or logging. The Save or Start (red circle) buttons in the toolbar below the displayed parameters allow you to save the parameters for later use. The Print button prints the displayed parameters, and the Pause Reading button pauses the parameter display.

The difference between saving parameters using the Save and Start buttons is as follows:

- The Save button is used for a one-time recording of all displayed parameter values into a file. The saving procedure is similar to saving the fault list, as described in Reading Fault Memory.
- The Start button allows you to start long-term recording of the measured (selected) parameters, also called logging. All displayed parameters are saved to a file, and the recording length is limited only by the memory size used for storing the data.

Monitored parameters can be selected and activated using the switches on the left, and inactive parameters can be hidden using the switch at the top left.

Another useful feature when displaying parameters is the so-called panel view. This type of display can be activated by clicking the Panels tab (Figure 11). Parameters are shown in a 3 × 3 matrix, meaning the maximum number of parameters is 9. If more than 9 parameters are selected, only the first 9 active parameters will be displayed. Parameter selection is done in the previous Parameters List tab. If fewer than 9 parameters are selected, three dashes will appear in the empty fields.

The selected parameters can also be displayed in a graph using the Graph tab. This allows you to monitor the changes in their values over time (Figure 12). The number of parameters that can be tracked simultaneously is limited to 8.

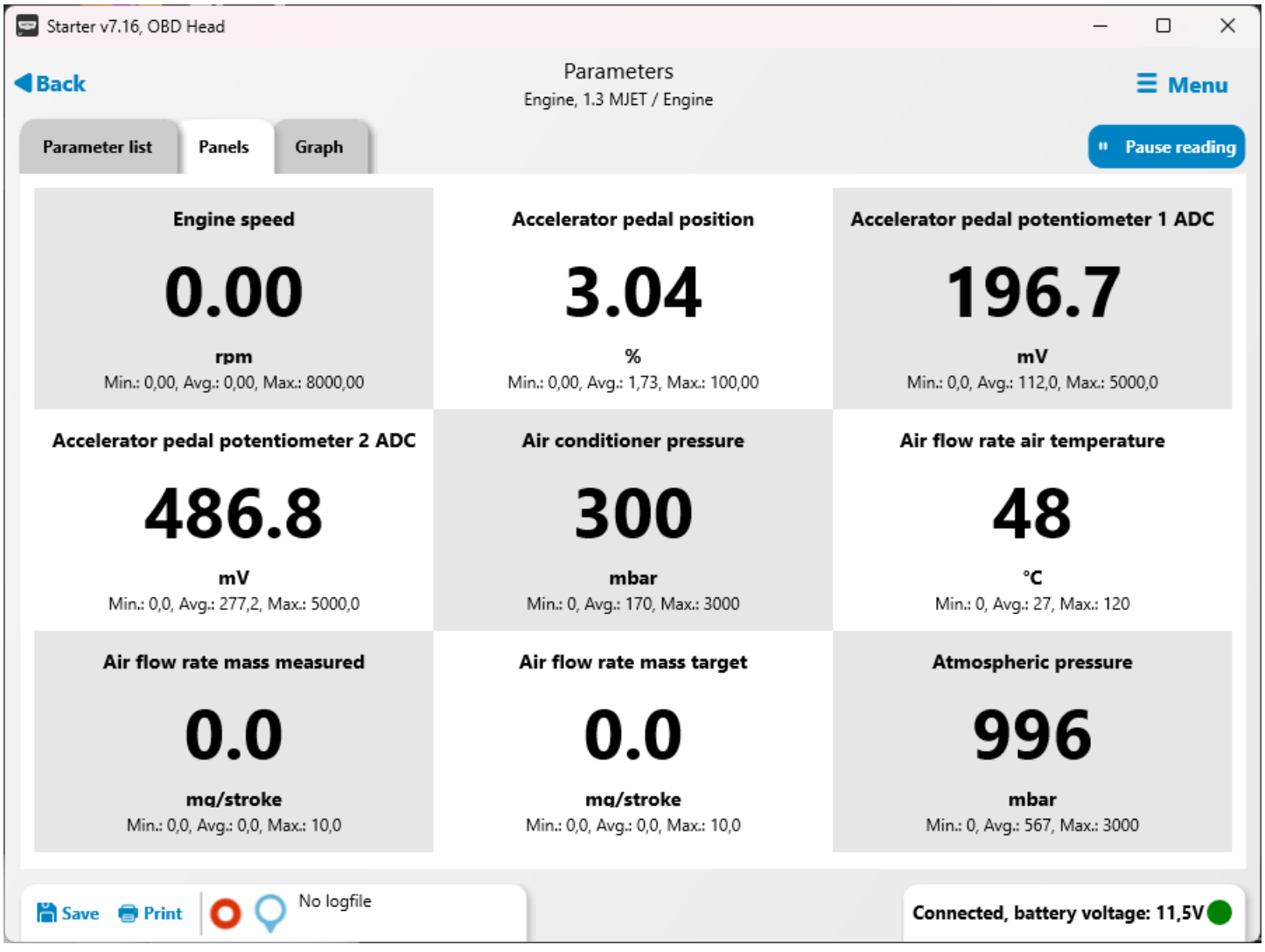

Figure 11

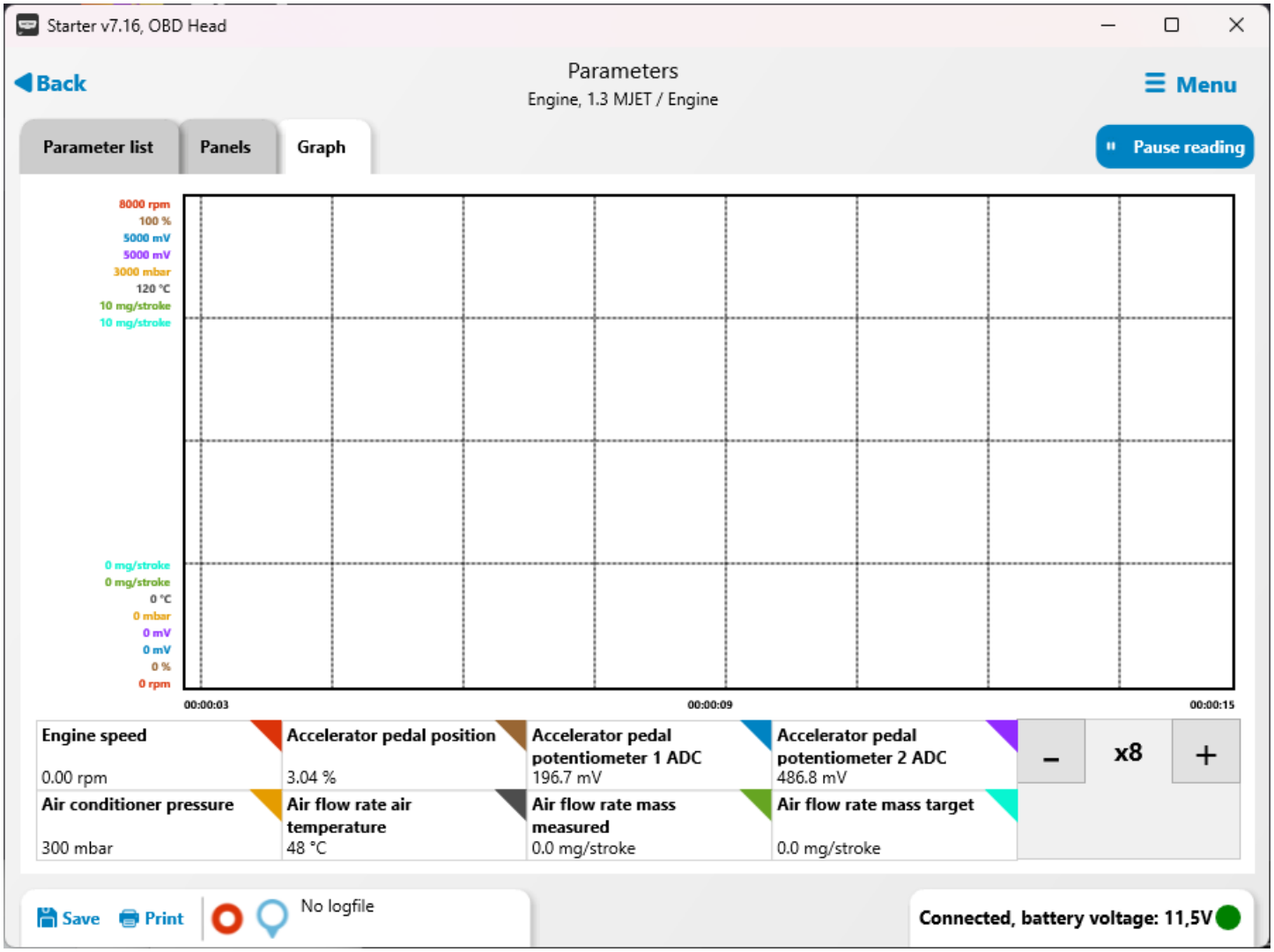

Figure 12

Actuator test

Another option in the main menu is the Actuator Test. This menu allows you to test the functionality of system actuators. For example, in an engine control unit, tests are available for fuel injectors, fuel pump relays, warning lights, glow plugs, and many others (Figure 13). It is important to note that the number and types of actuators depend on the specific system, its manufacturer, and the vehicle's production year.

The Actuator Test allows you to test the complete path from the control unit to the actuator, including the control unit's output circuits, connectors, wiring, and the actuator itself.

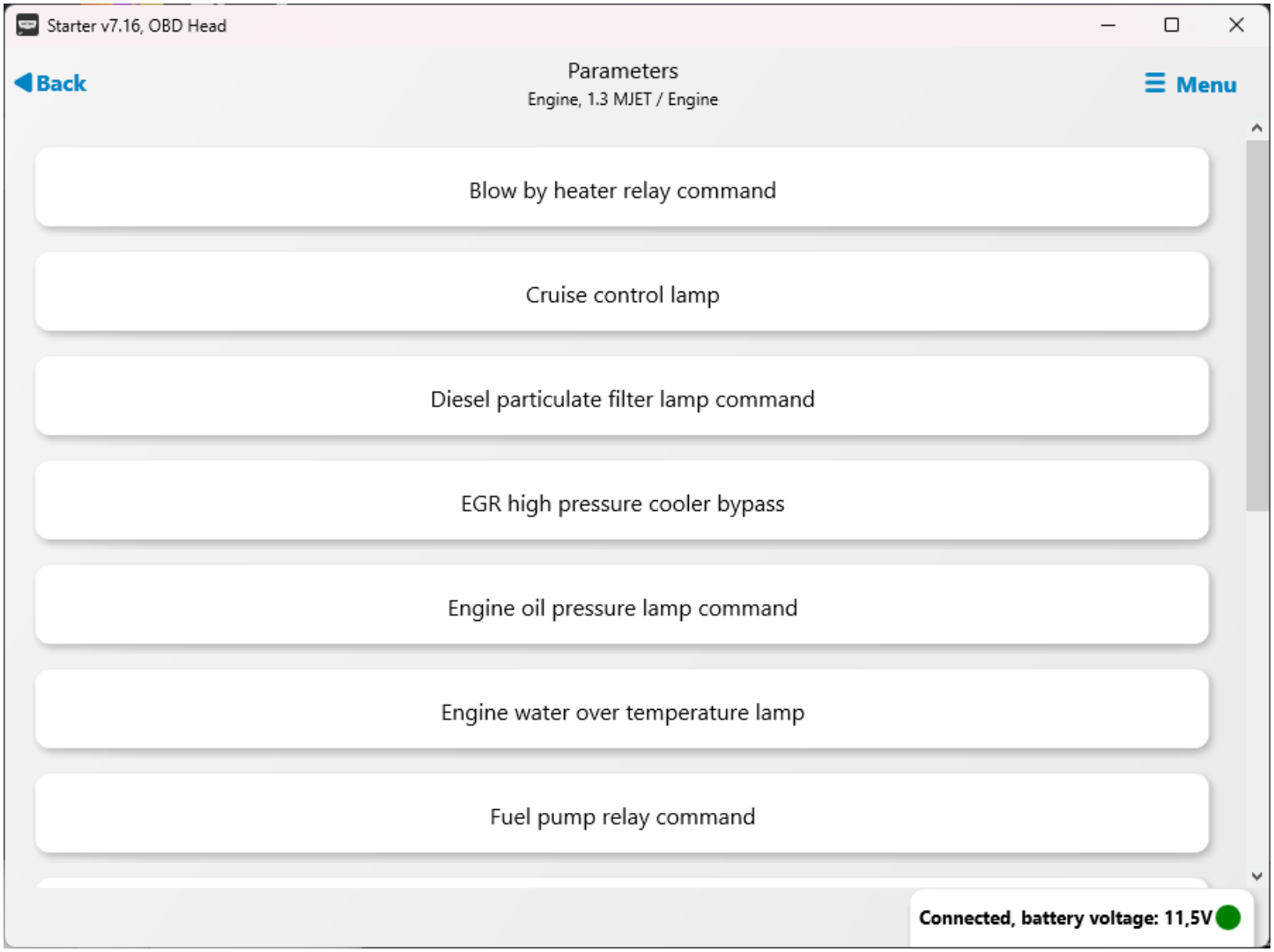

Figure 13

When an actuator from the menu is activated, a window appears on the screen showing information about the ongoing test (Figure 14). During the test, the actuator's function can be monitored visually or audibly.

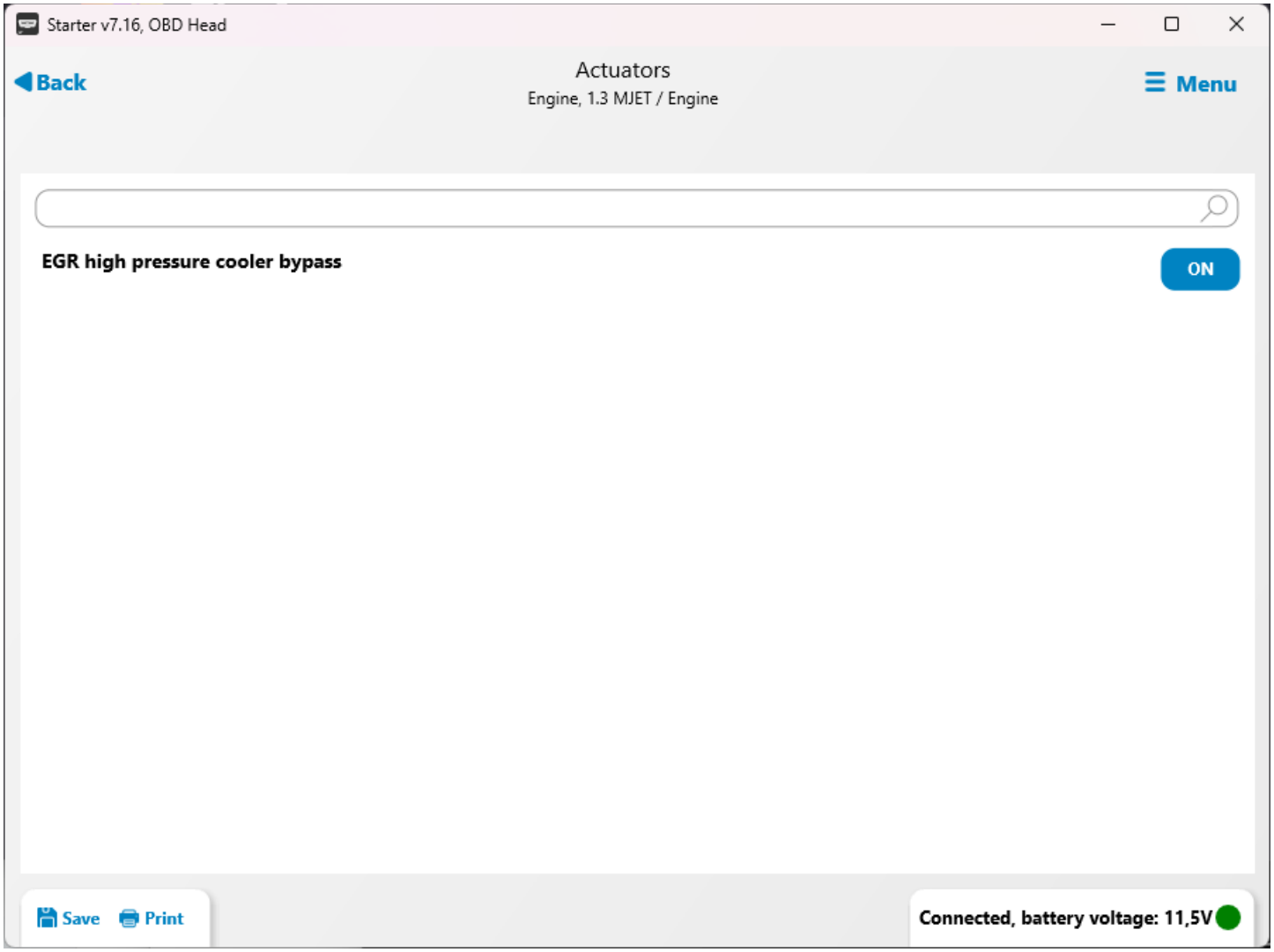

Figure 14

Component replacement and adjustment

This menu item includes all functions used to set important system parameters, configure the system, and perform initialization after component replacements, etc. Examples of these functions can be seen in the images below.

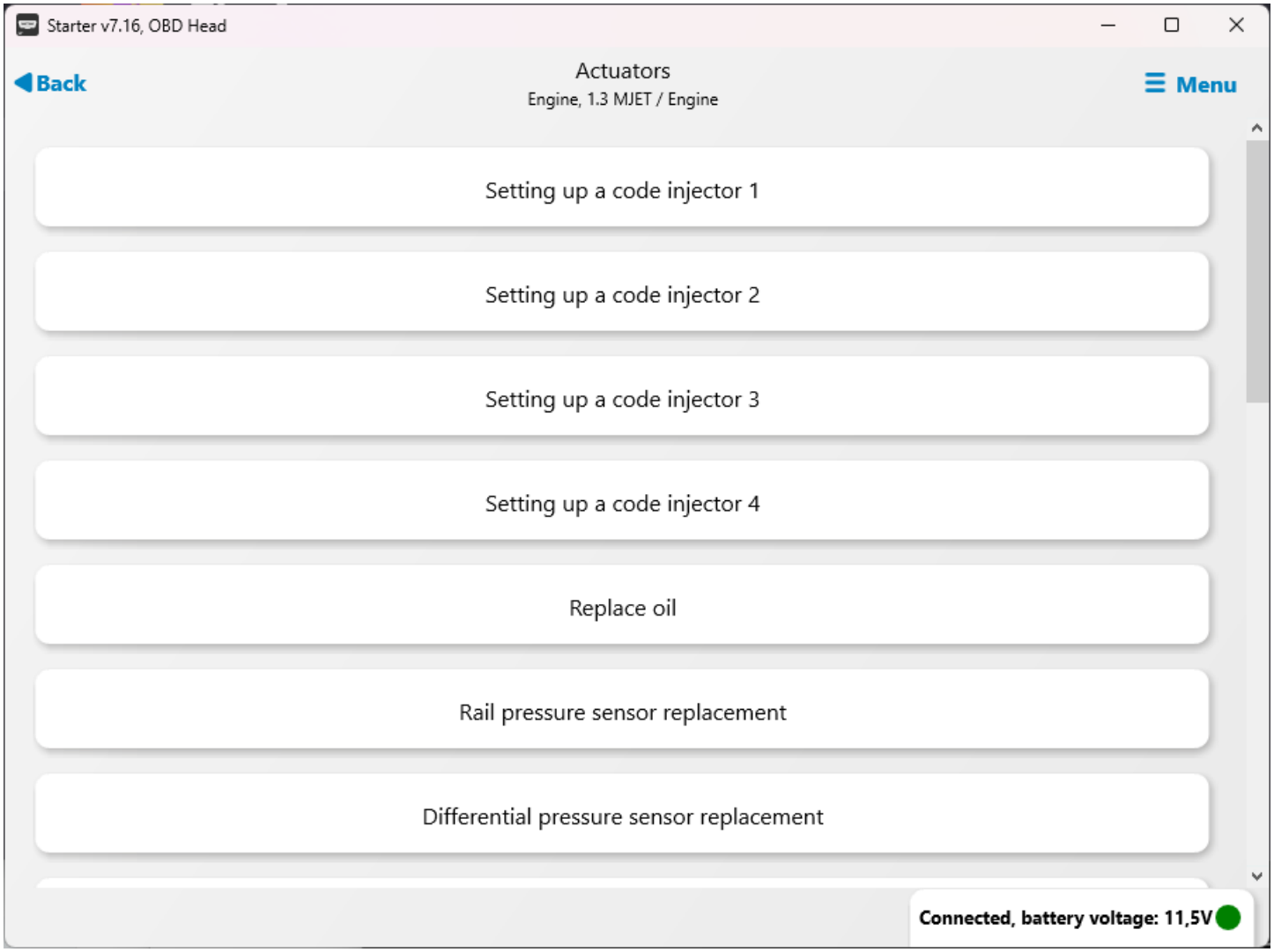

Figure 15

The number and type of available functions in this menu depend on the specific system. You may find, for example, the functions described in the following sections. Always follow the instructions displayed when each function is launched.

Injector coding

One of the most common functions in a common rail system is entering the injector calibration numbers. The calibration constant contains the mechanical parameters of the injector, so it must be entered after each replacement or repair of the injector. The length of the calibration constant varies depending on the type or manufacturer of the injector.

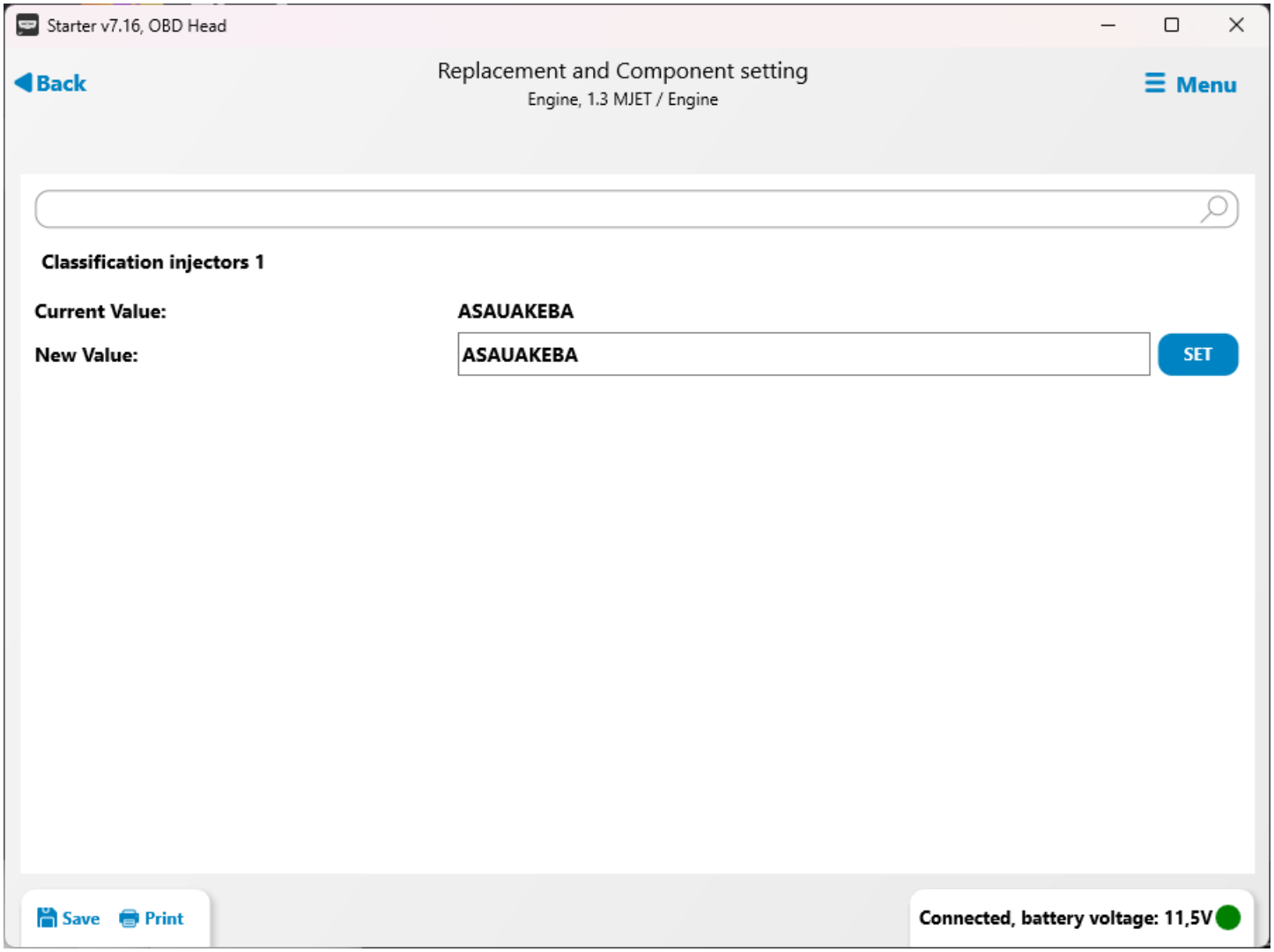

Figure 16

Diesel Particulate Filter (DPF) Regeneration

Another important function in diesel systems is the ability to regenerate the particulate filter. During driving, the DPF gradually fills with soot, and over time it can become clogged. In such cases, the regeneration function is used.

When this function is selected from the menu, the device sends a regeneration request, and the system, if all conditions are met (especially engine and exhaust temperatures), initiates the regeneration sequence. The system controls the entire sequence automatically, and the process may take several minutes.

Steering Angle and Acceleration Sensor Calibration

In ESP systems, this menu includes functions such as calibrating the steering angle sensor and longitudinal or lateral acceleration sensors. These functions are especially important after replacing the mentioned sensors. The steering angle sensor must also be calibrated after any service intervention in the vehicle's steering.

Configuration Settings, e.g., Airbag

This function allows you to change airbag configurations, such as enabling or disabling individual system components, including seatbelt pretensioners, passenger airbags, side or head airbags, and others. To change a parameter, click the corresponding button. All modified items are marked with an asterisk (*). Once you are certain of the desired changes, press the Save button to store them in the control unit. After this procedure, it is recommended to turn off the ignition and check the control unit's fault memory.

VW Group Diagnostic Differences

The following sections describe diagnostic functions that are specific to VW Group vehicles. Differences in the operation of standard diagnostic functions will also be explained. Figure 17 shows a typical appearance of the main diagnostics menu for an older VW Group vehicle.

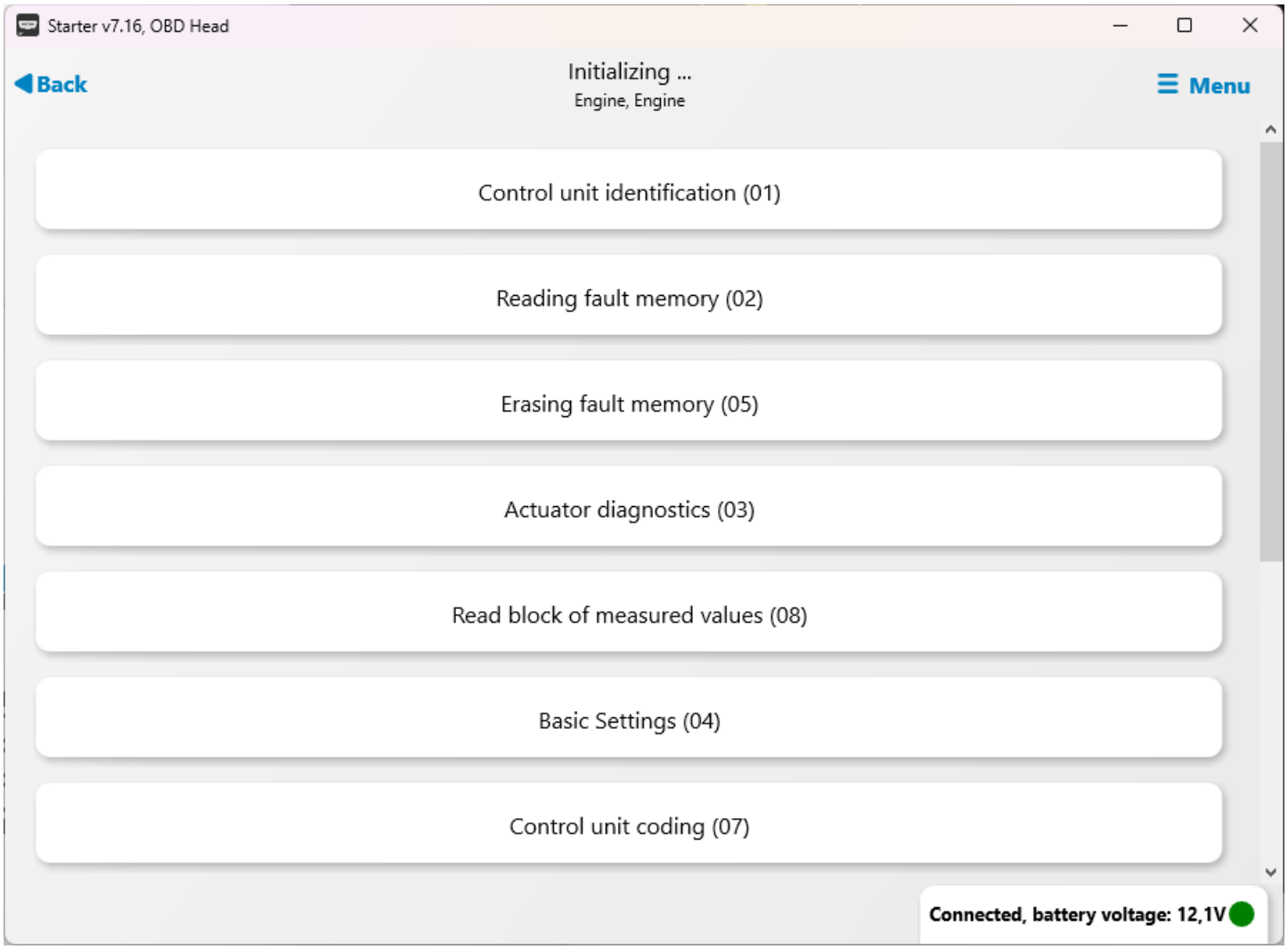

Figure 17

Actuator Diagnostics

The Actuator Test, especially on older VW Group (VAG) vehicles, differs from tests on vehicles from other manufacturers. When this menu is selected, a list of actuators does not appear as it does for other brands. Instead, the device simply sends a request to activate the actuators. The control unit then activates each actuator in the order programmed.

The operator only controls the sending of requests to start the next test by clicking the Next button. If another request is sent and the unit has already completed all tests, a window appears on the screen indicating that the test is finished. The test is controlled using the ON and NEXT buttons on the right side of the window (Figure 18).

On newer vehicles, actuators are activated individually, just like with other brands.

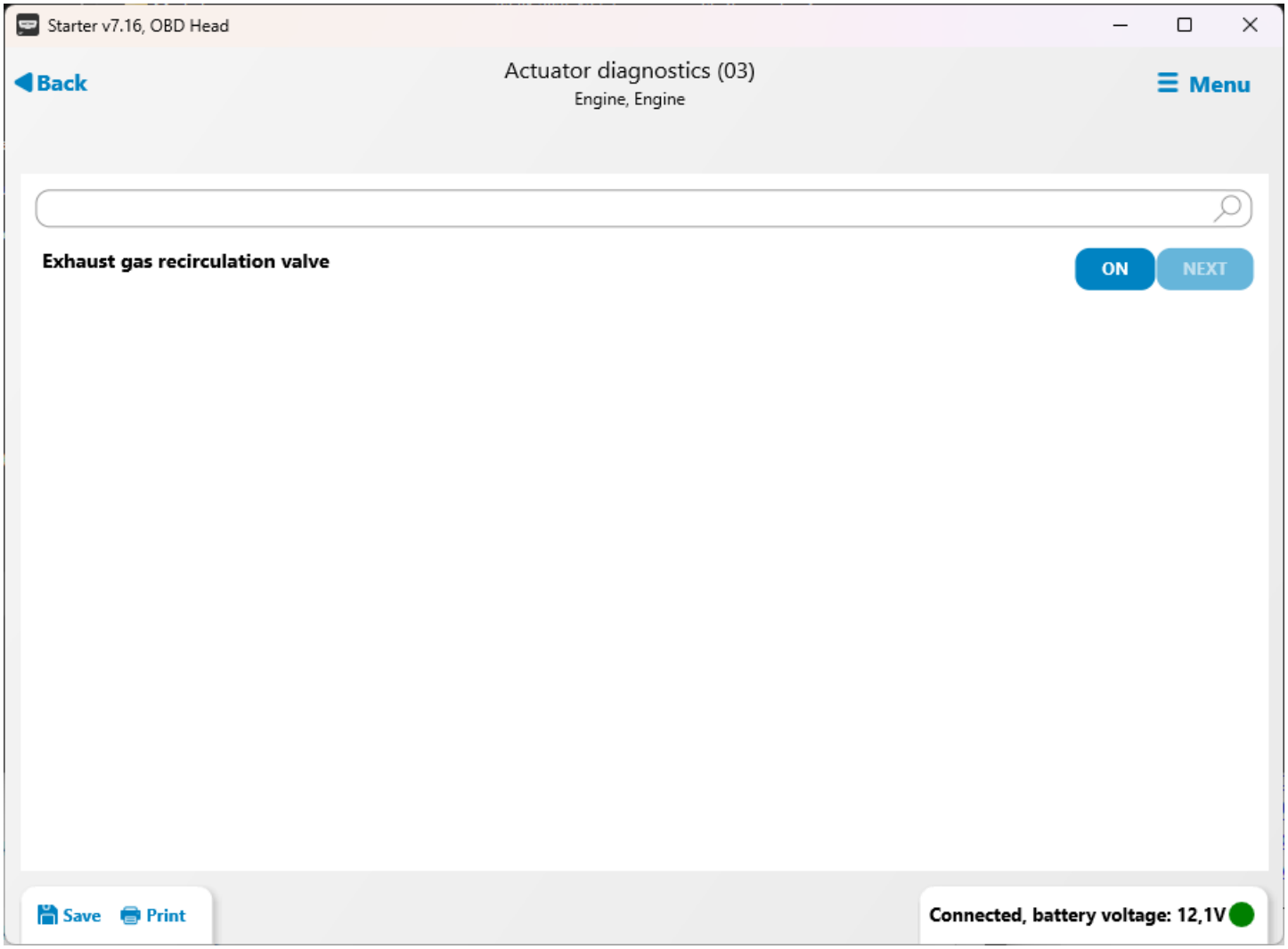

Figure 18

System Parameters (Measured Value Blocks)

On older VW Group vehicles, system parameters are displayed in groups. Each group shows 4 parameters, and these groups can be switched freely.

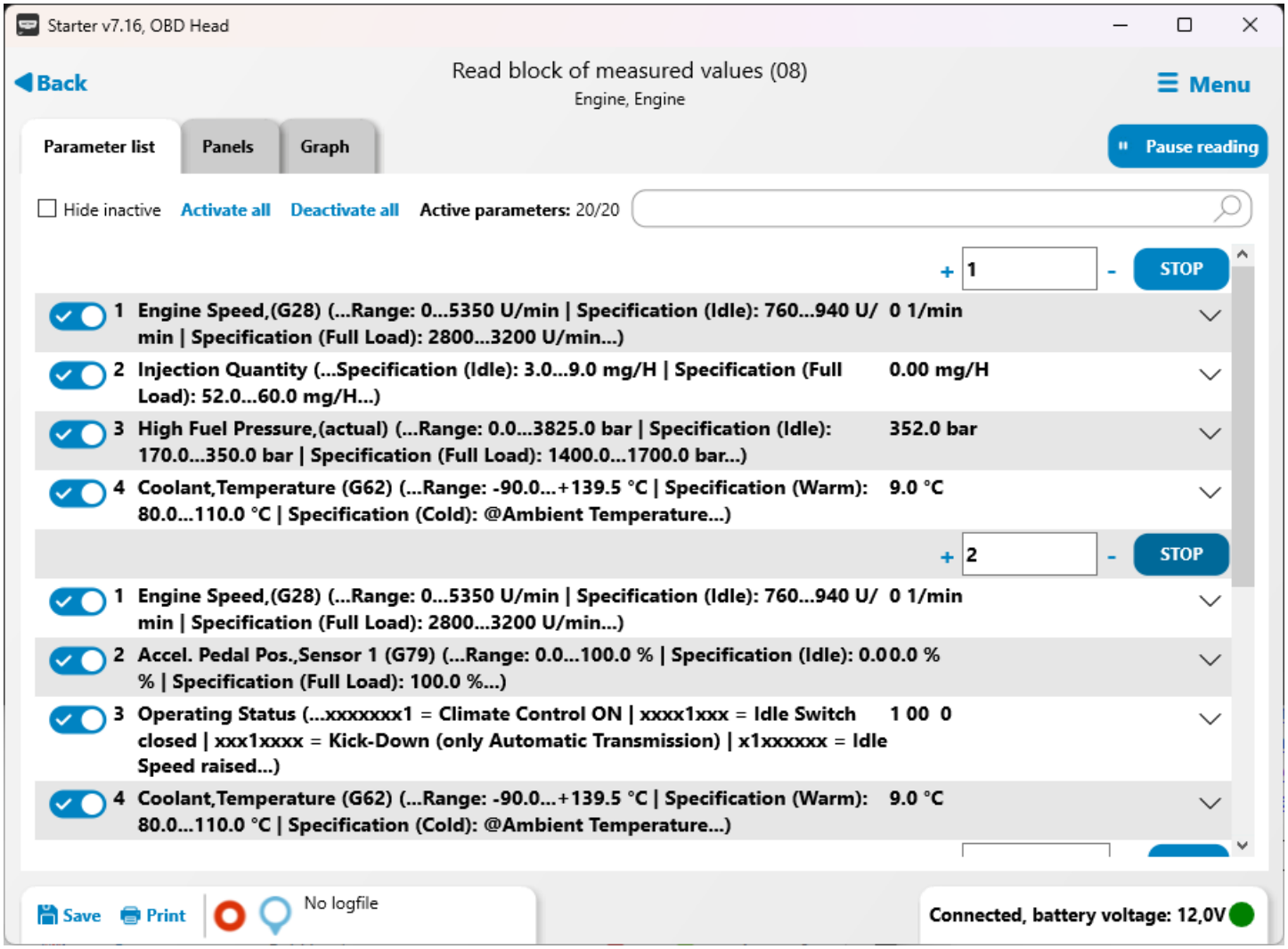

Figure 19

Basic Settings

The Reset to Basic Settings function allows you to clear the control unit's adaptation values and return to default settings. This function is most commonly used for throttle body calibration, bleeding the ABS hydraulic system on newer vehicles, or calibrating xenon headlights. In the menu, select the desired basic settings group.

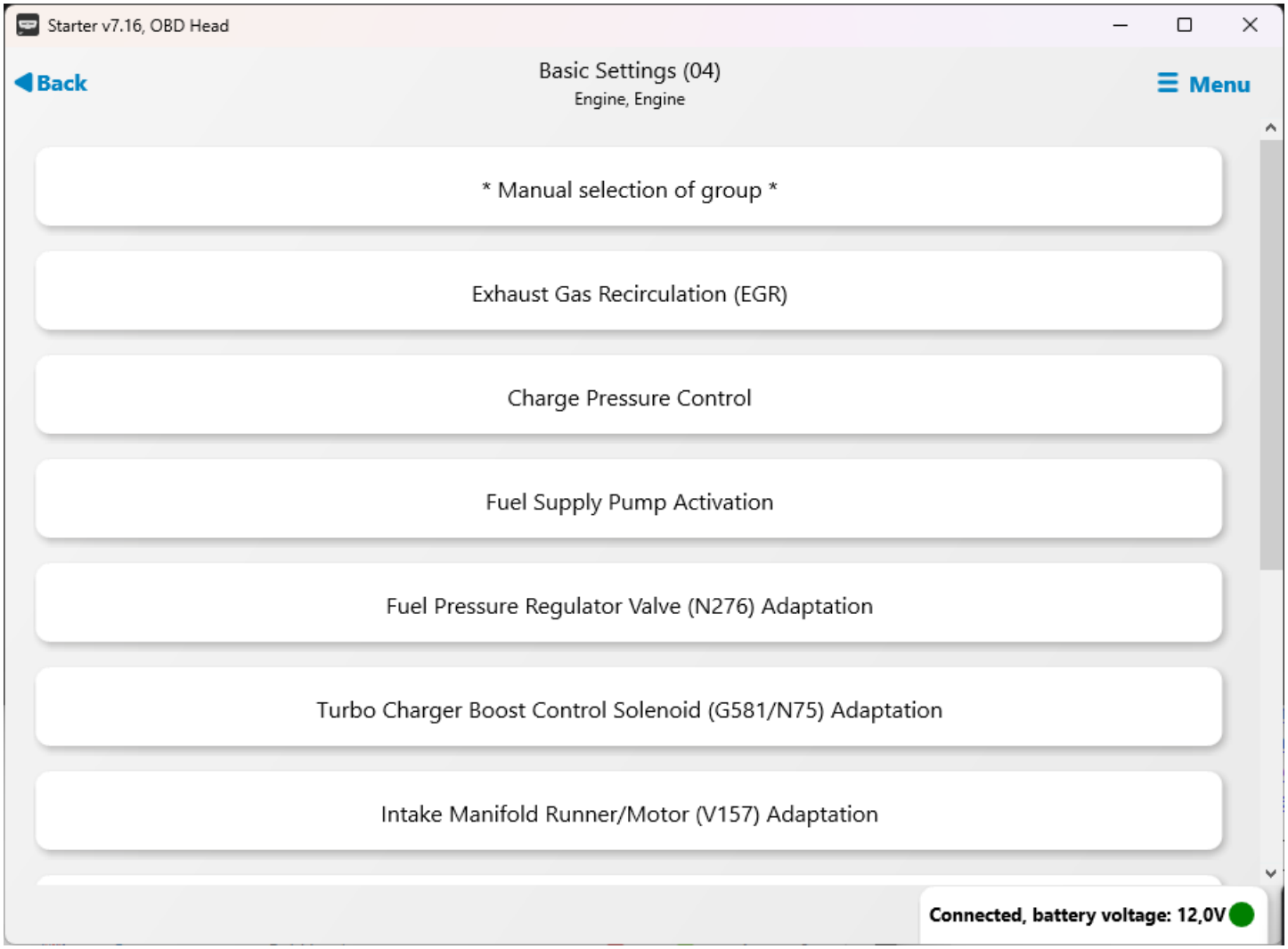

Figure 20

The program displays a window where the selected setting can be started. In this window, you will also find values of related parameters, as well as the group number. If you know the specific group of the basic setting you are looking for, you can enter it here and confirm by pressing the button on the right. Manual group selection can also be done by clicking on "Manual Group Selection" in the Basic Settings menu (Figure 20). Note that manually selected groups may not be supported by the control unit or the diagnostic tool.

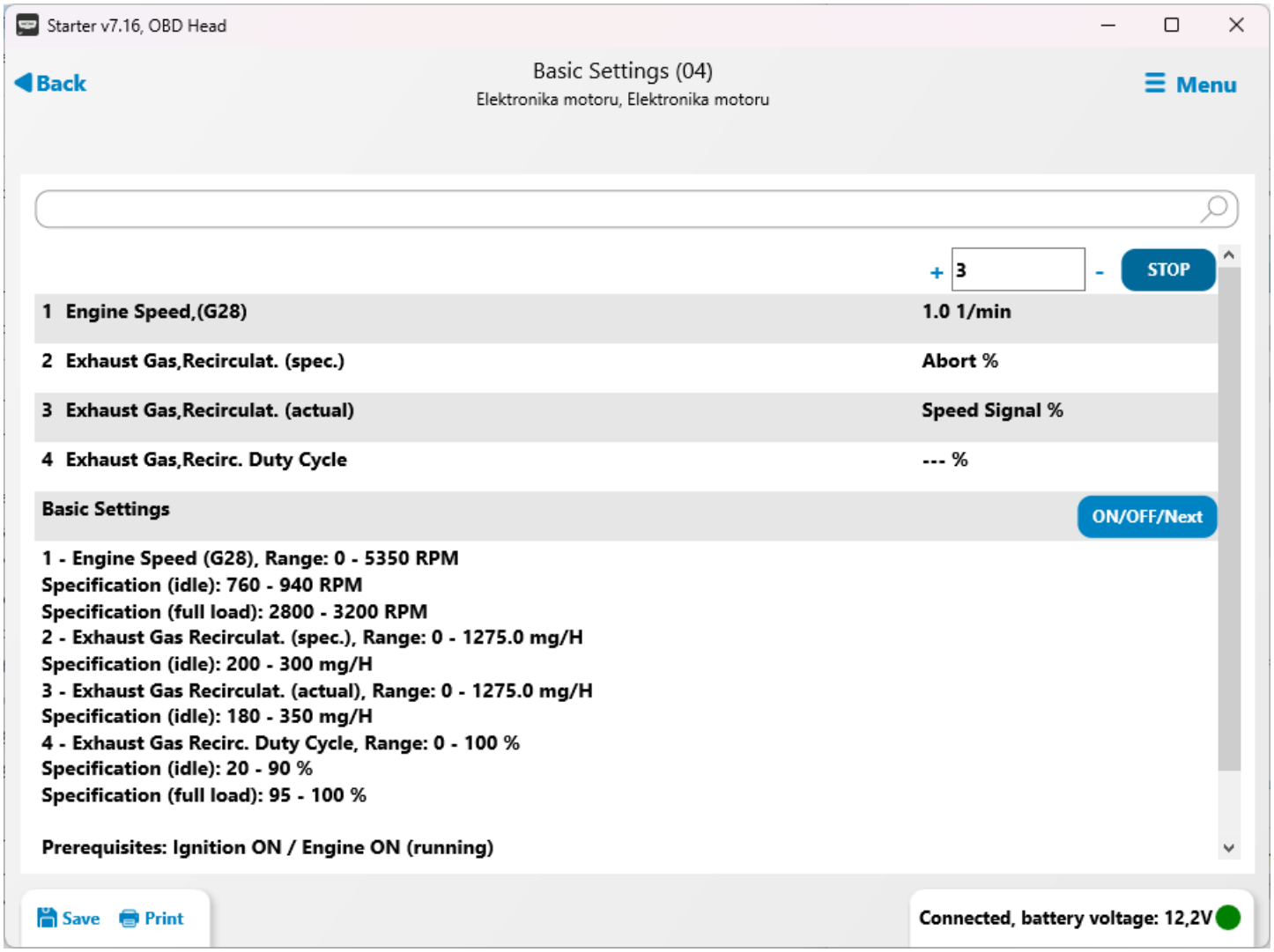

Figure 21

The basic setting is started by clicking the SET button next to the selected group (top right of the window). The process can be controlled using the ON/OFF/Next button on the right side of the window (Figure 21).

Control Unit Coding

Using the Control Unit Coding function, a 5-digit code representing the configuration of the control unit for the specific vehicle is entered into the control unit (Figure 22). For engine control units, this code differentiates, for example, whether the vehicle has an automatic or manual transmission, whether ABS or air conditioning is installed, and so on.

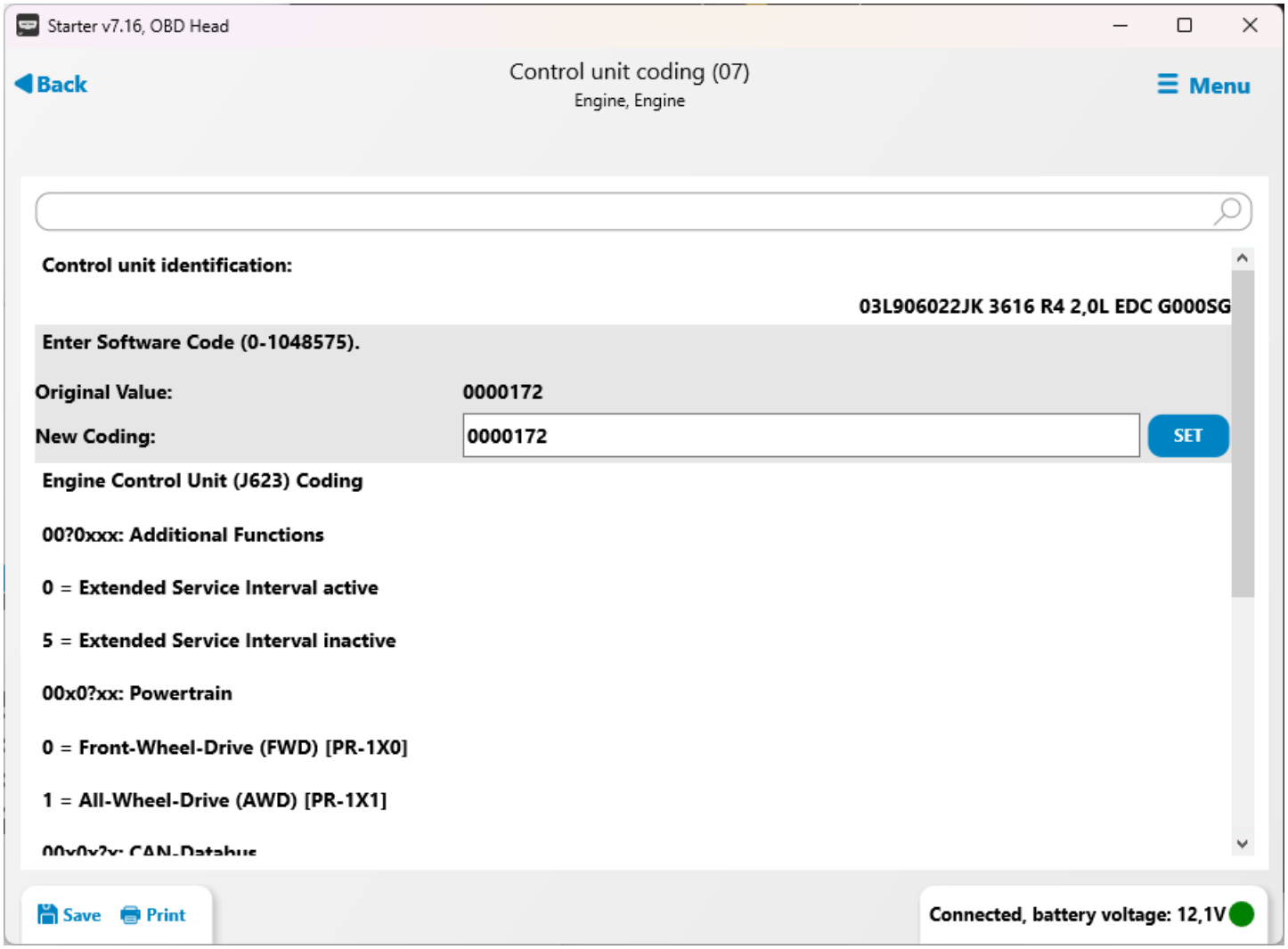

Figure 22

In the Control Unit Coding window, you will find a display of the current value, a field for entering the new coding value, and the SET button. Depending on the specific unit, explanations for coding the control unit are also provided. These can help you determine whether the current value is entered correctly and make any necessary adjustments. After pressing the SET button, you will be prompted to confirm the coding change.

Long Coding

In newer control units communicating via CAN, Long Coding is used to change the configuration. With Long Coding, you can, for example, activate daytime running lights, comfort window functions, coming home lights, and other features in the vehicle.

Instead of a 5-digit code, a hexadecimal string is entered, with a length corresponding to the size of the control unit's configuration memory area. For example, in a Gateway control unit, this is usually 7 bytes, which means a 14-character string. The string, however, can be up to 128 characters long.

The coding string is divided into groups of ten characters. The diagnostic tool offers two methods for entering Long Coding changes. The standard method (Figure 23) allows you to directly type the coding value into the provided field and save it. This option should only be used if you are completely certain of the correct coding value for the unit.

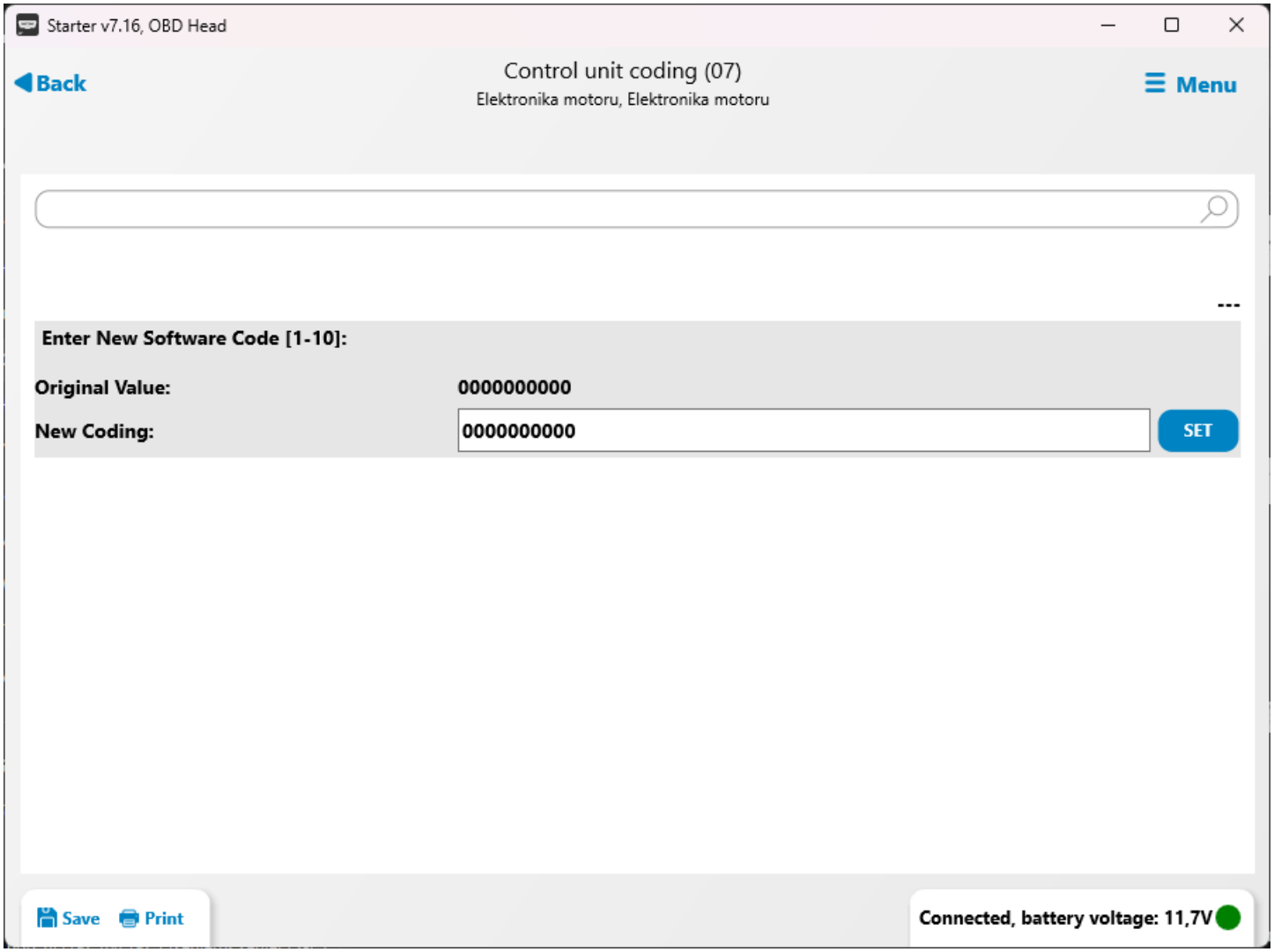

Figure 23

For easier entry of Long Coding, it is recommended to use the Comfort Settings function (Figure 24). The program displays the individual items that make up the final coding, and the user selects the options that correspond to the specific vehicle. The selected values can be saved using the button in the top right corner of the window. The program automatically converts the selected values into a Long Coding string and writes it to the control unit.

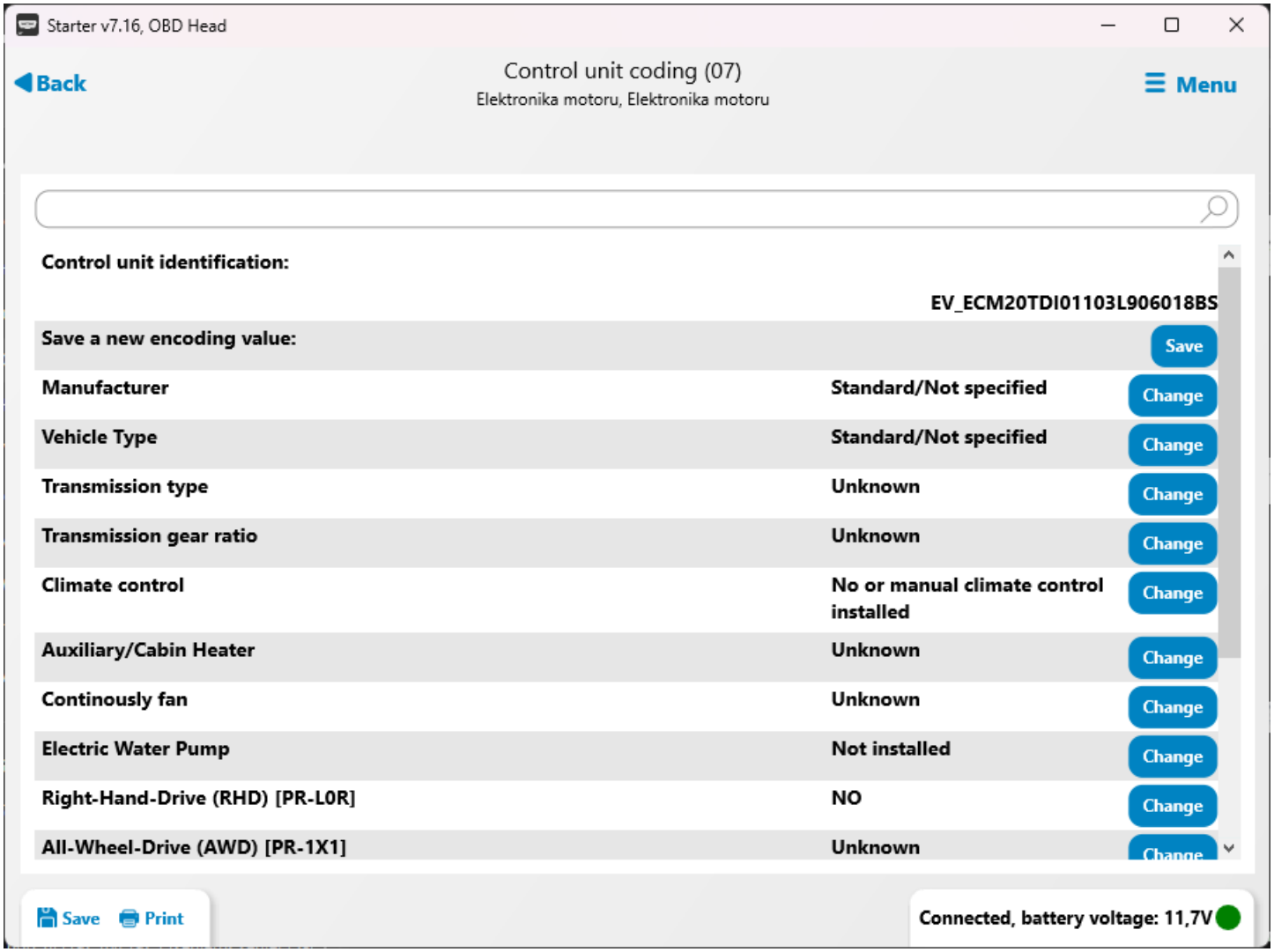

Figure 24

Adaptation

The Adaptation function (Figure 25 and Figure26) allows specific adjustments (adaptations) of control units. Using this function, you can reset service intervals, correct the starting dose of TDi engines, set idle speed, adjust fuel injectors in Common Rail engines, disable airbags, and perform many other tasks.

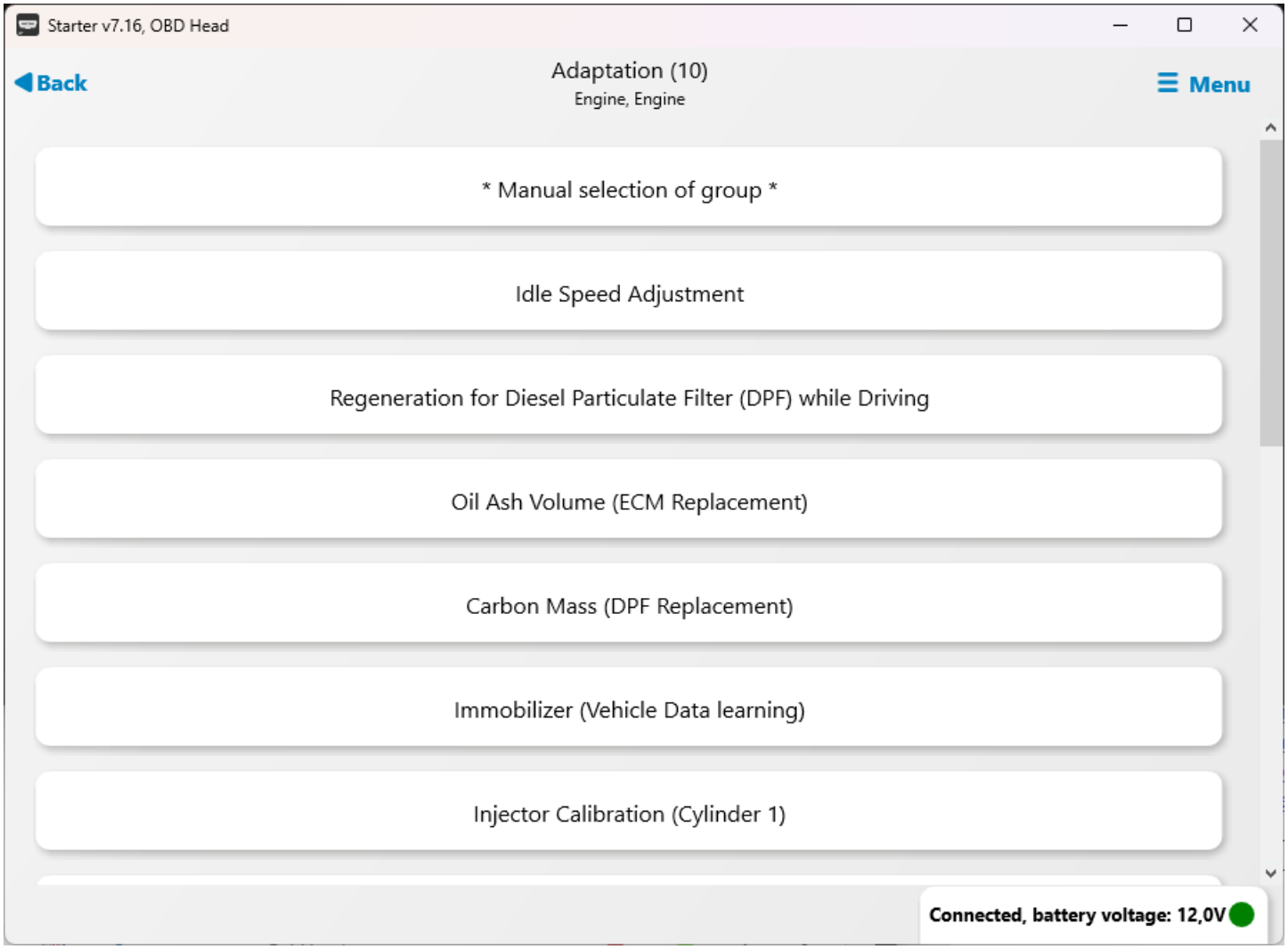

Figure 25

The displayed window may vary depending on the specific function. Follow the instructions provided in the program. For example, when calibrating injectors, the value printed on the new injector is entered into the displayed field. Similar to Basic Settings, it is also possible to manually select a settings group by choosing "Manual Group Selection" in the Adaptation menu. Note that manually selected groups may not be supported by the control unit or the diagnostic tool.

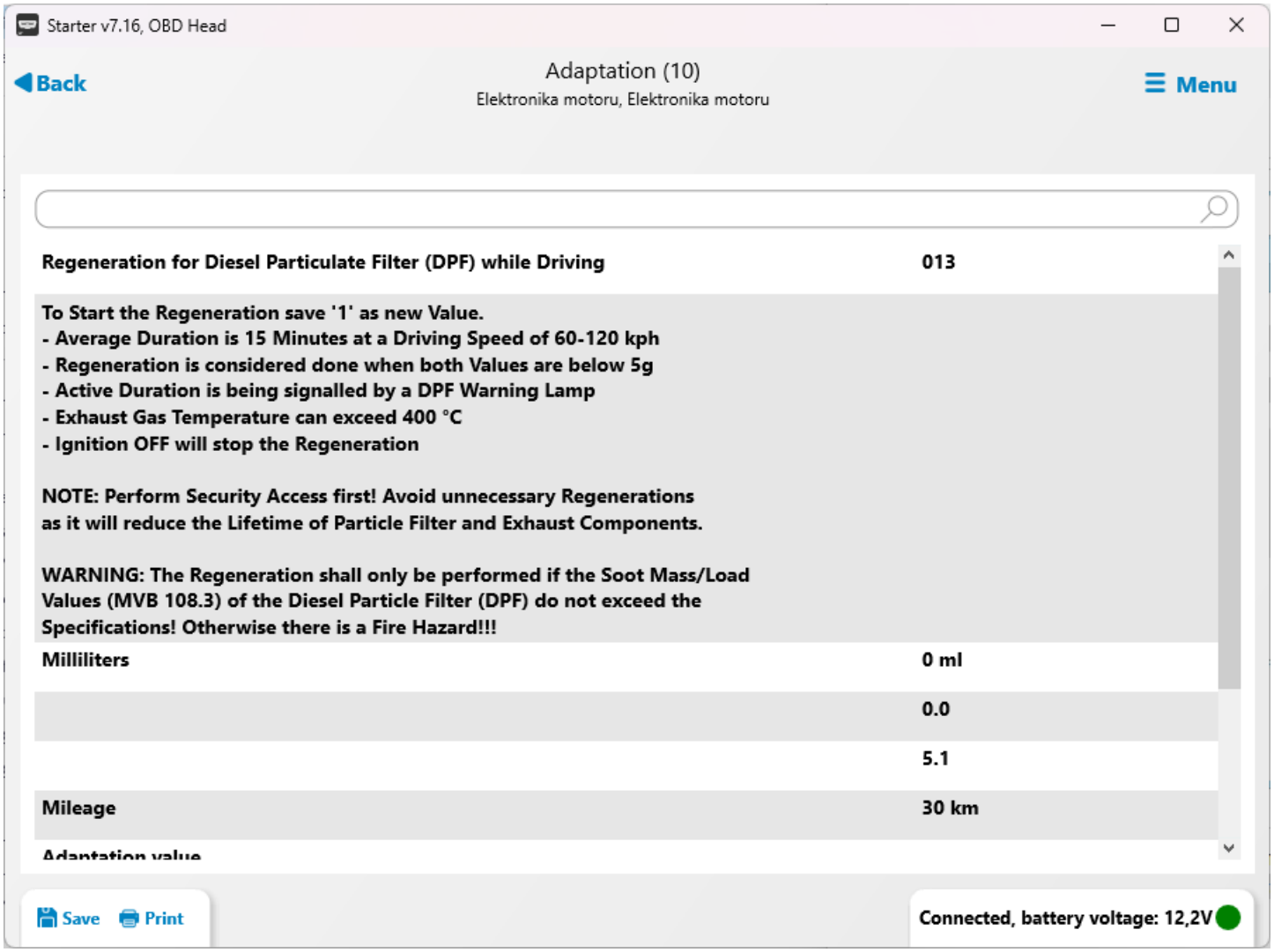

Figure 26

Login and Security Access Procedure

For some control units, it is necessary to enter an authorization code or password before performing certain operations (such as key learning or programming). Without entering this code, the operation cannot be carried out. Therefore, when performing adaptations or resetting to basic settings, you may encounter a warning that the function is unknown or cannot be executed.

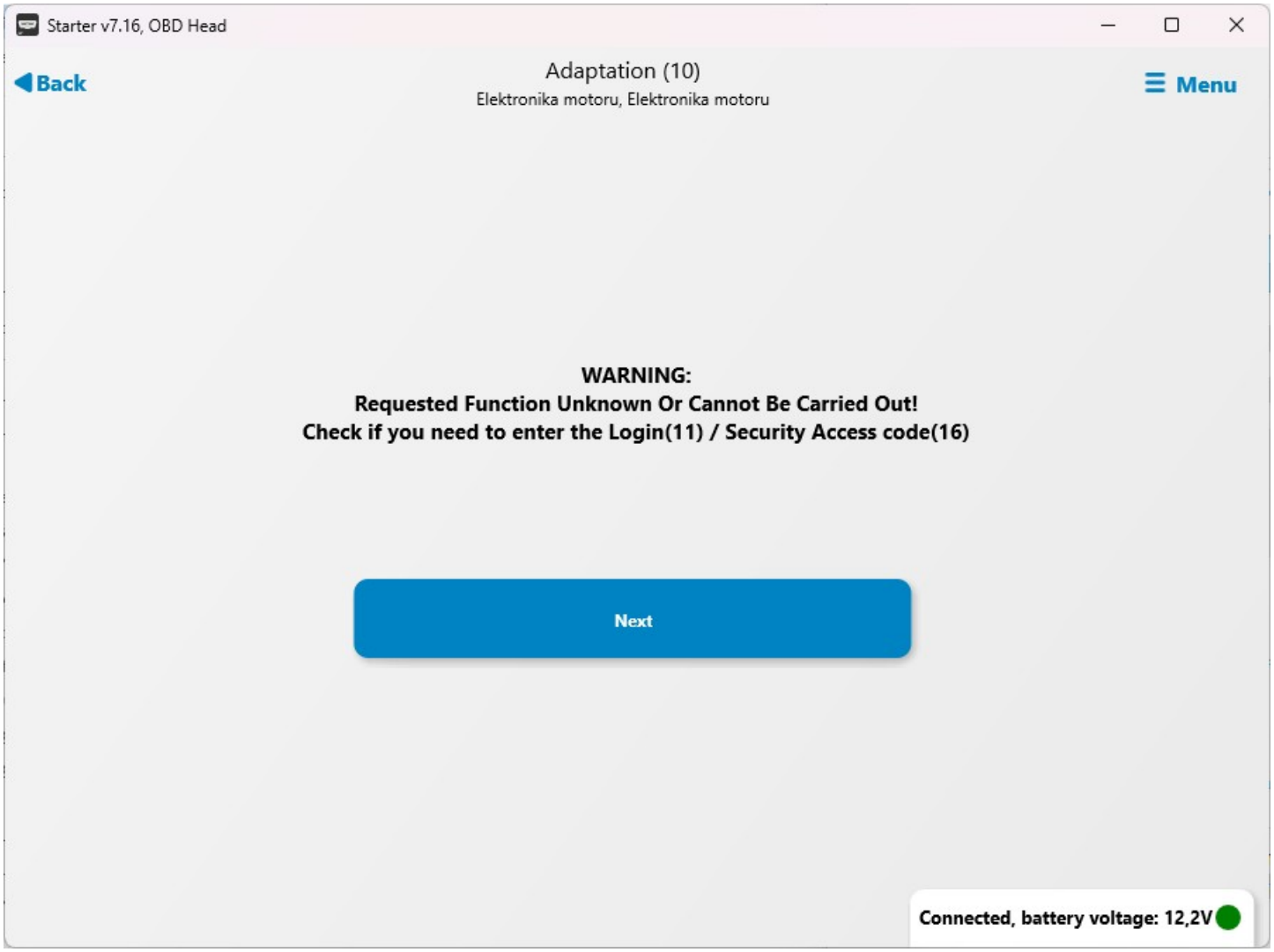

Figure 27

To access these locked functions, go to the main menu and select Login or Security Access, depending on what is available for the specific control unit. Entry is performed the same way as standard coding. Enter the value to unlock the desired functions into the provided field, following the guidance displayed below the entry field (Figure 28). Save the value by clicking the SET button. The values remain active for the duration of the connection with the control unit. After disconnecting and reconnecting the diagnostic tool, or in the event of a power loss in the vehicle, it will likely be necessary to perform Login or Security Access again.

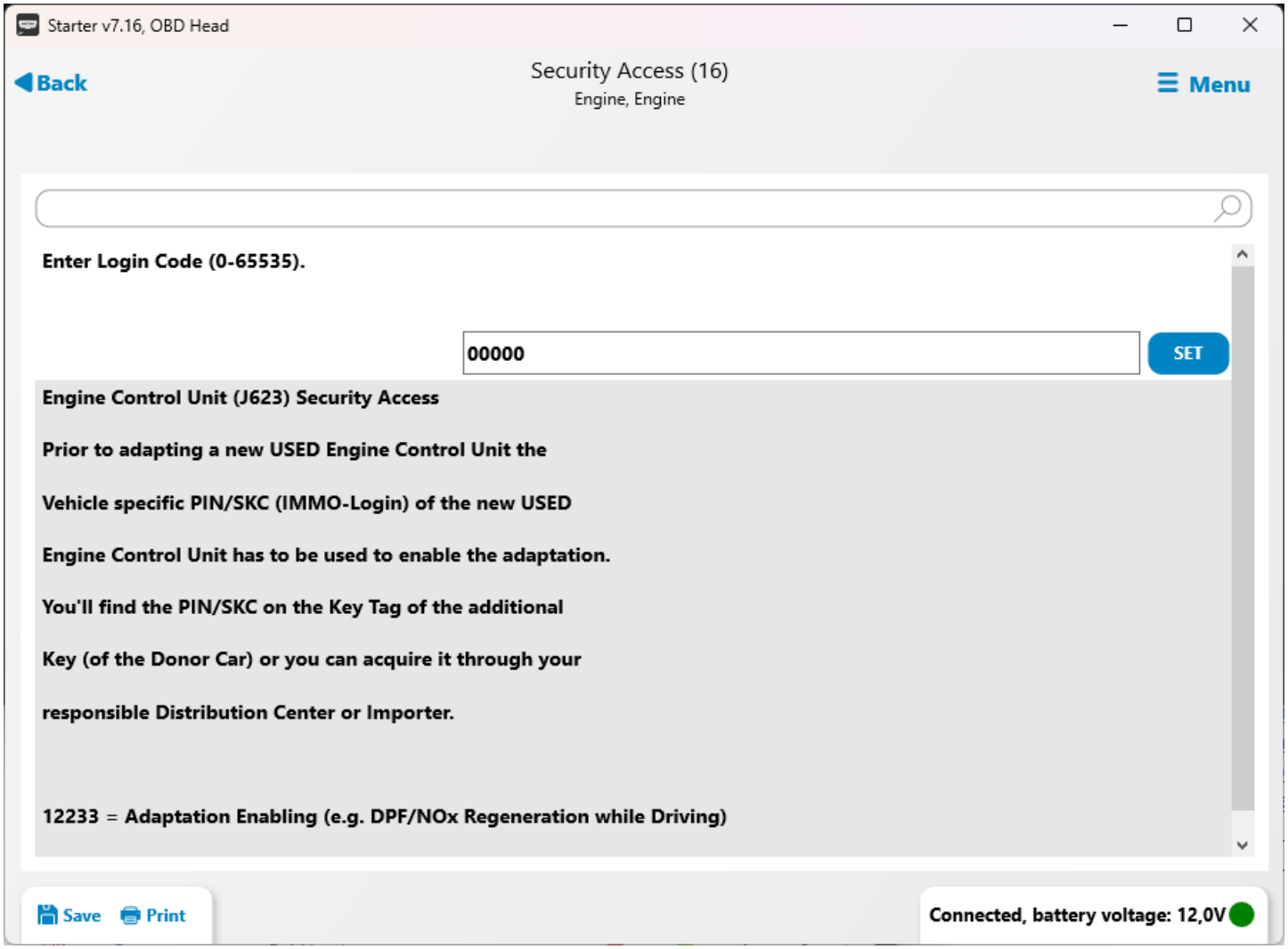

Figure 28

Reading the Readiness Code

The Readiness Code appears in vehicles from 1996 onward (OBD-II compliant) and is related to the operation of the catalytic converter and oxygen sensors.

TSPro Special Functions

The TSPro Special Functions menu contains a group of predefined functions (Figure 29), that simplify performing complex operations without needing detailed knowledge of specific settings or configurations. Examples include throttle body adjustment, fuel dose setting, injection timing adjustment, DPF regeneration, brake bleeding, turning daytime running lights on/off, steering angle sensor calibration, and many others. This menu is available for selected control units, primarily in VW Group vehicles, and the list of available functions depends on the type of control unit.

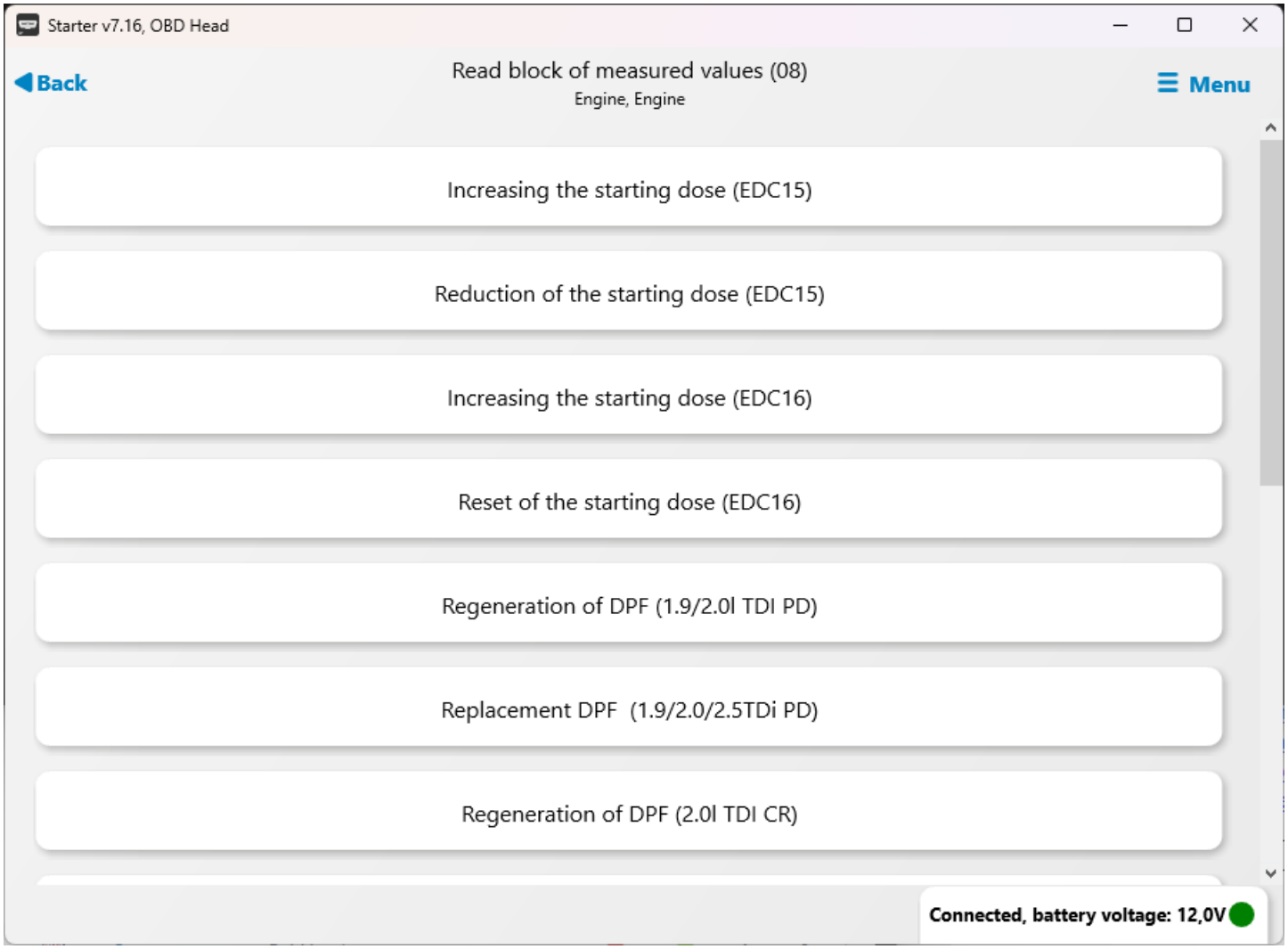

Figure 29

Ending the Connection

After completing the diagnostics, the device must be properly disconnected from the vehicle. This is done by pressing the End Connection button in the main menu. You will be prompted to turn off the vehicle ignition. After confirmation, the control unit selection menu will reappear on the diagnostic device screen.