

HJS Service Unit with SCR Dosing Pump



System Unit for SCRT® Systems

Technical Description
User's Manual



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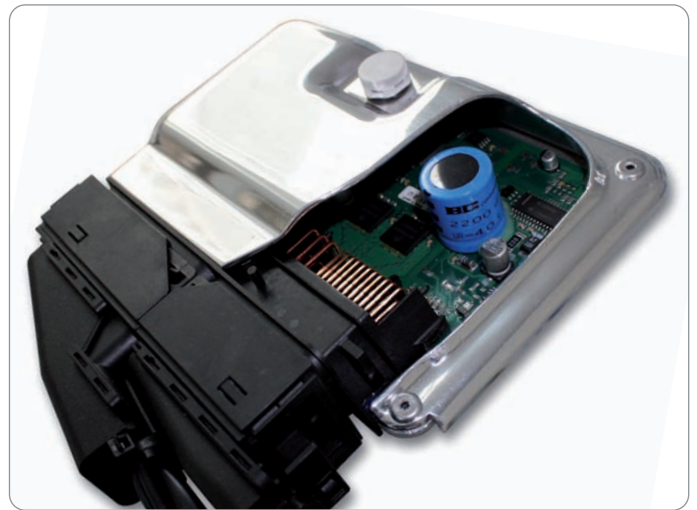
Dear customer!

HJS Fahrzeugtechnik GmbH & Co KG congratulates you on your decision to equip your vehicle with an HJS Service Unit. The instructions described in this document and stipulated by the manufacturer must be complied with. Non-compliance will result in the exclusion of all claims for warranty and of liability on the part of HJS Fahrzeugtechnik GmbH & Co KG for any form of personal injury and material damage.

The HJS Service Unit is to be used solely to monitor diesel particulate filter systems. The manufacturer shall accept no liability if the product is not used in the manner intended.

The general accident prevention regulations and all other generally recognised rules pertaining to safety and industrial health are to be complied with at all times.

The high standards of safety and quality at HJS Fahrzeugtechnik GmbH & Co KG are guaranteed by continuous ongoing development. Please note that manufacturers install different levels of equipment in their vehicles and that this can result in differences between the description given in this document and the actual situation in your vehicle. Despite having taken great care and attention while compiling this manual, we cannot exclude the possibility of errors. Please understand that no claims will be able to be made on the basis of the data and/or figures in this manual.



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General information

Information about and conventions applied in this User's Manual

> Work instruction or listing

(1) / ① Legend entry in text or a figure/photo

System requirements:

Microsoft Windows 98, Microsoft Windows 2000 or

Microsoft Windows XP

256 MB RAM

500 MHz CPU

10 MB free hard disk space

Safety instructions and warnings



These safety instructions must be observed for the sake of your own safety and the safety of others.



General instructions and additional pieces of information must be observed in order to prevent damage to the vehicle or the DPF® system.



All work procedures with the HJS ECU diagnostics software must be carried out by qualified staff of a vehicle workshop



Technical Description

The **HJS Service Unit** is a system for monitoring SCRT® systems. The filter is monitored automatically by observing the exhaust backpressure and exhaust gas temperature. Operability of the SCR module and the level of additive in the AdBlue® tank are also monitored.

As well as the combustible soot components, particulate filters also collect ash residues that are formed when engine oil is burnt and which cannot be regenerated.

This information is displayed to the operator by means of the **HJS ServiceCheck** display module, which means the operator is aware of the current loading state of the vehicle's particulate filter and the status of the SCR module.

Benefits: **HJS Service Unit**

- > Constant monitoring of the exhaust backpressure
- > Constant monitoring of the exhaust gas temperature
- > SCR system monitoring
- > AdBlue® level monitoring
- > Overload detection for the particulate filter
- > Lower maintenance costs

The **HJS ECU** complies with **VERT** specifications (Swiss certification for particulate filters) and has two separate memories.

1. Measured data memory

In the standard configuration, the induction mass flow rate, exhaust gas temperatures upstream of the CRT® and downstream of the SCR, the NO_x values up- and (optional) downstream of the system, the pump status and the exhaust backpressure are stored for 30 days (as specified by VERT) in a measured data memory (ring memory).

2. Fault memory

All events, such as pre-alarm, main alarm, acknowledgement of the main alarm, AdBlue® tank on reserve or empty and dosing unit fault message are saved to the fault memory and stored in chronological order with a comment.

All data stored in the **HJS ECU** can be read out and analysed on a computer. Data read out are saved in CSV format and can therefore be evaluated using e.g. Microsoft Excel.

Diagnostics units

The HJS Service Unit consists of two diagnostics units.

1. ECU diagnostics

The ECU diagnostics unit integrates the filter monitoring, AdBlue® tank level monitoring and all higher-level functions.

2. Pump diagnostics

The pump diagnostics unit is required for diagnosing the faults and errors that occur in the SCR system.

SCR-Pump

This User' Manual relates solely to the diagnostics software for the SCR pump (1) of SCRT® systems manufacturer by HJS Fahrzeugtechnik GmbH & Co KG. The software is to be put to use whenever the yellow indicator lamp (3) lights up constantly and "SCR FAULT" appears on the display of the HJS ServiceCheck display module (2).

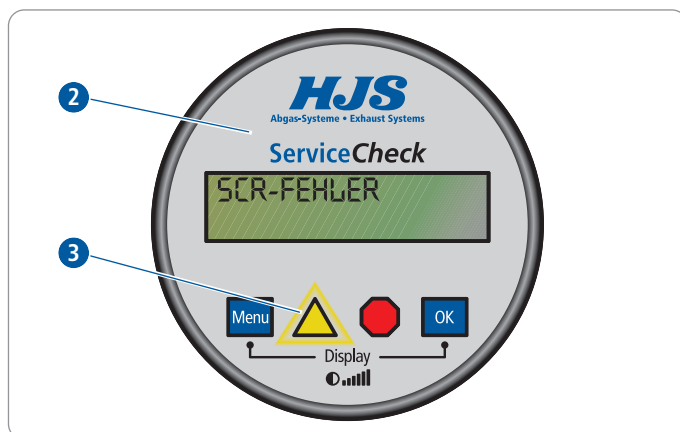
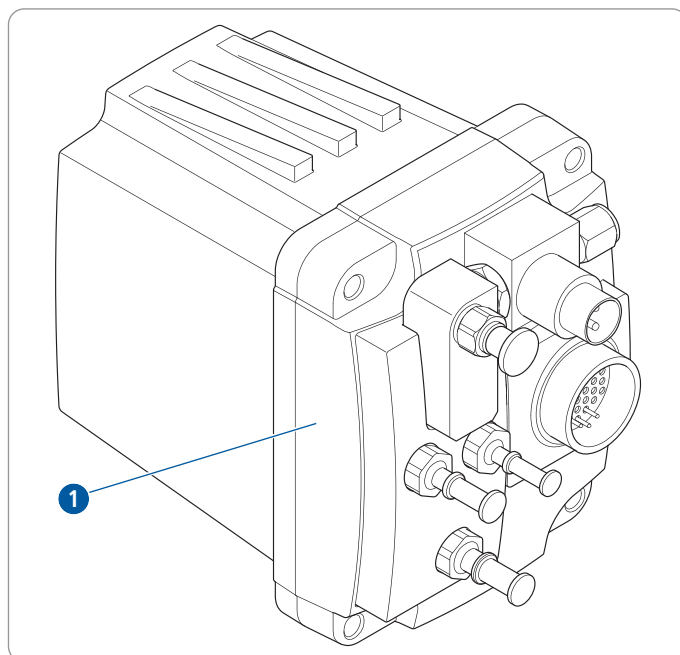
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Installation software / Connection to the system

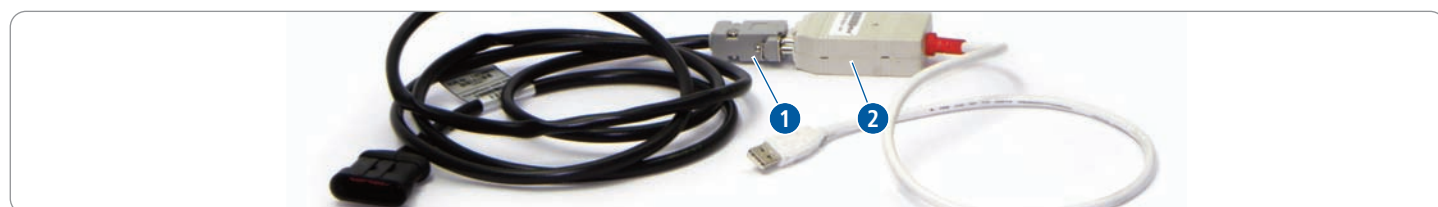
Installation Peak PCAN-USB: Please follow the instructions in the User's Manual of the PCAN-USB.

To be able to use the diagnostics software of the dosing unit, the PCAN-USB (1) must be connected to the computer. Using the adapter cable (2) SCR Logger CAN Diagnostics (HJS No.: 14030611), connect the PCAN-USB to the CAN bus diagnostics connector in the HJS cable harness (5-pin connector). The vehicle's ignition must be switched on before diagnostics can begin.

The diagnostics program for the SCR dosing unit can be started from the CD.

To do this, run the file "SCR Diagnostic Service Tool v0.07.exe" that is in the "SCR Diagnostic Service Tool" folder.

Please understand that no claims will be able to be made on the basis of the data and/or figures in this manual.



General information on ECU diagnostics

Components and accessories

ECU diagnostics kit, incl. diagnostics cable (1)

ECU password

Commercially available PC

Optional accessories: USB-serial adapter (2)

Remark: If your PC does not have a serial (COM) port, you will also require a USB-serial adapter.

The following adapters have already been tested by HJS:

Manufacturer: Conrad Elektronik

Designation: USB-SERIAL RS232 CABLE USB

Manufacturer: Digitus

Designation: USB 2.0 TO SERIAL CONVERTER

Remark:

The USB port chosen when installing the USB-serial adapter must continue to be used for the ECU diagnostics software. The USB-serial adapter is not installed for any of the other ports on the PC! Please note that the ECU diagnostics software is only able to function with COM ports 1 to 8. For this reason, please take care during installation that the virtual COM port of the USB adapter is set up for one of these ports.

Installation instructions can be found on the CD under "Documentation".





Installing the ECU diagnostics software

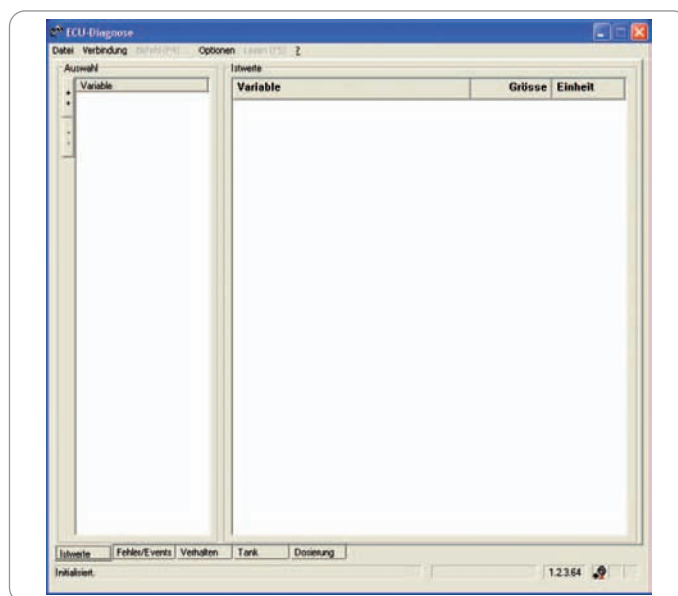
Copying the ECU diagnostics software from the CD-ROM

> The CD included in the scope of delivery contains the file "ECU-Diagnose.exe".

> Copy this file onto the PC (e.g. to the desktop). There is no need to install the software separately. The program can be started immediately after being copied onto the PC.

Starting the ECU diagnostics software

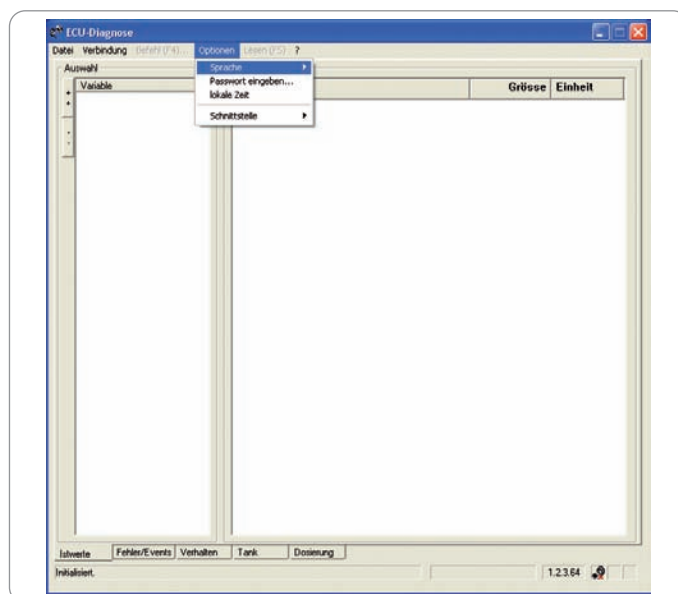
> Double-click the ECU Diagnostics icon to start the program.



Selecting the language

> You can set the language of the ECU diagnostics software user interface by means of the "Options" menu. You can choose between English, German and French.

> The default language is German. A language remains set once selected.



Selecting the port

> Command: Options / Serial Port

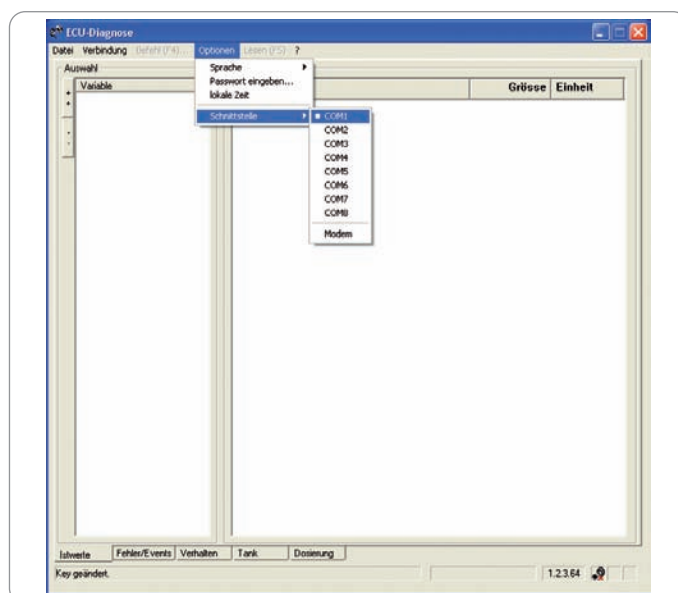
> Remark:

Select the port to which the readout cable of the ECU diagnostics is connected (possibly with the aid of a USB-serial adapter).



The ECU diagnostics software supports COM ports 1 to 8.

> If you need to use a USB-serial adapter, select the port on which you installed the adapter.



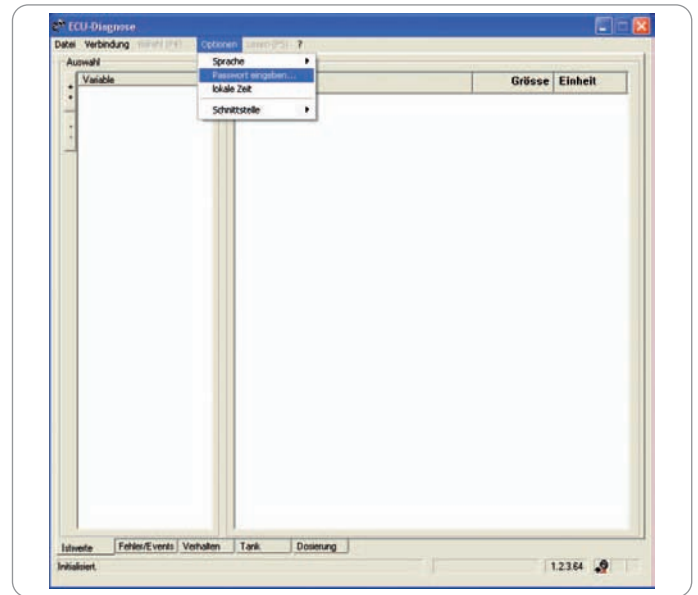


Entering the password

> ECU password:

A number of functions/commands of the ECU diagnostics program are protected by a password. You have to ask HJS for a password before you use the program for the first time. This password is stored by HJS in a database and is unique to one person. The password must never be divulged to a third party.

> You enter the password via the "Options" menu.



Entering the password

> When you call up the command, the following window appears.

> Enter the password in the text box and then confirm by clicking the "OK" button.



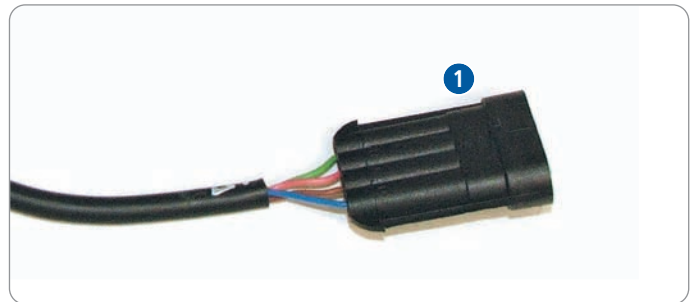
The password remains permanently set.



Connecting to the HJS ECU

Connecting the diagnostics software to the ECU

- > The cable harness includes the diagnostics connector (1) for the ECU.
- > Please refer to the User's Manual for the position of the connector in the vehicle.



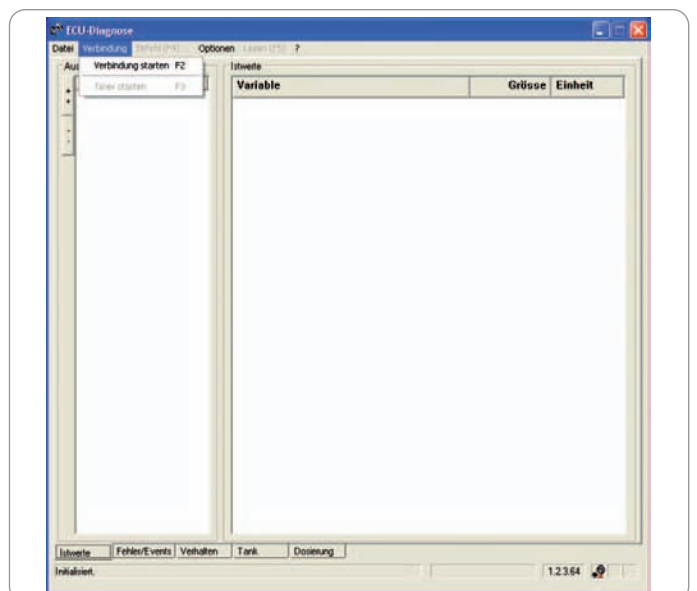
Connecting the diagnostics software to the ECU

- > Make the connection between the PC and the diagnostics port using the diagnostics cable (1). If your PC does not have a serial (COM) port, you will also require a USB-serial adapter (2).
- > Make the connection between the ECU diagnostics software and the ECU
- > Switch on the ignition of the vehicle and start the diagnostics program.



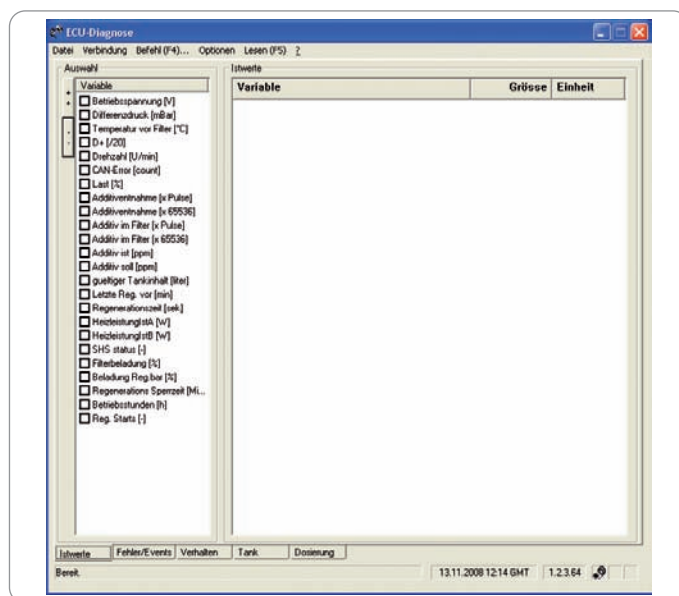
Connecting the diagnostics software to the ECU

- > A connection must be made to enable communication with the ECU.
- > You do this by selecting the "Start Connection" option in the "Connect" menu or by pressing the F2 key.



Connecting the diagnostics software to the ECU

- > The status message "Connection made." is displayed bottom left in the status bar and a list of variables is displayed in the "Select" box.
- > If a fault message appears indicating that no connection has been able to be made, this can be due to one or more of the following causes:
 - > Diagnostics cable incorrectly connected (not properly plugged in)
 - > Ignition not switched on
 - > Wrong COM port selected
 - > USB adapter not properly installed or
 - > connected to wrong USB port
 - > Check fuse of the ECU
 - > The system carries out a self-test when the ignition is switched on (both indicator lamps must light up for approx. 10 seconds).



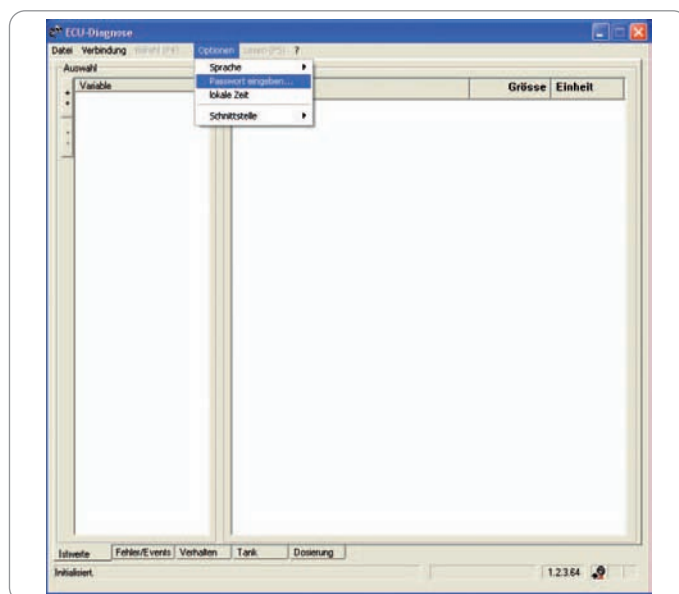
Configuring the HJS ECU

General information

The HJS ECU configuration can be modified in order to set different or user-defined pre-alarm and main alarm thresholds. For this purpose, the user requires the HJS diagnostics software and a password. Both can be requested from HJS.

When you start the diagnostics software for the first time, you have to select the PC port (COM1, COM2, ...) to be used for communicating with the ECU. You do this under "Options > Serial Port". The baud rate of the COM port must be set to 38,400. If your PC does not have a COM port, you will have to use a suitable USB-serial adapter. Not all USB-serial adapters on the market function perfectly with the diagnostics software. If you have any questions or problems, please contact us at HJS.

You enter the password required to access the HJS ECU in the diagnostics software under "Enter password..." in the "Options" menu. You have to contact HJS first to request your own personal password.

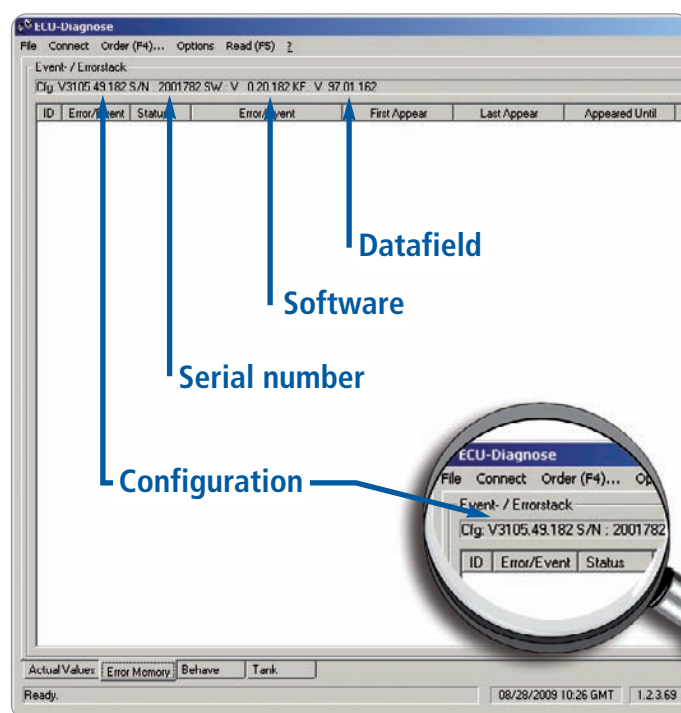




Configuration, datafield (characteristic map) and software versions

The configuration, datafield (= characteristic map) and software versions and the serial number can be found on the "Fault Memory" tab of the diagnostics program. After opening the "Fault Memory" tab, you may have to select the "Read (F5)" command in the menu bar.

The configuration number can be used to check which variant (configuration) is currently installed in the HJS ECU.



Programming the HJS ECU

Step 1: Make connection between PC and HJS ECU

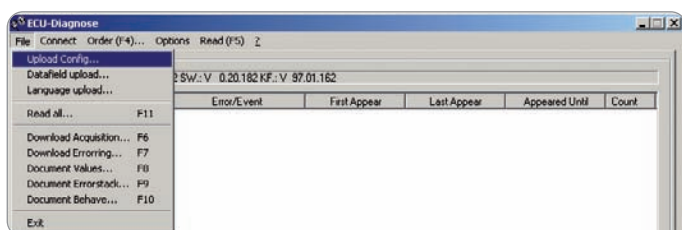
Command: Connect > Start Connection

Step 2: Upload new configuration

Command: File > Upload Config...

You then have to upload the datafield (characteristic map) file.

Command: File > Datafield upload...



When uploading the configuration or datafield, make sure you select the correct file (file extension ".cfg" for configuration or ".dat" for datafield) and the ECU variant needed. The first two digits of the configuration file indicate the ECU variant.

Step 3: Check programming

After programming has been completed, the connection between the diagnostics software and the HJS ECU must be closed (stopped) and the HJS ECU switched off: this can be done by switching off the ignition or disconnecting terminal 15. Command: Connect > Stop Connection

Checking the programming

Wait 3 minutes and then restart the HJS ECU.

Step 1:

Make connection between PC and HJS ECU

Command: Connect > Start Connection

Step 2:

Check programming

The configuration and datafield currently installed in the HJS ECU can be found on the "Fault Memory" tab of the diagnostics program. If the new configuration and datafield you programmed are not installed, you will have to repeat the programming steps.

Step 3:

Stop connection

Command: Connect > Stop Connection



Recording the operating data saved

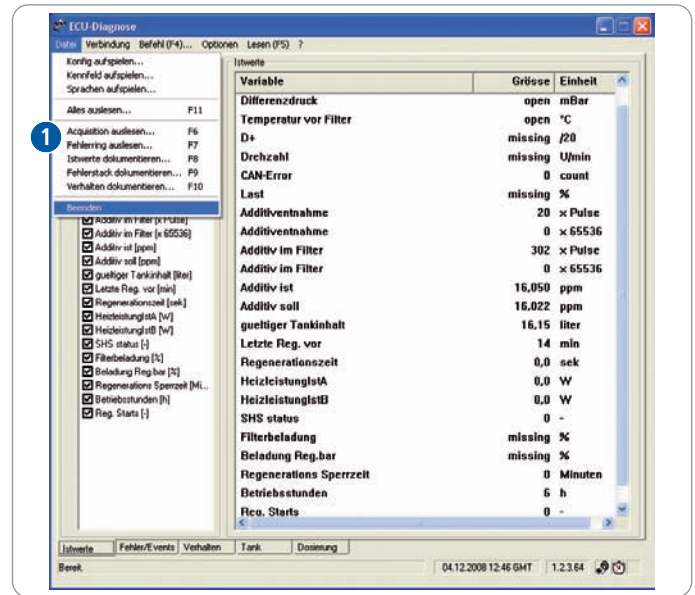
Reading out the data saved in the ECU and exporting them

- > The ECU diagnostics software enables you to download driving data (Acquisition) and faults/errors (Fault Memory).
- > These data can be exported and saved.

Downloading the measured data recorded (Acquisition)

- > To save the measured data recorded ("Acquisition") for the vehicle, select the menu item "Download Acquisition..." (1). You can also do this by pressing the F6 key.

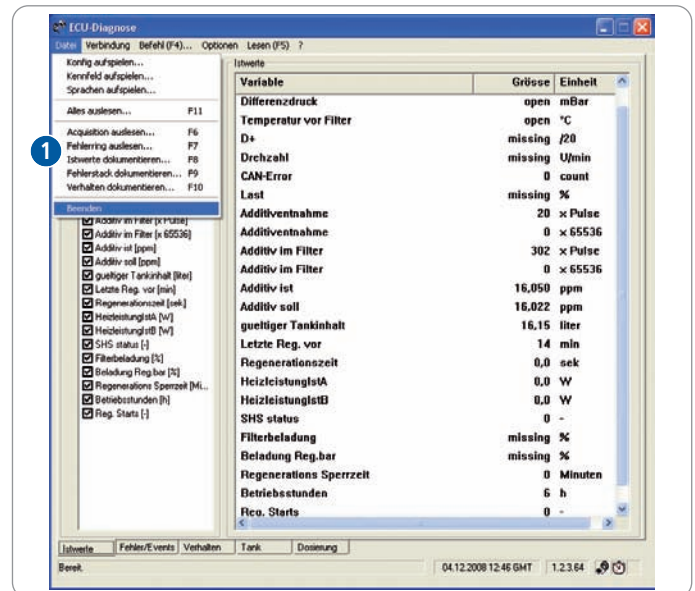
- > A window is opened in which you can then enter the name you want to give the file and the folder you want to save it to. It may take a number of minutes to save the file.



Downloading the fault memory

- > To save the fault memory of the vehicle, select the menu item "Download Fault Memory..." (1). You can also do this by pressing the F7 key.

- > A window is opened in which you can then enter the name you want to give the file and the folder you want to save it to. It may take a number of minutes to save the file.

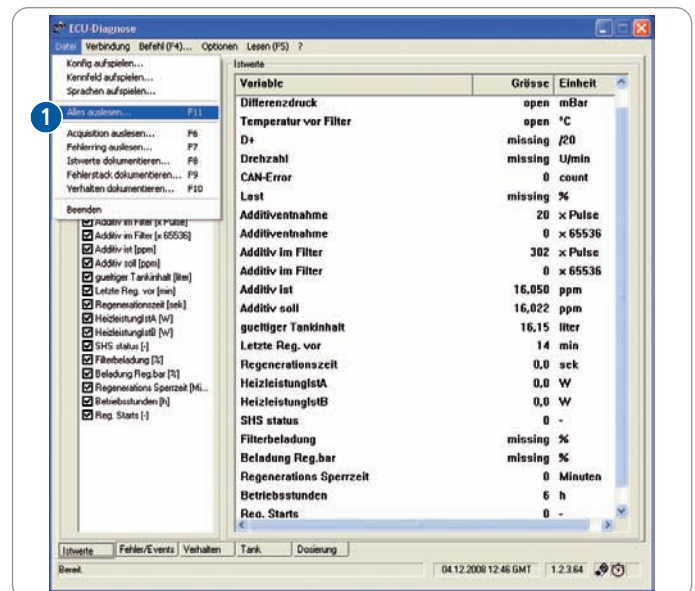


Reading out the complete set of data values

Reading out the data saved in the ECU and exporting them

- > To read out all the measured data and operating conditions of the ECU in a single step, select the menu item "Read all..." (1) in the "File" menu.

- > A window is opened in which you can then enter the name you want to give the file and the folder you want to save it to. It may take a number of minutes to save the files.

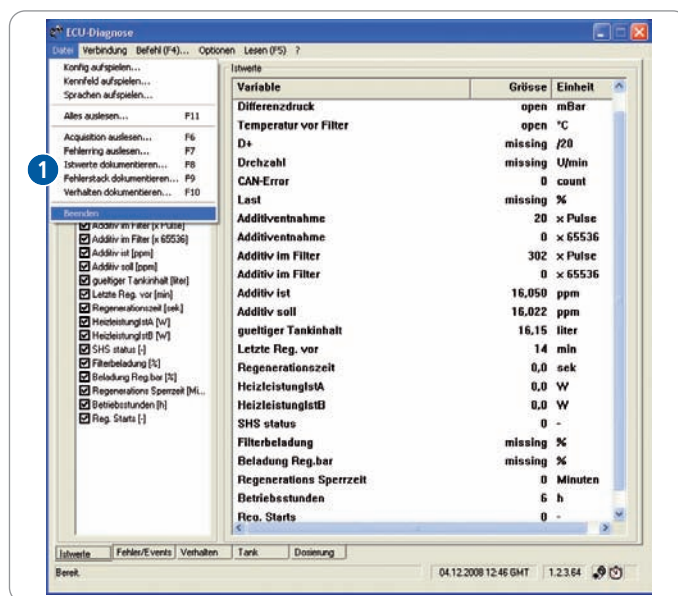


Documenting the instantaneous operating conditions

Documenting the actual values

> To document the actual values, select the menu item "Document Values..." (1) in the "File" menu. You can also do this by pressing the F8 key.

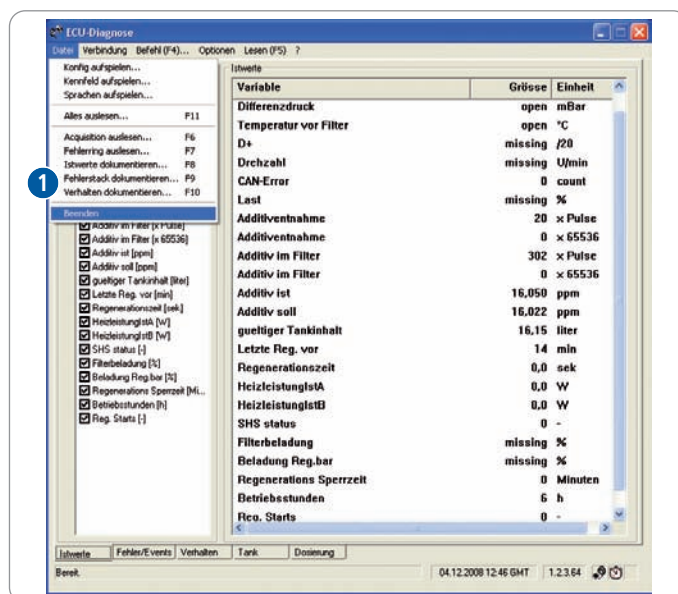
> A window is opened in which you can then enter the name you want to give the file and the folder you want to save it to.



Documenting the fault stack

> To document the data from the "Fault Memory" tab, select the menu item "Document Fault Stack..." (1) in the "File" menu. You can also do this by pressing the F9 key.

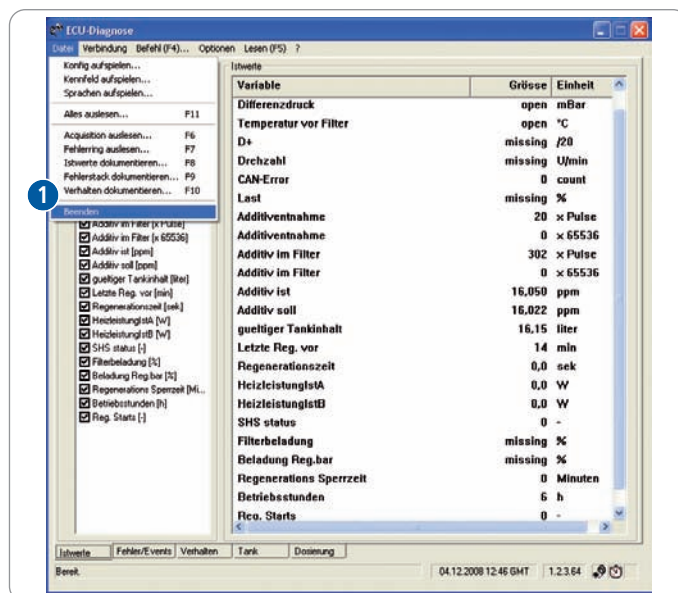
> A window is opened in which you can then enter the name you want to give the file and the folder you want to save it to.



Documenting the behaviour

> To document the data from the "Behaviour" tab, select the menu item "Document Behaviour..." (1) in the "File" menu. You can also do this by pressing the F10 key.

> A window is opened in which you can then enter the name you want to give the file and the folder you want to save it to.



Selecting and displaying variables

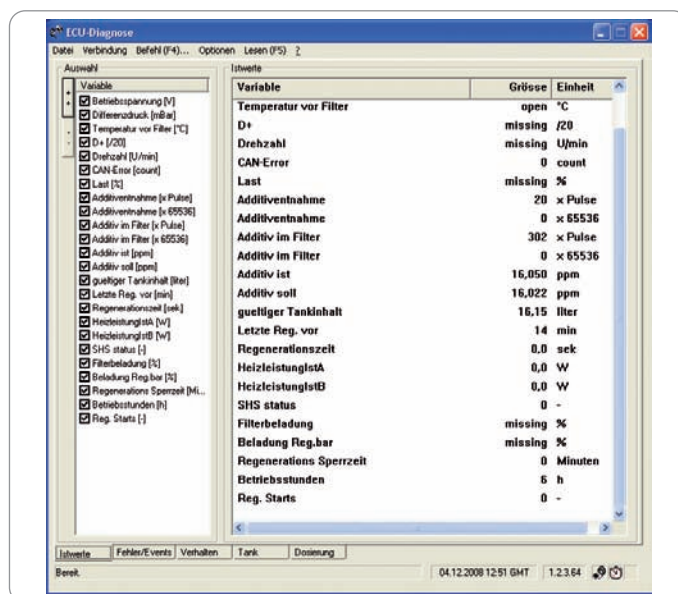
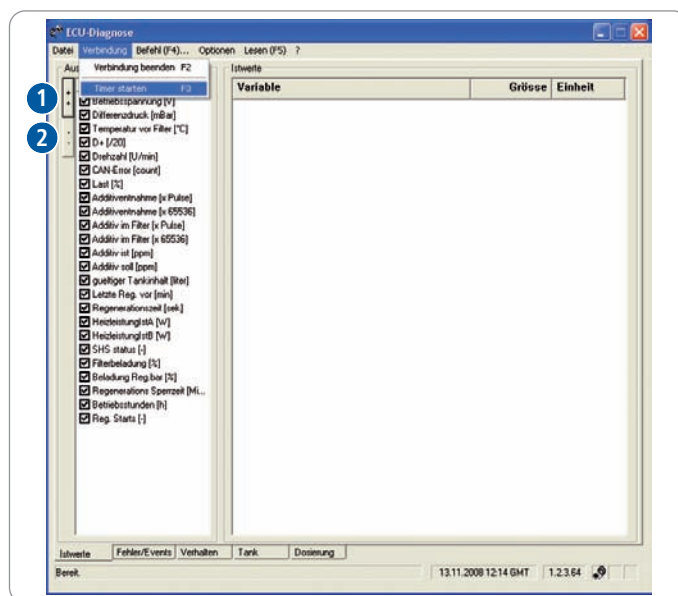
> The diagnostics software can display a number of pieces of data from the ECU. These data are displayed in the "Select" box on the left of the program window. You can now select the values you want by setting a check mark in the boxes in front of them. The "++" (1) or "--" (2) button can be used to check or uncheck all the values at one go.

> You can now display the instantaneous measured values either by selecting the "Read" menu or by pressing the F5 key while on the "Actual Values" tab.

> It is also possible to 're-measure' the measured values at regular intervals and to display them. This is useful, for instance, when the engine is running. For this purpose, you have to start the timer, which you do by selecting the "Start Timer" option in the "Connect" menu or by pressing the F3 key. The measured values selected are then updated every second.

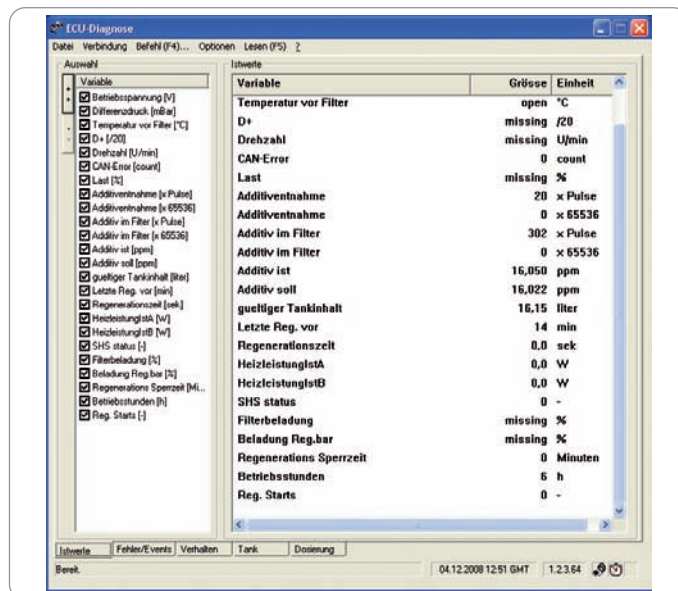
Displaying variables

> The values are displayed when you start the timer or select the "Read" command.



Fault Memory tab

> To display the contents of the fault memory, you can activate the "Fault Memory" tab (1) at the bottom of the program window. You do this simply by clicking the tab.





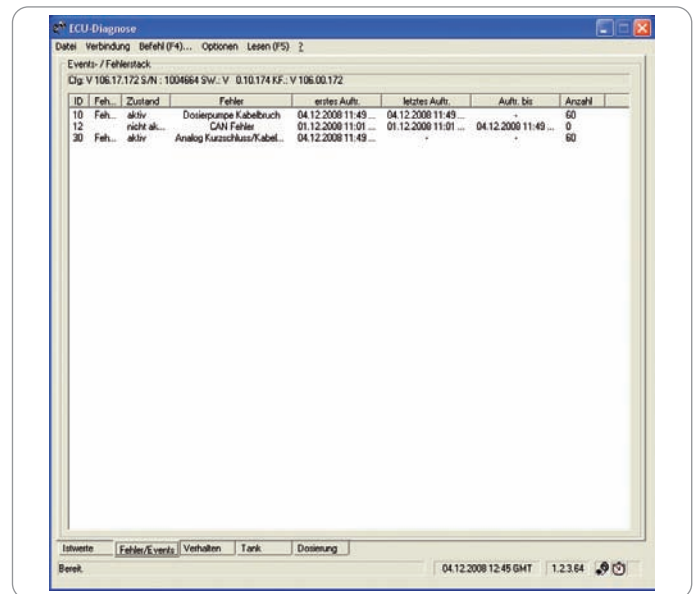
Fault Memory tab

> The first line "Events/Fault Stack" beneath the menu bar contains the version number and the serial number of the ECU.

> All faults and events are listed arranged according to their fault number (ID).



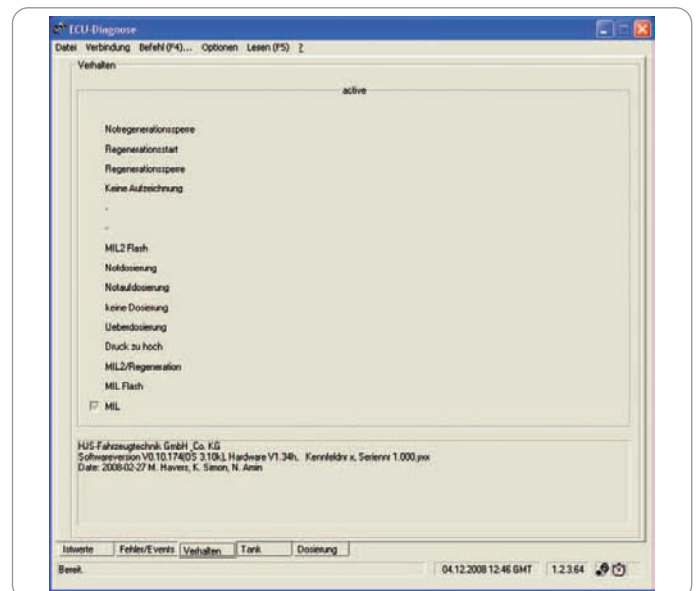
Additional information on the faults and events can be found in the fault list in the appendix.



Behaviour tab

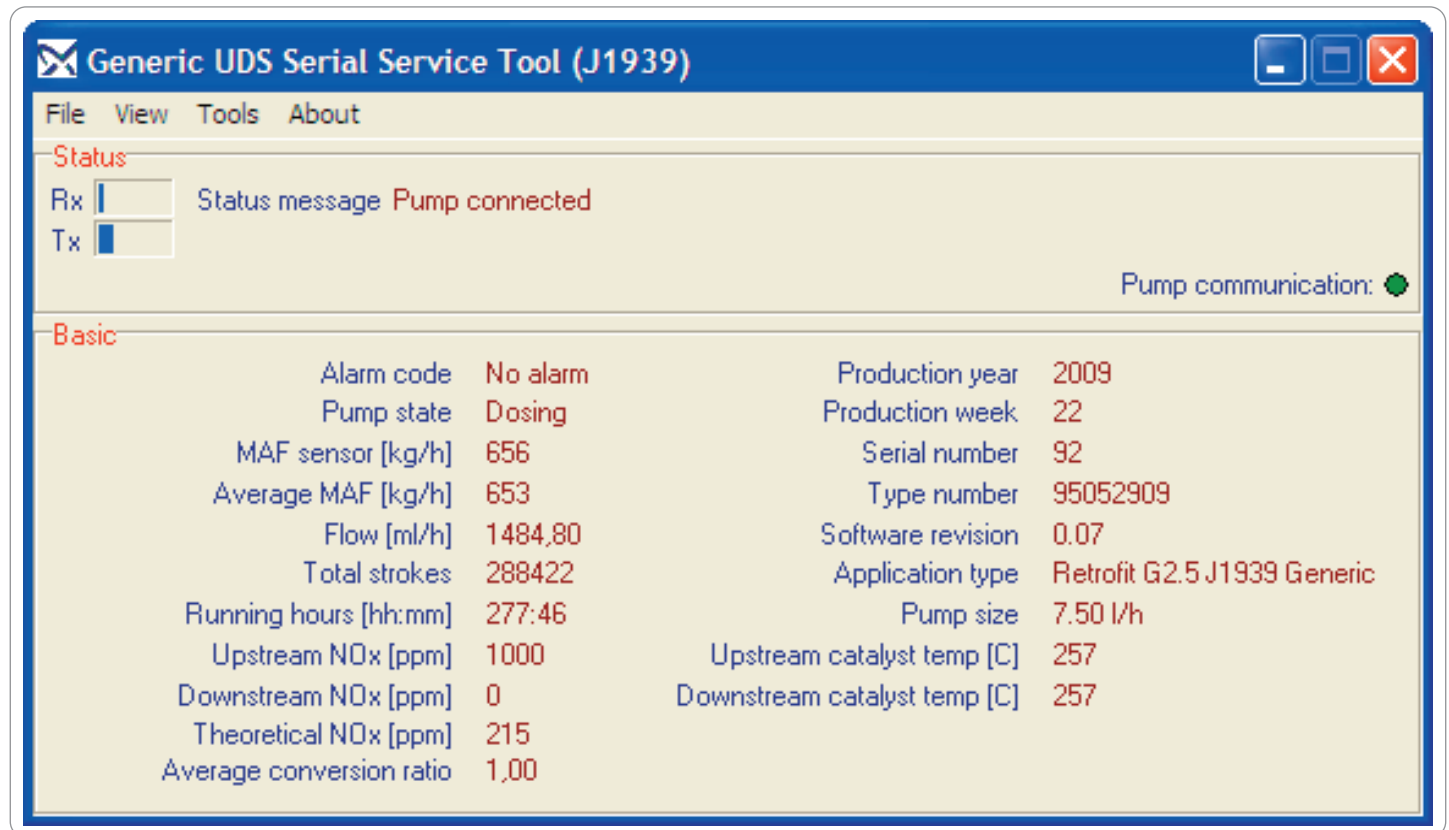
> The program screen shown opposite appears when you select the "Behaviour" tab.

> This tab displays the instantaneous behaviour of the ECU.





Main menu SCR-Pump



"File" menu

Load configuration

A configuration file can be loaded in the program.
Configuration files are written by HJS only.

Save configuration

The configuration file loaded can be saved.

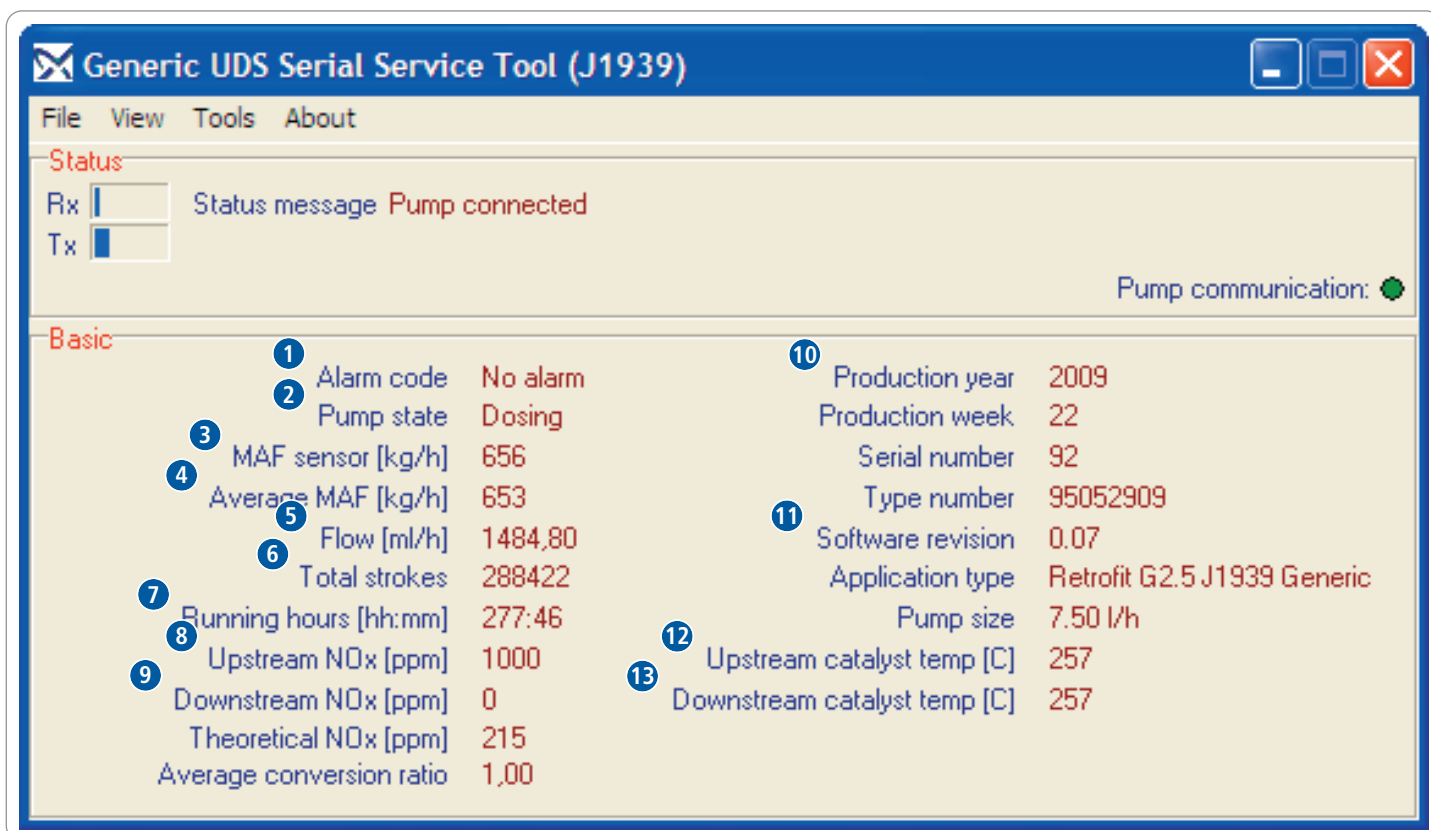
Close

Closes the diagnostic program.

"View" menu

Standard window

The standard window opens when the program is started. It contains the most important information required for testing the system.



Indication	Meaning
(1) Alarm code	<p>The alarm code indicates the status of the pump:</p> <ul style="list-style-type: none"> • No alarm • Urea tank low (= AdBlue® tank) • Urea tank empty (= AdBlue® tank) – no dosing • No alarm • No alarm • No alarm
(2) Pump state	<ul style="list-style-type: none"> • Initialising / electronic self-test by pump • Priming / hydraulic and pneumatic self-test after every start-up • Dosing / dosing status • Purging / purging function of pump • Pump off
(3) MAF sensor [kg/h]	<ul style="list-style-type: none"> • Mass flow value transmitted by HJS ECU
(4) Average MAF [kg/h]	<ul style="list-style-type: none"> • Filtered mass flow value
(5) Flow [ml/h]	<ul style="list-style-type: none"> • Instantaneous dosing volume
(6) Total strokes	<ul style="list-style-type: none"> • Total number of pump strokes
(7) Running hours [hh:mm]	<ul style="list-style-type: none"> • Number of pump operating hours
(8) Upstream NO _x [ppm]	<ul style="list-style-type: none"> • NO_x sensor reading upstream of SCR catalytic converter
(9) Downstream NO _x [ppm]	<ul style="list-style-type: none"> • NO_x sensor reading downstream of SCR catalytic converter
(10) Production year, Production week, Serial number, Type number	<ul style="list-style-type: none"> • Production date information
(11) Software revision, Application type, Pump size	<ul style="list-style-type: none"> • Pump characteristics data
(12) Upstream catalyst temp [°C]	<ul style="list-style-type: none"> • Temperature sensor reading upstream of SCR catalytic converter
(13) Downstream catalyst temp [°C]	<ul style="list-style-type: none"> • Temperature sensor reading downstream of SCR catalytic converter

Extended data

Generic UDS Serial Service Tool (J1939)

File View Tools About

Status

Rx ☐ Tx ☐

Status message Pump connected

Pump communication: ●

Basic

Alarm code	No alarm	Production year	2009
Pump state	Dosing	Production week	22
MAF sensor [kg/h]	652	Serial number	92
Average MAF [kg/h]	653	Type number	95052909
Flow [ml/h]	1491,00	Software revision	0.07
Total strokes	288364	Application type	Retrofit G2.5 J1939 Generic
Running hours [hh:mm]	277:44	Pump size	7.50 l/h
Upstream NOx [ppm]	1000	Upstream catalyst temp [C]	257
Downstream NOx [ppm]	0	Downstream catalyst temp [C]	257
Theoretical NOx [ppm]	213		
Average conversion ratio	1,00		

Extended data

Vehicle identification number (VIN)	vehicle type	Torque limiter	Inactive
Key switch [Clip 15]	Active	Alternator Input Frequency [Hz]	210
Battery voltage [V]	24.50	Engine speed [rpm]	707,1
Pressure switch	Active	Total OBD time	118:04
Urea tank level "low"	Not Active	Dosing valve	Open
Urea tank level "empty"	Not Active	Dosed urea [l]	212,99
Urea tank level lamp	Off	Dosing hours [hh:mm]	158:12
MIL lamp	Off	External heater configuration	Disabled
Pump head temp [C]	23.0	Internal heater state	Off
PCB temp [C]	27	Factory calibration [0.01ml]	7906
Max PCB temp [C]	35	User calibration [g]	1000
Min PCB temp [C]	20	MAF factor	556
Catalyst volume [l]	10,6	Conversion gain	0,90
Catalyst length [mm]	191	Lamp 3 state (urea)	Off
Power ons	124	Lamp 4 state (MIL)	Off
Min Flow [ml/h]	0,00	Remaining MIL on period [s]	0
Max Flow [ml/h]	3589,30	Remaining operational sequence	0
Urea tank temperature [C]	25		
Urea tank level [Ohm]	91,78		

This window contains more detailed information on the individual sensors and pump characteristics.



NO_x sensor(s)

NOx Sensor Data

Upstream sensor data

NO_x concentration [raw] 24000
Oxidation factor [raw] 62256

Status

Sensor supply in range
Sensor temperature at operating temperature
NO_x-signal valid
Oxygen-signal valid
Status Heater Mode automatic mode

FMI errors

Heater error no error
NO_x error no error
O₂ error no error

Upstream sensor communication:

Upstream nox [ppm] 1000
Upstream O₂ [%] 20,00

Downstream sensor data

NO_x concentration [raw] ?
Oxidation factor [raw] ?

Status

Sensor supply ?
Sensor temperature ?
NO_x-signal ?
Oxygen-signal ?
Status Heater Mode ?

FMI errors

Heater error ?
NO_x error ?
O₂ error ?

Downstream sensor communication:

Downstream nox [ppm] ?
Downstream O₂ [%] ?

Upstream pump data

NO_x concentration [raw] 24000
Oxidation factor [raw] 62256

Status

Sensor supply in range
Sensor temperature at operating temperature
NO_x-signal valid
Oxygen-signal valid
Status Heater Mode automatic mode

FMI errors

Heater error no error
NO_x error no error
O₂ error no error

Upstream nox [ppm] 1000
Upstream O₂ [%] 20,00
Upstream O₂_lin 43

Downstream pump data

NO_x concentration [raw] 4000
Oxidation factor [raw] 23347

Status

Sensor supply not available
Sensor temperature not available
NO_x-signal not available
Oxygen-signal not available
Status Heater Mode off / preheating mode

FMI errors

Heater error no error
NO_x error no error
O₂ error no error

Downstream nox [ppm] 0
Downstream O₂ [%] 0,00
Downstream O₂_lin 1000

The NO_x sensor window displays readings and the status of the NO_x sensor upstream and, if installed, of the NO_x sensor downstream of the SCR catalytic converter. When an internal fault in the NO_x sensor is displayed in the OBD window, more detailed information about the fault is listed here.

"Upstream sensor data" displays the characteristics of the NO_x sensor.
 "Upstream pump data" displays the interpretation of the pump.

If readings differ greatly, this can be indicative of a CAN bus fault between the pump and the sensor.

A "?" means that either there is no sensor connected or communication to the sensor is disturbed.



UDS error log

VIN vehicle type									
UDS serial number 92									
Time stamp [hh:mm]	Error name	Error time [hh:mm:ss]	NOx in [ppm]	NOx out [ppm]	Cat. in temp [C]	Cat. out temp [C]	MAF [kg/h]	Urea flow rate [ml/h]	
276:30	(03) NOx in sensor	00:00:12	0	0	257	257	217	0,00	1
275:20	(04) MAF	00:00:48	0	0	257	257	0	0,00	1
275:20	(04) MAF	00:00:48	0	0	257	257	0	0,00	1
274:50	(25) ECM communication	00:29:35	1000	0	257	257	216	0,00	1
219:12	(03) NOx in sensor	55:41:08	0	0	257	257	216	562,30	1
219:12	(03) NOx in sensor	55:41:08	0	0	257	257	216	562,30	1
210:56	(04) MAF	00:02:10	1000	0	800	257	0	0,00	1
210:56	(04) MAF	00:02:10	1000	0	800	257	0	0,00	1
210:04	(05) Cat. in temp.	00:55:06	1000	0	800	257	217	0,00	1
209:44	(25) ECM communication	01:02:07	1000	0	255	257	0	0,00	1
209:44	(25) ECM communication	01:02:07	1000	0	255	257	0	0,00	1
209:44	(04) MAF	00:07:30	1000	0	255	257	0	0,00	1
209:32	(18) Urea tank empty	00:00:01	1000	0	255	257	216	0,00	1

The pump archives all faults and errors that occur in the SCR system. These can then be called up in the "UDS error log" window. To call up the pump faults/errors saved, press the "Update error log" button. It may take a number of minutes to load the faults/errors. You can also save the data loaded by pressing the "Save error log.." button.

The faults/errors are listed in chronological order, with the latest fault listed first (i.e. at the top).

To be able to determine the exact moments the faults/errors occur, you have to either note down or make and save a screenshot of the pump running hours stated in the standard window. The error log cannot be deleted.

OBD

The "OBD" (On Board Diagnostics) window contains all system information together with the current status and fault message.

On Board Diagnostics	Current state
EEPROM	No problem
Purge	Incomplete
Drive unit	No problem
Upstream NOx sensor	No problem
MAF sensor	No problem
Upstream cat. temp	No problem
Downstream cat. temp	No problem
Dosing valve	No problem
Tank heater output	Disabled
Line heater output	Disabled
Internal heater	No problem
Urea tank temp.	Disabled
Pump head temp.	No problem
Pump frozen	Pump not frozen
SCR efficiency	No problem
Nozzle	No problem
Level sensor	No problem
Urea tank level	Full
Air and urea	No problem
Return line	No problem
Downstream NOx sensor	No problem
Engine speed	No problem
ECM communication	No problem

OBD fault list

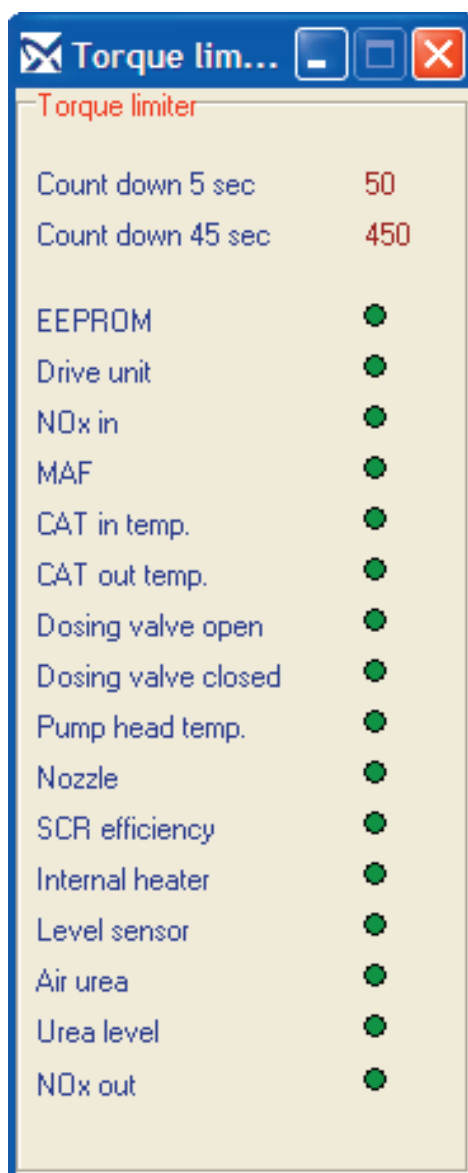
OBD Name	Fault message	Meaning	Action
EEPROM	• Internal problem	Error in pump software	Replace pump
	• Invalid data		
	• Invalid configuration		
Purge	• Complete	No problem	No fault
	• Incomplete	Last purge was unsuccessful	Usually not critical, but can lead to blockage of nozzle
Drive Unit	• Malfunction	Fault in pump motor	Replace pump
Upstream NOx sensor	• Internal failure	Internal problem of NOx sensor upstream of system	Read out "View -> NOx sensors", if nec. replace NOx sensor
	• No communication	CAN communication with NOx sensor lost	Check cables/leads and/or sensor
MAF sensor	• Out of range low	Wire break or loss of communication with HJS ECU	Check cables/leads, check HJS ECU
	• Out of range high	Short circuit in mass flow sensor or cable harness	Check cables/leads, check mass flow sensor
Upstream cat. Temp	• Out of range low	Wire break	Check cables/leads and/or sensor
	• Out of range high	Short circuit	
Downstream cat. Temp	• Out of range low	Wire break	Check cables/leads and/or sensor
	• Out of range high	Short circuit	
Dosing valve	• Shorted high	Short circuit to 24V	Check cables/leads
	• Shorted low	Short circuit to ground	Check cables/leads
	• Open load	Lost connection	Check connectors
	• Mechanical Failure	Mechanical fault	Replace pump
Tank heater output	• Shorted high	Short circuit to 24V	Check cables/leads
	• Shorted low	Short circuit to ground	Check cables/leads
	• Open load	Check connectors and valve if heater installed	Check connectors and valve if heater installed
	• Disabled	Heater is Off	No problem
Line heater output	• Shorted high	Short circuit to 24V	Check cables/leads
	• Shorted low	Short circuit to ground	Check cables/leads
	• Open load	Open cable/lead	Check connectors and valve
	• Disabled	Not activated – no problem	
Internal heater	• Heater failure	Internal temperature sensor defective	Replace pump
Urea tank temp.	• Out of range low	Wire break	Check cables/leads and actuator
	• Out of range high	Short circuit	
	• Disabled	Not activated	No problem
Pump head temp.	• Out of range low	Wire break	Replace pump
	• Out of range high	Short circuit	
Pump frozen	• Frozen	Pump too cold for too long	If heater installed, check it is properly connected to coolant system
SCR efficiency	• Reduced efficiency	SCR efficiency too low	Check quality of AdBlue
	• Limit exceeded	SCR efficiency too high	Check NOx sensors secured and functioning properly
			Calibration test
Nozzle	• Blocked	Injection nozzle blocked	Check nozzle, line and pump for blockage
Level sensor	• Out of range low	Wire break	Check cables/leads and sensor
	• Out of range high	Short circuit	
Urea Tank level	• Full	Tank full	No problem
	• Low	Tank level low	Fill tank
	• Empty	Tank empty (no dosing)	Fill tank

OBD fault list

OBD Name	Fault message	Meaning	Action
Air and Urea	• Low air or urea	Air pressure inadequate	Check air lines and air pressure at pump (> 6 bar)
		AdBlue pressure inadequate	Check tightness of AdBlue suction lines
			Check pump for blockage
Return Line	• Blocked	Return line blocked	Check return line for blockages
Downstream NOx sensor	• Internal failure	NOx sensor has internal problem	Replace NOx sensor
	• No communication	CAN communication lost	Check cables/leads
Engine speed	• Missing	Not used	Upload correct configuration
ECM communication	• No communication	CAN communication with HJS ECU lost	Check cables/leads and HJS ECU

Torque limiter

The torque limiter is deactivated and is not used.






Tools / Service

General information

The "Service" section relates to the actuator test for the pump.

 Each time after the service functions have been used, you must press the "Reset Pump" button in order to reset the SCR system to its initial state.

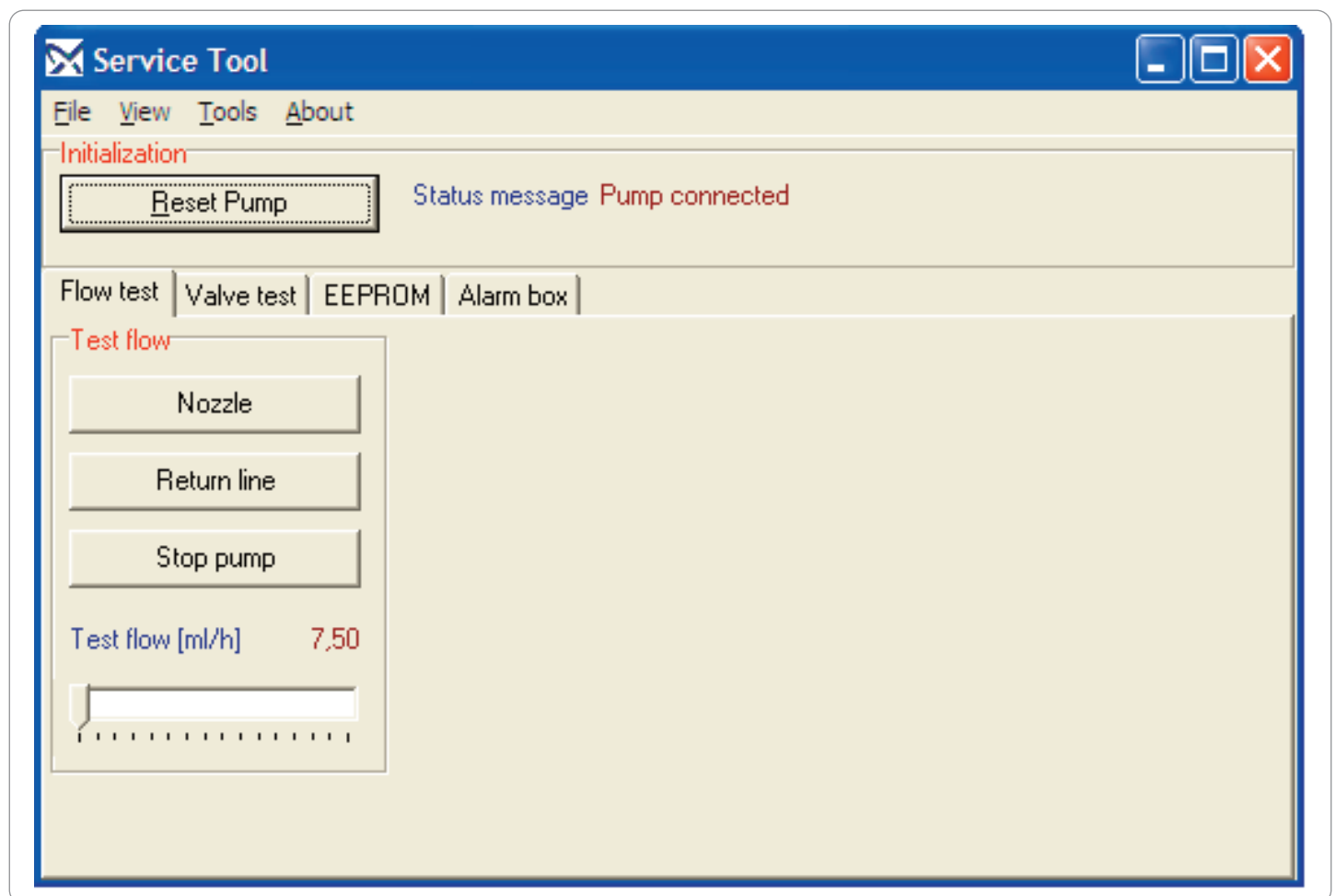
General information – "Flow test" tab

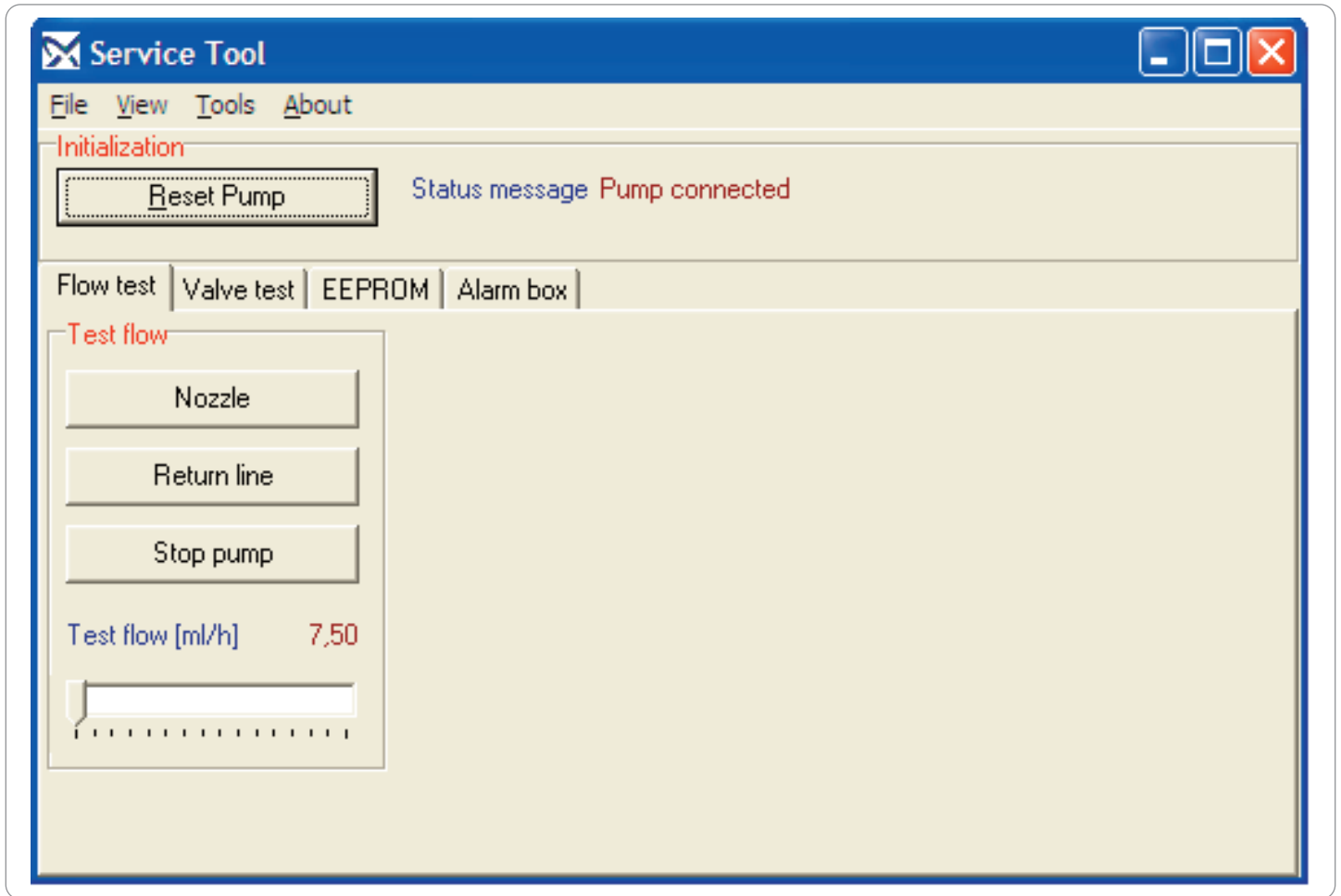
The "Flow test" tab enables you to start up the pump and set the volume of AdBlue® to be dosed. This function can be used to purge the pump.

(1) "Nozzle": If you select "Nozzle", the volume of AdBlue® you have set is fed to the nozzle by means of compressed air.

(2) "Return line": If you select "Return line", the volume of AdBlue® you have set is fed into the return line without compressed air.

(3) "Stop pump" terminates the dosing test.





Fault investigation using "Flow test"

The "Nozzle" and "Return line" functions are used when one of the following faults/errors occur:

SCR efficiency – Reduced efficiency / Limits exceeded:

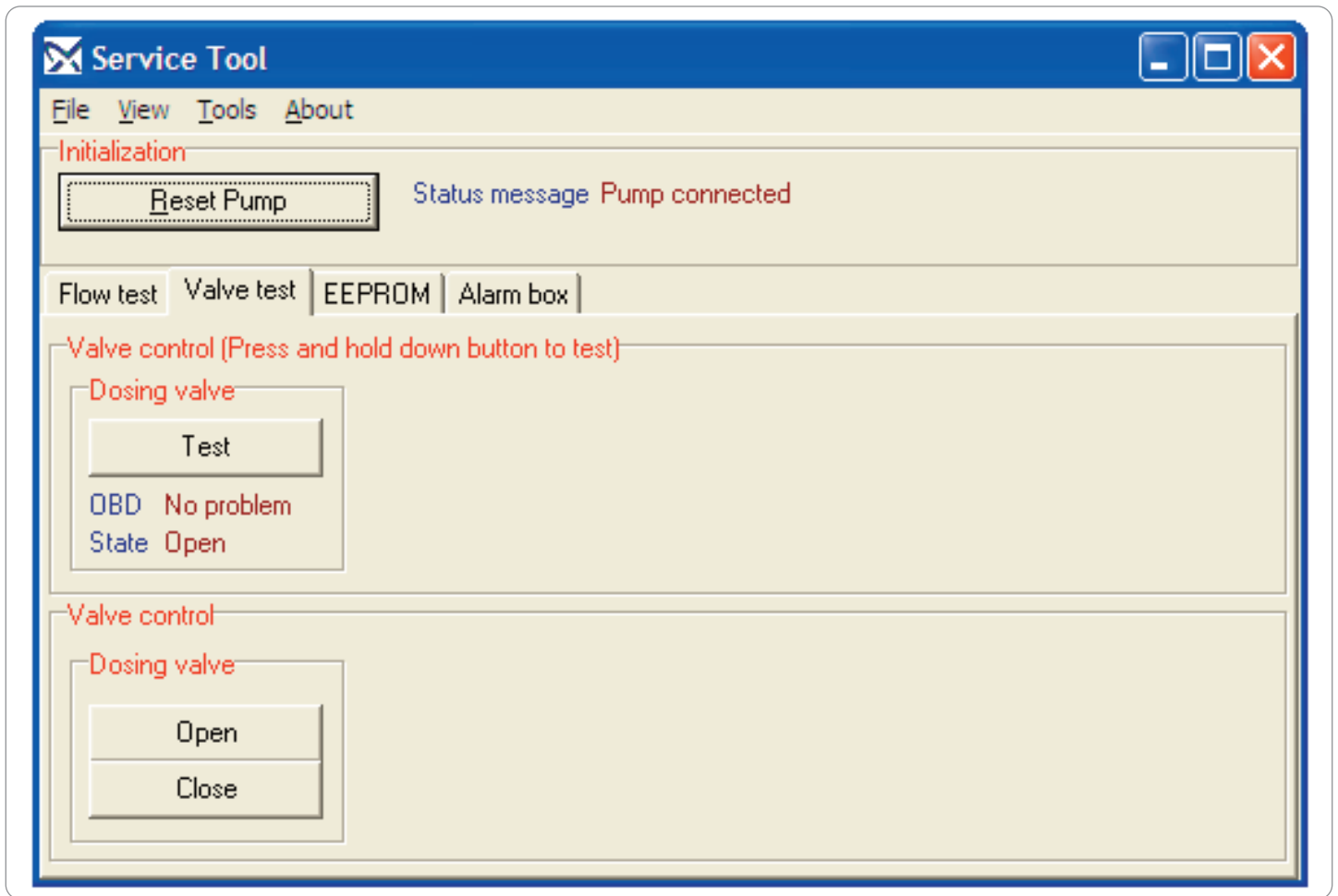
Disconnect the nozzle hose from the nozzle and hold it into a measuring beaker for a certain period of time while the pump doses urea (AdBlue®). Then compare the quantity of urea collected with the pump test flow specified. If the volume measured deviates significantly, the pump must be recalibrated. This can be done only by authorised HJS personnel.

Low air or urea:

To test for blockages in the pump, the "Return line" function is used to suck the AdBlue® out of the tank and pump it back into the tank again. To test the function, disconnect the return line from the tank and operate the pump at its maximum dosing volume ("Test flow [ml/h]" setting). If AdBlue® flows out of the return line, the urea supply and suction capacity of the pump are adequate. You then have to check the air supply. If no AdBlue® flows out of the return line, check the suction line for leaks or purge the pump.

Blocked Return Line:

To check a blocked return line, disconnect the line from the tank. Set the "Test flow [ml/h]" to its maximum setting, activate the "Return line" function and check whether AdBlue® flows out of the return line. If it does, you have to check the rest of the line through to the tank for blockages. If no AdBlue® flows out of the return line, disconnect the line from the pump and check whether AdBlue® now flows out of the return line connection. If it does, purge the return line; if it does not, purge the pump.



"Valve test" tab

"Test", "Open" and "Close" buttons:

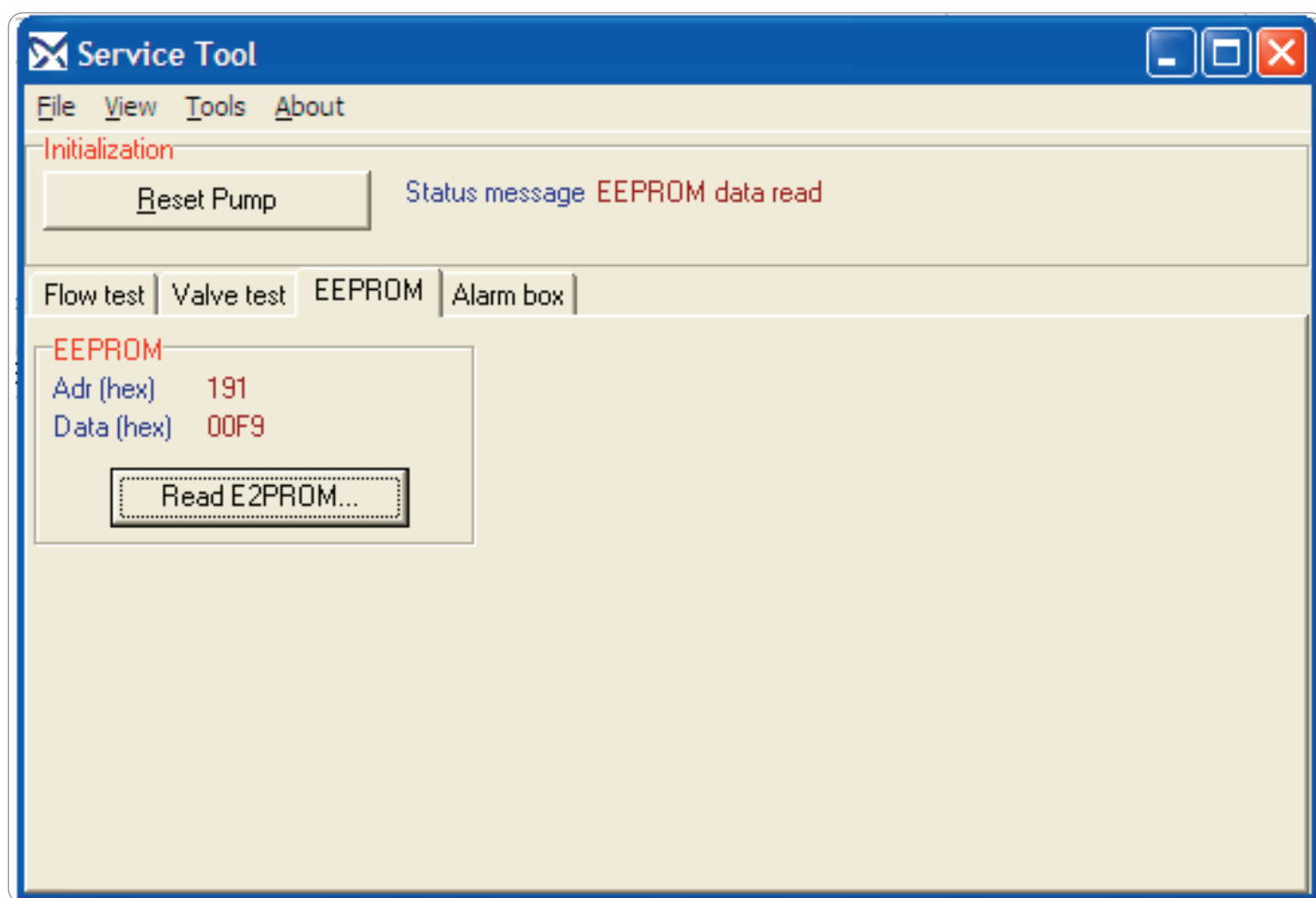
To activate the air valve, press the "Test" button. The valve switches off as soon as you take your finger off the button.

When the air valve is open, you must be able to feel a constant flow of air at the nozzle and at the nozzle line outlet of the pump. You must hear a clearly audible clicking noise when the air valve operates.

This function is used when the following fault/error occurs:

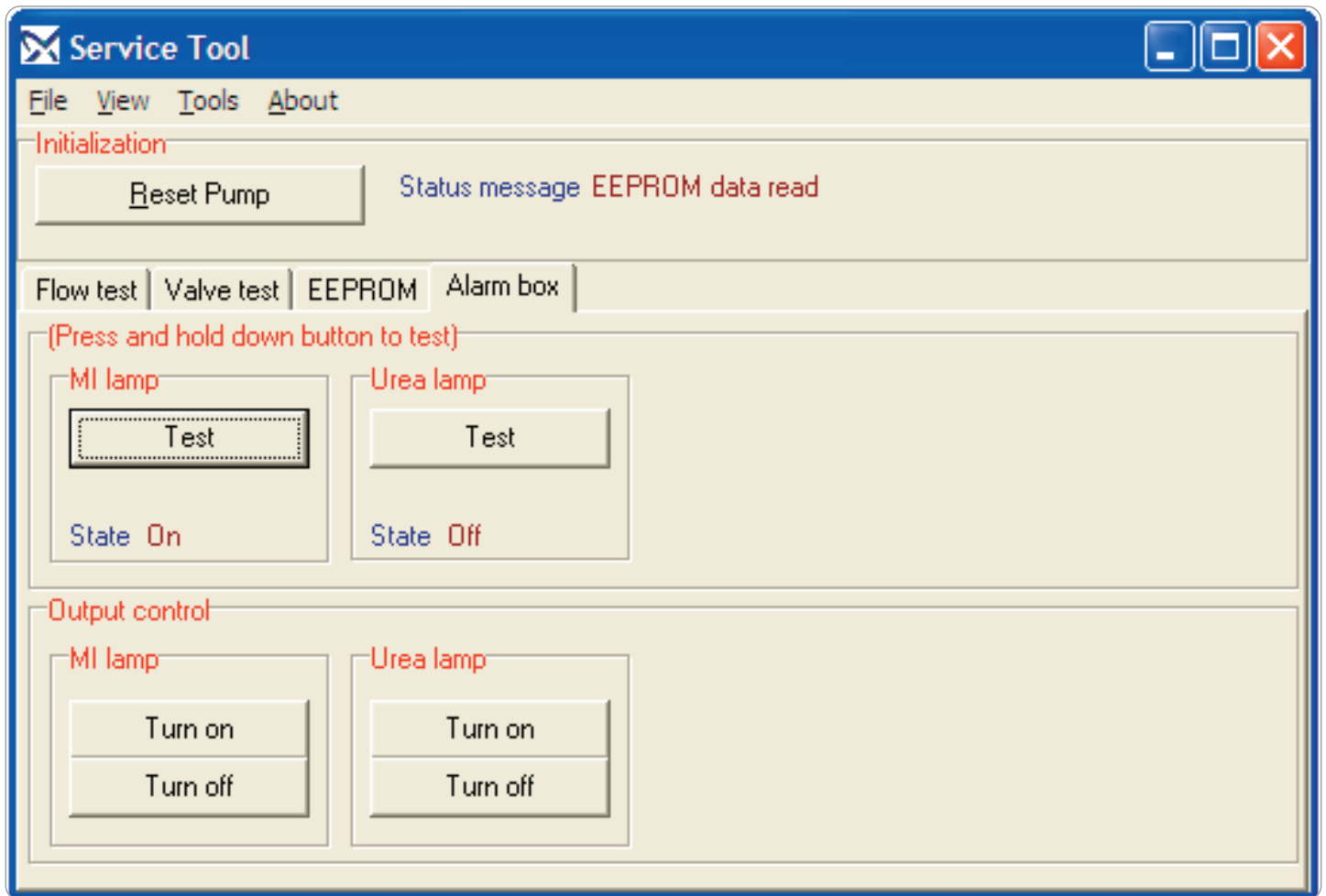
Blocked Nozzle:

Pull the connector off the nozzle and check whether air flows out of the air line when the valve is switched on. We recommend that you compare the airflow with that of a fully functioning system. If air does flow out of the line, remove the nozzle and check to see if it is blocked. If you cannot feel air flowing out of the end of the air hose, disconnect the other end of the line from the pump and you should be able to feel air coming out of the nozzle outlet of the pump. If this is the case, you will have to purge the hose line or, if this is not possible, replace the hose. If you cannot feel air flowing out of the nozzle connection when the valve is activated, you have to purge the pump.



"EEPROM" tab

The EEPROM can be read out. The data can only be interpreted by HJS.



"Alarm box" tab (not used)

A special display module for the pump is not connected. The HJS DPF-Check display serves as the diagnostics display.

Tools / Configure

All configurations are written by HJS only. This function is password-protected.

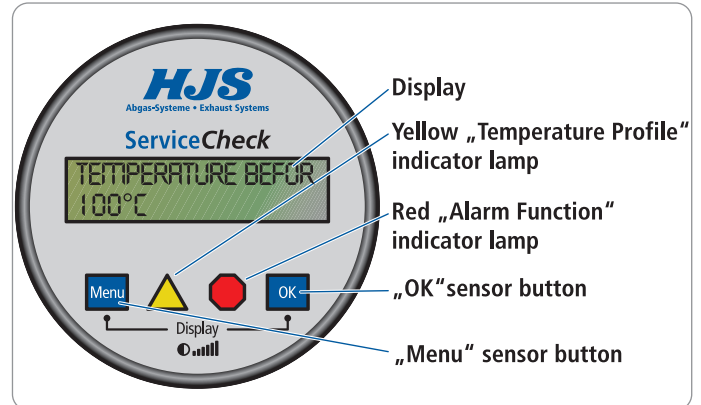


Functional description of the HJS ServiceCheck display module

Important information: The following description of the ServiceCheck display module relates to software version 1.19 and higher. The software version installed is displayed during the switch-on phase of the ServiceCheck display module.


General information

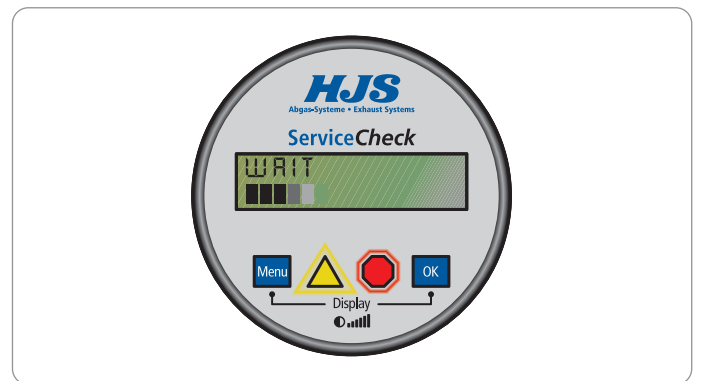
The HJS ServiceCheck display module displays instantaneous measured values, fault messages and display settings. Constant illumination of the red indicator lamp indicates pre-alarm. Flashing of the red indicator lamp indicates main alarm. The touch-sensitive sensor buttons are used to navigate through the menu and to acknowledge alarm messages. When one of the sensor buttons is touched, both buttons light up to acknowledge this activation.



System start

When the ignition is switched on, the yellow indicator light lights up briefly. The red indicator lamp of the ServiceCheck display module also lights up for approx. 10 seconds. The two touch-sensitive sensor buttons ("Menu" and "OK") then require approximately 1 minute for self-calibration. A status bar appears on the display while the HJS Service Unit is self-calibrating.

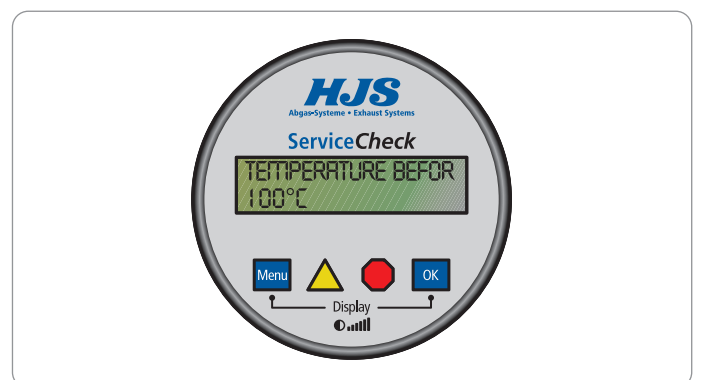
 Do **not** touch the "Menu" and "OK" sensor buttons while self-calibration is in progress!



Readiness for operation

The HJS Service Unit is then ready for operation. The display shows the last menu that was open beforehand.

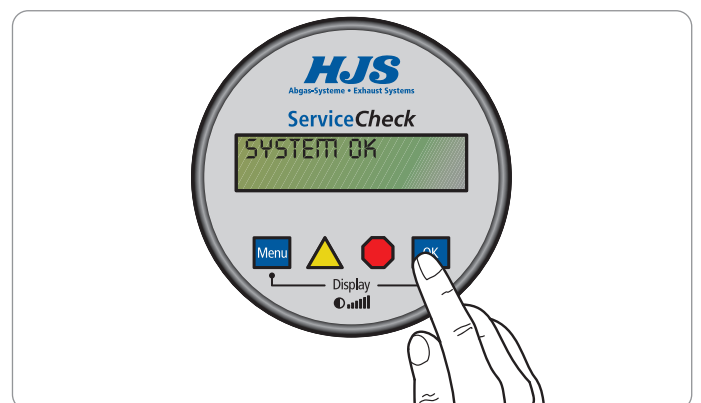
After approx. 30 seconds of trouble-free operation and no-one touching the sensor buttons, the ServiceCheck display module switches to standby mode. "System OK" is indicated on the display.



Standby mode / Activating the ServiceCheck display module

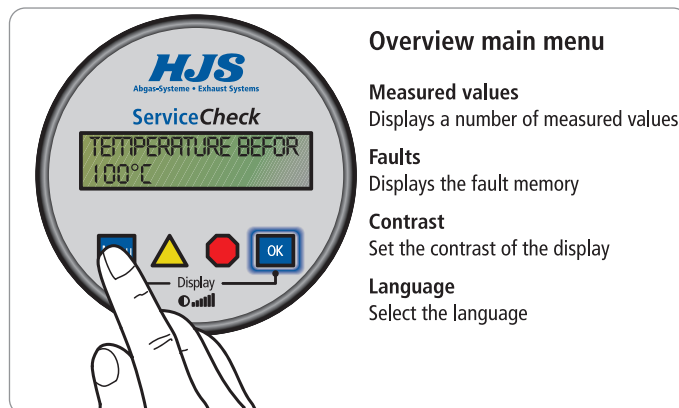
To activate the ServiceCheck display module, you have to touch either the "Menu" or the "OK" sensor button for 5 seconds. The display shows the last menu that was open beforehand.

The ServiceCheck display module is activated automatically if a fault message is output.



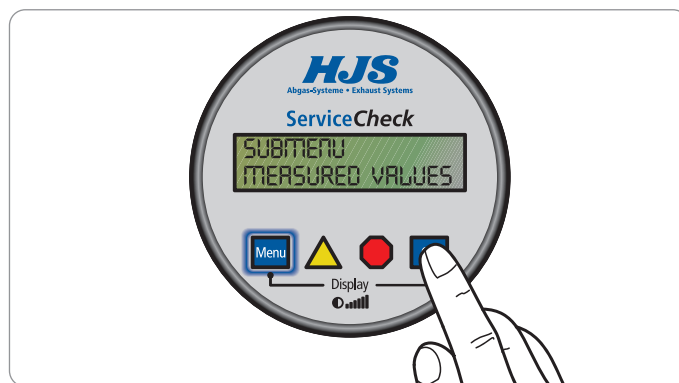
Navigating using the "Menu" sensor button Menu

Touching the touch-sensitive "Menu" sensor button is acknowledged by brief flashing of the sensor buttons. The "Menu" sensor button is used to open the main menu. The main menu contains various submenus that can be run through by touching the "Menu" button again until the submenu wanted is displayed. The second line of the ServiceCheck display module contains the name of the submenu currently selected.



Navigating using the "OK" sensor button OK

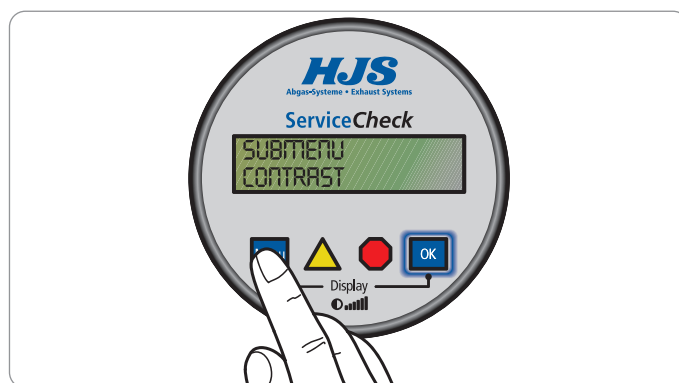
The "OK" sensor button is used to select the submenu currently displayed. Touching the touch-sensitive "OK" sensor button is acknowledged by brief flashing of the sensor buttons. Once you have selected a submenu, the "OK" sensor button functions as a scroll button (e.g. in the MEASURED VALUES submenu: scrolls through the various operating parameters; in the FAULTS menu: scrolls through the faults that may currently be present).



"CONTRAST" submenu

The "Menu" sensor button is used to select the "CONTRAST" submenu in order to set the contrast of the display. Touching the touch-sensitive "Menu" sensor button is acknowledged by brief flashing of the sensor buttons.

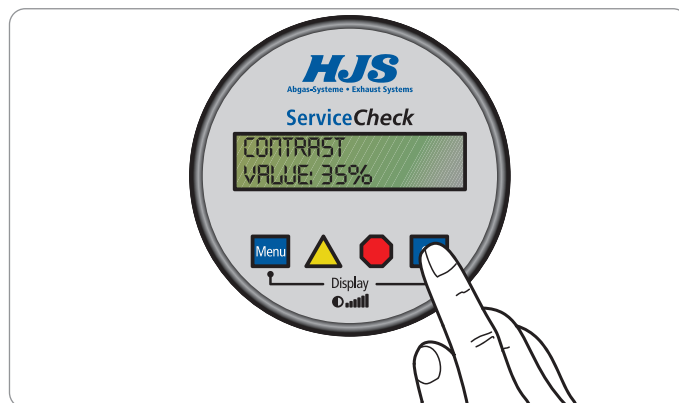
The "CONTRAST" submenu is displayed by touching the "OK" sensor button.



Setting in the "CONTRAST" submenu

The display shows the last value that was set. The "OK" sensor button is used to change the contrast setting. The contrast increases or decreases in line with the level of the value. The setting values are run through quicker if you keep your finger on the sensor button. By touching the "Menu" sensor button, you return to the main menu.

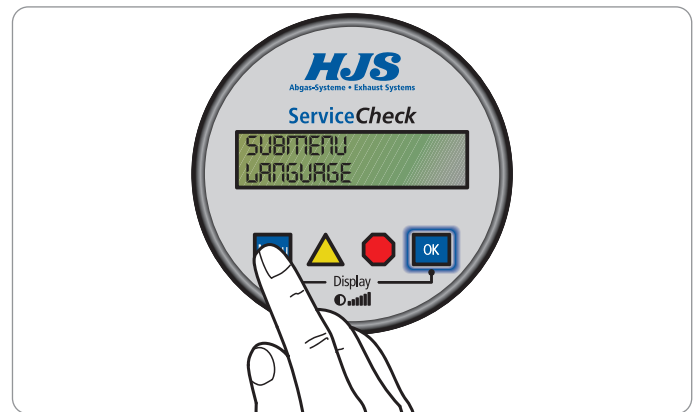
Note: The display contrast setting can be changed at any time by touching both sensor buttons simultaneously, such as after system start in the "MEASURED VALUES" submenu.



"LANGUAGE" submenu

The "Menu" sensor button is used to select the "LANGUAGE" submenu in order to set the language used in the display. Touching the touch-sensitive "Menu" sensor button is acknowledged by brief flashing of the sensor buttons.

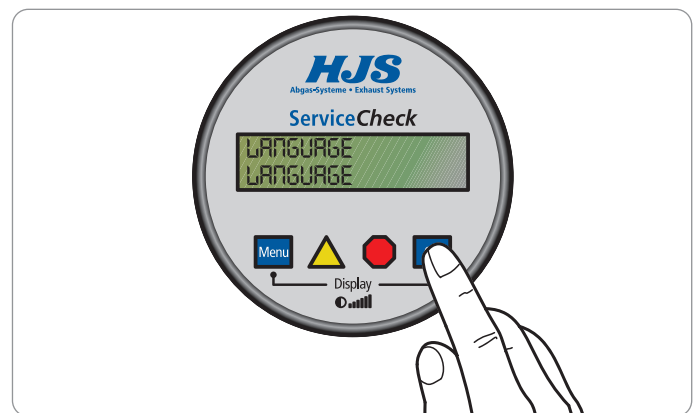
The "LANGUAGE" submenu is displayed by touching the "OK" sensor button. (The default languages programmed are English and German.)



Setting in the "LANGUAGE" submenu

The display uses the last language that was set. The "OK" sensor button can now be used to set the language.

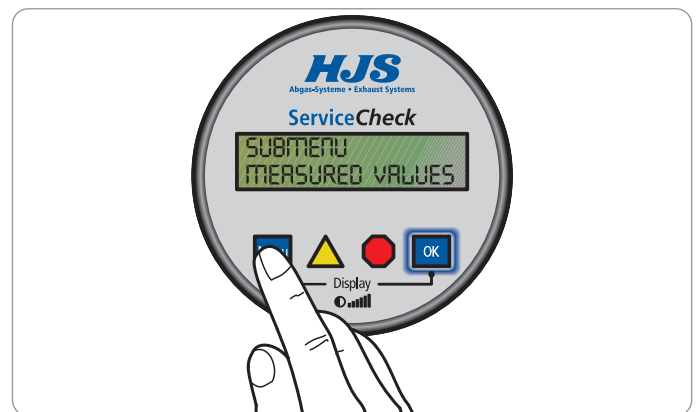
Once you have set the language you want, touching the "Menu" sensor button will return you to the main menu and the displays then displays "MENU LANGUAGE". The language you have selected will now be used in the display.



"MEASURED VALUES" submenu

This submenu contains a number of measured values that differ depending upon the configuration of the system and that can be called up. To open this submenu, the touch-sensitive "Menu" sensor button must be touched until "MENU MEASURED VALUES" appears in the display. Each touch of the touch-sensitive "Menu" sensor button is acknowledged by brief flashing of the sensor buttons.

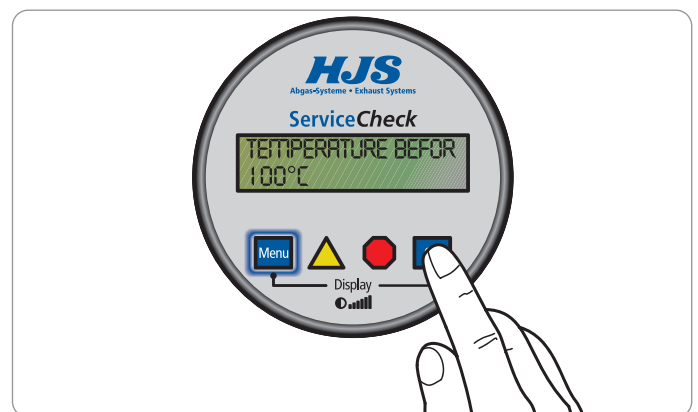
The "MEASURED VALUES" submenu is displayed by touching the "OK" sensor button.



Displaying the measured data in the "MEASURED VALUES" submenu

The display now contains the last value that was displayed. In the graphic illustrated here, the temperature upstream of the filter ("TEMP. UPSTR. FIL") is displayed. You can display more measured data by touching the "OK" sensor button. Touching the "Menu" sensor button is acknowledged by brief flashing of the "Menu" button and then the next measured value appears in the display.

To return to the main menu, touch the "Menu" sensor button. This is acknowledged by both sensor buttons flashing.





Alarm function

Alarm thresholds for exhaust backpressure

The HJS ECU makes a distinction between two alarm levels: "pre-alarm" when the lower pressure threshold is exceeded and "main alarm" when the upper pressure threshold is exceeded.



When using the ECU for other applications, observe the engine/vehicle manufacturer's specifications!

"Pre-alarm" – red indicator lamp lit constantly

If the lower alarm threshold is exceeded, pre-alarm is given and indicated on the HJS ServiceCheck display module by means of the red indicator lamp lighting up constantly. Pre-alarm remains activated until the pressure falls below the threshold again.



If pre-alarm is triggered, you should arrange for a filter service as **soon as possible**.



"Main alarm" – red indicator lamp flashes

Main alarm is activated if the upper alarm threshold for the exhaust backpressure is exceeded for longer than 5 seconds. Main alarm cannot be deactivated automatically.



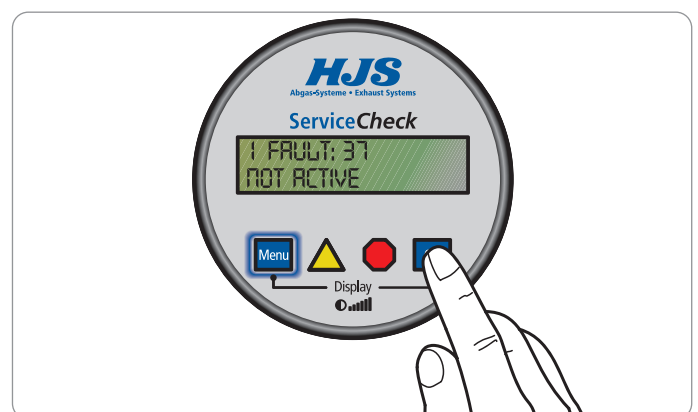
If main alarm is triggered, a filter service must be carried out **immediately**.



Acknowledging "Main alarm"

Main alarm can be deactivated as soon as the exhaust backpressure drops below the upper alarm threshold. This is done by touching the "OK" sensor button, and the acknowledgement is stored in chronological order in the fault memory. Pre-alarm remains indicated by the red indicator lamp as long as the lower alarm threshold remains exceeded.

To return to the main menu, touch the "Menu" sensor button. This is acknowledged by both sensor buttons flashing.





System alarms – yellow indicator lamp lit constantly

"Exhaust temperature window"

Constant illumination of the yellow indicator lamp indicates that the temperature profile is not within the optimum range. The diesel particulate filter can "overload". To prevent this overloading of the particulate filter, the engine must be run in the required temperature range (see the Diesel Particulate Filter System User's Manual).

"SCR fault"

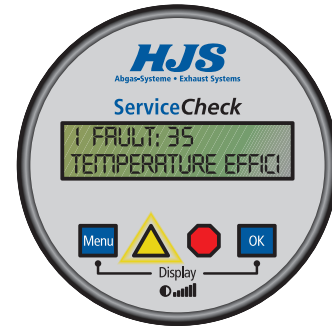
If there is a fault in the SCR system, Fault 41 "SCR fault" is displayed. Fault diagnosis is continued using the service tool for the pump (see "Software for SCR Dosing Pump" user's manual).

"AdBlue tank on reserve"

The level in the AdBlue® tank is now low. The tank must be topped up with AdBlue® soon. The SCR system continues to operate in the "AdBlue tank on reserve" status.

"AdBlue tank empty"

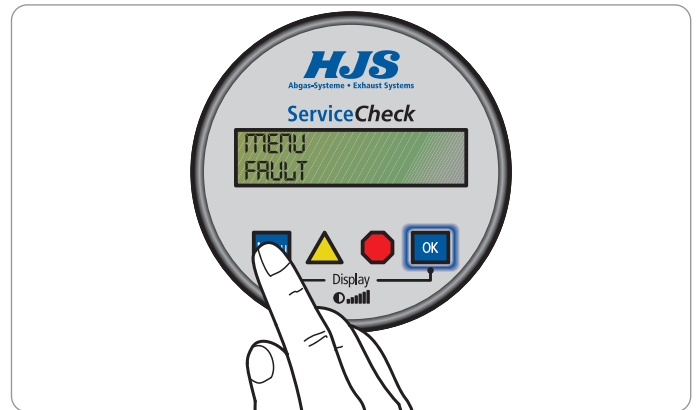
This alarm message is displayed when the AdBlue® tank is empty. The SCR system switches off automatically and the NO_x reduction process stops. The AdBlue® tank must be topped up immediately. The "AdBlue tank empty" status is saved to the fault memory.



Fault memory

General information

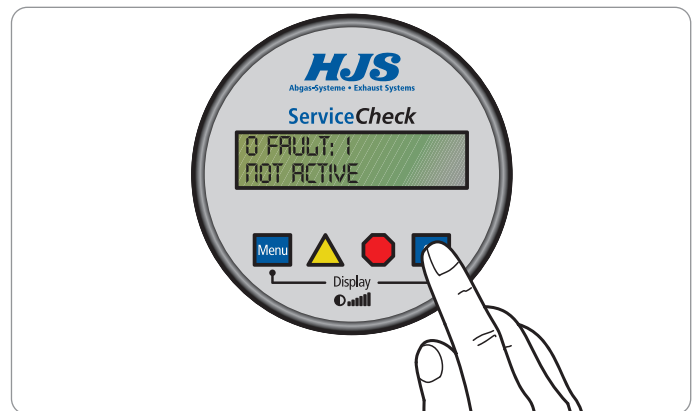
The "FAULTS" menu displays the fault memory. To open this submenu, the touch-sensitive "Menu" sensor button must be touched repeatedly until "MENU FAULTS" appears in the display. Each touch of the touch-sensitive "Menu" sensor button is acknowledged by brief flashing of the sensor buttons. Once "MENU FAULTS" is visible in the display, you can call up the contents of the submenu by touching the "OK" sensor button.



"FAULTS" submenu – Default value

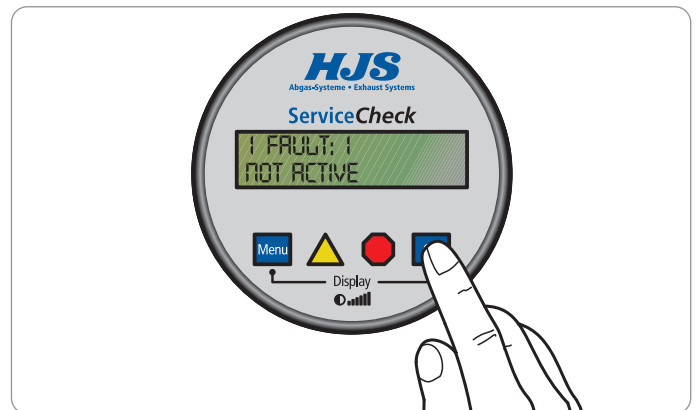
If there is no fault message active, the value that indicates the number of faults is set to "0". The value "1" is a default value and indicates there is no fault present. If a fault message has already been output and eliminated, the value indicated here is the one from the last fault message. "NOT ACTIVE" indicates that this last fault is no longer present. If you touch the "OK" sensor button now, nothing changes in the display.

To return to the main menu, touch the "Menu" sensor button. This is acknowledged by the "OK" sensor button flashing.



"FAULTS" submenu – With 1 fault message

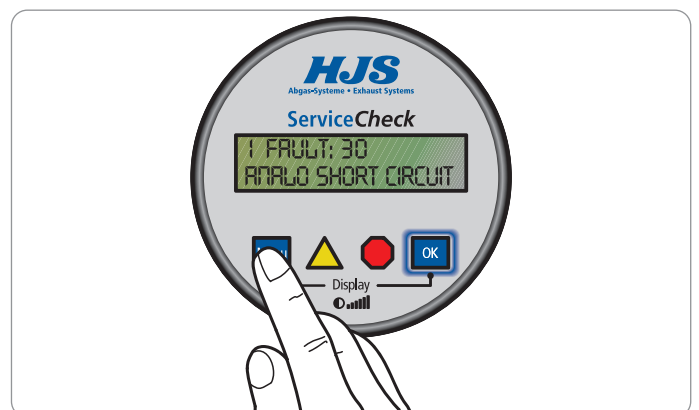
If a fault message is active, the value that indicates the number of faults is set to "1". The value "1" is a default value and indicates that previous faults have been deactivated. To call up the new fault message, touch the "OK" sensor button.



"FAULTS" submenu – With 1 fault message

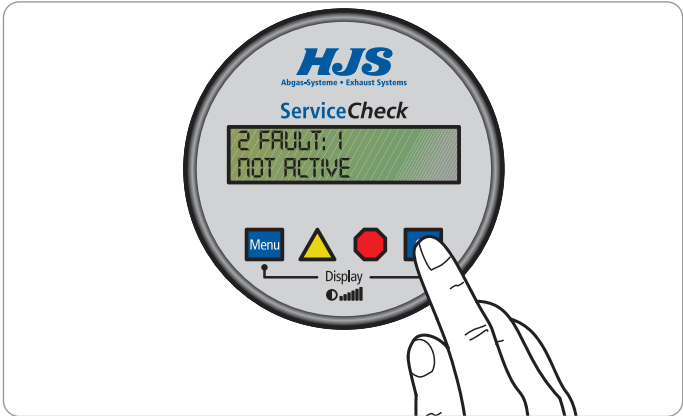
The example illustrated here displays fault 30 and a brief description of this fault in the second line of the display. This fault is saved to the fault memory, from where it can also be called up again later.

To return to the main menu, touch the "Menu" sensor button. This is acknowledged by the "OK" sensor button flashing.



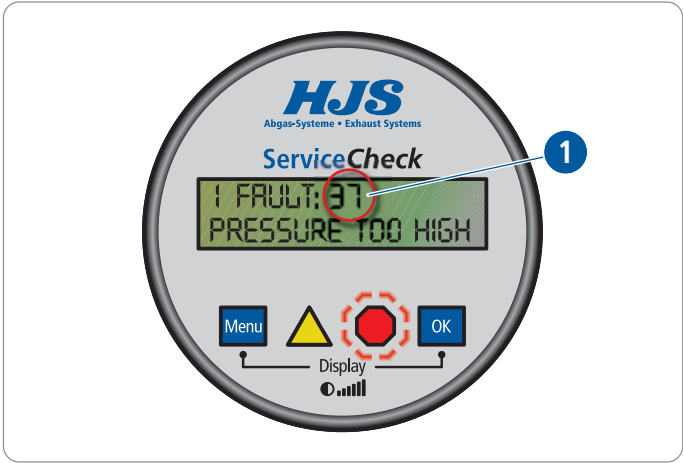
"FAULTS" submenu – With 2 fault messages

If there are two fault messages active, the value that indicates the number of faults is set to "2". The value "1" is a default value and indicates that previous faults have been deactivated. To call up the new fault messages, touch the "OK" sensor button. By touching the sensor button again, you can switch between the two fault messages. To return to the main menu, touch the "Menu" sensor button. This is acknowledged by both sensor buttons flashing.



Information about the section below entitled "Fault list"

- > The fault list contains a list of all potential faults that can arise in applications supplied by HJS.
- > The fault number (see 1) displayed in the "FAULTS" menu are described in more detail in the fault list (see 2).
- > The actions (see 3) described in the "Fault Rectification" column must be carried out once the possible causes of the fault (see 4) have been clarified.



No.	Description	New Description	Possible Cause of Fault	Test Steps	Fault Rectification
16	Fault: Charge-air pressure open circuit/short circuit (2)	Fault: Charge-air pressure open circuit/short circuit	1) Fault in wiring or sensor defective. Possible short circuit or open circuit in wire to charge-air pressure sensor	1) Check operation using ECU diagnostics software. A plausible charge-air pressure value must be displayed in "Actual Values" tab while engine is running. If reading for charge-air pressure is "short", there is probably a short circuit in wiring. If reading for charge-air pressure is "open", there is probably an open circuit (wire break) in wiring.	1) Check wiring for short circuit/open circuit or replace sensor if nec.
19	No characteristic map (1)	Fault: No characteristic map	No plausible value / wrong configuration	2) Ascertain serial number and software/configuration versions and contact HJS	2) Replace ECU if nec.
21	Pressure averaging error	CRT systems: Fault: Pressure sensor	1) Fault averaging differential pressure (4)	Check wiring of differential pressure sensor and sensor itself. Use ECU diagnostics software to check plausibility of differential pressure value	1) Replace wiring and/or replace sensor if nec. (3)

INFO-HOTLINE

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Fault list See previous section entitled "Fault memory" (page 34) for information about the fault list

SMF®	SCR	SCRT®	No.	Description	New Description	Possible Cause of Fault	Test Steps	Fault Rectification
	x	x	16	Fault: Charge-air pressure open circuit/short circuit	Fault: Charge-air pressure open circuit/short circuit	1) Fault in wiring or sensor defective. Possible short circuit or open circuit in wire to charge-air pressure sensor	1) Check operation using ECU diagnostics software. A plausible charge-air pressure value must be displayed in "Actual Values" tab while engine is running. If reading for charge-air pressure is "short", there is probably a short circuit in wiring. If reading for charge-air pressure is "open", there is probably an open circuit (wire break) in wiring.	1) Check wiring for short circuit/open circuit or replace sensor if nec.
x	x	x	19	No characteristic map	Fault: No characteristic map	No plausible value / wrong configuration	2) Ascertain serial number and software/configuration versions and contact HJS	2) Replace ECU if nec.
x		x	21	Pressure averaging error	CRT systems: Fault: Pressure sensor	1) Fault averaging differential pressure	Check wiring of differential pressure sensor and sensor itself. Use ECU diagnostics software to check plausibility of differential pressure value	1) Replace wiring and/or replace sensor if nec.
x		x	30	Analogue short circuit/open circuit	Fault: Sensors (differential-pressure/temperature sensor)	1) Fault in wiring or sensor defective. Possible short circuit or open circuit in temperature sensor	1) Check operation using ECU diagnostics software. A plausible temperature value must be displayed in "Actual Values" tab. If reading for temperature is "short", there is probably a short circuit in wiring. If reading for temperature is "open", there is probably an open circuit (wire break) in wiring. If nec., check plausibility of temperature sensor resistance using multimeter (200 to 600 ohms).	1) Check wiring for short circuit/open circuit or replace temperature sensor if nec.
						2) Fault in wiring or sensor defective. Possible short circuit or open circuit in differential pressure sensor 3) Differential pressure hose Hi blocked.	2) Check operation using ECU diagnostics software. A plausible differential pressure value must be displayed in "Actual Values" tab. If reading for differential pressure is "short", there is probably a short circuit in wiring. If reading for differential pressure is "open", there is probably an open circuit (wire break) in wiring. Furthermore, a plausible backpressure (>1 mbar) must be displayed when engine idling, which must increase as revs/load increases 3) Check hose	1) Check wiring for short circuit/open circuit or replace differential pressure sensor if nec.
x		x	31	Pressure sensor calibration	Fault: Differential pressure sensor	Faulty differential pressure sensor	Fault must be rectified by specialist workshop within 500 km	



Fault list See previous section entitled "Fault memory" (page 34) for information about the fault list

SMF®	SCR	SCRT®	No.	Description	New Description	Possible Cause of Fault	Test Steps	Fault Rectification
x		x	33	Temperature gradient low	Fault: T sensor	1) Incorrect installation position of temperature sensor 2) If fault occurs sporadically, it may possibly be owing to operating profile	1) Check installation of temperature sensor 2) -	1) Adjust installation position if nec. 2) -
x		x	34	Temperature gradient high	Fault: T sensor	1) Incorrect installation position of temperature sensor 2) If fault occurs sporadically, it may possibly be owing to operating profile	1) Check installation of temperature sensor 2) -	1) Adjust installation position if nec. 2) -
x		x	35	Temperature efficiency too low	Event: CRT temperature profile	Efficiency of CRT filter not within optimum range.	If yellow lamp lights up constantly, vehicle must be taken to specialist workshop after no more than 1000 km (600 miles) in order to have HJS Service Unit read out	
		x	36	Filter damaged	Fault: Filter damaged	1) Differential pressure hoses connected incorrectly or defective 2) Filter defective	1) Check differential pressure hose: - Check connections at sensor and filter => Hi inlet. => REF connection must be connected to filter outlet - Check hose lines are not blocked 2) Check values using ECU diagnostics software. A plausible backpressure (>1 mbar) must be displayed under "Actual Values" when engine idling. Actions: measure opacity, remove filter in acc. w. installation instructions and visually inspect filter for damage	1) Connect hoses correctly and replace if nec. Check whether measured values in diagnostics software are plausible 2) Remove filter, check and replace if nec.
x			36	Filter damaged	Fault: Filter damaged	1) Differential pressure hoses connected incorrectly or defective 2) Filter defective	1) Check differential pressure hose: - Check connections at sensor and filter => Hi inlet. => REF connection must be connected to filter outlet - Check hose lines are not blocked 2) Check values using ECU diagnostics software. A plausible backpressure (>1 mbar) must be displayed under "Actual Values" when engine idling. Actions: measure opacity, remove filter in acc. w. installation instructions and visually inspect filter for damage	1) Connect hoses correctly and replace if nec. Check whether measured values in diagnostics software are plausible 2) Remove filter, check and replace if nec.
						3) Engine running detection cable not connected to D+ but to term. 15	3) Check wiring	3) Change wiring

SMF®	SCR	SCRT®	No.	Description	New Description	Possible Cause of Fault	Test Steps	Fault Rectification
x		x	37	Pressure too high	Fault: Filter pressure too high	Differential pressure of filter too high	Have filter serviced	Have filter serviced
x		x	38	Pressure high	Fault: Filter pressure high	Differential pressure of filter high	Vehicle can continue to be operated, but appointment must be made for filter to be serviced. "Fault 37" message will be displayed soon	Have filter serviced
x	x	x	39	5V short circuit	Fault: Short circuit	Short circuit in 5V supply of differential pressure sensor or air mass flow sensor or diagnostics cable.	Check entire wiring for short circuit	Connect wires correctly and replace if nec.
	x	x	41	Fault: SCR fault	Fault: SCR fault	Internal fault in SCR dosing pump	Follow user's manual of SCR dosing pump	Follow instructions in "Software for SCR Dosing Pump" user's manual
x		x	44	Filter cleaning (ash)	Event: Filter maintenance	Filter requires servicing	After no more than 500 km (300 miles), vehicle must be taken to specialist workshop in order to have filter serviced	Carry out filter service
x		x	45	Pressure drop deviation too large	Fault: CRT pressure drop too high	Downward deviation (drop) of hourly averaged differential pressure not within valid range	After no more than 500 km (300 miles), vehicle must be taken to specialist workshop in order to have filter serviced	
x		x	46	Pressure rise deviation too large	Fault: High CRT pressure rise too high	Upward deviation (rise) of hourly averaged differential pressure not within valid range	Vehicle must be taken to specialist workshop within 6 hours in order to have diesel particulate filter checked	
x	x	x	47	Login	Event: Login	Internal event of ECU No fault		
	x	x	48	Event: AdBlue tank empty	Event: AdBlue tank empty	AdBlue tank empty. No fault present.		Fill AdBlue tank
	x	x	49	Event: AdBlue tank on reserve	Event: AdBlue tank on reserve	AdBlue tank level low. No fault present		
x	x	x	52	Series of measurements: Calc	Event: Series of measurements: No fault	Internal event of ECU No fault		
x	x	x	53	Fault: Red fault lamp	Fault: Red fault lamp	1) Short circuit or open circuit in wiring of red fault lamp 2) Lamp 'bulb' defective 3) Lamp 'bulb' defective 4) Faulty connection to ground	1) Check wire from ECU to red fault lamp for continuity and short circuit using multimeter 2) Check lamp 'bulb' for continuity using multimeter 3) Check lamp 'bulb' for continuity using multimeter 4) Check ground pins/contacts	1) Test wire and repair if nec. 2) Replace lamp 'bulb' if nec. 3) Replace lamp 'bulb' if nec.

Fault list See previous section entitled "Fault memory" (page 34) for information about the fault list

SMF®	SCR	SCR ⁺	No.	Description	New Description	Possible Cause of Fault	Test Steps	Fault Rectification
x	x	x	54	Fault Yellow indicator lamp	Fault: Yellow indicator lamp	1) Short circuit or open circuit in wiring of yellow indicator lamp. 2) Short circuit or open circuit in wiring of yellow indicator lamp 3) Lamp 'bulb' defective	1) Check lamp test following system start (term. 15 activation) 2) Check wire from ECU to yellow indicator lamp for continuity and short circuit using multimeter 3) Check lamp 'bulb'	1) Test wire and repair if nec. 2) Test wire and repair if nec. 3) Replace lamp 'bulb' if nec.
x		x	56	Temperature high	Fault: Temperature high	Temperature of filter high	Vehicle can continue to be operated, but appointment must be made for filter to be serviced. "Fault 57" message will be displayed soon	Have filter serviced
x		x	57	Temperature too high	Fault: Temperature too high	Temperature of filter too high	Have filter serviced	Have filter serviced
x	x	x	58	Fault Engine running detection	Fault: Engine running detection	Speed signal or D+ signal not active or pressure sensor defective	Check wiring. check pressure sensor	Connect wires correctly and replace if nec.
	x	x	61	Fault: Charge-air temperature open circuit/short circuit	Fault: Charge-air temperature open circuit/short circuit	1) Fault in wiring or sensor defective. Possible short circuit or open circuit in wire to charge-air temperature sensor	1) Check operation using ECU diagnostics software. A plausible charge-air temperature value must be displayed in "Actual Values" tab while engine is running. If reading for charge-air temperature is "short", there is probably a short circuit in wiring. If reading for charge-air temperature is "open", there is probably an open circuit (wire break) in wiring.	1) Check wiring for short circuit/open circuit or replace sensor if nec.
x	x	x	62	-	Event: order	Internal event of ECU No fault		
x	x	x	63	-	Event: order	Internal event of ECU No fault		



Notes



A medium-sized company founded in 1976 and based in Menden in central Germany, HJS Fahrzeugtechnik GmbH & Co KG boasts many years of experience and expertise in the field of exhaust-gas aftertreatment. Some 500 employees are engaged in the development, production and marketing of modular systems for reducing pollutant emissions. These innovative environmental protection technologies can be used either as original equipment or for retrofitting in passenger cars, light- and heavy-duty trucks and mobile and stationary applications in the non-road sector. In addition to systems for spark-ignition engines, HJS specialises in systems for diesel engines – especially for reducing the emissions of soot particles (PM) and nitrogen oxides.

With a wide range of patents for DPF® (Diesel Particulate Filter) and SCRT® (Selective Catalytic Reduction Technology) systems, HJS sets benchmarks both nationally and globally.



HJS Technology portfolio for OE- and Retrofit-Applications

- > Diesel Particulate Filter (DPF®)
Reduction of soot particle emissions
- > SCR-Systems
Reduction of nitrogen oxide emissions
- > SCRT®-Systems
Simultaneous reduction of soot particle and nitrogen oxide emissions

A clean future with HJS!