

# Operating instructions

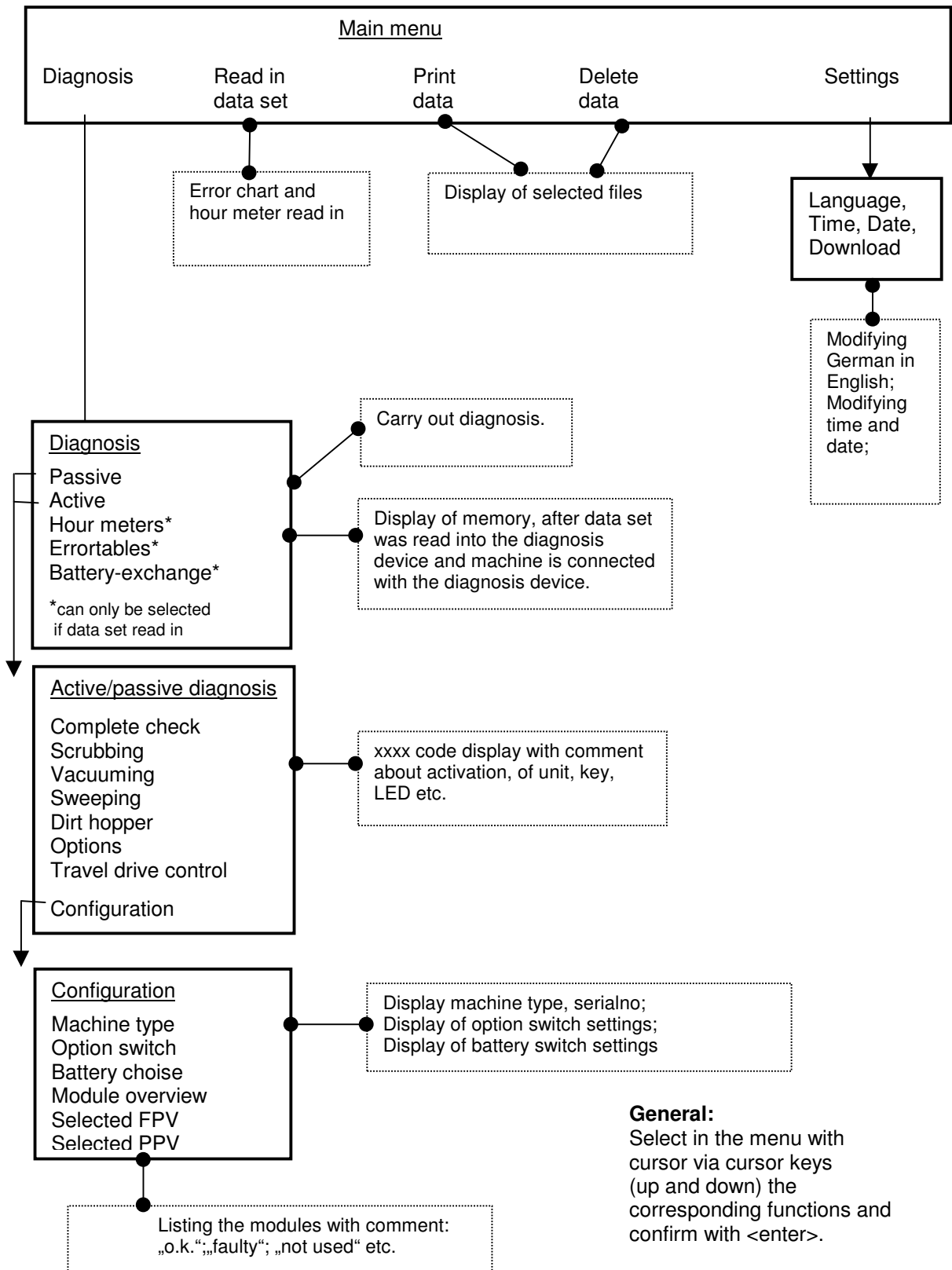
## Diagnosis device

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# 1 Menu system

The menu system is structured as follows:



## 2 General

The diagnosis device supports error detection and definition. It does not replace but facilitates error analysis.

This document generally describes the function of the diagnosis device which apply for all machines of the module range.

This is the recommended proceed in case of repair/troubleshooting:




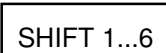

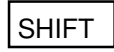
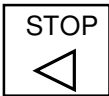
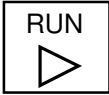




1. Read in data set, to see data on the diagnosis device, stored in the machine (hourmeters, errortables etc)
2. Carry out diagnosis (activ or passiv), every single item to be tested can be chosen separately

All of these items are described in this document.




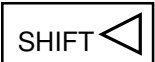



### 2.1 Key functions

The numbers and characters indicated within the SHIFT box have to be activated together with the SHIFT key. The double assignment of the STOP and RUN keys does not require switchover via SHIFT. The diagnosis device program selects the correct function (STOP or cursor arrow) automatically.


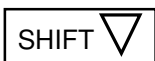

#### 2.1.1 General

|   |   |
|---|---|
|  | turn on device  |
|  | turn off device   |
|  | numeric keys to enter serial number, HAKO number, others.   |
|  | characters A, C, E, F, H, L to enter HAKO number  |
|  | Delete:<br>Data set → selected data set<br>Enter HAKO number → entire field<br>Others → place marked by cursor      |
|  | to select second level of keys. Depress this key together with another key the second function of which is required |
|  | Diagnosis active → LED, motor OFF (following the selected code)<br>for entering → shift cursor 1 digit to the left  |
|  | Diagnosis active → LED, Motor ON (following the selected code)<br>for entering → shift cursor 1 digit to the right  |
|  | Cursor up: previous menu item or code number  |
|  | Cursor down: next menu item or code number  |
|  | quit menu; interrupt entry without restoring (modified) data  |
|  | Menu item, entry, confirm selected data set   |

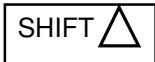
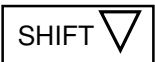



### 2.1.2 Passive / active diagnosis

|   |                                    |
|---|------------------------------------|
|  | go to first code or entry          |
|  | go to last code or entry           |
|  | enter HAKO number                  |
|  | decrease pump value (active only)  |
|  | increase pump value (active only)  |
|  | entry of pump value (active only)  |
|  | set pump value to 0% (active only) |

### 2.1.3 Error file / hourmeter

|   |   |
|---|---|
|  | go to first code, entry                                   |
|  | go to last code, entry                                    |
|  | go to error block of last, previous last etc. error found |

### 2.1.4 Select data set (to print, transmit, delete)

|   |   |
|---|---|
|  | go to first data set  |
|  | go to last data set   |
|  | start to print / transmit   |
|  | delete data set   |
|  | = character "A": delete all data sets. Caution: delete without confirmation |

## **2.2 Connection of diagnosis device**

Connect the diagnosis device when machine is turned OFF.

Hakomatik B550 – 850, B650S: connect to control panel,

Hakomatik B655 – 855, B655S: connect to control panel,

Hakomatik B900, B910, connect to control unit,

Hakomatik B1100, B1500: connect to control unit,

Jonas 1450: connect to control unit

Turn machine and diagnosis device ON.

You may now read the data (hourmeter parameter and error memory) from the machine in the diagnosis device and/or execute a diagnosis or check the settings.

For output of the data on a printer connect the diagnosis device with the broader plug at the top of the unit to your printer.

## **2.3 Auto-Power-Off**

Without connection to the machine for 5 minutes or longer and if no other actions (printing, depressing keys etc.) take place, the device is turned OFF automatically.

Caution: In the menu for time and date setting the auto power off function is not active!

## **2.4 Battery**

The diagnosis device may be used with 4 mignon cells (1.5 Volts, AA, batteries or accumulators). During operation with batteries the background light of the display is deactivated. As soon as the device is supplied via plug connector or diagnosis socket of the machine it switches over to power supply.

When replacing batteries the stored data as well as date/time is saved.

## 3 Diagnosis

In diagnosis mode you may select active or passive diagnosis. Moreover you may view (after data set read in, see chapter 5) the saved hourmeter status of the machine and the high loads as well as the saved error blocks of the machine (i.e. complete list of disturbances)

Diagnosis means that

1. units are activated by the keys of the control panel. The status of the corresponding units (e.g. lifting element and suction motor when squeegee lowers) are displayed in the diagnosis device (passive diagnosis).
2. unit by unit may be activated via the diagnosis device (i.e. only the suction motor or only the lifting element can be active and allow diagnosis of every single unit. The diagnosis device displays the status as well (active diagnosis).

Status is displayed as follows: e.g. „motor OFF“ or „motor running“

Activation of single units facilitates error detection. It's possible to activate e.g. the broom motor in the pre-sweeper of the Hakomatik B1100 without activation of the lifting element. During normal operation these units are always both activated.

The new software partly deactivates the units completely (brush unit, pre-sweeper unit etc.). If only one unit failed the active diagnosis now allows the independent activation of every single unit. The detection of the defective unit or the defective connection to the unit is facilitated.

### 3.1 *Passiv*

This mode allows to monitor the units and their status. To do so the machine is operated as usual (via control panel). The units are also operated as usual.

Select the passive diagnosis mode as outlined when the machine is turned ON and the seat switch actuated, i.e. when the machine is serviceable as usual.

Now select the field (complete check, scrubbing etc.) of which you want to test the functions. If you want to test e.g. the „sweeping“ unit, select the field „sweeping“. Only the codes which are valid for the sweeping unit are displayed (e.g. code xxxx „motor broom“ or code xxxx „lifting element broom“. The selection does not contain the codes for the „scrubbing“ field. If you want to display the latter select the fields „scrubbing“ first.

If you want to check all units or several units from various fields, select the field „complete check“. Additionally, this item allows to check the LEDs of the battery charge display.

Under the corresponding code you will find the information about e.g. activation of the motor via the control unit (= „motor running“) displayed.  
If a fault occurs during activation of the component (electronic circuit breaker triggered) the error code appears. Please note that the error codes for „common alarm display fuses“ of all components with fuses on this control unit are displayed in the diagnosis device. Check the single components in this case with the active diagnosis and the blown fuse can be detected.

Move to the components which are to be checked with the help of the cursor keys (up and down). Press <Shift cursor key (up)> or < Shift cursor key (down)> to jump to the first or to the last entry in the list.

### **3.2 Active**

This mode allows to monitor and activate the units and their status. To do this all functions of the machine which are activated by the control panel, are switched OFF. During diagnosis „d A“ is displayed (begin of diagnosis) and when finished „d E“ will appear (end of diagnosis). The hourmeter status or the actual error alarm is deleted or overwritten and is displayed again at the end of active diagnosis if the machine is turned OFF and ON.

Select the active diagnosis mode when the machine is turned ON. The seat contact switch need not be actuated for this type of diagnosis since the functions of the control panels are locked. They may only be activated by the diagnosis device.

Some units are completely turned OFF if the control unit detects a fault. If for instance the shaking motor in the pre-sweeper of the Hakomatic B1100 is defective the whole pre-sweeper unit is switched OFF. This diagnosis mode offers an effective error recognition.

Now select the field (complete check, scrubbing etc.) of which you want to test the functions. If you want to test e.g. the „sweeping“ unit, select the field „sweeping“. Only the codes which are valid for the sweeping unit are displayed (e.g. code xxxx „motor broom“ or code xxxx „lifting element broom“. The selection does not contain the codes for the „scrubbing“ field. If you want to display the latter select the fields „scrubbing“ first.

If you want to check all units or several units from various fields, select the field „complete check“. Additionally, this item allows to check the LEDs of the battery charge display.

Under the corresponding code you will find the information about e.g. activation of the motor via the control unit (= „motor running“) displayed. If a fault occurs during activation of the component (electronic circuit breaker triggered) the error code appears. Please note that the error codes for „common alarm display fuses“ of all components with fuses on this control unit are displayed in the diagnosis device.

Check the components in this case by activation of every single component with the help of the diagnosis device

To do so activate the units by <Run> and deactivate them with <Stop> and you may view the modification displayed.

Please note that the solenoid valve has to be opened first then the water pump starts running.

Move to the components which are to be checked with the help of the cursor keys (up and down). Press <Shift cursor key (up)> or < Shift cursor key (down)> to jump to the first or to the last entry in the list.



### 3.3 *Hourmeter*

The item „hourmeter status“ is only displayed if an actual data set had been read in previously (see chapter 5).

After mode selection as described above the hourmeter status and cycles of the machine and its high loads (e.g. suction motor, brush motor etc.) are displayed. Select the different data with the help of the cursor keys (up and down).  
First entry in the list: <Shift cursor (up)>,  
last entry: <Shift cursor (down)>.  
Modification of these data by the diagnosis device is not possible.

### 3.4 *Error menu*

The item „error menu“ is only displayed if an actual data set had been read in previously (see chapter 5).

After mode selection as described above each error block is displayed with a brief error code description. Select the different data with the help of the cursor keys (up and down).  
First entry in the list: <Shift cursor (up)>,  
last entry: <Shift cursor (down)>.  
Modification of these data via the diagnosis device is not possible.

The so-called error blocks which contain the error code, the hourmeter status and the cycle number are saved

An error block contains only one error code.

The hourmeter and cycle indications always refer to the unit. The hourmeter status and the cycle number is for instance saved for the 'Blocking protection' or 'Thermal protector brush'. If general errors come up (e.g. LDS or CCU defective) the saved information refers to the machine.

A new error block is saved if a new error code occurs or if the same error comes up and particular conditions are met.

The same error code is only saved as a new error block if some time or a certain number of cycles (referring to the hourmeter status/cycle number of the defective component) has passed since the last occurrence of the error

This means that the last saved error block must not necessarily contain the last error code occurred.

An example (see following representation):

Assumption: no error blocks saved

Error '3211' occurs (→ error block 1 is saved). Some time later the error code '4611' occurs (→ error block 2 is saved in addition).

If now the error code '3211' comes up again before not more than 6 minutes or 10 cycles have elapsed no new error block is saved. In this case the indication of the last error occurred is updated.

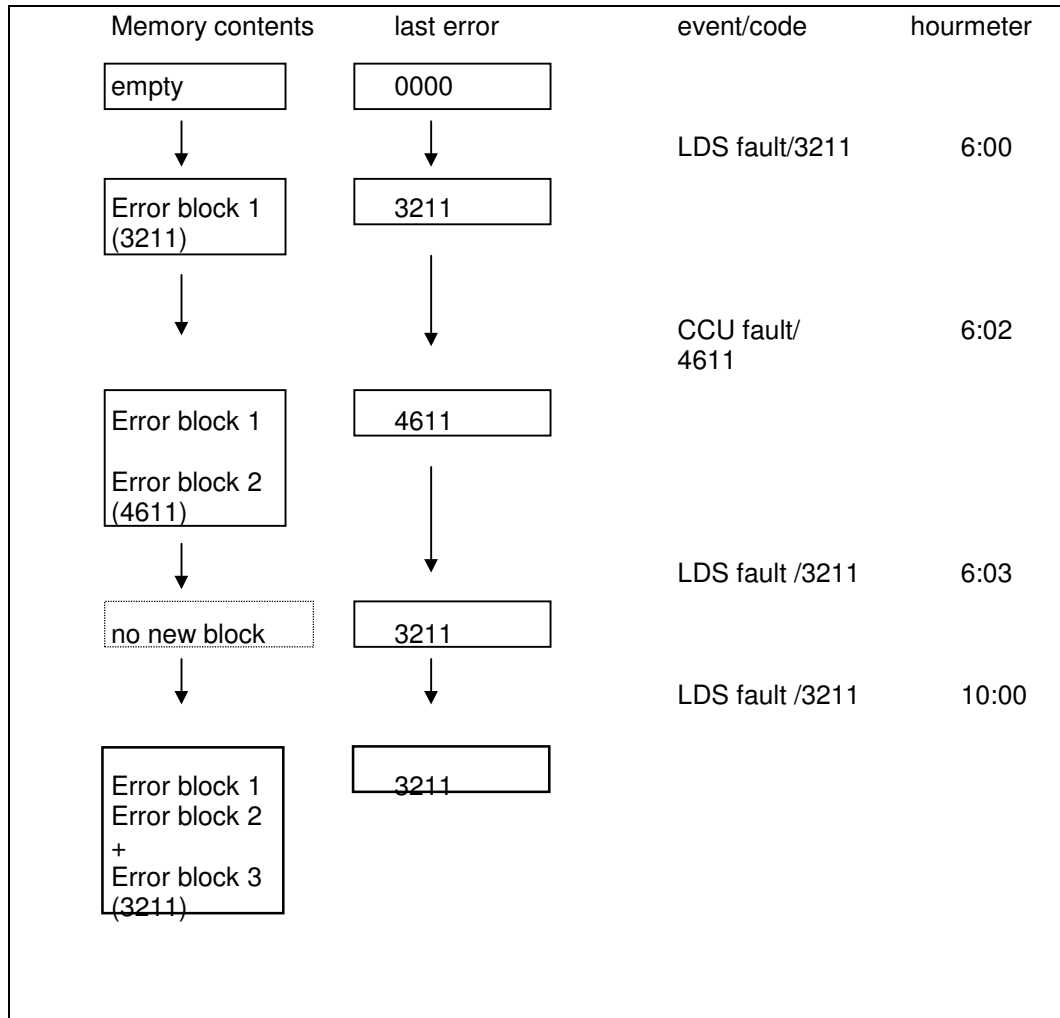
If the error '3211' occurs after more than 6 minutes and 10 cycles have passed it is saved as error block 3 and updated as last error.

The „last error“ sequence now is:

|         |            |
|---------|------------|
| "8...5" | unassigned |
| "4"     | 3211       |
| "3"     | 4611       |
| "2"     | 3211       |
| "1"     | 3211       |

If you press the „1“ key, the error block 3 containing error code 3211 as the last error is displayed. If you press the „2“ key, the error block 1 with error code 3211 as last error will appear since the error occurred again after code 4611 but within the period (6 minutes, 10 cycles) after the error block 1 has been saved

For this reason it is advisable to select the last or the previous last or ... error with the numeric keys and never interpretate the last error block as the last error occurred. Please keep in mind that the last error occurred may be contained in the last error block. In the above example this would be the case after the error code 4611 had been saved and before the error code came up again.



## 4 Configuration

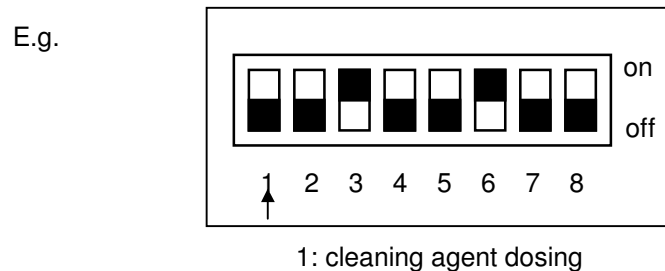
### 4.1 Machine type

Select mode as described above.  
Display of machine type and display of CCU and machine serial code.

### 4.2 Option switch

Select mode as described above.

The option switch is now displayed with the different switch positions.  
The black marks are the valid positions. (1 = OFF)



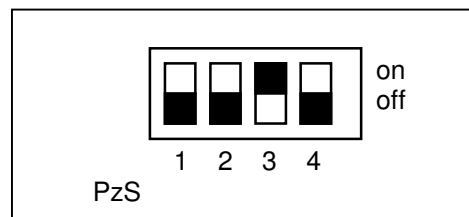
The arrow position is modified with the cursor keys (left, right). The description changes according to the arrow position (in this example: arrow points to the first switch which must be set for the cleaning agent dosing option).

The switch position cannot be modified with the diagnosis device. Modification is only possible via the control unit. The modified switch position is updated in the diagnosis device such that the changings can be directly monitored there.

### 4.3 Battery selection

Select mode as described above.

The option switch with the different switch positions is displayed now.  
(switch position at random)



The switch position cannot be modified with the diagnosis device. Modification is only possible via the control unit. The modified switch position is updated in the diagnosis device such that the changings can be directly monitored there.

## 4.4 **Module overview**

Select mode as described above.

The installed modules are displayed. The comment refers to the module which is marked by the cursor.

Other modules may be selected with the cursor keys (up and down).

All the modules installed in the machine which have been logged on (via option switch) are displayed

The bottom line contains the comment on the module status.

### **Comments:**

- |                     |                                       |
|---------------------|---------------------------------------|
| 1. "ok":            | module is installed and logged on     |
| 2. "faulty":        | module is logged on but not connected |
| 3. "not available": | module is connected but not logged on |

The comments no. 2 and 3 initiate error alarms for the missing or overhanging module when turning the machine ON.  
(e.g.: item 3. : code 4653: "too many modules")

## 5 **Read in data set**

The data set contains the saved hourmeter parameters and error blocks and must be read in the diagnosis device before viewing the machine parameters.

Select the item „Read in data set“ in the main menu with the cursor and confirm with <enter>.

Read in of the data set is confirmed with the display „Read error chart ...“. After reading in has been completed „d“ is displayed in the bottom status line on the screen of the diagnosis device.

Initialization is still in process if after selection and confirmation of the item „Read in data set“ an alarm is produced signalling that read in of data set is only possible after „r“ symbol has been displayed in the bottom status line. Initialization takes place automatically after switching ON the diagnosis device if the machine is turned ON. Complete initialization initiates the „r“ symbol displayed in the status line.

Confirm the item „Read in data set“ again if the „d“ symbol necessary for reading in has not yet appeared in the status line.

It is possible to save several data sets simultaneously in the diagnosis device. If the memory space is insufficient for reading in new data sets a message will appear in the display.

## 6 Print data

The data sets which are saved in the diagnosis device may be printed (read in data set see chapter 5).

Connect the diagnosis device directly to the printer with the broader plug at the top of the device. You may also use for instance the link of the printer to your PC. Disconnect the plug of the PC and link the printer with the diagnosis device instead of the PC. Select the item „Print data“ in the main menu with the cursor and confirm with <enter>.

The first data set will appear displaying the machine model, the serial and date and time saved. Two additional lines allow display of the comment about the data set status (printing is completed or is send to PC).

The data set number appears at the right bottom of the status line.

The data sets appear in order of saving i.e. the first data set being the oldest the last the most recent one.

<Shift cursor up> takes you to the oldest data set, <Shift cursor down> to the most recent one without stepping through the list.

Printing is only initiated if the displayed data set is confirmed with <enter>. Only the selected data set is printed.

The cursor keys (up and down) allow the selection of more data sets.

The comment „Data printed“ signals the end of printing.

If during the printing procedure the diagnosis device is still linked with the machine, „A“ is displayed with the actual data set after the data set number. As long as printing goes on the diagnosis device will interrupt a possible link to a machine. When print-out is complete, the link is established again. Status when leaving the print mode is the same as just having connected the diagnosis device with the machine.

## 7 Delete data

The data sets saved in the diagnosis device may be deleted (read in data set see chapter 5)

Select the item „Delete data“ in the main menu with the cursor and confirm with <enter>.

The first data set will appear displaying the machine model, the serial and date and time saved. Two additional lines allow display of the comment about the data set status (printing is completed or is send to PC).

The data set number appears at the right bottom of the status line.

The data sets appear in order of saving i.e. the first data set being the oldest the last the most recent one.

<Shift cursor up> takes you to the oldest data set, <Shift cursor down> to the most recent one without stepping through the list.

Delete the selected data set with <DEL>. This way only the selected data set is deleted. <Shift A> deletes all data sets Caution: The data sets are deleted without confirmation!

If an actual data set is deleted (i.e. data set belonging to a connected or active machine) the display of hourmeter parameters and error blocks is only possible after the data set has been read in again.

## **8 Settings**

### **8.1 Language**

Select this item as described above.

With <enter> key you can use either the English or the German version. When using the English version the date will change from dd.mm.yyyy to mm\dd\yyyy.

The selected language option will be saved when turning the system OFF.

### **8.2 Time and date**

Date and time will appear after selection of this item. With <enter> the first cipher is flashing and you may modify the setting or select with the cursor keys (right and left) the ciphers to modify.<ESC> allows cancelling without saving of the (modified) parameters, <ENTER> allows quitting the item with saving the (modified) parameters.

Years between 1995 and 2095 will be accepted, use the last two digits only, centuries will be selected automatically.

### **8.3 Download**

Never select and activate this item since all data sets in the diagnosis device would be deleted.