LIEBHERR

Diagnostics manual

LICCON 1

Operating instructions

BAL-No.: 99900-10-02

Pages: 165

Works-Number	
Date	

ORIGINAL OPERATING MANUAL

The operating manual is part of the crane!

It must always be available within reach!

The traffic regulations and those for crane operation must be observed!

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20.00 Diagnostics

Displaying errors in the superstructure

If there is a system error, application error or operating error, an error message **1.1** will appear in the program “Crane operation”, “Telescoping” or “Support” in the symbol element “Horn” on the LICCON monitor.
The error will be displayed by:
– the error class “E” =system error/application error or “B” =operating error
– the relevant CPU
– the processors of the CPU (TMS or HC11) or the relevant I/O module

Example, system error (illustration **1.1**):

Error code: E:OHC11	
Element	**Description**
E:	Error class
0	CPU
HC11	I/O module and number, or processor of CPU

NOTICE
Danger of property damage!
▶ In the case of fatal system errors, please also note the 7-segment displays on the CPUs.

▶ Press function key **F8** once.
Result:
– Horn is switched off.

▶ Press function key **F8** twice.
Result:
– Change to Error determination screen **1.2** in program “Test system”.
– The page of the error vault on which the error is stored appears. The error is displayed as a 6 digit LEC and documented. Active errors are identified by a “+”.

Inactive errors can be displayed using function key **F2** in subprogram “PARAMETER ON” **1.3**. Identification in this case is “-”. You can find more information on inactive errors in the section “System errors”, “Superstructure”.
▶ If inactive errors are to be displayed:
Press function key **F2**.

Displaying errors in the chassis (UW) (only for LTM and LG cranes)

If there is a system error “E”, the warning light **224** on the display unit flashes. Via the **i** -key **110** on the keypad unit, the LICCON-Error-Code (LEC) on the display unit **225** will be alternately displayed for the duration of the operation.
This means that the entire LEC will be alternately displayed by:
– error class
  • “E” =system error/application error
  • “b” =operating error
– the 6-digit error number

Example, system error (active error - illustration **1.1**):

Error	Possible cause
When switching on, monitor displays error text from illustration 4 - LED **I** does **not** illuminate.	Monitor is defective
	Monitor to CPU connection (via IPCB) has no power supply
	CPU defective

Possible rectification of error (follow given order for rectifying error):

▶ Open the control cabinet and check the CPU display.

If the CPU display

is shown

flashing:

▶ Check the connection of the CPU to the input PCB and the connection of the input PCB to the monitor for interruption.

▶ If the connections are OK:
Check the CPU of the monitor and error display and replace if necessary.

▶ If this flashing display is **not** shown on the CPU display after switching on:
Check the CPU or program memory card and replace if necessary (see section “Locating basic module errors”, “Checking the CPU”).

▶ Replace the defective LICCON monitor with a functioning replacement monitor.

Error during software update			
Power unit display	**Error text**	**Possible causes of error**	**Possible remedy for error**
	FLASH Timeout Polling	FLASH module defective	See power unit display F5.

Error during software update			
Power unit display	**Error text**	**Possible causes of error**	**Possible remedy for error**
	FLASH Timeout Erase	FLASH module defective	See power unit display F5.

Error during software update			
Power unit display	**Error text**	**Possible causes of error**	**Possible remedy for error**
	insert card defective	incorrect insert card	See power unit display F5.

To change to the program “Test system” proceed as follows:

▶ Switch off LICCON computer system.

▶ Switch LICCON computer system back on after approx. 5 seconds.

Result:

– The subprogram “Error determination” of the LICCON test system will automatically appear (see Fig. above). The system error will be documented there with a 6-digit number.

▶ Press **F2** key.

Result:

– Call-up of subprogram “PARAMETER ON/OFF”. Error-specific data as well as the date the error occurred can be read off (see illustration below).

▶ Press **F6** key.

Result:

– Call-up of subprogram “MORE”. Other errors from the error vault can be read off.

It is not possible to change back to other LICCON programs directly via the program keys.

▶ Switch off LICCON computer system.

▶ Switch LICCON computer system back on after approx. 5 seconds.

Other system errors (basic module errors)

Other system errors are only differentiated from fatal system errors in that no monitor error display appears. The monitor can no longer be described by the type of error for these system errors. Typical signs of other system errors on the monitor are e.g.:

– the monitor display freezes
– the monitor display goes dark
– the monitor display is disturbed

Other system errors can also be subsequent errors of other errors. If the monitor stays dark, the error can only be defined using the CPU displays. The procedure for searching for these errors is exactly the same as for searching for fatal system errors (see section “Locating basic module errors”).
The chart “Other system errors” describes the errors according to their displays on the CPU display. The chart provides information on possible causes of error and possible error rectification methods.

Errors on the central processing unit			
CPU display	**Type of display**	**Error description, poss. causes of error for customer service**	**Possible causes of error**
	-	CPU display dark:	CPU defective
		no power supply	check fuse
		program memory card missing or defective	program memory card was not inserted
		CPU defective	

Possible error rectification:

▶ Check CPU.

blank page!

1.3.6 Checking the central processing unit

Illustration **1** shows the central processing unit when fitted.
Illustration **2** shows the individual parts of the central processing unit as seen on the control cabinet.
Illustration **3** shows a side view of the individual parts of the central processing unit.
During the checking procedure, test whether the central processing unit **28** and the program memory card **27** inserted in it are properly pushed in. To do this, remove and refit the central processing unit **28** used and the program memory card **27** once.
Ensure that the crane is turned off.

Dismounting the central processing unit

Ensure that you have a screwdriver to hand.

Note
Pull out the central processing unit!

- When pulling out the central processing unit from the module carrier, the stand-by power supply of the CPU will be interrupted. This results in a cold start on this central processing unit. The set-up state data and the adjusting events stored on this CPU are lost. The values must be subsequently reset.

- Push lightly down and unlock the locking spring **22** on the front cap **23** with a screwdriver. At the same time, pull out the output plug **30** and remove it from the socket **29**.
- Unscrew screw **21** and screw **24**. The screws remain screwed to the front cap **23**.
- Pull out the central processing unit insert firmly.
- Undo screw **25** on the front cap **23** of the power unit. Demount and remove the front cap **23** at the bottom on the central processing unit **28**.
- Pull the program memory card **27** out of the central processing unit **28**.

Fitting the central processing unit

NOTICE
Danger of damage to the plug connections!
When inserting the program memory card **27** into the central processing unit, the plug connections could be damaged.

- Press the program memory card **27** lightly on at first, then insert firmly to the limit position.

- Push the program memory card **27** into the central processing unit **28**.
- Attach the front cap **23** at the bottom on the central processing unit **28**. Tighten the screw **25** on the top on the front cap **23** of the central processing unit and mount the front cap **23**.

NOTICE
Danger of damage to the plug connections!
When inserting the central processing unit the plug connections could be damaged.

- Press the central processing unit lightly on at first, then insert firmly to the limit position.

- Push the central processing unit insert into the basic module carrier.
- Screw in screw **21** and screw **24** on the front cap **23**.

NOTICE
Danger of property damage!
The locking spring **22** must engage so that it can execute its function properly.

- When inserting the output plug **30** into the socket **29**, allow the locking spring **22** to engage.

- Insert the output plug **30** in the socket **29**.
- Start the crane.
- Check whether the error occurs once more.

1.5.2 Chassis

Note

▶ This section applies to LTM and LG cranes only.

Active system errors

Only active engine and transmission errors will be treated and displayed as system errors.
If there is a system error, the warning light **224** on the display unit flashes. Via the **i** -key **110** on the keypad unit, the LICCON-Error-Code (LEC) on the display unit **225** will be alternately displayed for the duration of the operation. This means that the entire LEC will be alternately displayed.
Example of an active system error, CH: **E.02 0266**

▶ If several active errors are present at the same time:
Press the **i** -key **110** again.

Result:

– All existing active errors will be displayed.
– Once all existing errors have been displayed “End.” appears on the display unit **225**. By pressing the **i** -key **110** again, the first error will be displayed once more.

Inactive system errors

Inactive errors can be displayed by pressing the Hand button **143** and the **i** -button **110** on the display unit **225** at the same time. Identification in this case is “-”.
Example of an inactive system error, CH: **-E.02 0266**

▶ If inactive errors are to be displayed:
Press the Hand button **143** and the **i** -button **110** simultaneously.

▶ Press the function key **F1**.

Result:

– The assignment of the function key **F2** and the function key **F3** changes, see fig. **7**.

Note

▶ By pressing the function key **F2**, all errors in the entire system are deleted.

▶ By pressing the function key **F3**, the error parameters are superimposed.

▶ Press the function key **F3**.

Result:

– Selecting the function “Parameter ON/OFF” expands the error description of each error by the parameter line, see fig. **8**.

– In addition to the parameters, the “inactive” errors are also displayed.

Note

▶ Operating errors are shown with a delay in the error determination screen - as long as the error control is active.

▶ Severe operating errors are shown immediately in the error determination screen.

▶ With the function key **F4**, one gets into the high level menu or back to the “Menu overview” program.

1.3.2 Error information

The information of an error as well as the date when the error occurred is distributed to 3 lines. When calling up the sub function **PARAMETER ON** with the function key **F3**, the error text is expanded by the parameters. In addition, all inactive errors “-” are shown, see fig. **8**.

Line 1:	**Type of error**	**Error text**
	±B: = operating error **±E:** = system error	Documentary description of the error
Line 2:	**Time/error frequency**	
	When error last occurred/how often error has occurred	
Line 3:	**Date**	
	When the error last occurred	
Line 4:[1]	**Error-specific data in hexadecimal form**	
Line 5:[1]	**Error-specific data in hexadecimal form**	

[1] When function “PARAMETER ON” is selected

1.3 LSB overview - general

In the LSB overviews, the LSB detail views “Master” the LSB detail views “Slave”, it is shown in the header line of the corresponding overview if the bus system is functioning properly.

Note

- ▶ The bus system is constantly monitored for errors or problems.
- ▶ If errors or problems arise on the bus system, then they are shown in the header line.

Description of abbreviations:

- C: = check (check the bus system that it is free of errors)
- K: = collision (check for collision of bus data)

	Error/fault
C: 0	no
C: 1, .. 2, .. 3, ..	yes (error in the bus system)
K: 0	no
K: 1, .. 2, .. 3, ..	yes (bus data collided)

Note

- ▶ If a number larger than 0 (zero) is shown, check the bus system!

Data

No data will be displayed with the I/O module or the CPU since these exchange larger-sized data blocks with each other. The contents of these data blocks cannot be read by the user.

Function key line

F5 INPUT OUTPUT	• Call-up of sub-function Input/Output I/O module x (see relevant section)
F8 BACK	• Back towards “Main menu”

1.6.6 Shaft encoder horizontal (DR)

Information

The actual/setpoint value of the type identifier will be displayed in the detail display (see “Hoist limit switch with wind sensor” in section “LSB detail display slave”)

Data

degrees	• Current position of crane superstructure related to the main work direction “to the rear” in degrees

Function key line

see “Hoist limit switch with wind sensor” in section “LSB detail display slave”

1.6.7 Master switch (MS)

Information

The actual/setpoint value of the type identifier will be displayed in the detail display (see “Hoist limit switch with wind sensor” in section “LSB detail display slave”)

Data

<0	• **X-value** Excursion in X-direction in %
<0	• **Y-value** Excursion in Y-direction in %
0000	• **T_S1S2S3** Keypad assignment on master switch

Function key line

see “Hoist limit switch with wind sensor” in section “LSB detail display slave”

Error vault empty

The empty state of the selected error vault is dependent on the sub-function “PARAMETER ON” or “PARAMETER OFF”:

– **Sub-function PARAMETER OFF**:
  If there is no active error and no operating error, the information “- no current ERROR entry ! ! -” will be displayed on the monitor.
  There may, however, still be inactive errors present in the error vault. In order to display these, call up sub-function PARAMETER ON using function key **F2**.
– **Sub-function PARAMETER ON**:
  If the error vault is completely empty, meaning that there are no old or inactive errors stored still, the information “- ERROR deleted ! ! -” will be displayed on the monitor.

▶ Press keys **SHIFT** + **F6** (AUTOMATIC).

Result:

– Automatic assignment is completed.

Note

Switching over from system mode “TEST SYSTEM” to system mode “CRANE OPERATION”.
For safety reasons, switching over is **not** possible.

▶ Stop and restart the LICCON computer system (see section “Starting the Multi-CPU test system”, “System mode Crane operation”).

▶ Restart the LICCON computer system in system mode “CRANE OPERATION”.

Troubleshooting

Sensor cannot be assigned using automatic assignment and is allocated address 0?
Example: Hoist limit switch with incorrect, but not allocated address. Sensors which cannot be assigned uniquely are assigned the address 0. If address 0 has already been filled by another sensor the next free (not configured) position will be selected. As soon as address 0 is free, the automatic system ensures that the next sensor which cannot be assigned is allocated address 0.

▶ To assign sensors from address 0 using semi-automatic assignment, see the section “Assigning not uniquely identifiable sensors semi-automatically”.

1 Diagnostics – disk brake pads*

If the warning light **204** on the display unit lights up, it is a sign that at least one brake pad on the crane is worn and has reached the wear limit.

1.1 Finding the worn disk brake pad

You can find the worn brake pad via the diagnostics plug -X98 **70** – located in the center console. Make sure that the cover of the center console is open:

– Make sure that the diagnostics plug -X98 **70** is easily accessible.
– Prepare the multimeter for diagnostics.

Note

- ▶ Carry out the diagnostics for each brake pad individually.
- ▶ Connect the multimeter for the diagnostics according to the wiring diagram.
- ▶ The current determined with the multimeter provides information if the inspected brake pad is OK or if the brake pad is worn, or an electrical problem is present in the diagnostics circuit.
- ▶ During the diagnostics of the disk brake pads, always check all brake pads.