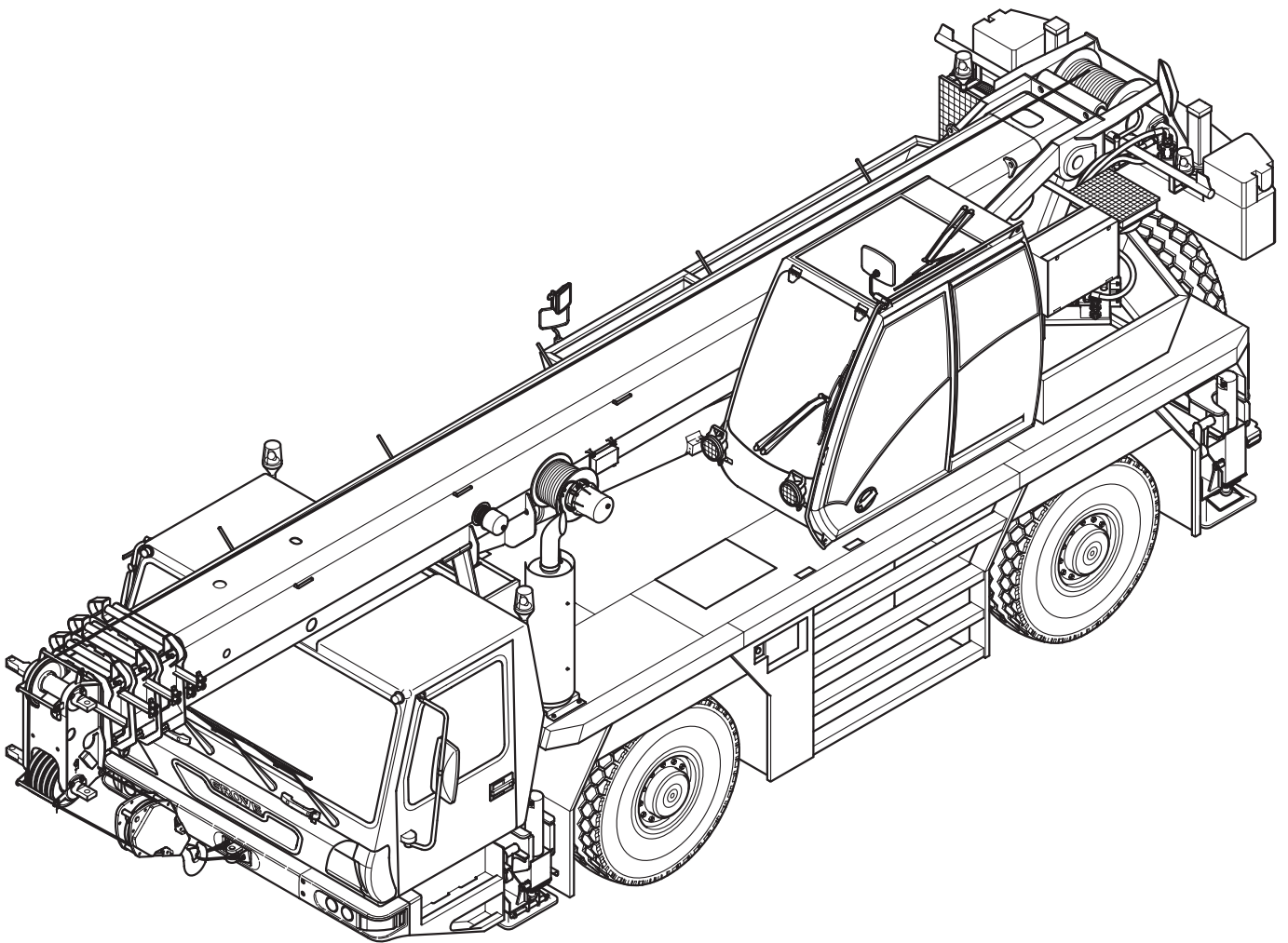


GROVE®

GMK 2035E



Lattice extension operating instructions



Serial number

**3 112 294 en
19.07.2006**

Manitowoc®
Crane Group

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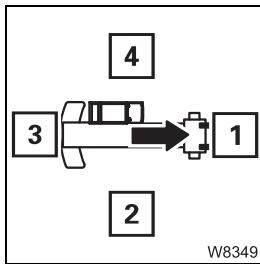
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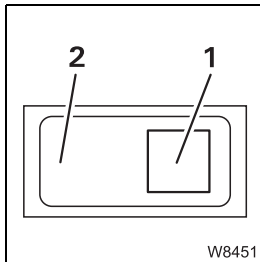
On the superstructure



The main boom head is always at the front, which means that:

- | | |
|-----------------|-----------------|
| 1: front | 2: right |
| 3: rear | 4: left |

Switches and buttons

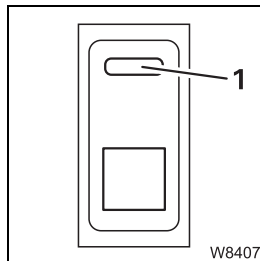


For switches and buttons, the terms **down** and **up** are used.

Regardless of the fitting position (vertical, horizontal, diagonal, perpendicular or turned), the following always applies:

- down:** press (1) – next to the symbol
up: press (2) – opposite the symbol

General information on the operating elements



Some switches are provided with a lock button.

The lock button (1) will not be mentioned again during operation. For all switches with a lock button, the following applies:

- **To switch on:**
 - first press the lock button
 - then push the switch down and inwards
- **To switch off:** push the switch inwards and up until the lock button latches into place

2.1.5

Transport



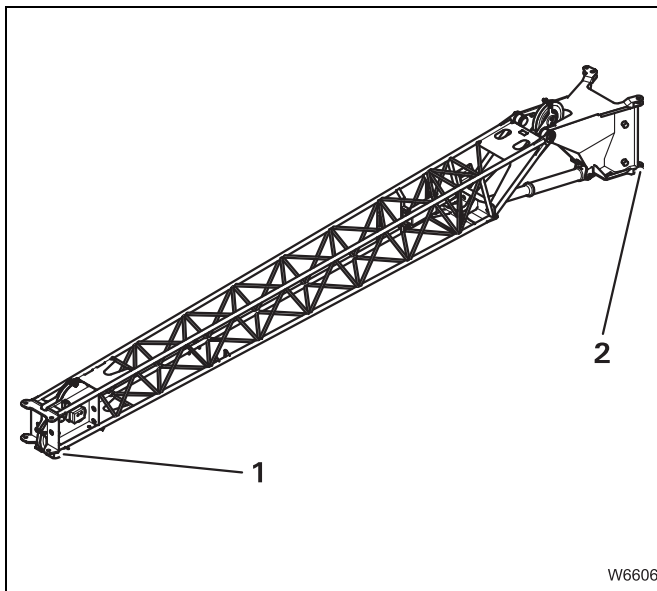
Risk of accidents from a falling lattice extension

Only attach the lattice extension in such a way that it is positioned in the centre of gravity and always use lifting gear with sufficient lifting capacity. This prevents the lattice extension falling and injuring people while loading.



Risk of damaging the lattice extension

Always secure the lattice extension by tying it down with suitable belts when it is transported on a separate vehicle. This prevents the swing-away lattice extension from tipping and becoming damaged during transportation.



- Check whether all the required connections for transport condition are established;
▣► *Transport condition with removed swing-away lattice, p. 3 - 29.*
- For transportation, place the lattice extension on the skid (1) at the front and onto the lower connecting points (2) at the rear.
- Always secure the lattice extension on the transport vehicle with belts to prevent slipping and overturning.

3.3

Checklists for rigging work

3.3.1

Overview of the required rigging work

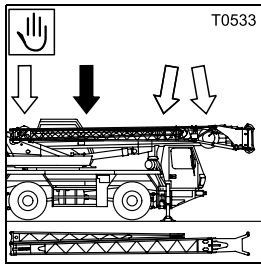
There are different initial states for rigging the swing-away lattice, depending on whether the swing-away lattice is:

- folded at the side of the main boom or
- dismantled for on-road driving.

The following table shows you which checklist describes the required rigging work for your initial state.

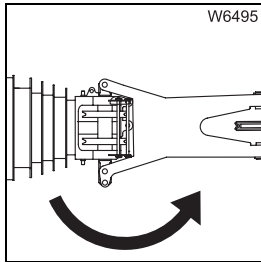
	Starting position of the swing-away lattice	Associated checklist for ...
Before crane- operation	– On the side of the main boom	▣▣▣▣▶ Rigging; p. 3 - 15
	– Completely dismantled	▣▣▣▣▶ Installation; p. 3 - 8
After crane- operation	– Must be folded to the side of the main boom	▣▣▣▣▶ Unrigging; p. 3 - 21
	– Must be removed for on-road driving	▣▣▣▣▶ Removal ¹⁾ ; p. 3 - 10

¹⁾ Driving mode specifications ▣▣▣▣▶ *Operating instructions GMK 2035E – driving modes.*

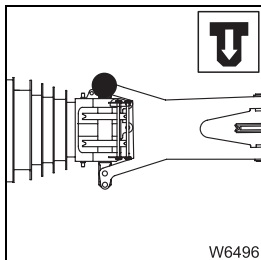


12. Only applies for the inclinable swing-away lattice.

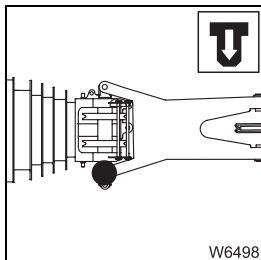
When the **15 m**-swing-away lattice extension is rigged, release section 2 in the *Middle* area; *Securing/releasing section 2*, p. 3 - 46.



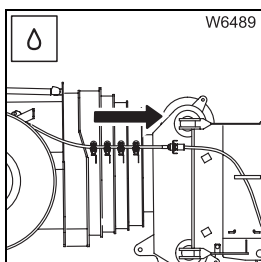
13. Swing the lattice extension in front of the main boom head; *When rigging – section 1*, p. 3 - 53.



14. Pin section 1 onto the main boom head, on left-hand side; *Releasing connections*, p. 3 - 51.



15. Pin section 1 onto the main boom head, on the right-hand side; at the same time, release the bearing points, if necessary;
 Releasing connections, p. 3 - 51,
 Relieving the connecting points, p. 3 - 52.



16. Only applies for the derricking swing-away lattice.

Attach the hydraulic hoses to the front holder and place on the guide sheaves; *When rigging*, p. 3 - 35.



If the **8.5 m** swing-away lattice is rigged – continue with **item 22.**; p. 3 - 18.



3.4

Description of rigging work

3.4.1

Securing the swing-away lattice with rope

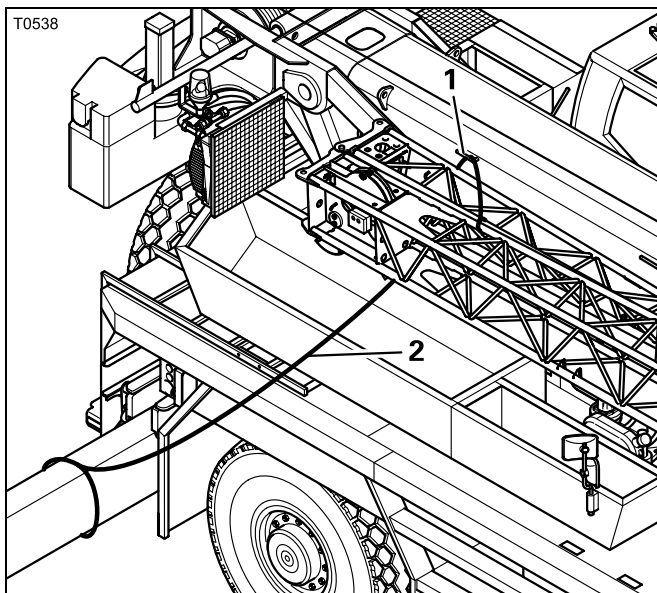
When the truck crane isn't favourably aligned, the swing-away lattice can swivel around independently if you disconnect the last connection to the main boom.



Risk of accidents due to the swing-away lattice swinging of its own accord

Always secure the swing-away lattice with a guide rope on the main boom before disconnecting anything.

This will prevent the swing-away lattice from swinging around of its own accord and pushing you off the crane base or causing injury to you or other persons.



Secure the swing-away lattice in the following manner:

- Attach a rope (2) at the front of the swing-away lattice.
- Guide the rope underneath the swing-away lattice, over the holding rod (1) on the main boom and back again.
- Have a helper hold the rope tight while you are removing the last connection.



If you are alone, secure the other end of the cord on the crane (depending on the slewing direction of the superstructure, e.g. on the rear right on the outrigger beam or on the left on the steps of the access ladder to the carrier).

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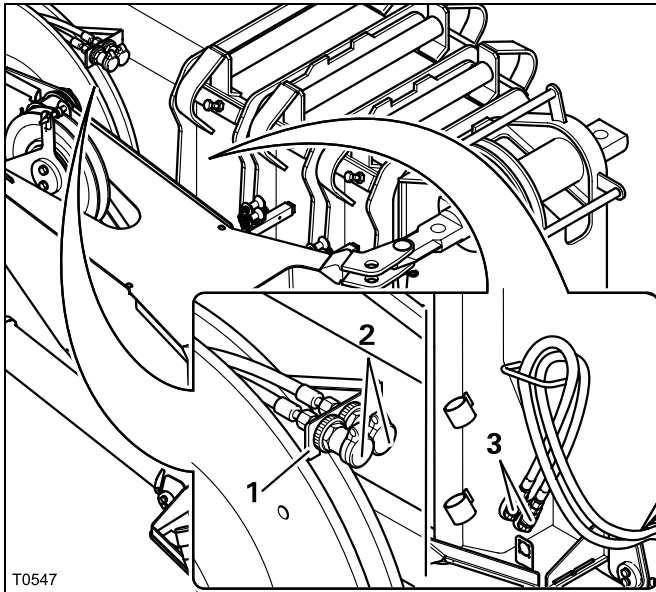
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Disconnecting the hydraulic connection

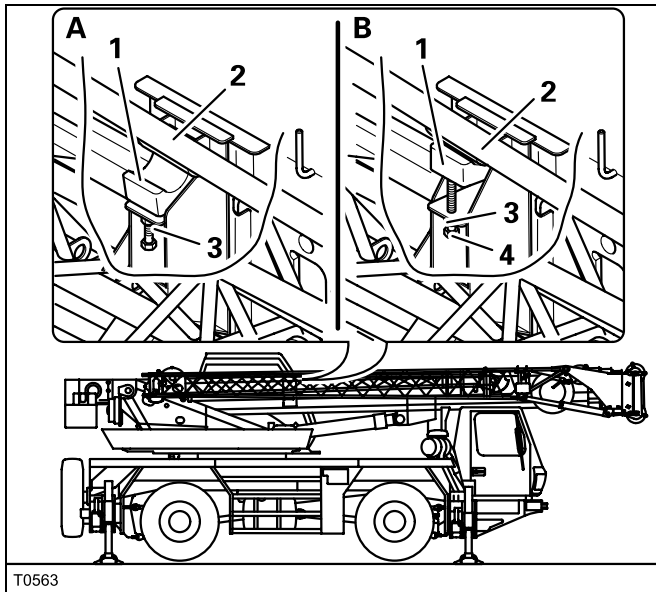


Risk of damage to the swing-away lattice

If the derricking swing-away lattice is folded to the side on the main boom, the hydraulic connection must be separated. If the hydraulic connection is not separated, the foot section can lower itself down on its own. If the main boom is retracted, the head sheave axles knock against the foot section. If the hydraulic connection is separated, the foot section cannot lower itself down on its own.



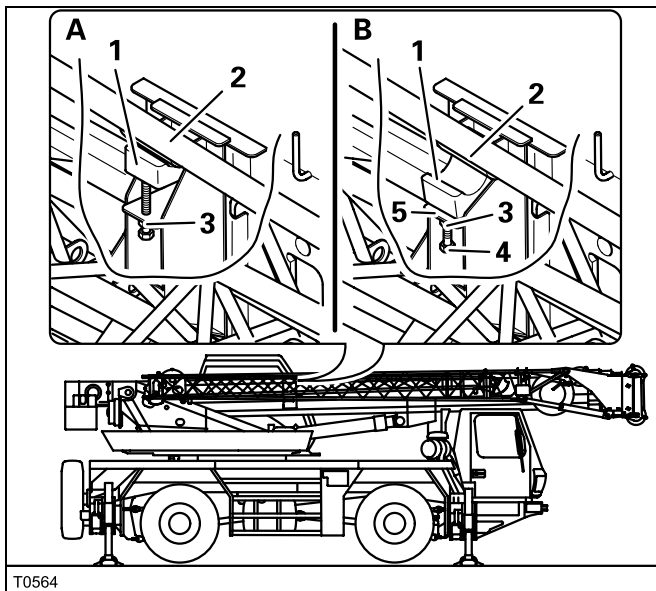
- Remove the hydraulic hoses from the connections (2).
- Hang the connections (2) into the holder (1).
- Connect the connections (3) under the hydraulic hoses.
- Seal the connections with protective caps.



Securing section 2

(A) – The swing-away lattice is swung onto the run-up rail.

- Turn the nut (3) downwards.
- (B) – Turn the screw (4) upwards until the holder (1) touches section 2 (2).
- Continue to turn the screw (4) upwards until section 2 is raised slightly.
- Secure the screw with the nut (3).



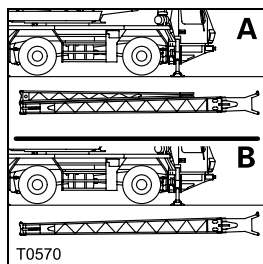
Releasing section 2

(A) – Section 2 (2) is secured.

- Turn the nut (3) downwards.
- (B) – Turn the screw (4) downwards until the holder (1) is resting on the surface (5).
- Secure the screw with the nut (3).

3.4.10


Establishing/disconnecting connections to the swing-away lattice



(A) – When section 1 and section 2 are folded up on the side for transportation, you only need to establish and release the connection on the **left-hand side**.

(B) – If only section 1 is folded up on the side for transportation and section 2 is removed for transportation, you must establish and release the connections on **both sides**.

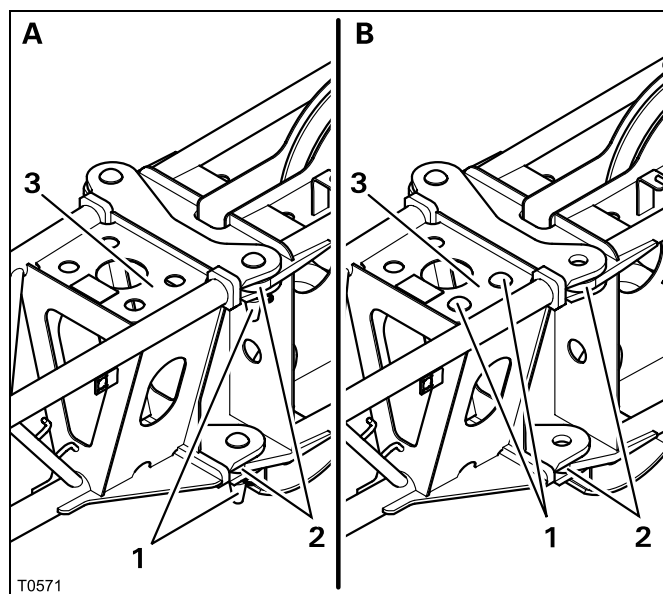
Section 1 and section 2 installed

If necessary you can relieve the strain on the connecting points by setting down section 2 on the ground or raising it;  *Relieving the connecting points*, p. 3 - 52.



Risk of accidents through section 2 swinging of its own accord

Always secure section 2 with a guide rope and only position the ladder on the left of section 1. In this way you prevent part 2 from swinging round of its own accord and knocking you off the ladder.



(A) – Making a connection

The connection is established after section 2 is slewed in front of section 1.

- Pull the pins (1) out of the retaining sheet (3).
- Insert the pins (1) into the connecting points (2) and secure them with retaining pins.

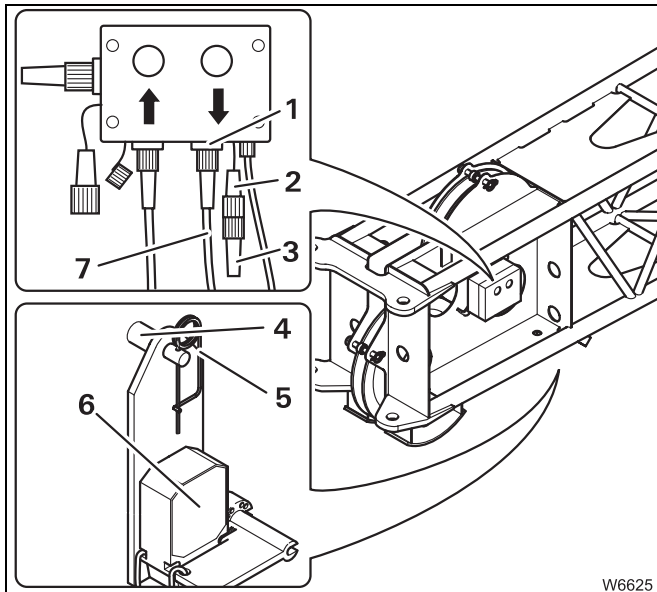
(B) – Releasing a connection

The connection is released before section 2 is folded onto the side of section 1.

- Remove the pins (1) from the connecting points (2).
- Insert the pins (1) into the retaining sheet (3) and secure them with retaining pins.

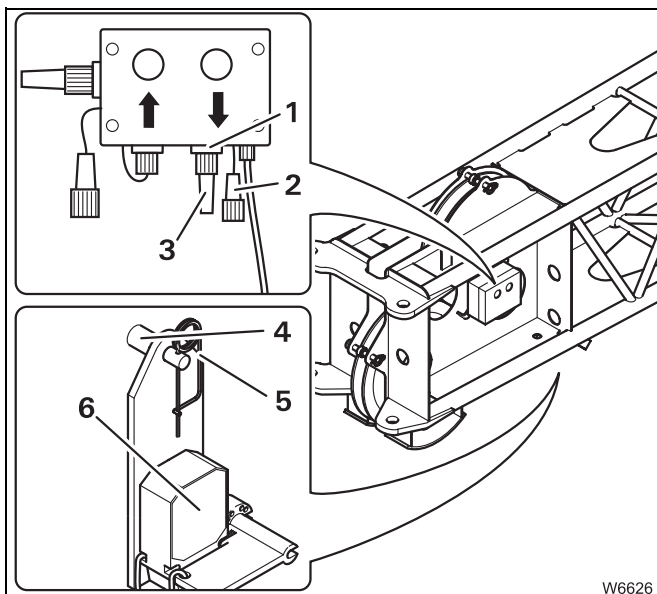


On the 8.5 m swing-away lattice



Connecting the lifting limit switch

- Fit the lifting limit switch (6) onto the clamp (4) and secure it with the retaining pin (5).
- Remove the bridging plug (3) from the socket (1) and plug it into the dummy socket (2).
- Lay the connecting cable (7) in such a way that it will not be damaged during crane operation, and insert the lifting limit switch into the socket (1).



Removing the lifting limit switch

- Pull the plug from the socket (1).
- Remove the bridging plug (3) from the dummy socket (2) and plug it into the socket (1).
- Remove the lifting limit switch (6) from the clamp (4).
- Attach the retaining pin (5) to the lifting limit switch.



3.4.19

Setting the angle – without the auxiliary crane

If an auxiliary crane is not available, the swing-away lattice must be set down before it is angled.



Risk of damage to the hoist rope

Unreeve the hook block and set down the hoist rope beside the swing-away lattice before you angle the swing-away lattice.

In this way you prevent the hoist rope from being damaged when the head of the swing-away lattice is set down on the ground for angling.

Entering the SLI code

When angling without an auxiliary crane, you must enter an SLI rigging code. The SLI rigging code depends on:

- The rigged outrigger span
- The rigged counterweight
- The working position



Risk of overturning with impermissible rigging mode

Always enter the SLI rigging code for the current rigging mode of the truck crane, and only slew the superstructure into the working position permitted by the SLI rigging code set according to the *Lifting capacity table*.

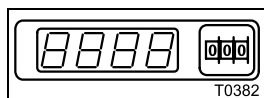
This prevents the truck crane from overturning when the main boom is extended.




Risk of overturning with raised hook block (hook tackle).

The telescoping range which is enabled for the rigging code set is only permissible for telescoping without a load and without hook block/hook tackle. When the main boom is fully extended, load measurement is not possible and the SLI monitoring depends on the working radius.

For this reason, you must unreeve the hook block. This prevents the truck crane from overturning when the main boom is extended.




- Enter the SLI rigging code for angling in accordance with the current rigging mode of the truck crane;  *Lifting capacity tables – Chapter Rigging tables – Swing-away lattice extension.*
- Slew the superstructure into a working position permitted by the *Lifting capacity table* for the SLI rigging code set.



3.5.4

Information about the SLI shutdown

Operation with the lattice extension is monitored by the SLI.

When operating with the lattice extension, SLI shutdowns may occur for the same reasons as when operating with the main boom;  *Operating Instructions Lattice Extension GMK 2035E*.

When operating the derricking lattice extension, there are additional points to be considered:

- Different lifting capacities are released for the angles 0°, 0 – 20° and 20 – 40°. Lowering the lattice extension can lead to the SLI shutting down, when the currently raised load in the recently set angle range is not permitted.
- For the above-named angles, the lattice extension can be derricked under load. If the current load is greater than permitted for the angle range, the lowering of the lattice extension is stopped by the SLI.
- When the SLI has shut down, the lower lattice extension movement as well as all other movements which increase the load moment are blocked.

3.7

Finding and eliminating malfunctions

Malfunction	Cause	Remedy
Lifting limit switch switches off (lamp is illuminated)	Lifting limit switch not connected	Connect the lifting limit switch; p. 3 - 66.
	The connection for the lifting limit switch on the main boom head is not overridden. There is a second lifting limit switch connected to the main boom and it is not locked.	Override the lifting limit switch on the main boom head; p. 3 - 66.
	For 8.5 m: Electrical connection between main boom head and section 1 is not established. The bridging plug is not inserted in the socket to the front of section 1.	Establish the electrical connection; p. 3 - 59. Change over the bridging plug; p. 3 - 60.
	For 15 m: Electrical connection between main boom head and section 1 is not established. Electrical connection between section 1 and section 2 is not established.	Establish the electrical connection; p. 3 - 59. Establish the electrical connection; p. 3 - 60.
The main boom cannot be telescoped with the rigged lattice extension	The main boom is at an impermissible angle.	Derrick the main boom to the required angle; p. 3 - 86.
The lattice extension cannot be derricked	Derricking gear of the lattice extension is switched off	Switch on the derricking gear of the lattice extension; p. 3 - 2.
	The electrical connection has been broken.	Establish the electrical connection; p. 3 - 59.
	The hydraulic connection has been disconnected.	Establish the hydraulic connection; p. 3 - 35.
	The specified SLI code does not apply to operation with the lattice extension.	Enter the SLI code for operation with the lattice extension; p. 3 - 84.
	Current load greater than derricking load – <i>lower lattice extension</i> movement is disabled. SLI error code 5 02 6 is displayed.	<ol style="list-style-type: none"> 1. Raising the lattice extension. 2. Press button once. 3. If necessary, increase the working radius using the movement <i>Lower main boom</i>

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