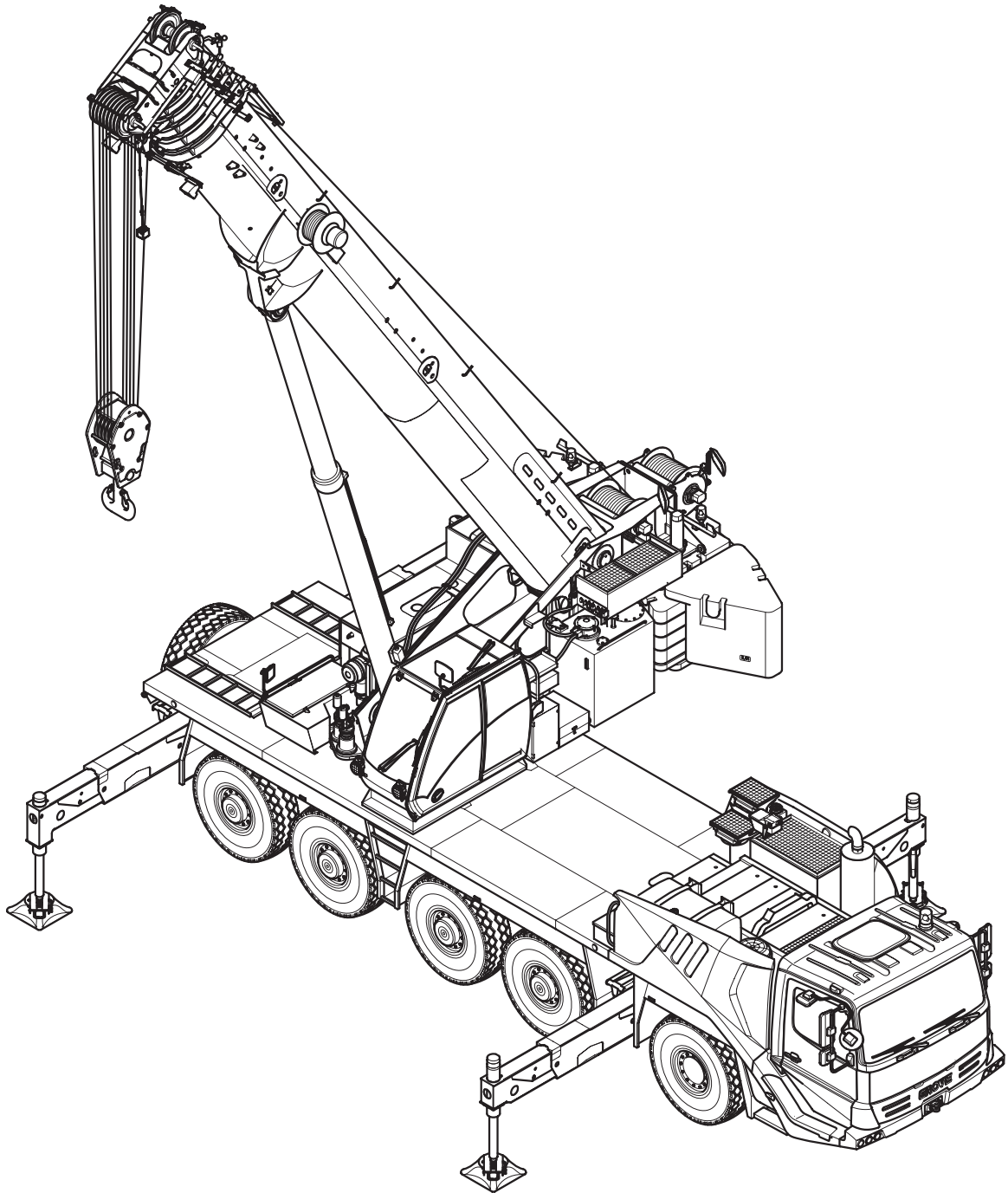


# Grove GMK 5110-1/5130-2

## Operating instructions Lattice extension



3 112 785 en  
28.02.2011

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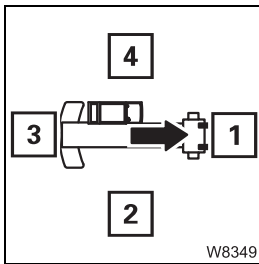


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**On the superstructure**

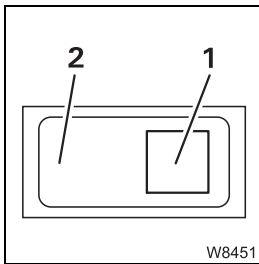
The main boom head is always at the front, which means that:



- 1:** Front
- 2:** Right
- 3:** Rear
- 4:** Left

**Switches and buttons**

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

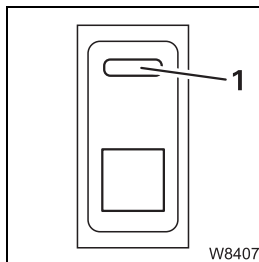


Regardless of the fitting position (vertical, horizontal, diagonal, perpendicular or turned), the following always applies:

- Down:** Press (1) – on 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. The following applies to all switches with a lock button:

- **Switching on:**
  - First press the lock button
  - Then press lower part of switch down
- **To switch off:** Press top half of switch down until the lock button latches into place

**General rules for buttons and symbols**

Information on display of buttons and symbols on the display

➡ *GMK 5130-2/5110-1 operating manual* section *General rules for buttons and symbols*.

---

## 3 For operations planning


<b>3.1</b>	<b>Information</b> .....	3 - 1
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## 3.3

## Boom extension

### 3.3.1

### Assembly

Observe the instructions on Assembly and Identification;  p. 3 - 1.

Only the specified boom extension sections are permissible for the specified crane types:

Type of crane	Length of the boom extension in m (ft)		
	26 (85)	32 (105)	38 (125)
GMK 5110-1	●	●	●
GMK 5130-2	●	●	

## 4.2

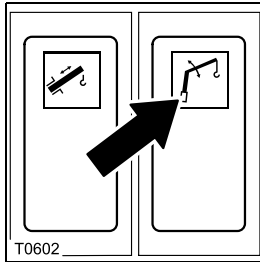
## Short description of the operating elements

### 4.2.1

### In the crane cab

#### At the control console, right

This section is only valid for the derricking swing-away lattice.

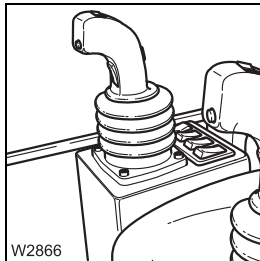


#### Derricking gear of lattice extension on/off

There is a lamp in the button.

- **Press once**
- Lamp bright – derricking gear on, power units with the same control lever configuration off
- Lamp dim – derricking gear off

➡ p. 4 - 89



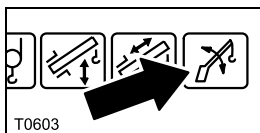
#### Right control lever

- **To the left:** Raise – lift swing-away lattice
- **To the right:** Lower – lower swing-away lattice

➡ p. 4 - 89

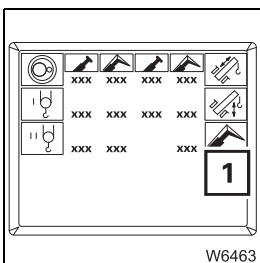
#### On the crane control display

This section is only valid for the derricking swing-away lattice.



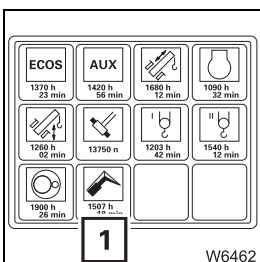
#### Power unit display – in main menu

- **Green:** Derricking gear on
- **Red:** Derricking gear off



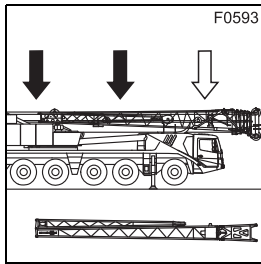
#### Limiting power unit speed – power unit speed submenu

If the symbol (1) is shown in black, a maximum speed can be set for the derricking gear of the lattice extension; ➡ *Operating instructions GMK 5130-2/5110-1.*

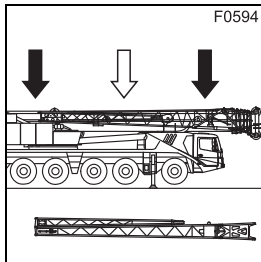


#### Display operating hours – operating hours submenu

The operating hours of the derricking gear of the lattice extension are displayed under the symbol (1); ➡ *Operating instructions GMK 5130-2/5110-1.*

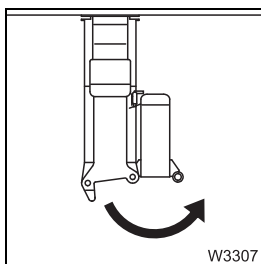


- 5.** If the 18 m (59 ft) swing-away lattice is folded to the side:
- Check if the connection between section 1 and section 2 is established in the *Rear* area; ■■■▶ p. 4 - 60.
  - Check that the connection in the *Middle* area is in the position *Section 1/Section 2*; ■■■▶ p. 4 - 54.
  - See **point 6**.

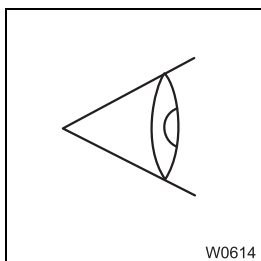


- 6.** If the 18 m (59 ft) swing-away lattice is folded to the side:
- Disconnect the connection between section 2 and the main boom in the *Rear* area; ■■■▶ p. 4 - 57.
  - Release the connection in the *Front* area; ■■■▶ p. 4 - 51.

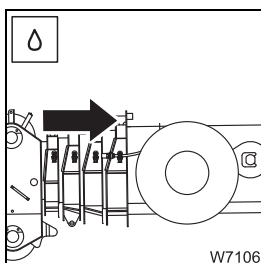
- 7.** Set down swing-away lattice on the separate vehicle; ■■■▶ *Transport*, p. 3 - 7.



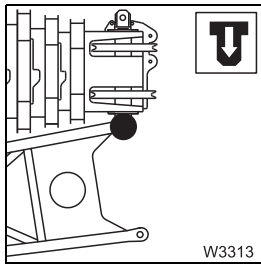
- 8.** Fold in the run-up rail; ■■■▶ p. 4 - 48.



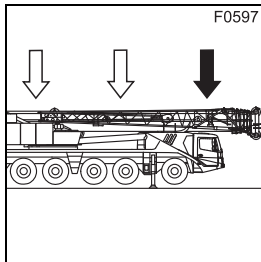
- 9.** Check the transport condition of the swing-away lattice; ■■■▶ *Transport condition with removed swing-away lattice*, p. 4 - 41.



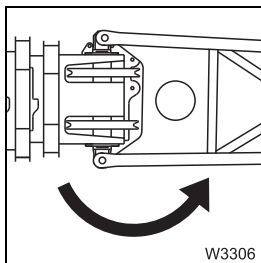
- 10.** For derricking swing-away lattice:  
Position hydraulic hoses for working with the main boom; ■■■▶ p. 4 - 46.



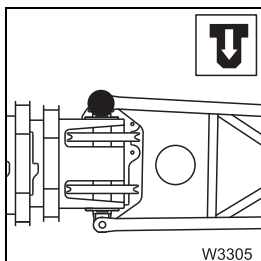
- 11.** Pin Section 1 on to the main boom head, on the right-hand side;  
 ■■■▶ p. 4 - 61.



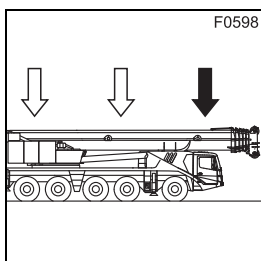
- 12.** Disconnect the connection in the *Front* area; ■■■▶ p. 4 - 51.



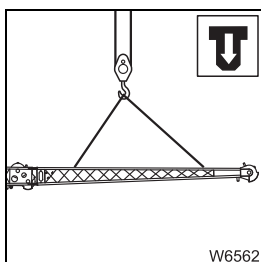
- 13.** Swing the swing-away lattice in front of the main boom head; ■■■▶ *When rigging – section 1*, p. 4 - 67.



- 14.** Pin section 1 to main boom head, on the left-hand side; if necessary release the bearing points or use the hydraulic rigging aid (additional equipment);  
 ■■■▶ *Left-hand connection*, p. 4 - 62,  
 ■■■▶ *Relieving the connecting points*, p. 4 - 63,  
 ■■■▶ *Hydraulic rigging aid (additional equipment)*, p. 4 - 63.



- 15.** In the *Front* area, move the connection into the position *Unrigging*;  
 ■■■▶ p. 4 - 53.



- 16.** If section 2 is transported on a separate vehicle, install section 2 in front of section 1:  
 – Sling section 2; *Slinging points*, p. 3 - 6.  
 – Raise section 2 in front of section 1 and pin it there; ■■■▶ p. 4 - 71.  
 – After installing section 2, proceed as from **point 22**.

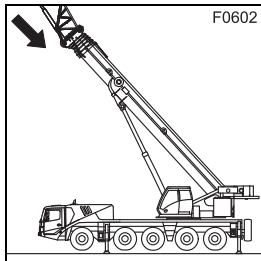


### 4.3.7

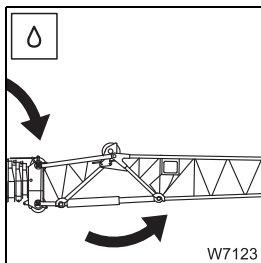
## CHECKLIST: Unrigging 18 m (59 ft) swing-away lattice



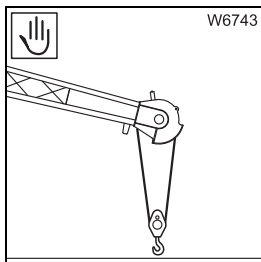
This checklist is not a complete set of operating instructions. There are accompanying operating instructions which are referred to by cross-references. **Observe the warnings and safety instructions there.**



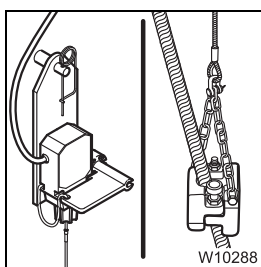
1. Retract the main boom completely; *Telescoping with rigged heavy load lattice extension, p. 4 - 102.*



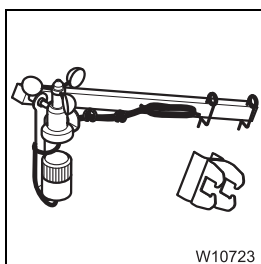
2. Only applies for the derricking swing-away lattice.
  - Completely raise the swing-away lattice; *Swing-away lattice, derricking, p. 4 - 87.*
  - Lower the main boom to the horizontal position; p. 4 - 101.



3. Only applies for the inclinable swing-away lattice.
  - Lower the main boom for unreeving the hook block.

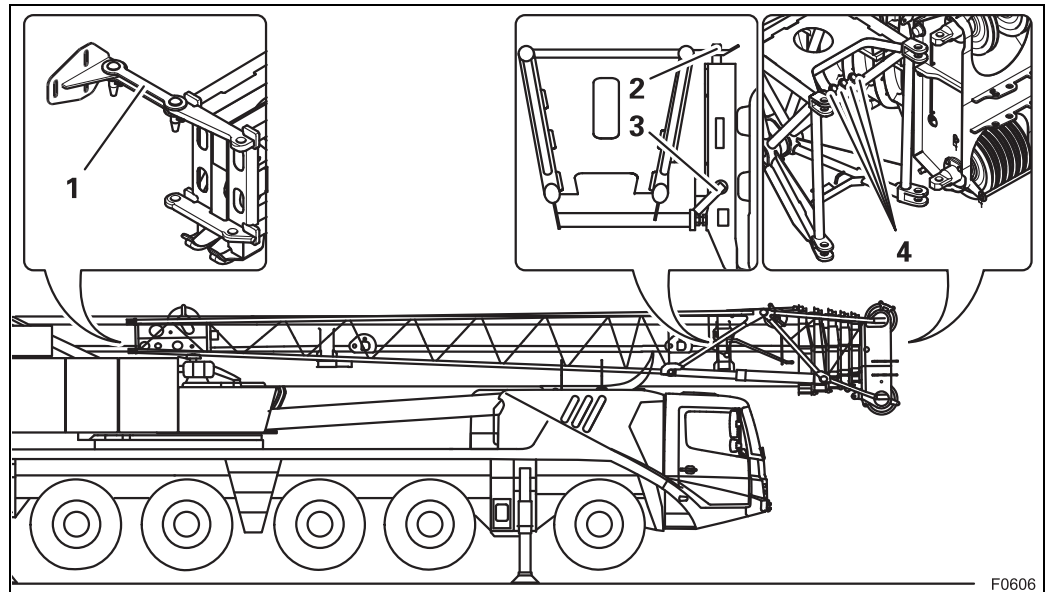


4. Remove the lifting limit switch weight and remove the lifting limit switch; *Installing/removing the lifting limit switch, p. 4 - 80.*



5. If necessary, disconnect the electrical connection of the air traffic control light and remove the anemometer;
  - Air traffic control light – electrical connection, p. 4 - 85,*
  - Installing/removing the anemometer, p. 4 - 83.*





**When only section 1 is folded:**

- In the *rear* area, the connection (1) between section 1 and the main boom is established; ■■■▶ p. 4 - 58.
- In the *Front* area, section 1 must be engaged at the slewing axis (2) on the main boom and the slewing axis must be secured with the pin (3); ■■■▶ *Establishing a connection*, p. 4 - 50.
- The pins (4) on section 1 are secured with retaining pins.



### Moving the *Front* connection into the *Unrigging* position

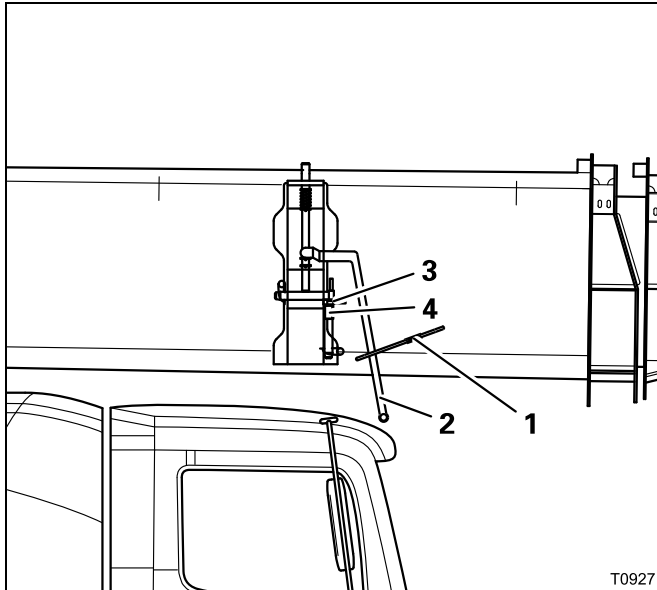
Before you fold the lattice extension on to the side during unrigging, the *Front* connection must be moved into the *Unrigging* position.



#### **Danger of becoming trapped due to swinging lattice extension**

Start the subsequent work only if the lattice extension is locked in front of the main boom head or it is secured against swinging around.

This will prevent the lattice extension from swinging inadvertently to the side of the main boom and possibly crushing you.



The following requirements must be satisfied before unrigging:

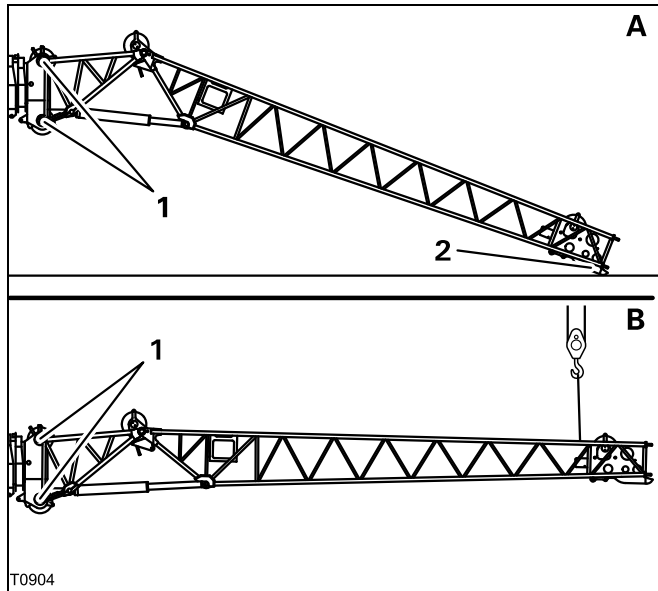
- The pin (3) must be secured in the holder (4).
- The lever (2) must be underneath the rest (1).
- Insert the pin (3) into the bracket (4) if necessary, and secure it with the retaining pin.
- If necessary, raise the lever (2) to the side from the rest (1) and yield slightly to the spring force.

The *Front* connection is then in the *Unrigging* position.




## Relieving the connecting points

Proceed in the following manner to relieve the strain on the connecting points:



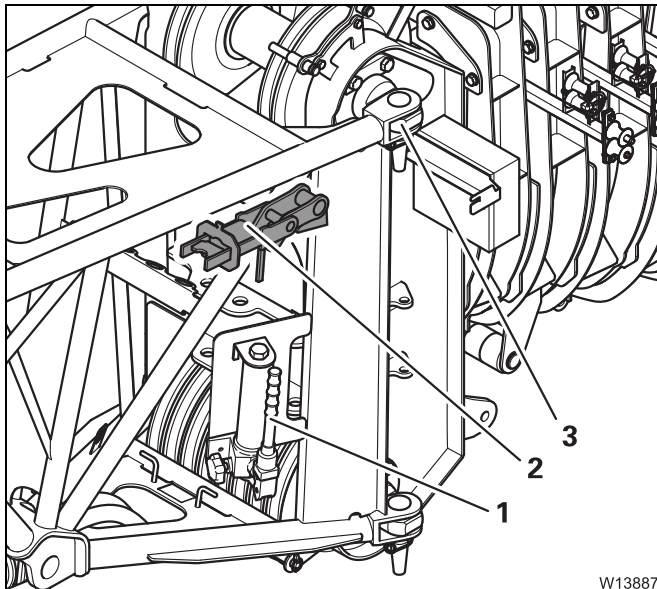
### (A) – For derricking swing-away lattice

- Derrick the swing-away lattice until it is on the ground with the skids (2) (if necessary, override the lifting limit switch).
- Continue to derrick carefully until the connecting points (1) align or until the load has been removed from the pins;  *Swing-away lattice, derricking, p. 4 - 87.*

### (B) – For inclinable swing-away lattice

- Strike the swing-away lattice with an auxiliary crane.
- Carefully raise the swing-away lattice until the connecting points (1) align or until the load has been removed from the pins.

## Hydraulic rigging aid (additional equipment)



The hydraulic cylinder is operated with the hand pump (1) to pull a swing-away lattice toward the main boom during rigging and unrigging.

### When rigging:

- Align the bores in the connecting point (3); the pin can be inserted.

### When unrigging:

- The pin on the connecting point (3) is relieved.



## 4.4.12

### Electrical connections to the swing-away lattice

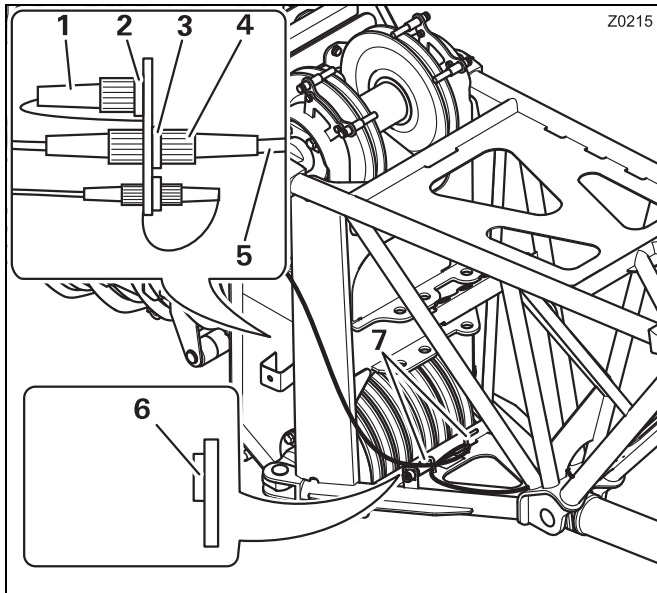


#### Risk of crushing due to swinging swing-away lattice

Start the subsequent work only if the swing-away lattice is locked in front of the main boom head or it is secured against swinging around.

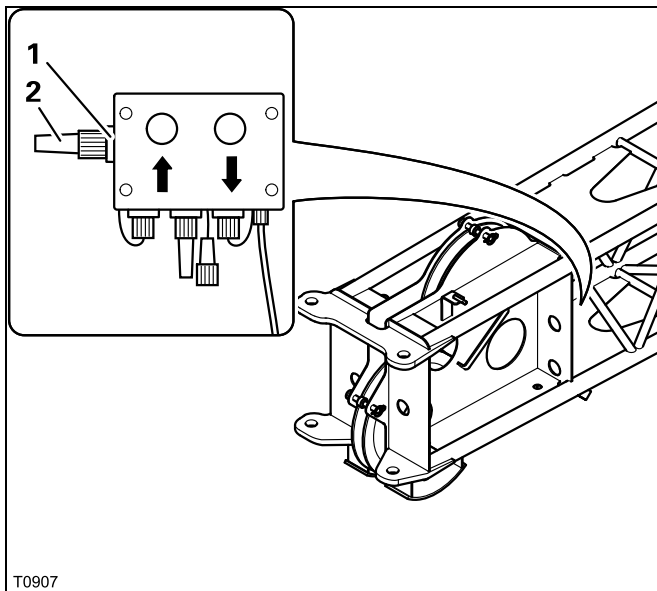
This will prevent the swing-away lattice from swinging inadvertently to the side of the main boom and possibly crushing you.

#### 11 m (36 ft) swing-away lattice



#### Establishing an electrical connection

- Remove the bridging plug (1) from the socket (3) and plug it into the dummy socket (2).
- Unwind the cable (5) from the clamp (7).
- Remove the plug (4) from the dummy socket (6) and plug it into the socket (3).
- Wind up the cable (5) far enough on the clamp (7) so that it does not sag.



- Check whether the bridging plug (2) is inserted in the socket (1) at the front on section 1.



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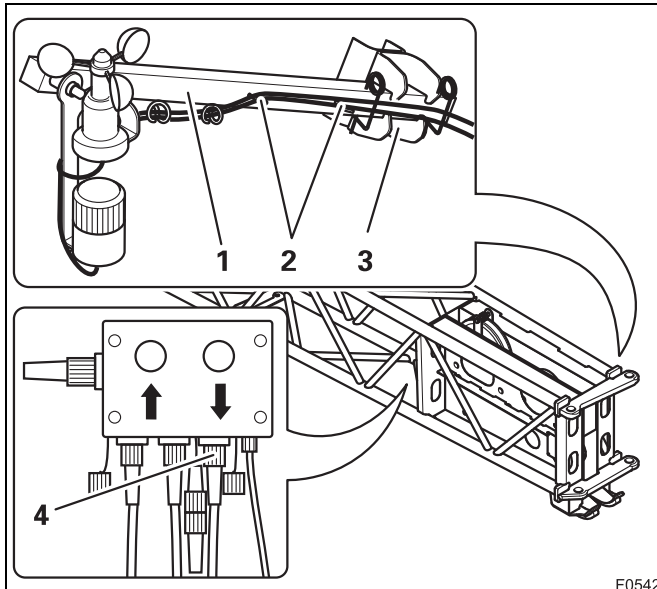


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## 4.4.16 Installing/removing the anemometer

**On the 11 m (36 ft) swing-away lattice** The anemometer of the main boom is used on the lattice extension.



### Mounting the anemometer

- Insert the rod (1) into the holder (3) and secure it with the retaining pins.
- Remove the cable of the anemometer from the clamps (2) and connect it to the socket (4).
- Lay the cable so that it will not be damaged during crane operation.
- Check that the anemometer is able to swing so that it hangs vertically even when the main boom is raised.

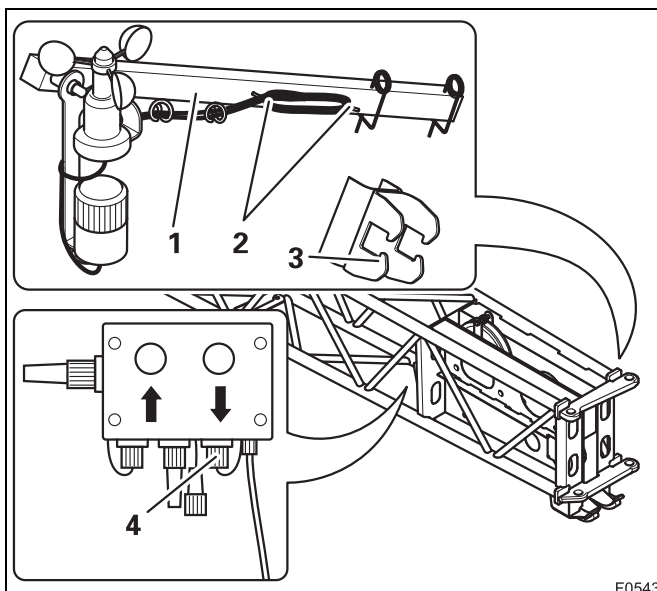
You must remove the anemometer before driving on the road.



### Risk of damage to the anemometer

Remove the anemometer for on-road driving.

This prevents the anemometer from being damaged by wind (e.g. by suction currents caused by oncoming traffic in tunnels).



### Removing the anemometer

- Take the plug out of the socket (4) and close the socket with the protective cap.
- Wind the cable on to the clamps (2).
- Take the rod (1) out of holder (3).
- For transportation, fasten the retaining pins to the rod (1).



### Setting an angle of 20° or 40°

This section assumes that the swing-away lattice has been pinned in front of the main boom and the unreeved hoist rope has been set down beside the swing-away lattice.



#### Risk of accidents if this procedure is not followed!

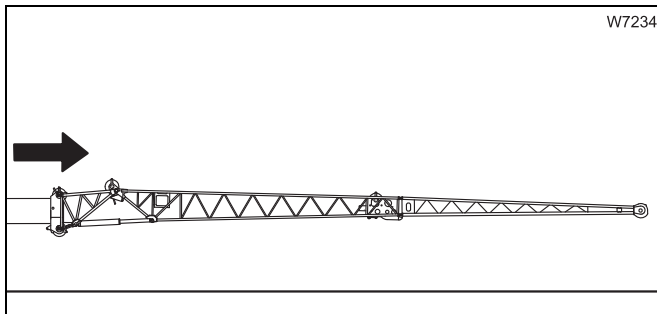
For the procedure described here, the swing-away lattice must be set down on the ground. If the swing-away lattice is to be set down on some other structure for inclination, please bear in mind that the swing-away lattice will slide towards the truck crane when raised, until the angle of inclination is reached.


This means that the swing-away lattice could slip off an unsuitable structure, fold down and cause personal injury.

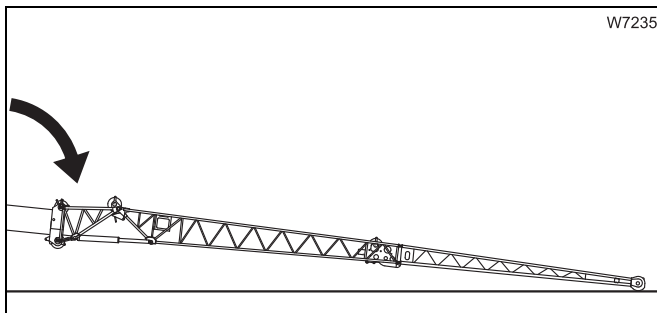



#### Risk of accidents when SLI is overridden

Never override the SLI if the crane movements are switched off. In this way you prevent the superstructure from being slewed into impermissible areas and the truck crane tipping over as a result.



- Enter the SLI rigging code for the inclination;  p. 4 - 92.
- Extend the main boom as far as is permitted for the SLI rigging code set, or as far as possible given the space available.



- Lower the main boom until the swing-away lattice head is no longer touching the ground.
- If the ground cannot be reached, you can incline the truck crane further;  p. 4 - 97.




In the steps which follow, the swing-away lattice head is pulled or pushed over the ground. Lay boards, for example, under the skids on the head so that it is not pushed against the ground or damaged.



#### 4.5.4

### Information about the SLI shutdown

Operation with the swing-away lattice is monitored by the SLI.

When operating with the swing-away lattice, SLI shutdowns may occur for the same reasons as when operating with the main boom;  *Operating instructions GMK 5130-2/5110-1*.

#### Additional reasons for a shutdown

When operating with a derricking swing-away lattice:

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

#### 4.5.5


### Procedure if permissible wind speed is exceeded



#### Risk of accidents due to excessively high wind speeds!

If the current wind speed is higher than the maximum permissible wind speed, stop crane operation immediately and restore the corresponding rigging mode.

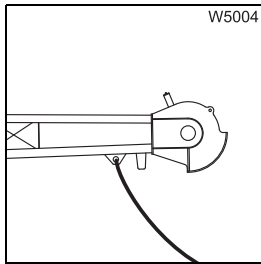
This prevents the truck crane from overturning due to overloading.

- Prior to and during crane operation, check whether the actual wind speed is lower than the maximum permissible wind speed.
- Make sure that you follow the instructions for checking the wind speed;  *Lifting capacity table* and *Operating instructions GMK 5130-2/5110-1*.

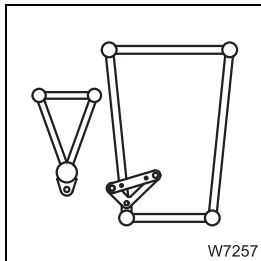
#### If the maximum permitted wind speed is exceeded

**No** automatic shutdown occurs if the maximum permissible wind speed is exceeded.

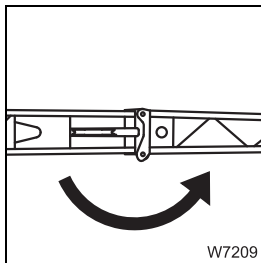
- Immediately stop crane operation.
- Bring the truck crane into the rigging mode specified for the current wind speed in the *Lifting capacity table*.



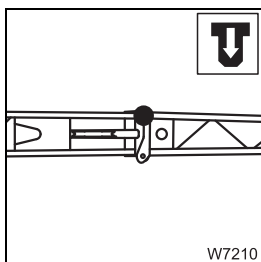
9. Fasten the guide rope to the head of section 2 of the swing-away lattice.



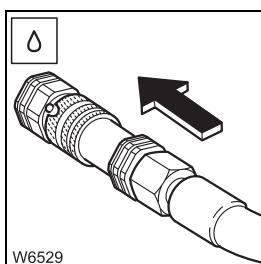
10. Move the connection in the *Middle* area into position *On section 1*;  
 ■■■▶ p. 4 - 55.



11. Swing section 2 in front of section 1; ■■■▶ *When rigging – section 2*,  
 p. 4 - 69.



12. Establish the connection on the left between section 2 and section 1;  
 ■■■▶ *Connections to the swing-away lattice, establishing/disconnecting*,  
 p. 4 - 71.



13. Only applies for the derricking swing-away lattice.  
 – Establishing the hydraulic connection:

Connection	Boom extension in m (ft)		
	26 m (85 ft)	32 m (105 ft)	38 m (125 ft)
Main boom/section 3	■■■▶ p. 5 - 15		
Section 4/section 5			■■■▶ p. 5 - 16
for swing-away lattice	■■■▶ p. 5 - 17		



## 5.2.2

### Installing/removing the swing-away lattice for the boom extension



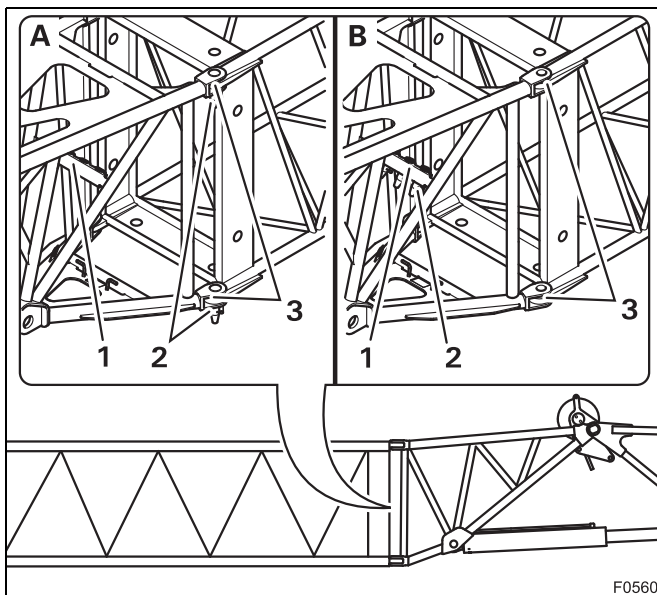
You can install the folded away swing-away lattice.



#### Risk of damage to connection cables and hydraulic hoses

Before dismantling, check that the electrical and hydraulic connection has been broken.

This prevents damage to the connection cable and the hydraulic hoses when removing.



#### Mounting

- (A) – Sling the swing-away lattice; p. 3 - 6.
- Lift the lattice extension in front of the main boom head in such a way that the connecting points (3) align on both sides.
- Remove the pins from the holders (1).
- Insert the pins (2) into the connecting points (3) and secure them with retaining pins.
- Carry out the procedure on the other side.

#### Removing

- (B) – Sling the swing-away lattice; p. 3 - 6.
- Check whether the electrical and hydraulic connections have been disconnected;
  - Hydraulic connection at the boom extension*, p. 5 - 14,
  - Electrical connection on the boom extension*, p. 5 - 18.
- Remove the pins from the connecting points (3).
- Plug the pins (2) into the holders (1).
- Secure the pins using the retaining pins.
- Carry out the procedure on the other side.
- Set down the lattice extension and check the transport condition;
  - Transport condition with removed swing-away lattice*, p. 4 - 41.

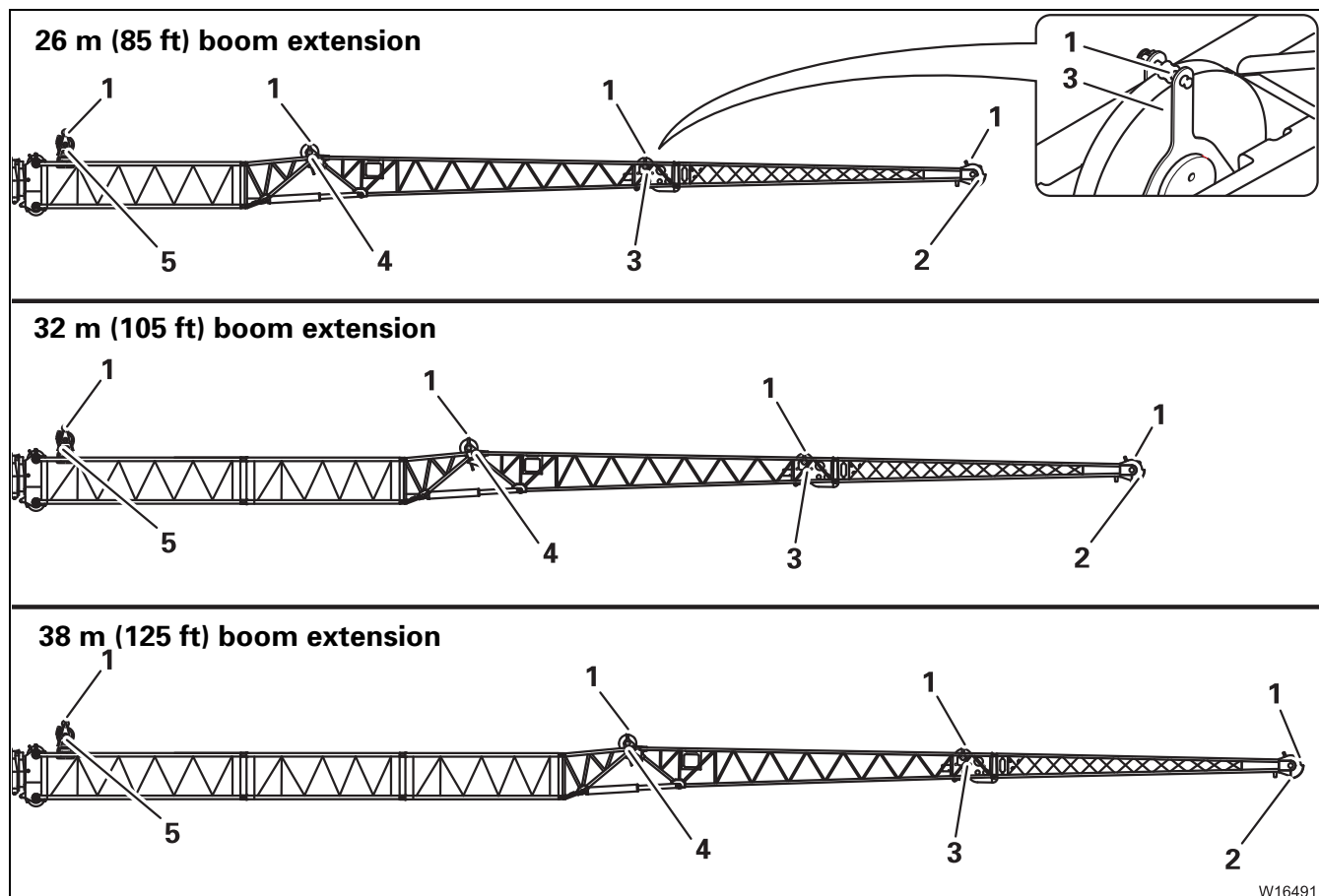
## 5.2.6

## Positioning/removing the hoist rope



### Risk of accidents due to falling parts!

Always secure the hoist rope holding rollers and rods with retaining pins. This prevents elements from coming loose, falling down and injuring people.



### Positioning the hoist rope

- Remove the sheaves (1). Guide the hoist rope over the deflection sheaves (5), (4), (3) and over the head sheave (2) on section 1.
- Put all sheaves (1) back in place and secure them with retaining pins.
- Install the hook tackle or the hook block. The hoist rope can only be reeved once on the boom extension; ► p. 5 - 24.



## 6.2

## Rigging the auxiliary single-sheave boom top

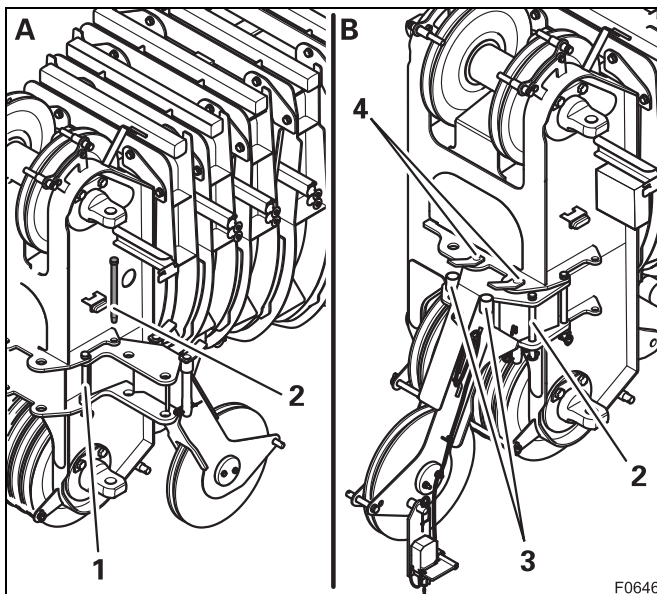
### 6.2.1

### Rigging in working position/transport position



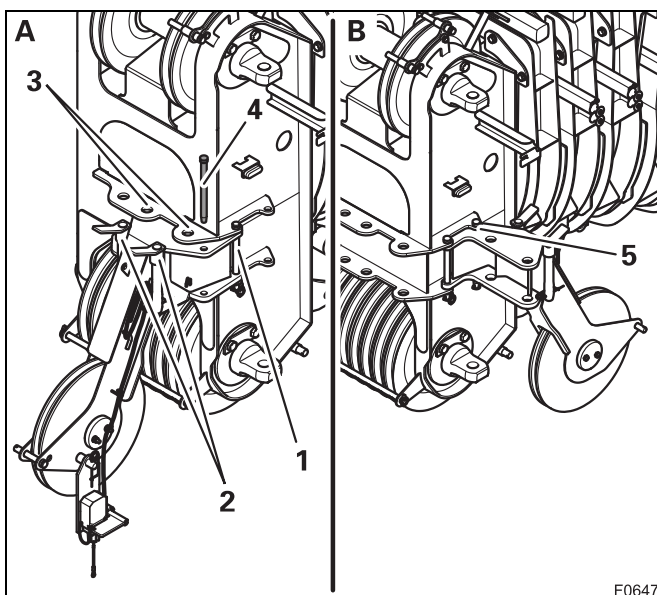
#### Risk of accidents due to falling parts!

For swinging into the working position or the transport position, the swivel pin must be inserted. This prevents the auxiliary single-sheave boom top from falling down and injuring someone.



#### Working position

- (A) – Check if the swivel pin (1) is inserted.
- Pull out the pin (2).
- (B) – Swing the auxiliary single-sheave boom top in front of the main boom head.
- Pull out the pins from the clamps (3).
- Insert the pins into the bearing points (4) and secure them with retaining pins.
- Insert the pin (2) into the bearing point.



#### Transport position

- (A) – Check if the swivel pin (1) is inserted.
- Pull out the pins from the bearing points (3).
- Insert the pins into the clamps (2) and secure them with retaining pins.
- Pull the pin (4) out of the bearing point.
- (B) – Swing the auxiliary single-sheave boom top onto the side of the main boom.
- Insert the pin in the bearing point (5) and secure it with a lynch pin.

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## 7 Turning loads

7.1	Requirements.....	7 - 1
7.2	Setting the SLI.....	7 - 3
7.3	Turning a load .....	7 - 5

# 8

## Driving with a rigged crane

### 8.1

### Safety instructions



**Risk of accidents if your view of the truck crane is partially obstructed!**

While driving, always stay in visual or radio contact with a banksman who can observe the parts which you cannot see.




**Risk of overturning due to superstructure slewing**

When driving the rigged truck crane, the slewing gear must be switched off.



**Risk of accidents when driving on public roads!**

Driving on public streets is only permitted when all items on the *CHECK-LIST: Checks before on-road driving* are fulfilled;  *Operating instructions GMK 5130-2/5110-1*.

Driving on public roads with a rigged truck crane is not permitted.



**Danger of tipping when driving the rigged truck crane**


Driving with a rigged truck crane is an operating mode which must be carried out with the utmost care. For this reason, make sure that you observe the safety instructions listed in the relevant sections of the operating instructions GMK 5130-2/5110-1.




**Risk of accidents due to swinging hook block/load!**

Secure the hook block/load when driving so that it cannot swing. Start to drive slowly so that the hook block/load does not swing.

Counter-weight in t (lbs)	Telescoping Telescopic section I-II-III-IV-V	Main boom angle (°)	Lattice exten- sion incli- nation (°)	Main boom position <sup>1)</sup>	Maximum axle load <sup>2)</sup> in t (x 1,000 lbs)	
					Front	Rear
28.5 (62,800)	0.5 - 0 - 0 - 0 - 0	20 – 30	0 – 20	Front	12,5 (27,5)	20,5 (45,2)
	0 - 0 - 0 - 0 - 0	50 – 80	0 – 40	Rear	19,0 (41,9)	20,5 (45,2)
40.1 (88,400)	Not permitted!			Front		
	0 - 0 - 0 - 0 - 0	40 – 80	0 – 40	Rear	23,5 (51,8)	23,0 (50,7)

1), 2)  Information about the tables, p. 8 - 5

Counter-weight in t (lbs)	Telescoping section I-II-III-IV	Main boom angle (°)	Lattice exten- sion incli- nation (°)	Main boom position <sup>1)</sup>	Maximum axle load <sup>2)</sup> in t (x 1,000 lbs)	
					Front	Rear
28.5 (62,800)	0.5 - 0 - 0 - 0	20 – 30	0 – 20	Front	13.5 (29.7)	19.0 (41.9)
	0 - 0 - 0 - 0	60 – 80	0 – 40	Rear	19.0 (41.9)	19.0 (41.9)
40.1 (88,400)	Not permitted!			Front		
	0 - 0 - 0 - 0	40 – 80	0 – 40	Rear	23.5 (51.8)	23.0 (50.7)

1), 2)  Information about the tables, p. 8 - 5

## 9.3

## Description of maintenance work


### 9.3.1

### Lubricating pins

**M 1**

Grease, spare parts and tools

Grease <sup>1)</sup>	Designation according to DIN 51502	Specification Classification	GROVE part no. <sup>1)</sup>
Grease	KP - L2K	DIN 51825	00554201

1)  *Maintenance manual*, Lubricant list and lubricant use

– Brush.



Designation	Quantity	GROVE part no.
No spare parts		



Lubricate the pins additionally after every high-pressure cleaning in order to avoid corrosion.






**On the swing-away lattice**

#### Requirements

- The truck crane must be secured to prevent unauthorised use;  *Maintenance manual*, or
- swing-away lattice is removed;  p. 4 - 10.

#### Lubricating the pins:

Lubricate all pins:

- Pins for the connections with folded swing-away lattice;  p. 4 - 49,
- The pins for the connections on the left and right of the main boom head;  p. 4 - 61,
- Pins for the section 1 and section 2 connections;  p. 4 - 71,
- Pins of the deflection sheave;  p. 4 - 76,
- Spring latch on the hose drum;  p. 4 - 45.



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