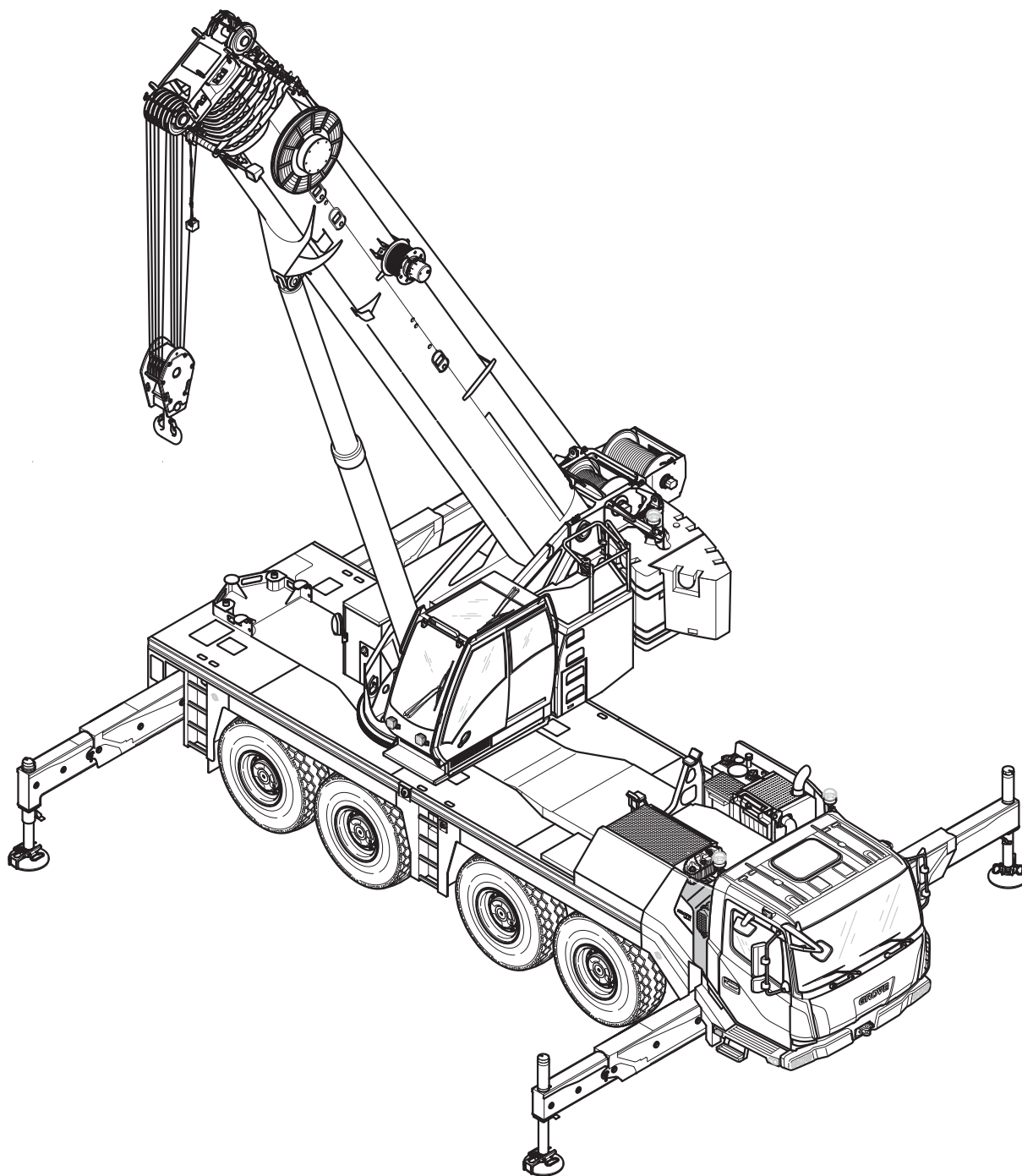


Lattice extension operating manual



3 302 683 en
07.11.2018

Grove

Manitowoc

National Crane

Potain



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4 Rigging work on the main boom

4.1	Hose drum	4 -	1
4.1.1	Attachment points	4 -	1
4.1.2	Transport dimensions and weights.....	4 -	2
4.2	Rigging work on the hose drum	4 -	3
4.2.1	Fitting/removing the hose drum	4 -	3
4.2.2	Checking the locking device on the hose drum	4 -	5
4.2.3	Positions of the hydraulic connections.....	4 -	6

9 Turning loads over

9.1 setting the RCL 9 - 2

9.2 Turning a load over 9 - 3


2

Basic safety instructions

In principle, all the basic safety instructions from the *Operating Instructions GMK 4100L-1* are applicable.

Observe also all safety instructions and warnings on the truck crane!



Information regarding the used warnings and symbols;  *Operating Instructions GMK 4100L-1*.

2.1

Other applicable documents

In addition to the information in this operating manual, all the instructions in the following sections of the supplied *Operating Instructions GMK 4100L-1* are also applicable:

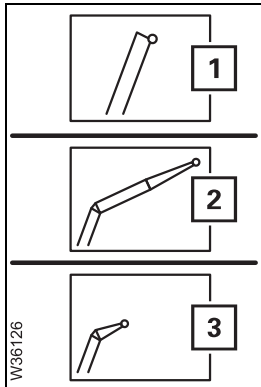
- Intended use
- Improper use
- Organisational measures
- Personnel qualifications

3.2.3

On the RCL control unit

Enter rigging mode/telescope status menu

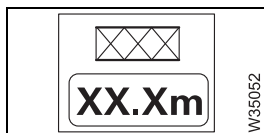
For the *Standard* slewing range type only.



Boom system entry

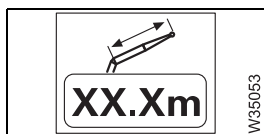
In input mode – select and confirm the boom system

- 1 Main boom
- 2 Lattice extension/boom extension
- 3 Heavy load lattice extension



Input lattice extension – the length before the angle

In input mode – select and confirm length.



Input lattice extension – the length after the angle

In input mode – select and confirm length.

4.2.2

Checking the locking device on the hose drum

The locking device must be undone before you operate with a lattice extension.

The locking device must be inserted before removal of the hose drum.



Risk of damage to the hoses

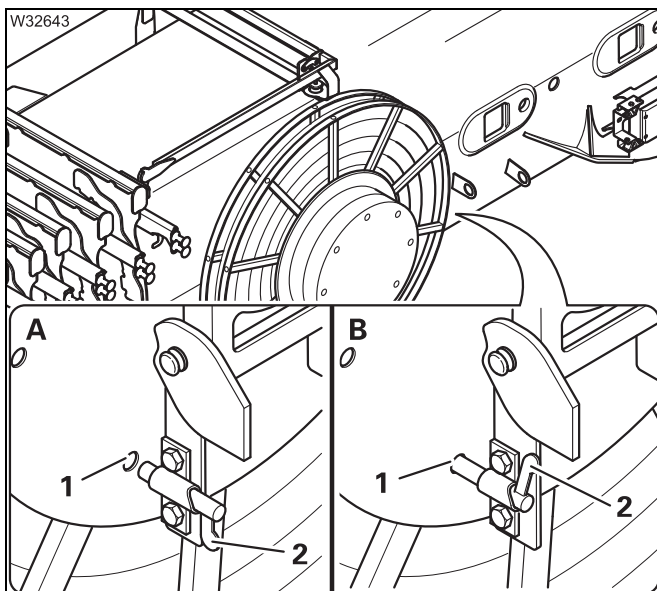
Always check if the locking device is released before beginning operation with a lattice extension.

In this way you can prevent the hoses being torn off when telescoping.



Risk of accidents from uncontrolled rotation of the hose drum!

The locking device must always be inserted before the hose drum is removed. Otherwise the hose drum will rotate uncontrollably against the holder and could injure you.



There are holes (1) distributed around the inner face of the hose drum.

A – Releasing the locking device

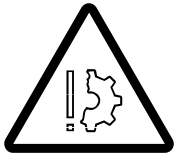
- Rotate the spring latch (2) so that it is **not** engaged in a bore (1).

B – Inserting the locking device

- Rotate the hose drum so that the spring latch (2) is aligned with a bore (1).
- Rotate the spring latch (2) so that it engages in the bore (1). The hose drum is now secured against rotation.

5.1.5

Transport condition – removed



Risk of damage to 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 lattice extension from tipping over and becoming damaged during transportation.



Risk of injury

Before transport make sure that all pins are secured in the clamps with retaining pins. Secure any pins that are not secure. This way you prevent the pins from falling down while driving and injuring or even killing other persons.



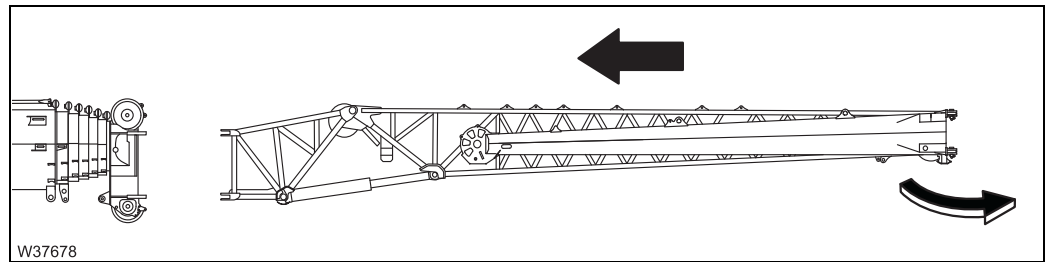
Risk of injury

Before transport, ensure that all cables and hoses are securely fastened in the clamps and cannot come loose during driving. Additionally fasten the cables and hoses if necessary. This way you prevent the cables or hoses from falling down while driving and injuring or even killing other persons.



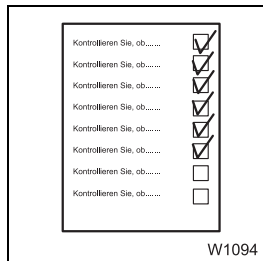
5.2.2

CHECKLIST: Installing the swing-away lattice – into the working position



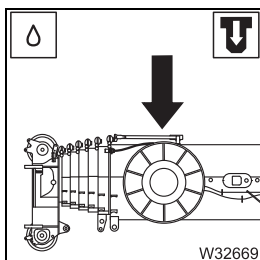
This checklist is not equivalent to the complete operating instructions. There are accompanying operating instructions which are indicated by cross-references.

Observe the warnings and safety instructions specified here!

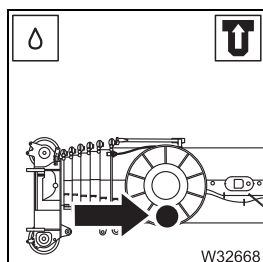


1. Prerequisite

- The truck crane is on outriggers and the superstructure is turned to the side or to the rear; ||||► *GMK4100L-1 Operating Instructions*.
- The appropriate counterweight for the crane operation must be rigged; ||||► *GMK4100L-1 Operating Instructions*.
- The main boom must be completely retracted and lowered into the horizontal position; ||||► *GMK4100L-1 Operating Instructions*.
The telescoping cylinder must be locked in telescopic section VI; ||||► p. 5 - 65.
The main boom is lowered to the horizontal position; ||||► *GMK4100L-1 Operating Instructions*.
- An auxiliary crane must be available.



2. If necessary, mount the hose drum; ||||► p. 4 - 3.

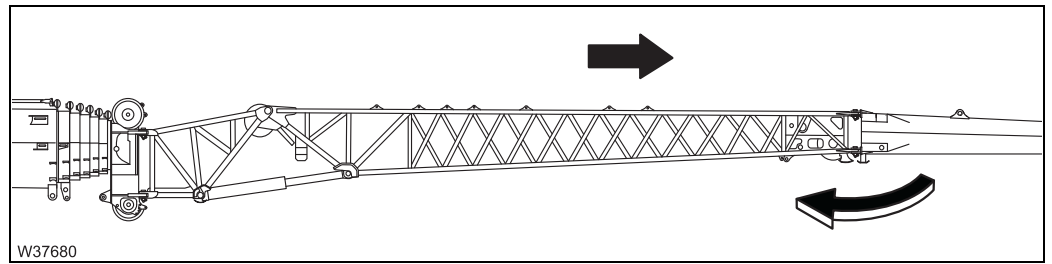


3. If necessary, check whether the locking device has been released; ||||► p. 4 - 5.



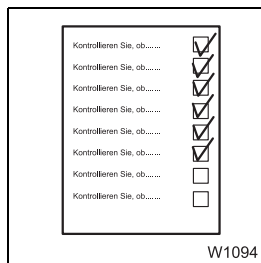
5.2.4

CHECKLIST: Removing the swing-away lattice – from the working position



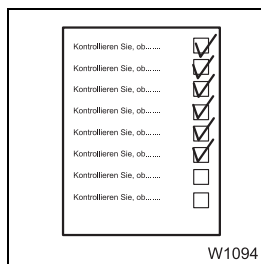
This checklist is not equivalent to the complete operating instructions. There are accompanying operating instructions which are indicated by cross-references.

Observe the warnings and safety instructions specified here!

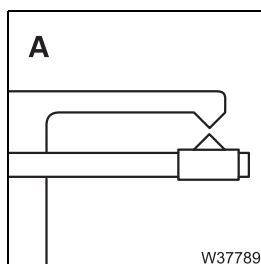


1. Prerequisite

- The truck crane is on outriggers and the superstructure is turned to the side or to the rear; **||||▶** *GMK4100L-1 Operating Instructions*.
- The appropriate counterweight for the crane operation must be rigged; **||||▶** *GMK4100L-1 Operating Instructions*.
- The main boom is fully retracted and locked.
The telescoping cylinder must be locked in telescopic section VI;
||||▶ p. 5 - 65.
The main boom is lowered to the horizontal position;
||||▶ *GMK4100L-1 Operating Instructions*.
- An auxiliary crane must be available.

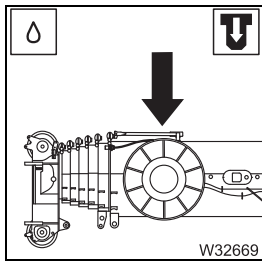


2. Perform preliminary unrigging work; **||||▶** p. 5 - 60.

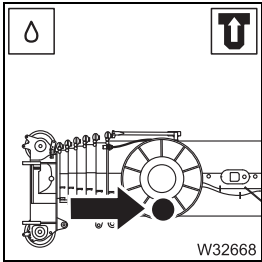


3. If necessary, move the derricking cylinder into position **A**; **||||▶** p. 5 - 79.

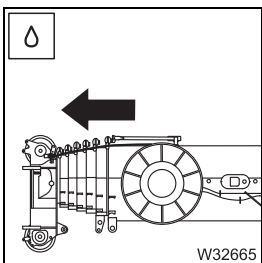




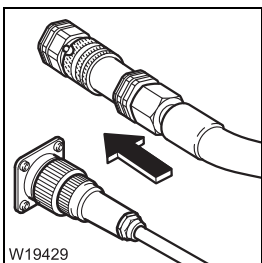
4. If necessary, mount the hose drum; ||||▶ p. 4 - 3.



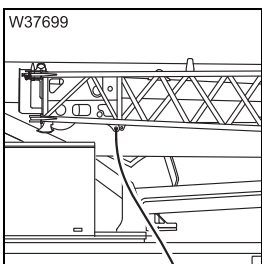
5. If necessary, check whether the locking device has been released; ||||▶ p. 4 - 5.



6. If necessary, move the hoses into the position for working with the lattice extension; ||||▶ p. 4 - 6.



7. Establish the hydraulic/electrical connections on the main boom.
– Hydraulic connection; ||||▶ p. 5 - 83,
– Electrical connection; ||||▶ p. 5 - 84.

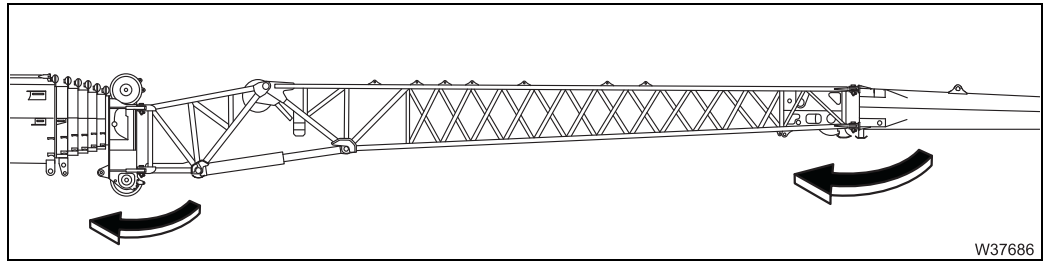


8. Fasten the guide ropes to section 2; ||||▶ p. 5 - 63



5.2.8

CHECKLIST: Rigging the swing-away lattice 1.7 + 14.3 m – in the transport position



W37686



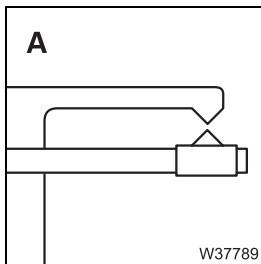
This checklist is not a complete operating manual. There are accompanying operating instructions which are indicated by cross-references. **Observe the warnings and safety instructions there.**

Kontrollieren Sie, ob.....	<input checked="" type="checkbox"/>
Kontrollieren Sie, ob.....	<input checked="" type="checkbox"/>
Kontrollieren Sie, ob.....	<input checked="" type="checkbox"/>
Kontrollieren Sie, ob.....	<input checked="" type="checkbox"/>
Kontrollieren Sie, ob.....	<input checked="" type="checkbox"/>
Kontrollieren Sie, ob.....	<input checked="" type="checkbox"/>
Kontrollieren Sie, ob.....	<input type="checkbox"/>
Kontrollieren Sie, ob.....	<input type="checkbox"/>

W1094

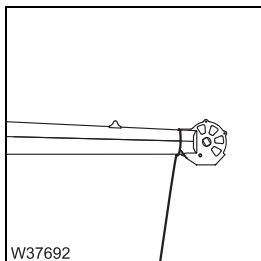
1. Prerequisite

- The truck crane is on outriggers and the superstructure is turned to the side or to the rear.
- The appropriate counterweight for the crane operation must be rigged; **|||▶ GMK4100L-1 Operating Instructions.**
- The main boom is fully retracted and locked.
The telescoping cylinder must be locked in telescopic section VI;
|||▶ p. 5 - 65.
The main boom is lowered to the horizontal position;
|||▶ GMK4100L-1 Operating Instructions.



W37789

2. If necessary, move the derricking cylinder into position A; **|||▶ p. 5 - 79.**

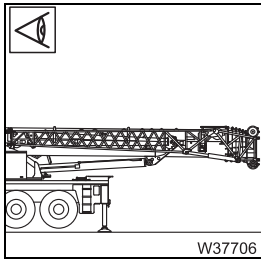



W37692

3. Attach the guide rope to section 1; **|||▶ p. 5 - 63.**

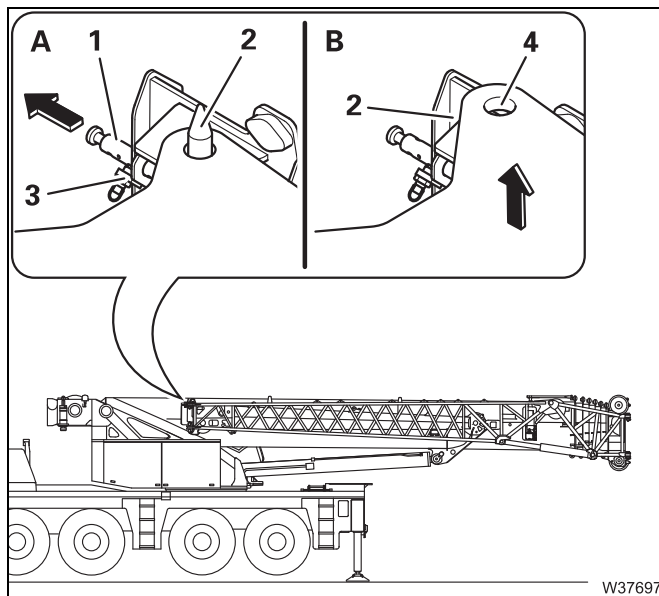


22. Remove the guide rope.



23. Check the transport condition of the swing-away lattice;  p. 5 - 11.

Disconnecting



Prerequisites:

- The *centre* and *front* connections are disconnected;
 - ▣▣▣▣ Establishing/releasing the front connection, p. 5 - 69.
 - ▣▣▣▣ Establishing/disconnecting the centre connection, p. 5 - 68
- The slewing connection has been made;
 - ▣▣▣▣ p. 5 - 77.

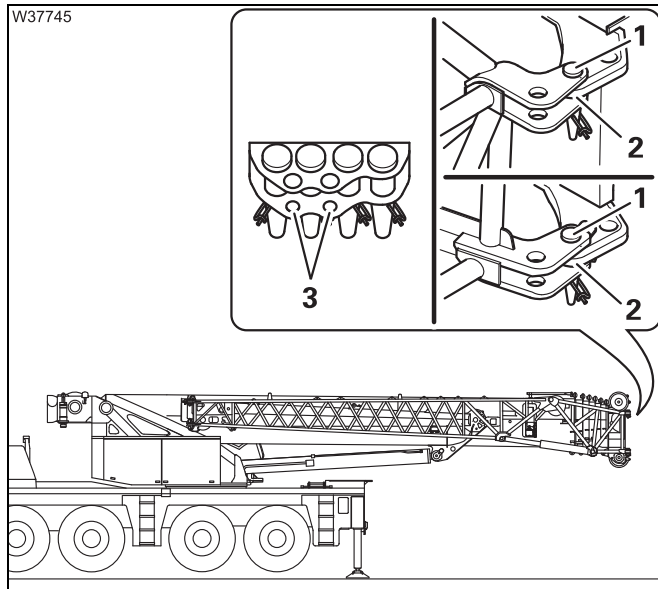
(A) – With the rigging hook:

- Pull out the locking bar (3) and lock it by turning to the right.
- Pull the pin (1) out as far as possible.
- Unlock the locking bar (3) by turning it to the right.
- Push the pin (1) until the locking bar (3) engages in the pin's bore hole (1).

(B) – Use the hand-held control to raise the swing-away lattice until the hole (4) is located over the arbor drift (2).

5.3.11 Establishing/parting the slewing connection

Establish



Prerequisites:

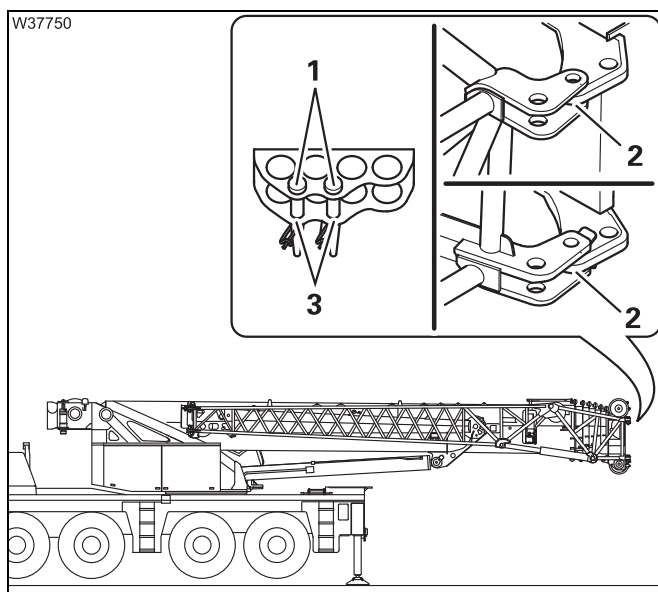
- The derricking cylinder is derricked into position **A**; p. 5 - 79.
- Use the hand-held control to move the swivel ram until the connecting points (1) are aligned.
- Remove the pins (1) from the clamps (3) and plug them into the connecting points (2).
- Secure the pins.

Disconnect



Risk of accidents due to the swing-away lattice falling!

Ensure that the swing-away lattice is slung on an auxiliary crane or attached to the main boom before separating the slewing connection. This prevents the swing-away lattice from falling down and injuring or killing you or other persons.



Prerequisites:

- The derricking cylinder is derricked into position **A**; p. 5 - 79.
- Remove the pins (1) from the connecting points (2) and plug them into the clamp (3).
- Secure the pins.

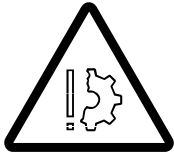
5.3.18

Swinging the swing-away lattice when rigging



Risk of accidents due to uncontrolled swinging of the swing-away lattice!

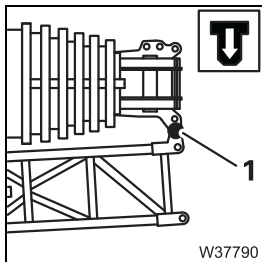
Ensure that no people or objects are in the swinging range and always swing the swing-away lattice with a guide rope from the ground.



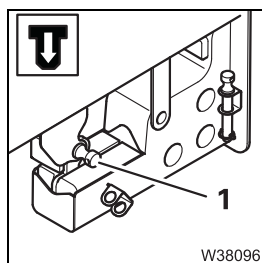
Risk of damage to electrical and hydraulic connections!

Ensure that the hydraulic and electrical connections are not trapped/jammed when swinging.

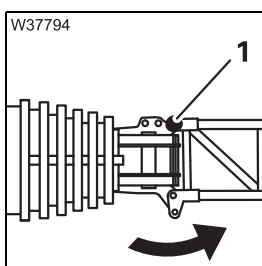
When rigging into the working position



- Check that the following conditions are met:
 - The swing-away lattice is secured with a guide rope; ||||➔ p. 5 - 63.
 - The slewing connection (1) must be established; ||||➔ p. 5 - 77.
 - The derricking cylinder is derricked into position B; ||||➔ p. 5 - 79.
 - The rear, centre and front connections are disconnected; ||||➔ p. 5 - 66, p. 5 - 68 and p. 5 - 69.



If the swing-away lattice is to be swung with the **swivel ram**, then the *swing-away lattice – swivel ram* connection (1) must be established; ||||➔ p. 5 - 70.



Swinging the swing-away lattice in front of the main boom head

- Swing the swing-away lattice in front of the main boom head using the guide rope so that the connecting points (1) line up.
- An extra person must keep the guide rope tightly tensioned or you must fasten the guide rope so that the swing-away lattice cannot slew back before the connection between the swing-away lattice and the main boom has been established at connecting point (1).



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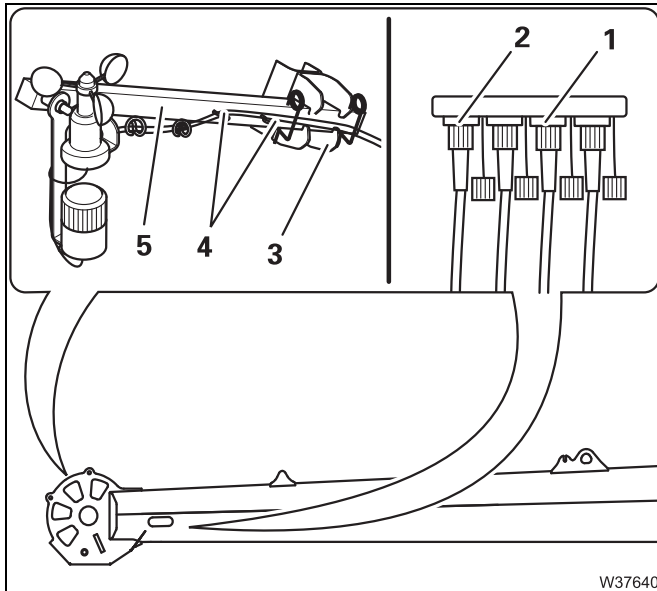
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5.3.23

Installing / removing the anemometer and air traffic control light

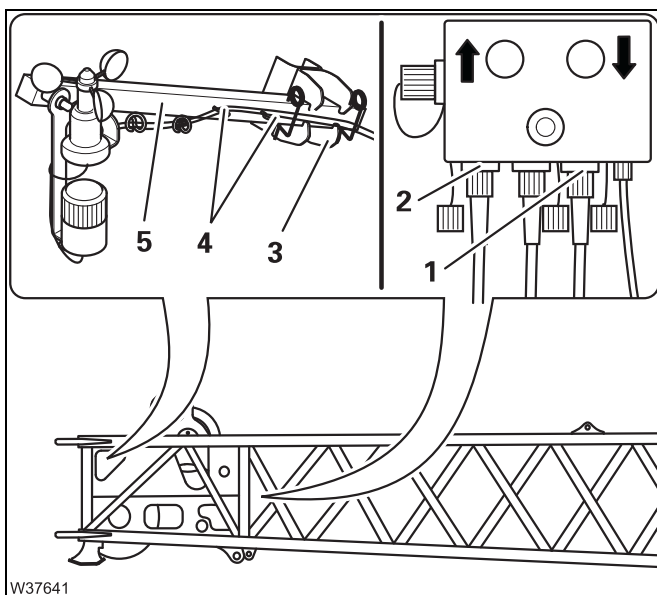
Installation

The anemometer and the air traffic control light – if provided – are located on the same rod.




On section 1

- Insert the rod (5) into the clamp (3) and secure it.
- Remove the cable from the clamps (4) and connect
 - The anemometer to socket (1)
 - The air traffic control light to the socket (2)
- Lay the cables in such a way that they 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.




On section 2

- Insert the rod (5) into the clamp (3) and secure it.
- Remove the cable from the clamps (4) and connect
 - The anemometer to socket (2)
 - The air traffic control light to the socket (1)
- Lay the cables in such a way that they 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.

Switching the air traffic control light on and off;  *GMK4100L-1 Operating Instructions.*



Raising and lowering

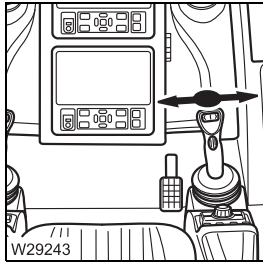
You can adjust the sensitivity of the control levers to the operating conditions;  *Operating Instructions GMK 4100L-1*.



Risk of accident due to unexpected crane movements!

If assigned more than one function, check that the *lattice extension derricking gear* control lever function is switched on before you move the control lever for derricking the swing-away lattice.

This prevents accidents due to unexpected crane movements.



Lowering: Push the control lever to the right – the swing-away lattice will be lowered.

Raising: Push the control lever to the left – the swing-away lattice will be raised.

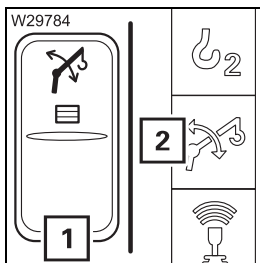
Other derricking settings are performed in the same manner, as described in the *Operating Instructions GMK 4100L-1*.

- Changing the engine speed
- Limiting the derricking speed
- Operating hours display

When derricking the swing-away lattice the RCL switches automatically to the values for fixed angle and intermediate angle stated in the *lifting capacity table* if permissible for the load currently being lifted.

If this switchover is not permitted for the load currently raised, derricking will be switched off and a corresponding error message will be generated.

Switching off the derricking gear




- Press the button (1) once.
 - The lamp in the button (1) will light up dimly.
 - Symbol (2) will be **red** if the derricking gear is switched off.

All power units are switched off and the lamps in the corresponding buttons light up only dimly after turning off the ignition.



Joints

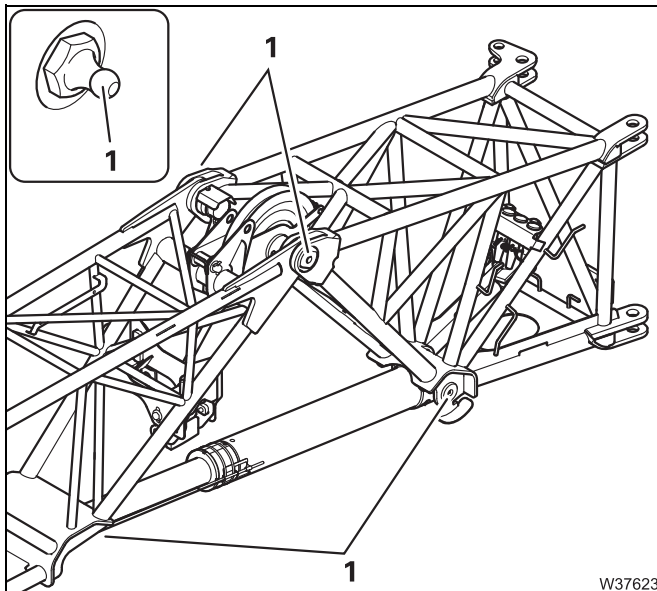
Grease ¹⁾	Designation acc. to DIN 51502	Specifications Classification	GROVE part no. ¹⁾
Grease	KP - 1K - 50	DIN 51825	03233369

¹⁾  *Maintenance Manual*

- Grease gun

Prerequisite

- The truck crane is secured against unauthorised use;  *Maintenance Manual*.
- or
- The swing-away lattice is removed;  p. 5 - 27.



Lubricate joints

Section 2 is fitted with four grease nipples (1).

- Clean the grease nipples (1).
- Press grease into the grease nipples (1) until new grease comes out at the lubricating point.
- Remove the excess grease.



6.2 Checklists for rigging work

6.2.1 Overview

The following table shows which checklist is applicable for any required rigging work.

	Required rigging work	Checklist
Boom extension	– Installing the boom extension	<i>CHECKLIST: Installing the boom extension, p. 6 - 6</i>
	– Removing the boom extension	<i>CHECKLIST: Removing the boom extension, p. 6 - 10</i>

6.3

Description of the rigging work

6.3.1

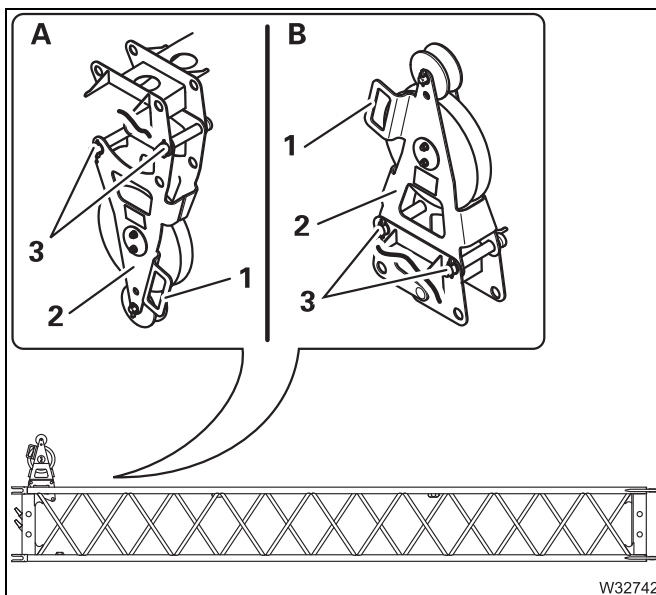
Folding the deflection sheave out/in – section 3



Risk of crushing!

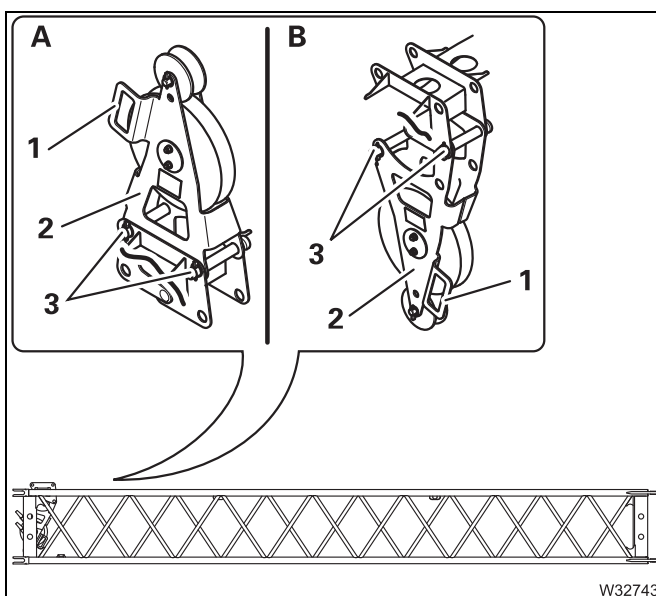
Always hold the deflection sheave firmly by the handle (1) when removing the pins.

Your fingers may be crushed if you hold the sheave by the side panel.



Folding out

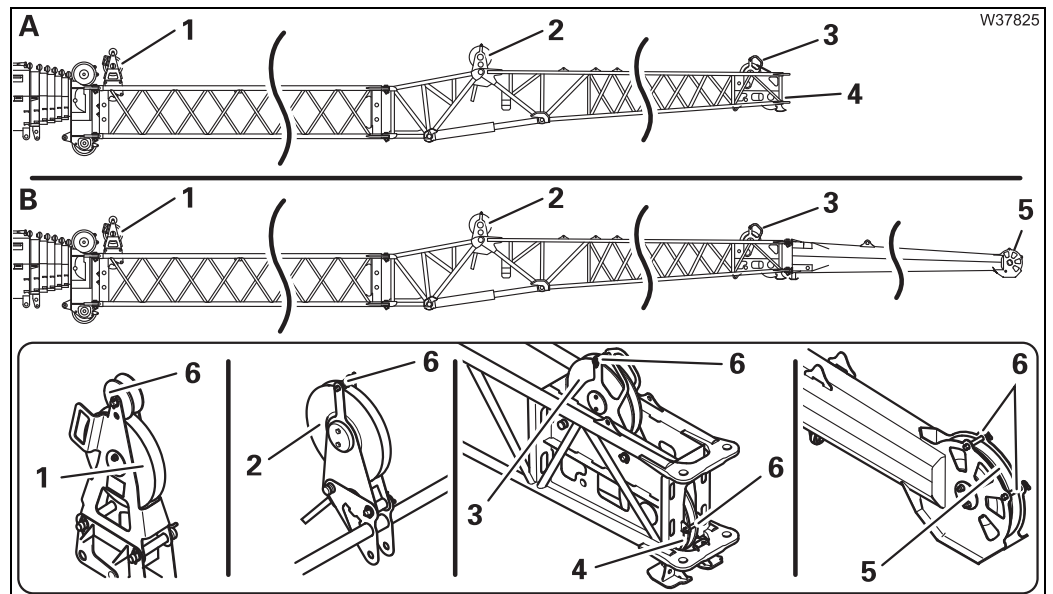
- (A) – Hold the deflection sheave (2) by the handle (1) and pull out the pins (3).
- (B) – Fold the deflection sheave (2) upwards until it is aligned with the connecting points.
- Insert the pins (3) into the connecting points.
- Secure the pins.



Folding in

- (A) – Hold the deflection sheave (2) by the handle (1) and pull out the pins (3).
- Fold the deflection sheave (2) downwards until the connecting points align.
- Insert the pins (3) into the connecting points.
- Secure the pins.

Removing



- Remove the sheaves (6) and rods (6).
- Take the hoist rope from the deflection sheaves (1), (2) and (3) and from the head sheaves (4) or (5).
- Lay the hoist rope down on the ground at the left-hand side or roll it onto the drum up to the main boom head/hoist.
- Install all sheaves (6) and rods (6).
- Secure all sheaves (6) and all rods (6).

Possible reeving methods

Possible reeving methods; |||||▶ p. 5 - 94

7.1.3

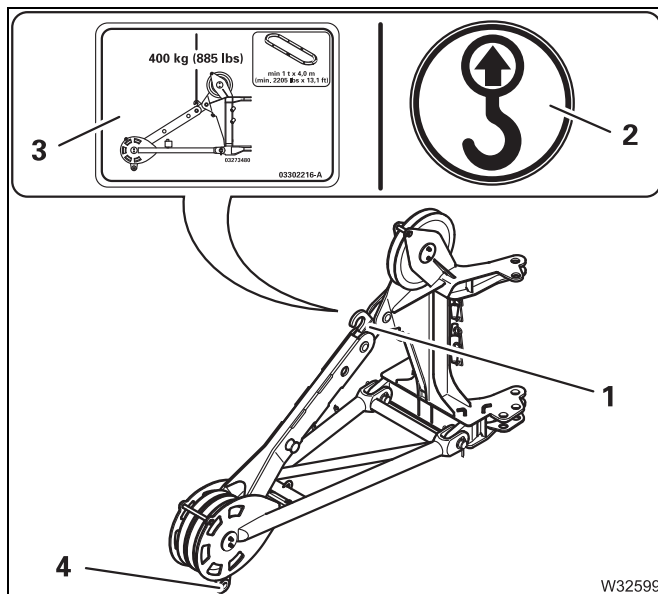
Attachment points



Risk of accidents if used improperly!

Sling the heavy load lattice extension only at the slinging points provided. Use only lifting gear and joining elements of sufficient load bearing capacity.


Section 6



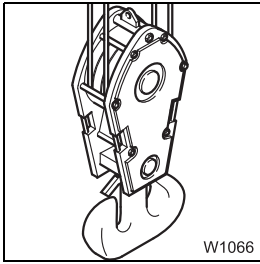
The fixed slinging point (1) is marked with a sticker (2).


- Attach the heavy load lattice extension at a 0°-angle to the slinging point. Now the heavy load lattice extension hangs in a horizontal position on the auxiliary crane.

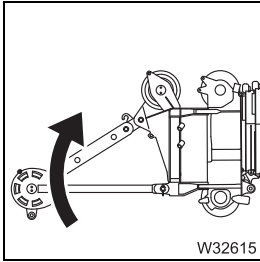
The sticker (3) gives data on the weight and the necessary lifting gear.


Dimensions and weights;  *Transport dimensions and weights*, p. 7 - 4.

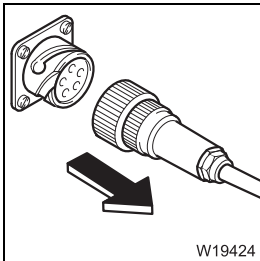
The rope attachment point (4) serves as the slinging point for the guide rope.




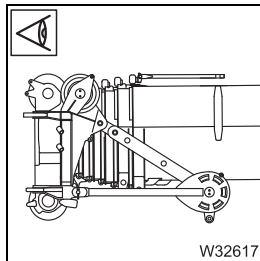
5. Unreeve the hoist rope and remove it from section 6;  p. 7 - 31.




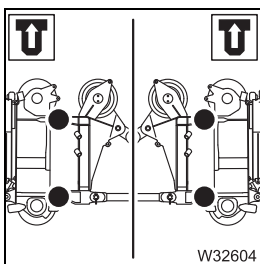
6. Set 0° angle, if necessary;  p. 7 - 36.




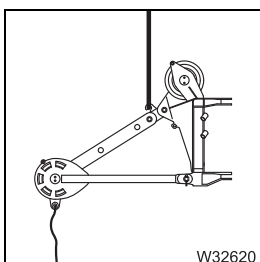
7. Breaking the electrical connection;  p. 7 - 30.



8. Fasten slings to section 6 and attach a guide rope;  p. 7 - 3.



9. Disconnect the connection between section 6 and the main boom;  p. 7 - 24.



10. Remove section 6 from the main boom and put it aside.



7.3

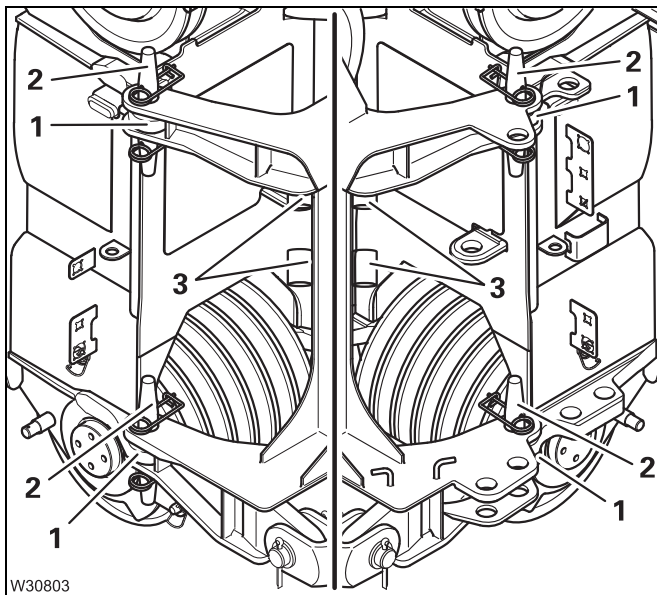
Rigging work

7.3.1

Mounting section 6 to the main boom / removing it from the main boom

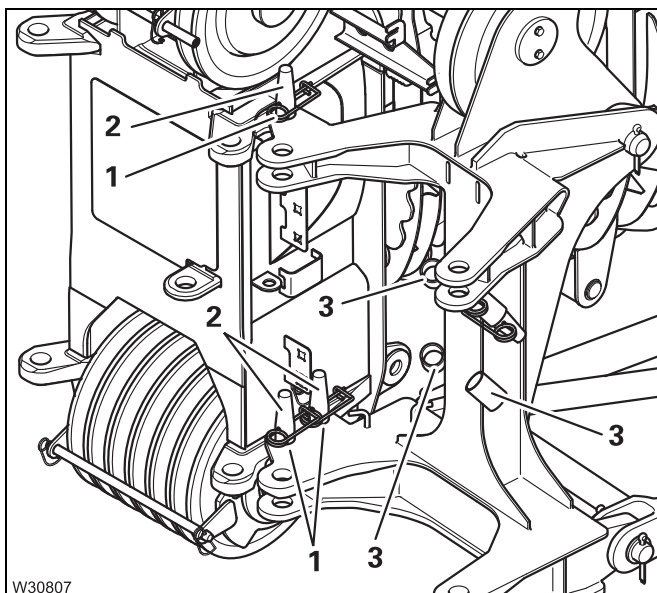
Installing

- Section 6 must be attached to an auxiliary crane.
- A guide rope must be attached.



In the working position

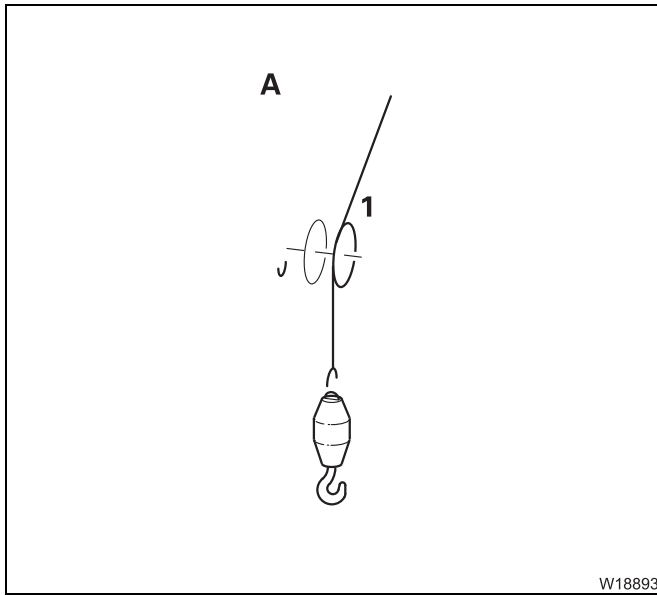
- Align the connecting points (1).
- Remove the pins (2) from the clamps (3) and insert them into the connecting points (1).
- Secure the pins.
- Disconnect the guide rope and the lifting gear.
- If necessary, set the 40° angle; ▮▮▮ p. 7 - 36.
- Remove the chain hoist; ▮▮▮ p. 7 - 36.
- Position the hoist rope if necessary; ▮▮▮ p. 7 - 31.



Into the transport position

- Align the connecting points (1).
- Remove the pins (2) from the clamps (3) and insert them into the connecting points (1).
- Secure the pins.
- Disconnect the guide rope and the lifting gear.

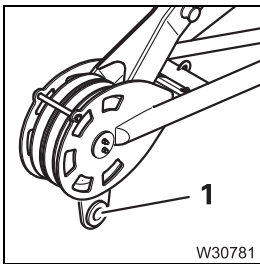





Hook tackle

Reeving

A 1-fall



The rope end fitting is fastened to the fixed point (1) for 2-fall, 4-fall, 6-fall reevings, etc.

Reeve the hoist rope;  *Operating Instructions GMK 4100L-1.*

8

Auxiliary single-sheave boom top

8.1

Operations planning

8.1.1

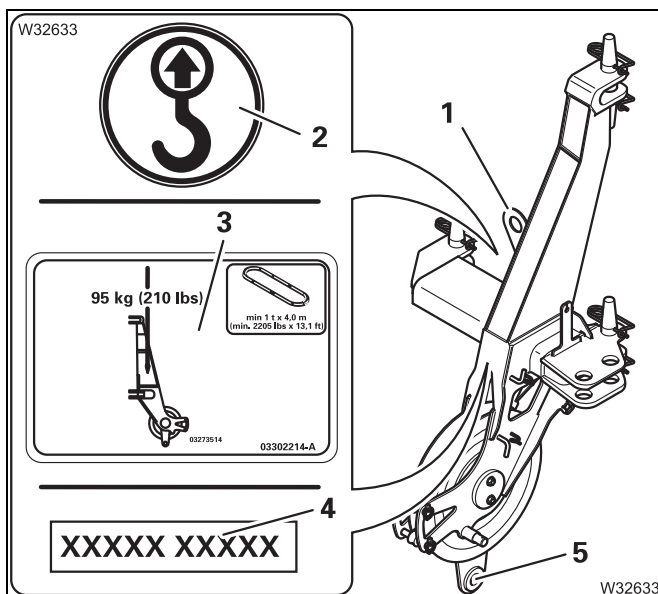
Identification and slinging points



Risk of accidents if auxiliary single-sheave boom tops are interchanged!
Install only a auxiliary single-sheave boom top that belongs to the crane.
No other auxiliary single-sheave boom tops may be installed.



Risk of accidents if used improperly!
Only fit slings to the auxiliary single-sheave boom top at the slinging points provided. Use only lifting gear and joining elements of sufficient load bearing capacity.



Identification

The crane and the corresponding auxiliary single-sheave boom top must be labelled with the same serial number (4).

Attachment points

The fixed slinging point (1) is marked with a sticker (2).

The sticker (3) gives data on the weight and the necessary lifting gear.

The rope attachment point (5) serves as the slinging point for the guide rope.

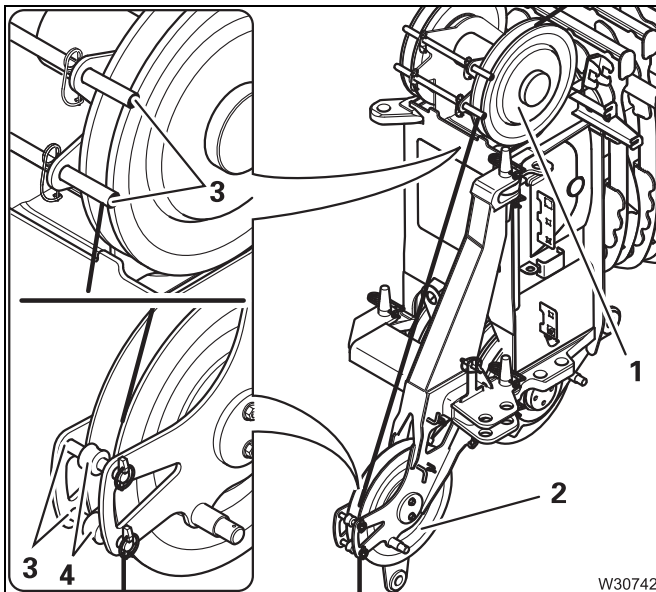
8.2.4

Attaching and removing the hoist rope



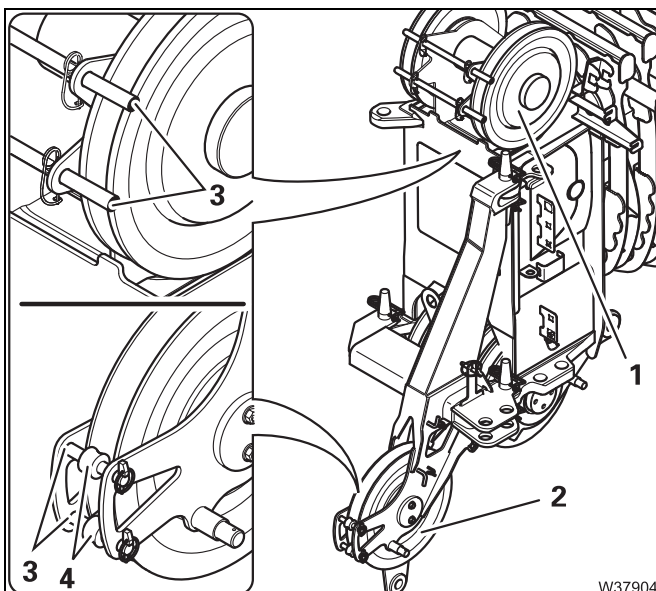
Risk of accidents due to falling parts

Always secure the sheaves and rods with retaining pins.
This prevents sections coming loose, falling out and causing injuries.



Fitting

- Remove the rods (3) and sheaves (4).
- Guide the hoist rope over the sheaves (1) and (2).
- Insert the rods (3) and fasten the guide sheaves (4).
- Secure the rods.



Removing

- Remove the rods (3) and sheaves (4).
- Remove the hoist rope from the sheaves (2) and (1).
- Insert the rods (3) and fasten the guide sheaves (4).
- Secure the rods.



8.4

Maintenance



If the lattice extension has been in storage for an extended period of time, perform maintenance work on it no later than when it is next used.

8.4.1

Maintenance plan M 1

M 1

**Maintenance work on the LATTICE EXTENSION:
Monthly/after approx. 100 operating hours**

Auxiliary single-sheave boom top

– Lubricating the pins

p. 8 - 22

8.4.2

Maintenance plan M 3

M 3

**Maintenance work on the LATTICE EXTENSION:
every three months/after 250 oper. hrs.**

Auxiliary single-sheave boom top

– Check the sheaves

p. 8 - 22


Counterweight in t	Telescoping Telescopic section I-II-III-IV-V-VI in %	Main boom angle in °	Lattice extension inclination in °	Superstruc- ture posi- tion ¹⁾	Maximum Axle load ²⁾ in t	
					front	rear
21,4	50-0-0-0-0-0	45 - 45	0 - 40	front	12,5	22,0
	0-0-0-0-0-0	40 - 80	0 - 40	rear	22,5	19,0
24,0	50-50-0-0-0-0	40 - 50	0 - 40	front	15,0	22,5
	0-0-0-0-0-0	40 - 75	0 - 40	rear	22,5	19,0
26,2	50-50-0-0-0-0	40 - 50	0 - 40	front	14,5	22,5
	0-0-0-0-0-0	45 - 75	0 - 40	rear	23,5	19,0

^{1), 2)} ■■■► Notes on the tables, p. 10 - 3



10.4

Before driving


- Before driving you must sequentially perform all steps described here, while also observing all specifications and safety instructions in the corresponding sections of the operating manual provided;  *Operating Instructions GMK 4100L-1*.
 - Secure the superstructure against slewing
 - Checking tyre pressure and wind speed
 - Putting the truck crane on the wheels
 - Select the driving direction and switch on the separate steering (transmission/connections)

10.5

Whilst driving


The same specifications, restrictions and safety instructions applying to driving a rigged truck crane without a rigged lattice extension also apply to driving a rigged truck crane with a rigged lattice extension.

For safety reasons, the outrigger beams should remain extended corresponding to the space available. The outrigger pads must not touch the ground whilst the crane is being driven.

- Observe all specifications and safety instructions in the corresponding sections of the operating manual provided;  *Operating Instructions GMK 4100L-1*.

10.6

After driving

- After driving you must perform the same steps as those required after driving a rigged truck crane without a rigged lattice extension. When doing this you must also observe all specifications and safety instructions in the corresponding sections of the operating manual provided;  *Operating Instructions GMK 4100L-1*.

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