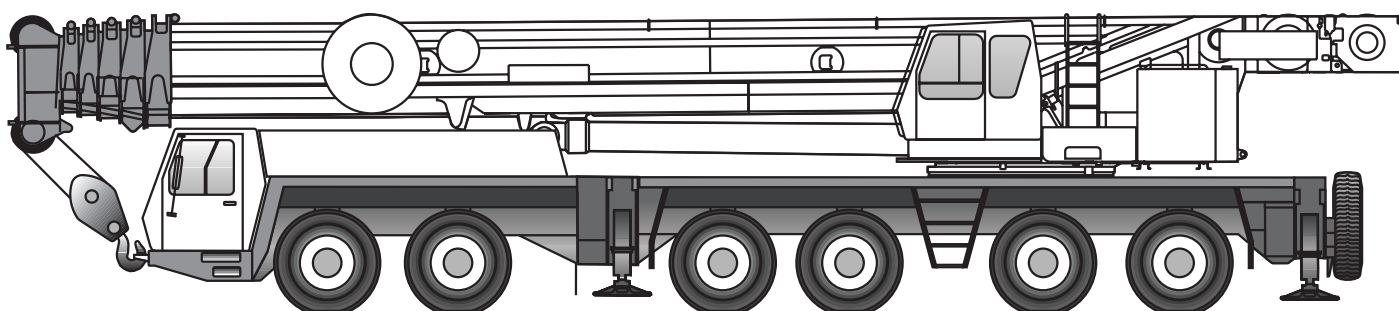
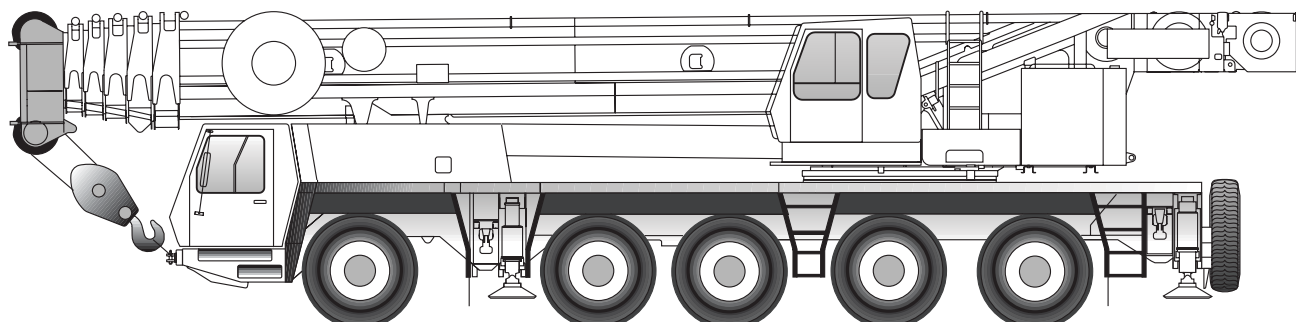


GROVE

GMK5200/6220-L



Operating instructions lattice extension

Vehicle serial number:

2 084 906 en
04.08.2004

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1.4

Organisational measures

The operating instructions and the lifting capacity table should be kept in the truck crane for immediate access and should not be removed from the truck crane. You need to have read and understood the operation and safety instructions in these operating instructions and to comply with them when working.

In addition to the operating instructions and the lifting capacity table, observe all general, statutory and otherwise applicable regulations concerning accident prevention and environmental protection. You need to have read and understood these and to work accordingly.

This includes:

- the use of hazardous materials,
- wearing protective clothing and equipment,
- traffic regulations or
- all regulations applying to the operation of the crane.

Ensure that those appointed to work on the truck crane are given the information required to carry out the work before starting operations. Give your employees (e.g. banksmen, slingers, rigging personnel) appropriate instruction.

Ensure that the maintenance personnel possess the necessary know-how to safely operate the crane. Ensure that the maintenance personnel have access to the operating instructions.

Only properly trained or instructed personnel may carry out work on the truck crane.

Responsibilities related to crane operation, rigging, maintenance and repair work must be clearly defined.

Ensure that only the appointed employees operate the truck crane.

Do not leave long hair down or wear loose clothing or jewellery (including rings) when working with the crane. These could get caught or pulled into the unit and result in injury.

Use your personal protective equipment whenever necessary or prescribed.

Observe all safety and warning signs on the truck crane.

Ensure that all safety and warning signs on the truck crane remain legible.



2

Dimensions and weights

2.1

Dimensions and weights in metric units

This section contains information on the transportation measurements and weights of lattice extensions in metric units.

2.1.1

Two-stage swing-away lattice extension

Description	Length x width x height (m)	Weight (kg)
12.5 m (41 ft) part, complete	13.0 x 1.00 x 1.50	1850
9 m (30 ft) part, complete	9.10 x 0.55 x 0.75	550
Two-stage swing-away lattice extension, complete, folded	13.0 x 1.15 x 1.50	2400
Hose drum, complete with hoses	1.30 x 1.30 x 0.35	160

2.1.2

Auxiliary single-sheave boom top

Description	Length x width x height (m)	Weight (kg)
Auxiliary single-sheave boom top	1.05 x 0.95 x 1.00	60

2.1.3

Boom extension

Description	Length x width x height (m)	Weight (kg)
8 m part, complete, each	8.20 x 0.90 x 1.15	790

3.2

Identification

The two-stage swing-away lattice extension is designed for the truck crane with which it was delivered. The two-stage swing-away lattice extension parts belonging to the truck crane have the same serial number as the truck crane.

The following parts are identified by the serial number:

- the 12.5 m (41 ft) section on the fixed section,
- the 12.5 m (41 ft) section on the luffing section,
- the 9 m (30 ft) section.



Operate only two-stage swing-away lattice extension sections which have the same serial number as the crane.
The SLI is only set for this two-stage swing-away lattice extension.
This prevents malfunctions and damage.



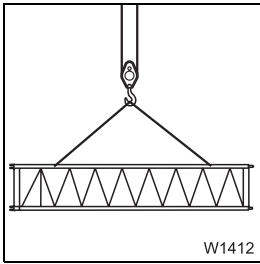
For technical reasons a truck crane may only be set with one two-stage swing-away lattice extension.

If you wish to use the two-stage swing-away lattice extension on several GROVE truck cranes, the two-stage swing-away lattice extension sections must be adjusted for the corresponding cranes and labelled with all of the respective serial numbers.

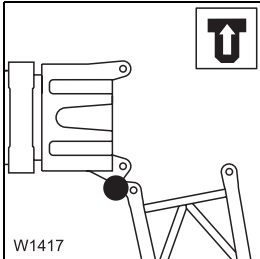


The two-stage swing-away lattice extension should only be adjusted by your local GROVE Customer Support!

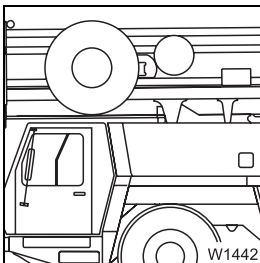




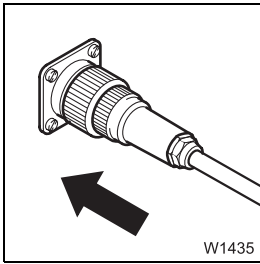
5. Sling two-stage swing-away lattice extension on auxiliary crane;
▣▣▣▣▶ *Slings points*, p. 3 - 9.



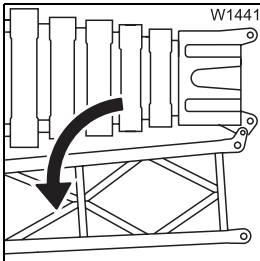
6. Loosen swinging connection between 12.5 m (41 ft) section and basic section and set down two-stage swing-away lattice extension onto separate vehicle with auxiliary crane;
▣▣▣▣▶ *Connections on main boom head*, p. 3 - 48.
▣▣▣▣▶ *Transportation on a separate vehicle*, p. 3 - 76.



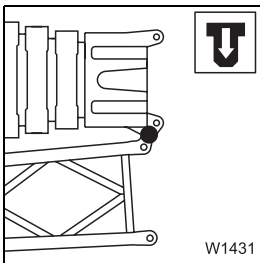
7. Remove hose drum for hydraulic supply (if applicable); ▣▣▣▣▶ *Installing hose drum*, p. 3 - 39.



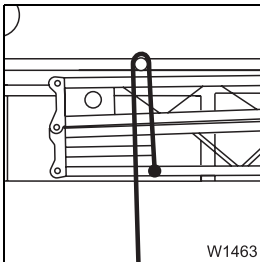
7. Establish electrical connection between lattice extension and main boom; ■■■▶ *13 m (43 ft) swing-away lattice extension, p. 3 - 65.*



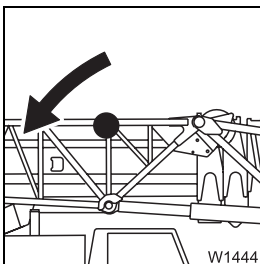
8. Swing 12.5 m (41 ft) section onto the main boom head; ■■■▶ *Swinging the lattice extension onto the main boom head, p. 3 - 64.*



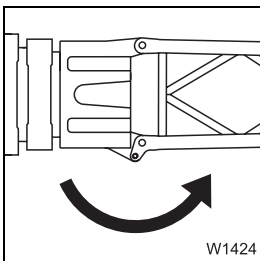
9. Establish the swinging connection between the 12.5 m (41 ft) section and the main boom head; ■■■▶ *Connections on main boom head, p. 3 - 48.*



10. Secure the 12.5 m (41 ft) section with guide rope on the main boom; ■■■▶ *Securing lattice extension with cord, p. 3 - 59.*



11. Lower lattice extension with retaining mandrel out of the holder on the main boom; ■■■▶ *Lowering/raising retaining mandrel on main boom, p. 3 - 57.*

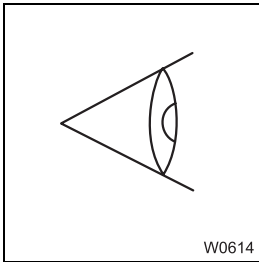


12. Swing two-stage swing-away lattice extension in front of the main boom head; ■■■▶ *Swinging the lattice extension when rigging, p. 3 - 61.*



3.6.2

Checking the transport condition



For transportation you must establish certain connections between both parts of the lattice extension. The connections which need to be established depend on whether the lattice extension:

- is folded up at the side of the main boom for transportation or
- is completely removed for transportation.

Transport condition is when the lattice extension has been removed as described in the corresponding checklists.



Be careful not to damage the lattice extension and the main boom!

Always put the lattice extension into transport condition before driving the truck crane with a lattice extension folded at the side or working with the main boom.

Only then is the lattice extension secured against slipping.

In this way you prevent the partly fastened lattice extension hitting the main boom or the individual components of the lattice extension hitting each other and becoming damaged.

You must check transport condition:

- After unrigging the lattice extension, before you drive the truck crane with the lattice extension folded at the side or work with the main boom.
- Before installation and before rigging the lattice extension.
The corresponding checklists require that the lattice extension is in transport condition.

The following paragraphs and the diagram show the necessary connections for the transport condition with the lattice extension folded at the side and removed.



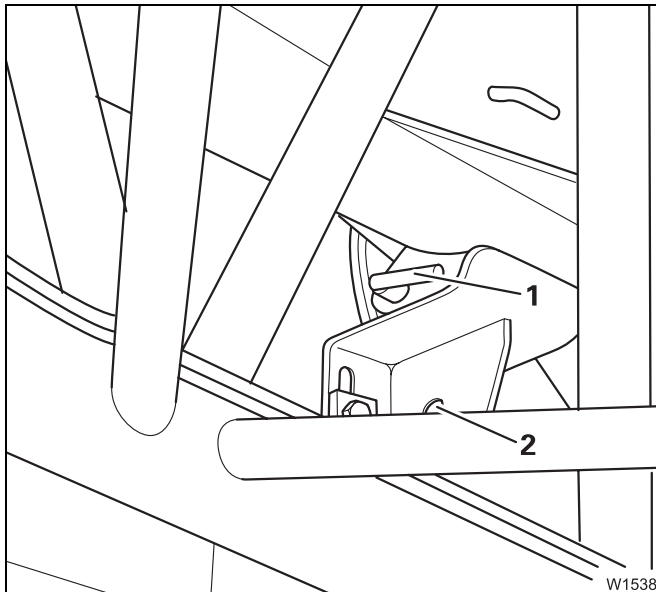
Connection between 9 m (30 ft) section and main boom

The connection must be made:

- When rigging the 13 m (43 ft) swing-away lattice extension,
- for transportation when only the 9 m (30 ft) section is folded at the side of the main boom.

The connection must be disconnected:

- When rigging the 22 m (72 ft) two-stage swing-away lattice extension,
- after operation with 13 m (43 ft) swing-away lattice extension when the lattice extension needs to be removed.



Making connection

- Swing the 9 m (30 ft) section fully onto the main boom.
- Attach the 9 m (30 ft) section to the main boom with the pin (1).
- Secure the pin with the retaining pin.

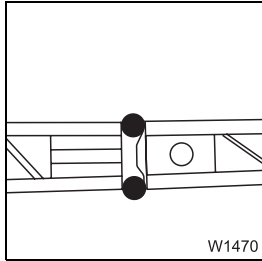
Disconnecting connection

- Remove the pin (1) from the connection and insert it in the bore (2).
- Secure the pin with the retaining pin.

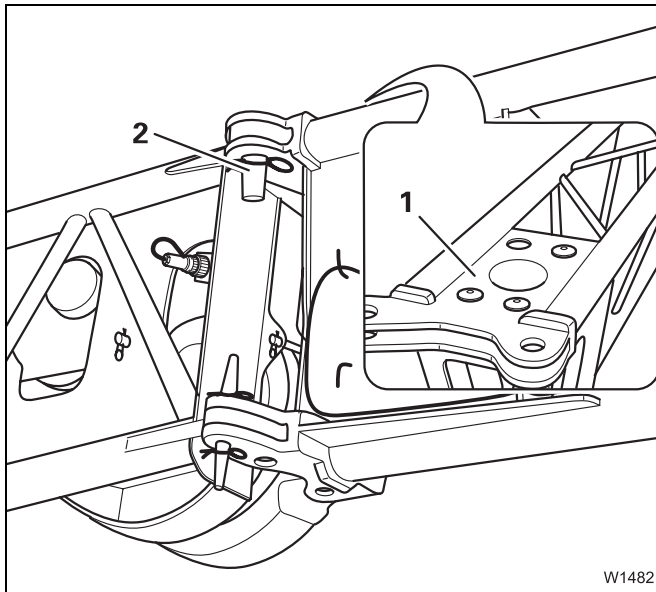


**Connections on
lattice extension**

If the bearing points for locking do not align or the pins can not be knocked out, the load must be removed from the bearing points; p. 3 - 53.



If the 9 m (30 ft) section is swung in front of the 12.5 m (41 ft) section when rigging the 22 m (72 ft) two-stage swing-away lattice extension, it must be locked on the head of the 12.5 m (41 ft) section.



The securing pins for this connection are all in the retaining sheet (1) on the foot of the 9 m (30 ft) section and are secured with retaining pins.

A securing pin (2) has already been inserted for the swinging connection.



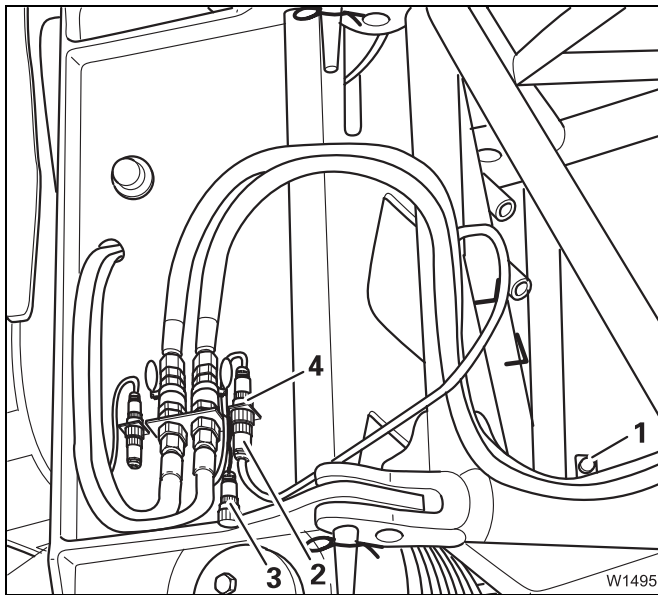
3.6.11

Electrical connection on the lattice extension

The SLI, lifting limit switch, lowering limit switch and the control system for derricking the lattice extension are connected via the electrical connection on the lattice extension.

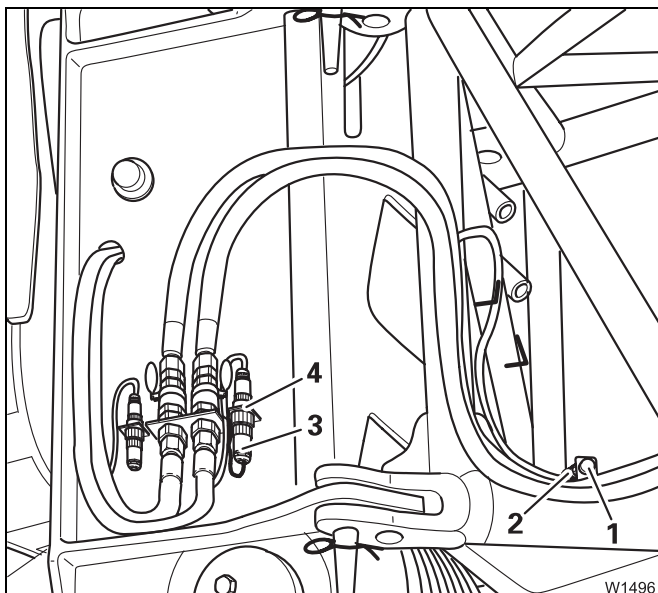
13 m (43 ft) swing-away lattice extension

For the 13 m (43 ft) swing-away lattice extension the electrical connection is made or disconnected on the right side of the main boom head.



Establishing electrical connection

- Remove the short-circuit plug (3) from the socket (4) on the main boom.
- Remove the plug (2) from the dummy socket (1) and insert it in the socket (4) on the main boom head.



Disconnecting electrical connection

- Remove the plug (2) from the socket (4) on the main boom head and insert it in the dummy socket (1) on the 12.5 m (41 ft) section.
- Insert the short-circuit plug (3) in the socket (4) on the main boom.

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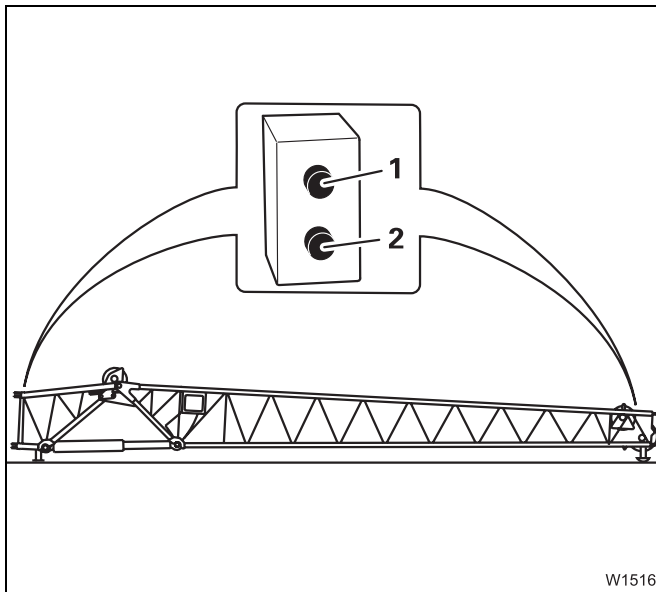


3.6.17 Derricking lattice extension

Before derricking the lattice extension set an SLI rigging code or a SLI code for work with the lattice extension.

When rigging

To derrick the lattice extension when rigging there are two control units each with two pushbuttons on the 12.5 m (41 ft) section.



- To **raise** press the top pushbutton *Raise lattice extension (1)*.
- To **lower** press the bottom pushbutton *Lower lattice extension (2)*.

During operation

During operation the lattice extension is derricked from the crane cab.



- Press the *Preselection of derricking control lever function / telescoping / derrick lattice extension* rocker switch down.



- The indicator lamp *Right control lever in derrick lattice extension function* lights up and you can derrick the lattice extension with the right control lever.
- To **raise** press the right control lever to the **left**.
- To **lower** press the right control lever to the **right**.

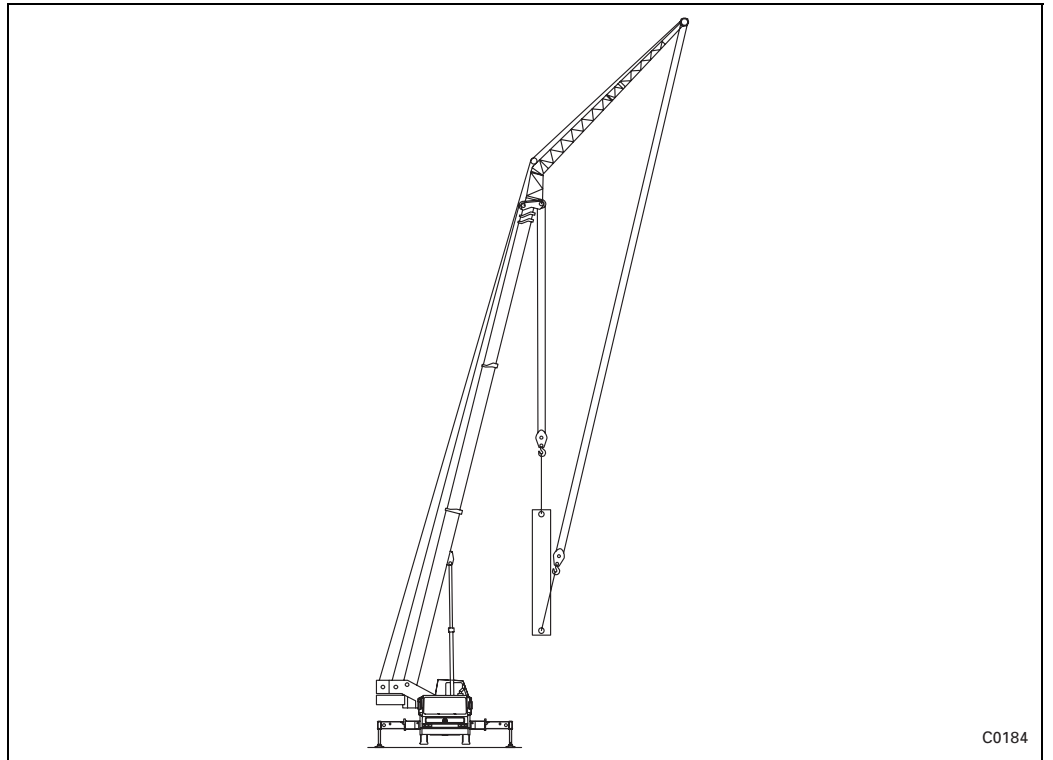
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- Slacken the hoist rope on the lattice extension until the load is only hanging from the hook block on the main boom.
Turning the load is thus completed.

3.9.4

Driving the rigged crane

Engaging the slewing gear permanent brake

Before the truck crane is moved, the superstructure must be locked to the carrier;  *GMK 5200/6220-L operating instructions, Part 2, Chapter Crane operation, Section Checking the truck crane before working with the crane – Mechanical superstructure lock.*



- Check that the superstructure is locked. The *Counterweight locked* indicator lamp must be lit.



- Apply the slewing gear permanent brake and switch off the *Slewing* function to prevent inadvertent operation. To do this push down the *Slewing gear permanent brake* rocker switch. The *Slewing gear permanent brake applied* indicator lamp lights up when the slewing gear permanent brake is applied.



If the crane engine stops the slewing gear permanent brake is automatically applied.

Retracting the outrigger



- Retract the outrigger cylinders until the wheels are just above the ground.

Risk of overturning!

To reduce the risk of the truck crane overturning do not raise the outrigger pads more than 5 to 10 cm (2 to 4 inches) off the ground. Leave the outrigger beams extended.

Switching over the suspension locking system



- Switch the suspension locking system off. To do this push up the *Suspension locking system* rocker switch. The *Suspension locking system* indicator lamp must go out.
- Retract the outrigger cylinders until the truck crane is approximately at on-the-road level.



- Activate the suspension locking system again. To do this push down the *Suspension locking system* rocker switch. The *Suspension locking system* indicator lamp lights up when the suspension system is locked.
- Continue to retract the outrigger cylinders.



Risk of overturning!

To reduce the risk of the crane overturning do not raise the outrigger pads more than 5 to 10 cm (2 to 4 inch) off the ground. Leave the outrigger beams extended.



3.12 Table of lubricants

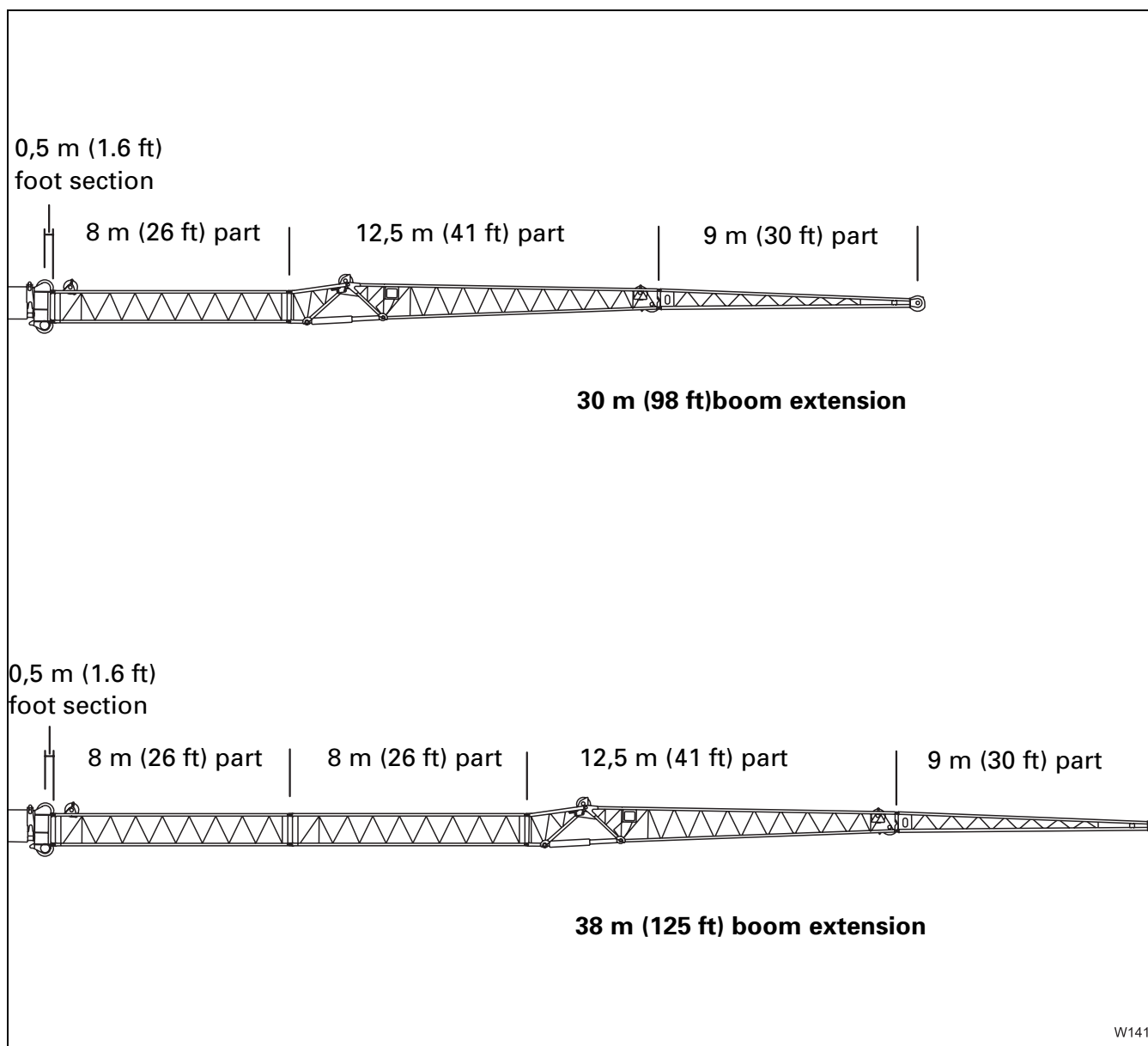


The lubricant chart in the following table applies to the maintenance of the two-stage swing-away lattice extension. If the table of lubricants in the *Maintenance manual* of the GMK 5200/6220-L contains other lubricants under the same designation, use only those lubricants in this table for the two-stage swing-away lattice extension.

Designation	Lubricating point	Type of lubrication	Designation in acc. with DIN 51502	Specification Classification	Lubricant type Viscosity range
K	Bearings	Use for repairs with grease	KP - L2K	DIN 51825	

4.3

Assembly

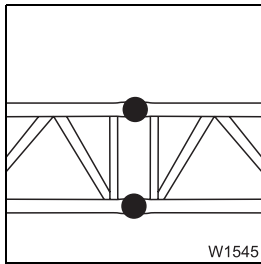


The 12.5 m (41 ft) part consists of a fixed 2 m (6.6 ft) part and a luffing part 10.5 m (34 ft).

The 0.5 m (1.6 ft) foot section serves as a connection between the main boom head and the boom extension. It is an integral part of the two-stage swing-away lattice extension.

4.5.3

Installing/removing two-stage swing-away lattice extension for boom extension

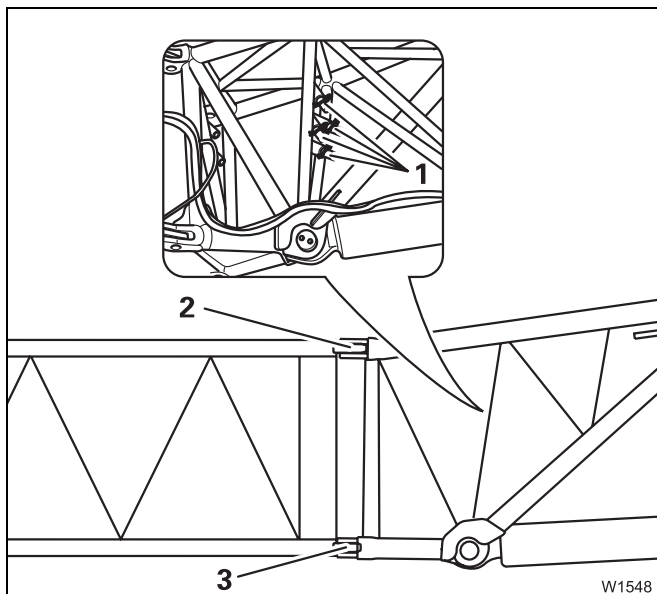


This section describes the installation and removal of the folded two-stage swing-away lattice extension.

You can also install the two-stage swing-away lattice extension which has been folded in front of the other in front of a 8 m (26 ft) section (e.g. when you are changing directly from the 22 m (72 ft) two-stage swing-away lattice extension to a boom extension).



An auxiliary crane must be used to install and remove the two-stage swing-away lattice extension.



The securing pins (1) for the connection are in the holders on the foot of the 12.5 m (41 ft) sections and are secured with retaining pins.

Installation

- Sling the two-stage swing-away lattice extension onto an auxiliary crane;
 ▣▣▣▣ *Slings points*, p. 3 - 9.
- Lift the two-stage swing-away lattice extension in front of the 8 m (26 ft) section so that the bearing points (2) and (3) align on both sides.
- Insert the securing pins on both sides into the bearing points (2) and (3).
- Secure all the pins with retaining pins.

Removing

- Sling the two-stage swing-away lattice extension onto an auxiliary crane;
 ▣▣▣▣ *Slings points*, p. 3 - 9.
- Lift the two-stage swing-away lattice extension until the bearing points are relieved.
- Release the pins and knock them out of the bearing points (2) and (3) on both sides.
- Insert the pins into the holders on the 12.5 m (41 ft) section and secure them with retaining pins.

30 m (98 ft) boom extension

The axle loads specified in the following tables refer to a driving mode with the basic unit and **12 t hook tackle** reeved on the lattice extension, hook blocks must be unreeved.

Counterweight in t	Telescoping Tele.I/II/III/IV/V	Main boom angle in °	Lattice extension angle in °	Main boom position ¹⁾	Axle load ²⁾ in t (x 1000 lbs)	
					front	rear
22,5	0 / 0 / 0 / 0 / 0	15	5	front	12,5 (27.6)	25,0 (55.1)
	0 / 0 / 0 / 0 / 0	80	5	rear	16,5 (36.4)	18,5 (40.8)
33,5	0 / 0 / 0 / 0 / 0	80	5	rear	20,0 (44.1)	19,0 (41.9)
44,0	0 / 0 / 0 / 0 / 0	70	5	rear	23,0 (50.7)	19,5 (43.0)
64,0	0 / 0 / 0 / 0 / 0	60	5	rear	24,5 (54.0)	27,5 (60.6)
70,0	0 / 0 / 0 / 0 / 0	60	5	rear	26,5 (58.4)	27,5 (60.6)

- 1) Boom position at rear = 0° position, boom over rear edge, undercarriage
 Boom position at front = 180° position, boom over driver's cab

- 2) Axle load front: on 1st, 2nd and 3rd axle line
 rear: on 4th and 5th axle line



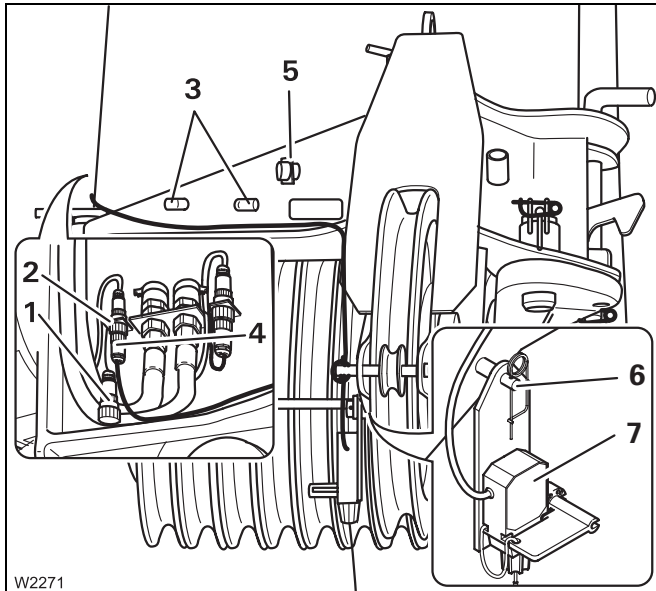
5 Auxiliary single-sheave boom top

5.1	Identification	5 - 1
5.2	Installing/removing auxiliary single-sheave boom top	5 - 3
5.3	Installing the auxiliary single-sheave boom top	5 - 5
5.4	Reeving the hoist cable	5 - 7
5.5	Connecting the anchor-to-bracket-switch and anemometer	5 - 9
5.6	Operation with the auxiliary single-sheave boom top	5 - 11
5.6.1	Turning loads	5 - 12


5.5

Connecting the anchor-to-bracket-switch and anemometer

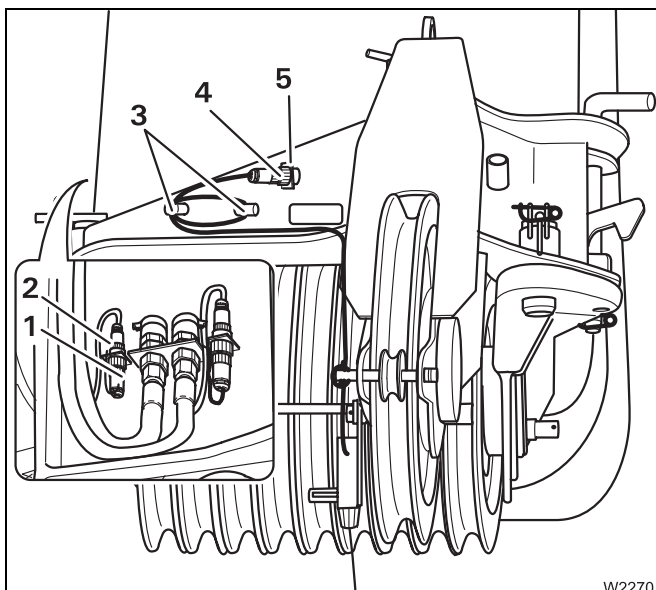
Connecting the anchor-to-bracket-switch



- Hang up the anchor-to-bracket-switch (7) on the bolt (6) on the auxiliary singlesheave boom top and secure with a locking pin.
- Remove the connection cable plug from the dummy case (5).
- Unwind the connection cable from the hooks (3).
- Remove the short-circuit plug (1) from the socket (2) on the main boom head.
- Put the connection cable plug into the socket (2).
- Put the hoist cable through the lifting limit switch weight.

If a hook block is also reeved on the main boom, connect the anchor-to-bracket-switch of the main hoist with the socket on the left side of the main boom head;  *GMK 5200/6220-L operating instructions, Part 2, Chapter Crane operation, Section Rigging work on the main boom – Reeving and unreeving the hoist rope - Lifting limit switch on the main boom.*

Disconnecting the anchor-to-bracket-switch



- Remove the connecting plug (4) from the socket on the main boom.
- Plug the short-circuit plug (1) into the socket (2).
- Wind the connecting cable of the anchor-to-bracket-switch around the hooks (3) on the auxiliary single-sheave boom top.
- Plug the connecting plug (4) into the dummy case (5).



6

Heavy load lattice extension

For crane operation, the heavy load lattice extension is mounted in front of the main boom head. For transporting on open roads, it must be removed and set onto a separate vehicle.

Operating the heavy load lattice extension is permitted only with 1 or 2 fall reeved auxiliary hoist gear rope.

6.1

Identification

The heavy load lattice extension is aligned to the truck crane with which it was delivered. The heavy load lattice extension has the same serial number as the truck crane to which it belongs.



Danger of malfunction and damage!

Operate the truck crane only with the heavy load lattice extension which bears the same serial number as the crane.

The SLI is set only for this lattice extension. In this way you will avoid malfunctions and eventual damage.



For technical reasons a truck crane may only be set with one heavy load lattice extension.

If you wish to use the lattice extension on several GROVE truck cranes, the extension must be adjusted for these cranes and labelled with all of the respective serial numbers.



Danger of damage if the heavy load lattice extension has not been adjusted or if it has been incorrectly adjusted!

Have the adjustment of the extension carried out only by GROVE Customer Support at the respective location!

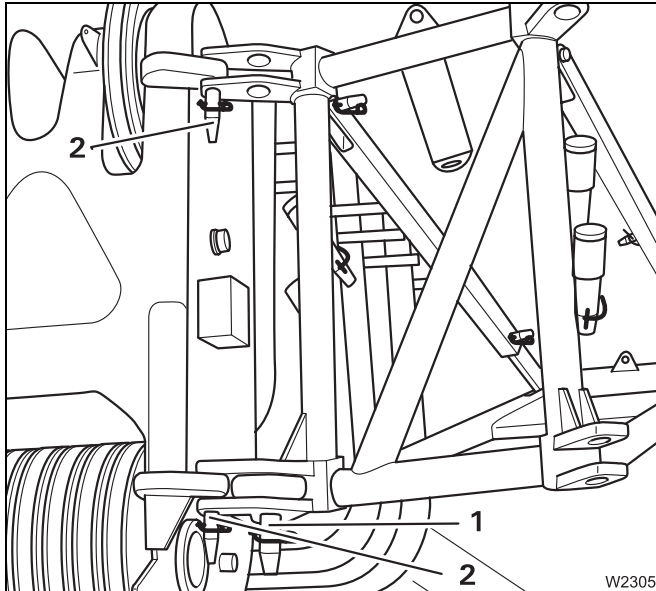


6.3

Installation and rigging work

6.3.1

Heavy load lattice extension in transport position



The heavy load lattice extension is in transport position if

- it is at 0°,
- the swivel pins (2) are inserted and secured,
- the heavy load lattice extension is folded onto the side of the main boom basic section and
- the safety pin (1) is inserted and secured.



Risk of accidents due to falling parts!

Always secure the pins both in the bearing points and in the holders using retaining pins.

This prevents unsecured pins from becoming loose, falling out and causing injuries.

6.4

Raising and setting down the main boom with rigged heavy load lattice extension



Risk of accidents if the chain hoist should fall off!

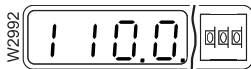
Always detach the chain hoist for setting working positions before operating with the heavy load lattice extension.

In this way you will avoid damaging the main boom with the chain hoist or causing injury should the hoist drop.



To raise and set down the main boom with a rigged lattice extension, the main boom must be fully retracted because the SLI then automatically switches to the rigging program.

To raise and set down, the following requirements must be met:



- On the SLI, the SLI code is selected for the actual rigging mode with heavy load lattice extension; *Operating instructions GMK 5200/6220-L, Part 2, Chapter Crane operation, Section Operation of the safe load indicator – Setting the rigging mode.*



- The current reeving of the hoist cable on the lattice extension is entered.
- Apart from the hook block there is no load on the lattice extension.

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