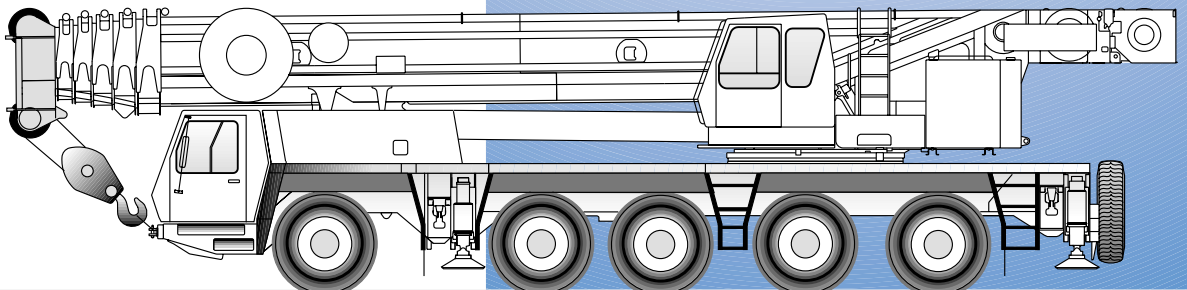


# GMK 5180



## Operating Instructions Part 1 Carrier

Vehicle serial number:

2 085 291 en  
15.09.1999  
(18.03.1999)

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# 1

## Overview

### 1.1

#### Vehicle identification

These operating instructions are intended only for the truck crane of which the serial number is specified on the front cover.



**Example of cross-reference usage**

This will be explained using the example of switching on the transverse differential lock.

The following seven sample pages show how the cross-references guide you through the Operating Instructions. The example starts with the overall view and goes on to the function of an individual switch.



The sample pages in this example originate from Operating Instructions for the GMK 3050 and can deviate from the actual Operating Instructions!

Beschreibung des Kranes - Kranwagen  
4.1 Übersicht von Teilen- und Baugruppen

4 - 4

2 185 103 01      Baugruppenzeichnung GMK 3050

Beschreibung des Kranes - Fahrerhaus  
4.1 Übersicht von Teilen- und Baugruppen

1	Objektive Teilenummer	→ 5.5.1
2	Elektronenreglerstarterle Dienerleiste	→ 5.5.7
3	Überholspur-Größenmotor	→ 5.8.5
4	Umlenkrolle	→ 5.6.30
5	Leinwand	→ 5.4.15
6	Endflansch des Kupferfließblechs	→ 5.6.17
7	Größen- und Überholspur-Automatikschleife	→ 5.5.15
8	Unvollständiger Baugruppenentwurf	→ 5.6.1
<b>9 Drivers cab</b> <span style="float: right;">→ p. 4 - 6</span>		
11	Einbaueinbaueinheit	→ 5.6.12
12	Wahlr-Außenspiegel	→ 5.6.12
13	Handpumpe Fahrtrieb- und Kupplungsdruck	→ 5.11.13
14	Rammpumpenpumpe	→ 5.6.12
15	Batteriekasten mit Batterieabgeschalteter	→ 5.5.1
16	Abschneideline Hydraulik	→ 5.5.2
17	Hydraulische Nocken, Schwenker	→ 5.5.2

4 - 5

Baugruppenzeichnung GMK 3050      2 185 103 01

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On page 4 - 4 of our example there is the overall view of the truck crane with the position numbers 1 to 17. You will find the designation of the truck crane part labelled with the number 9 on the opposite page 4 - 5. There under the number 9 is *Driver's cab*. The accompanying cross-reference (→) refers you to page 4 - 6.



**Improper use includes:**

- Transporting loads on the carrier,
- Pushing, pulling or lifting loads with the level adjustment system, the beams or the outrigger cylinders,
- Pushing, pulling or lifting loads off the ground using the slewing gear, the derricking gear or the telescoping gear,
- Pulling off fixed objects using the crane,
- Two-hook operation with the boom extension and two-hook operation on the main boom head without additional equipment,
- Operation when crane is not on outriggers (free on wheels),
- Defining SLI codes that do not correspond to the actual rigging mode,
- Working with an overridden SLI or overridden lifting limit switch,
- After SLI deactivation, the radius must be increased by pulling the raised load at an angle (e. g. with a chain hoist).
- Misuse of the outrigger pressure display as a safety function to prevent overturning after an SLI shutdown (outrigger pressure greater than 0 t),
- Road driving in an unauthorised driving mode (axle load, dimension),
- Moving the rigged crane in an unauthorised driving mode,
- The transportation of raised loads by moving the truck crane,
- Using equipment that is not authorised for use with the crane,
- Transporting passengers on unauthorised parts of the vehicle,
- Transport of passengers without previous written permission from the manufacturer,
- Carrying passengers outside the driver's cab,
- Loading and unloading work, i.e. continuous operation without a corresponding break,
- Usage for any kind of sport or recreation event, especially for "bungee jumping".

# 4

## Description of the truck crane – vehicle section

### 4.1

#### Overview of the operating and display instruments

This section only contains the operating and display instruments for driving that are located on the outside of the truck crane or in the driver's cab.

#### 4.1.1

##### Overview of the vehicle

The figures on the following pages illustrate the location of the operating and control instruments that are required to drive the truck crane and are found on the outside of the vehicle.

All operating and control instruments required for crane operation are described in Chapter 7.





1	Rocker switch for level adjustment system, right	▣▣▣▣ p. 4-32
2	Key switch for level adjustment	▣▣▣▣ p. 4-32
3	Rocker switch for level adjustment system, front	▣▣▣▣ p. 4-32
4	Rocker switch for level adjustment system, rear	▣▣▣▣ p. 4-32
5	Rocker switch for level adjustment system, left	▣▣▣▣ p. 4-32
6	Indicator lamp for raising vehicle level	▣▣▣▣ p. 4-32
7	Indicator lamp for no on-the-road level	▣▣▣▣ p. 4-32
8	Rocker switch with indicator lamp for additional heating system <sup>*)</sup> (additional equipment)	▣▣▣▣ p. 4-34
9	Rocker switch for raising/lowering vehicle level	▣▣▣▣ p. 4-32
10	Indicator lamp for lowering vehicle level	▣▣▣▣ p. 4-32
11	Rocker switch for raising/lowering truck crane	▣▣▣▣ p. 4-33
12	Rocker switch for on-the-road level	▣▣▣▣ p. 4-33
13	additional heating system with timer <sup>*)</sup> (additional equipment)	▣▣▣▣ p. 4-34
14	Heating system display	▣▣▣▣ p. 4 - 35
15	Regulate temperature knob	▣▣▣▣ p. 4 - 35
16	Push button for setting time/day	▣▣▣▣ p. 4 - 35
17	Call up storage places pushbutton	▣▣▣▣ p. 4 - 35
18	Switch on/off heating pushbutton	▣▣▣▣ p. 4 - 36
19	Input+ pushbutton	▣▣▣▣ p. 4 - 36
20	Input+ pushbutton	▣▣▣▣ p. 4 - 36

<sup>\*)</sup> Either **8** or **13** possible as additional equipment



### Rocker switch for parking light / headlight

**Switch off light:** Press rocker switch up

**Parking light:** Rocker switch in mid-position

**Headlight:** Press rocker switch down

The headlight is switched from low-beam to high-beam by means of the multipurpose switch.

The instrument lighting is switched on with the parking light / headlight.



### Indicator lamp for full-beam headlight



### Rocker switch with fog lamp and tail light indicator lamp (accessory)

The rear fog light and the fog lamps may only be switched on with low-beam headlight.

**Switch fog lamp / rear light off:** Press rocker switch up

**Switch fog lamp on:** Rocker switch in mid-position

**Switch fog lamp / rear light on:** Press rocker switch down

The indicator lamp in the rocker switch illuminates when the rear fog light is switched on.



### Rocker switch with hazard warning system indicator lamp

**To switch on:** Press rocker switch down.  
The indicator lamp in the rocker switch flashes.

**To switch off:** Press rocker switch up.



### Rocker switch with indicator lamp for rotating warning beacon

**To switch on:** Press rocker switch down.  
The indicator lamp in the rocker switch illuminates.

**To switch off:** Press rocker switch up.



### Rocker switch with indicator lamp for wing-mirror heating

**To switch on:** Press rocker switch down.  
The indicator lamp in the rocker switch illuminates.

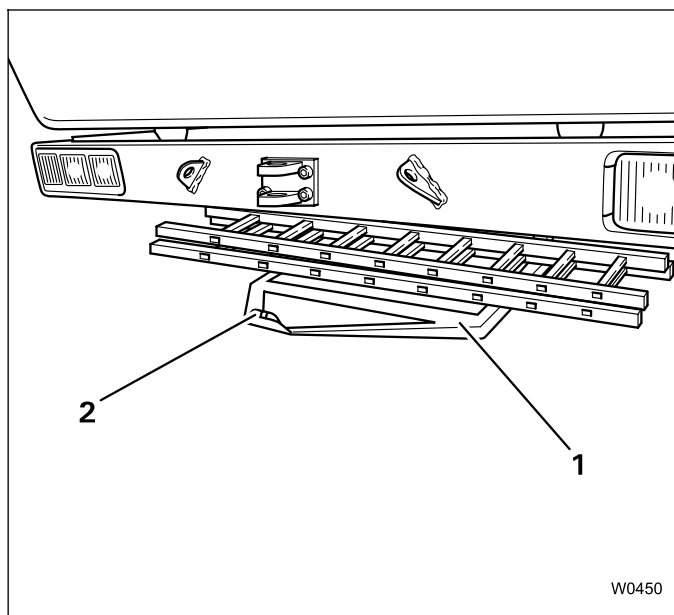
**To switch off:** Press rocker switch up.



## Ladders

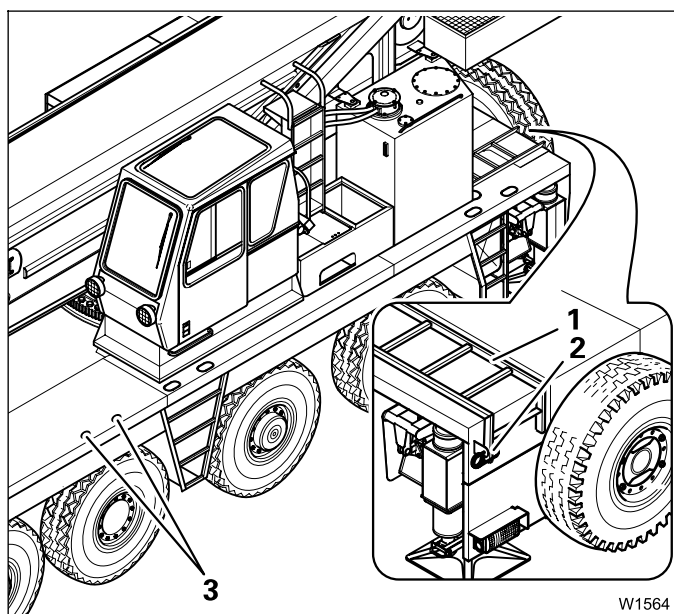
As well as the fixed access ladders you will find the following on the truck crane:

- an extendable ladder and
- two ladders for attachment.



The **extendable ladder** can be transported in a foldable holder (1) at the front underneath the truck crane.

The holder with the extendable ladder is folded up and the lock (2) engages for transport.



A **small hook-on ladder** (1) is at the rear on the left of the carrier and is secured in the holder (2).

The ladder can be attached in the bores (3) on the left side of the carrier at the height of the third axle line.

(e. g. to connect the hydraulic hoses to the 4.4 t counterweight base plate)

- Attach the ladder so that the plugs go as far as possible in the bores.
- Fold out the spreader at the bottom of the ladder so that you have a safe stopper on the sheet metal panel or the tyres.



### **Danger from ladder falling down!**

Secure the ladder in the appropriate holder after each use. In this way, you prevent the ladder from falling down during on-road driving which could endanger vehicles behind you or people standing at the side of the road.



### Checking the hydraulic system stop cocks

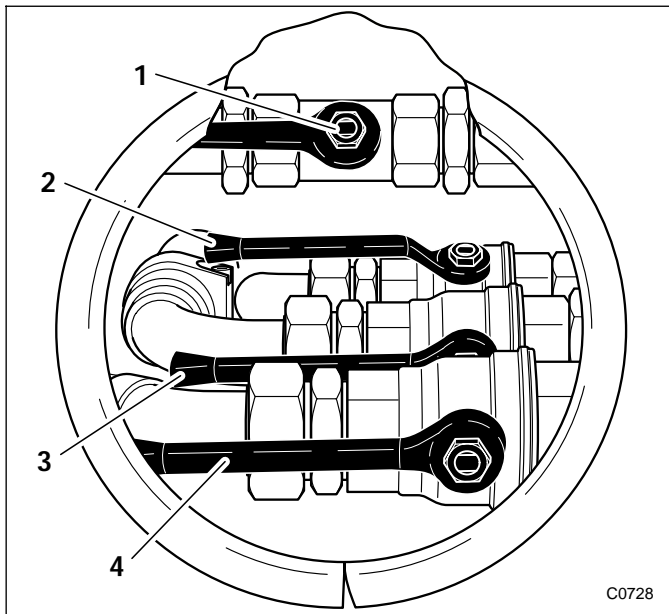
The 4 stop cocks in the hydraulic system suction lines must be open, when the vehicle engine is started.



#### **Damage may occur to the hydraulic pumps!**

The vehicle engine may only be started if the four stop cocks in the suction lines of the hydraulic pumps are open!

The stop cocks are open when the handles are parallel to the suction lines.



The stop cocks are located on the left side of the vehicle and are accessible through a hole in the side panelling.

- Check whether stop cocks (1) to (4) are open.

# 6

## Driving the truck crane

### 6.1

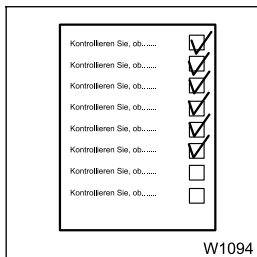
### Checking the truck crane before driving

#### 6.1.1

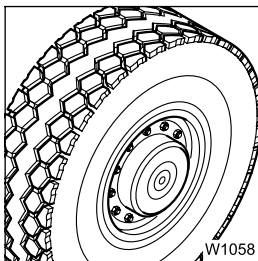
#### CHECK LIST: Condition of the truck crane for on-road driving



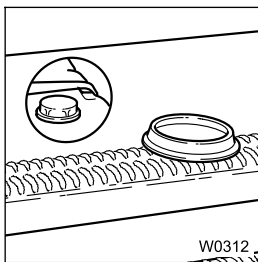
This checklist is not equivalent to a complete instruction manual. There are accompanying handling instructions which are indicated by cross-references. **Observe the warning and safety information given there!**



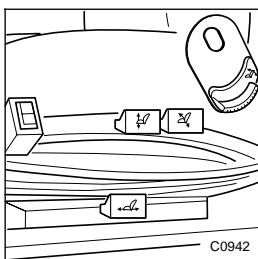
1. Carry out the required checks and tasks before starting the vehicle engine; *CHECK LIST: Starting vehicle engine*, p. 5-1, Items 1-7.



2. Check the tyres; *Checking the tyres*, p. 6-9.

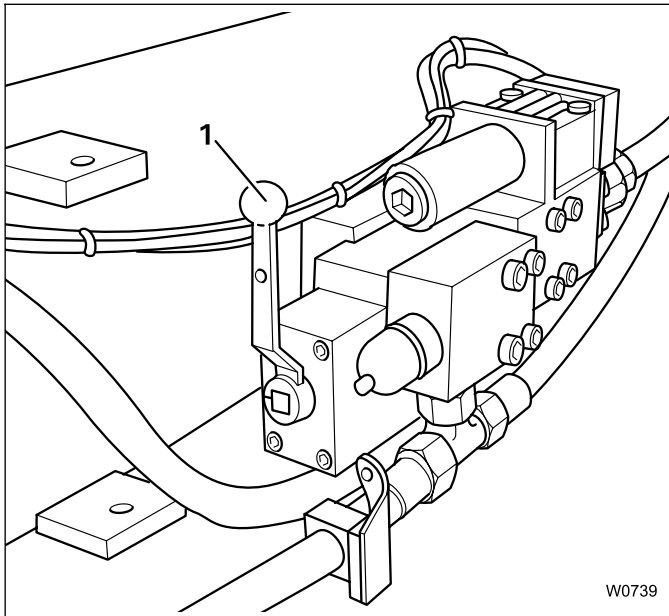


3. Check the fluid level of the windscreen washing system; *Checking the windscreen washing system reservoir*, p. 6-9.



4. Adjust the driver's seat; *Adjusting the driver's seat*, p. 6-14.





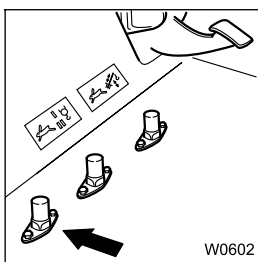
- Turn the hand lever (1) so that it is pointing vertically upwards.  
Boom floating position is now switched on.

### Switching on the slewing gear free-wheel

Applies only to on-road driving with boom placed on trailer (only with additional equipment).

If the boom is placed on the trailer during on-road driving, the superstructure must be able to turn freely, e. g. when driving around corners. The following points must be fulfilled:

- the slewing gear brake must be locked while disengaged (slewing gear freewheel),
- the negative castor offset and return must be connected to the slewing gear units.
- Place the boom on the trailer as described in section *Switching on boom floating position*; ■■■► p. 6-10.



You can only switch on the slewing gear freewheel when the free movement of the slewing gear is switched on.

- Have the foot-operated switch *free movement of the slewing gear* pressed and held down by a second person to switch on the slewing gear freewheel.

For a **longer stop** when the vehicle engine is running you must

- release the accelerator,
- engage the service brake,
- lock the parking brake,
- shift the automatic gearbox to neutral position **N**.

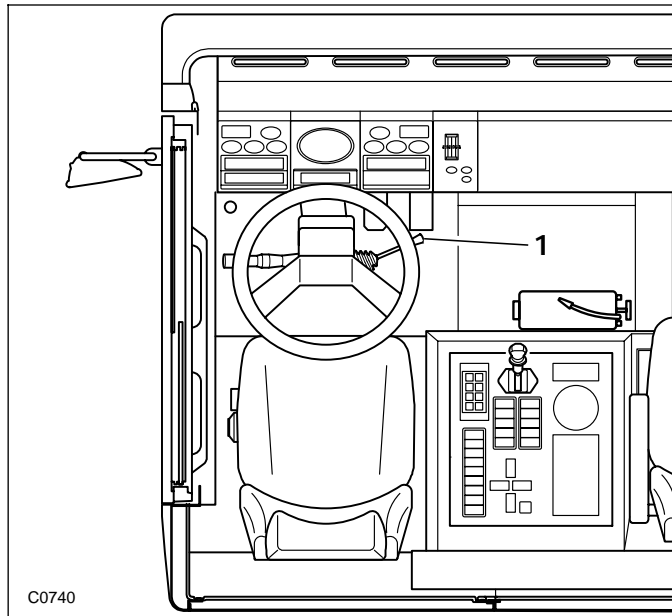
### **Upshifting the automatic gearbox**

The position of the accelerator can be used to influence the time at which the automatic gearbox upshifts.

If you press the accelerator down completely, the automatic gearbox will not shift until the engine speed is high. The automatic gearbox will only shift at lower engine speeds when the accelerator is only partially pressed down.

**Eddy current retarder (additional equipment)**

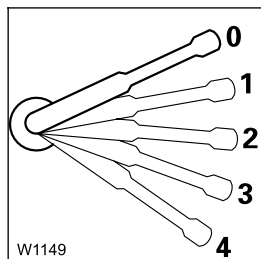
You can brake the vehicle with the eddy current retarder (additional equipment) on downhill slopes. The eddy current retarder can be used for all braking procedures as soon as the truck crane is in motion. This reduces wear on the service brakes.



The eddy current retarder is operated with the lever switch *Eddy current retarder (1)* on the steering column.



You cannot regulate the engine speed with the accelerator as long as the eddy current retarder is in operation.



- Press the *eddy current retarder* switch from level 0 to one of the switch levels from 1 to 4.

Level 0 =	no	braking power
level 1 =	$\frac{1}{4}$	braking power
level 2 =	$\frac{1}{2}$	braking power
level 3 =	$\frac{3}{4}$	braking power
level 4 =	full	braking power



As soon as the eddy current retarder is activated, the indicator lamp *eddy current retarder* illuminates.



When switching over a number of levels, the switch must engage briefly in each level in order to build up the power-supply connection of the retarder.

The braking force of the eddy current retarder is dependent only on the driving speed. In contrast to the retarder, the driving range engaged does not influence the function of the eddy current retarder.

When driving down steep slopes, you can support the braking force of the eddy current retarder by means of the retarder and the service brake.

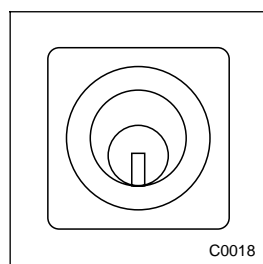
The rocker switches for the following functions are also activated using this key switch:

- Transverse differential locks in all driven axle lines;
- Longitudinal differential locks / drive of the 2nd axle line (drive of 2nd axle line only with 10 x 8 x 10 additional equipment)
- Separate steering;
- Blocking gears 3, 4 and 5 in the automatic gearbox (only gears 1, 2 and R may still be used).

### Activating the level adjustment system



The suspension locking system of all axle lines must be switched off for all level changes!  
The transverse differential locks and the drive of the second axle line / longitudinal differential locks must also be switched off!



- Insert the key into the *Level adjustment system* key-operated switch and turn on the switch.
- Maintain the engine speed at between 1000 and 1300 rpm using the accelerator during each level change.

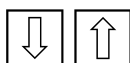
### Raising or lowering the entire truck crane



- Select the direction of movement of the level adjustment using the *Raise / lower vehicle level* rocker switch:

**Raising the truck crane:** Press rocker switch up.

**Lowering the truck crane:** Press rocker switch down.



The *Raise vehicle level* and *Lower vehicle level* indicator lamps show the selected direction of movement.

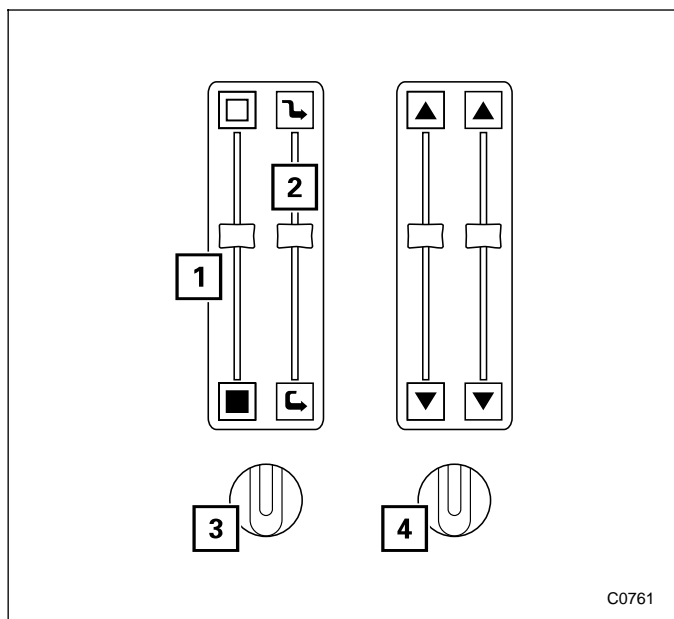
- Let the truck crane roll at approx. 2 mph during the level change.



Applying the brakes during the level change increases tyre wear as well as the load on the suspension cylinders. Therefore you should – if possible – release the parking brake and allow the truck crane to roll during a level change.



## Ventilating the driver's cab



- Push the regulator *heater temperature* (1) up as far as it will go and turn on the blower using the knobs (3) and (4).
- Push the regulator *Circulation air operation / fresh air mode* (2) up.

### 6.5.2

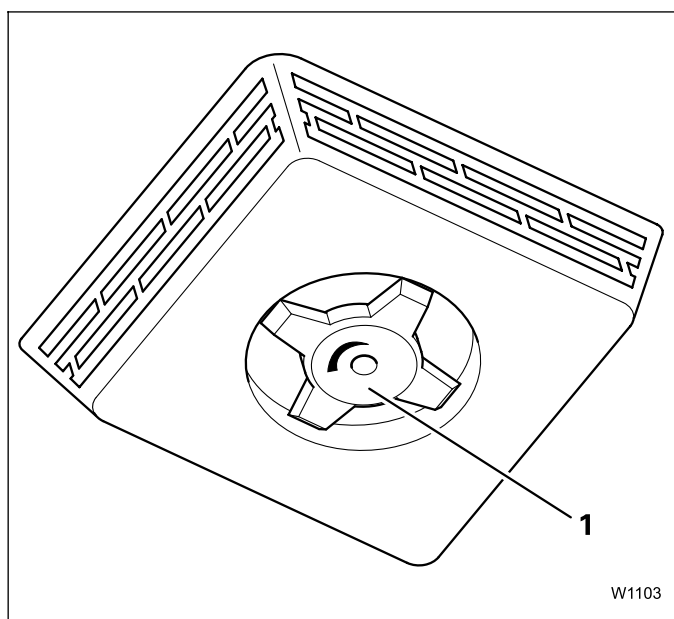
## Roof blower (additional equipment)

The blower used to ventilate the driver's cab is installed in the ceiling of the cab.



You may determine the direction of the air flow (in or out) using the *Roof fan* rocker switch located on the front instrument panel.

- Remove air:** switch pressed up  
**Off:** mid-position  
**Air in:** switch pressed down



You may adjust the volume of air and close the roof blower using the handwheel (1).

### Dehumidifying the air in the driver's cab

On humid days at the turn of the season you can dehumidify the air in the crane operator's cab by operating the air-conditioning system in the combined heating and cooling mode. Operation of the heating system is described in section *Heating and Ventilation*, p. 6-49.

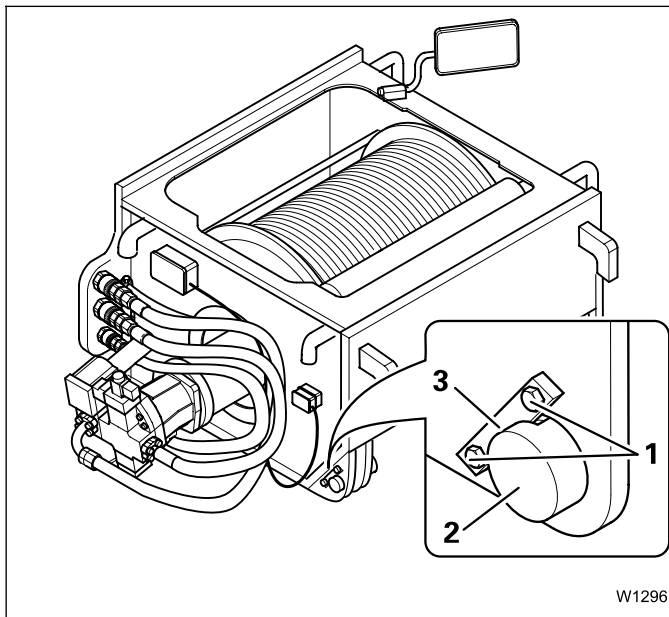


As this involves the heating and air-conditioning system functioning "in opposition to each other" dehumidifying produces little or no heat.

- Set the knob *Driver / passenger side heater fan* and the knob switch *Thermostat* of the air-conditioning system to approximately the same output.
- Switch on the blower.



The air in the cab will be dehumidified more thoroughly the higher the heating and cooling settings are set.

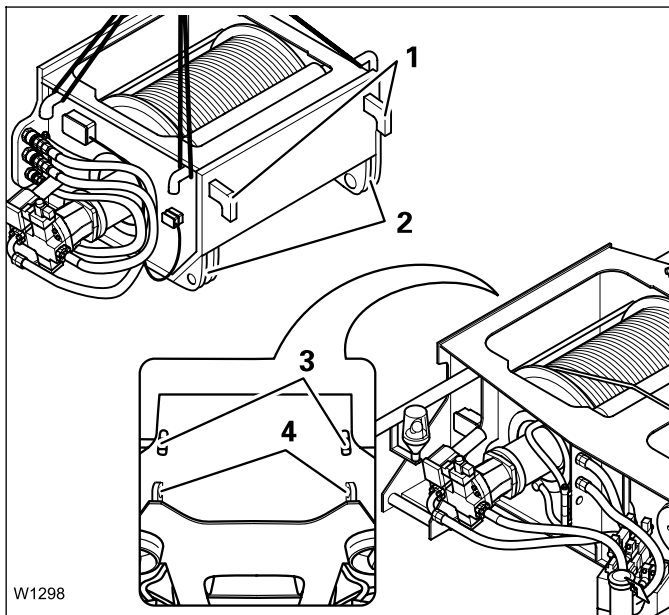
**6.8.2****Mounting the auxiliary hoist****Remove axle holders and pins**

W1296

- Unscrew the screws (1) on the axle holders (3) on both sides of the auxiliary hoist and remove the axle holders.
- Extract the connecting pins (2) on both sides of the auxiliary hoist.

**Attach the auxiliary hoist to the main hoist**

- Sling the auxiliary hoist onto an auxiliary crane; ► *Slings points*, p. 6-69.



W1298

- Attach the auxiliary hoist with both (1) hooks at the top of the holding rod (3).
- When attaching the auxiliary hoist, be careful that the forks (2) are aligned with the holdings (4) on the main hoist frame.
- Correct the position of the auxiliary hoist if necessary.



7. Remove other outrigger beams as necessary for the reduction of the axle load.
8. Set the outrigger beam and outrigger pad on the separate vehicle;  
    ▣▣▣▣ *Transport of the outrigger beam/pad*, p. 7-17.

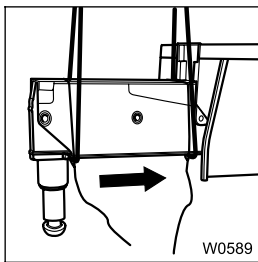
## 7.1.2

### CHECK LIST: Installation of outrigger beams

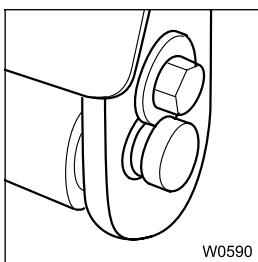


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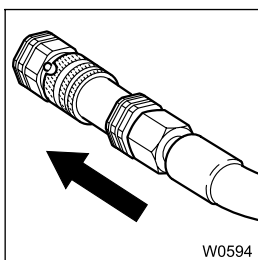
1. Prepare the truck crane for the installation of the outrigger beams;  
    ▣▣▣▣ *Preparing the truck crane for removal/installation*, p. 7-7.



2. Lift the outrigger beams from the separate vehicle and insert them into the outrigger housing; ▣▣▣▣ *Removing/inserting outrigger beams*, p. 7-15.



3. Lock the sliding cylinder on the outrigger housing; ▣▣▣▣ *Locking/releasing the locking pin of the sliding cylinder*, p. 7-14.

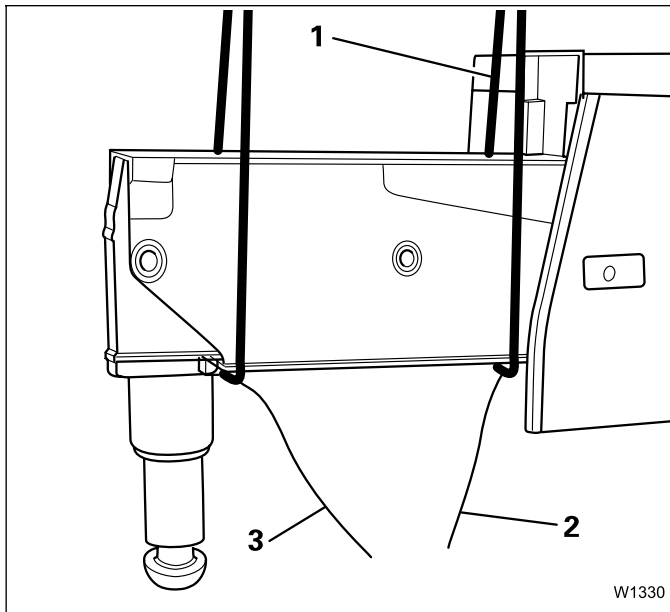


4. Establish hydraulic joint and, if necessary, connect the electrical cable for the outrigger pressure status display (additional equipment);  
    ▣▣▣▣ *Disconnecting/establishing the hydraulic joint*, p. 7-9.





If the outrigger beam cannot be pulled out, one of the quick couplings could have become trapped.



- Attach a second line (1) of lifting gear to the outrigger beam as close to the truck crane as possible.
- Attach two guide ropes to the front and rear of the outrigger beam (2, 3).



**Risk of crushing by swinging outrigger beam!**

Keep a safe distance from the outrigger beam when it is pulled out of the outrigger housing. The outrigger beam can swing. Hold the outrigger beam with the guide ropes; in this way you prevent the swinging outrigger beam from crushing you or another people. This applies especially when space is tight.

- Pull the outrigger beam completely out of the outrigger housing.

**Inserting outrigger beams**

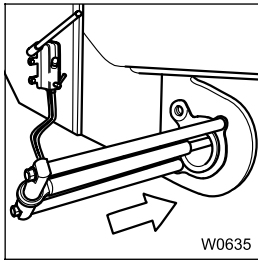
- Remove the pin-type keeper of the beam on the holder in the outrigger housing; ➡ *Sliding cylinder – releasing locking pin*, p. 7-13.



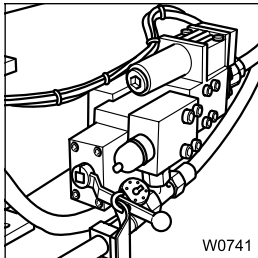
**Risk of crushing when inserting the outrigger beam!**

Always use guide ropes when inserting the outrigger beam and keep a safe distance from the range of the outrigger beam being inserted into the outrigger housing. In this way you prevent fingers or hands from being crushed between the outrigger beam and outrigger housing.

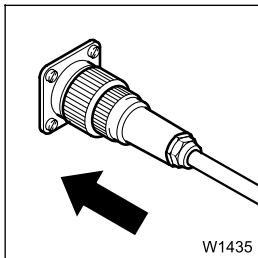




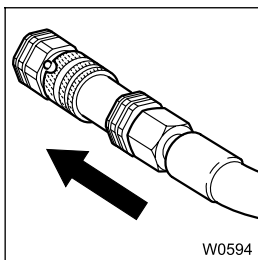
10. Insert bolt in derricking cylinder head eyelet; **|||▶ Locking pin at derricking cylinder head eyelet**, p. 7-34.



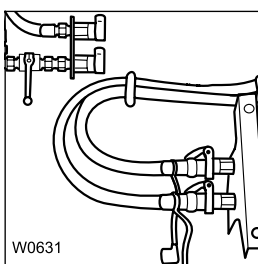
11. Switching off floating boom position and securing; **|||▶ Derricking cylinder pressure relief**, p. 7-45.



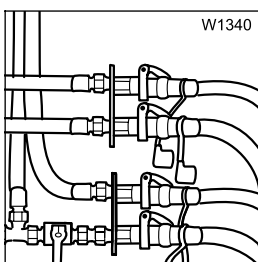
12. Establish an electrical connection between the main jib and the superstructure guide plate with; **|||▶ Establish electrical connection**, p. 7-40.



13. Put the guide plates with hydraulic lines in position and establish a hydraulic connection between the main jib and the superstructure hydraulics;  
**|||▶ Guide plates removing/placing**, p. 7-38  
**|||▶ Establishing hydraulic connections**, p. 7-38.

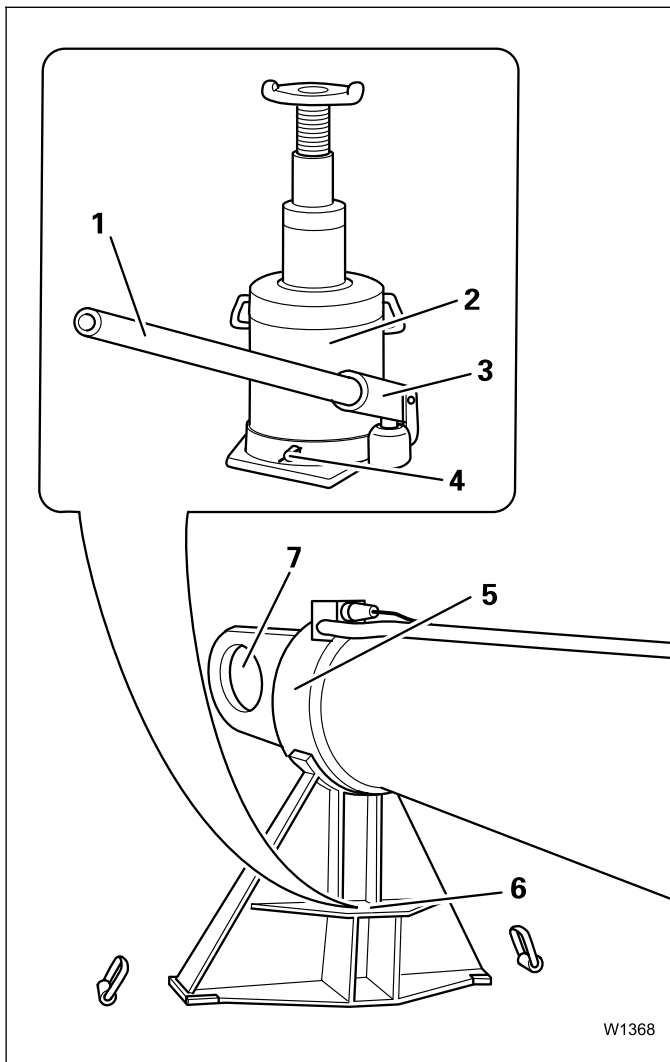


14. Detach the connections of the withdrawing device for the bottom axle of boom; **|||▶ Withdrawing device on the bottom axle of boom – detaching hydraulic connections**, p. 7-32.



15. With additional equipment including lattice extension, establishing hydraulic connection with lattice extension; **Establishing /disconnecting hydraulic connection to the lattice extension**, p. 7-29.





- Insert the end of the pump lever (1) into the holder (3). The correct end of the pump lever is indicated by a punched mark.
- Turn the pump lever to the left. The pump lever is now securely connected to the lifting device.
- Open the drain screw (4). Unscrew the screw anticlockwise.
- Move the pump lever up and down a number of times while the drain screw is open.
- Close the drain screw. Close the screw clockwise.
- Place the lifting device (2) centrally on the bracket (6) of the support for the derricking cylinder (5).
- Screw the setting spindle of the lifting device out until it is under the derricking cylinder.
- Raise the derricking cylinder until the pin (7) can be moved with the hydraulic cylinder. Lower the derricking cylinder again if necessary.

**Lifting:** Move the pump lever up and down while the drain screw is closed. Use the full travel of the lever.

**Lowering:** Turn the drain screw two or three turns anticlockwise. Open the drain screw slowly.



Have the lifting device checked by an expert at least once annually.  
The test mark attached to the device documents the last check.



## 7.2.11

### Pressure relief of derricking cylinder

As soon as the crane engine is started, slight pressure builds up on both sides of the derricking cylinder. Due to the difference in area between the piston head and the surface of the piston ring, power predominates in the direction *extend derricking cylinder*. Movement is suppressed, however, by the weight of the main boom.

Pressure relief must be switched on to prevent the derricking cylinder from extending after the removal of the main boom.

#### Switching on pressure relief

The pressure relief is switched on when the boom floating position is switched on.

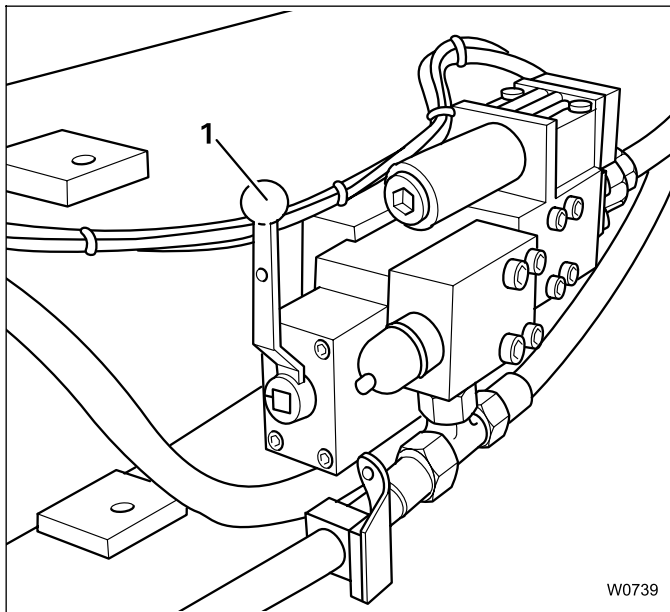


#### Risk of accidents by falling boom!

Only switch over the valve when the boom is in the boom support.  
In this way you prevent the raised boom from falling down.



Always switch on pressure relief before you start the crane engine when the main boom has been removed. Otherwise the derricking cylinder will extend when the crane engine is running.



- Remove the padlock and turn the lever (1) so that it points up vertically.

The pressure relief is now switched on.





The supply pressure in brake circuit 3 is not high enough if the indicator lamp does not go out.

Increase the supply pressure by waiting a few minutes with the vehicle engine running or with the filling connector in place and the towing vehicle engine running.

If the indicator lamp still does not go out, the parking brake system is damaged and the parking brake must be mechanically released before towing;

➡ *Releasing the parking brake mechanically*, p. 8-9.

### Mechanically releasing the parking brake

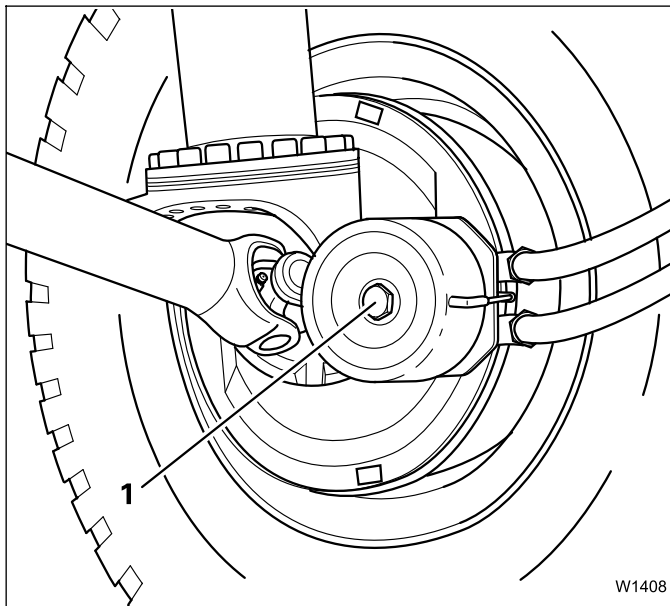


The parking brake should only be released mechanically if it can no longer be pneumatically released. It should only be released mechanically if the truck crane must be towed!



**Accidents may occur due to the unchecked movement of the truck crane!**

The movement of the truck crane can no longer be stopped by means of the parking brake when the parking brake is mechanically released. Secure the vehicle with wheel chocks before mechanically releasing the parking brake.



Open all spring accumulators (two each on the second to fifth axle lines) as follows:

- Unscrew the hexagon screw (1) (spanner size 27) until it is touching the preloaded spring.
- Continue to unscrew the hexagon screw (1) until the wheel brake is released (torque 3.7 to 11 lbf ft).



**Accidents may occur due to released parking brake!**

The spring-loaded brake cylinder must be unblocked immediately after towing. This may be carried out by trained, qualified personnel only as the operational safety and roadworthy condition of the truck crane could otherwise be impaired!

Name in circuit diagram: F 4	Rating (A)	Function
1	15	Heating system
2	10	Mobile phone (additional equipment)
3	5	Diagnostic plug for transfer case
4	10	No function
5	10	No function
6	10	No function
7	10	No function
8	10	Fog lights (additional equipment)/ rear fog lights

Name in circuit diagram: F 5	Rating (A)	Function
1	5	Position lamps left superstructure / left parking light
2	10	Position lamps right superstructure / right parking light
3	10	Left rear circumference lamps / instrument lighting
4	5	Right rear profile lamps
5	10	Left fog lamp / left headlight – high-beam
6	10	Right fog lamp / full beam indicator lamp high beam
7	10	Left low-beam headlight
8	10	Right low-beam headlight



## 8.7

## Procedure in the event of malfunctions

### 8.7.1

### Switching the fan thermostat to emergency operation

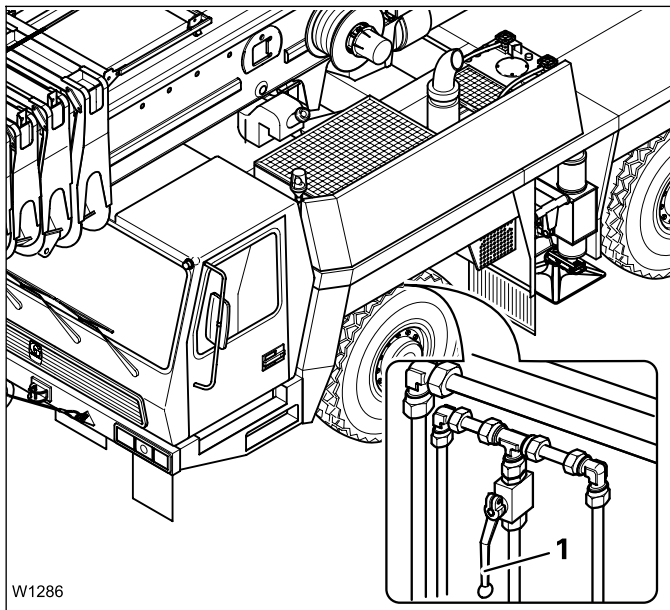
Two heat exchangers cool the coolant. The speed of the fan in each heat exchanger is controlled by a hydraulic valve with a thermostat. The respective valve can be switched manually in the event of a thermostat malfunction.



#### **Accidents may occur due to turning fan wheel!**

If you switch a fan to emergency operation the fan wheel immediately begins to turn very quickly. Objects or loose clothing can be sucked in. Make sure that there are no people or objects in the vicinity of the fan when switching to emergency operation.

The coolant radiator is located on the left and right sides of the vehicle above the first axle line.



#### **On the left side**

The tap (1) is located under the radiator.

- Close tap (1) for emergency operation. The grip must be at right angles to the pipe line. Close the tap slowly!

## 9.1.6

### Steering

The steering gear is mechanically connected to the first, second, third and fifth axle lines. The dual-circuit hydraulic steering supports the steering movement through hydraulic cylinders on all steerable axle lines.

The steering is divided into two steering circuits which are supplied by different hydraulic pumps. If both steering pumps malfunction, an emergency steering pump flanged onto the transfer case is switched on automatically.

The steering system can be switched from normal steering mode to separate steering for slow manouvering. This switches on the steering of the 4th axle line. The wheels of the fourth and fifth axle lines are then turned regardless of the steering direction of the front wheels. With separate steering, the wheels of the 1st, 2nd and 3rd axle lines are steered with the steering wheel; the fourth and fifth axle lines are steered with the rocker switch of the separate steering at the driver's seat.

If you switch to separate steering, you can drive with either all-wheel steering or with crab travel mode:

- The size of the turning circle decreases with all-wheel steering. The front and rear axle lines turn in opposite directions.
- The truck crane moves diagonally sideways in crab travel mode. The front and rear axle lines now turn in the same direction.

## 9.1.7

### Suspension system

All wheels are individually suspended from the crane carrier with hydro-pneumatic suspension cylinders. The hydraulic system of the suspension system is separated from the carrier's hydraulic system by solenoid valves.

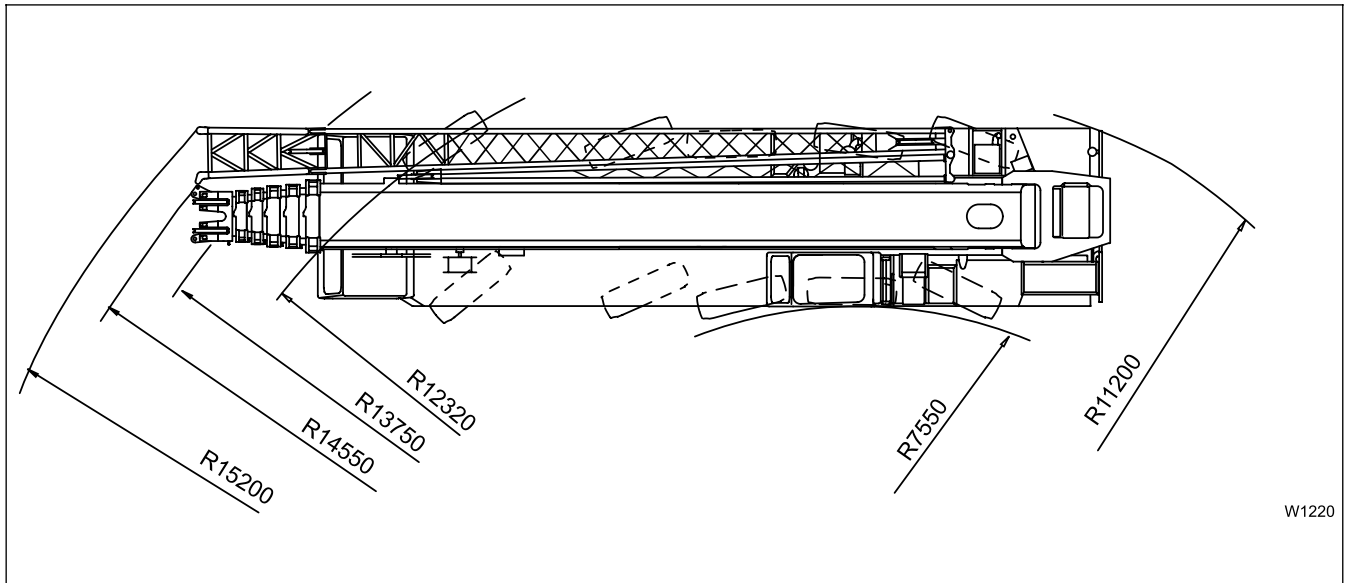
The suspension system is adjusted by control signals of the gearbox control and the level adjustment system by the various driving modes (e.g. driving off-the-road).

The axle lines are interconnected respectively to suspension groups. The wheel load is transferred equally between all axle lines of a suspension group. The oil displaced when the suspension cylinders are compressed is stored in pressure accumulators.

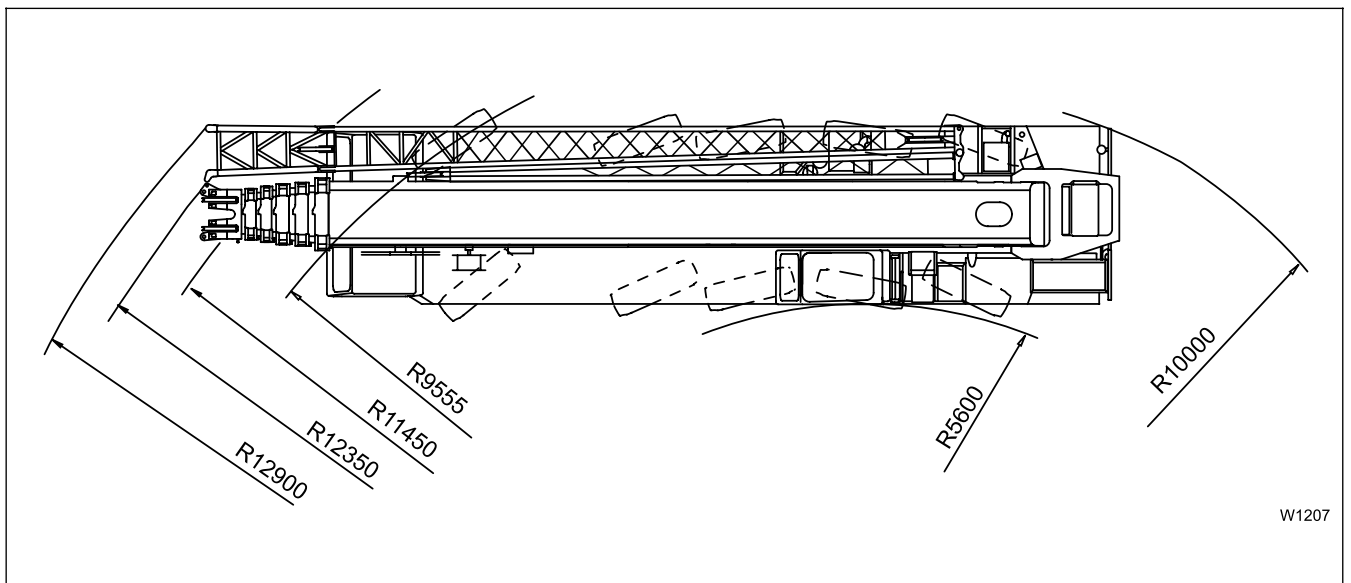
The suspension groups must be locked for various driving modes on the site and during crane work. The suspension cylinders are separated from the pressure accumulators by pneumatically operated blocking valves.

## Turning radii

– for normal steering mode



– for separate steering mode



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# 11

## Description of the truck crane – crane section

### 11.1

#### Overview of the operating and display instruments

This section deals only with display and operating instruments for crane operations which are located on the outside of the mobile crane and in the crane cab.

#### 11.1.1

##### Overview of crane section

The figure on the following page shows the position of the operating and control instruments on the outside of the truck crane which are necessary for crane work.



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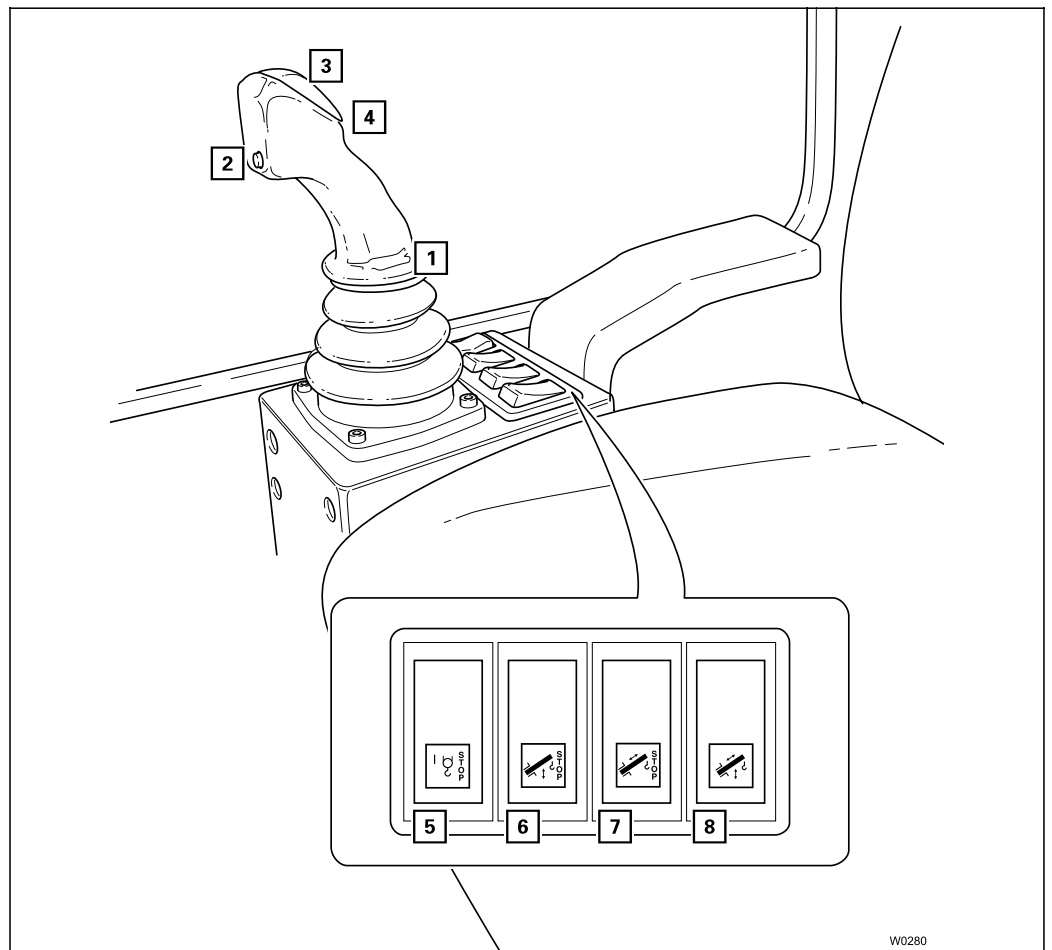


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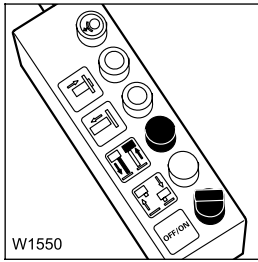
1 Crane cab electronic level	▣▣▣▣▶ p. 11-53
2 Anemometer	▣▣▣▣▶ p. 13-34
3 Warning lamp for lifting limit switch shutdown	▣▣▣▣▶ p. 11-35
4 Front left outrigger pressure display (additional equipment)	▣▣▣▣▶ p. 11-56
5 Indicator lamp for slewing gear permanent brake	▣▣▣▣▶ p. 11-36
6 Front right outrigger pressure display (additional equipment)	▣▣▣▣▶ p. 11-56
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8 Rear left outrigger pressure display (additional equipment)	▣▣▣▣▶ p. 11-57
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13 Override key switch	
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– for lifting limit switch	▣▣▣▣▶ p. 11-63

## 11.1.5 Right control console



- |   |                                                                                                                          |                                                                                                            |
|---|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| 1 | Control lever for main hoist and derricking gear/telescoping gear/lattice extension <sup>1)</sup>                        | <ul style="list-style-type: none"> <li>▣▣▣ p. 11-34</li> <li>▣▣▣ p. 11-21</li> <li>▣▣▣ p. 11-39</li> </ul> |
| 2 | Horn button                                                                                                              |                                                                                                            |
| 3 | Dead man's switch                                                                                                        | ▣▣▣ p. 11-64                                                                                               |
| 4 | Hoist drum synchro for main hoist                                                                                        | ▣▣▣ p. 13-39                                                                                               |
| 5 | Rocker switch for main hoist shutdown                                                                                    | ▣▣▣ p. 11-34                                                                                               |
| 6 | Rocker switch for shutdown derricking gear/ lattice extension <sup>1)</sup>                                              | ▣▣▣ p. 11-37                                                                                               |
| 7 | Rocker switch for telescoping gear shutdown                                                                              | ▣▣▣ p. 11-38                                                                                               |
| 8 | Rocker switch for preselecting control lever function derricking / telescoping / lattice extension incline <sup>1)</sup> | <ul style="list-style-type: none"> <li>▣▣▣ p. 11-37</li> <li>▣▣▣ p. 7-35</li> <li>▣▣▣ p. 11-55</li> </ul>  |

<sup>1)</sup> Preselecting control lever function *Lattice extension incline* only with additional equipment.



### Extend counterweight lifting cylinder / lift counterweight switch

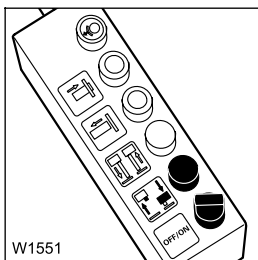
To extend the counterweight lifting cylinders, press this switch in addition to the *Release switch unit* knob.

If the counterweight is on the counterweight platform, it is lifted by this movement.

If the counterweight is locked on the turntable, the lifting cylinders move down out of the 4.4 t base plate.

The counterweight lifting cylinders continue to move as long as you hold the switch down or until an end position is reached;

▣▣▣▣▶ *Extending / retracting the lifting cylinders of the 4.4 t counterweight section / lifting / lowering counterweight*, p. 14-60.



### Retract counterweight lifting cylinders / lower counterweight switch

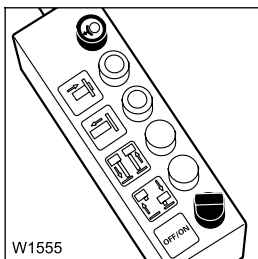
To retract the counterweight lifting cylinders, press this switch in addition to the *Release switch unit* knob.

If the counterweight is on the counterweight platform, it is lowered by this movement.

If the counterweight is locked on the turntable, the lifting cylinders move up into the 4.4 t base plate.

The counterweight lifting cylinders continue to move as long as you hold the switch down or until an end position is reached;

▣▣▣▣▶ *Extending / retracting the lifting cylinders of the 4.4 t counterweight section / lifting / lowering counterweight*, p. 14-60.



### Switch for releasing the slewing gear permanent brake

To release the slewing gear permanent brake, press this switch in addition to the *Release switch unit* knob; ▣▣▣▣▶ p. 14-61.

The selection to release is only accepted by the crane control system if both the telescope section and the telescoping cylinder are locked.



**Warning lamp for telescoping cylinder is unlocked**

Shows the position of the locking pins of the telescoping cylinder. Flashes as soon as release is selected if the locking pins are retracted and the end position has not been reached. Illuminates when the locking pins are have been retracted to the end position during release. Goes out when the locking pins are extended to the end position during locking.



**Indicator lamp for locked telescoping cylinder**

Shows the position of the locking pins of the telescoping cylinder. Flashes when locking is selected and keeps flashing until the locking pins are pushed out and the locking process is finished. Illuminates when the locking pins are pushed out to the end position during locking and the locking process is finished. Goes out when the locking pins are retracted to the end position during release.



**Indicator lamp for telescope section locked (green)**

Shows the position of the locking pins of the telescope section in which the head of the telescoping cylinder is located. Flashes when locking is selected and keeps flashing until the telescope section is on the pushed out locking pins. Illuminates when the locking pins are pushed out of the telescope section into the telescope section above and the telescope section is on the pins. Goes out if the locking pins in the telescopic section are retracted.

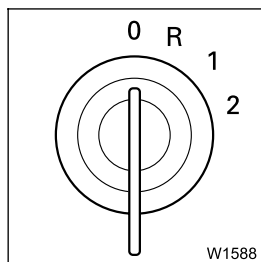


**Warning lamp for telescope section released (red)**

Shows the position of the locking pins of the telescope section in which the head of the telescoping cylinder is located. Flashes as soon as release is selected if the locking pins are retracted and the end position has not been reached. Illuminates if the locking pins in the telescopic part are retracted. Goes out when the locking pins are extended from the telescope section into the telescope section above it.



## Electronics



### Ignition lock

- 0** Ignition off, crane engine and crane functions off, key may be removed.
- R, 1** Ignition on, instrument lighting on.  
 Additional power supply on for:  
 Control units of the crane control, engine control, SLI 2
- 2** Starting position; *Starting the crane engine*, p. 12-8.



### Warning lamp for charge indicator

Illuminates if the ignition is switched on and the crane engine is switched off. Goes out after the crane engine is started;  
*Starting the crane engine*, p. 12-9.



### Rocker switch for socket for spotlight

(left and center rocker switches)  
 The two sockets in front of the crane cab for the *Crane cab working spotlights* are standard components. The working spotlights are used to illuminate the working area in front of the crane cab.

Switching on the spotlight for working area: Press rocker switch down.

Switching off the spotlight for working area: Press rocker switch up.



### Rocker switch for hoist rope control spotlight (additional equipment)

(Right-hand rocker switch)  
 A spotlight can be connected as additional equipment for illuminating the rope drum. This enables the orderly reeling in of the hoist rope even when it is dark.

Switching on the spotlight: Press rocker switch down.

Switching off the spotlight: Press rocker switch up.

## Other operating instruments



### Rocker switch for windscreen wiper

Used to activate the windscreen wiper on the crane cab.

Switching on: Press rocker switch down.

Switching off: Press rocker switch up.

The windscreen wiper returns to end position after switching off.



## 11.3

## Functional description of the safety devices

### 11.3.1

### Safe load indicator (SLI)

To increase operational safety, the GMK 5180 truck crane is equipped with a safe load indicator (SLI) as overload protection.

The SLI covers operation with one hook only.



#### **Danger of overturning with two-hook operation!**

The safe load indicator covers operation with one hook only!

The two-hook operation is not secured by the SLI and is not permissible!

The safe load indicator serves to prevent the permissible load bearing capacity of the truck crane from being exceeded at a particular radius. The load bearing limit can be exceeded, for example, during crane operation when the main boom is telescoped out or lowered further than is allowed.

The safe load indicator is an electronic unit. It is used to set the truck cranes rigging mode.

The SLI automatically registers the following factors:	These factors must be set according to the current rigging mode:
<ul style="list-style-type: none"> <li>- Length of the main boom</li> <li>- Angle of main boom</li> <li>- Actual load (from the pressure load on the derricking cylinder)</li> <li>- Angle of the luffing jib (additional equipment)</li> </ul>	<ul style="list-style-type: none"> <li>- supporting span</li> <li>- counterweight mass</li> <li>- length of the lattice extension</li> <li>- number of reevings of the hoist rope</li> </ul> <p>Setting either by entry of the individual components or by SLI code.</p>



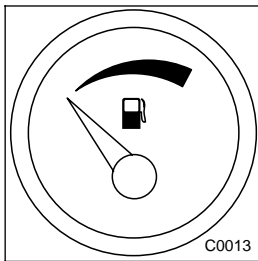
#### **Danger of overturning if wrong settings are entered into the SLI!**

The SLI does not automatically assimilate all information in crane operation required to calculate the load limit.

You must therefore enter the rigging mode (SLI code) and the reeving mode at the SLI control unit manually.



## Refuelling

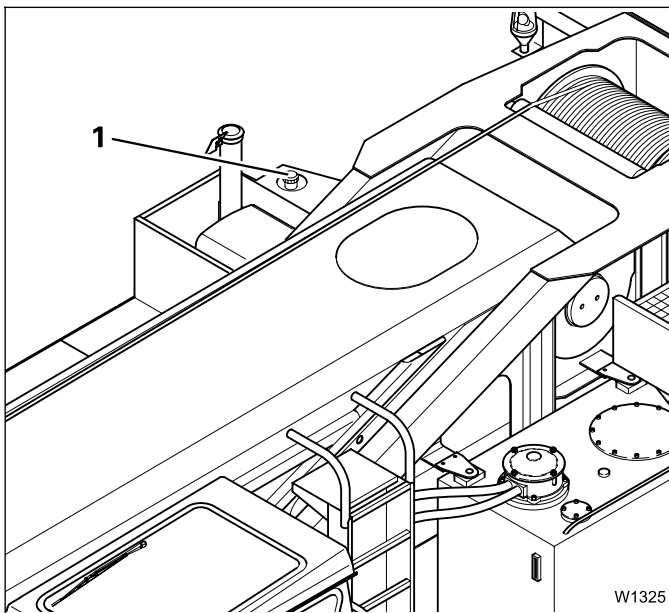


Monitor the *Fuel supply* status display, even when working with the crane. Refuel with diesel whenever necessary.



**Fires may occur due to flammable gases!**

Switch off the crane engine, crane cab heater and all additional heating devices before refuelling.



The diesel tank is located at the rear on the right side of the superstructure. The filler neck (1) is run upwards through the sheet metal.

Always use a funnel and filter when refuelling.

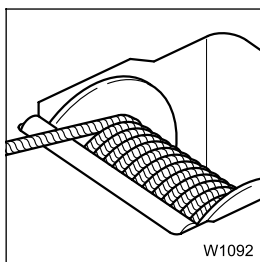
The fuel tank holds approx. 330 l.

See the enclosed Mercedes-Benz Operating Instructions for information on the prescribed fuel specification.

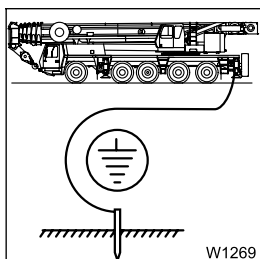


**Danger of accident if the fuel tank is not closed!**

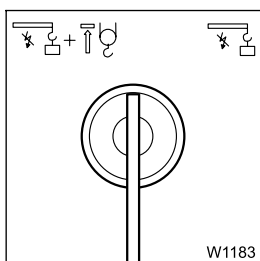
Screw the sealing cover back on after each refueling. In this way you prevent vehicles behind you from being endangered by the sealing cover falling off or fuel escaping.



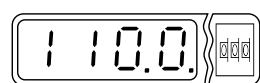
12. The position of the hoist ropes on the hoist drum have been checked;   
 ■■■► *Checking the position of the hoist ropes*, p. 13-10.



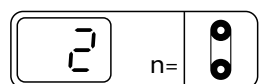
13. The truck crane is earthed accordingly;   
 ■■■► *Earthing the truck crane*, p. 14-17.



14. The key from the key-operated switch *Override* for SLI and lifting limit switch has been removed; ■■■► *SLI override*, p. 13-32.

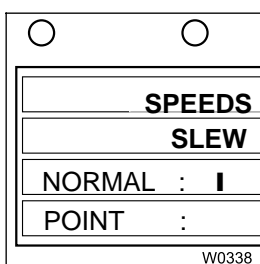


15. The current rigging mode is set on the SLI and the accompanying SLI code is displayed according to the *Lifting capacity table*; ■■■► *Entering values*, p. 13-21.

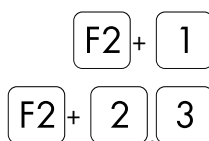


16. The number of the reeved rope lines for the corresponding hoist has been entered with the membrane switch or via the numerical pad and appears in the display *Reeving*; ■■■► *Setting rigging mode*, p. 13-18.

The telescope status has been checked; ■■■► *Check before telescoping for the first time*, p. 13-55



18. The maximum permitted slewing speed for the current rigging mode is set; ■■■► *Maximum permitted slewing speeds*, p. 13-47.



19. The lamp test has been performed on the SLI and the brightness of the SLI status display has been set in such a way that all of the displays are easily read; ■■■► p. 13-16.



If the lifting limit switch is not functioning correctly, do not start crane work. Notify the appropriate GROVE Product Support and have them repair the anchor-to-bracket switch.

### Dead man's switch system



#### **Risk of accidents if dead man's switch system is defective!**

Do not stand beside the crane cabin on the carrier during this check. If the dead man's switch is defective, the superstructure can turn and knock you off the crane. Get inside the crane cab!

#### **Monitoring the dead man's switch system in the crane operator's seat**

- Do not sit on the crane driver's seat.
- Do not press either of the dead man's switches on the control levers.
- Check that no crane movement can be carried out.

#### **Monitoring the dead man's switch system on the control levers**

- Slowly raise the hook block. At the same time press the dead man's switch on a control lever.
- Release the dead man's switch. After approx. 1 second the crane movement must be shut down.
- Repeat the check. Press the dead man's switch on the other control lever.

The dead man's switch system now functions properly when no crane movement can be carried out with an unoccupied crane operator's seat and dead man's switches which are not pressed and after letting go of a dead man's switch the crane movements are stopped.

If the dead man's switch is not functioning correctly, do not start crane work. Inform the appropriate GROVE Product Support and have them repair the dead man's switch.



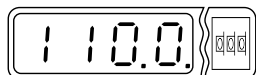
### After entering the values

When you have selected all necessary values on the displays or have entered them via the numerical pad, you must confirm the entry and transfer the values to the SLI.

#### Confirming entry




- Press the membrane switch *Confirm entry* once.



The numerical value on the status display *Rigging mode* or *Reeving* does not flash any more (depending on on which status display the entry mode was switched on). The signalling point at the right edge of the respective status display illuminates.

The entry is now confirmed and the SLI is ready to transfer the entered value.



If you have entered a value which is not allowed according to the *Lifting capacity table*, the value is not transferred and the status display continues to flash after pressing the membrane switch *Confirm entry*; furthermore an error message is displayed;  *Error messages*, p. 13-30.

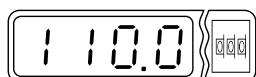
#### Transferring values

For the transfer of newly entered values, you must transfer the value on the status display at which the signalling point is displayed:

- A newly entered value for reeving is transferred on the status display *Reeving*.
- All other newly entered values are transferred on the status display *Rigging mode*.



Press the membrane switch next to the corresponding status display (here *Rigging mode* is used as an example).



The signalling point goes out; the value displayed has been accepted by the SLI.



If you have changed several rigging components (e.g. the outrigger span and the length of lattice extension as well), then these values are transferred at the same time as the new SLI code.  
In addition you must confirm and transfer the current reeving on the display *Reeving*.



## 13.3

## Crane work with the main boom

### 13.3.1

### External influences during crane operation

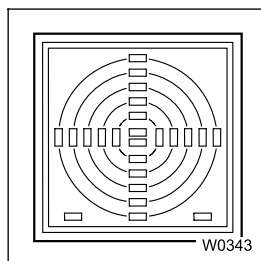
#### Horizontal alignment

The horizontal alignment of the truck crane may change due to the varying load on the ground during crane work.



#### **Risk of accidents if the truck crane is not horizontally aligned!**

The SLI calculates the radius using the length and angle of the main boom. If the truck crane is not horizontal the actual radius will change and the crane may overturn!



- Check the horizontal alignment of the crane on the status display of the *Electronic spirit level* in the crane cab immediately before commencing crane work. When the alignment is horizontal, only the two squares in the center of the status display illuminate.
- Check the *electronic level* regularly while working with the crane. If a diode lights up on the crossed bars, the truck crane is no longer positioned horizontally.

Due to deformation of the frame, the horizontal positioning can change up to 2° when the superstructure is turned from the 0° or 180° position. If the truck crane does not return to the horizontal position after turning back to the 0° or 180° position, you must immediately determine the cause and eliminate it and realign the crane if necessary. Check the position of the superstructure when doing so; ►► p. 14-38.

#### Safe distances

When working with the crane, maintain adequate distance between all parts of the truck crane including the load and objects on the site as well as all persons on the site.

Keep a particularly close watch on objects that pose a direct risk (for example, scaffolding or gas containers).

Keep a safe distance away from electrical lines;  
►► *Safe distance from electrical lines*, p. 14-14.

#### Effect of wind on crane operations

Strong winds can overstrain the truck crane.

Monitor the wind speed on the *Anemometer* continuously during crane operation.

If your truck crane is not equipped with an anemometer, enquire about the expected wind speed at the local meteorological office. The permissible wind speed for a fully loaded truck crane may be found in the *Lifting capacity table*.



### 13.3.4

## Derricking gear

The main boom can be inclined between  $-1,5^\circ$  and  $+ 80^\circ$ . The angle of the main boom in relation to the horizontal position can be set by raising and lowering the main boom.

The SLI switches off lowering of the boom, depending on the load size and main boom length according to the *Lifting capacity table*.

Raising the boom out of a horizontal position and lowering it to the horizontal with the completely retracted main boom is automatically cleared by the SLI if it is permitted by the SLI rigging programs (Rigging programs  $\Rightarrow$  *Lifting capacity tables*)

With other telescope statuses a rigging code must be entered.



For the outrigger span 29.9 x 8.9 ft, a rigging code must also be entered when the boom is retracted and raising and placing is only permitted in the positions  $0^\circ$  to the rear or  $180^\circ$  to the front.



### The truck crane may overturn when lifting loads!

Lifting loads by raising the boom is strictly prohibited as the SLI does not function when this is carried out!



Raising the boom is a movement which decreases the load moment; it is not deactivated by the SLI. However, if excessively heavy loads are lifted by raising the boom, the truck crane can overturn.



- Switch the derricking gear on.

Push the *Derricking gear shutdown* rocker switch on the right-hand control lever upward.

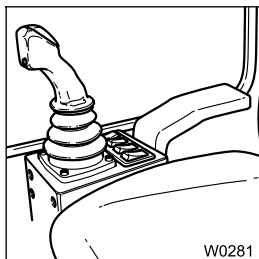


- Switch the right-hand control lever to the *Derricking* function.

Set the rocker switch *Preselect control lever function Derricking / telescoping / lattice extension angle* in the central position.



The *Derricking control lever function* indicator lamp illuminates.



**Lowering:** (= lower boom) Push the right control lever to the right.

**Raising:** (= raise boom) Push the right control lever to the left.



This section deals with the status display of the telescope status on the SLI, the status display of the telescope status on the *Crane control display* is described starting at the section *Example of procedures when telescoping*.

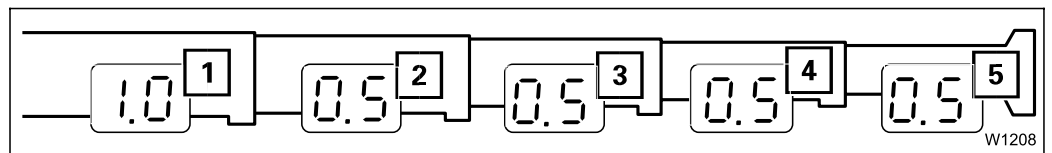
If a telescope section is retracted or extended, both the length of the main boom and the length of the respective telescope section change on the display.

The main boom fixed length is displayed in decimals (e. g. 0.5) and the main boom intermediate length and main boom telescoping length are displayed as two-digit percent values (e. g. 47).



Intermediate lengths and telescoping lengths at 100% are indicated by the flashing display 1.0.

**Example:** Telescope status display for main boom **fixed lengths**



Telescope section I	100 % extended	(fixed length)
Telescope section II	50 % extended	(fixed length)
Telescope section III	50 % extended	(fixed length)
Telescope section IV	50 % extended	(fixed length)
Telescope section V	50 % extended	(fixed length)

The following percent values represent main boom **fixed lengths**:

Telescope section I	0 / 50 / 100 [%]
Telescope section II	0 / 50 / 100 [%]
Telescope section III	0 / 50 / 100 [%]
Telescope section IV	0 / 50 / 100 [%]
Telescope section V	0 / 50 / 100 [%]



Not all locked telescope statuses are permitted as main boom fixed lengths; p. 13-51.

The fixed lengths can be found in the *Lifting capacity table*.





If the locking process is not finished after about 10 seconds (warning lamp *Telescoping cylinder unlocked* is not on), you can not retract the locking pins because they are under load.

With the *Telescoping cylinder at locking point* indicator lamps you can see if you need to retract or extend the telescoping cylinder to relieve the load.



If only the bottom indicator lamp lights up, you must extend the telescoping cylinder.



If both indicator lamps or only the top indicator lamp light up, you must retract the telescoping cylinder.



#### **Risk of damaging the boom system!**

If extending and retracting the telescoping cylinder several times does not cause unlocking, you must not move the telescoping cylinder any further against the stop.

If extending and retracting several times does not unlock the telescoping cylinder:

- Lock the telescoping cylinder by pressing the *Select locking/unlocking* rocker switch up and moving the control lever.
- Start the locking process again by pressing the *Select locking/unlocking* rocker switch down and moving the control lever.



The process of unlocking applies to all telescoping procedures; thus the red indicator lamp *Telescoping cylinder unlocked* would also now illuminate in our **example**. The display would display the length  $L = 3.6$  ft.

Current end state: - telescoping cylinder is locked in telescope section IV

- The next target: - Moving telescoping cylinder in foot section III -



In our **example**, the section “Locking the telescope section at the fixed length reached first” applies. Telescope section III should be extended to 50 %, so you can select locking as soon as the telescope section has been telescoped approx. 2 % from initial state.

The values in this section are suited to the example. You can accept this section directly as an example.

Present end state: – Telescope section III extended to 50 % –

New objective: – Extend telescope section II –

In order to reach the end position of the example from page 13-58, you would have to now extend telescope section II first. You would have to repeat the sections which are referred to in items 2 to 5 of the example on page 13-58. The steps are the same as with extending telescope section III. The initial and end positions would simply have to be changed for telescope section II and the status displays would change accordingly. This is the case for every other telescoping process.

You can also telescope a telescope section without selecting the lock, as described in the next section.

### Telescoping telescope section to intermediate length

Before you telescope a telescope section to an intermediate length, the following prerequisites must be fulfilled:



– The telescoping cylinder is situated in the foot section of the telescope section which is to be telescoped. The corresponding display lamp (e.g. *Telescoping cylinder in foot section I*) illuminates; *Extending/retracting telescoping cylinders and locking them*, p. 13-64.



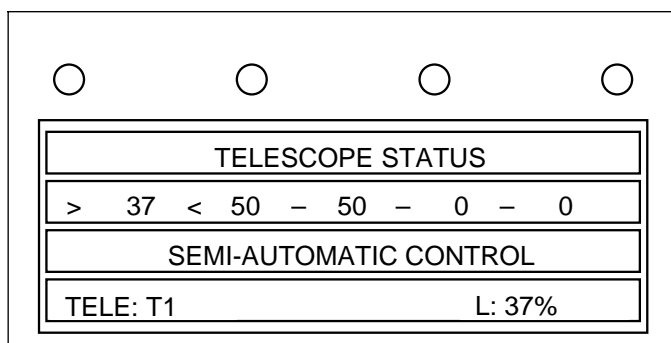
– The telescope section in which the telescoping cylinder is located is unlocked, the red indicator lamp *Telescope section unlocked* illuminates; *Unlocking telescopic section*, p. 13-67.



– The telescoping cylinder is locked to the telescope section; the green indicator lamp *Telescoping cylinder locked* illuminates.



• Check if the *Telescoping gear switched on* indicator lamp is on and telescope the telescope section.

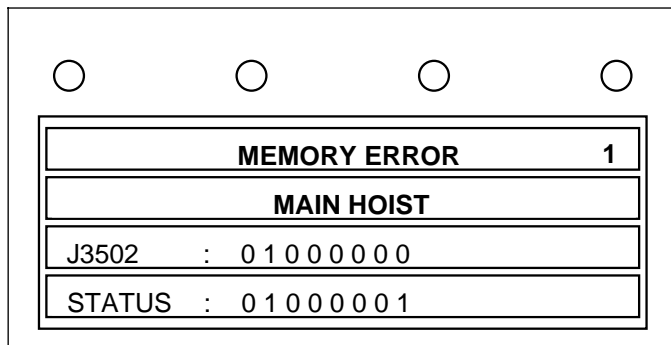


While you are telescoping the telescope section, the status display on the *Crane control display* changes for the current telescope status (e.g. for telescope section I).

Extend the telescope section until the status display shows the desired intermediate length in percent (e.g. L. 37 %).



The display now changes to the sub-menu *Memory error*.



The entry MEMORY ERROR is in the top line; to the right of it is the number of the error which was acknowledged (e.g. 1).

The second line shows the power unit concerned (e.g. main hoist)

Both lower lines display the error exactly like the corresponding error message which was acknowledged; *Display of an error message*, p. 13-89.



You can call up further existing errors with both of these membrane switches next to the display. The errors are numbered consecutively and the corresponding number of the error is displayed at the top right.

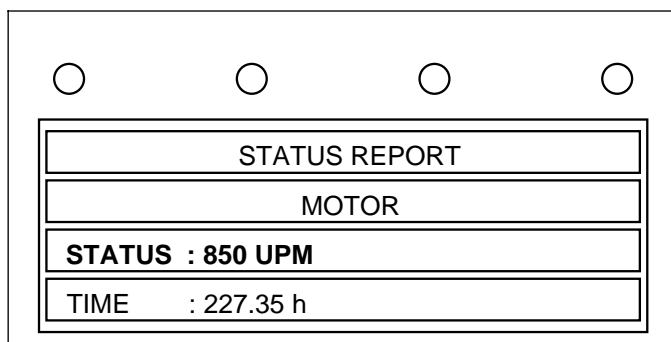


Once the error with the number 1 has been reached and you press the upper membrane switch again, the display changes back to the menu *Display states*.



To leave the *Memory error* submenu you can press one of the adjacent membrane switches.

### Menu items with special displays



In the *Engine* menu item, the current engine speed of the crane engine is displayed in the third line. In this example the current engine speed is 850 revolutions per minute.

The speed display is updated when the speed of the crane engine changes.

If there is an error, the message ERROR appears as with the other menu items in the third line.



You can switch on this display when setting a constant engine speed if you would like to set the constant engine speed to a certain value (e.g. 1300 rpm); *Setting constant motor speed*, p. 13-91.



### Inclining crane cab to the rear

- Close the crane cab door.
- Press the rocker switch *Incline crane cab* downward.



The crane cab inclines rearward as long as you hold the rocker switch down until the end position of 20°.

### Incline the crane cab back to the horizontal

- Press the rocker switch *Incline crane cab* upward.



The crane cab inclines forward as long as you hold the rocker switch down until the horizontal end position.

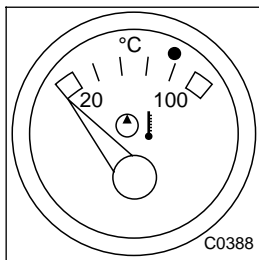
## 13.3.12

### Cooling the hydraulic oil

#### Standard oil cooler

The truck crane is equipped with a hydraulically driven oil cooler which is controlled via a thermostat. When the hydraulic oil reaches a temperature of 55 °C (131 °F), the oil cooler is switched on.

During normal crane operation the temperature of the oil must not exceed 80 °C (176 °F).



- Monitor the *Hydraulic system oil temperature* status display during crane operation.

If the hydraulic oil reaches a temperature of 80 °C (176 °F), you must stop crane operation and allow the oil to cool down with the crane engine running.

#### Additional oil cooler

The truck crane can be equipped with a second oil cooler as additional equipment. This second oil cooler is switched on parallel to the standard installed oil cooler.

### Additional water heating system (additional equipment)

The engine-independent additional water heating system heats up the crane engine's coolant. The heat is generated by burning fuel from the tank in the superstructure. The heating system is operated by onboard electrics in the superstructure. The additional heating system may be operated when the engine is stationary or running.

In the case of a stationary and cold engine, this can be preheated using the additional heating system. The heating pump circulates the coolant within the engine. The *Temperature* regulator in the crane operator's cab should be set up to the setting "Cold".

If you set the regulator *Temperature* to "Warm" and turn on the fan as described in section *Heating the crane cab*, p. 13-102, the crane cab will be heated at the same time.



If you operate the additional heating system while the crane engine is switched off, the batteries will run down. The batteries must then be recharged after shorter periods of time!

When the engine is running, the additional heating system supports the preheating of the engine until the engine operating temperature is reached.

The heat supply will be interrupted when the engine operating temperature is reached. The heating pump continues to run until, using the rocker switch, the additional heating system is switched off.



When the engine operating temperature is reached, the additional heating system should be switched off to prevent uncontrolled starting when the engine temperature drops.

### Switching on the additional heating system



To activate push down the *Additional heating system* rocker switch. The indicator lamp in the rocker switch illuminates.

After a preheating period of approx. 15 seconds, automatic ignition takes place. If the heating system does not trigger after 30 seconds, ignition is aborted.



The indicator lamp in the rocker switch merely indicates that the switch has been operated and that the heating system has been switched on or off. It does not indicate whether the heating system has been triggered.

The heating system has ignited if:

- the air flowing from the fan vents is warming up (cab heating system) or
- the engine temperature rises (preheating the crane engine).

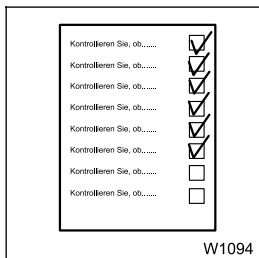


**14.1.2**

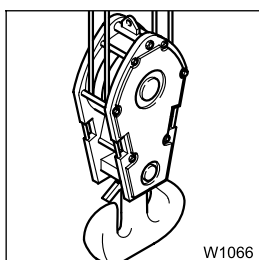
**CHECK LIST: Unrigging (boom set down on the boom support)**



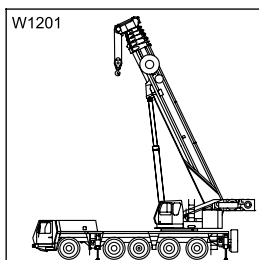
This checklist is not equivalent to a complete instruction manual. There are accompanying handling instructions which are indicated by cross-references. **Observe the warning and safety information given there!**



1. Unrigging the counterweight; **▶▶▶ CHECK LIST: Unrigging the counterweight**, p. 14-49.



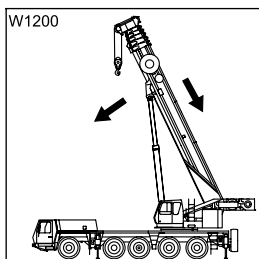
2. Depending on the transportation of the hook block place this  
 - on a separate vehicle; **▶▶▶** p. 14-69  
 - attach to the bumper; **▶▶▶** p. 14-67.



3. Turn the boom in the direction of driving.



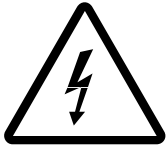
4. Lock the superstructure.



5. Retract and set down boom.



If it is not possible to switch off the current:



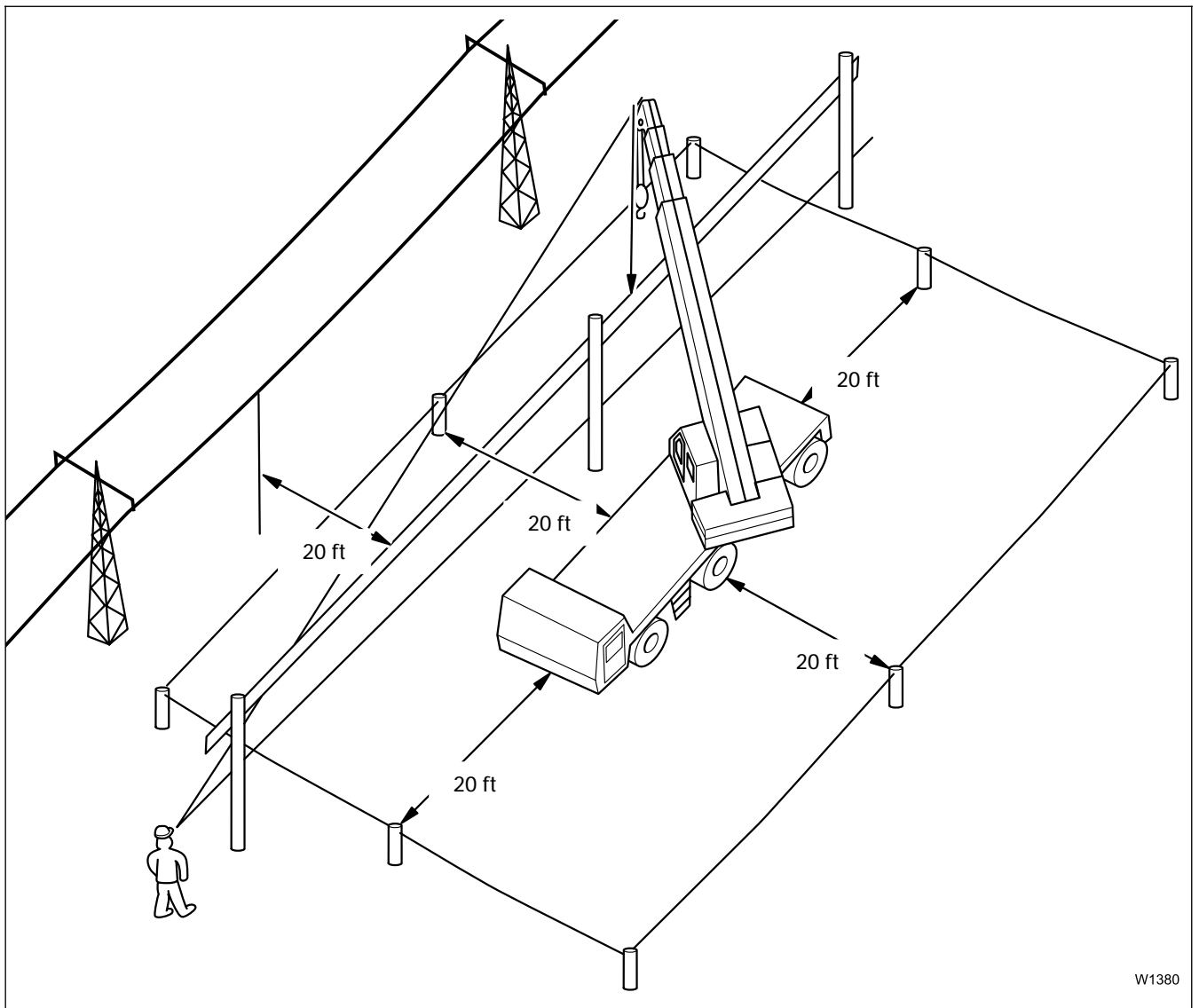
**Risk of accidents due to electrical shock!**

This truck crane is not insulated. Contact between overhead power lines and the boom or the hoist rope, the lifting tackle, the load itself or the guide lines can result in serious, possibly fatal injuries.

Keep the truck crane, its attachments, lifting tackles and the load at a **safe distance of at least 20 ft** away from the power lines and their associated equipment.



The US Department of Labor "Occupational Safety and Health Administration" (OSHA) forbids working with the crane with a distance of less than 10 ft when sources of voltage up to 50 000 volts are involved; higher voltages require a greater distance. The manufacturer recommends a minimum safe distance of 20 ft.



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**Risk of overturning with a rigged outrigger span of 27.9 x 8.9 ft!**

No counterweight may be rigged with this outrigger span. The truck crane tips over when slewing with a rigged counterweight.

Raising and lowering the boom under the angle permitted in the working range is only permitted in the superstructure positions 0° to the rear or 180° forwards with the superstructure locked and with the corresponding SLI rigging code set.


If you raise or lower the boom outside of these permitted positions, the truck crane tips over even with the boom retracted.

### 14.3.4

## Preparing the outriggers

### Aligning the truck crane horizontally

Before supporting the truck crane it should be aligned horizontally and lowered as far as possible.

- Align the truck crane horizontally in longitudinal and lateral directions using the level adjustment system;  *Switch on level adjustment system*, p. 6-37.



If the truck crane is situated on a low level, the distance of the outrigger pads to the ground is small. If necessary, uniformly lift the truck crane with the level adjustment system if you have to pack the outrigger pad or, owing to the condition of the terrain, you extend a support against a hill.

### Locking the suspension

The suspension must be locked in all axle lines when the truck crane is supported.



- Press down the *Suspension locking system* rocker switch in the driver's cab to lock the suspension. The indicator lamp lights up when the suspension is locked.



## 14.3.7

## Extending / retracting the outrigger cylinders

### Extending the outrigger cylinders

The outrigger cylinders can be operated individually, in pairs or all together.



**Danger of overturning if the load bearing capacity of the ground is too low!** Monitor the outrigger pressure and keep the load bearing capacity of the ground in mind during crane work. If the ground does not have sufficient load bearing capacity, you must support the outrigger pads with a suitable material.

In this way you prevent the ground under the outrigger pads from collapsing, causing the truck crane to incline and overturn; ➡ *Enlarging the surface area of the outrigger*, p. 14-13.

- Ensure that the packing of the outrigger pad is horizontally aligned.

Choose packing that will provide the outrigger cylinders with enough stroke to align the truck crane horizontally and lift all wheels off of the ground.



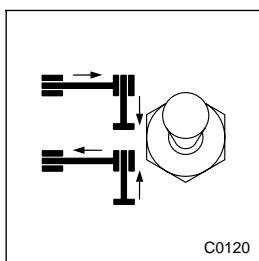
The outrigger cylinders must have a remaining stroke of at least 0.98 inch in order to carry out alignment corrections. The outrigger cylinders may not be completely extended.



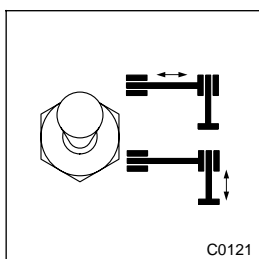
**Accidents may occur when outrigger movements are performed outside of your field of view!**

Block off the danger area of the moving outrigger beams before moving them. Monitor the movements of the outrigger beams closely or have a banksman with whom you are in visual contact monitor the movements during operation.

No one may be in the danger zone of moving outrigger beams, not even the banksman.



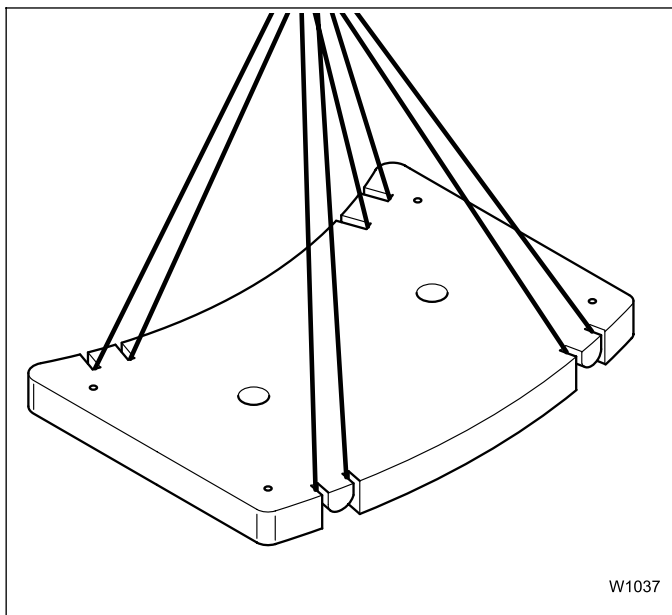
- Press up the *Preselection of direction of outrigger movement* toggle switch.



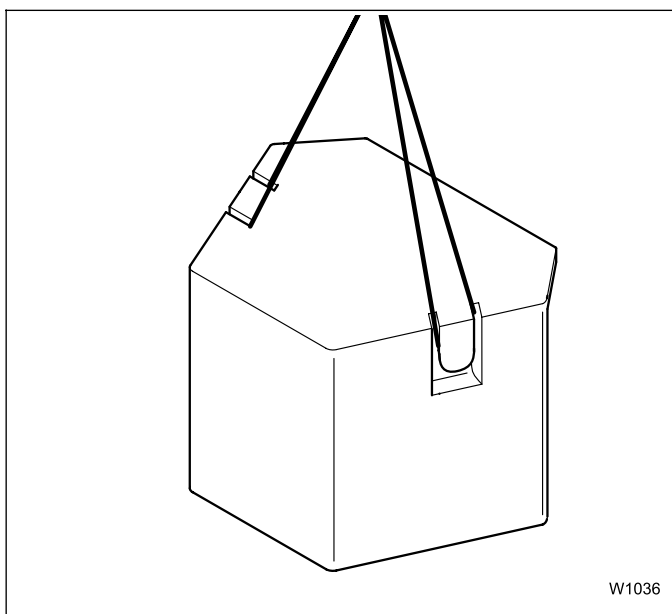
- Press down the *Preselection of outrigger cylinder / outrigger beam* toggle switch.



### 14.4.3 Slings points on the counterweight sections



There are 4 slinging points in each of the cast counterweight sections.  
There are four slinging knobs welded onto each of the 3.5 t counterweights and the 4.4 t base plates.



Each of the 10 t counterweight blocks is equipped with two slinging points (additional equipment).



#### **Risk of accidents if used incorrectly!**

Only attach the various counterweight sections to the appropriate slinging point and use lifting gear with sufficient lifting capacity.  
Only lift the counterweight sections individually. The slinging points are not designed for lifting counterweight sections placed on top of each other.

## 14.4.8

### Assembling the counterweight version

To assemble the counterweight version, the 4.4 t base plate must be lying on the counterweight platform; **►►► Place 4.4 t base plate onto counterweight platform**, p. 14-51.

For the counterweight versions 9.5 t, 13 t, 21.5 t, 32.5 t and 43 t, the needed counterweight sections are stacked on the 4,4 t base plate. For the counterweight version 63 t, two additional counterweight blocks (additional equipment) must be attached.

The individual counterweight sections are lifted with the truck crane.



#### **Danger – free-standing truck crane may overturn!**

Stabilize the truck crane with the outrigger span required for working with the crane, before you slew the superstructure and lift the counterweight sections; **►►► Outrigger span**, p. 14-23.



#### **Accidents may occur due to falling counterweight parts!**

Hoist the counterweight sections and counterweight blocks only individually. The holders for the lifting gear are not designed for hoisting sections/blocks placed on top of each other; **►►► Slinging points on the counterweight sections**, p. 14-45.

Always attach the counterweight blocks slowly and only vertically from above. This prevents overloading and the possibility of the attachment plates breaking off. When attaching the counterweight blocks, ensure that no persons are located under the counterweight.



The 3.5 t counterweight section does not need to be locked on the turntable for crane operation.

If you want to lock the 3.5 t counterweight section on the turntable and a counterweight of less than 43 t is rigged, you must rig the 3.5 t counterweight section with the installation rods (additional equipment);

**►►► Rigging the 3.5 t counterweight section with installation rods**, p. 14-58.

- Use the truck crane to hoist the counterweight parts onto each other. Pay attention to the order for each counterweight version, shown as follows.




## Unlocking the counterweight

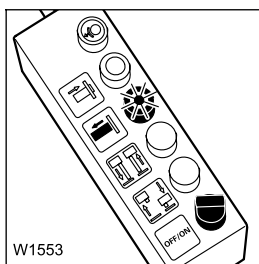


To unlock the counterweight, the hasps must be in the **unlocked** position.

### **Risk of accidents from falling counterweight!**

Before unlocking the counterweight, ensure that the hydraulic cylinder of the 4,4 t base plate is fully extended into the cylinder mountings of the counterweight platform and the counterweight is supported. This prevents the counterweight from falling down during unlocking.

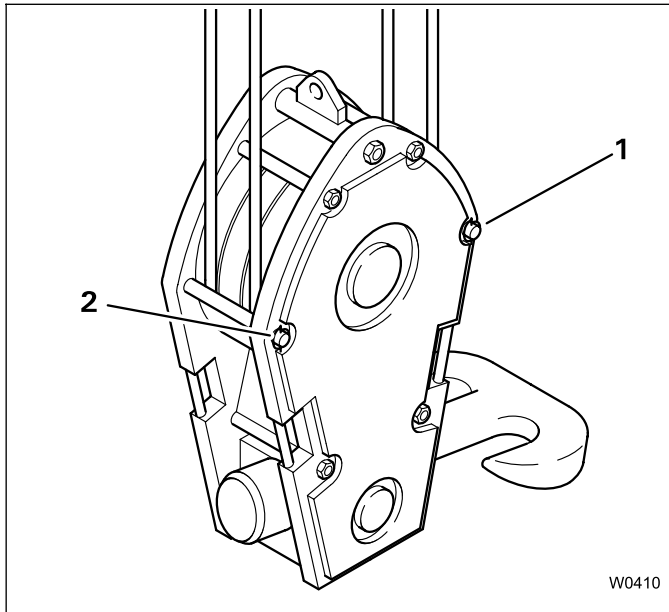
- Open the safety cock;  p. 14-64.
- Turn the *Release switch unit* switch to the right and hold it down.
- Also press the *Unlock counterweight* switch and hold it until the *Counterweight unlocked* indicator lamp lights up in the switch.



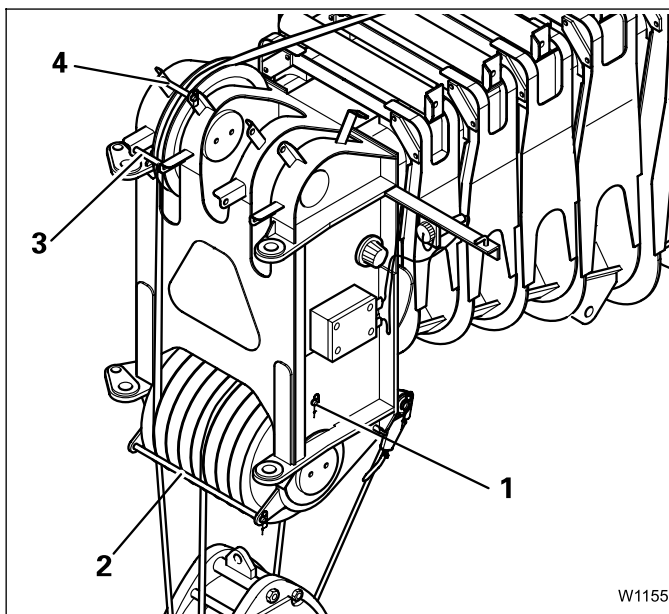
When the warning lamp lights up, the counterweight is unlocked.



If the warning lamp does not light up, extend the lifting cylinders a little so that the pressure on the hasps is relieved.



- Fold both guards on the hook block back up and insert the holding rods (1) and (2) in the bore holes. Secure the rods into place using the spring cotter pins.



- Reinsert the rope retaining rods (1), (2) and (3) into the bores on the boom head. Secure the rods into place using the retaining pins.

### Lifting limit switch on the main boom

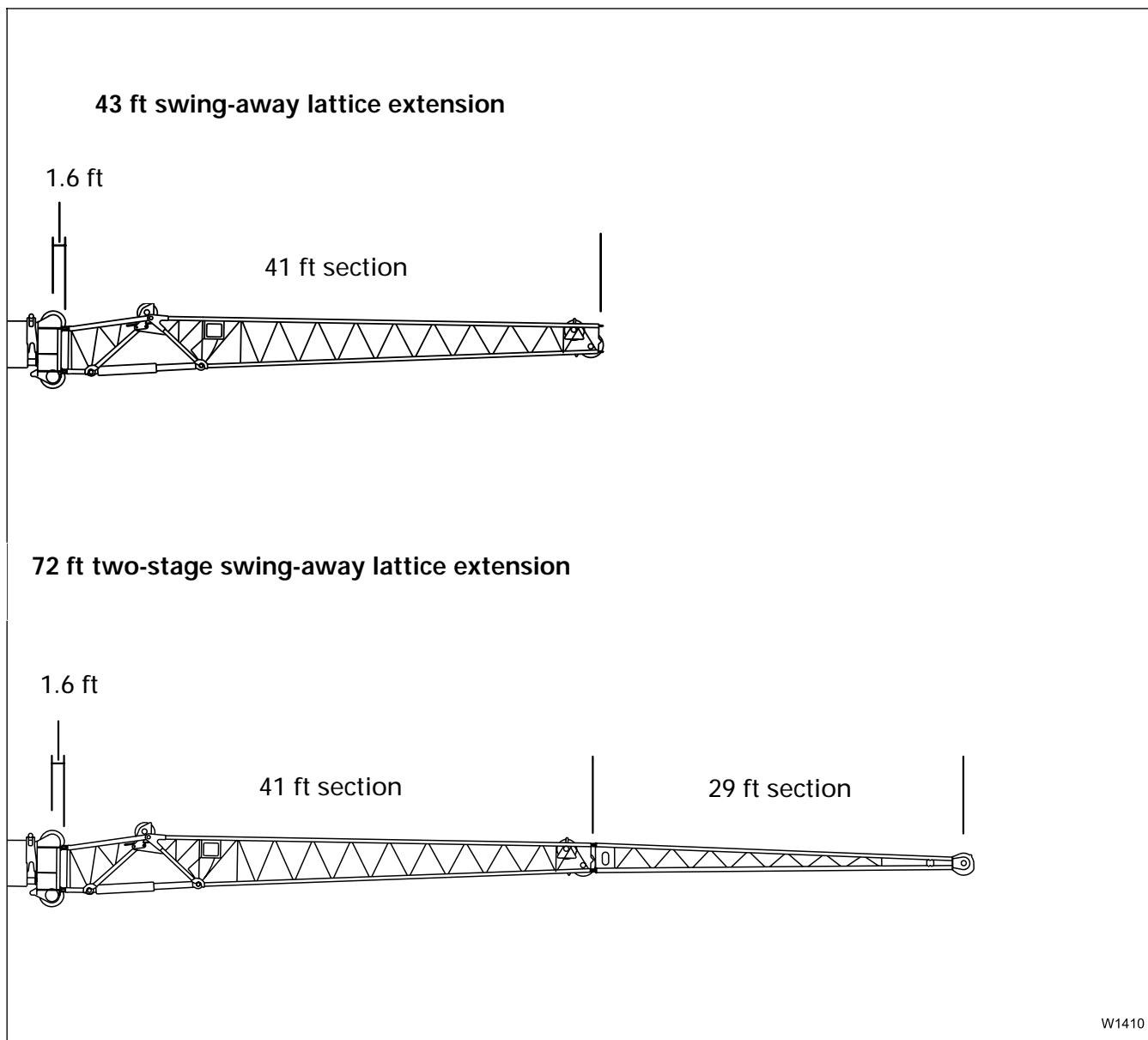
The lifting limit switch must be mounted on the main boom during crane work with the main boom. The lifting limit switch weight must be attached and the hoist rope must be attached.

If no anchor-to-bracket-switch is installed on the main boom, remove the switch from the two-stage swing-away lattice extension, if necessary. For operation with the main boom and two-stage swing-away lattice extension, the same anchor-to-bracket-switch is used; **►► Changing the anchor-to-bracket-switch and anemometer**, p. 11-23.

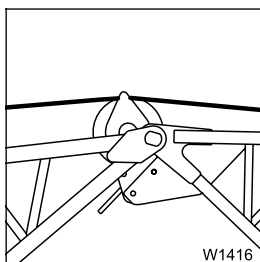


**15.1.2**

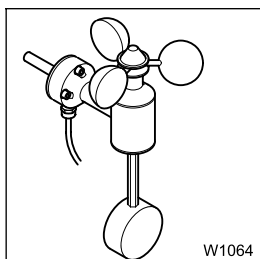
**Assembly of lattice extensions**



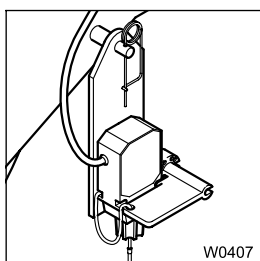
The 41 ft section consists of a fixed 6.6 ft section and a 34.4 ft luffing section.



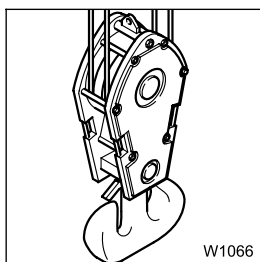
19. Place hoist rope above both deflection sheaves and the head sheave on the 41 ft section; ■■■► *Placing hoist rope on 43 ft swing-away lattice extension*, p. 15-62.



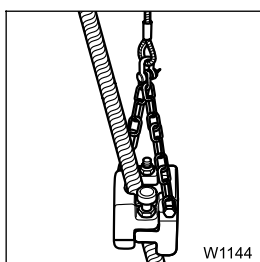
20. Move anemometer (additional equipment) from the head of the main boom to the head of the 41 ft section; ■■■► *Anemometer on lattice extension*, p. 15-66.



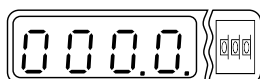
21. Move lifting limit switch from the head of the main boom to the head of the 41 ft section; ■■■► *Lifting limit switch*, p. 15-64.



22. Reeve the hoist rope on the hook block; ■■■► *Reeving and unreeving the hoist rope*, p. 14-71.

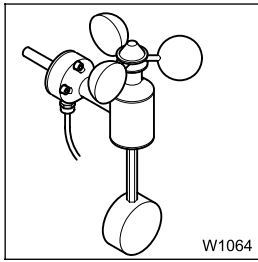



23. Attach lifting limit switch weight and guiding hoist rope through the weight; ■■■► *lifting limit switch on the main boom lifting limit switch weight*, p. 14-77.

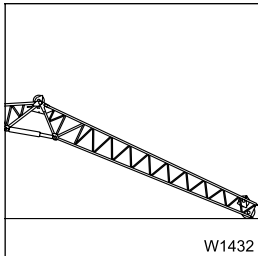


24. Enter the SLI code according to the *Lifting capacity table* for the actual rigging mode of the truck crane with the 43 ft swing-away lattice extension; ■■■► *Setting rigging mode*, p. 13-18.

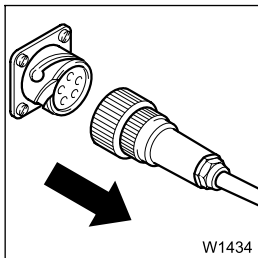
Further working steps for raising the boom; ■■■► p. 15-69.  
Telescoping with rigged lattice extension; ■■■► p. 15-70.




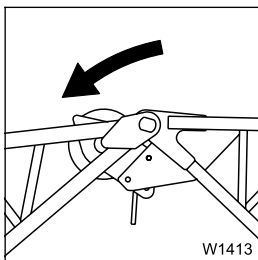
6. Remove anemometer (additional equipment);  *Anemometer*, p. 15-66.



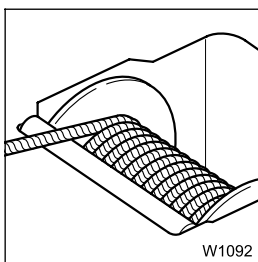
7. Lower lattice extension until it is on the ground with the supports on the head of the 29 ft section, remove hoist rope from head sheave and deflection sheaves and place on the left side of the lattice extension on the ground.



8. Disconnect the electrical connection between the 29 ft and 41 ft sections;  *Establishing/disconnecting electrical connection on the lattice extension*, p. 15-58.



9. Fold in both deflection sheaves;  *Folding out/in the deflection sheaves on the 41 ft section*, p. 15-60.



10. Reel up hoist rope up to the main boom head.



If the 29 ft section needs to be removed and only the 41 ft section at the side of the main boom needs to be folded, see Point 15.

11. Attach the guide rope to the 29 ft section of the lattice extension.

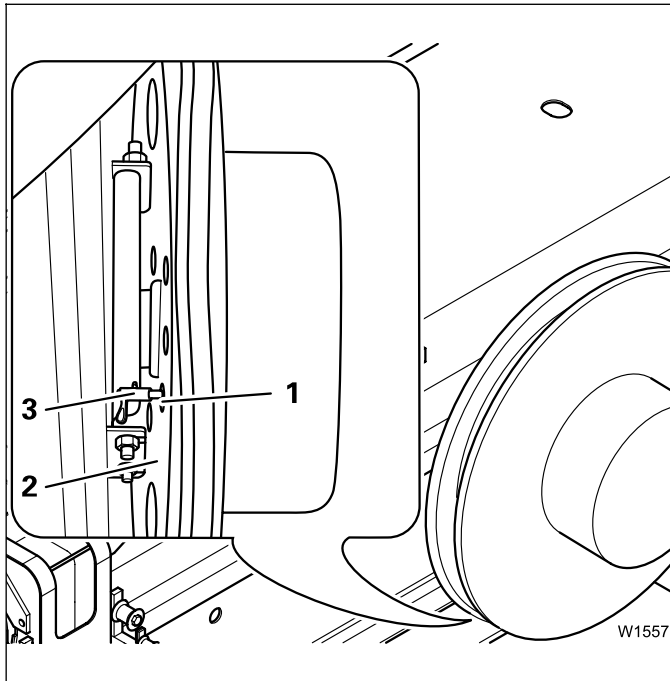




**Risk of accidents from unchecked turning hose drum!**

You may release the anti-twist device only when you have attached the strain relief on the main boom beforehand.

By doing this you prevent the hose drum twisting unchecked against the holder and the turning hydraulic hoses injuring other people.



There are eight bores (1) above the radius on the inner flanged wheel (2) of the hose drum.

**Inserting anti-twist device**

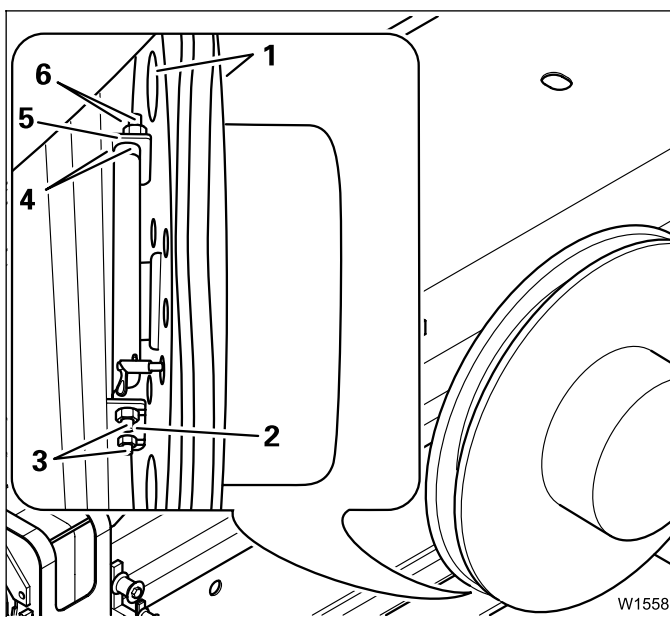
- Turn the hose drum until a bore is in front of the spring latch (3).
- Move the spring latch into the bore, the hose drum is secured against twisting.

**Removing anti-twist device**

- Attach the strain relief on the main boom before removing.
- Withdraw spring latch (3) from the bore in the flanged wheel.

**Installing hose drum**

If the hose drum has been removed for on-road driving, you must re-install it before working with the lattice extension.



- Attach the hose drum to the recesses (1) with an auxiliary crane.
- Lift the hose drum onto the left side of the main boom.
- First move the upper threaded pins (6) diagonally from below into the retaining sheets (5).
- Then swing the hose drum down onto the main boom so that the lower threaded pins (3) slide into the retaining sheet (2).
- Insert the spacer sheets (4).
- Attach the hose drum by turning the nuts on the threaded pins (3) and (6).

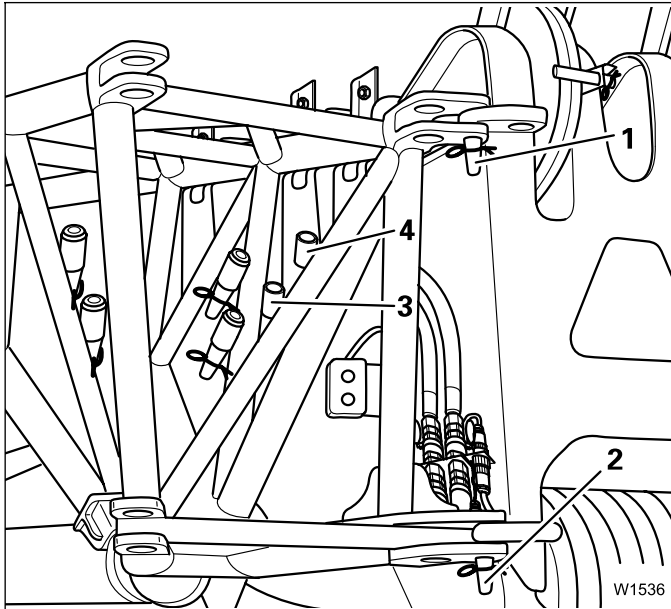
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### Establishing connection between 41 ft section and main boom head

The connection must be made:

- for swinging the 43 ft swing-away lattice extension,
- for swinging the 72 ft two-stage swing-away lattice extension.




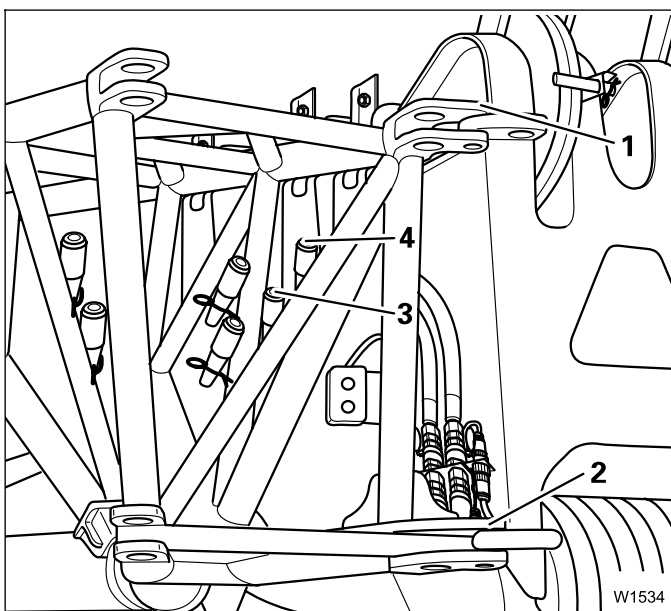
- Release the retaining pins and remove the two pins from the holders (3) and (4).
- Insert one pin into each of the bearing points (1) and (2).
- Secure both pins with the retaining pins.

### Disconnecting connection between 41 ft section and main boom head

The connection must be disconnected so that the lattice extension can be swung at the side of the main boom.



Before you disconnect this connection, the lattice extension must be raised into the bearing point on the main boom;  *Bearing point on main boom*, p. 15-51.



- Remove the retaining pins and pull the two pins (1) and (2) out of bearing points (1) and (2).
- Insert a pin into each of the holdings (3) and (4).
- Secure both pins with the retaining pins.



## 17.1.5

### Main boom

The main boom consists of the basic section and 5 telescope sections. As additional equipment, the main boom can be extended with a two-stage swing-away lattice extension and a boom extension (both pipe grille construction).

The boom extension consists of the two-stage swing-away lattice extension and two additional intermediate sections.

Two-stage swing-away lattice extensions, including those connected with the boom extension, can be derricked hydraulically from the crane cab even under partial load.

## 17.1.6

### Telescoping gear

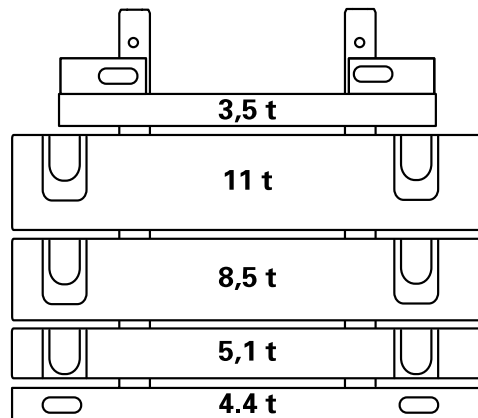
The telescoping gear consists of the basic section, five telescope sections and a single-level telescoping cylinder with a locking mechanism. Each telescope section is equipped with locking pins which are extended by spring force. All telescope sections can be locked at the fixed lengths. The telescoping cylinder is also equipped with locking pins. These locking pins make the connection between the telescoping cylinder and the telescope section to be telescoped.

All telescope sections must be telescoped separately. To telescope, the telescope cylinder locks itself together with the appropriate telescope section. Subsequently, the telescoping cylinder unlocks the telescope section with its mechanism and extends it or retracts it to the desired length. With 0%, 50% and 100% telescope statuses, the telescoping cylinder can lock the telescope section there again with the mechanism, release its lock with the telescope section and move to the next telescope section.

Locking or unlocking can be selected and is automatically carried out by the crane control system. Fully automatic telescoping of the telescope sections to 0%, 50% and 100% is also possible. The desired end state of the telescoping gear is entered in the crane control here.

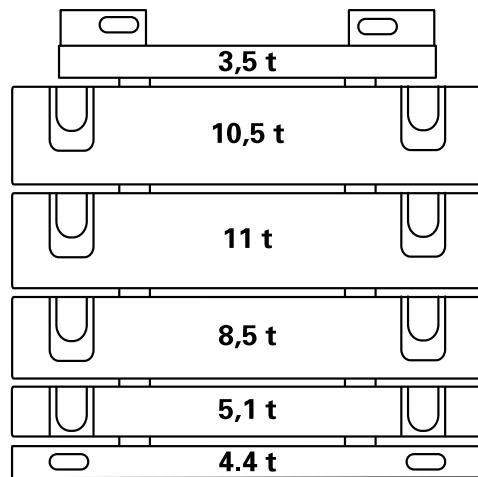
The telescoping gear is equipped with a mechanical and hydraulic emergency operation with which the telescoping gear can be retracted during a malfunction.





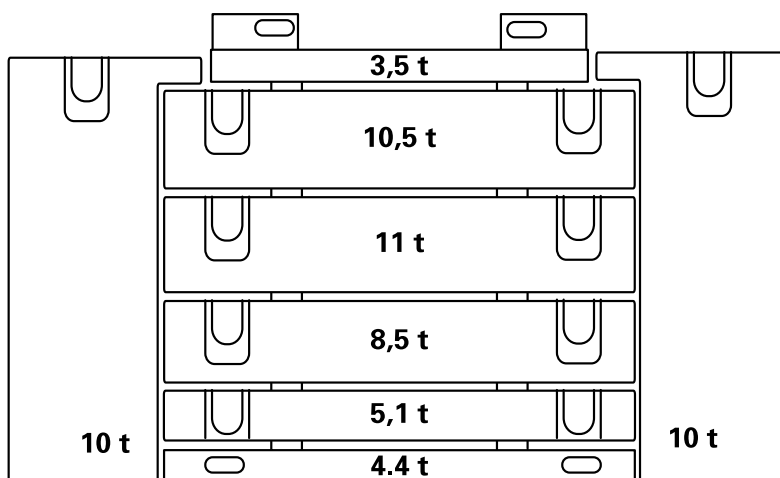
**71 650 lbs (32,5 t)**

- 3.5 t counterweight section
- 11 t counterweight section
- 8.5 t counterweight section
- 5.1 t counterweight section
- 4.4 t base plate



**94 799 lbs (43,0 t)**

- 3.5 t counterweight section
- 10.5 t counterweight section
- 11 t counterweight section
- 8.5 t counterweight section
- 5.1 t counterweight section
- 4.4 t base plate



**138 891 lbs (63,0 t)**

- 3.5 t counterweight section
- 10.5 t counterweight section
- 11 t counterweight section
- 8.5 t counterweight section
- 5.1 t counterweight section
- 4,4 t base plate
- 10 t counterweight block (2x)  
(additional equipment)

18.03.1999

W1025

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