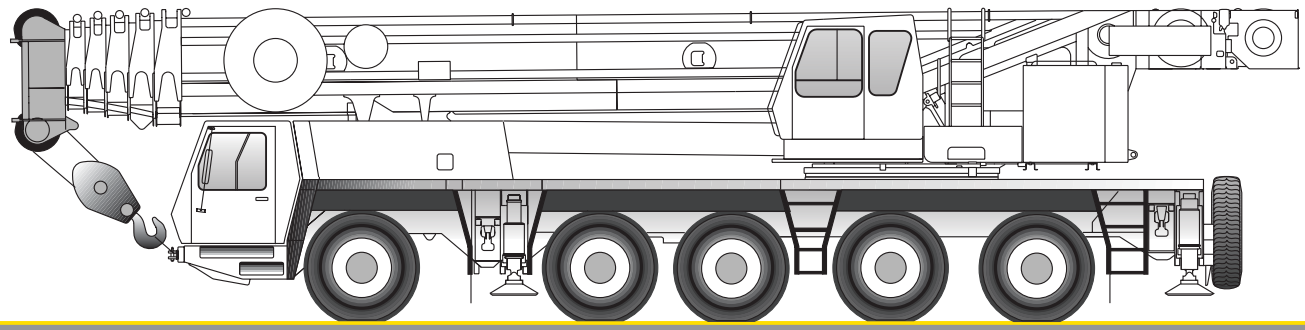
GROVE®

GMK5200



Operating instructions Part 1 – Driving

Vehicle serial number:

2 084 829 en
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These operating instructions consist of two parts:

Part 1 – Driving

Part 2 – Crane operation

Part 1 comprises the following chapters:

Chapter 11 to 17 are in Part 2 – Crane operation

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1.3.4 Lifting capacity tables

These tables contain data concerning the load bearing capacity, the permissible wind speed and the SLI code of the truck crane in various rigging modes and boom positions.

1.3.5 Outrigger pressure tables

These tables contain data concerning the outrigger pressure on the pressure points of the support in relation to the load, radius, rigging mode and boom direction.

1.3.6 Safety manual

The *Safety manual* is intended to warn the crane operator of the hazards that may occur during normal operation of the truck crane. It illustrates how to avoid these hazards from the onset and how to react should they occur.

The *Safety manual* contains

- General safety instructions
- Safety instructions that apply to truck crane driving
- Safety instructions for rigging and working with truck cranes
- Safety instructions for crane operation under specific operating conditions

The crane operator is obliged to read the *Safety manual* carefully, as this is essential for the safe operation of the truck crane.

1.3.7 Circuit diagrams

Circuit diagrams are used for troubleshooting and intended for trained maintenance personnel and ***CraneCARE*** at the respective location.

Enclosed are:

- The compressed-air circuit diagram
- The hydraulic circuit diagram and
- The electrical circuit diagram.

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1.4.5 Conversion table for US measurements

The following conversion factors will help you convert from metric to US units and vice versa when the truck crane is being used in countries that use US units of measurement.

Converting from	to	Multiply by
mm	inches	0.03937
inches	mm	25,4
m	ft	3.28084
ft	m	0,30479
m2	ft^2	10.76391
cm^2	in^2	0.155
cm^3	in^3	0.061
l	gal (US)	0.264178
kg	lbs	2.204622
lbs	kg	0.45359
t	lbs	2204.622
lbs	t	0,0004536
kN	lbf	224.809
daN/cm^2	lbf/in^2	14.50378
lbf/in^2	daN/cm^2	0,06895
bar	psi	14.50378
psi	bar	0,06895
m/s	ft/s	3.28084
km/h or km	mph or mi	0.62137
mph or mi	km/h or km	1,60935
Nm	lbf ft	0.7375
°C	°F	1.8 x °C+32
°F	°C	(°F -32) / 1.8
t/m^2	lbs/ft^2	204.8
m^2/t	ft^2/lbs	0.004882

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2.5 Safety instructions that apply to truck crane driving

Walk around the truck crane before beginning to drive. Check the condition of the truck crane carefully using the checklists in the operating instructions. Do not assume that everything is in working order simply because it was in working order when work was last completed.

Before starting the vehicle, check that all guards and safety devices are correctly fitted and that they are all in a proper condition.

Use the appropriate access aids when checking overhead crane parts. Do not use parts of the machine as access aids.

Keep all handles, steps, step treads and ladders free of dirt, snow and ice.

Check all operating and control elements in the driver's cab before starting the vehicle engine.

Monitor all warning and indicator lamps as well as the control instruments when the engine is started.

Lock the truck crane after operation to prevent unauthorized use.

2.6 Safety instructions for truck crane work

Carefully select a safe site for the truck crane to stand from where you can work safely.

Check over the truck crane before beginning crane work. Check the condition of the truck crane carefully using the checklists in the operating instructions. Do not assume that everything is in working order simply because it was in working order when work was last completed.

Check daily before starting to work with the crane that all guards and safety devices are correctly fitted and that they are all in a proper condition.

Check the safety devices each day before beginning work (SLI, lifting limit switch, dead man's switch, emergency stop switch for crane control).

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4 Description of the truck crane – Vehicle section

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1 No function
2 MODE switch with indicator lamp ➠ p. 4 - 26
3 Selector key and button switch for upshifting ➠ p. 4 - 25
4 Selector key and button switch for downshifting ➠ p. 4 - 25
5 Transmission display ➠ p. 4 - 25
6 Button for transmission mode **R** ➠ p. 4 - 25
7 Button for neutral position **N** ➠ p. 4 - 25
8 Button for transmission mode **D** ➠ p. 4 - 25

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Indicator lamp for eddy current retarder (additional equipment)

Lights up when the eddy current retarder is switched on; ➠ *Eddy current retarder (additional equipment)*, p. 6 - 30.

Suspension

Rocker switch for suspension locking system

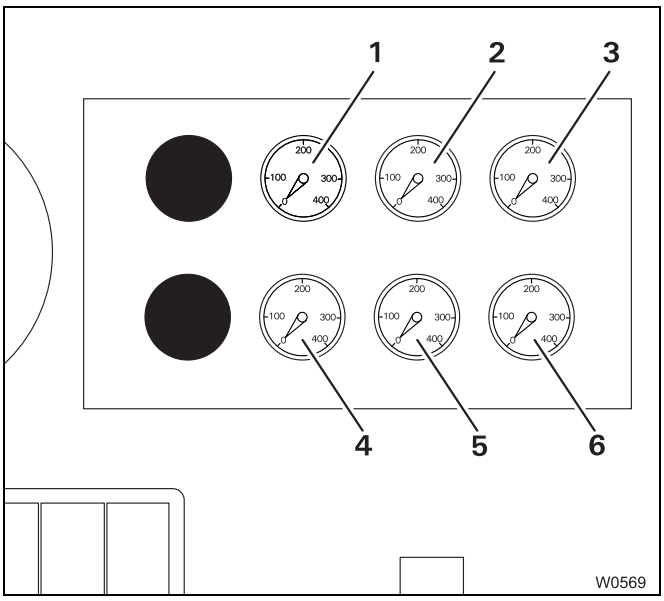
Locks all suspension cylinders in their respective positions;
➠ *Checking suspension*, p. 6 - 10; ➠ *Switching over the suspension locking system*, p. 13 - 102.

To switch on:	Press rocker switch down.
To switch off:	Press rocker switch up.

Indicator lamp for suspension locking system

Lights up if the suspension is locked.
Goes out if suspension locking system is released;
➠ *Checking suspension*, p. 6 - 10; ➠ *Switching over the suspension locking system*, p. 13 - 102.

Suspension operating pressure gauge (additional equipment)



Displays the operating pressure in the suspension groups on the individual axle lines.

1 Suspension operating pressure, right-hand side, 1st axle line

2 Suspension operating pressure, right-hand side, 2nd and 3rd axle lines

3 Suspension operating pressure, right-hand side, 4th and 5th axle lines

4 Suspension operating pressure 1st left

5 Suspension operating pressure, left-hand side, 2nd and 3rd axle lines

6 Suspension operating pressure, left-hand side, 4th and 5th axle lines

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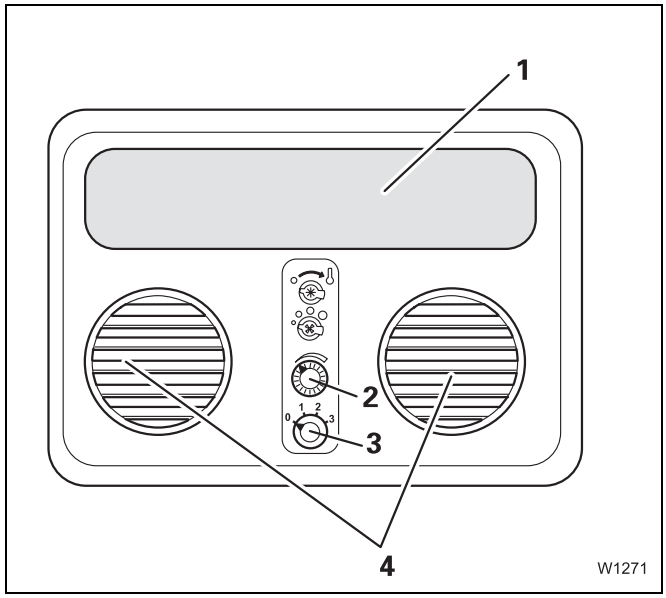


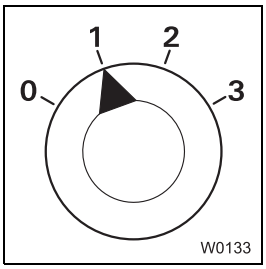
Version B

1 Air exit vents

2 Rotary switch for thermostat

3 Rotary knob for blower

4 Air exit vents, adjustable for air quantity and direction



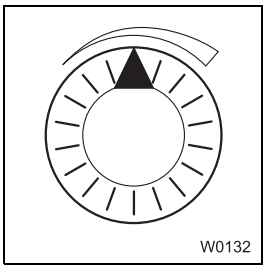
Rotary switch for blower

0 Fan and air-conditioning system off

1 Output level *low*

2 Output level *medium*

3 Output level *high*



Knob switch for thermostat

Turning the knob switch to the right increases the cooling output.

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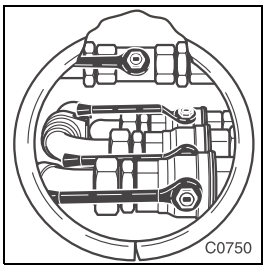
5 Vehicle engine

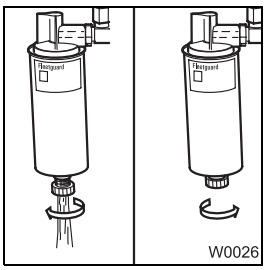
5.1 Starting/turning off the vehicle engine

5.1.1 CHECKLIST: Starting the vehicle engine

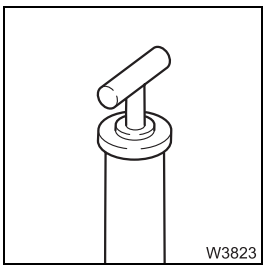
This checklist is not a complete instruction manual. There are accompanying instructions which are indicated by cross-references.
Observe the warning and safety instructions given there.



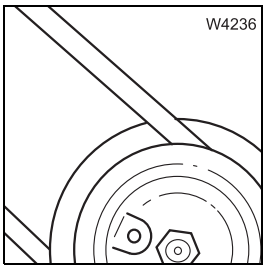
1. Check the position of the shut-off valves in the hydraulic system; ➠ *Checking the hydraulic unit's shut-off valves*, p. 5 - 5.



2. Draining off water from fuel filter; ➠ p. 5 - 8 and vehicle engine operating instructions.



3. Pre-check the oil level in the automatic transmission; ➠ *Pre-checking the oil level in the automatic transmission*, p. 5 - 6.



4. Visual inspection of the drive belts; ➠ p. 5 - 10 and vehicle engine operating instructions.

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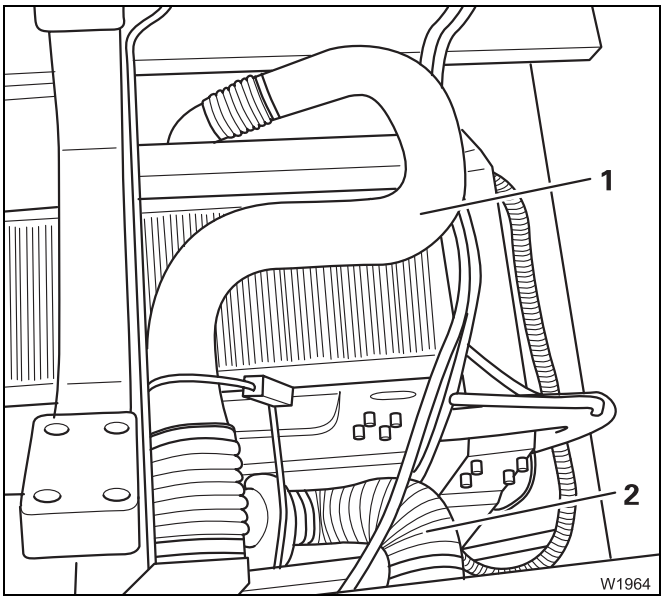
Visual inspection of the combustion air system

See also the section in the enclosed vehicle engine operating instructions.

The visual inspection of the combustion air system should prevent parts or products of corrosion (e.g. rust particles, corroded and loosened parts of hoses) from getting into the combustion air system. The system must be checked to ensure that no leakage is present.

For this visual inspection you have to take off two covers (➠ *Topping up engine oil*, p. 5 - 14).

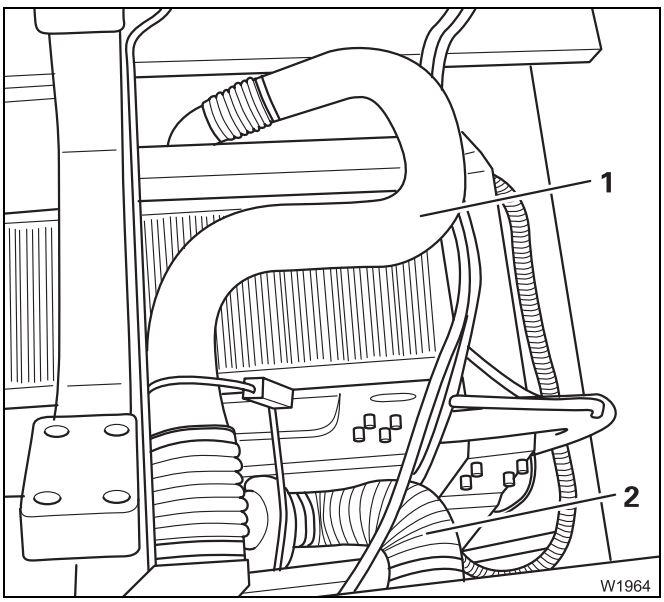


Suction air system

- Check the lines (**2**) of the suction air system for broken and torn hose stubs, holes and tears.
- Check the piping for corrosion (rust) under the hoses and pipe brackets.
- Check that the pipe fastenings and the pipe brackets are secure.
- Replace any damaged parts and tighten loose screw connections.

Tightening torque for the pipe brackets: 6,5 Nm (4,8 lbf ft).

Remove any products of corrosion. If necessary, remove hoses or hose stubs.



Charge air system

The charge air system is made up of piping and a charge air cooling system. The charge air cooler is installed behind the driver's cab on the left-hand side of the vehicle.

- Check the lines (**1**) of the charge air system for damaged hose stubs, holes and tears.
- Check that the pipe fastenings and the pipe brackets are secure.
- Replace any damaged parts and tighten loose screw connections.

Tightening torque for the pipe brackets: 8,0 Nm (5,9 lbf ft).

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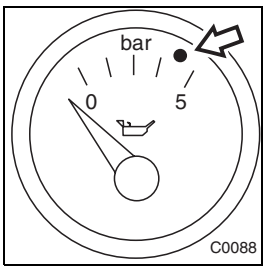
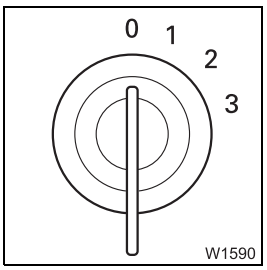
5.1.6 Checks after the engine has been started

Checking instruments

The following indicator and warning lamps must go out when the engine is running:



- Monitor the *Vehicle engine oil pressure* status display as soon as you have started the vehicle engine.



If the oil pressure does not increase after 10 seconds and the warning light on the status display *Vehicle engine oil pressure* status display does not go out, switch off the vehicle engine by turning the ignition key to position **0**.

Battery charge indicator

If the *Charge indicator* warning lamp lights up when the vehicle engine is running, switch off the vehicle engine and attempt to find the cause of the problem; ➠ *Vehicle engine malfunctions*, p. 8 - 29.

Engine control system

If the *Engine malfunction* warning lamp lights up or does not go out, switch the vehicle engine off immediately and eliminate the cause of the malfunction.

Steering circuit I

The steering circuit II warning lamp goes out only when the truck crane is moving at around 10 km/h (3 mph).

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6 Driving the truck crane

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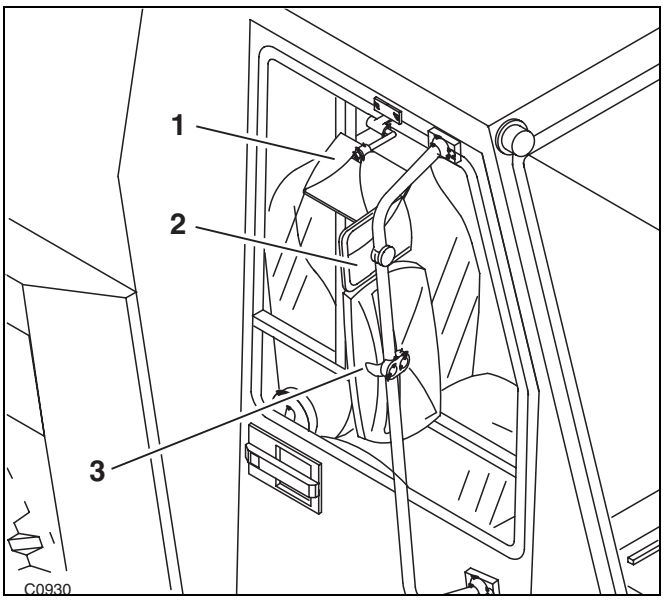
Checking the mirror settings

The crane is equipped with several wing mirrors. Adjust the mirror relative to your sitting position.

- Adjust the wing mirror on the driver's door.



- Adjust the wide-angled wing mirror (**2**) on the right-hand side of the vehicle and the wing mirror (**3**) for the field of view on the right-hand side of the crane.
- Adjust the ramp mirror (**1**) on the right-hand side of the vehicle for the field of view right next to the vehicle at the height of the driver's seat.

Checking the compressed-air and braking system

- Fill the compressed-air supply in neutral gear until it reaches a cut-out pressure of 8.1 bar (117.5 psi).

The *Supply pressure brake circuits I and II* warning lamp will not go out until the pressure in the tanks has reached 5.5 bar (80 psi) (*Supply pressure brake circuits I and II* status display).

You may not begin driving until the air pressure in brake circuit III is sufficient to release the parking brake. The releasing pressure is ca. 5.4 bar (78.3 psi). The *Vehicle parking brake* indicator lamp will not go out until the wheel brakes have been released.

Risk of accidents due to unchecked movement of the truck crane
If the pressure is too low the parking brake will not be released, even if the parking brake lever is in released position.
Use the service brake to stop the truck crane moving when the parking brake is released for a functional check.
Refill the compressed air only when the parking brake is locked!

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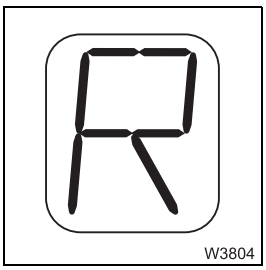
Selecting the driving direction

The following description assumes the following:
– the truck crane is stationary,
– the holding brake is on,
– the vehicle engine is running at idling speed.

Do not use the accelerator before selecting the driving direction and only use the accelerator gradually straight after selection.

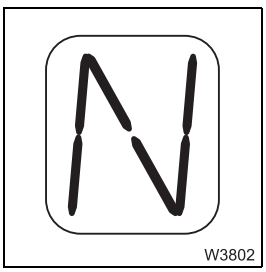
Danger from unexpected movement
If you apply an engine speed which is too high with the accelerator, no gear will be selected immediately following the selection of the driving direction. If, however, the engine speed drops to an acceptable value within 3 seconds (e.g. when you release the accelerator), the gear will be selected immediately and the truck crane may move unexpectedly.

- For **Reverse travel** press the *Transmission mode* ***R*** button once.



An **R** will appear on the *Transmission* display when reverse travel has been selected.

- For **Forward travel** press the *Transmission mode* button **D** once.



The *Transmission* display shows the highest gear which can be selected while driving. 7th gear is always selected and displayed automatically.

The *Downshift* button can be used to lower the highest gear possible. Every time it is pressed, the gear will decrease by once level (6, 5, 4, etc.)

The *Upshift* button can be used to increase the highest gear possible again. Every time it is pressed, the gear will increase by one level.

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Preselecting gears

To increase the braking force of the vehicle engine, you can select a lower transmission mode and switch to driving mode **P**. The automatic transmission will then shift down if the engine speed permits this.

If these isn't sufficient braking power on downhill slopes and the engine speed increases to an impermissible level, the automatic transmission shifts into the next highest gear to protect against excessive engine speed, although this was not the gear previously selected.

If the automatic transmission has already shifted to top gear and engine speed is nevertheless excessive, the engine electronics will throttle the vehicle engine until it switches off.

If the vehicle engine switches off before the truck crane has come to a stationary position:

- Keep calm.
- Do **not** remove the ignition key.
- Stop the truck crane with the foot brake until it has come to a standstill.
- Turn the ignition off.
- Restart the vehicle engine.

Risk of accidents due to truck crane steering not functioning
Under no circumstances should you remove the ignition key, as long as the truck crane is still moving after switching off the vehicle engine. When you remove the ignition key, the steering locks and you will lose control of the moving truck crane. Restart the engine after you have stopped the truck crane.

When driving on surfaces with changing increases and decreases, you should avoid constantly shifting up and down by choosing a suitable gear.

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When you turn on the *Drive 1st axle line/longitudinal differential locks* rocker switch, you trigger the mechanical activation procedures for the drive of the 1st axle line and the longitudinal differential locks. The *Drive of the 1st axle line / longitudinal differential locks* indicator lamp will already light up when one of the activation procedures is complete.
The indicator lamp also lights up when a further activation process is not carried out or completed mechanically (e.g. due to a malfunction).

Switching off drive / longitudinal differential locks

- Stop the truck crane or let it go forward at max. 3 km/h (2 mph).

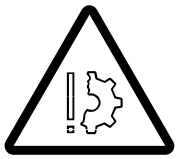
- Switch the automatic transmission into neutral position **N**.

- Press the *Drive of the 1st axle line / longitudinal differential locks* rocker switch down.

- Wait until the *Drive of the 1st axle line / longitudinal differential lock* indicator lamp goes out.
  The indicator lamp only goes out once **all** deactivation procedures are completed mechanically.

If the *Drive of the 1st axle line / longitudinal differential locks* indicator lamp does not go out, assist the deactivation procedure by driving forward and back slowly.

- Once the indicator lamp has gone out, switch the *Level adjustment system* key-operated switch off again.



Transmission damage may occur due to the transfer case not functioning properly.
Make sure you switch the drive of the 1st axle line/the longitudinal differential locks off with the rocker switch *Drive of the 1st axle line / longitudinal differential locks*.
Do not use the level adjustment system key-operated switch.
This prevents faulty switching and damage in the axle center and transfer case.

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6.4 Separate steering

Deutsche GROVE GmbH recommends switching to separate steering when driving on the construction site at low speeds or when steering at a standstill on the construction site.

When you switch on the separate steering, the wheels of the 4th axle line are steered as well. Prerequisites for this:

– the steering lock on the 4th axle line must be unlocked,

– the drag rod joint between the 3rd and 5th axle lines must be separated,

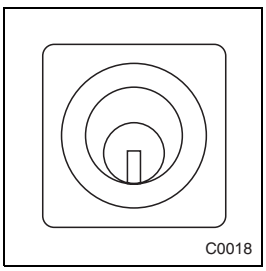
– the drag rods must be connected between the 4th and 5th axle lines.

All locks are held by spring force for normal steering. For separate steering, this spring force is counteracted pneumatically and thus the lock is released.

When separate steering is switched on:

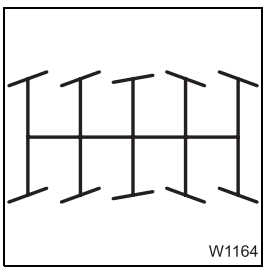
– The wheels of the 1st, 2nd and 3rd axle lines are steered with the steering wheel.

– The 4th and 5th axle lines are steered with the *Separate steering* rocker button on the bottom left side of the driver's seat.



Operation of the separate steering is inhibited by the *Level adjustment system* key-operated switch. Leave the key-operated switch on as long as the aforementioned joints are unlocked or separate.
Re-establish the joints as soon as possible, switch the key-operated switch off again and remove the key.
As long as the *Level adjustment system* key-operated switch is switched on, only the gears **1** and **2** are active in transmission mode **D**.

You can drive with all-wheel steering as well as crab travel mode when the separate steering is switched on.



All-wheel steering:

If you cramp the wheels of the 1st, 2nd and 3rd axle lines and the wheels of the 4th and 5th axle lines in opposite directions, the turning circle of the truck crane becomes smaller.

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- To switch on the auxiliary heater, press down the *Auxiliary heater* rocker switch. The indicator lamp in the rocker switch lights up.

Automatic ignition occurs after a preheating period of approx. 15 seconds. If the heating system does not trigger after 30 seconds, the ignition process is aborted.

The indicator lamp in the rocker switch only indicates that the switch has been pressed and if the heating system is on /off. It does not indicate whether the heating system has been triggered.

The heating system has triggered if:

– The *Auxiliary heater* indicator lamp lights up and
– the air flowing from the blower vents is warming up (heating system for driver's cab) or
– the engine temperature rises (preheating vehicle engine).

Once the heating system has triggered, a thermostat in the heater takes over control of it.

If a malfunction occurs which last around 10 seconds while the heating is on, the heating system automatically shuts down.

To restart the heating system, you must turn off the *Auxiliary heater* rocker switch and turn it back on again.

Switching off the auxiliary heater

- Press the *Auxiliary heater* rocker switch up to turn off the auxiliary heater. The *Auxiliary heater* indicator lamp will go out.
  The heating pump continues to run for about three minutes to cool down the heater.

Turning off the battery master switch while the heater is cooling down does not interrupt the cooling of the heater.

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6.7 Towing a trailer (additional equipment)

A towbar coupling has been installed on the rear side of the chassis to facilitate towing a trailer.

Please observe the permissible trailer load of your truck crane.

Risk of accidents if the trailer rolls away
Before coupling or uncoupling the trailer, it must be secured with the trailer parking brake as well as chocks on the rear axle to prevent it from rolling away. Ensure that it still possible to swivel the unbraked front axle of the trailer.

Before coupling the trailer, adjust the towbar to the height of the towbar coupling.

Risk of accidents when coupling the trailer
No one may stand between the truck crane and the trailer when coupling the two vehicles.

Please observe the professional trade association regulations regarding the coupling and uncoupling of the trailer.

Effects on the axle loads

Pay attention to effects on the axle loads when towing a trailer. The axle loads of your truck crane change in the following manner when operating with central axle trailers:

– Per 100 kg (220 lbs) of drawbar load the axle loads on the first, second and third axle lines is reduced by 25 kg (55 lbs).

– Per 100 kg (220 lbs) of drawbar load the axle loads on the fourth and fifth axle lines is increased by 87 kg (192 lbs).

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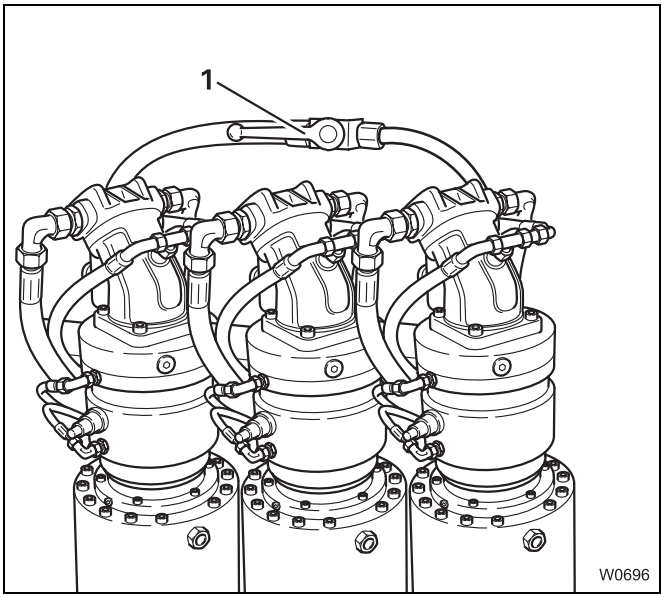
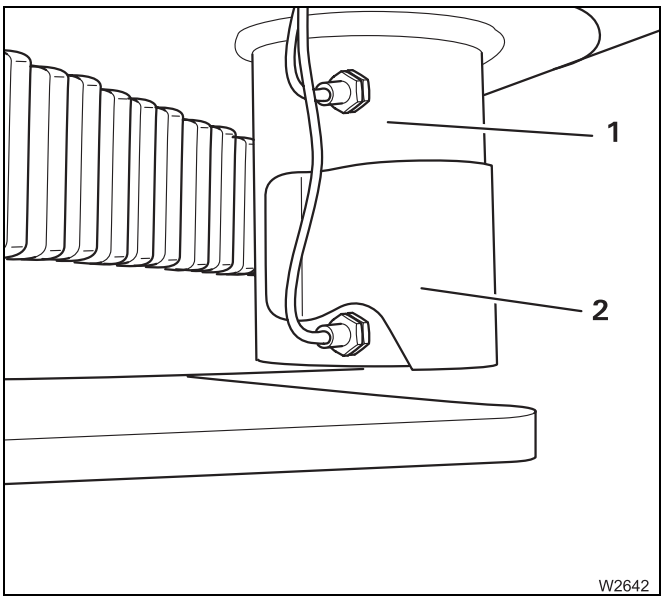


- Release the *Slewing gear free movement* floor switch.

The slewing gear freewheel is only effective when the pressure and return lines are hydraulically connected.

- This is accomplished by opening the valve (**1**).



Before driving with the slewing gear freewheel switched on, you have to secure the locking pin of the superstructure lock against unintentional extension.

- Clamp the fuse box (**2**) onto the cylinder pipe (**1**) of the locking pin.
- Push the fuse box as far as possible onto the cylinder pipe so that the base of the box partially covers the locking pin.

Switching off the slewing gear freewheel after on-road driving; ➠ p. 14 - 18.

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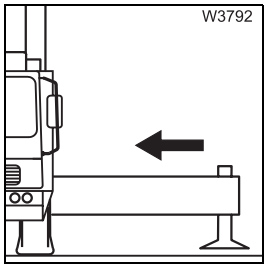
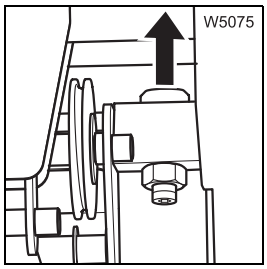
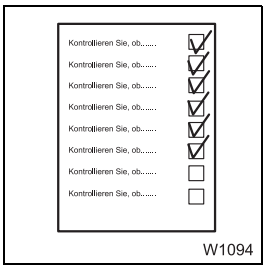


7. Release outrigger beams and retract completely to a span of 2.72 m (8,9 ft).

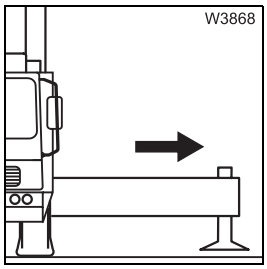


8. Unscrew and set spacers; ➠ *Unscrewing and setting spacers*, p. 7 - 20.



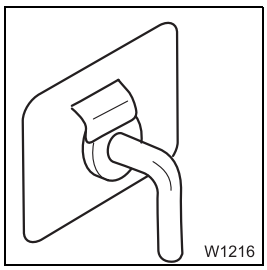
9. Mount the outrigger beam on the opposite side in the same way described in this checklist.

If necessary, install the outrigger beams of the other outriggers (front or rear) in the same way described in this checklist.



10. When the truck crane is in the working area:

Extend the outrigger beams to the necessary outrigger span, secure them and stabilize the truck crane.



11. If the truck crane has to be driven to the work area:

Secure the outrigger beams.

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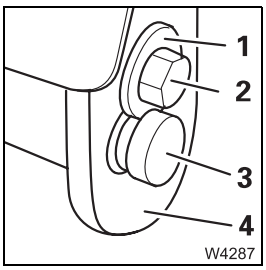
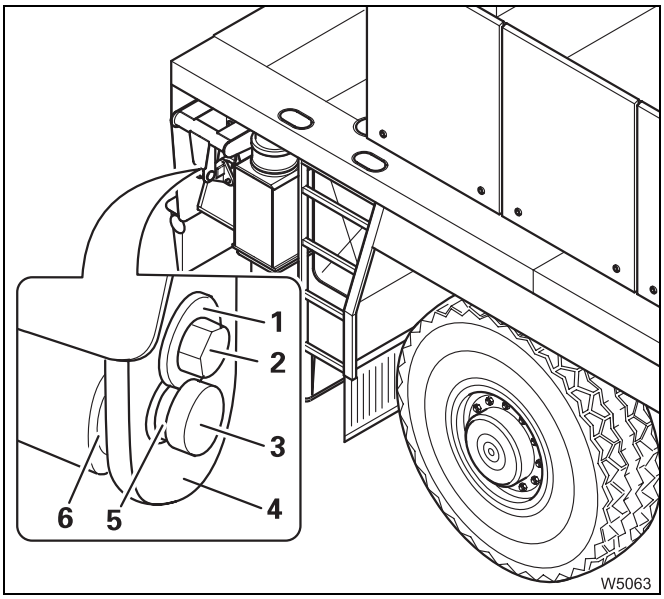
Locking the extension cylinder

To lock the extension cylinder into place, the outrigger beam must be pushed into the outrigger box so that the outrigger span is 5.70 m (18,7 ft) and locked into place with the locking pin.



- Release the pin-type keeper. To do this, unscrew the screw (**2**) and remove it together with the securing washer (**1**).
- Pull the pin (**3**) out of the holder (**4**).

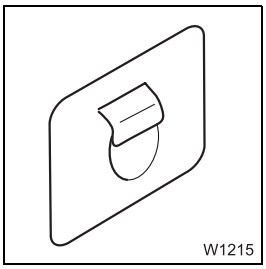


- Lift the extension cylinder until the sleeve (**6**) on the extension cylinder aligns with the holder (**4**).
- Insert the pins (**3**) into the holder; make sure that the recess (**5**) in the pin remains outside the holder.
- Set the securing washer (**1**) into the recess (**5**) of the pin and fasten the securing washer with the screw (**2**).

7.2.10 Extending/reinserting outrigger beams

Extending the outrigger beam

Before you extend the outrigger beams, you must pull out the locking pin.



- Pull the locking pin from the front outrigger beam and insert it into the holder on the outrigger box.

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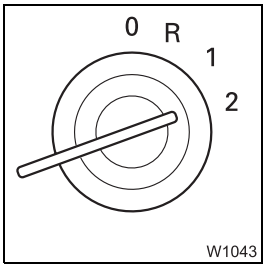
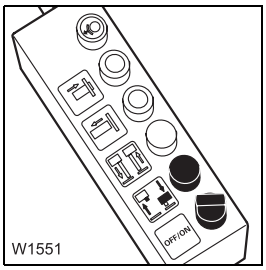
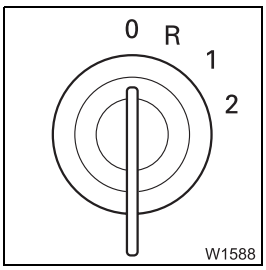


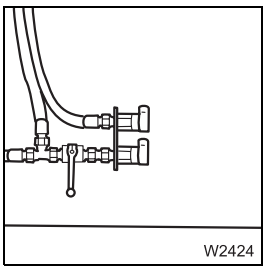
11. Start the crane engine; ➠ *Starting the crane engine*, p. 12 - 12.



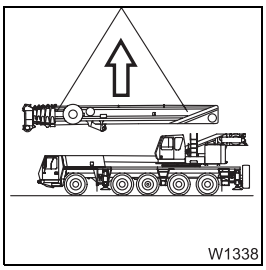
12. Release the pin-type keepers and retract the pins of the boom pivot pin;
➠ *Bottom axle pin-type keepers*, p. 7 - 43,
➠ *Retracting/extending pins*, p. 7 - 45.



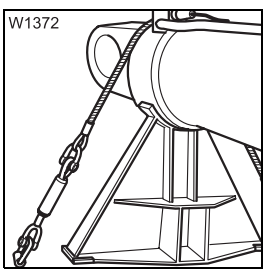
13. Switch off the crane engine; ➠ *Switching off the crane engine*, p. 12 - 18.



14. Detach the connections of the pulling device for the boom pivot pin;
➠ *Hydraulic connection*, p. 7 - 44.



15. Remove the main boom from the superstructure using the auxiliary crane and place on separate vehicle;
➠ *Lifting the main boom from the turntable*, p. 7 - 39,
➠ *Transporting the main boom*, p. 7 - 56.



16. Securing the derricking cylinder for road driving; ➠ *Securing the derricking cylinder for on-road driving*, p. 7 - 56.

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7.3.6 Pulling device on the boom pivot pin (additional equipment)

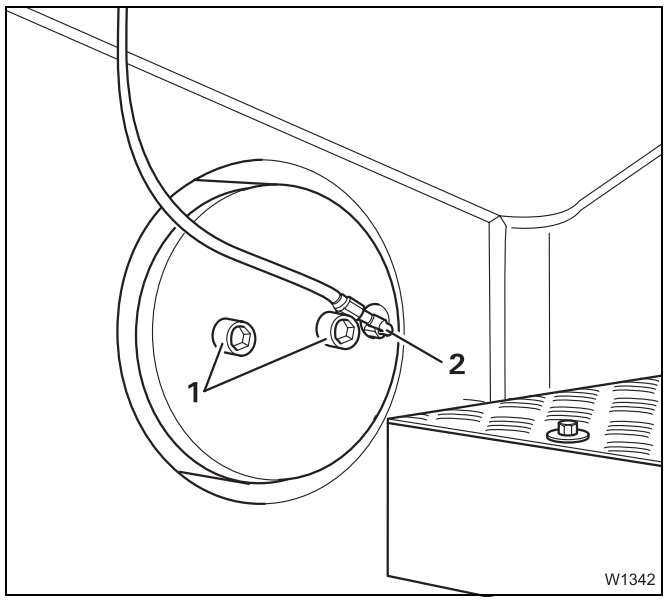
The main boom is locked to the turntable by two pins in the foot section of the boom. There is a hydraulic pulling device at the bottom of the boom which retracts the pins into the bottom of the boom during removal and extends the pins out of the bottom of the boom during installation. Before you can retract the pins, you must:

– remove the pin-type keepers and

– connect the pulling device hydraulically.

Bottom axle pin-type keepers

The pins at the bottom of the boom are secured against unintentional retraction on both sides of the main boom by a screwed-on cap.



Removing of the main boom

Before retracting pins with the pulling device, remove the cap.

- Unscrew the central lubrication connection (**2**).
- Unscrew both of the screws (**1**) and remove the cap.
- Also remove the cap on the other side.
- After removing, screw both caps back onto the pins on the main boom.

Mounting of the main boom

After you have locked the bottom of the boom to the turntable, you must screw the cap back on.

- Put the cap on and fasten it with both screws (**1**) (tightening torque 440 Nm (324,5 lbs ft).
- Screw the central lubrication connection (**2**) into the prescribed bore hole.
- Also fasten the cap on the other side.

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7.3.10 Checks following main boom installation

Risk of malfunctions during crane operation
It is imperative that you perform the checks described below. This will prevent malfunctions during boom installation caused by faulty hydraulic or electrical connections.

Hydraulic system check

- Check whether the boom floating position is switched off; ➠ *Deactivating pressure relief*, p. 7 - 58. The lever of the changeover valve must be secured with a lock.

Risk of accidents from falling boom
The changeover valve must always be secured with a lock to prevent inadvertent operation. The main boom will fall down if boom floating position is switched on while working with the crane with the main boom raised.

Before proceeding with subsequent steps, the following conditions must be met:

– The truck crane is rigged with an outrigger span of 8.50 x 2.72 m (27,9 x 8,9 ft) ➠ *Permissible outrigger spans*, p. 14 - 27.

– The superstructure is slewed to the front.

– The main boom is set down in the boom rest.

- Unlock the telescopic section in which the telescoping cylinder is situated.
- Telescope the telescopic section ca. 1 m (3,3 ft) out and back in.
- Unlock the telescoping cylinder and move it into another telescopic section and lock it there.

Check to see whether the hydraulic lines are properly connected to the shutter of the turntable with quick couplings when:

– Crane movements are not executed consistently with the operation of the control lever.

– The telescopic section cannot be unlocked.

– The main boom cannot be telescoped.

– The telescoping cylinder cannot be locked or unlocked.

– Other errors occur.

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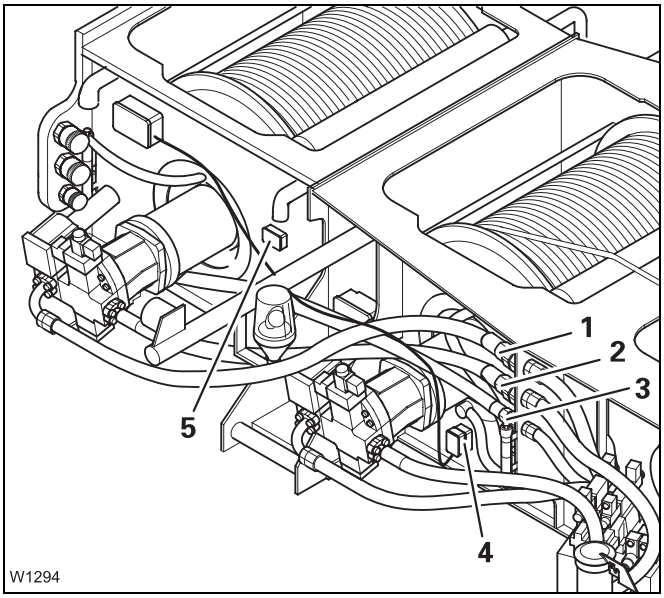

- Unscrew the three hydraulic hoses from the dummy connections and screw them onto connections (**1**, **2**, **3**).
  The connections (**1**) and (**2**) and the associated quick couplings on the hoses are colour coded and the connection (**3**) is smaller.
- Remove the plug from the dummy socket (**5**) and insert it into the socket (**4**) on the main hoist.

7.4.3 Removing the auxiliary hoist

Removal of the auxiliary hoist takes place in the reverse logical order of installation:

– Turn off the ignition and disconnect the electrical and hydraulic connections; ➠ *Establishing hydraulic and electrical connections*, p. 7 - 62.

– Sling the auxiliary hoist to the truck crane; ➠ *Slinging points*, p. 7 - 59.

– Remove axle supports and connecting pins; ➠ *Removing pin-type keeper and pins*, p. 7 - 61.

– Bring the auxiliary hoist into transport mode; ➠ *Transport*, p. 7 - 60.

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8.3 Towing the truck crane

Observe the following when towing the truck crane:

- The truck crane may only be towed with a tow-rod. Attach the tow-rod on the tow-rod coupling on the front bumper of the truck crane and the tow-bar coupling of the towing vehicle.
- The statutory regulations concerning the overall length of the towing and towed vehicle, including the tow-rod must be observed.
- If the vehicle engine, the steering and the service brake still work, you may tow the truck crane with a truck.
- If the vehicle engine, the steering and the service brake no longer function properly, the truck crane must be towed with a special breakdown truck.
- The maximum speed for towing is 25 km/h (15 mph).

The front towing coupling is designed for a maximum tractive force of 10 t (22,050 lbs) when going forward. The tractive force may go forwards or at an angle of 45° to both sides from the longitudinal axle of the truck crane.

8.3.1 Towing in the case of engine or transmission damage

The procedure for towing the truck crane in the case of an engine or transmission breakdown varies depending on how far you need to tow the truck crane, i.e. whether you need to:

- tow it out of the danger area or
- longer distances.

The engine-dependent power steering is only supported by the emergency steering pump of the *Transfer case* during engine failure.
The emergency steering pump only pumps oil if the truck crane is rolling at a minimum of 2 km/h (1.2 mph).

Risk of accidents due to stiff steering
Steering will become difficult if the power steering is only supplied by the emergency steering pump.

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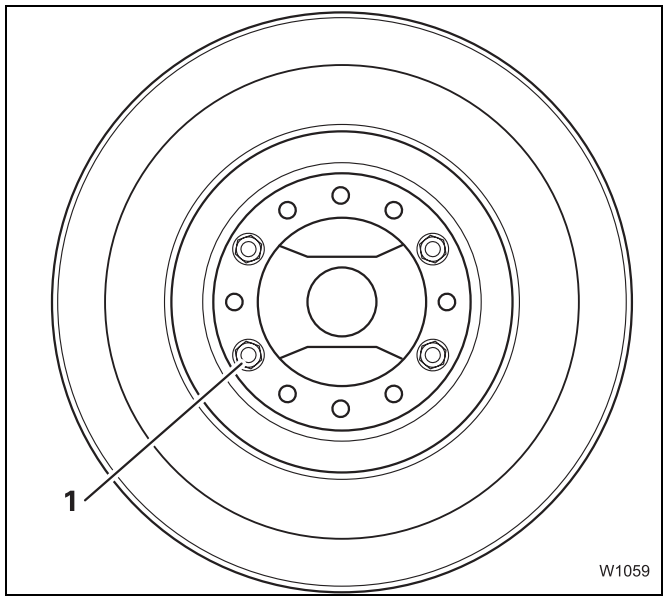
Mounting a damaged wheel on the spare wheel holder

When you lift the wheel with the truck crane on the spare wheel holder, before slewing observe the safety instruction *Danger of overturning with rigged outrigger span 8.50 m x 2.72 m (27,9 x 8,9 ft)* in the previous section.

- Raise the wheel onto the spare wheel holder.



- Screw the spare wheel onto the holder with four nuts (**1**).
  Tightening moment: per 500 Nm (370 lbf ft).

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Desig. in elec. circuit diagram: F 2	Strength (A)	Function
1	10	Not assigned
2	10	Not assigned
3	10	Vehicle engine ECM / ignition lock
4	10	Constant throttle for motor brake
5	10	Level adjustment system / axle spring actuator
6	10	Suspension locking system / steering circuit display I+ II / Separate steering
7	10	Differential locks / transfer case
8	10	Outriggers / electronic level (inclination indicator) / Outrigger pressure indicator

Desig. in elec. circuit diagram: F 3	Strength (A)	Function
1	10	Automatic transmission control panel / Automatic transmission control / Indicator lamp battery charge indicator / Display for automatic transmission oil temperature
2	5	Speedometer
3	10	Heater fan
4	10	Mirror heating / air drier
5	15	Windscreen wiper and washing pump / roof fan (additional equipment) / horn
6	10	Reversing lights
7	20	Rotating beacons
8	15	Flashing lights

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8.7.7 Suspension locking system malfunctions

Malfunction	Cause	Remedy
Suspension locking system cannot be switched off	Compressed air system not sufficiently filled	Let the engine idle. Ten minutes after the indicator lamp for the air pressure in circuit 3 goes out, the fourth circuit is filled for the secondary consumers
	Fuse F2/6 UW defective	Check fuses and replace if necessary

8.7.8 Level adjustment system malfunctions

Malfunction	Cause	Remedy
Level adjustment system not working	Level adjustment key-operated switch switched off	Switch on the level adjustment system key-operated switch
	Automatic transmission is not in neutral	Switch automatic transmission to position **N**.
	Suspension locking system switched on	Switch off the suspension locking system
	Compressed air system not sufficiently filled	Let the engine run idle approx. 10 min. after the indicator lamp for compressed-air circuit 3 goes out (parking brake) the 4th circuit is filled for the secondary consumer
	Fuse F2/5 UW defective	Check fuses, replace if necessary; ➠ p. 8 - 24.

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Front emergency activation			Button V	Designation of the valve in hydraulic circuit diagram
Front outrigger cylinder	retracting	left	2	44 Y 1
		right	8	44 Y 2
	extending	left	4	44 Y 5
		right	6	44 Y 6
Front outrigger beams	retracting	left	1	44 Y 51
		right	7	44 Y 61
	extending	left	3	44 Y 11
		right	5	44 Y 21

Rear emergency activation			Button H	Designation of the valve in hydraulic circuit diagram
Rear outrigger cylinders	retracting	left	1	44 Y 3
		right	8	44 Y 4
	extending	left	3	44 Y 7
		right	6	44 Y 8
Rear outrigger beams	retracting	left	4	44 Y 31
		right	5	44 Y 41
	extending	left	2	44 Y 71
		right	7	44 Y 81

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9.2 Technical data

GROVE truck crane GMK 5200

permitted temperature range: –25 to +40 °C (–13 °F to +104 °F)

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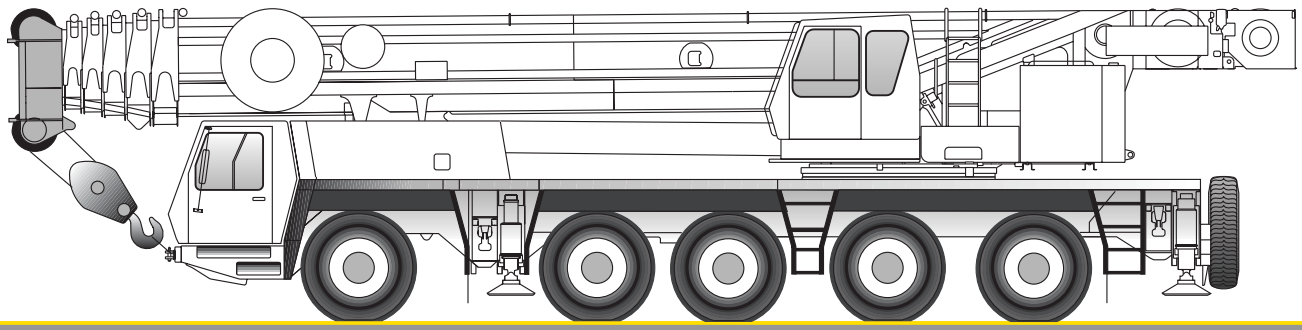
GROVE®

GMK5200



Operating instructions Part 2 – Crane operation

Vehicle serial number:

2 084 829 en
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1 Main hoist ➡ p. 11 - 34

2 Auxiliary hoist (additional equipment) (removed) ➡ p. 11 - 35

3 Counterweight hoist switch unit ➡ p. 11 - 25

4 Counterweight (removed) ➡ p. 14 - 47

5 Hydraulic oil cooler (second hydraulic oil cooler, (additional equipment)) ➡ p. 13 - 97

6 Rear outriggers
Outrigger operation ➡ p. 14 - 23
Installing / removing ➡ p. 7 - 9

7 Shut-off valve for superstructure hydraulic system ➡ p. 12 - 5

8 Hydraulic oil tank, inspection glass ➡ p. 12 - 7

9 Switching valves for hydraulic emergency operation according to ZH 1/461 (additional equipment) ➡ p. 15 - 81

10 Connections for crane control unit ➡ p. 15 - 66

11 Crane cab (inclinable) operating elements ➡ p. 11 - 4

12 Electronic level switch box / ➡ p. 11 - 26
outrigger pressure indicator ➡ p. 11 - 26

13 Switch boxes for outrigger operation ➡ p. 11 - 24

14 Working area spotlight (additional equipment) ➡ p. 11 - 51

15 Boom floating position (additional equipment) ➡ p. 14 - 20

16 Boom pretensioning (additional equipment) ➡ p. 14 - 21

17 Front outriggers (outrigger beam, outrigger pad)
Outrigger operation ➡ p. 14 - 23
Installing/removing ➡ p. 7 - 9

18 Data transmitters

19 Filler neck of fuel tank in crane engine ➡ p. 12 - 11

20 Hoist mirror ➡ p. 13 - 15

21 Crane engine oil filler neck ➡ p. 12 - 8

22 Air intake inhibitor (additional equipment) ➡ p. 12 - 19

23 Central lubrication system *Maintenance Manual*

24 Hook block ➡ p. 14 - 75

25 Slewing gear freewheel ➡ p. 14 - 18

26 Slewing gears ➡ p. 13 - 47

27 Battery master switch ➡ p. 12 - 5

28 Crane engine dipstick ➡ p. 12 - 7

29 Crane engine emergency stop switch (only for additional equipment with air intake inhibitor) ➡ p. 12 - 19

30 Crane engine coolant reservoir ➡ p. 12 - 6

31 Crane engine ➡ p. 12 - 1

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1 Status display for current telescoping of telescopic section I ➠ p. 11 - 43

2 Status display for current telescoping of telescopic section II ➠ p. 11 - 43

3 Status display for current telescoping of telescopic section III ➠ p. 11 - 43

4 Status display for current telescoping of telescopic section IV ➠ p. 11 - 43

5 Status display for current telescoping of telescopic section V ➠ p. 11 - 43

6 Status display for angle of lattice extension with membrane button *)

7 Warning lamp for SLI shutdown ➠ p. 11 - 46

8 SLI early warning lamp ➠ p. 11 - 46

9 Status display for length of lattice extension with membrane button *)

10 Status display for maximum load ➠ p. 11 - 44

11 Status display for degree of utilization ➠ p. 11 - 44

12 Status display for actual load ➠ p. 11 - 44

*) ➠ *Operating instructions lattice extension GMK 5200 / 6220-L*

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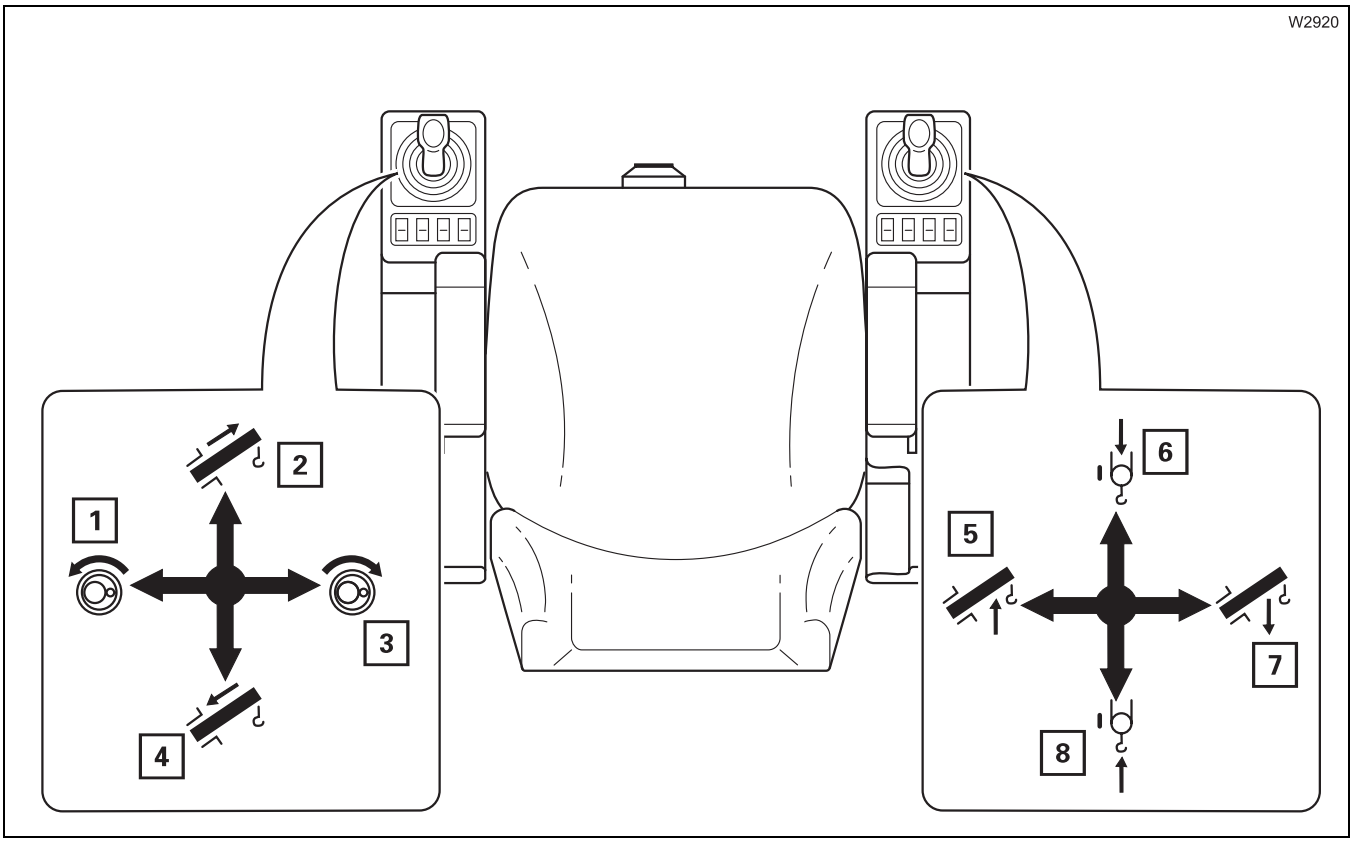
Version 2 (additional equipment)

The illustrations in this section show the control lever allocation in version 1 (truck crane without auxiliary hoist); ➠ *Version 1 (standard)*, p. 11 - 22.



Left-hand control lever allocation

- **1** Slewing to the left
- **2** Extending
- **3** Slewing to the right
- **4** Retracting

Right-hand control lever allocation

- **5** Raise derricking gear / lattice extension [1)]
- **6** Lowering the main hoist
- **7** Lower derricking gear / lattice extension [1)]
- **8** Lifting the main hoist

[1)] Additional equipment

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F1 **"Display statuses" membrane button**

Pushing the button selects the *Display statuses* menu. This menu shows the current statuses and operating hours of the crane engine, the hoists, the derricking gear, the slewing gear, the telescoping mechanism, the control units, the locking devices and, with additional equipment, the lattice extension. If a function is completely or partially blocked by the crane control system due to a malfunction, the menu indicates that a malfunction is present;
➠ *The menu Display states*, p. 13 - 83.

F2 **"Power unit speeds / critical load control" membrane button**

Pressing the button selects the *Power unit speeds / Critical load control* menu. In this menu, you can enter the maximum speed for main boom and lattice extension operation for the slewing gear, hoists, telescoping mechanism, derricking gear and, with additional equipment, for the derricking cylinder or the lattice extension. The critical load control can be switched on and off in a further submenu;
➠ *Menu Power unit speeds/Critical load control*, p. 13 - 87,
➠ *Critical load control*, p. 13 - 95.

F3 **"Control lever emergency program" membrane button**

Pushing the button selects the *Control lever emergency program* menu. If one control lever fails, the corresponding crane motions can be carried out in an emergency using this menu; ➠ *Control lever emergency program*, p. 15 - 70.

F4 **"Telescoping display and teleautomation" membrane button**

Pressing the button selects the *Telescoping display and teleautomation* menu. This menu shows the current telescoping status of all telescopic sections as a percentage.
If all telescopic sections are locked, the current extended length of the telescoping cylinder is shown in metres (feet); ➠ *Telescoping mechanism*, p. 13 - 51.
Pressing the button a second time selects the "Fully automatic telescoping" submenu; ➠ *Automatic telescoping*, p. 13 - 77.

F5 **"Enter telescoping after emergency operation" membrane button**

This button selects the *Enter telescoping after emergency operation* menu. In order to select the menu, the button must be pressed three times in a row within 2 seconds. This menu is required to enter the current telescoping if the crane control system is to be suddenly cut off from the power supply during storage of the values, or if telescoping was done in emergency mode;
➠ *"Entering telescoping after emergency operation" menu*, p. 15 - 78

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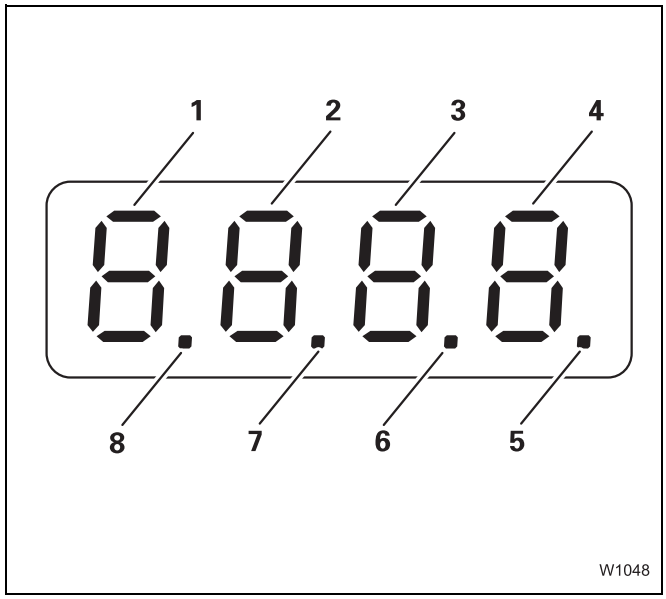
Safe load indicator ➠ *Operating the safe load indicator (SLI)*, p. 13 - 17.



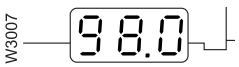
The elements in a display

1-4 Value specifications

5 Signalling point

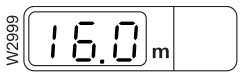
6 Decimal point;
in the *Rigging mode* display:
Separator point between the SLI code and supplement

7-8 Decimal points



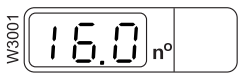
Current telescoping display (telescopic section I - V)

Indicates the current telescoping status of telescopic sections I to V.
Fixed lengths are indicated as decimal values (**0.0**, **0.5** and **1.0**).
Intermediate lengths and telescoping lengths up to 99% are indicated as percentages (**00** to **99**).
The intermediate length of 100% is indicated as a decimal value with a signalling point (**1.0**), and the display flashes.
Structure of a status display; ➠ *The elements in a display*, p. 11 - 43.



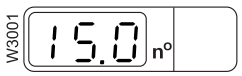
Status display with membrane button for length of lattice extension

Function only exists with additional equipment
(➠ *Operating instructions lattice extension GMK 5200 / 6220-L*).



Status display with membrane button for angle of lattice extension

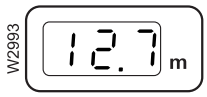
Function only exists with additional equipment
(➠ *Operating instructions lattice extension GMK 5200 / 6220-L*).



Status display for current main boom angle

Displays the current main boom angle to the horizontal in degrees.
For negative angles, a minus sign (-) appears to the left of the number.

Status display for current radius



Displays the current radius in metres (feet).

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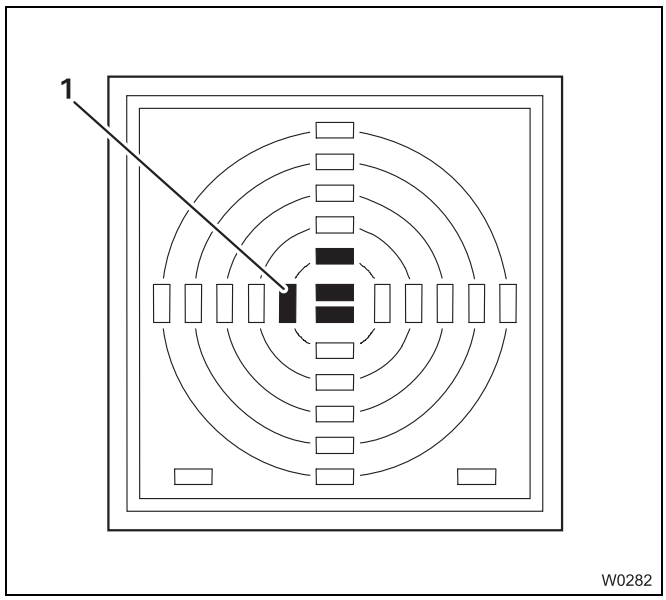
Electronic level in the crane cab

Display of the electronic level in the switch boxes on the carrier;
➠ *Reading the status display*, p. 14 - 43.



The electronic level only displays correct values when the ignition in the crane cab has been switched off on the carrier.

Indicates the current alignment of the truck crane on the LED display (**1**); ➠ *Horizontal alignment*, p. 13 - 35.

Two different measurement ranges can be set.

1°

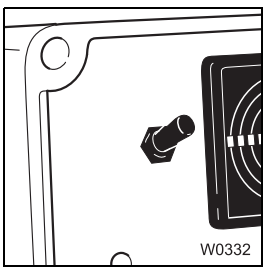
Switching over the rocker switch with indicator lamp for level measurement range
(crane cab)

Changes the measurement range of the electronic level in the crane cab between an angle of 1° and 5°.

Measuring range 0° to 1° inclination:	Press rocker switch down, the indicator lamp lights up. 1 graduated ring corresponds to 0.2° inclination
Measuring range 0° to 5° inclination:	Press rocker switch up; 1 graduated ring corresponds to 1° inclination

Changeover switch Change over measuring range

(Toggle switch in the outrigger switch boxes)
➠ *Switching over the measuring range*, p. 14 - 44.



Changes the measurement range of the electronic level on the carrier between 1° and 5° inclination;

Measuring range inclination 0° to 1°:	Press the toggle switch upwards
Measuring range inclination 0° to 5°:	Press the toggle switch downwards

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11.3 Functional description of the safety devices

11.3.1 Safe load indicator (SLI)

For increased operational safety the truck crane GMK 5200 is equipped with a Safe Load Indicator (SLI) to safeguard against overloading.

Risk of overturning with two-hook operation
Two-hook operation with the boom extension or lattice extension is not stored by the SLI and is not permitted!
Two-hook operation is permitted with the main boom and auxiliary single-sheave boom top only as described in *Operating instructions lattice extension GMK 5200 / 6220-L - Auxiliary single-sheave boom top*.

The safe load indicator prevents 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 crane's rigging mode.

The SLI automatically registers the following factors:	These factors must be set according to the current rigging mode:
– Length of the main boom	– Supporting span
– Angle of main boom	– Counterweight mass
– Actual load (from the pressure load of the derricking cylinder)	– Length of lattice extension Number of hoist rope reeves
– Angle of the lattice extension (additional equipment)	Setting either by entering the individual components or by means of the SLI code.

Danger of overturning if wrong settings are entered into the SLI
The SLI does not automatically assimilate all factors of the 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.

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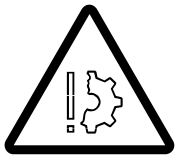
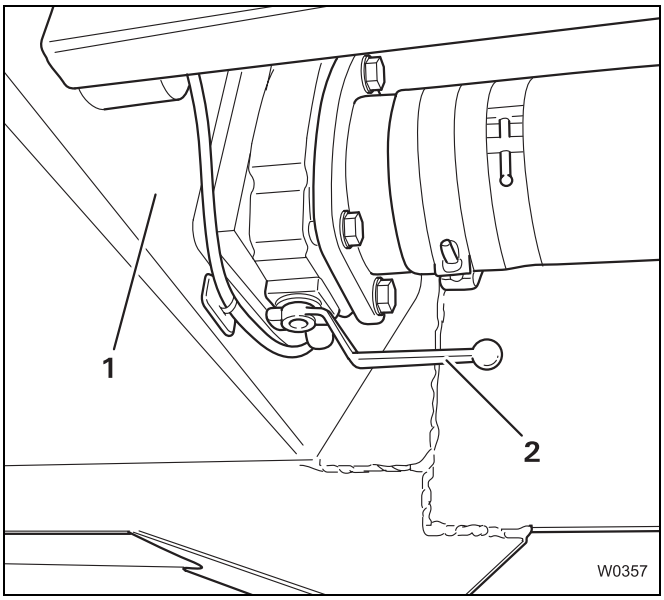
12.1.3 Checks before starting the crane engine

Checking the shut-off valve in the hydraulic system

To start the crane engine, the shut-off valve in the suction line of the hydraulic system must be open.



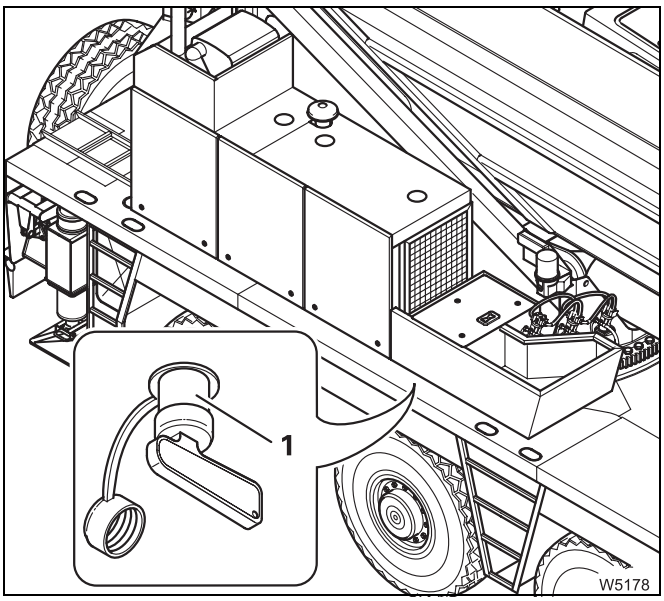
Risk of damage to the hydraulic pumps
The crane engine may only be started if the shut-off valve in the suction line of the hydraulic pumps is open!
The shut-off valve is open when the handle is parallel to the suction line.



The shut-off valve (**2**) in the suction line of the hydraulic pump is located on the inner side wall of the hydraulic oil tank (**1**) for the superstructure, behind the cover plate.

- Check that the shut-off valve (**2**) is open.

Switching on the battery master switch



The battery master switch (**1**) is located on the right-hand side of the superstructure, under the battery box behind the side plate, and is accessible from below.

- Switch on the battery master switch.

The battery master switch is switched on if the selector handle cannot be pulled off.

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Starting the cold crane engine in temperatures below -7 °C (20 °F)

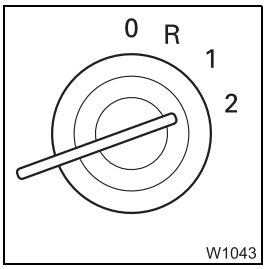
Observe the safety instructions on the use of volatile cold start agents at the start of the section *Starting the crane engine*, p. 12 - 13.

When the outside temperature is under -7 °C (20 °F) you can facilitate the starting of the crane engine by preheating the coolant with the auxiliary water heating system (additional equipment); ➠ *Preheating the vehicle engine* in the section ➠ *Auxiliary water heating system (additional equipment)*, p. 6 - 58.

Risk of engine explosion
If the crane engine has been preheated with the auxiliary water heating system (additional equipment) you may not use the cold start unit (additional equipment). The cold start agent can ignite from contact with hot engine parts, and this can lead to an explosion.

The start process is the same as is described under *Starting the warm crane engine* in this section. Observe the times given here for maximum activation.

When using the cold starting unit (additional equipment):



- Turn the ignition key to position **2** and hold it there.

- Also press the *Cold start unit* rocker button.

When the container carrying the cold start agent is empty, change it; ➠ *Cold start device - changing the cartridge containing the cold start agent*, p. 15 - 5.

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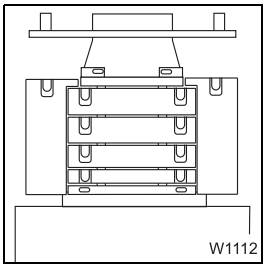
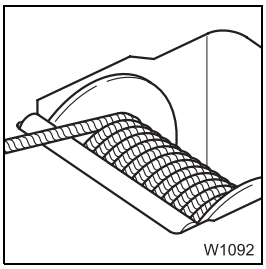
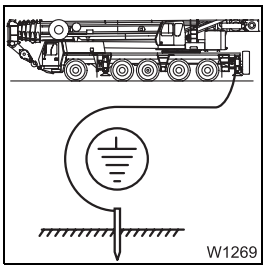
11. The safety devices have been checked for perfect working order:
– SLI
– Lifting limit switch
– Dead man's switch system
– Crane control emergency stop switch
➠ *Checking the safety devices*, p. 13 - 8.



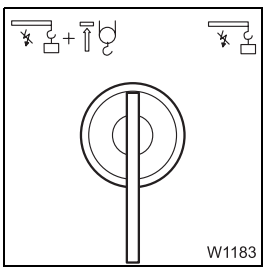
12. The counterweight version required in accordance with the *Lifting capacity table* is rigged; ➠ p. 14 - 47.



13. The position of the hoist ropes on the hoist drum has been checked; ➠ p. 13 - 7.

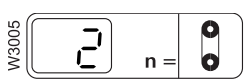


14. The truck crane is earthed as necessary;
➠ *Earthing the truck crane*, p. 14 - 13.



15. The key has been removed from the *Override* key-operated switch for the SLI and the lifting limit switch has been removed; ➠ *SLI override*, p. 13 - 34.

16. 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 - 23.



17. The number of the reeved rope lines for the corresponding hoist has been entered with the membrane switch or via the numerical pad and is shown on the *Reeving* display; ➠ *Setting the rigging mode*, p. 13 - 20.

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- Press the *Superstructure lock* rocker switch downward.

When the locking pin moves, the *Superstructure unlocked* indicator lamp goes out.

The *Superstructure locked* indicator lamp lights up when the locking pin reaches the lower final position.

If the locking pin does not exactly engage with the bore in the carrier, the *Superstructure locked* indicator lamp does not light up. In this case turn it slightly from side to side until the indicator lamp *Superstructure locked* lights up.

13.1.7 Houselock (additional equipment)

As additional equipment, the truck crane may be equipped with a houselock. The houselock basically consists of a slewing ring segment which is pushed into the slewing ring by a hydraulically actuated cylinder. This makes it possible to create a positive fit between the superstructure and carrier.
The cylinder can be operated from the crane cab.

You can only switch on the houselock if the superstructure is in a position in which the indicator lamp in the *Houselock on/off rocker button* is lit. The *Switch on houselock* function is only released if the slewing gear holding brake is engaged beforehand.

Switching on the houselock

The *Houselock off* indicator lamp lights up.

- Rotate the superstructure to the position in which it is to be locked. Stop the movement in such a way that the indicator lamp in the *Switch houselock on/off* rocker button lights up.

- Switch on the slewing gear permanent brake. To do this push down the *Slewing gear holding brake* rocker switch.

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Entering values

You can only enter values when the SLI is in input mode. Depending on the display, there are two ways of entering the desired value. On the status display you can

– select the desired value in **single steps** or

– enter the values **directly via the numerical pad**.

The following table shows which displays are activated in connection with the flashing SLI code and assigns the entry options to the various displays.

	Activated with SLI code for		**single steps**	**via numerical pad**
	Main boom	Lattice extension		
Outrigger span	**X**	**X**	**X**	
Counterweight	**X**	**X**	**X**	
Rigging mode	**X**	**X**	**X**	**X**
Reeving	**X**	**X**	**X**	**X**
Lattice extension length (additional equipment)		**X**	**X**	

In the detailed descriptions of the entry options in this section, the *Counterweight* display is generally given as an example.

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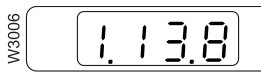
Example of an error display:



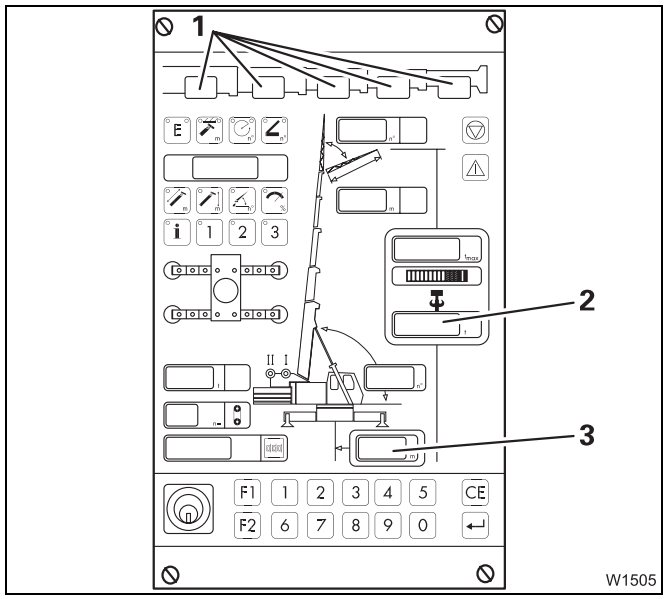
An error code consists of three different numbers which are separated by decimal points in the display. Read from left to right, the numeric values stand for:

The error group:	e.g.	**1**
The components in this error group	e.g.	**13**
The type of error	e.g.	**8**

Table of error messages with possible causes and remedies;
➠ *Malfunctions on the SLI*, p. 15 - 29.

Error messages with additional optical displays

In addition to SLI shutdown, some error messages are indicated by the respective display flashing. The following displays flash:



Either

– The display *Current telescope status, telescopic section I to V* (**1**).

or

– The *Actual load* display (**2**) and
– The *Current radius* display (**3**).

or

– The *Current telescope status, telescopic section I to V* displays (**1**) and
– The *Actual load* display (**2**) and
– The *Current radius* display (**3**).

Flashing values mean that the SLI can no longer safely calculate these values. The error message occurs if the SLI detects deviations between measured and calculated values that are too great, or if the values from the SLI and the crane control deviate from each other (e.g. after a manual entry of a telescoping status on the *Crane control* display). Countermeasures;
➠ *Malfunctions on the SLI*, error messages 1.19.1 and 3.06.3 in the *SLI error message table*, from p. 15 - 30.

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The hoist rope is stiff at low temperatures. A weight must be added if the repeatedly reeved hook block cannot be lowered.
You must operate the hoist slowly when reeling in the rope, as stiff rope is difficult to wind.

You can use the *Main hoist shutdown* rocker switch on the right control lever to prevent accidental actuation of the main hoist.
To do this, press the rocker switch downward.

F1

You can display the operating hours and possibly the blocked functions of the hoist on the *Crane control* display with the membrane button *Display status*; ➠ *The menu Display states*, p. 13 - 83.

Auxiliary hoist (additional equipment)

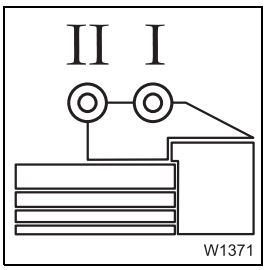
You can work on the main boom or, with additional equipment, also on the two-stage swing-away lattice extension or on the boom extension using the hoist rope of the auxiliary hoist.

Risk of accidents due to accidental operation of a hoist
Always switch off the hoist that is not in use.
You are not allowed to turn the drum if the hook block is unreeved and you have completely reeled in the hoist rope.

– If the hoist rope is rotated unintentionally in the lowering direction, the switching point of the lowering limit switch shifts resulting in slack rope. This results in rope loops forming on the hoist drum that lead to load slippage and to the hoist rope being destroyed.
– If the hoist rope is accidentally rotated in the direction of lifting, the switching point of the lowering limit switch shifts to produce fewer safety

- Switch on the auxiliary hoist.
  Press the *Auxiliary hoist shutoff* rocker switch on the left-hand control lever upward.

- Check whether the main hoist is switched off to prevent accidental actuation.
  The *Main hoist shutoff* rocker switch must be pressed down.



Lamp **II** of the *Hoists* indicator lamp is activated when the auxiliary hoist is switched on.
Lamp **II** lights up if only the auxiliary hoist is switched on.
Lamp **II** flashes when the main hoist was still switched on.

The lamp which lights up must always be for the hoist with which the load is to be lifted. Switch over the status display if necessary; ➠ *Switching over the Hoists indicator lamps*, p. 13 - 26.

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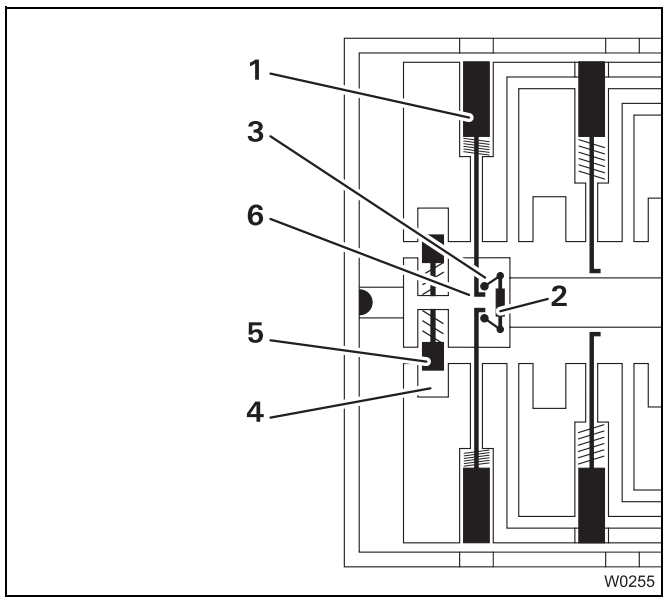
Telescoping cylinders and telescopic sections can be locked and unlocked at all locking points. In order to telescope, the telescoping cylinder must be locked with the corresponding telescopic section and the telescopic section must be unlocked.



The locking pins (**5**) are pushed into the bores (**4**) of the telescopic section by spring force in order to lock the telescoping cylinder.

To unlock the telescopic section, a hydraulic cylinder (**2**) is extended.
The mechanism (**3**) transfers this movement to the brackets (**6**) and retracts the locking pins (**1**) against the spring force.

After telescoping, the telescopic section is re-locked in the reversed sequence as for unlocking.
For unlocking the telescoping cylinder, the locking pins are hydraulically retracted against the spring force.

The locking pins of the telescoping cylinder and of the mechanism are moved hydraulically. The necessary pressure for this comes from a reservoir which must be filled first. This can result in retardations of 2 to 3 seconds.

A hydraulic/mechanical switch and the crane control prevent a telescopic section from being unlocked at the same time as the telescoping cylinder. A telescopic section can only be unlocked if the telescoping cylinder is locked and vice versa.

Main boom fixed length, intermediate length, telescoping length

Main boom fixed length

All telescoping statuses are usually called main boom fixed lengths if all telescopic sections are locked. Higher load bearing capacities are only permitted if all telescopic sections are locked.
For the GMK 5200, due to the number of possible locked telescoping statuses for the same length of the main boom, only the telescoping statuses with the highest lifting capacities are enabled as main boom fixed lengths. There are thus a total of 32 main boom fixed lengths (➠ *Lifting capacity table*).
The lifting capacity values for the fixed lengths of the main boom are automatically monitored by the SLI.

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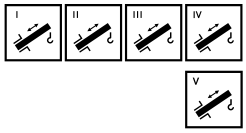
Checking the position of the telescoping cylinder

The current telescoping is now known; the next thing you should do is check in which telescopic section the head of the telescoping cylinder is located.



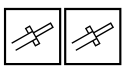
One of the indicator lamps *Telescoping cylinder in foot section* I, II, III or IV indicates the position of the telescoping cylinder.
The corresponding display lamp lights up when the head of the telescoping cylinder is locked at the locking point in the foot section of the respective telescopic section.

Definition: If the statement: "The telescoping cylinder is in foot section II" appears in the following chapters, this means that the "head" of the telescoping cylinder is in the foot section.

In our **example** the initial position is defined as follows: The telescoping cylinder in telescopic section IV is locked, thus the head of the telescoping cylinder must be there. The *Telescoping cylinder in foot section* IV indicator lamp would then light up.

Checking the position of the locking pins

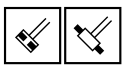
If you know in which telescopic section the telescoping cylinder is located, check the positions of the locking pins as the last initial position.



Both indicator lamps *Telescopic section unlocked* and *Telescopic section locked* display the position of the locking pins in the telescopic section in which the telescoping cylinder is located.

The **red** *Telescopic section unlocked* indicator lamp lights up if the telescopic section is **not locked** to the telescopic section above it.

The **green** *Telescopic section unlocked* indicator lamp lights up if the telescopic section is **locked** to the telescopic section above it.



The two indicator lamps *Telescoping cylinder unlocked* and *Telescoping cylinder locked* show the position of the locking pins at the telescoping cylinder.

The **red** indicator lamp lights up if the telescoping cylinder is **unlocked**.

The **green** indicator lamp lights up if the telescoping cylinder is **locked** to the telescopic section in which it is located.

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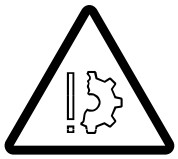
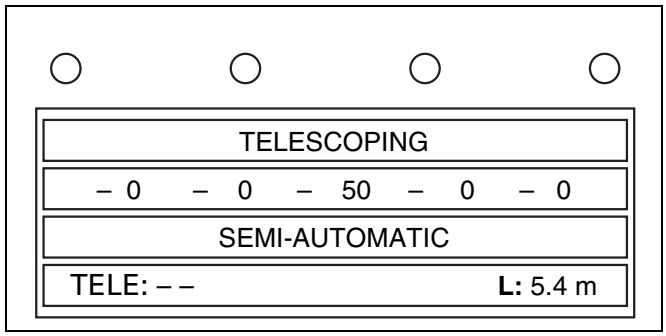


Risk of damage to the telescoping cylinder
Keep on moving the control lever until the green indicator lamp *Telescopic section locked* stops flashing and goes out. If necessary, move the telescopic section slightly from side to side until the indicator lamp lights up.
Only then is the locking process completed and the telescopic section is connected by force with the telescopic section above it. In this way you prevent the load from affecting the telescoping cylinder when the crane is in operation, and enable the release of a load for fixed lengths.

- Complete the telescoping process, and move the control lever to the middle position.



As soon as the telescopic section is locked, the brackets surrounding the numerical value for the telescopic section disappear.
Both dashes are now displayed again on the left side of the lower line.
The display to the lower right changes back to the current extended length of the telescoping cylinder (in the example, **L:** 5.4 m (17,7 ft)).

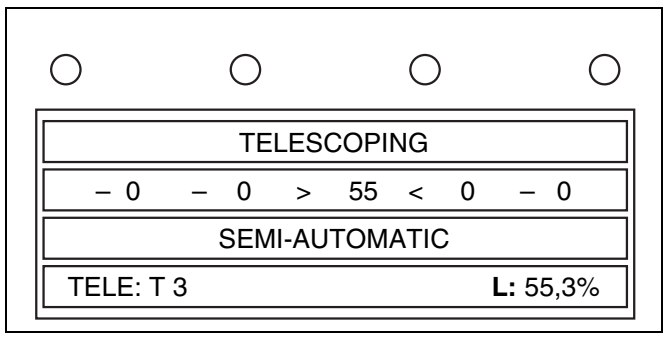
Locking the telescopic section at the next but one fixed length

This applies if you want to telescope a telescopic section from e.g. 0% to 100% or vice versa.

Before you telescope a telescopic section, the prerequisites at the beginning of this chapter must be fulfilled.

- Check if the *Telescoping mechanism on* indicator lamp is on and telescope the telescopic section.

The following actions can be performed simultaneously. You do not need to interrupt the telescoping process.



The numerical value in brackets and the value at the bottom right of the display change continuously as you telescope the telescopic section (e. g. telescopic section III).

- Watch the telescoping process on the display (e. g. **L:** 55%).

Wait until the first fixed length of this telescopic section has been exceeded (e. g. up to 55%; the first fixed length for T 3 is at 50%).

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13.3.8 Menus on the crane control display

You can call up various menus on the *Crane control* display. In these menus, you can find information about the power units, you can enter some values and error messages are displayed. You can directly select five different menus:

– The *Status display* menu
– The *Power unit speeds/critical load control* menu
– The menu *Control lever emergency operation*
– The *Telescoping display and teleautomation* menu
– The *Telescoping after emergency operation* menu.

Error messages and a sub-menu *Emergency program* are displayed automatically and with priority; ➠ *Display of an error message*, p. 13 - 92.
Whenever submenus are allocated to a menu, you can call these up from within the open menu.

Not all menus are described in this section:
The menu *Control lever emergency program*, p. 15 - 70
"Entering telescoping after emergency operation" menu, p. 15 - 78,
Emergency operation submenu, p. 15 - 72.

The menu *Display states*

In this menu you can display the operating hours of all power units and read off the present malfunctions. The operating hours of the crane engine correspond to the superstructure operating hours, which are specified in the *Maintenance Manual*.

F1

- Select the menu. Press the *Display states* membrane button once.

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Acknowledging error messages

You can acknowledge an error message and thus return to the menu which was selected before the error message occurred.

Enter

- Press the *Enter* membrane button once to acknowledge. There are three possible reactions:

– If there is no further error message present, the display switches back to the menu which had been selected before the error message occurred.

– If there are further error messages present, the next error message now appears on the display. You can acknowledge all error messages one after the other.

– If the error message was displayed because the crane control cannot detect any lengths and positions (proximity switch or length indicator is faulty or the line has been cut), the crane control switches to the *Emergency operation submenu*, p. 15 - 72 after the acknowledgement.

Calling up error messages again after acknowledging them

All acknowledged error messages are saved in the submenu *Error memory*. As long as the ignition remains switched on, you can call up the acknowledged error messages again:

F1

- To do this, change to the *Statuses* menu.

↑ ↓

- Call up the menu item for the power unit responsible for the error message.

→

- Change to the *Error memory* submenu. You can have another look at the acknowledged error messages here.

The error memory is erased each time the ignition is switched off. As long as the cause of error has not been eliminated, the error message reappears after switching on the ignition and moving the power unit concerned and is again stored in the error memory after being acknowledged. This way, you can make a note of the error message after switching off the ignition to, for example, contact ***CraneCARE***.

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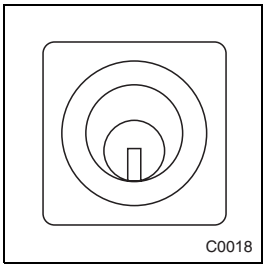
Risk of overturning if the outrigger cylinders are retracted too far
To reduce the risk of the crane overturning do not raise the outrigger pads more than 5 to 10 cm (2 to 4 inch) off the ground. Leave the outrigger beams extended.

Switching on separate steering

Before driving with the rigged crane you must switch on separate steering:



- Switch on the *Level adjustment system* key-operated switch.

- Switch on separate steering. To do this, disengage the *Separate steering* rocker switch and press it down.

Risk of damaging the steering linkage
Before driving the rigged crane always switch on separate steering. Steer the truck crane only when the vehicle is moving.
If separate steering is switched off or if you steer with the vehicle stationary the steering linkage may become damaged.

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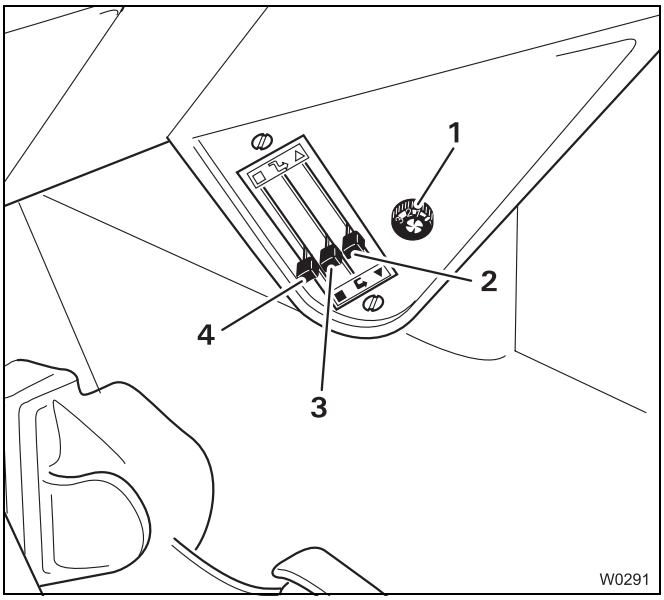
13.6.4 Ventilating the crane cab



- Push the regulator *Temperature* (**4**) as far upward as possible (cold position).
- Push the *Re-circulated air / fresh air mode* regulator (**3**) as far upward as possible (fresh air position).
- Push the *Windscreen / cab floor air distribution* regulator (**2**) to the central position (all nozzles).
- Switch the rotary switch for the heater fan (**1**) to level **3**.

Various windows in the crane cab can also be opened for ventilation;
➠ *Doors, keys, windows*, p. 11 - 59.

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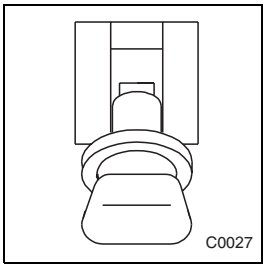
14.1 Checklists for rigging work for crane operation with main boom

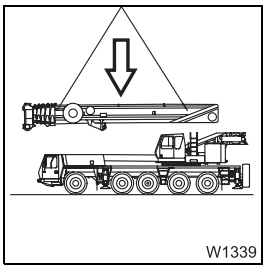
14.1.1 CHECKLIST: Rigging

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

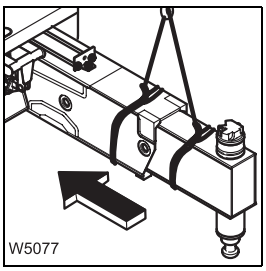
1. Choose a suitable site; ➠ p. 14 - 9.



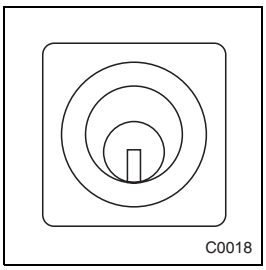
2. Check whether the parking brake is locked (parking brake lever points toward the rear).



3. If necessary, mount the main boom; ➠ p. 7 - 29.



4. Reinstall the removed front outrigger beam if necessary; ➠ *Rigging the outrigger beam*, p. 7 - 9.



5. Lower the truck crane as far as possible and align horizontally using the level adjustment system in the driver's cab; ➠ *Activating the level adjustment system*, p. 6 - 42.

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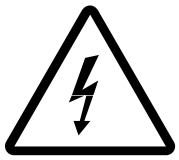
14.2.3 Earthing the truck crane



Risk of accidents due to electric shocks
Earth the truck crane before starting crane work
– near strong transmitters (radio transmitters, radio stations, etc.),
– near high-frequency switching stations,
– if a thunder storm is forecasted.

The truck crane can become electrostatically charged. This applies in particular if the truck crane is equipped with synthetic outrigger pads or the outrigger pads are packed with insulated material (e.g. wooden planks).

Earthing the truck crane

To prevent electrostatic charging of the truck crane, you will need:

– an electrically conductive metal rod to be placed in the earth (approx. 2.0 m (6,6 ft) long),
– an electrically conductive cable (minimum cross section 16 mm^2 (0,016 $inch^2$),
– a screw clamp for welding work.

Risk of accidents due to electric shocks
Ensure that the connection between the truck crane and the ground is in perfect condition.

- Connect one end of the cable to the metal rod that is to be inserted into the ground. Hammer the metal rod at least 1.5 m (5 ft) into the ground. Moisten the soil around the metal rod for better conductivity.

Risk of accidents due to electric shocks
Fasten the screw clamp for welding work on welded parts of the main boom or the superstructure only. Do not fasten the clamp to screwed on parts such as valves, cover plates, engines, gear units, etc.

- Connect the other end of the cable to the screw clamp for welding work and fasten the clamp to the main boom or the superstructure.

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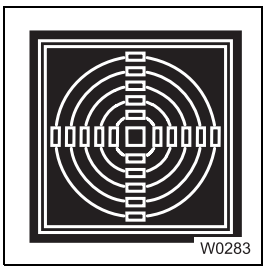
14.4 Outriggers

Risk of crushing when extending outriggers
You may activate the outriggers only if you yourself or a banksman with whom you are in visual contact have an unobstructed view of their movements.

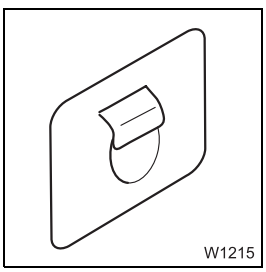
14.4.1 CHECKLIST: Extending the outriggers

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

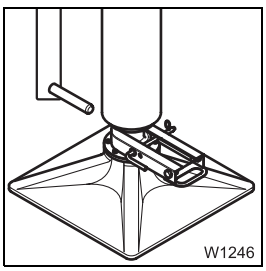


1. Align and lower the truck crane horizontally with the level adjustment system; ➠ *Securing / releasing the outrigger beams*, p. 14 - 30.

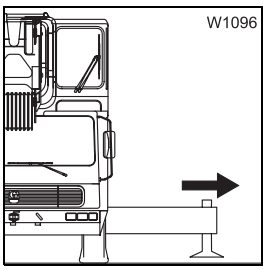
2. Switch on the suspension locking system; ➠ p. 14 - 29.



3. Tighten all four locking pins and plug into the holders;
➠ *Releasing the outrigger beams*, p. 14 - 31.



4. Move the outrigger pads into working position and lock them into place; ➠ p. 14 - 38.



5. Extend all outrigger beams to the necessary span of the desired outrigger span;
➠ *Permissible outrigger spans*, p. 14 - 27,
➠ *Extending / retracting the outrigger beams*, p. 14 - 32.

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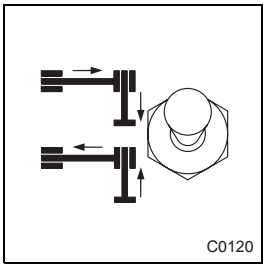
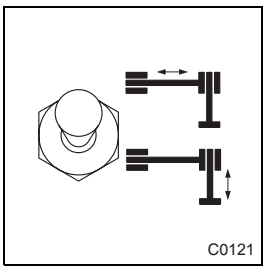
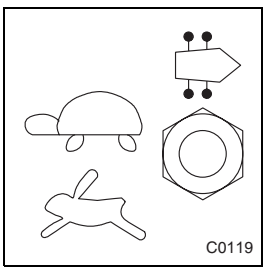


- Press up the *Preselection of direction of outrigger movement* toggle switch.



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



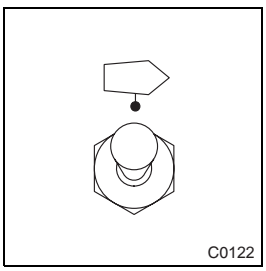
Two speeds are available for extending the outrigger beams:

Quick outrigger movements:

- Press down the *Outriggers* central toggle switch. The speed of the vehicle engine is increased.

Slow outrigger movements:

- Press up the *Outriggers* central toggle switch. The vehicle engine continues running at idling speed.



- Also press the toggle switch for the desired outrigger beams (e.g. front right).
- Extend all four outrigger beams to the necessary span of the desired outrigger span; ➠ *Permissible outrigger spans*, p. 14 - 27.

You can also extend or retract the outrigger beams on the side where you are standing in pairs when you simultaneously press two toggle switches (e.g. both toggle switches for front right and rear right).

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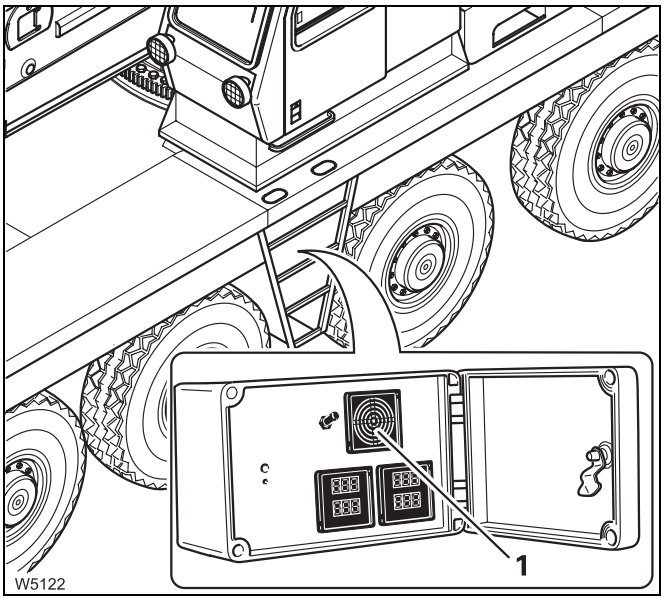
14.4.9 Aligning the truck crane horizontally

Before working with the crane, you must align the truck crane horizontally with the outrigger cylinders. The current alignment of the truck crane is displayed by two electronic levels on the carrier.

The electronic level only displays correct values when the ignition in the crane cab has been switched off on the carrier.

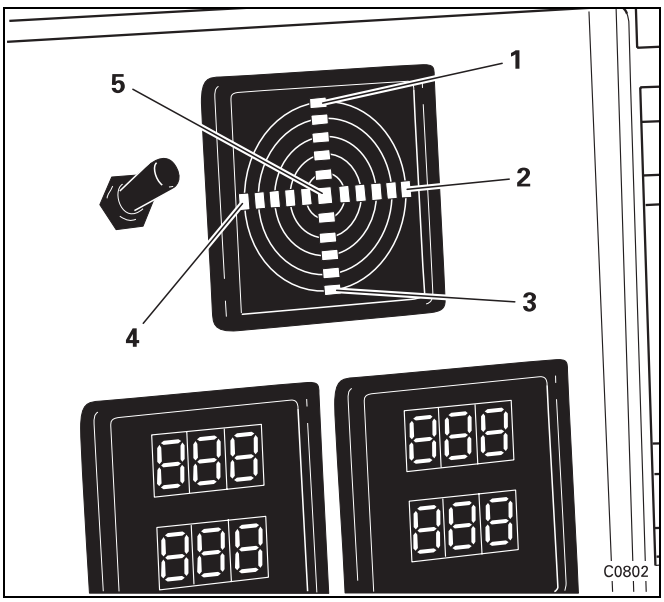


The electronic level (**1**) is located on both sides of the carrier in a switch box behind the steps.

The status display is activated in both control boxes as soon as you open the door of one control box.

Reading the status display

Whenever the truck crane is higher on one side, the diodes in the cruciform arranged bars (**1** to **4**) light up. Each bar corresponds to one particular direction.



- **(1)** The side of the truck crane opposite to you is higher than the side where you are.
- **(2)** The truck crane is higher to the right of the status display than it is left of it.
- **(3)** The side of the truck crane where you are is higher than the side opposite to you.
- **(4)** The truck crane is higher to the left of the status display than it is to the right of it.
- **(5)** The truck crane is horizontal

Diagonal inclines are displayed with the diodes on twobars next to each other lighting up simultaneously.

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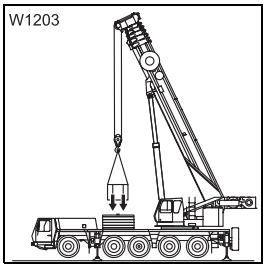
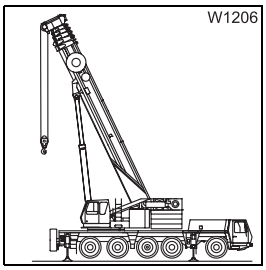
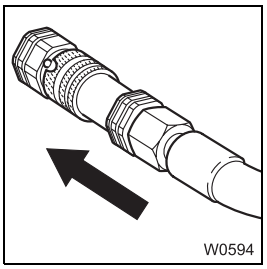


3. **If 64 t or 70 t counterweight is to be rigged**:
Lift the two 10 t or 13 t counterweight blocks one after the other from the separate vehicle with the truck crane and attach them in the holdings of the upper 10.5 t counterweight section; ➠ *Assembling the counterweight version*, p. 14 - 61.

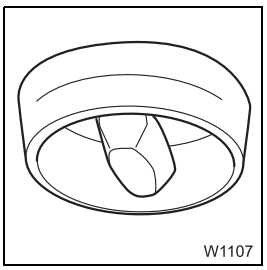


4. Slew the superstructure to the rear.

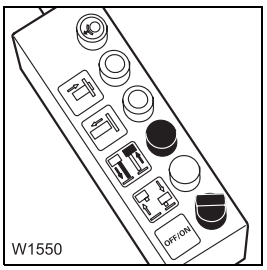
5. Lock the superstructure; ➠ *Superstructure lock*, p. 13 - 11.



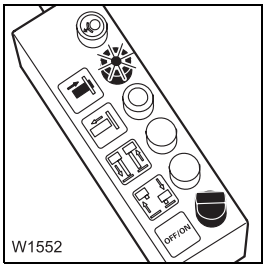
6. Establish the hydraulic connection at the 5.4 t base plate;
➠ *Establishing / releasing hydraulic connection*, p. 14 - 59.



7. Check that the lock on the turntable is open;
➠ *Locking the counterweight*, p. 14 - 72.
From 44 t counterweight and/or if the 3.5 t counterweight section is equipped with installation rods (additional equipment), also check if the pins on the 3.5 t counterweight section lie with the hand grips in the back openings;
➠ *Locking the 3.5 t counterweight section*, p. 14 - 67.



8. Extend the lifting cylinders on the 5.4 t base plate to lift the counterweight; ➠ *Extending / retracting the 5.4 t base plate or raising / lowering the counterweight*, p. 14 - 68.



9. Lock the counterweight to the turntable; ➠ *Locking the counterweight*, p. 14 - 72.

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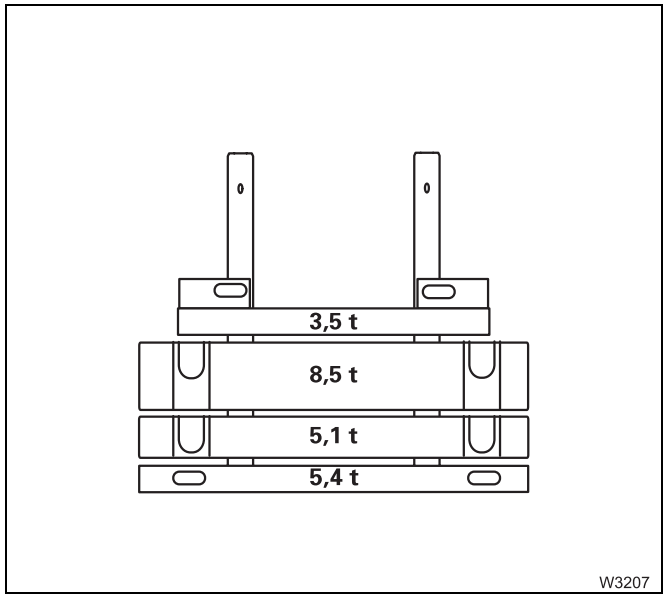
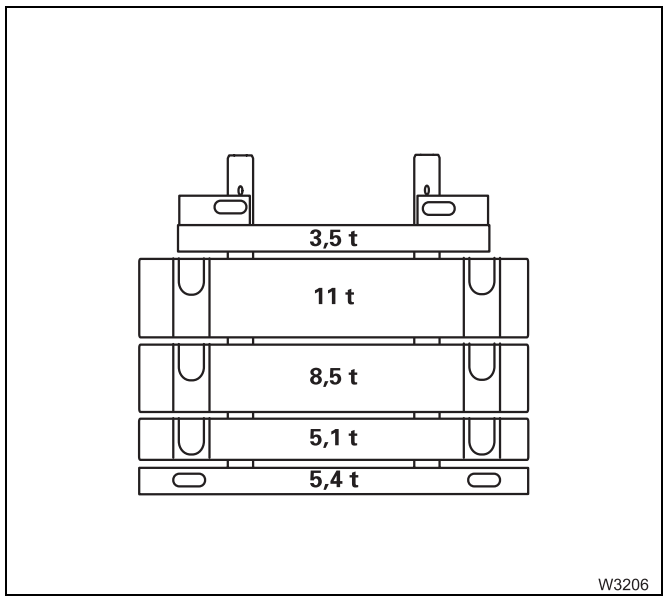


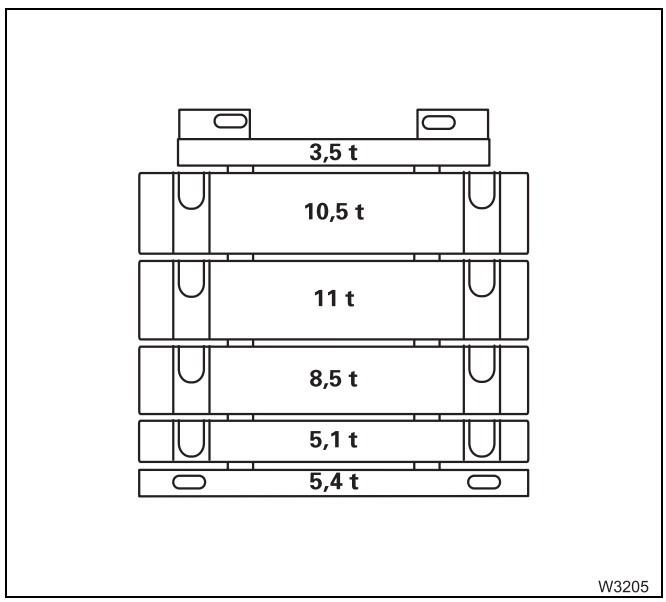
22.5 t (49,600 lbs) counterweight combination

- Hoist one after another
  – the 5.1 t counterweight section,
  – the 8.5 t counterweight section and
  – the 3.5 t counterweight section
  onto the 5.4 t base plate.



33.5 t (73,850 lbs) counterweight combination

- Hoist one after another
  – the 5.1 t counterweight section,
  – the 8.5 t counterweight section,
  – the 11 t counterweight section and
  – the 3.5 t counterweight section
  onto the 5.4 t base plate.



44.0 t (97,000 lbs) counterweight combination

- Hoist one after another
  – the 5.1 t counterweight section,
  – the 8.5 t counterweight section,
  – the 11 t counterweight section,
  – the 10.5 t counterweight section and
  – the 3.5 t counterweight section
  onto the 5.4 t base plate.

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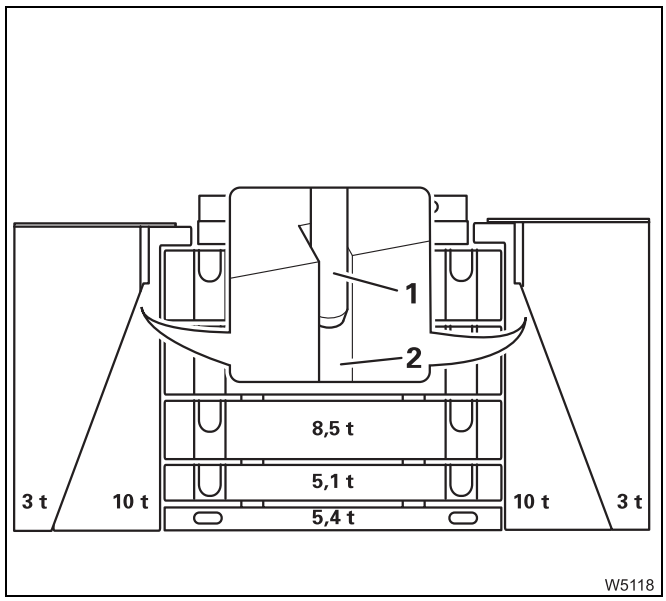
14.5.12 Rigging 3 t counterweight blocks (additional equipment)

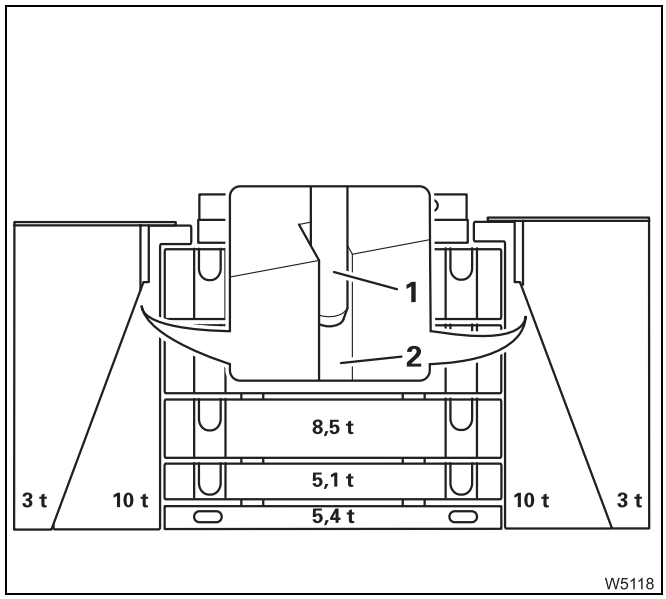
As additional equipment the 70 t counterweight version can also be combined with the 64 t counterweight version and two 3 t counterweight blocks (additional equipment).



The 3 t counterweight blocks are placed over the 10 t counterweight block.

During rigging, two pegs (**1**) in the 3 t counterweight blocks are put into the space (**2**) between the 10 t counterweight block and the slinging point. This secures the 3 t counterweight blocks to the 10 t counterweight blocks.

Risk of accidents if used incorrectly
Attach the various counterweight sections only to the appropriate slinging points and use lifting gear with sufficient load bearing capacity.
The counterweight sections should be lifted one at a time. The slinging points are not designed for hoisting stacked counterweight sections.



- Lift the 3 t counterweight blocks over the 10 t counterweight blocks.
- Make sure that the plugs (**1**) on the 3 t counterweight blocks are positioned vertically above the slinging points of the 10 t counterweight blocks.
- Lower the 3 t counterweight blocks so that the plugs (**1**) fit into the space (**2**) on the 10 t counterweight blocks.

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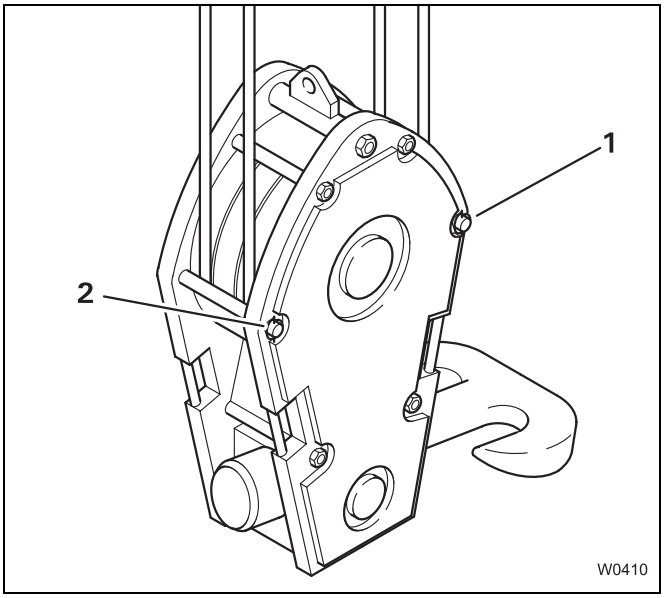
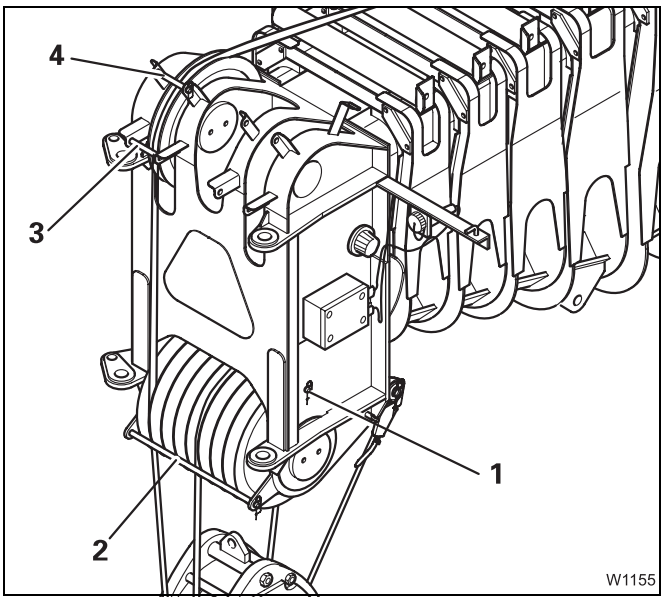


- Fold both guards on the hook block back up and insert the holding rods (**1**) and (**2**) into the bore holes. Secure the rods into place using the spring cotters.



- 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 lifting limit switch is installed on the main boom, remove the switch from the two-stage swing-away lattice extension (additional equipment), if necessary. For work with main boom and double swing-away lattice extension, the same lifting limit switch is used; ➠ *Operating instructions lattice extension GMK 5200 / 6220-L – lifting limit switch on lattice extension*.

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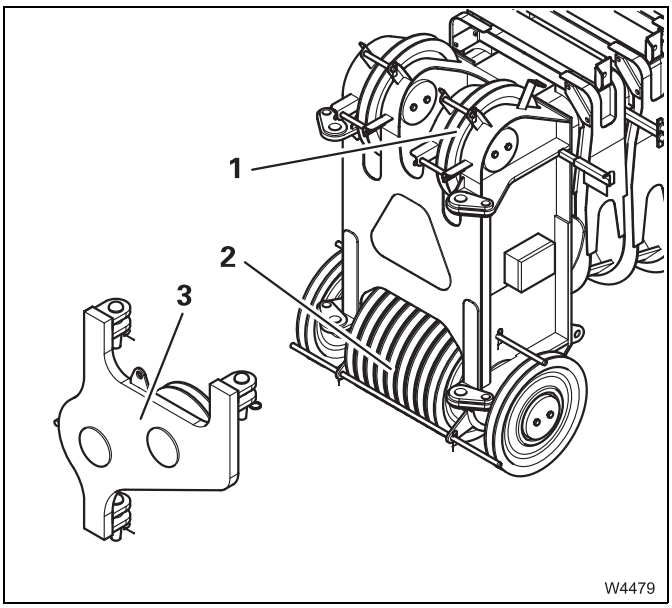
14.6.6 Rigging heavy duty equipment

Heavy duty equipment is available as additional equipment. When the heavy duty equipment is rigged the hoist rope can be reeved up to 22 times, whereby a maximum lifting capacity range of 685 tm can be reached (191 t x 2,40 m) (421,083 lbs x 7,87 ft).
The heavy duty equipment is only intended for main boom operation.

Heavy duty equipment parts

For heavy duty equipment various parts are mounted on the truck crane and further parts are supplied.



Mounted parts

1 Additional head sheave (attached to the left of the axle)

2 Extended head sheave axle with 11 sheaves (2 sheaves outside on single-sheave boom top)

Supplied parts

3 Adapter for rope deflection (with securing pins and safety clips)

Equipment required

In addition, you will require the following auxiliary equipment:

– An auxiliary crane with sufficient lifting capacity

– A suitable lifting gear with sufficient lifting capacity

For the dimensions and weights of the removed parts; ➠ *Heavy duty-equipment*, p. 16 - 12.

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15 Malfunctions on the superstructure

15.1 Superstructure emergency stop device

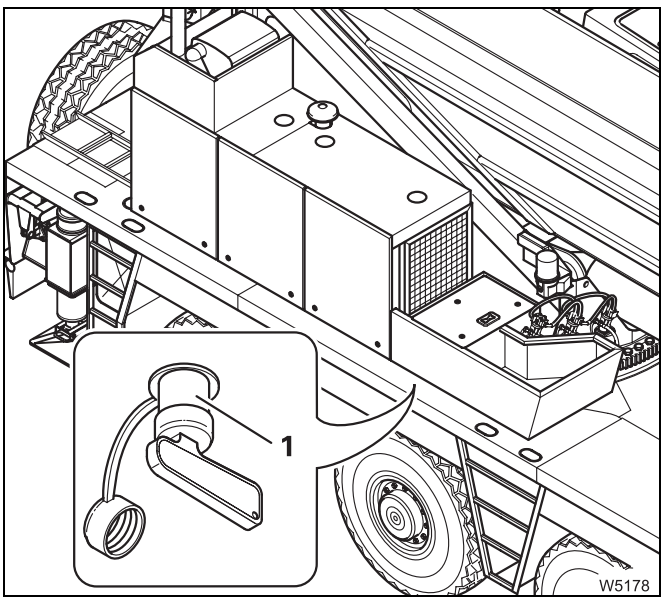
On the superstructure, the truck crane GMK 5200 is equipped with two emergency stop devices which you can

– turn off the **vehicle engine** from outside of the crane cab (e.g. if the ignition lock has developed a malfunction or if entry to the crane cab is blocked);

– turn off the **crane control** when a crane movement cannot be switched off (e.g. in the case of a crane control malfunction).

Switching off the crane engine

You can switch off the crane engine from outside the crane cab by switching off the battery master switch.



The battery master switch (**1**) is located on the right-hand side of the superstructure, under the battery box behind the side plate, and is accessible from below.

- Switch off the battery master switch. Turn the selector handle so that it can be pulled off.

The crane engine switches off.

With additional equipment, you can switch off the crane engine with the *Crane engine emergency stop switch* using the air intake inhibitor; ➠ p. 12 - 19.

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Designation in circuit diagram: F 2	Strength (A)	Function
1	10	Not assigned
2	10	Not assigned
3	10	Not assigned
4	10	Not assigned
5	10	Not assigned
6	15	Not assigned

Designation in circuit diagram: F 3	Strength (A)	Function
1	10	Indicator and warning lamps for engine, hydraulic system
2	15	Windscreen wiper / washing system
3	5	Pressure sensors / switch Crane control
4	10	Control lever, high-speed mode for derricking gear and telescoping mechanism, slewing gear, slewing gear superstructure lock
5	10	VDO electronics
6	10	VDO electronics

Designation in circuit diagram: F 4	Strength (A)	Function
1	5	Switches and indicator lamps
2	15	Spotlights Switches and indicator lamps for spotlights and shutdown of derricking gear / telescoping mechanism / main hoist
3	5	Horn, switch and indicator lamps for auxiliary hoist shutdown, slewing gear holding brake and crane cab incline
4	10	Crane cab heating system
5	15	Crane cab electronic level SLI early warning / shutdown
6	10	SLI shutdown, lifting limit switch shutdown, dead man's switch, seat contact

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Malfunction	Cause	Remedy
Lifting or lowering function cannot be switched off	Malfunction on the crane control	Stop movement with the *Crane control emergency stop switch*; ➠ p. 15 - 2.

First of all, check whether the malfunction occurs in both directions of movement.
In this case also check the causes listed in section *Auxiliary hoist not functioning*!

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Error messages from error group 1, Sensor system		
Error message	**Cause**	**Remedy**
1. 05. 2...6	Angle sensor B, basic section reporting error	Angle sensor B, switch off basic section; ➠ p. 15 - 37 and notify ***CraneCARE***
1. 05. 7	Notify ***CraneCARE***	
1. 05. 8	Information message; you have switched off angle sensor B, basic section because of an error message	Message is shown for as long as the ignition is switched off
1. 06. 1	Length indicator A to telescopic section V not responding	Check the supply line; ➠ p. 15 - 40. If supply line is OK, switch off length indicator A; ➠ p. 15 - 37 and notify ***CraneCARE***
1. 06. 2...6	Length indicator A to telescopic section V reports an error	Switch off length indicator A to telescopic section V; ➠ p. 15 - 37 and notify ***CraneCARE***
1. 06. 7	Notify ***CraneCARE***	
1. 06. 8	Information message; you have switched off the length indicator A to telescopic sectionV because of an error message	Message is shown for as long as the ignition is switched off
1. 07. 1	Length indicator B to telescopic section V not responding	Check the supply line; ➠ p. 15 - 40. If supply line is OK, switch off length indicator B; ➠ p. 15 - 37 and notify ***CraneCARE***
1. 07. 2...6	Length indicator B to telescopic section V reporting error	Switch off length indicator B to telescopic section V; ➠ p. 15 - 37 and notify ***CraneCARE***
1. 07. 7	Notify ***CraneCARE***	
1. 07. 8	Information message; you have switched off the length indicator B to telescopic sectionV because of an error message	Message is shown for as long as the ignition is switched off
1. 08. 1	Length indicator A of telescoping cylinder not responding	Check the supply line; ➠ p. 15 - 40. If supply line is OK, switch off length indicator A of telescoping cylinder; ➠ p. 15 - 37 and notify ***CraneCARE***
1. 08. 2...6	Length indicator A of telescoping cylinder reporting error	Length indicator A of telescoping cylinder to be switched off; ➠ p. 15 - 37 and notify ***CraneCARE***
1. 08. 7	Notify ***CraneCARE***	

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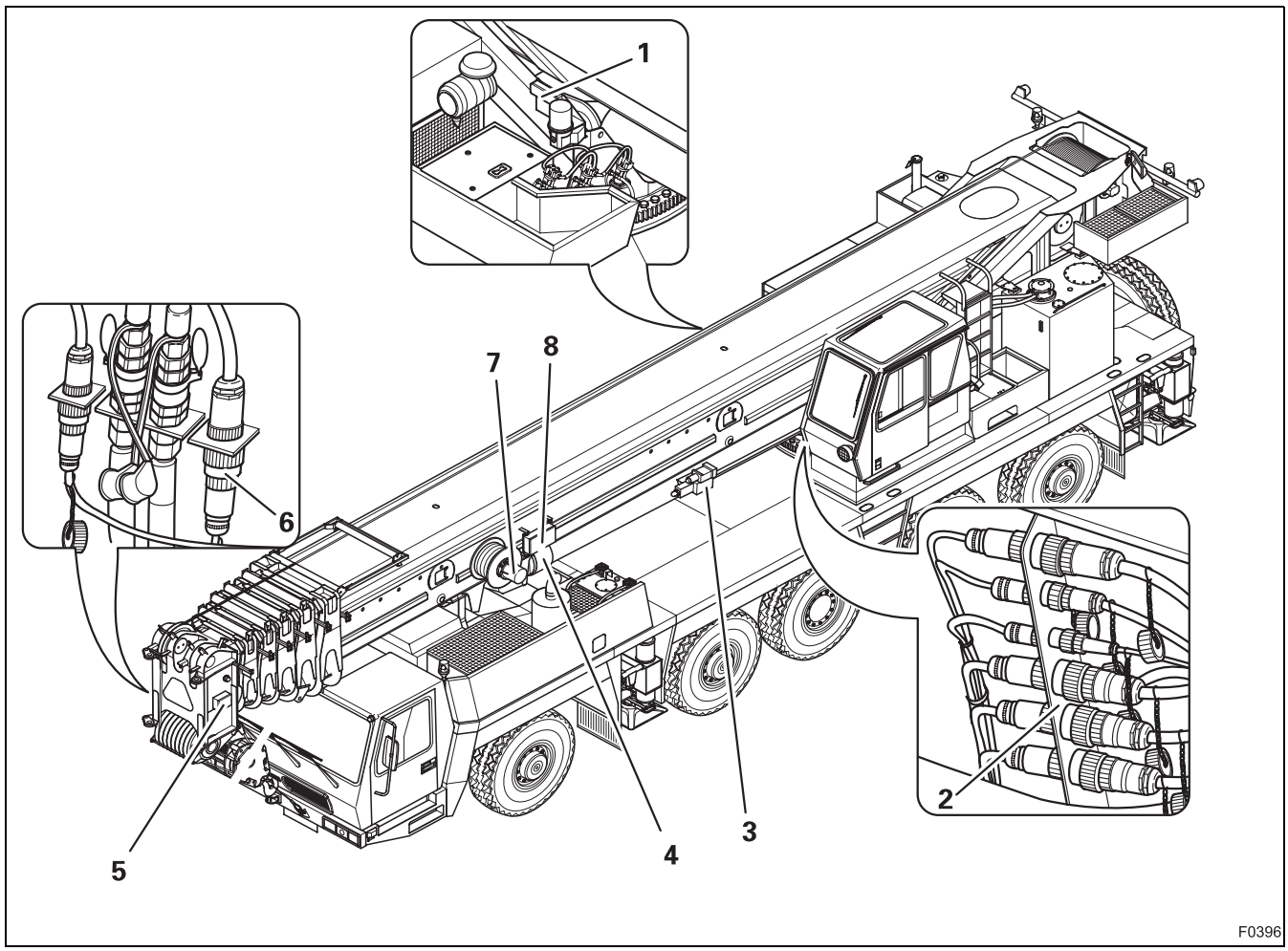
On truck crane



1 Switch box for pressure sensors upper chamber and lower chamber

2 Plug connections under the main boom and on the inside of the rotary table (connection for indicators in the main boom)

3 Pressure sensor for derricking cylinder lower chamber

4 Pressure sensor derricking cylinder upper chamber

5 SLI terminal box

6 Connection for lattice extension / boom extension (both additional equipment)

7 Length indicator

8 Switch box for angle sensor basic section **A** and **B**

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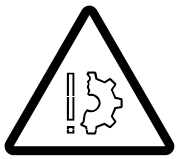


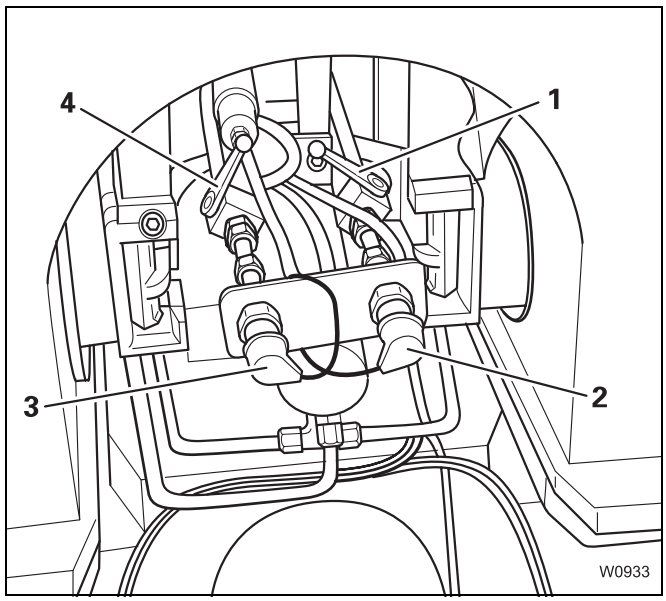
Risk of damage to hydraulic hoses
Always guide the hydraulic hoses through the rear opening in the basic section. If you guide the hydraulic hoses through the manhole at the top of the basic section the hydraulic hoses will be cut during retracting.

To reach the connections on the telescoping cylinder:

– through the rear opening in the basic section or

– **or**, if you can extend telescopic section I approx. 2 m (6,5 ft), through the manhole at the top of the basic section.

Risk of crushing from unintentional retraction
Secure the main boom against unintentional retraction before you reach into or enter the manhole in order to connect the hydraulic hoses. During retraction, telescopic sections move into the area of the manhole and can crush you or your limbs.



The hydraulic hoses are connected directly to the head of the telescoping cylinder.

- Insert the quick couplings in the two connections (**2**) and (**3**).
- Close the two hand valves (**1**) and (**4**). The hand valves are closed if the handles are at right angles to the lines.
- Mark a hose at the other end. For emergency operation it is important that you know which hose is connected with the right connection (**2**) and which hose with the left connection (**3**).

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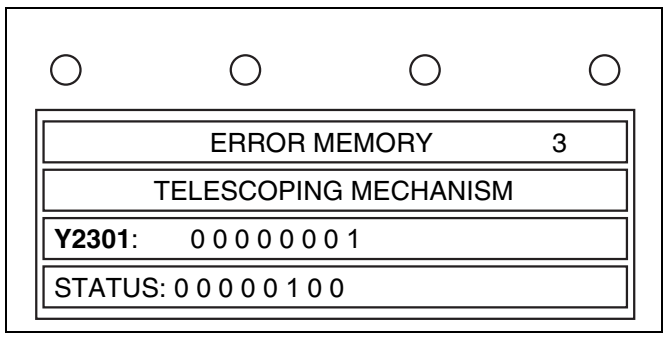
Finding a defective part

The first entry in the third line on the display describes the defective part (e.g. Y2301). The following table shows all the possible messages and their meanings.

Entry	Error	Further error search
J3501	Control lever error	Determine the cause of the error; ➠ *Error causes and effects*, p. 15 - 63.
J3502		
A3502	Length indicator error	
A100	Error occurred during communication with the SLI	
ECOS	Logical error identified by the crane control	
Other entry (e.g. Y2301)	Error on a different component (valve, digital input, pressure sensor)	Determine area of error; ➠ *Determining the area of error*, p. 15 - 62.

Example



The example on the left shows the entry **Y2301**. According to the table there is an error with a part for which you need to determine the area of error before being able to determine the cause of error.

Executing emergency program

To carry out the emergency program you must extend the defective control lever and press a membrane button.

- Press the *Control lever emergency program* repeatedly until the defective control lever is shown on the display.
- Move the control lever in the desired direction (e.g. move the right-hand control lever forwards to *Lower main hoist*)
- Also press the corresponding membrane button next to the display:

In addition, press this membrane button when you have moved the control lever **to the front** (in this example you would need to press this button).

In addition, press this membrane button when you have moved the control lever **backward**.

In addition, press this membrane button when you have moved the control lever to the **left**.

In addition, press this membrane button when you have moved the control lever to the **right**.

As soon as you press the relevant button in addition to moving the control lever, crane movement begins (e.g. lowering the main hoist).

- Release the button or the control lever to stop the crane movement.

In the emergency program, the speed is restricted to approx. **10% of the maximum speed**.

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15.7 Hydraulic emergency stop on the superstructure according to ZH1/461 (additional equipment)

15.7.1 Important instructions for hydraulic emergency operation

The truck crane can be fitted with an emergency hydraulic drain plug compliant with ZH1/461 (4.2.8). It then has a unified interface for connecting the superstructure hydraulic system to the carrier, to another crane or to an external hydraulic energy source.

This enables the movement of small loads in case of an emergency, e.g. failure of the crane engine. Crane movements like *Lifting, lowering, raising boom, lowering boom* and *Slewing*can be carried out in this case.

Risk of accidents as a result of improper use
Use hydraulic emergency operation only in case of an emergency for the movement of small loads and subsequently rectify the malfunction. It is prohibited to carry out crane work with the emergency operation, because the safety devices do not function in this mode.

Risk of tilting due to too large a radius
The lowering of the boom is not switched off automatically in emergency operation. While raising, take care that the maximum permissible radius according to the lifting capacity table for the current rigging mode is not exceeded.

Risk of damage to hoses and transformers
Take care to ensure that connecting hoses can move freely during emergency operation. This prevents the hoses hanging and tearing off, or the transformer falling off the superstructure. If necessary, stop the slewing movement and position the transformer on the other side of the superstructure.

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16 Technical information for superstructure

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Dimensions for driving on public roads

All measurements relate to on-road driving mode (*Driving mode table*; ➠ p. 6 - 5) with the hoist mirror folded up.

Dimension and weights of the parts which must be transported on separate vehicles during on-road driving: ➠ *Dimensions and weights of removable parts*, p. 16 - 10.

Length:	15.63 m (51.3 ft)
Width:	3.00 m (9.8 ft) with 14.00 R25 or 16.00 R25 tyres 3.10 m (10.2 ft) with 20.50 R25 tyres
Height at on-road level:	3.95 m -130 / +170 mm (12.96 ft mit –5.1 / +6.7 inch) suspension range with 14.00 R 25 tyres
	4.00 m -130 / +170 mm (13.12 ft mit –5.1 / +6.7 inch) suspension range with 16.00 R 25 tyres
Slope angle, front:	approx. 20° at on-road level
Slope angle, rear:	approx. 18° at on-road level
Total weight:	60 t (132,280 lbs)
Axle loads:	12 t (26,400 lbs) each in on-road driving mode

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