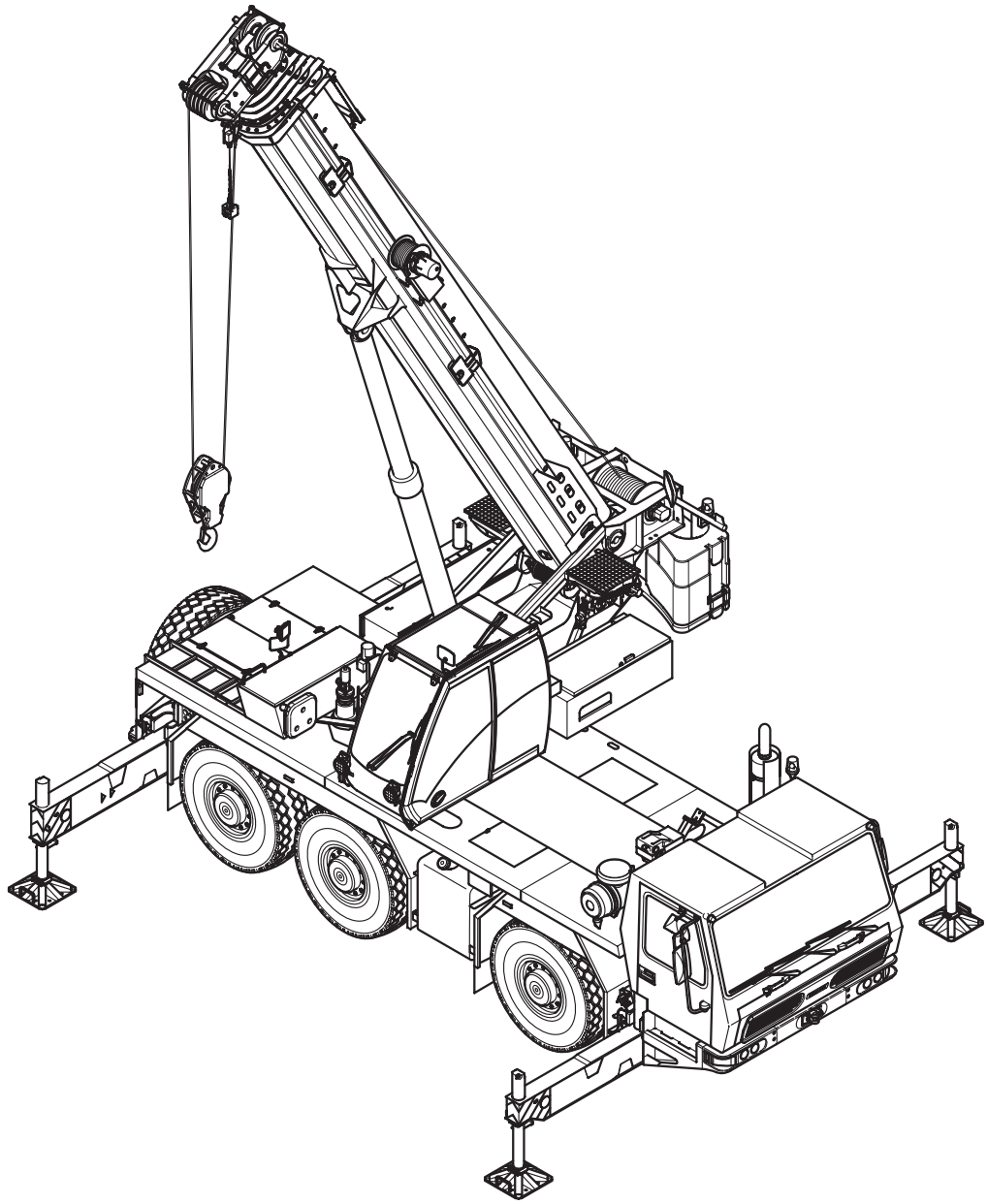
GROVE

# GMK3055



# Operating instructions Part 1 Driving

Serial number

2 084 849 en
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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

Observing the information and carrying out the measures which are given in the *Safety manual* is the responsibility of the crane operator and a prerequisite for operating the truck crane safely.

## 1.3.7 Circuit diagrams

Circuit diagrams are used for troubleshooting and are intended for trained maintenance personnel and for the local ***CraneCARE***.
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 | to | 0.03937 |
| to | mm | 25.4 |
| m | ft | 3.28084 |
| ft | m | 0.30479 |
| $m^2$ | $ft^2$ | 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 |
| $m^2/t$ | $ft^2/lbs$ | 0.04882 |

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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 diesel 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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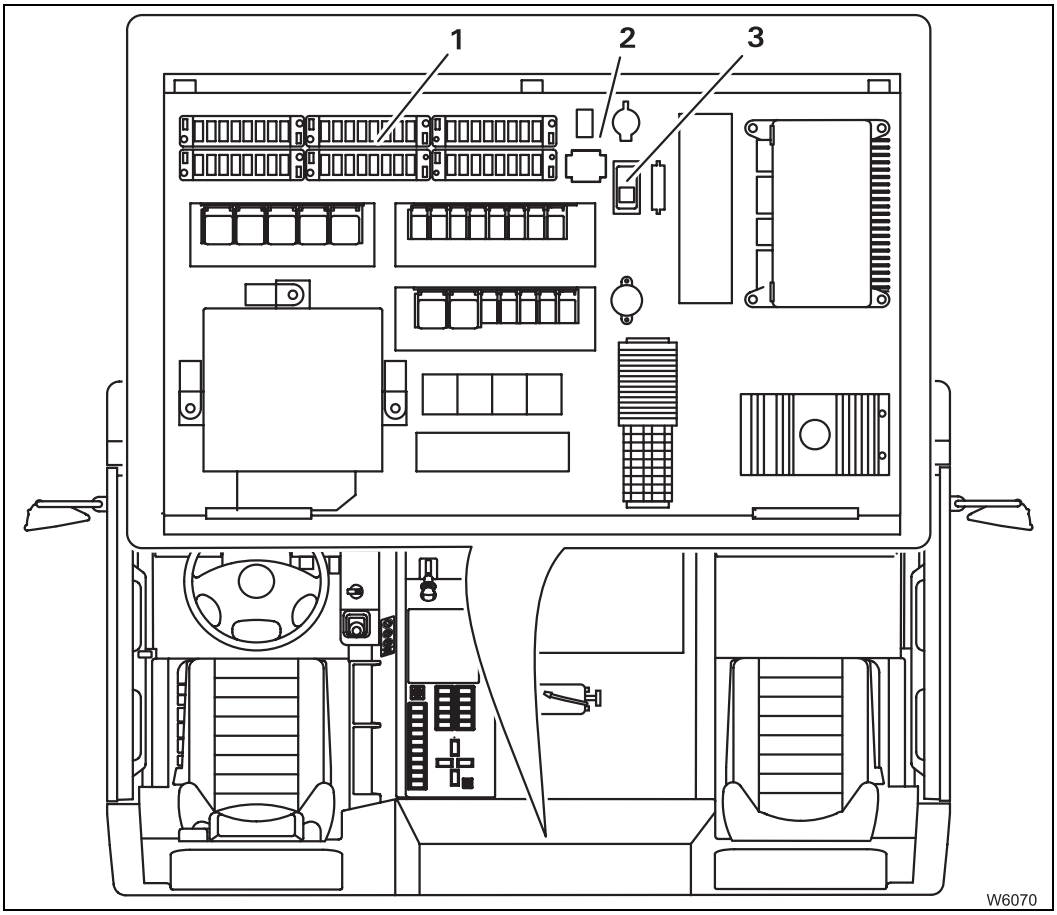
**To the rear in the driver's cab**




**1** Fuses ➠ p. 8 - 32

**2** Diagnostics plug ➠ p. 4 - 54

**3** Rocker switch for emergency operation[1)] ➠ p. 14 - 1

[1)] Additional equipment

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**1** Warning lamp for transmission shift lock ➠ p. 4 - 34

**2** Crane operation indicator lamp ➠ p. 4 - 49

**3** "Steering unlocked" warning lamp ➠ p. 4 - 38

**4** Rocker switch for outrigger lighting[1)] ➠ p. 4 - 49

**5** Rocker switch with lock button for driving mode/crane operation ➠ p. 4 - 49

**6** Rocker button for right-hand level adjustment ➠ p. 4 - 44

**7** Key switch for level adjustment system ➠ p. 4 - 43

**8** Rocker button for front level adjustment ➠ p. 4 - 44

**9** Rocker button for rear level adjustment ➠ p. 4 - 44

**10** Rocker button for left-hand level adjustment ➠ p. 4 - 44

**11** Rocker switch for separate steering on/off (with lock button) ➠ p. 4 - 38

**12** Rocker switch for separate steering automatic/ manual ➠ p. 4 - 38

**13** Rocker switch for selecting steering mode ➠ p. 4 - 39

**14** "Longitudinal differential lock/Drive of 1st axle line" rocker switch (only with 6 x 6 x 6 drive as additional equipment) ➠ p. 4 - 35

**15** Rocker switch for transverse differential locks ➠ p. 4 - 35

**16** Combination button for mirror setting ➠ p. 4 - 42

**17** Auxiliary heater with timer[1)] ➠ p. 4 - 23

**18** Indicator lamp for raising vehicle level ➠ p. 4 - 43

**19** "Not on-road level" indicator lamp ➠ p. 4 - 44

**20** Rocker switch for raising/lowering vehicle level ➠ p. 4 - 43

**21** Indicator lamp for lowering vehicle level ➠ p. 4 - 43

**22** Rocker button for raising/lowering truck crane ➠ p. 4 - 44

**23** Rocker button for on-road level ➠ p. 4 - 44

[1)] Additional equipment

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# 4.2 Functional description of the display and operating elements

Definition of directional information for using operating elements;
➠ p. 1 - 18.

## 4.2.1 On the instrument panels

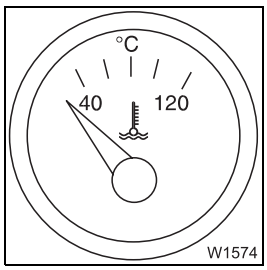
### Diesel engine

**Indicator lamp for flame start system**

The indicator lamp is only available with additional equipment.
Lights up when ignition is switched on and the diesel engine is cold.
Goes out when the diesel engine is ready to run (waiting period of up to 20 seconds depending on the temperature of the engine coolant);
➠ *Starting the diesel engine*, p. 5 - 13.

**Diesel engine oil pressure warning lamp**

This lights up when the motor is off and the ignition is switched on;
➠ p. 5 - 11.
It goes out after the engine has been started; ➠ p. 5 - 17.




**Diesel engine coolant temperature display**

Displays the current coolant temperature of the diesel engine. The temperature is monitored by the engine electronic system; ➠ p. 6 - 33.

**Indicator lamp for diesel engine coolant level**

Lights up if the coolant level is too low; ➠ p. 6 - 34.

**Indicator lamp for diesel engine air filter**

Lights up if the air filter is soiled and must be replaced; ➠ *Maintance manual*.

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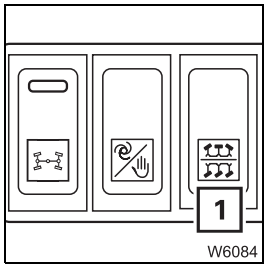
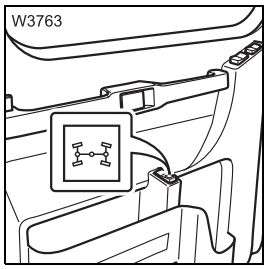



**Rocker switch for selecting steering mode**

The rocker switch is only active in the operating mode *Automatic*. Used to switch between the steering modes *All-wheel steering* and *Crab travel mode*.

**All-wheel steering:** Press rocker button up

**Crab travel mode:** Press rocker switch down




**Rocker button for manual separate steering**

Is only active when the operating mode *Manual* is switched on. Used to manually steer the wheels of the 3rd axle line.

**To turn to the left:** Press the rocker button to the left.

**To turn to the right:** Press the rocker button to the right.

## Suspension

**Rocker switch for suspension locking system**

Locks all suspension cylinders in the current position.

**To switch on:** Press rocker switch down; ➠ p. 13 - 43.

**To switch off:** Press rocker switch up; ➠ p. 6 - 10.

**Indicator lamp for suspension locking system**

Lights up if the suspension is locked.
Goes out if suspension locking system is released;
➠ p. 6 - 10.

## Hydraulic system

**Indicator lamps for hydraulic oil return filters I and II**

The relevant lamp lights up when the filter is soiled and the filter cartridge needs to be changed.
To exchange the filter cartridges; ➠ *Maintenance manual*.

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**Rocker switch with lock button for driving mode/crane operation**

Only switch from *Driving mode* to *Crane operation* and vice versa when the engine is switched off.
The rocker switch may only be pressed up or down if the lock button is pushed down simultaneously.

**Driving mode**: Press rocker switch up.
All driving functions may only be operated from inside the driver's cab; ➠ p. 6 - 8.

**Crane operation**: Press rocker switch down.
All crane functions can be operated from the crane cab. The pumps in the crane's hydraulic system are switched on.
The driving functions "service brake", "vehicle parking brake", "shift transmission", "steering", "separate steering", "transverse differential locks", "longitudinal differential lock/1st axle line drive" can only be operated from the crane cab; ➠ p. 12 - 27.

**Crane operation indicator lamp**

Lights up when the *Driving mode/crane operation* rocker switch is in *Crane operation* position.
Goes out when the *Driving mode/Crane operation* rocker switch is switch to the position *Driving mode*.
➠ *Check the change-over to driving mode*, p. 6 - 8.

**Rocker switch for outrigger lighting**

The rocker switch is only available as additional equipment. Used to switch on the spotlight which is fitted to the outrigger box in the case of additional equipment.

**To switch on**: Press rocker switch down

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

**"Boom not set down" warning lamp**

The warning lamp is only available as additional equipment. Lights up if the boom is not in the boom rest and the ignition is switched on.
A warning buzzer sounds at the same time. The warning lamp and buzzer indicate that the vehicle height given in the driver's cab is exceeded at on-road level; ➠ p. 6 - 12.

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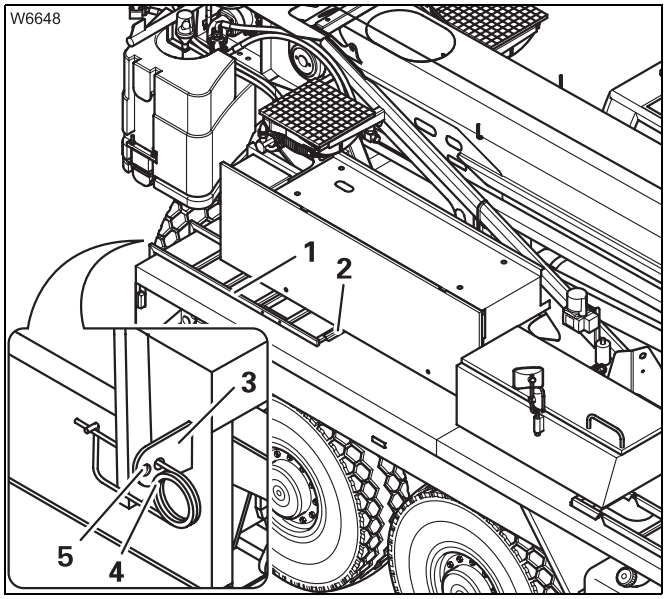


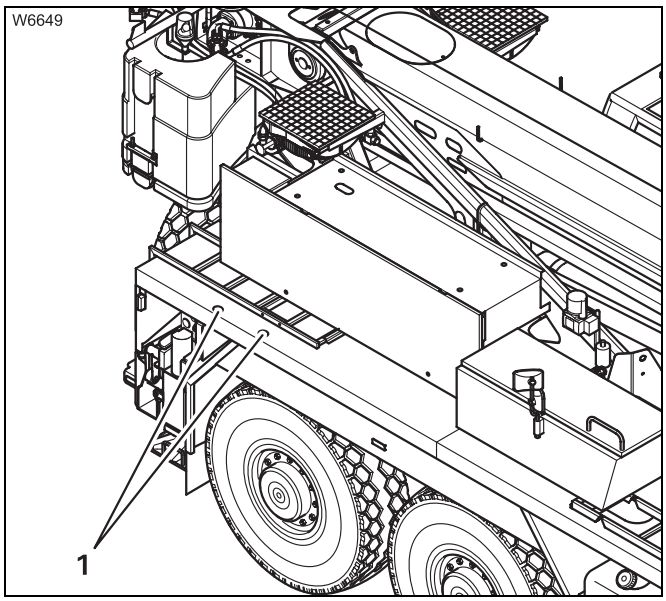

**Ladder**

At the rear of the carrier, there is a hook-on ladder (**1**) on both sides.

- For driving, push the ladder under the angle (**2**) with the lowest rung.
- Secure the ladder on the holder (**3**) using the retaining pin (**4**).

The bore (**5**) is secured with the padlock provided.

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




The hook-on ladders can be hung at the rear on the right and the left on the bores (**1**).

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

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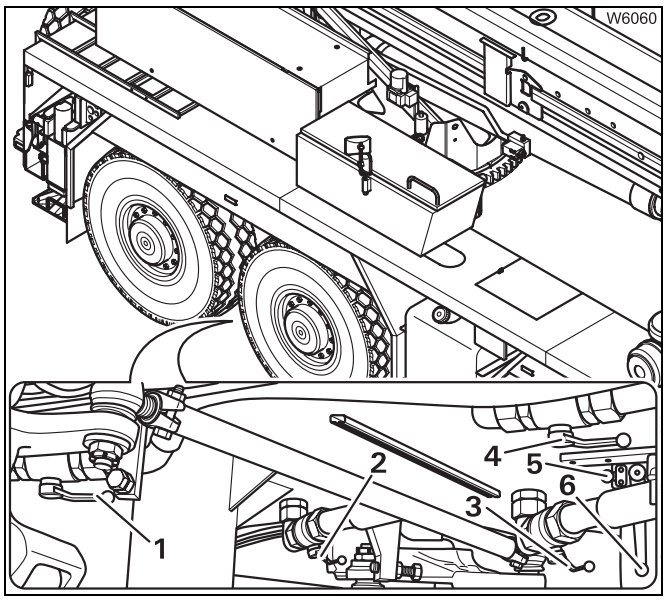
## 5.1.3 Checks prior to starting vehicle engine

**Checking the shut-off valves in the hydraulic system**

All four shut-off valves in the hydraulic system suction lines must be open before the diesel engine is started.

**Risk of damage to the hydraulic pumps**
The diesel engine may only be started if all of the four shut-off valves in the suction lines of the hydraulic pumps are open.
The shut-off valves are open when the handles are parallel to the suction lines.

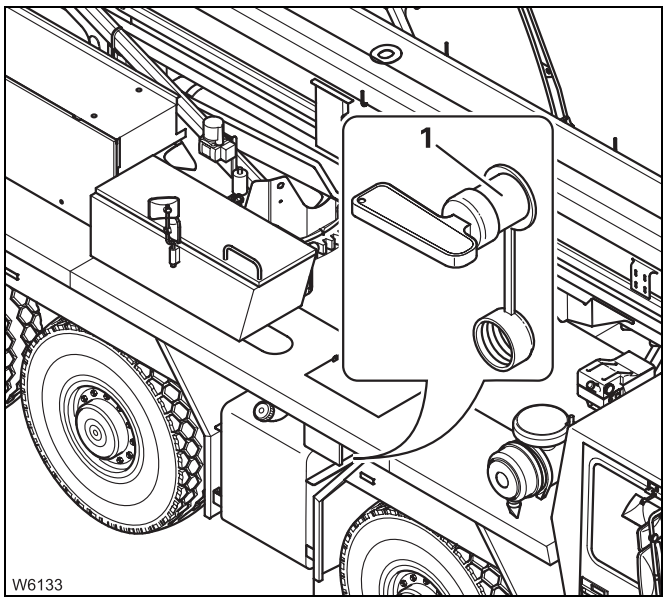



Below the hydraulic tank, you will find:
– at the height of the 3rd axle line, the shut-off valves (**1**) and (**2**).
– at the height of the 2nd axle line, the valves (**3**), (**4**) and (**6**).
The illustration shows the opened position.

- Check that all the shut-off valves are open, and open any shut-off valves which are closed.

To open the shut-off value (**6**), you have to:
– pull out the spring latch (**5**) as far as possible.
– turn the handle parallel to the line,
– let the spring latch engage again.

**Switching on the battery master switch**




The battery master switch (**1**) is located on the right side in front of the fuel tank.

- 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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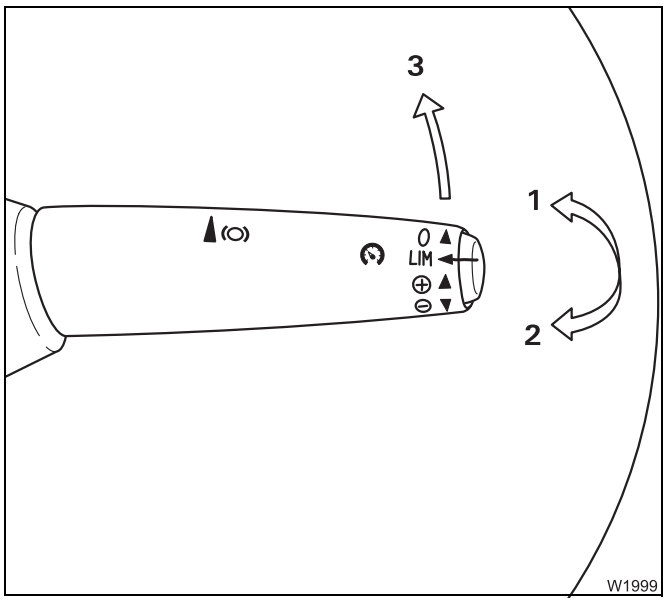
**Set idling speed**

After starting the diesel engine, adjust the idling speed in relation to the coolant temperature. If necessary, the idling speed can be increased up to about 200 RPM.

The idling speed is increased with the *Right-hand multipurpose switch*.

This multipurpose switch function is only active when the vehicle is stationary.




**Increasing the idling speed:**

| | |
|---|---|
| **(1) Push upwards once:** | The speed increases by 20 RPM. |
| **(1) Pull upwards and hold:** | The engine speed increases continuously. |

**Decreasing the idling speed:**

| | |
|---|---|
| **(2) Push downwards once:** | The speed decreases by 20 RPM. |
| **(2) Push down and hold:** | The engine speed decreases continuously. |

**Switching off engine speed change:**

| | |
|---|---|
| **manually:** | Push the multipurpose switch forward once (**3**). |
| **automatically:** | Start the truck crane and accelerate over 20 km/h . |

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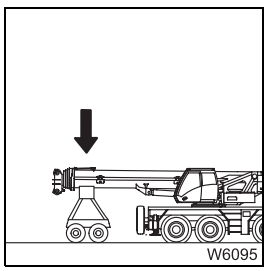
# 6 Driving the truck crane

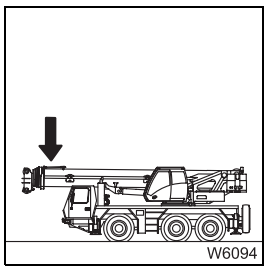
## 6.1 Checks and adjustments before driving

### 6.1.1 CHECKLIST: Condition of the truck crane for on-road driving

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. **If the main boom is set down on a trailer for driving (only with additional equipment):**
   - The anemometer has been removed; ➠ p. 13 - 142,
   - The main boom is laid on a trailer; ➠ p. 7 - 10.
   - All telescopic sections are locked,
   - The superstructure is **unlocked**; ➠ p. 12 - 17,
   - If additional equipment if fitted, the houselock is switched off; ➠ p. 12 - 22,
   - The boom floating position is switched on; ➠ p. 7 - 10,
   - The slewing gear freewheel is switched on; ➠ p. 7 - 8,
   - The main boom pretensioner (additional equipment) should be switched on; ➠ p. 7 - 12.




2. **When the boom is placed on the boom rest for driving:**
   - The boom is resting on the boom rest,
   - All telescopic sections are interlocked; the telescoping cylinder is locked in telescopic section I,
   - The anemometer has been removed; ➠ p. 13 - 142,
   - The superstructure is locked; ➠ p. 12 - 17,
   - When the *Boom not set down* warning lamp has gone out (applies to additional equipment); ➠ p. 6 - 12.

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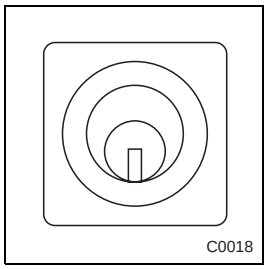
**Checking on-road level**

During on-road driving, the truck crane must be on-the-road level. Check whether the truck crane is on-road driving status.

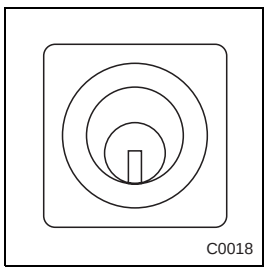
- Shut off the truck crane to check on flat ground.




Insert the key into the *Level adjustment system* key-operated switch. Turn the key to the right, push it in and turn it back to the left.

- Press down the *On-road level* rocker button.

- Check whether the *Not on-road level* indicator lamp has gone out. If the indicator lamp lights up, hold down the *On-road level* rocker button until the indicator lamp goes out.




- After checking the on-road level, switch off the *Level adjustment system* key-operated switch and remove the key.

**Checking the transverse differential locks**

All transverse differential locks must be switched off for on-road driving.

- Check whether the *Transverse differential lock* indicator lamp has gone out (operation ➠ p. 6 - 52).

**Checking the longitudinal differential locks**

The longitudinal differential lock (and with additional equipment, the actuator of the 1st axle line) must be switched off for on-road driving.

- Check whether the *Longitudinal differential locks* indicator lamp has gone out (operation ➠ p. 6 - 50).

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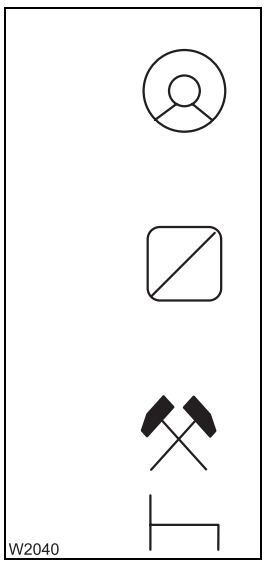
The different time groups are shown with the following symbols:




**Driving times**: As soon as the vehicle starts to move the tachograph automatically switches to the symbol for driver 1 driving time.
If there are two diagram sheets inserted, the tachograph automatically switches to stand-by time for two-drivers operation.

**Working hours**: For all other work, the same activities apply as do for stand-by time.
When setting the working hours and stand-by time, observe the applicable local regulations for the country in which you are working.

**Stand-by time**: Periods of presence at the truck crane, e.g. crane operation, maintenance work, passenger time etc.

**Breaks and periods of rest:** These times are prescribed by law and must be observed.

If the drivers were changed during **Two-driver operation**, the diagram sheets in the trip recorder also have to be changed. The driving time is always recorded on the diagram sheet which is on the isolating plate (driver 1).

The symbol for resting time has to be set for driver 2 in **Single-driver operation**. Otherwise an error message will appear.

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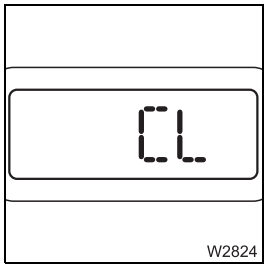


If the electronic gear system identifies a danger of clutch overload (e.g. from prolonged manoeuvring mode), the *Transmission display* indicates **C L and a warning buzzer sounds**.

- In this case, remove your foot from the accelerator immediately and actuate the service brake.

If the accelerator does not release, the motor output is throttled and the electronic gear system engages. In this way, the engine is cut off.

**On the roller type dynamometer**

- Always switch the transmission to neutral position **N** after driving onto a roller type dynamometer.

**Danger from unexpectedly moving out of the rollers**
Always switch the transmission to neutral position **N** if the truck crane is on a roller type dynamometer. When the rollers are running, the electronic gear system will identify a thrust operation, as when starting to move down a slope. If transmission mode **D** is selected now, an adequate gear is engaged even if you do not press the accelerator. The engine braking power acts against the rollers and the truck crane can drive out of them.

**Starting at extremely low temperatures**

When the outside temperature is between –20 °C and –25°C, the gear oil must be preheated before you start driving the truck crane.

Let the diesel engine run at idling speed for at least 10 minutes before you start driving.

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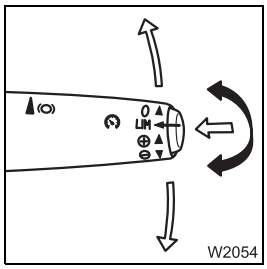
## 6.2.5 Tempomat

The truck crane is equipped with a Tempomat. This allows you to drive at a speed that you have determined.

**Risk of accidents through carelessness**
Always be prepared to brake even when the Tempomat is activated!
Only switch the Tempomat on if the traffic situation permits a constant speed.

**Activating the Tempomat**

The Tempomat is switched on and off with the *Multipurpose switch, right*. This function of the multipurpose switch can only be activated at speeds greater than 15 km/h.



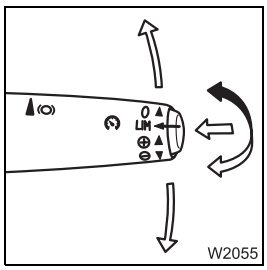

- Tap the *Multipurpose switch, right* upwards or downwards once.

The Tempomat is switched on and the current speed will be saved as the set value.

**Driving with the Tempomat**

With the Tempomat function switched on, you can take your foot from the accelerator at any time without changing the set speed.

**To increase speed:**




- Pull the *Multipurpose switch, right* upwards and hold it until the desired speed has been reached.
  After letting go, the current speed will be saved and kept as the set value.

**or**

- Tap the *Multipurpose switch, right* upwards once. The speed will increase by 0.5 km/h and will be saved.

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**Switching off the longitudinal differential locks**

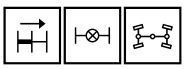
The longitudinal differential locks can only be switched off when the truck crane is stationary or moving at a maximum of 3 km/h.

- Press the *Longitudinal differential lock/drive of the 1st axle line* rocker switch up.

- Wait until the *Longitudinal differential lock* indicator lamp goes out.
  The indicator lamp will **flash** if **not all** of the deactivation procedures have been mechanically completed yet. The indicator lamp only **goes out** once **all** deactivation procedures have been completed mechanically.

If the *Longitudinal differential locks* indicator lamp does not go out, you can support the switching off process by driving slowly forwards and backwards;

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



- Check whether the rocker switches for the *Longitudinal differential lock/ Drive for the 1st axle line*, *Transverse differential locks* and *Separate steering on/ off* are switched off.

The longitudinal and transverse differential locks and the separate steering will be switched off together with the *Level adjustment system* key-operated switch, even when the individual rocker switches are still on.
Turn off these rocker switches afterwards. This prevents unnecessary switching procedures, since all the switch procedures corresponding to the rocker switch positions will be activated every time the key-operated switch is switched on.

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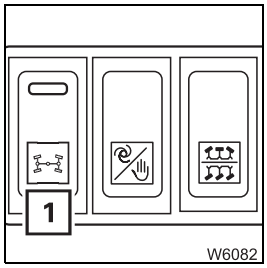



- Switch on the separate steering by pressing the *Separate steering on/off* (**1**) rocker switch down.

The electronics for the separate steering is switched on and the following locking procedures are automatically begun:

– The steering wheel lock on the 3rd axle line is unlocked,

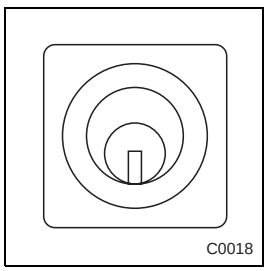
– The drag rod joint between the 1st and 2nd axle lines is separated.

As soon as a lock is released, the *Steering unlocked* warning lamp **flashes**.

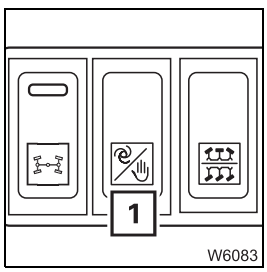
When the unlocking procedures are completed, the *Steering unlocked* warning lamp **lights up**. The steering system is now in separate steering mode.

If an error is recognised in the carrier electronics when executing the unlocking procedures, the *Carrier electronics* collective warning lamp flashes;
➠ *Steering malfunctions*, p. 8 - 43.

The separate steering is immediately active after switching it on. The electronics immediately steers the wheels on the rear axle lines to the steering angle that is intended for the current position of the *Select steering mode* rocker switch. Even when you don't activate the steering wheel.




Leave the key-operated switch on as long as the aforementioned joints are unlocked or separate.
Reestablish the joints as soon as possible, switch the key-operated switch off again and remove the key.




When the separate steering is switched on, the rocker button for the *Separate steering automatic/manual* (**1**) is simultaneously activated and the indicator lamp in the rocker switch lights up.

Now you can select the desired operating mode.

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## 6.5.3 Auxiliary heater with timer

There is a water auxiliary heater with timer as additional equipment.
The auxiliary heater is in the radiator circuit of the engine and transmission cooling.

If you run the auxiliary heater while the engine is off, the batteries will run down. If you use the auxiliary heater frequently, you must recharge the batteries at shorter intervals.

**Preheating**

When the coolant temperatures are low, the auxiliary heater first warms the part of the coolant water circuit with which only the driver's cab is heated. The temperature in the coolant water circuit increases as the driver's cab becomes warm. When a certain coolant water temperature is reached, the entire coolant water circuit is heated and so is the diesel engine also prewarmed.
When the operating temperature of the coolant is reached after starting the diesel engine, the auxiliary heater is automatically switched off.

To switch the auxiliary heater on and off, you can:

- manually switch the auxiliary heater on and off, to do this the ignition must be switched on.
- or set the automatic heating start and the automatic heating duration using the time.

**Setting air distribution**

You set the air distribution with the air distribution rotary switch;
➠ p. 6 - 68.

**Setting recirculated air/fresh air operation**

Switching between recirculated air and fresh air modes is carried out using the Fresh air/recirculated air *Rocker switch*; ➠ p. 6 - 67.

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# 6.7 Towing a trailer

With 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 with chocks to prevent it from rolling away. Ensure that it is still possible to swivel the 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.

**Risk of accidents from unexpected acceleration**
When you move slowly to the trailer, the transmission automatically shifts into manoeuvring mode. If the warning buzzer sound when doing this, release the accelerator **immediately**.
If you do not release the accelerator, the electronics will engage automatically within a few seconds. The truck crane could accelerate unexpectedly and people might be crushed between the trailer and the truck crane.

Please observe the relevant national 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. When towing a center-axle trailer the axle loads of your truck crane will change as follows:

- For every 100 kg drawbar load, the axle loads on the 1st axle lines are reduced by 74 kg .
- For every 100 kg drawbar load, the axle loads on the 2nd and 3rd axle lines are increased by 87 Kg .

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## 7.1.2 Tables for maximum axle load 12 t

**For 14.00 R25 tyres** The following table only applies for mounted tyres 14.00 R25.

Also observe the effects on the axle loads when towing a trailer;
➠ p. 6 - 81.

| | | Driving mode | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Equipment | 14.00 R25 tyres | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| | 6 x 4 x 6 drive | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | | | |
| | 6 x 6 x 6 drive | | | | | | | | ✔ | ✔ | ✔ | ✔ |
| | Towbar coupling | | | | ✔ | | | ✔ | | | ✔ | |
| | Eddy current retarder | | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | | |
| | Auxiliary hoist mounted | | | | | ✔ | ✔ | ✔ | ✔ | | | |
| Rigging mode | 14.00 R25 spare tyre at the rear | | | | | ● | ● | ● | ● | | | |
| | 3-sheave hook block on the bumper[1)] | ● | ● | ● | ● | ● | ● | ● | | | | |
| | 1-sheave hook block on the bumper[1)] | | | | | | | | ● | ● | ● | ● |
| | 15 m two-stage swing-away lattice extension folded at the side | | | ● | ● | ● | ● | ● | ● | ● | | ● |
| | 6.6 t counterweight attached to the turntable | | | | | ● | ● | ● | ● | | | |
| | 7.6 t counterweight attached to the turntable | ● | ● | ● | ● | | | | | ● | ● | ● |
| | One 1 t counterweight section on the counterweight platform | ● | ● | | | | | | | | | |

[1)] The information from these operating instructions was applied for the weight of the hook block; ➠ p. 15 - 12.

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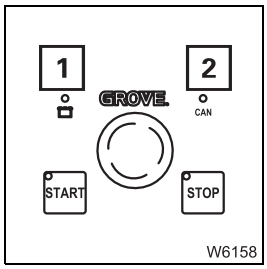
- To fill the pressure accumulator, connect the hand-held control to the socket behind the crane cab.

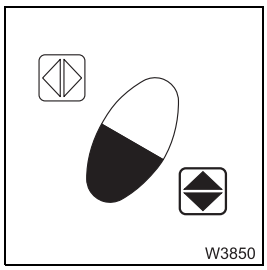



- Wait until the indicator lamps *CAN* (**2**) and *Charge control* (**1**) light up.

If the *CAN* indicator lamp does not light up or flash in approx. 20 seconds, there is a malfunction; ➠ *Driving mode and rigging for on-road driving*, p. 7 - 1.


- Press the *Start* button; the crane engine will start.
- Release the button as soon as the crane engine is running.

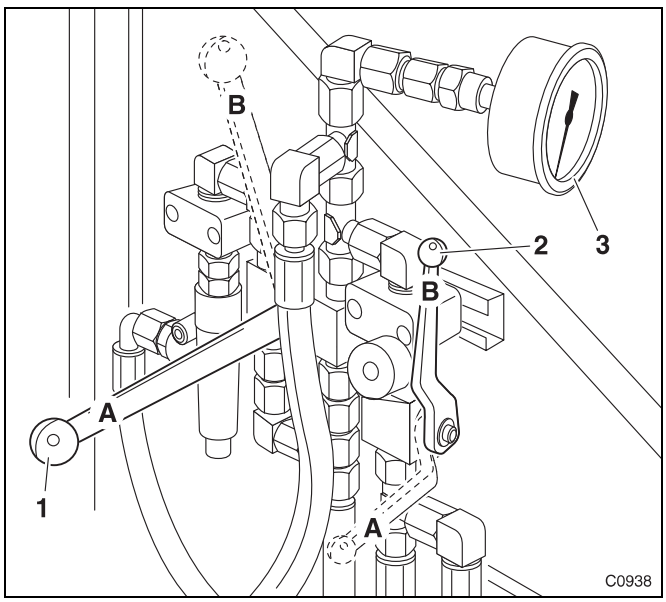
- Press the *Slewing gear/turntable lock* preselection button. The red LED in the button should light up.




To fill the pressure accumulator, you must perform the movement *Unlock turntable*:

- Press and hold the *Direction button* ⬍.
- Press the *Movement button* down to the left as well.

The pressure accumulator will fill as long as the button is held down.




- Fill up the pressure accumulator until the pressure on the pressure gauge (**3**) stops increasing.

The hydraulic system is designed in such a way that the pressure in the reservoir can increase only until the required pressure for pressurizing the boom is reached.

The exact value for the required pressure can be found in the hydraulic circuit diagram.

- Switch valve III (**1**) to position **A** (closed).

Valve II (**2**) remains in position **A** (closed).

Boom pretensioning is now switched on.


- Switch the crane engine off and press the *STOP* button located on the hand-held control. The crane engine switches off.

Switching off boom pretensioning after on-road driving; ➠ *Switching off boom pre-tensioning*, p. 13 - 19.

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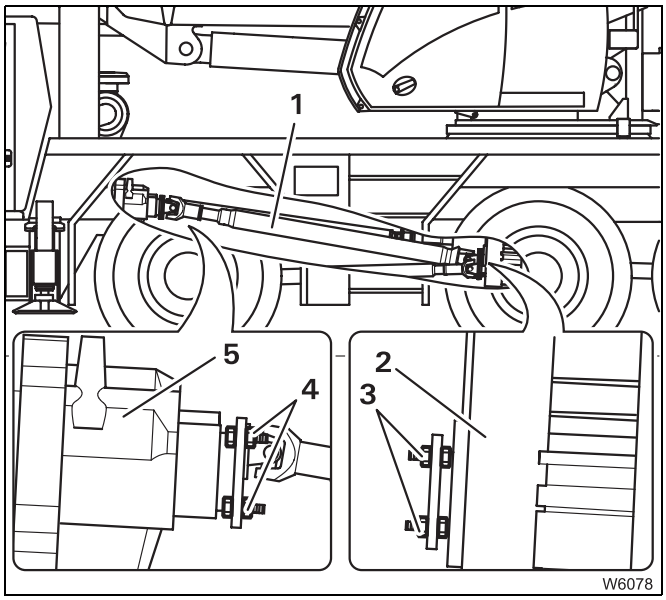
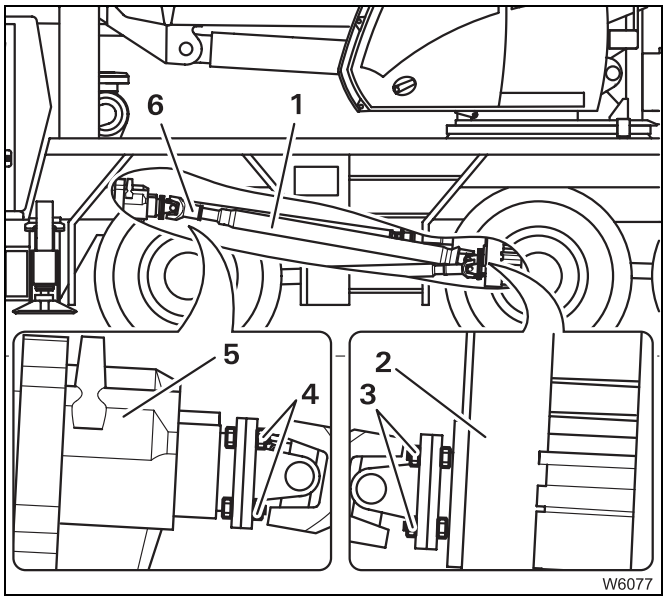
**Risk of accidents due to falling cardan shaft**
Always support the cardan shaft before removing. This will prevent the cardan shaft with its weight of approx. 80 kg from falling and injuring you after it is released.

**Risk of damage due to untightened screws**
After removing the cardan shaft, always secure the screws to the flanges with the nuts. This will prevent damage to the gears due to dragging screws on the rotating flanges.




**Removing the cardan shaft**

- Secure the cardan shaft (**1**) to prevent it from falling.
- Disconnect the cardan shaft (**1**) from the transfer case (**2**) and from the transmission (**5**).
- Fasten the screws onto the flanges of the transmission with the nuts (**3**) and (**4**), so that they cannot drag when towing or when starting the engine.
- Remove the cardan shaft (**1**) and store them safely.




**Mounting the cardan shaft**

- Remove the nuts (**3**) and (**4**) from the screws on the flanges of the transmission.
- Connect the extendable end (**6**) of the cardan shaft (**1**) on the transmission (**5**).
- Connect the other end of the cardan shaft on the transfer case (**2**).
- Tighten the nuts (**3**) and (**4**) with a torque of 190 Nm .

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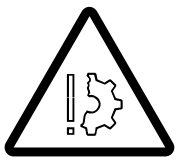
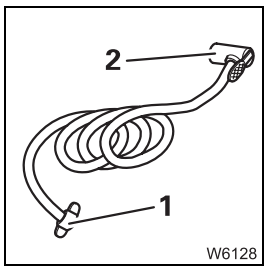
## 8.4.2 Filling the tyres yourself at tyre inflator connection

You should only fill the tyres yourself using the tyre inflator hose (additional equipment) in an emergency.
A tyre filler valve with a pressure of 10 bar can be found on the truck crane.
The tyres can be filled to a maximum of 10 bar.



**Risk of damage when tyre pressure is too high**
Depending on the size of the tyres, the prescribed pressure is under 10 bar ; ➠ *Tyres*, p. 9 - 14. Fill the tyres no more than the prescribed amount of pressure. If necessary, abort the filling procedure. In this way you prevent the tyres becoming damaged during driving, and bursting.

You should always drive directly to a service station or workshop as soon as you have refilled the tyres, and check the air pressure in the tyres there.

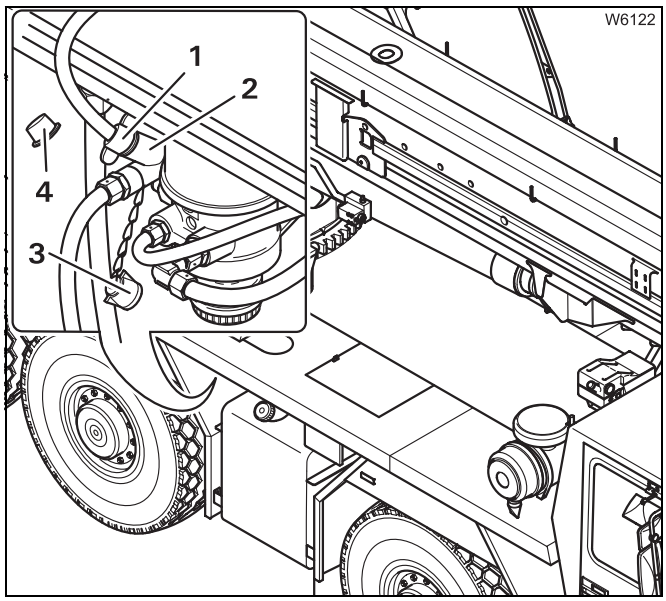



The tyre inflator hose is located in the tool box of the truck crane.

A tyre inflator connection (**2**) and a screw connection (**1**) are fitted to the tyre inflator hose.

The tyre inflator hose is connected to the tyre inflator connection of the truck crane's compressed air system.

**Connecting the filling hose**




The tyre inflator connection (**2**) is located to the right of the carrier on the air drier.

Unscrew the cap (**3**) from the tyre inflator connection (**2**).

- Remove the cap (**4**) from the screw connection (**1**).
- Screw the screw connection (**1**) onto the tyre inflator connection (**2**).

The valve in the tyre inflator connection opens as the screw connection is screwed on, and the tyre inflator hose will be pressurized at the same pressure as in the truck crane's compressed air system.

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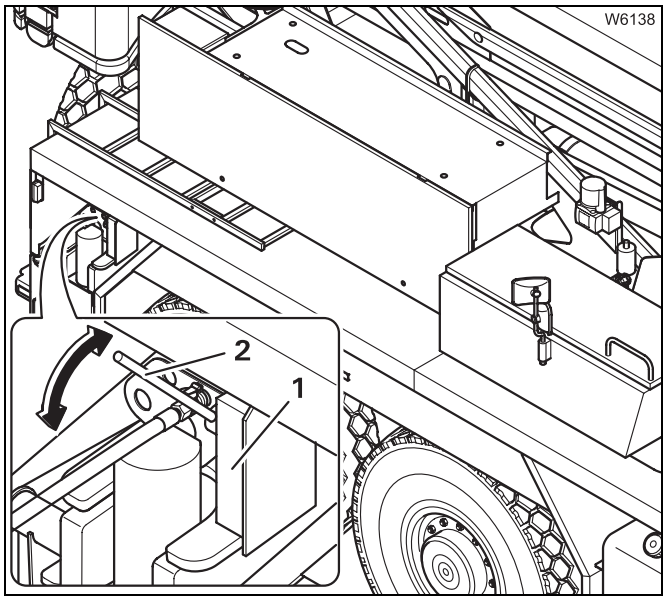
## 8.6.4 Performing emergency operation

You cannot operate the derricking gear and hoisting gear simultaneously, as is common in crane operation, during emergency activation. In emergency operation, you must always perform these functions alternately (e.g. when detaching the hook block from the bumper).

When the required hydraulic circuit has been connected you can perform the emergency operation with a hand pump on the carrier.




The hand pump (**1**) is located on the right behind the carrier.

- Insert the pump lever (**2**) into the holder on the hand pump.
- Pump on the pump lever.

The corresponding crane movement is performed.

- Take the pump lever out of the holder after emergency activation and stow it in the tool box.

## 8.6.5 After the emergency activation

After emergency operation, re-establish the original state.

- Switch the continuous operation on the solenoid valves Y1104 and Y1105 off again; ➠ *Switching off continuous operation*, p. 8 - 26.
- Switch all the hand valves on the console to position *Crane operation*; ➠ *Establishing required hydraulic circuits*, p. 8 - 25.
- Remove the connecting hose from th connections on the console and on the right behind the carrier. Close all connections and the connecting hose with the protective caps; ➠ *Connecting/disconnecting the hose*, p. 8 - 24.
- Remove the pump lever from the hand pump and put it away in the toolbox; ➠ *Performing emergency operation*, p. 8 - 27.

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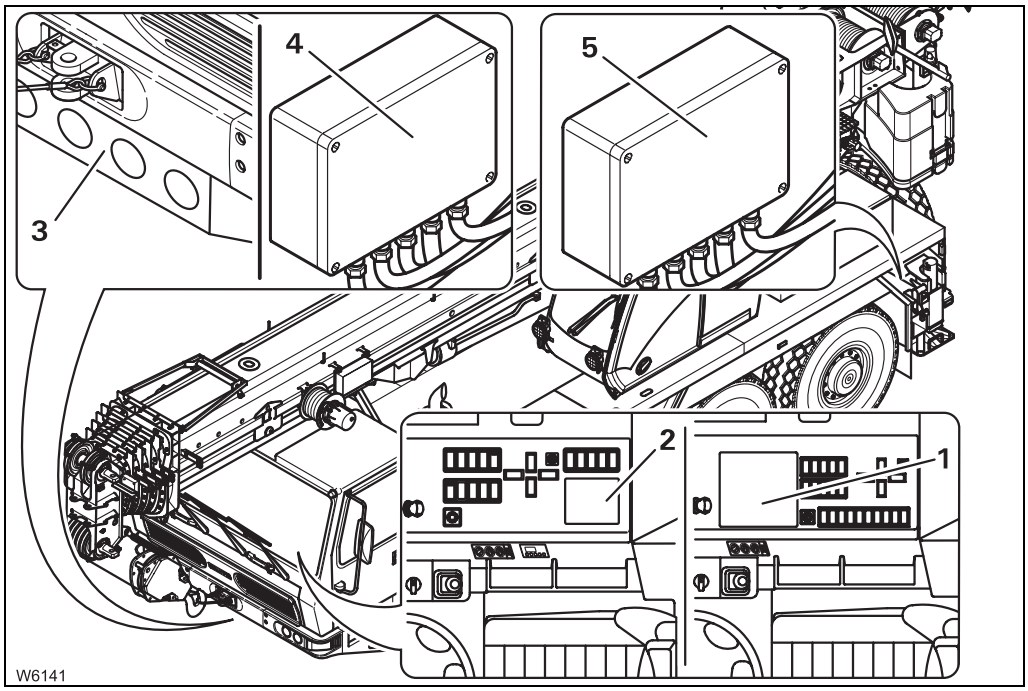
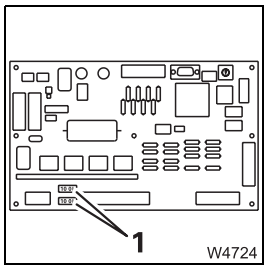
**Fuses on I/O circuit boards**

The control unit on connection 3 of the carrier electronics is located on the left, behind the access ladder. It is connected to input-output boards which are each equipped with a further fuse.
Please check these fuses if the fuses for the control unit on connection 3 are intact and the instructions for remedy stated in section *Troubleshooting* do not help eliminate the malfunction.

**There are three input-output circuit boards (I/O) on the carrier:**




| Designation in elec. circuit diagram | Position on the truck crane |
|---|---|
| I/O 0 | On the side instrument panel:<br>– for version 1 under the cover (**1**)<br>– for version 2 under the cover (**2**) |
| I/O 1 | Behind the cover (**3**) on the front right-hand side, on the inside of the vehicle chassis, in the switch box (**4**). |
| I/O 2 | At the rear left, over the outrigger beam in the switch box (**5**). |




All fuses (**1**) on the circuit boards have a strength of **10 amps**.

Depending on the model, one or two fuses may be located on a single circuit board.

- Check the fuses and replace defective ones.

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## 8.8.10 Malfunctions in the carrier electronic system

If there is a malfunction in the carrier electronic system, the *Carrier general warning lamp* lights up.

Current errors in the carrier electronics that occur during crane operation can be read on the *Crane control* display; ➠ p. 14 - 50.

Current errors in the carrier electronics, the errors that occur while driving, can be read as follows depending on the equipment:

– With additional equipment, you can read the error message at the switch boxes *Outrigger/Electronic level/Outrigger pressure indicator*.

– With standard equipment, you can read the error messages in the driver's cab; ➠ p. 8 - 49.

**Reading error messages on carrier**

You can call up an error menu on the switch boxes' *Outrigger/Electronic level/ Outrigger pressure indicator* (additional equipment) in which an error code is displayed for each error. The error can be more precisely described using this error code.

**Calling up error menu**

The ignition must be switched on to read the error messages.

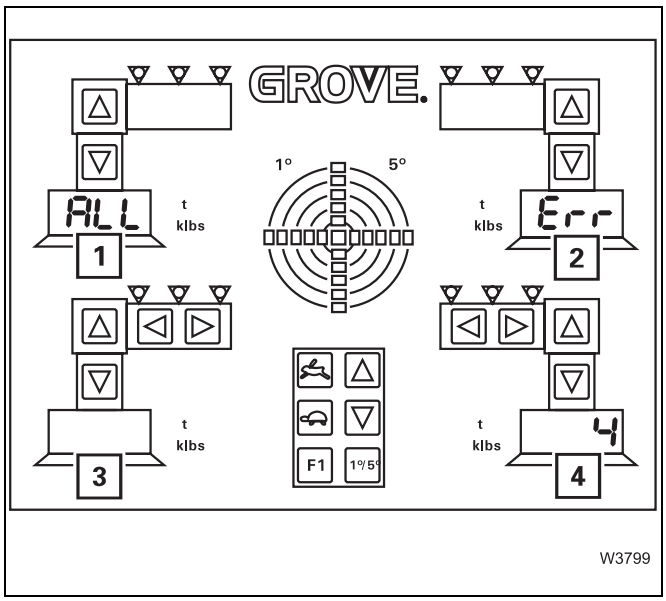
- Open the door on one of the two switchboxes *Outrigger/Electronic level/ Outrigger pressure indicator*.

F1

- Press the *Switch on second level button* and hold it down.

1°/5°

- Also press the *Switching over measuring range* button once.




The error menu is opened and the display fields (**1**) to (**4**) display e.g. the entries

| ALL | Err |
|---|---|
| | 4 |

The number in the field (**4**) shows the total number of existing error messages (e.g. **4**).

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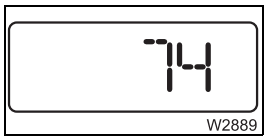
**Calling up current error codes**

These error codes refer to a currently occurring malfunction.

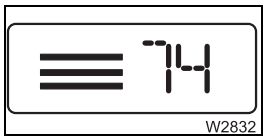
- Engage the holding brake.
- Switch the transmission to neutral position **N**.
- Do **not** operate the service brake.
- Push the *Transmission* touch lever forwards.

The *Transmission* display indicates the current error code. If there are several errors, all the error codes are displayed repeatedly in sequence as long as you hold the push lever forwards.

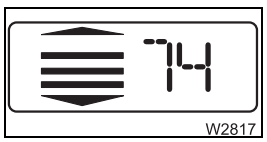
The error codes are displayed in various ways:




– Error codes up to 99 are simply indicated as a number (e.g. error code 74).




– If bars appear in front of the indicated number, you need to add 100 to the number shown (e.g. error code 174).

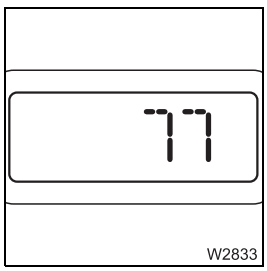



– If bars and arrows appear in front of the number, you need to add 200 to the number shown (e.g. error code 274).

**Calling up stored error codes**

These error codes refer to malfunctions not active at present. These error codes were stored with previous malfunctions.

- Engage the holding brake.
- Switch the transmission to neutral position **N**.
- Operate the service brake and push the *Transmission* touch lever forwards.




The *Transmission* display indicates the stored error code. If there are several errors, all the error codes are displayed repeatedly in sequence as long as you hold the push lever forwards.

- They are displayed in the same way as the current error codes (e.g. error code 77).

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# 9 Technical Information on Carrier

## 9.1 Technical description of the carrier

### 9.1.1 Crane carrier

The following parts are attached to the crane carrier:

- the travel drive units
- the axle lines
- the suspension system
- the steering
- the driver's cab
- the outriggers
- the swivelling connection to the crane superstructure

### 9.1.2 Driver’s cab

The driver's cab is made of aluminium and buffered with rubber elements. The side window panes with electrical window lifters are made of safety glass and the front window pane is made of laminated glass.
The driver's seat has an integrated 3-point seatbelt system. On the air-cushioned driver's seat the side supports and the lumbar vertebrae support are pneumatically adjustable.
The driver's cab can be tilted forwards hydraulically.
All operating and control equipment for driving the truck crane is located in the driver's cab, which is heated by a heat exchanger using the engine coolant.

As additional equipment, the coolant used to preheat the engine and to heat the driver's cab can be heated by an auxiliary heater with a timer.

As additional equipment, a combined air-conditioning system can be installed on the carrier. When driving mode is switched on, the refrigerant is directed through the heat exchanger for the driver's cab. When crane operation is switched on, the refrigerant is directed through the heat exchanger for the crane cab.

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**Dimensions for driving on public roads**

All measurements relate to on-road driving mode (➠ *Driving modes*, p. 7 - 1).

| | |
|---|---|
| Length without auxiliary hoist and without spare wheel: | 10.90 m |
| Width: | 2.55 m with 14.00 R25 tyres<br>2.75 m with 16.00 R25 tyres<br>2.86 m with 20.50 R25 tyres |
| Height at on-the-road level: | 3.67 m –130/+170 mm (14.00 R25)3.72 m –130/+170 mm (16.00 or 20.50 R25) |
| Slope angle, front: | approx. 20° for on-road level (14.00 R25) |
| Slope angle, rear: | approx. 29° for on-road level (14.00 R25) |

If there is a ladder in the holder under the driver's cab or if the spare wheel and the rear outrigger pads are installed, then the specified slope angle is correspondingly reduced.

**Total weight and axle loads**

For equipment with the specified axle loads in on-the-road mode; ➠ *Driving modes*, p. 7 - 1.

Dimensions and weights of the parts which must be transported on separate vehicles during on-road driving; ➠ p. 9 - 12 und ➠ p. 15 - 12.

| | |
|---|---|
| Total weight: | depending on driving mode 36 t |
| Axle loads: | depending on driving mode 12 t |
| Axle loads: | each 24 t in working position free on wheels |

The value for the axle load in working position free on wheels applies to driving with a rigged truck crane and a maximum load that is allowed to be hoisted according to the *Lifting capacity table*.

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# 10 Index

How to use the alphabetical index; ➠ p. 1 - 18.
To avoid making the index unnecessarily long and unclear too long and unclear we have not included every single element from the instrument panel.
These elements, such as rocker switches, rocker buttons, warning and indicator lamps, as well as status displays, are described and named in detail in the overviews of Chapter 4 and Chapter 11 *Description of the truck crane*.
From there you will be referred to more detailed descriptions of these elements.

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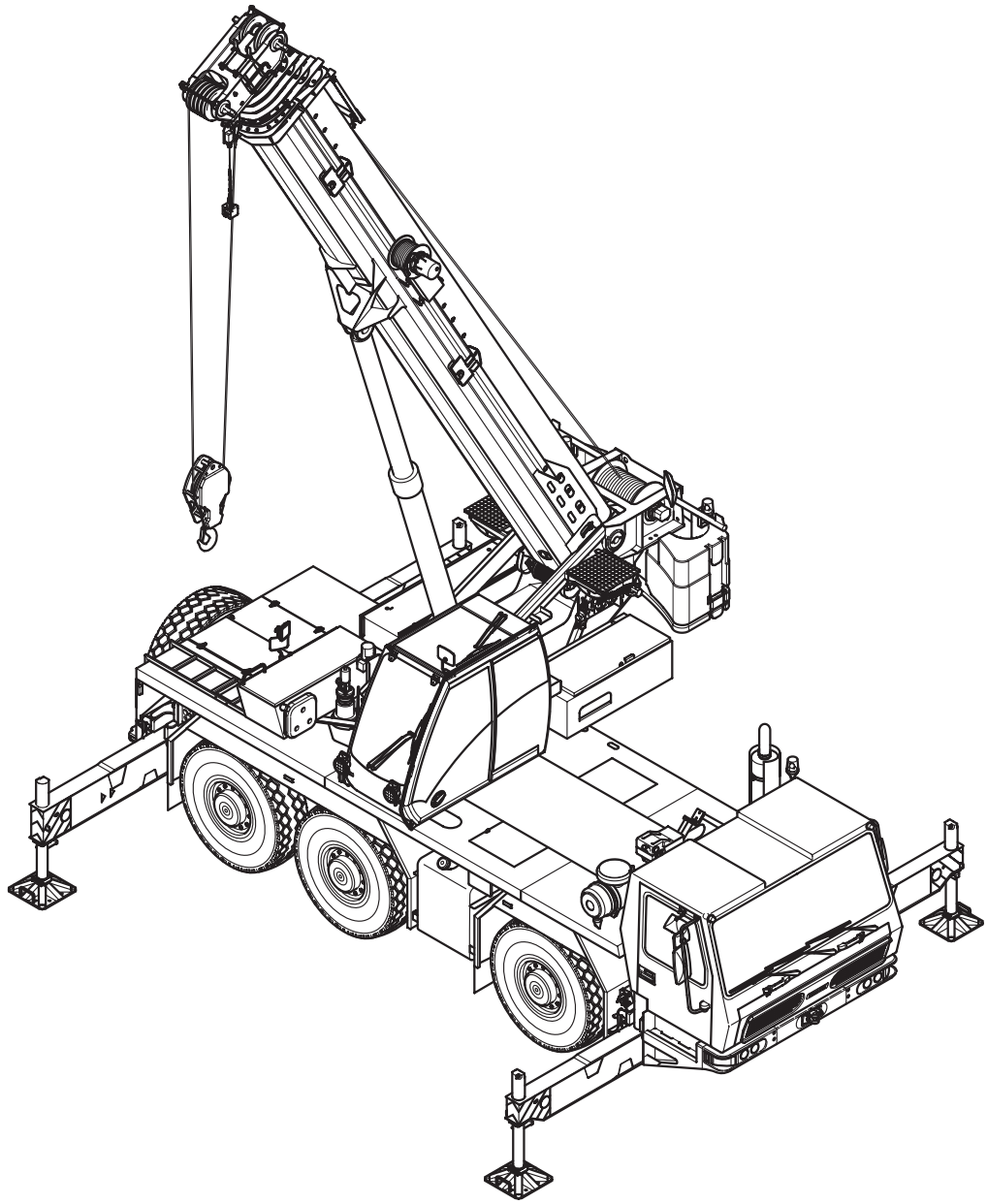
GROVE

# GMK3055



# Operating instructions Part 2 Crane operation

Serial number

2 084 849 en
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| | | |
|---|---|---|
| **1** | Air vents | ➠ p. 11 - 102 |
| **2** | Hoist high speed indicator lamp | ➠ p. 11 - 67 |
| **3** | Rocker button for windscreen wiper | ➠ p. 11 - 100 |
| **4** | Rocker button for roof window wiper | ➠ p. 11 - 100 |
| **5** | Rocker button for washing system | ➠ p. 11 - 101 |
| **6** | Indicator lamp for high-speed derricking gear/telescoping mechanism | ➠ p. 11 - 73<br>➠ p. 11 - 76 |
| **7** | Rocker button for working area spotlight sockets | ➠ p. 11 - 99 |
| **8** | On/off rocker button for slewable working area spotlight[1)] | ➠ p. 11 - 100 |
| **9** | On/off rocker button for air traffic control light[1)] | ➠ p. 11 - 99 |
| **10** | Rocker button for pivoting working area spotlight[1)] | ➠ p. 11 - 100 |
| **11** | Indicator lamp for transverse differential locks | ➠ p. 11 - 118 |
| **12** | Indicator lamp for longitudinal differential locks | ➠ p. 11 - 117 |
| **13** | Indicator lamp for flame start system[1)] | ➠ p. 11 - 46 |
| **14** | Charge indicator warning lamp | ➠ p. 11 - 115 |
| **15** | Indicator lamp for vehicle parking brake | ➠ p. 11 - 118 |
| **16** | Steering unlocked warning lamp | ➠ p. 11 - 120 |
| **17** | Rocker button for constant engine speed | ➠ p. 11 - 45 |
| **18** | Rocker button for vehicle parking brake | ➠ p. 11 - 118 |
| **19** | On/off rocker button for derricking lattice extension[1)] | ➠ p. 11 - 66 |
| **20** | Ignition lock | ➠ p. 11 - 45 |
| **21** | Cigarette lighter (24 Volt) | |

[1)] Additional equipment

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**1** Crane control display ➠ p. 11 - 20

**2** Error warning lamp/warning message ➠ p. 11 - 47

**3** Button F 1 to F 4 ➠ p. 11 - 46

**4** Button F 5 to F 8 ➠ p. 11 - 46

**5** Sensor for brightness ➠ p. 11 - 49

**6** Button F 9 to F 14 ➠ p. 11 - 46

**7** Button for opening the error menu and Error menu overview LED ➠ p. 11 - 47 ➠ p. 11 - 33

**8** Buttons for key code input and LEDs ➠ p. 11 - 47

**8.1** Button for Warning message submenu and LED button ➠ p. 11 - 32

**9** Button for closing submenu/input mode and LED ➠ p. 11 - 48

**10** Indicator lamp for slewing gear brake ➠ p. 11 - 48

**11** Input rotary switch ➠ p. 11 - 46

**12** Warning lamp for lifting limit switch shutdown ➠ p. 11 - 48

**13** Button for input confirmation and LED ➠ p. 11 - 48

Various menus are shown on the *Crane control* display.
The menus are operated with the buttons F 1 to F 14. The individual buttons have different functions in each menu. The function of the buttons in the displayed menu corresponds to the symbol located next to or above the button; ➠ p. 11 - 46.

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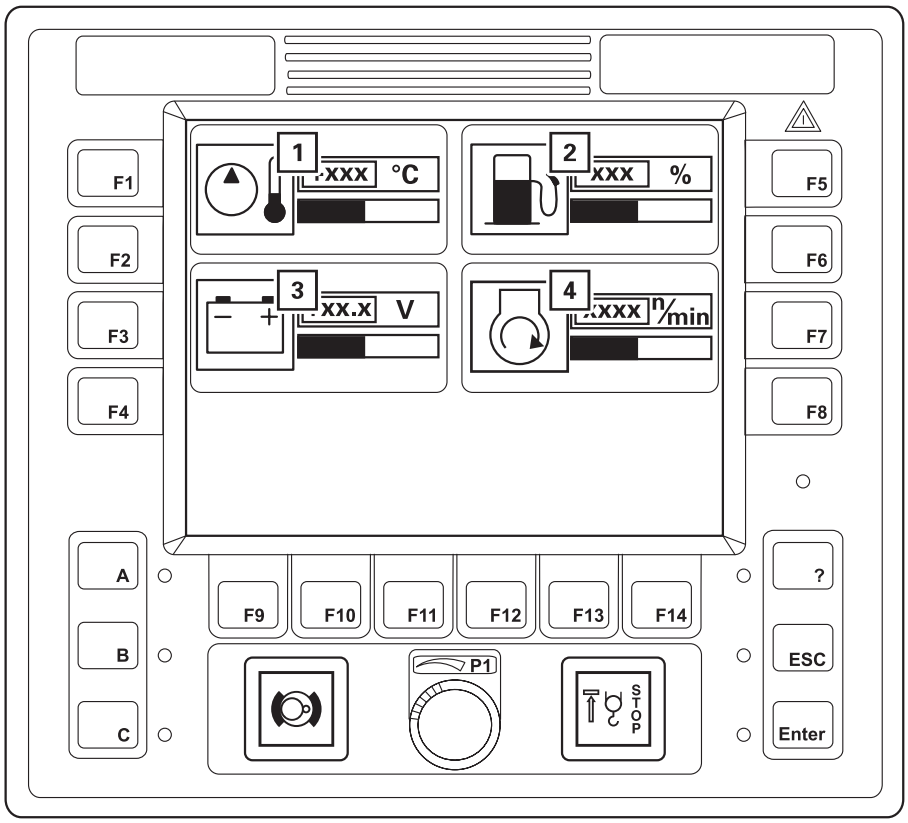
**Control instruments submenu**

This submenu contains displays as well as symbols which represent the function of the buttons.




**1** Display for hydraulic system oil temperature ➠ p. 12 - 36

**2** Display for diesel engine fuel tank level ➠ p. 12 - 33

**3** On-board voltage display ➠ p. 12 - 36

**4** Diesel engine r.p.m. display ➠ p. 12 - 36

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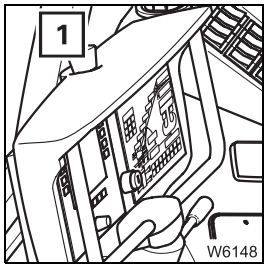


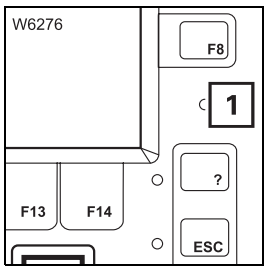

**Crane control emergency stop switch**

Used for switching off the crane control system in an emergency. Immediately switches off the diesel engine. Crane functions are stopped abruptly.

**To stop crane functions:** Push in the emergency stop switch. The switch clicks into position.

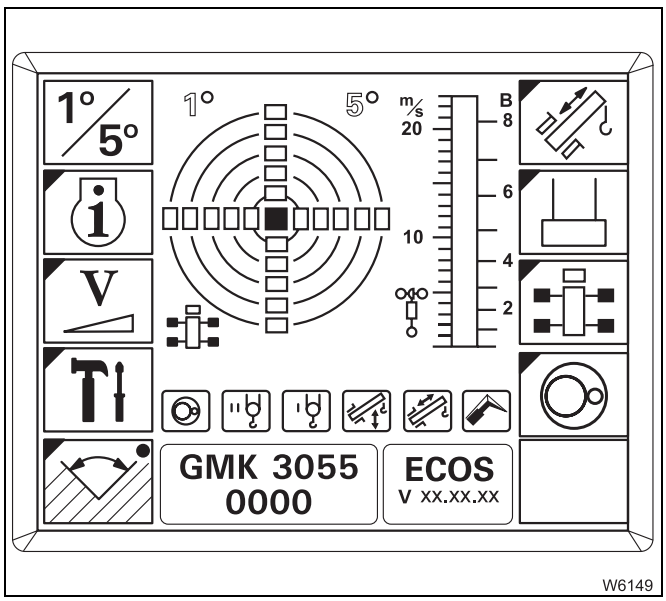
**To release crane functions again:** Turn the emergency stop switch. The switch pops back out.

➠ *In the crane cab*, p. 14 - 2.




**Sensor for brightness**

Sensor (**1**) registers the light intensity around the *Crane control* insert. After switching on the ignition, the basic brightness of all displays automatically adjusts to the ambient light. The brightness of the displays can also be manually adjusted; ➠ p. 12 - 139.




**Crane control display**

This display is used to show various menus for crane operation and to display information and error messages.

The main menu appears after switching on the ignition. The main menu contains display elements and various symbols.

Symbols which represent submenus are indicated by a blue top left corner. Pressing the button next to or under a symbol opens the corresponding submenu.

The *Crane control* display can indicate metric units of measurement and US units of measurement. The unit of measurement is set at shipment. If you would like to change the setting, please contact ***CraneCARE***.

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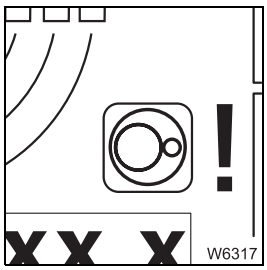
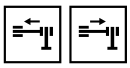



**Movement locked symbol**

The (!) symbol is shown if the outrigger is preselected when the slewing gear is switched on.
When the symbol appears the symbols for moving the outrigger are shown in light grey and the associated buttons are not active.



**Retracting/extending outrigger beams**

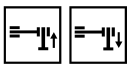
The buttons next to the symbols are only active when movement of the pre-selected outrigger cylinder is allowed and when the slewing gear is switched off. The colour of the symbols indicates the current status:

**Black:** The button next to the symbol is activated.

**Light grey:** The button next to the symbol has no function.

These buttons are always pressed in addition as long as the pre-selection of an outrigger is switched on and the point in the associated symbol is green.

– After pressing the button next to the *Retract outrigger beam* symbol the outrigger beam retracts to the preselected outrigger.
– After pressing the button next to the *Extend outrigger beam* symbol the outrigger beam extends to the preselected outrigger.



**Retracting/extending outrigger cylinders**

The buttons next to the symbols are only active when movement of the pre-selected outrigger cylinder is allowed and when the slewing gear is switched off. The colour of the symbols indicates the current status:

**Black:** The button next to the symbol is activated.

**Light grey:** The button next to the symbol has no function.

These buttons are always pressed in addition as long as the pre-selection of an outrigger or the pre-selection of outrigger cylinders is switched on and the point is green in the associated symbol:

– After pressing the button next to the *Retract outrigger cylinder* symbol the outrigger cylinder retracts to the preselected outrigger.
– After pressing the button next to the *Retract outrigger cylinder* symbol the outrigger cylinder extends to the preselected outrigger.

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**Auxiliary hoist**

The auxiliary hoist is only available with additional equipment; ➠ *Auxiliary hoist*, p. 12 - 80.

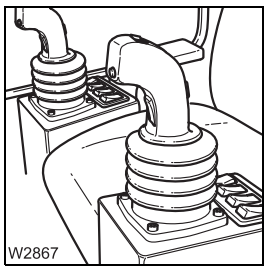
**On/off rocker button for auxiliary hoist**

Used for switching the auxiliary hoist on and off. There is an indicator lamp in the rocker button.
After switching on the ignition, the auxiliary hoist is off and the indicator lamp in the rocker button is dimly lit.

| | |
|---|---|
| **To switch on the auxiliary hoist:** | Indicator lamp is dimly lit.<br>Press rocker button upwards once; the indicator lamp will then be brightly lit. |
| **To switch off the auxiliary hoist:** | Indicator lamp is brightly lit.<br>Press rocker button upwards once; the indicator lamp will then be dimly lit. |

**Auxiliary hoist on/off indicator lamp**

This indicator lamp is located in the *Crane control* display in the main menu.
The lamp lights up **red** when the auxiliary hoist is off.
The lamp lights up **green** when the auxiliary hoist is on.




**Left-hand control lever**

| | |
|---|---|
| **To lift auxiliary hoist:** | Move control lever backwards |
| **To lower auxiliary hoist:** | Move control lever forwards |

The sensitivity of the control lever can be changed by setting various characteristic curves; ➠ p. 12 - 140.

High-speed mode for the auxiliary hoist is switched on together with high-speed mode for the main hoist; ➠ *Rocker button for hoist high speed*, p. 11 - 68. The function of the indicator and warning lamps is the same as for the main hoist.

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**Select Unlock telescopic section**

The display always refers to the telescopic section shown in the *Telescoping cylinder in foot section* display:
Shows an active selection screen in the crane control for unlocking the telescopic section or displays the current locking status of the telescopic section by means of various background colours or by flashing.

- The background of the symbol appears **yellow** when the telescopic section is **unlocked**.
- The background of the symbol appears **grey** when the telescopic section is locked and unlocking has not been selected in the crane control at the same time.
- The background of the symbol **flashes** (background changes between grey and yellow) when the crane control has selected unlock and will carry out the procedure in the next step.

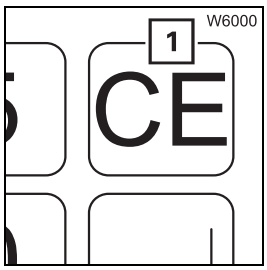
Press the button next to the symbol once in order to **select unlocking**.
The crane control saves the selection and the symbol for the next step necessary for unlocking the telescopic section flashes (e.g. the *Lock* selection flashes when the telescoping cylinder is unlocked by pressing the button).

**Select Lock**

Shows an active selection screen in the crane control for locking (telescopic section or telescoping cylinder) or displays the current locking status of the system by means of various background colours or by flashing:

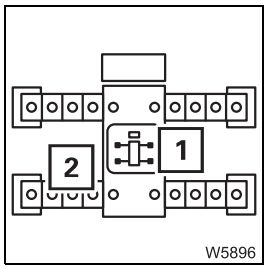
- The background of the symbol appears **yellow** when the telescoping cylinder and telescopic section are locked.
- The background of the symbol appears **grey** when the telescoping cylinder or telescopic section is unlocked and locking has not been selected in the crane control at the same time.
- The background of the symbol **flashes** (background changes between grey and yellow) when the crane control will carry out locking as the next step and until the locking process has been completed mechanically.

Press the button next to the symbol once in order to **select locking**. The crane control saves the selection and the symbol next to the button flashes (background changes between grey and yellow).
The crane control automatically detects whether a telescopic section or the telescoping cylinder is locked based on whether telescoping is being carried out or whether the telescoping cylinder is moving without the telescopic section.




### Acknowledge button

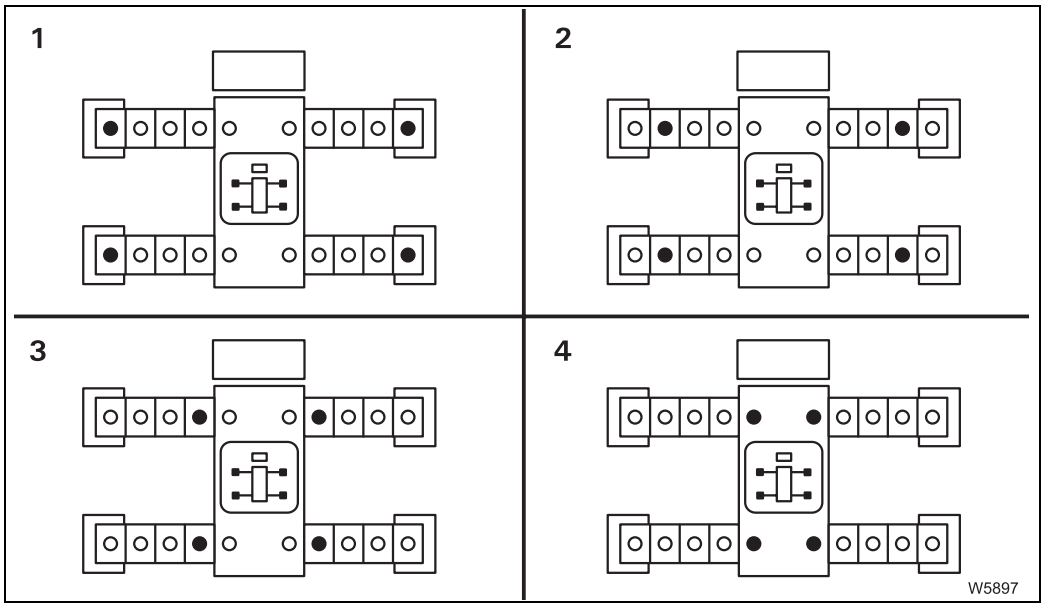
The *Acknowledge* (**1**) button is used to switch off the buzzer tone and to acknowledge an error message.




### Outrigger span display and input

The LEDs on the *Outrigger span* (**2**) display show the required outrigger span in line with the SLI code entered.
When input mode is switched on in the *SLI code* display, press the *Input outrigger span* (**1**) button repeatedly to show one after another all outrigger spans permitted according to the *Lifting capacity table*.

The LEDs indicate the various outrigger spans as follows:




**1** Outrigger span 6.825 x 6.20 m

**2** Outrigger span 6.825 x 4.40 m

**3** Outrigger span 6.825 x 2.32 m

**4** Free on wheels

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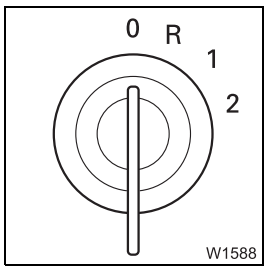
## 11.2.12 Electricity, lighting, windscreen wiper/washing system

### Electricity




**Ignition lock**

**0** Ignition off, diesel engine and crane functions off, key can be removed.

**R, 1** Ignition on, instrument lighting is on.
Additional power supply on for:
control units for crane control, engine control system, SLI

**2** Starting position; ➠ *Start diesel engine from the crane cab*, p. 12 - 29.

**Charge indicator warning lamp**

Lights up if the ignition is switched on and the diesel engine is stationary. Goes out after the diesel engine is started; ➠ *Start diesel engine from the crane cab*, p. 12 - 29.

### Lighting

**Rocker button for working area spotlight sockets**

One working area spotlight comes as standard; a second working area spotlight is available as additional equipment. There are two clamps and two sockets on the front of the crane cab for the working area spotlights. The voltage in the two sockets is switched on and off with the rocker button.

**To switch on working area spotlight:** Press rocker switch down

**To switch off working area spotlight:** Press rocker switch up

**Air traffic control light on/off rocker button**

With additional equipment there is a socket for the air traffic control light on the main boom head. The voltage in this socket is switched on and off with the rocker button.

**To switch on air traffic control light:** Press rocker switch down

**To switch off air traffic control light:** Press rocker switch up

➠ *Installing/removing the air traffic control light*, p. 13 - 143.

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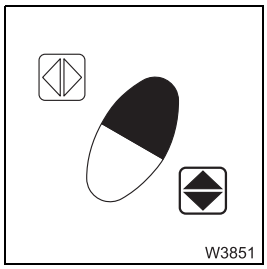
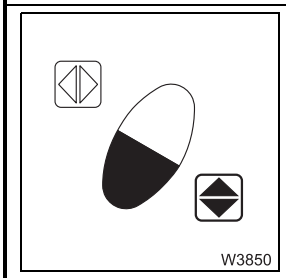
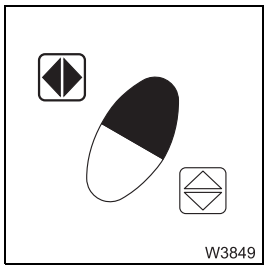
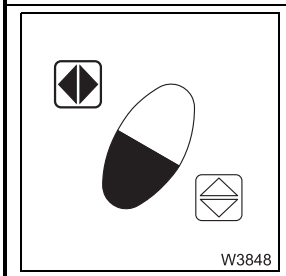
Buttons that have been pressed are shown in black in the illustrations

| Button combination | Pre-selected power unit: Telescoping mechanism | Derricking gear | Slewing gear/ locking of turntable | Main hoist | Auxiliary hoist | Derricking lattice extension[1)] |
|---|---|---|---|---|---|---|
|  W3851 | Extend | Lower | Lock turntable | Lower | Lower | Lower |
|  W3850 | Retract | Raise | Unlock turntable | Lift | Lift | Raise |
|  W3849 | No | No | Turn to the right | No | No | No |
|  W3848 | No | No | Turn to the left | No | No | No |

1) Function only when additionally equipped with hydraulically derricking lattice extension

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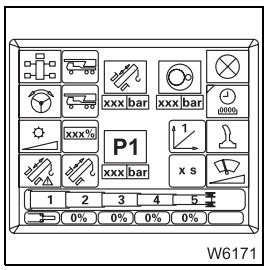
## 11.3.5 Steering

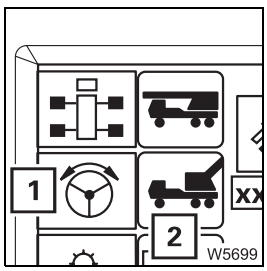
In this section it is assumed for the *right* and *left* specifications that the steering direction is appropriately set for the current superstructure position.

**Switching steering direction**

➠ *Adapting the steering direction to the superstructure setting*, p. 12 - 180.




All the elements described in this section can be found in the *Settings/Displays* submenu.
To open this menu, press the button next to the Ti symbol in the main menu.

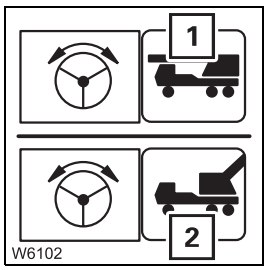



**Switching steering direction**

Used to switch the steering direction when steering with the rocker buttons in the control levers. Each time the button under the *Switch steering direction* symbol (**1**) is pressed, the steering direction is switched. The *Current steering direction* (**2**) shows the currently active status.

**Current steering direction display**

Displays the currently active steering direction. There are two symbols:




**Turned forwards (1):** In the work position 0° forwards the steering direction of the wheels corresponds to the direction of extension of the rocker button

**Turned backwards (2):** In the work position 180° backwards the steering direction of the wheels corresponds to the direction of extension of the rocker button

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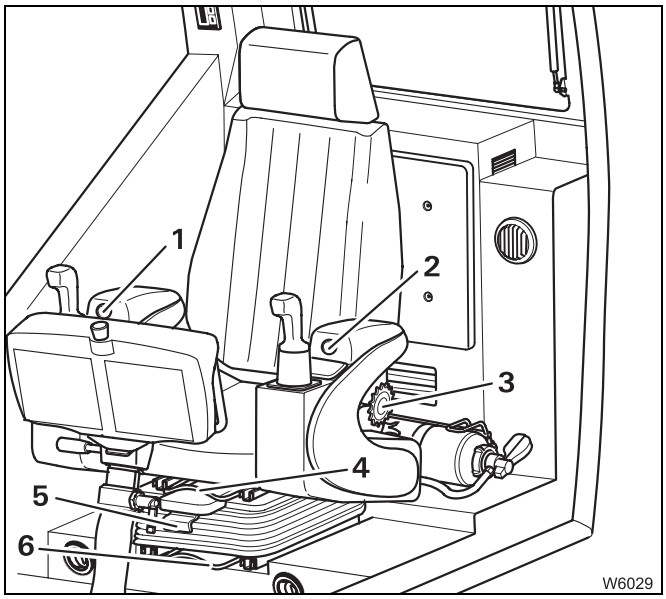
**Adjusting the crane cab**

You may adjust the hydraulically-sprung seat in the crane cab to suit your height.




**1** Unlocking and adjusting the height of the right-hand control panel

**2** Unlocking and adjusting the height of the left-hand control panel

**3** Adjusting the seat back angle (rotary knob on each side)

**4** Adjustment backwards/forwards of the seat and the back rest without the control consoles

**5** Seat height adjustment

**6** Adjustment backwards/forwards of the whole seat with the control consoles

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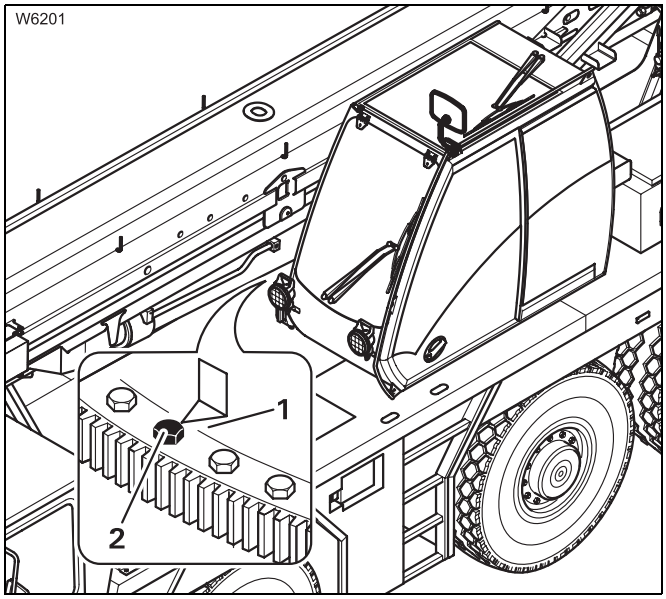
**Slew to the locking point**

The turntable locking can only be engaged when the superstructure is at a locking point.

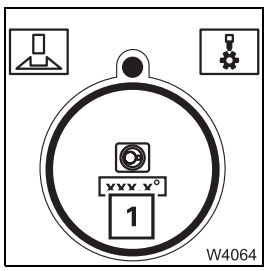



The locking points are at working positions *0° rearwards* and *180° forwards*.

The superstructure is at a locking point when the arrow (**1**) points to a marked bolt (**2**) on the swivelling connection.

- Swivel the superstructure to the locking point of the working position *0° rearwards* or *180° forwards*.

An indication that the locking point has been reached is also shown in the *Superstructure lock* submenu:




The superstructure is at the locking point when the *Current slewing angle* (**1**) display shows one of the following:

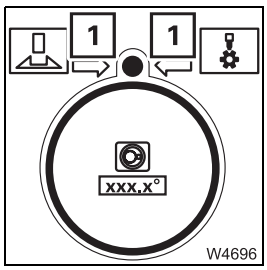
– either **180°** when the superstructure is slewed forwards,

– or **0°** when the superstructure is slewed rearwards.

When you slew the superstructure out of the 0° position
– angles in the **right-hand arc** are shown as **positive** (0° to +180.0°),

– angles in the **left-hand arc** are shown as **negative** (0° to –179.9°).

- Swivel the superstructure to the locking point of the working position *0° rearwards* or *180° forwards*.




In the range ± 20° around the locking point, the directional indicator (**2**) give additional information:

– When the superstructure is ca. 20° in front of or behind the locking point, one of the two arrows shows the slewing direction which is necessary to come closer to the locking point.

– When the locking point is reached, both arrows light up.

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## 12.2.2 Start diesel engine from the crane cab

**Checks on carrier before starting**

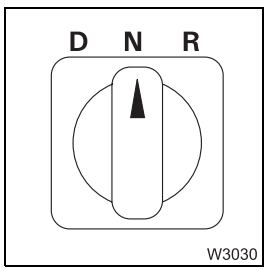
When starting a warm diesel engine from the superstructure it is assumed that the following prerequisites have been fulfilled:

- In the driver's cab the *Driving mode/crane operation* rocker switchis pressed downwards for *Crane operation*.
- The battery master switch is switched on.
- The diesel engine's oil and coolant levels have been checked.
- The oil level in the hydraulic system has been checked.
- The shut-off valves on the hydraulic tank have been opened.
- If the truck crane is to be moved from the crane cab, the ignition key must be inserted at position **1** so that the steering is not locked; ➠ *Preparing to drive*, p. 12 - 178.

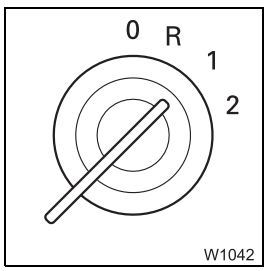
**Switching on the ignition**

This section describes only how to start the diesel engine from the crane cab. You can also start the diesel engine from the hand-held control; ➠ *Starting and turning off the diesel engine with connected hand-held control*, p. 13 - 30.

The ignition can only be switched on, if the bridging plug has been inserted in all sockets for hand-held control;➠ *Connections on the truck crane*, p. 11 - 105.




- Turn the *Transmission* rotary switch to position **N**; ➠ *Transmission rotary switch*, p. 11 - 116.
  You can only start the diesel engine in this shift position.




- Switch on the ignition in the crane cab. Insert the ignition key into the ignition lock and turn the key to position **1**.

Switching on the ignition causes the vehicle parking brake to be locked. The *Vehicle parking brake* indicator lamp ⊡ will light up

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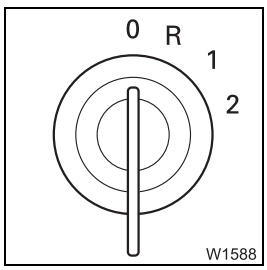
## 12.2.4 Shutting down the diesel engine

This section deals with switching off the diesel engine in normal operation, at the ignition switch and at the hand-held control. In an emergency the diesel engine can however also be shut down by operating the emergency stop; ➠ *Emergency-stop devices for crane operation*, p. 14 - 1.

**Risk of accidents due to suspended loads**
Never turn the diesel engine off while a load is suspended. Never leave the crane cab while a load is suspended on the hook.
Always keep your hands near the control levers while a load is suspended. This enables you to take corrective action at all times.
Always put down the load before you interrupt work!

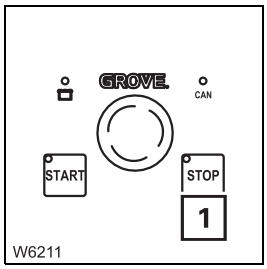
**In normal operation**

In normal operation you can switch off the diesel engine at the ignition switch or at the hand-held control, depending on which was used to start the diesel engine.




**Ignition lock**

- Turn the ignition key to position **0,** the diesel engine will stop.




**On the hand-held control**

- Press the *Stop* button (**1**), and the diesel engine will stop.

- Refer to the instructions in the respective section for each type of stopping work;

➠ *Short work breaks*, p. 12 - 193,
➠ *Work breaks lasting more than 8 hours*, p. 12 - 193.

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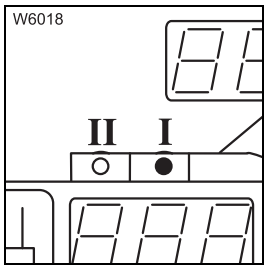
**Entering a reeving**

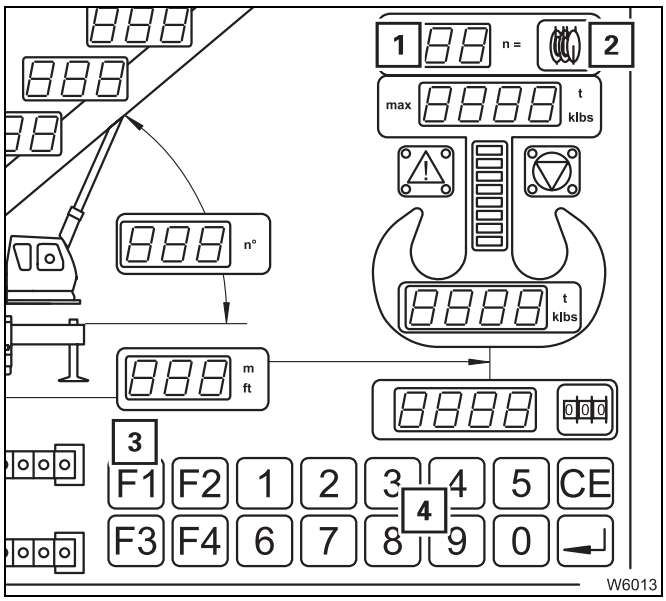
The rigging mode is fully input only when after the SLI code has been accepted you enter the current reeving.




The newly input reeving always applies to the hoisting gear for which the lamp on the *Hoisting gear* indicator lamp is lit, e.g. the lamp **I** for the main hoist.

- Check whether the indicated hoist is the one that will be used to lift the load and if necessary switch the display over to a different hoist;
  ➠ *Example of how to switch over the display*, p. 12 - 56.

For inputting the reeving you must perform the same steps at the *Reeving* display that were required for inputting the SLI code at the *SLI code* display. For this reason the procedure is described only briefly.



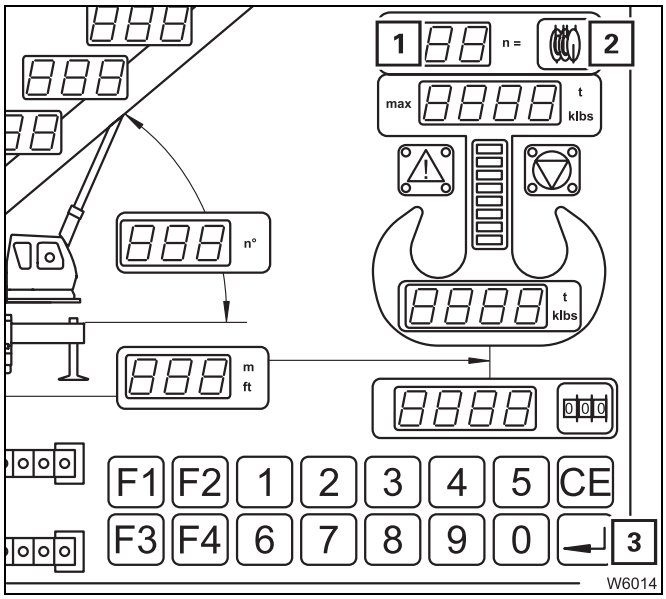

**Switching on input mode**

- Keep the *Second level numeric keypad* button (**3**) pressed and in addition press the *Input reeving* button (**2**).

The value in the *Reeving* display (**1**) will flash.

**Inputting the value**

- Input the value by pressing the keys of the numeric pad (**4**).
  **or**
- Select the value using the *Input reeving* button (**2**).




**Confirming the input**

- Press the *Confirm entry* button (**3**) once.

The input is confirmed when the signalling point appears on the *Reeving* display (**1**).

**Accepting the values**

- Press the button *Enter reeving* (**2**) once.

The signalling point will go out and the reeving is accepted.

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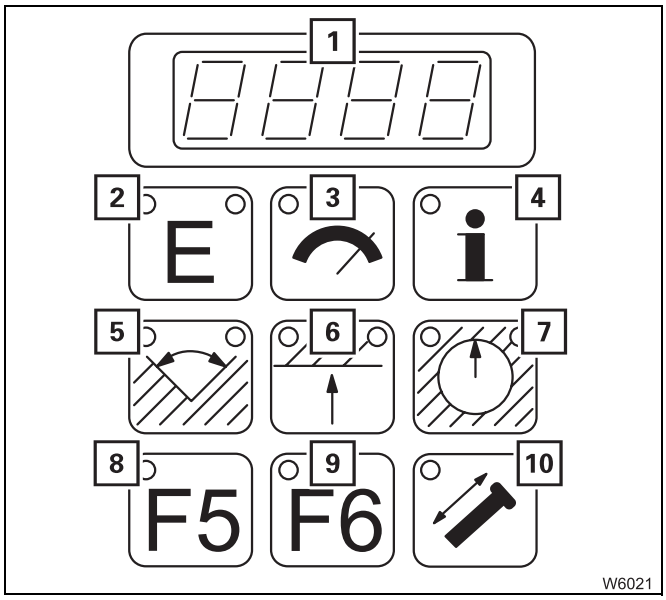
**Optional displays**

The information listed in the following section can be shown on the *Information/error* display. If an error message is reported the *Information/error* display will automatically change to showing the error code (unless input mode is enabled).




The value currently shown in the *Information/error* display (**1**) always relates to the button whose LED is lit (in the case of the *Error information* button, both LEDs light up).

- To call up a value, press the associated button and it will be displayed.

– *Error information* button (**2**),
– *Degree of utilisation* button (**3**),
– *Oil pressure derricking cylinder lower chamber* button (**4**),
– *Current slewing angle* button (**5**),
– *Current overall height* button (**6**),
– *Current radius* button (**7**),
– *Second level information* button (**8**),
– *Third level information* button (**9**),
– *Main boom length* button (**10**).

If one of the buttons that has no function is pushed, the value in the *Information/error* display will not change. The green indicator lamp in the button will not light up.

Further information regarding the respective displays; ➠ *Information displays*, p. 11 - 95.

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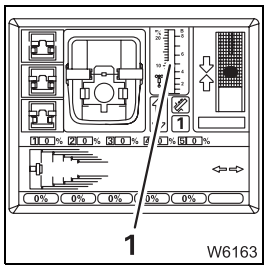
**Monitoring wind speed with an anemometer**

Strong winds lead to the truck crane being overloaded. The permitted wind speed for a fully loaded truck crane can be found in the *Lifting capacity table*.

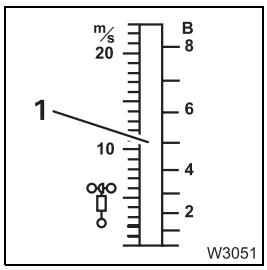
If an anemometer is fitted as additional equipment, whether on the main boom head or on the lattice extension head, you can continuously monitor the wind speed at the *Anemometer* display whilst operating the crane.

- To do this, open the main menu or the *Telescoping* submenu.




- If another menu is shown on the *Crane control* display, press the *Exit submenu/input mode* button (Esc) until the main menu is displayed.

If necessary to open the *Telescoping* submenu press the button alongside the symbol. The *Anemometer* display (**1**) can be found at about the same place in both menus.




The *Anemometer* display (**1**) indicates the current wind speed. The display is divided into three areas; the bar in the diagram has a different colour in each of these areas:

| | |
|---|---|
| **Green:** | 0 to 6 m/s |
| **Yellow:** | 6 to 12 m/s |
| **Red:** | over 12 m/s |

- Cease operating the crane immediately when the wind speed shown exceeds the maximum permitted wind speed as shown in the *Lifting capacity table*, and take heed of all the instructions given in the section *If the maximum permitted wind speed has been exceeded*; ➠ p. 12 - 70.

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**Switching off the main hoist**

If the main hoist is not required, it should be switched off to avoid unintentional use.

- Press the *Main hoist on/off* rocker button down once.
  The main hoist is switched off when the indicator lamp in the rocker button lights up dimly.

When the main hoist is switched off, the *Main hoist on/off* indicator lamp in the main menu of the *Crane control* display lights up in **red**.

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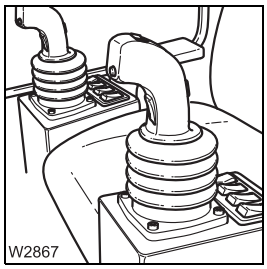


You can adjust the sensitivity of the control lever to the operating conditions; ➠ *Setting characteristic curves for the control lever*, p. 12 - 140.

**Turning to the left:** Push the left-hand control lever to the left.

**Turning to the right:** Push the left-hand control lever to the right.

The further you move the control lever to the right or left, the more quickly the slewing gear slews.

If you let go of the control lever or move it to the middle position, the slewing movement slowly comes to a stop; the slewing movement does not automatically brake; ➠ *Braking the slewing movement*, p. 12 - 91.

Furthermore, you can change the slewing speed by:

– Changing the engine speed with the accelerator
– Setting a constant engine speed; ➠ p. 12 - 145

The maximum slewing speed is limited automatically. As the working radius increases, the maximum hoist speed is decreased.
If you now reduce the radius (e.g. by raising) the slewing speed will automatically be increased again (overview of the limit values ➠ p. 12 - 93).

You can also limit the maximum slewing speed manually in the submenu *Power unit speed*; ➠ p. 12 - 142.

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**Telescoping**

The position of the telescopic sections, i.e. which telescopic section has been telescoped how far, is called the telescoping. The current telescoping is displayed:

– on the SLI and

– on the *Crane control* display

This section deals with the *Current telescoping* display on the SLI. The display of the telescoping on the *Crane control* display is described from section *Example of the procedure for telescoping* onwards; ➠ p. 12 - 105.

### Displaying the main boom fixed lengths

For the main boom fixed lengths the current telescoping is displayed as a decimal value with two places after the decimal point (e.g. **1.00** or **0.51**). Only the following percentage values are valid as main boom-**fixed lengths**:

Telescopic section I 0 / 47 / 100 [%]

Telescopic section II 0 / 49 / 100 [%]

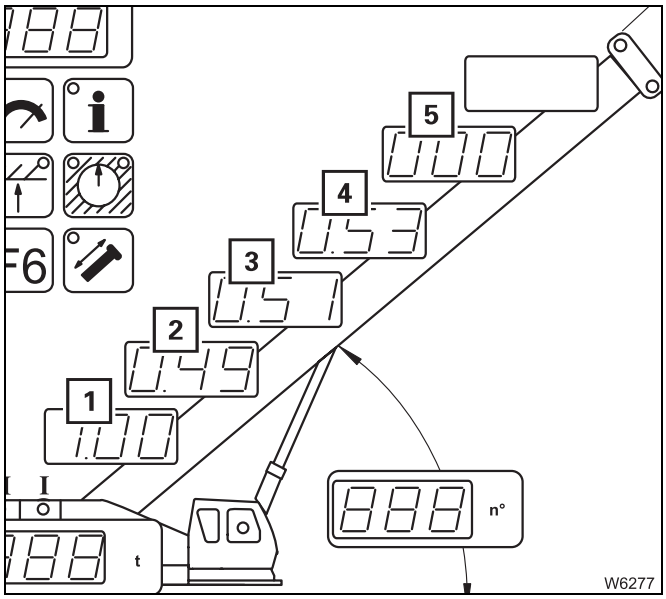
Telescopic section III 0 / 51 / 100 [%]

Telescopic section IV 0 / 53 / 100 [%]

Telescopic section V 0 / 55 / 100 [%]

Not all locked telescopings are available as main boom fixed lengths; ➠ p. 12 - 97. The approved fixed lengths can be found in the *Lifting capacity table*.

**Example:** Displaying the telescoping for main boom fixed lengths




**1** Telescopic section I 100% = Fixed length

**2** Telescopic section II 49% = Fixed length

**3** Telescopic section III 51% = Fixed length

**4** Telescopic section IV 53% = Fixed length

**5** Telescopic section V 0% = Fixed length

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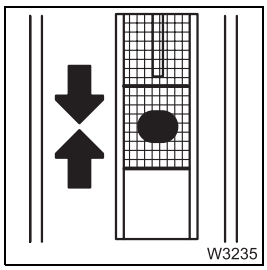
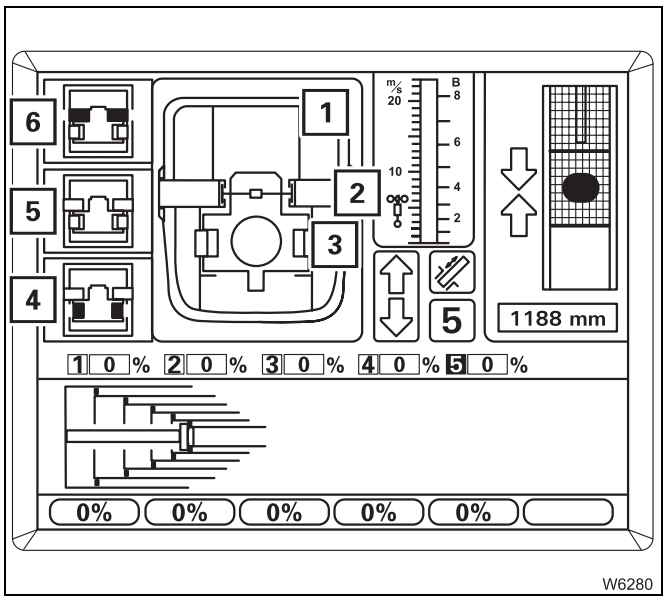



If the telescoping cylinder is located directly at the locking point, two **green** arrows are displayed that point to one another.

In this **example**, the displays are presented in the same way as they are shown in the illustration at the beginning of this section.
"Initial position" is defined as the following: The telescoping cylinder in telescopic section V is locked, meaning that the head of the telescoping cylinder is there. The value **5** is then displayed in the *Telescoping cylinder in foot section* display and the number **5** is highlighted in green on the *Current telescoping* display. Since the telescoping cylinder is locked, and therefore located at the locking point, the *Telescoping cylinder at locking point* display shows both green arrows. The current extended length of the telescoping cylinder is approx. 1188 mm, since the head of the telescoping cylinder extends into the foot section of telescopic section V.

**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.



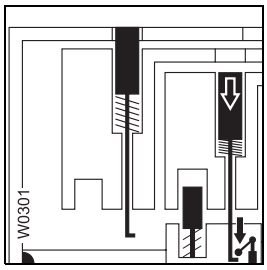

The *Current locking status* display (**1**) shows the current status of the locking pins, which is detected by proximity switches.
The locking pins (**2**) for the telescopic sections are shown above.
The locking pins (**3**) for the telescoping cylinder are shown below.

The different positions of the locking pins are shown directly and are also highlighted in colour:

| | |
|---|---|
| **Red:** | End position *Unlocked* reached |
| **Green:** | End position *Locked* reached |
| **Yellow:** | Neither of the two end positions reached |

**Unlock telescopic section**

Before you can telescope a telescopic section, you have to unlock it. You can only unlock the telescopic section in which the telescoping cylinder is locked.




When unlocking, the locking pins of this telescopic section are retracted from the mechanism on the telescoping cylinder.

**Initial positions for unlocking the telescopic section**:

Unlocking can be selected at any time. The crane control reacts differently, depending on:

– whether the telescoping cylinder is also locked; in this case the background of the *Select lock* symbol is in **yellow**, or

– whether the telescoping cylinder is unlocked; in this case the background of the *Select telescoping cylinder unlock* symbol is in **yellow**.

For safety reasons, simultaneous unlocking of both telescoping cylinder and telescopic section is firstly blocked by a hydraulic/mechanical switch and secondly is not permitted by the crane control.

**Unlocking the telescopic section**

- Check that the telescoping mechanism is switched on. The *Telescoping mechanism on/off* indicator lamp must light up in **green**.

- Select the function for unlocking the telescopic section. To do this, press the button next to the *Select telescopic section unlock* symbol.

If the **telescoping cylinder is locked**, the crane control selects the unlocking of the telescopic section as its next step and the *Select telescopic section unlock* symbol **flashes**.

When the **telescoping cylinder is unlocked**, the crane control selects the locking of the telescoping cylinder as its next step and the *Select lock* symbol **flashes**.

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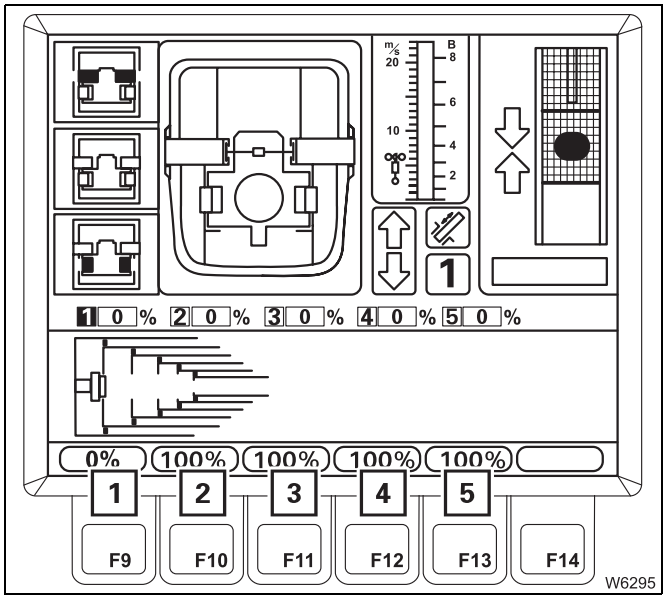



- To change a set value press the corresponding button under the respective value (**1**) thro (**5**).

Each time a button is pressed, the value for the respective telescopic section runs continuously through the following fixed lengths.

**1** Telescopic section I 0 / 47 / 100

**2** Telescopic section II 0 / 49 / 100

**3** Telescopic section III 0 / 51 / 100

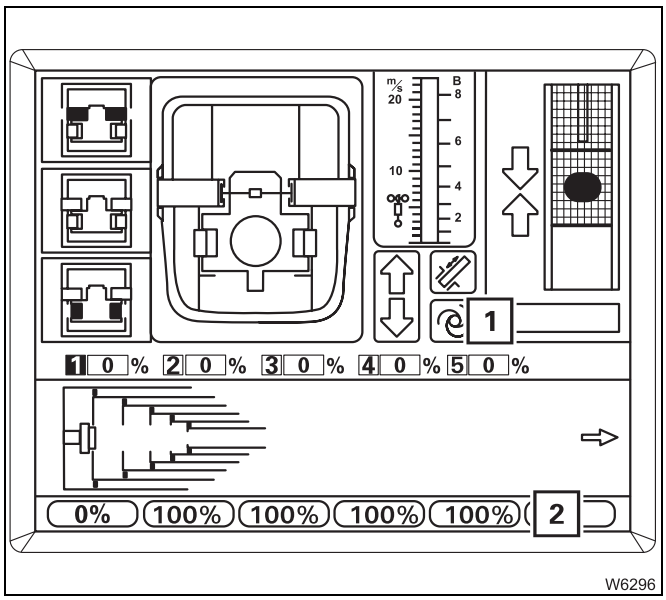
**4** Telescopic section IV 0 / 53 / 100

**5** Telescopic section V 0 / 55 / 100

- Call up the desired set values for all the telescopic sections (e.g. 0%, 100%, 100%, 100%, 100%).

Esc You can **interrupt the entry** by pressing the switch *Exit submenu/input mode* once.
In this way, input mode is switched off again and the values in the *Enter set value for teleautomation* display are shown in red.

Enter Confirm the set values by pressing the *Confirm input* button once.




If the set values entered are **not permitted**, the values on the display (**2**) will be shown in **red**, and teleautomation is switched off.

If the set values entered are **permitted**, the values on the display (**2**) will be shown in **green**; teleautomation is switched on.

The *Telescoping cylinder in foot section* display goes out and the *Teleautomation on* symbol (**1**) is now shown in its place.

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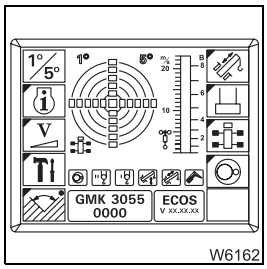
# 12.5 Adjustments and displays whilst operating the crane

This section does not describe all user controls or submenus. It deals primarily with those adjustments and displays that are directly required whilst operating the crane, such as inclining the crane cab or adjusting the power unit speeds.

Further adjustment capabilities and submenus which are directly subordinate to other procedures are described in the respective sections, such as changing the sense of steering in section *Driving the truck crane from the crane cab* and the *Emergency telescoping program submenu* submenu in chapter *Malfunctions during crane operation*.

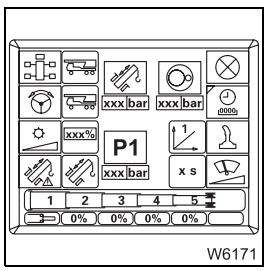
## 12.5.1 Adjusting the brightness of the displays

The degree of brightness of the *Crane control* display is regulated automatically in response to the ambient brightness. You can set a minimum degree of brightness manually; this will always be observed when the brightness is regulated.
The setting is carried out on the *Crane control* display, in the *Settings/displays* submenu. The manual setting will also apply to the *SLI* display.




- If another menu is shown on the *Crane control* display, press the *Exit submenu/input mode* button (Esc) until the main menu is displayed.

- Press the button in the main menu next to the *Settings/displays* symbol.




The display changes to the *Settings/displays* submenu.

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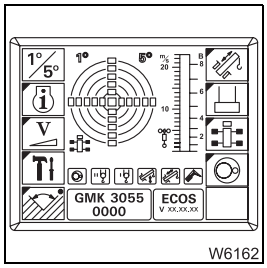
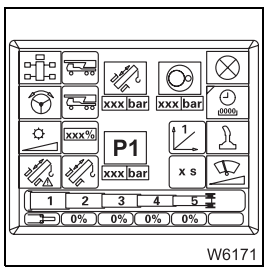
## 12.5.8 Display operating hours

In this submenu you can read the operating hours for all power units. This submenu can be opened from the *Settings/displays* submenu in the *Crane control* display.




- If another menu is shown on the *Crane control* display, press the *Exit submenu/input mode* button (Esc) until the main menu is displayed.

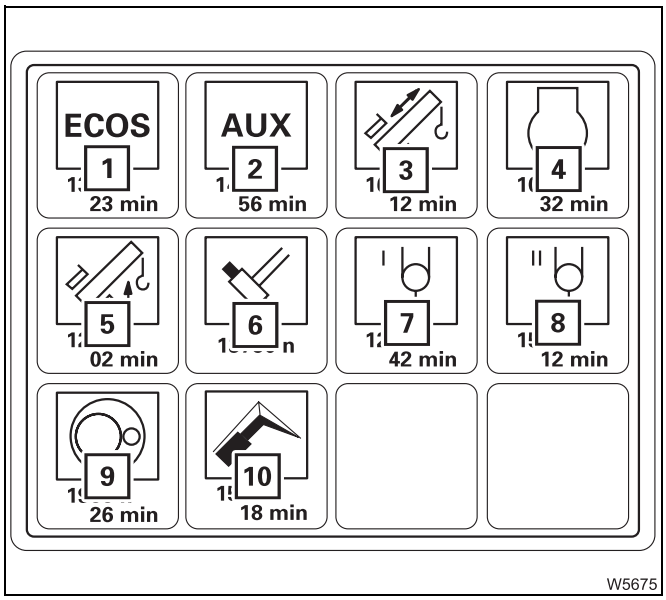
- Press the button in the main menu next to the *Settings/displays* symbol.




The display changes to the *Settings/displays* submenu.

In this menu press the button next to the symbol *Operating hours counter submenu*.
The display changes to the submenu *Operating hours counter*.

The symbols for all the power units supplied with the crane are displayed here. Power units currently not connected (e.g. the auxiliary hoist) are also displayed.




- *Crane control* (**1**)
- *Auxiliary power units* (**2**)
- *Telescoping mechanism* (**3**)
- *Diesel engine* (**4**)
- *Derricking gear* (**5**)
- *Locking system* (**6**) (locking pins in the telescoping mechanism)
- *Main hoist* (**7**)
- *Auxiliary hoist* (**8**) (additional equipment)
- *Slewing gear* (**9**)
- *Lattice extension* (**10**) (additional equipment)

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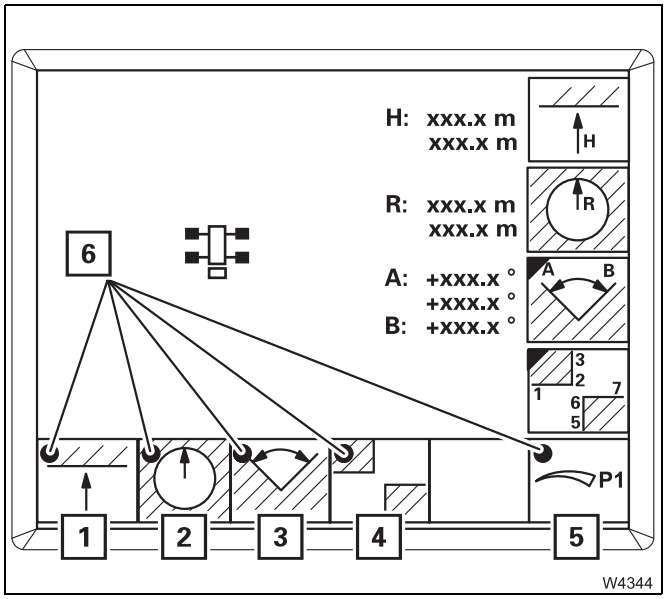
## 12.6.2 Reading current settings

**Display monitoring switched on/off**

You can check in the *Working range limiter* submenu which monitoring functions are switched on or off.




In the symbols for the monitoring functions there are indicator lamps for

**1** Monitoring overall height on/off

**2** Monitoring working radius on/off

**3** Monitoring slewing angle on/off

**4** Monitoring objects on/off

The indicator lamps' colour (**6**) show whether monitoring is activated or not:

**Green**: Monitoring on

**Black**: Monitoring off

**Reading the limit values entered**

You can check in the *Working range limiter* submenu which limiting values are entered for the individual monitoring functions.

All illustrations in these operating instructions use metric measuring units. Depending on the country in which you are working, the display can also be in US units of measurement; conversion is carried out at the factory.

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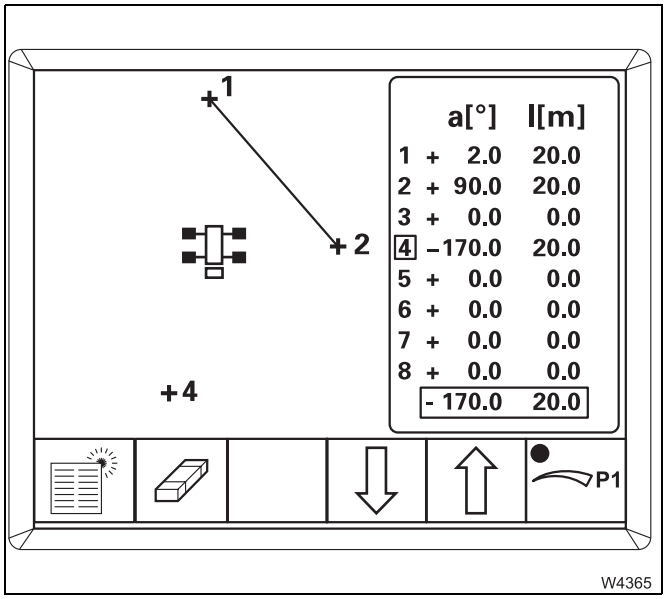


- Enter the data for the next limiting point of the object in the same way as for point **1** (e.g. for point **2**).

As soon as you accept the data for a new point, this point is integrated into the object and connected with a line.

If you wish to enter a second object, you must delete the data for the following point or enter as 0.0 value (e.g. for point **3**, data = 0.0).

The next point you enter now is the first point for a new object (e.g. point **4**).

Therefore you have the entry options for the following objects:

– 1 object with a maximum of 8 points or
– 2 objects with a maximum of 7 points altogether or
– 3 objects with 2 points each.

When the values for the point data are known, you can also enter the values into the selected points manually and accept them as a limit value;
➠ *Entering limit values manually*, p. 12 - 170.

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**Preconditions for driving without a load**

The following additional conditions must also be fulfilled before driving off without load:

- The superstructure is turned to the rear in the 0° position and locked.
- The slewing gear holding brake is engaged.
- The truck crane is in the *Free on wheels* working position.
- At the SLI the outrigger span *Free on wheels* is selected and the corresponding SLI code in accordance with the *Lifting capacity table* will be shown.
- The main boom is in the working range of inclination for the SLI code that is set.
- The suspension is locked.
- For safety, the outrigger beams should remain extended corresponding to the space available. The outrigger pads must not touch the ground whilst the crane is being driven.
- The steering system is now in separate steering mode from the crane cab; ➠ p. 12 - 182.
- The ground on the route is stable enough to withstand the maximum axle load during free-standing work; ➠ *Total weight and axle loads*, p. 15 - 11.
- The air pressure in the tyres must be correct; ➠ *Tyres*, p. 9 - 14.
- The route must be a flat, even surface; ➠ p. 12 - 180.

**Preconditions for driving with a load**

If the truck crane has to be driven with a raised load, then in addition to the preconditions set out above for driving without a load, the following preconditions must also be fulfilled.

**Risk of accidents when driving with a lifted load**
When driving the rigged truck crane secure the load against swinging and switch to *Driving with load*. In this way, you avoid driving too fast and stop the load from swinging due to a gear change in the transmission.

- The hook block and the load must be secured or lashed securely.

- The *Driving with a load* rocker switch must be switched upwards, so that the transmission will not shift reducing jerks to the greatest extent possible; ➠ p. 11 - 121.
- The main boom is in the working range of inclination for the SLI code that is set.
- The driving speed is max. 1.5 km/h .

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## 12.7.6 Possible connections

If necessary because of difficulties in obtaining traction on slippery terrain, you can undertake the following connections in succession:

– the longitudinal differential lock in the transfer case. With additional equipment with 6 x 6 x 6 the drive of the 1st axle line is also activated. You may not, however, use the longitudinal differential lock on firm ground.

**Risk of damage to the differential lock**
The differential locks may not be switched on when the vehicle is on solid ground. Do not leave the differential locks switched on any longer than necessary. It is imperative that you switch off the differential locks when driving on firm ground!

**Switching on the longitudinal differential lock**

With 6 x 6 x 6 drive as additional equipment, the drive of the 1st axle line is also activated.

- Stop the truck crane.
- Position the steering straight ahead.

- Press the *Longitudinal differential lock/drive of the first axle line* rocker switch down.

- Carefully start the truck crane until the *Longitudinal differential lock/first axle line drive* indicator lamp lights up.
  The indicator lamp will **flash** if **not all** of the activation procedures have been mechanically completed yet. The indicator lamp only **goes out** when **all** activation procedures have been completed mechanically.

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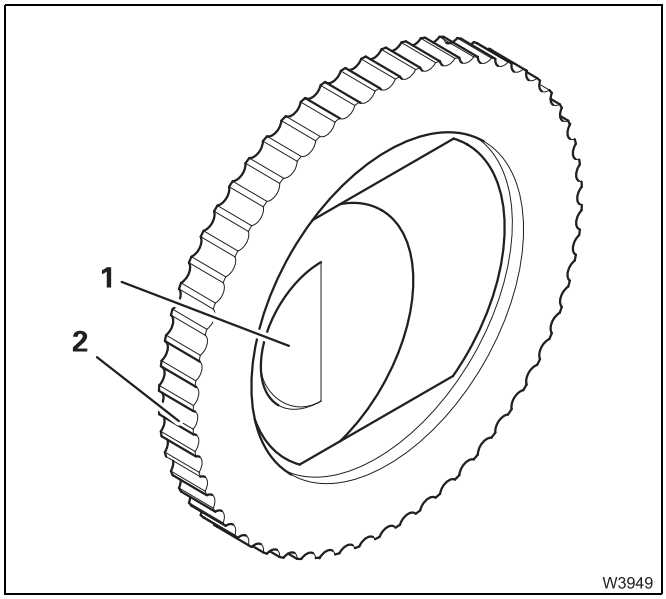



**Adjusting the air vents**

To **open** press in the plates in the recess (**1**) so that they are at right angles to the air vent.

To **close** press the plates back in again.

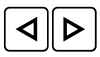
To **direct** the air flow, you can also turn the air vents at the serrated ring (**2**).

**Setting time and weekday**

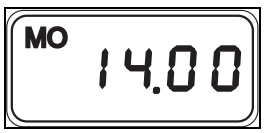
Always set the current time and current weekday. These settings are required for the correct switch-on time for automatic heating start.

If the power supply is interrupted, all symbols in the *Heater* display will flash and you must set the time and day again.


- Press the *Set time/day* push-button (⊙) for longer than 2 seconds. The displayed time will flash, e.g. 10.00.

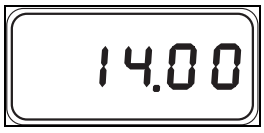


- Set the desired current time with the *Input* push-buttons while the display is flashing, e.g. 14.00.




- Wait 5 seconds. The new time is saved and then the weekday (e.g. **MO** top left) flashes.
-

- Set the current day with the *Input* push-buttons while the display is flashing.




After five seconds the display stops flashing and the current time is displayed.

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# 13 Rigging work

Once you have reached the site, you must carry out numerous rigging tasks before you can begin crane work. To do so, proceed according to this checklist.

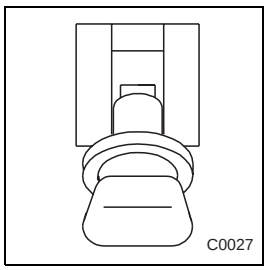
If the truck crane on the site has already been rigged, proceed according to the *CHECKLIST: When truck crane is rigged*, p. 12 - 1.

## 13.1 Checklists for rigging work for crane operation with main boom

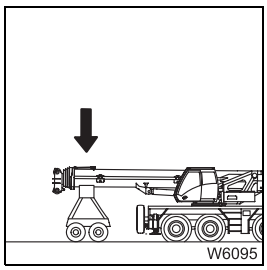
This checklist is not a complete instruction manual. There are accompanying instructions which are indicated by cross-references.
**Observe the warning and safety instructions given there.**

### 13.1.1 CHECKLIST: Rigging

1. Choose a suitable site; ➠ *Choosing a suitable site*, p. 13 - 9.




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




3. **When the main boom is resting on a trailer:**
   - Switch off the boom floating position (additional equipment); ➠ p. 13 - 18,
   - Switch off the slewing gear freewheel (additional equipment); ➠ p. 13 - 20,
   - With additional equipment, switch off boom pre-tensioning if necessary; ➠ p. 13 - 19.

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Always align the packing horizontally. Always align the truck crane horizontally with the outrigger cylinders.

**Risk of overturning when carrier or truck crane is at an angle**
Line up the carrier horizontally and align the truck crane horizontally with the outrigger cylinders. In this way you prevent the outrigger pads slipping from the angled carrier, or the truck crane from having an unfavourable centre of gravity owing to an incline and overturning when subject to a load.

**Enlarging outrigger surface area**

Only use durable materials for the packing, such as:

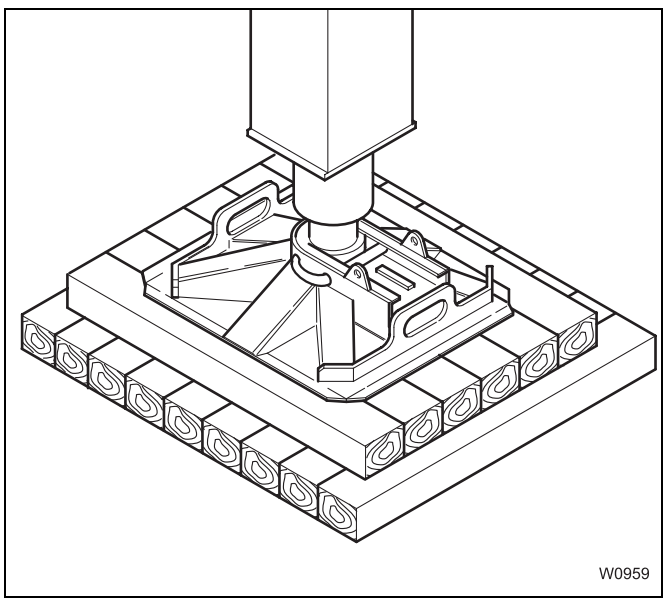
– thick wooden planks or squared timbers made of hardwood (such as Guinean red ironwood (ekki), etc.)

– thick steel plates with welded webs that prevent the outrigger pads from slipping or

– wide steel profiles welded together (girders), with weld on webs that prevent the outrigger pads from slipping.

**Risk of accidents by crane overturning due to weak packing**
Thin boards or planks made of pine wood or bricks are not made to withstand the resulting pressure and divert it safely into the ground.

Wooden planks and square timbers must be at least 80 mm in height. They must be knotless and free of fractures.




Please note the illustration on the left when constructing the packing.

The materials used must have the same height in every layer.

The layers must be offset one below the other by 90°.

Consult your supervisor if you are in doubt.

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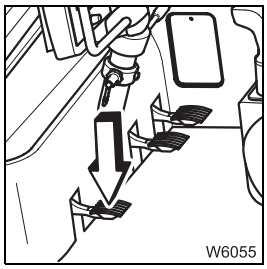
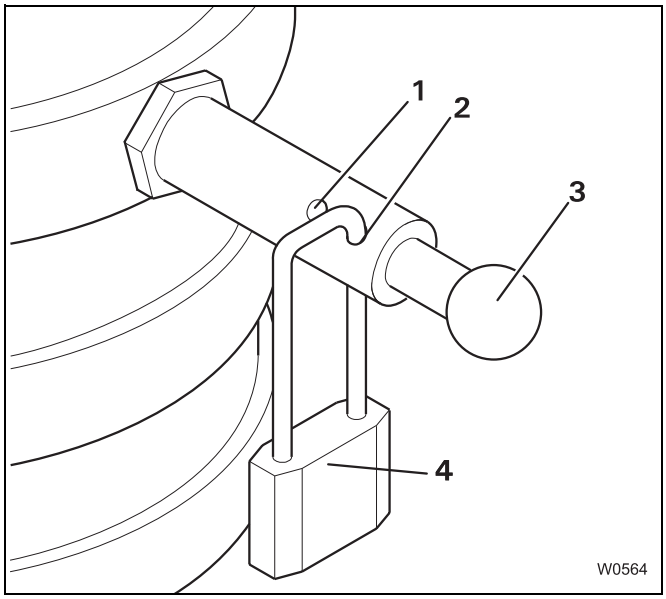


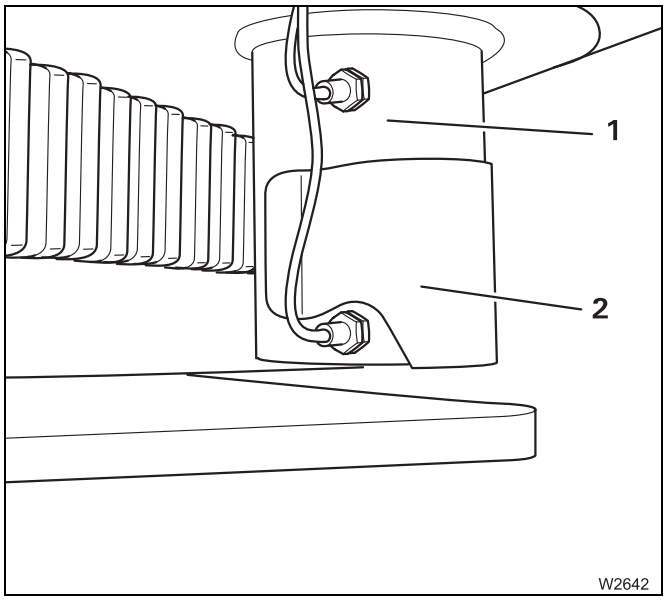

– the service brake *Slewing gear* is **not** activated; ➠ p. 12 - 91.

When the pin cannot be pulled out in the following step, then you can relieve the system by performing *Inclining the crane cab back to a horizontal position*. Press up the *Incline crane cab* rocker button.




- Remove the lock (**4**) from the bore hole (**1**).
- Pull the pin (**3**) out as far as possible.
- Guide the lock with the bracket through the bore (**2**).
- Lock and remove the key.

The slewing gear freewheel is now switched off and secured against being switched on by unauthorised persons.




- After switching off the slewing gear freewheel, remove the fuse box (**2**) from the cylinder pipe (**1**) of the turntable lock.

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**With the hand-held control**

If the battery master switch is switched on and the hand-control is connected, you must switch the *Driving mode/crane operation* rocker button as follows in order to turn on the diesel motor:

– If the hand-held control is connected, then press the *Driving mode/crane operation* rocker button up into the *Driving mode* position.

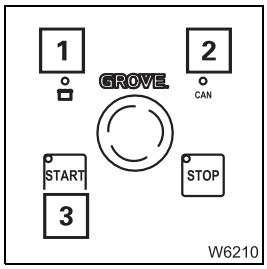
– If the hand-held control is connected to a superstructure socket, then press the *Driving mode/crane operation* rocker button down into the *Crane operation* position.

If the hand-held control is connected to a superstructure socket, you cannot drive the power units from the crane cab.

### Starting the diesel engine

You can also start the diesel engine if the ignition in the driver's cab or crane cab is switched on.

Before starting the diesel engine, all activities and checks for starting the diesel engine must be carried out; ➠ p. 5 - 1.

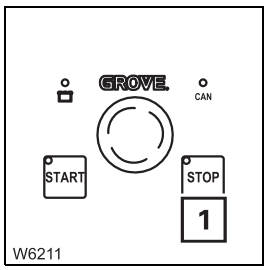



- Wait until the indicator lamps *CAN* (**2**) and *Charge control* (**1**) light up.

If the *CAN* indicator lamp does not light up or flash after approx. 20 seconds, there is a malfunction; ➠ p. 14 - 16.

- Press the *START* (**3**) button; the diesel engine starts. Release the button as soon as the diesel engine is running.

### Turning off the diesel engine




- On the hand-held control press the *Stop* (**1**) button, the diesel engine shuts down.

If you start the diesel engine from the hand-held control, you cannot switch it off by switching off the ignition in the driver’s house or crane cab.

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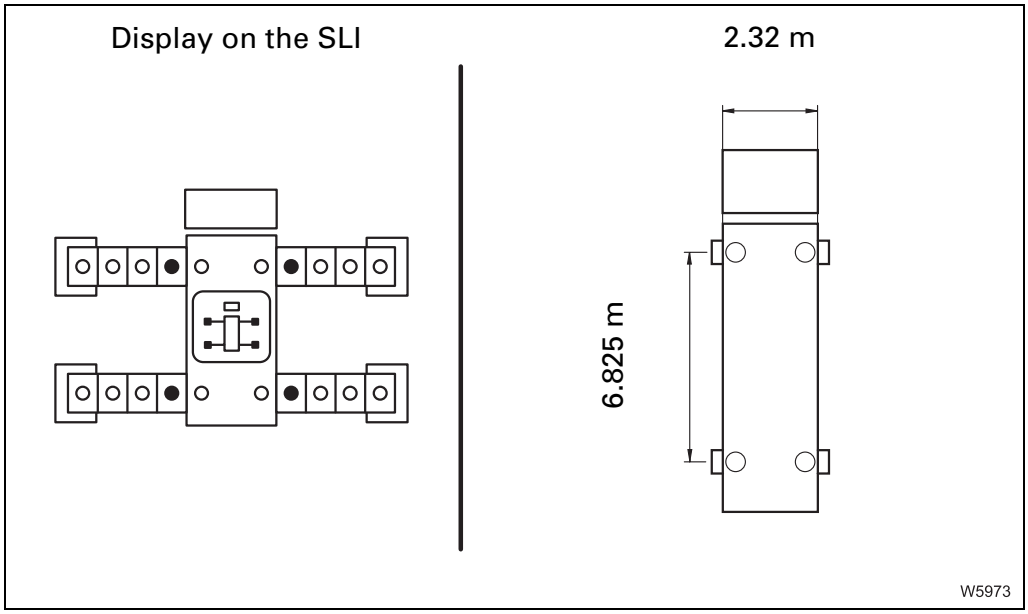
**Outrigger span**
6.825 x 2.32 m

The outrigger length is 6.825 m.

| | |
|---|---|
| **Span at front** | 2.32 m |
| **Span at rear** | 2.32 m |




**Risk of overturning with an outrigger span of 6.825 x 2.32 m!**
With an outrigger span of 6.825 x 2.32 mthe superstructure may only be rotated if there is a maximum of 8.6 t counterweight on the turntable and the radius permitted in the working area is maintained according to the *Lifting capacity table* (at least 3.0 m ); ➠ *Slewing with the rigged counterweight*, p. 13 - 112.

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**Risk of accidents when outrigger movements are performed outside of your field of vision**
Block off the danger area of the moving outrigger beams before moving them. Monitor the movements of the outrigger beams closely or have a banksman, with whom you are in visual contact, monitor the movements during operation. Set the *Mirror for monitoring outriggers* in such a way that both the outrigger beams can be observed from right side of the crane cabin.
Nobody, not even the banksman, may be in the danger zone of moving outrigger beams.

**The truck crane may overturn if improperly supported**
Only ever extend the outrigger beams to the span of a permitted outrigger span (6.20 m, 4.40 m) or retract them completely (2.32 m).

- Switch off the slewing gear. The Telescoping mechanism on/off indicator lamp must light up **red**. The lamp lights up **red** when the slewing gear is off.

The following designations for front, rear, right and left refer to the carrier, irrespective of the position of the superstructure.
The driver's cab is always at the front.

For reasons of safety extend the outrigger beams individually from the crane cabin. To extend an outrigger beam, always press two buttons one after another.

- First pre-select the desired outrigger beam by pressing the button next to the corresponding symbol:

– *Front left outrigger* or

– *Front right outrigger* or

– *Rear left outrigger* or

– *Rear right outrigger*.

Now in the symbol of the pre-selected outrigger (e.g. *front left*) the point is shown in **green** for approx. 10 seconds. During this time you can start moving the outrigger beam.

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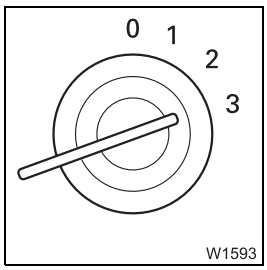
**From the switch boxes**

With the corresponding additional equipment, the operating elements for the outriggers are in the *Outrigger/electronic level/outrigger pressure display* switch boxes. On the location of the switch boxes and to switch on the lighting; ➠ p. 13 - 48.

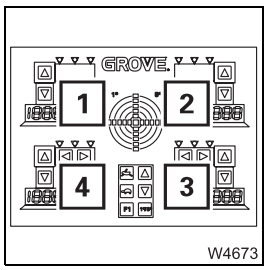



- Remove the hand-held control if necessary and start the diesel engine from the driver's cab; ➠ p. 5 - 11.

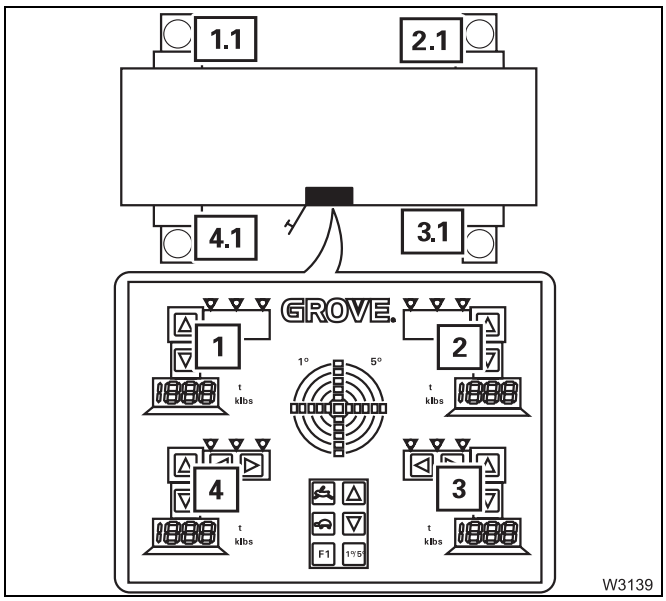
If the hand-held control is connected, the operating elements are not active in the switch boxes.

**Assignment of the switching units to the outrigger cylinders**

Assignment of the button units to the outrigger cylinders is the same for both switch boxes:




– Outrigger cylinders to the left of the switch box are operated with the two left-hand button units (**1**, **4**).
– Outrigger cylinders to the right of the switch box are operated with the two right-hand button units (**2**, **3**).
– Outrigger cylinders on the operator's side are operated with the lower button units (**3**, **4**).
– Outrigger cylinders on the opposite side of the operator are operated with the upper button units (**1**, **2**).




This results in the following arrangement:

– Button unit **1** for outrigger cylinder **1.1**
– Button unit **2** for outrigger cylinder **2.1**
– Button unit **3** for outrigger cylinder **3.1**
– Button unit **4** for outrigger cylinder **4.1**

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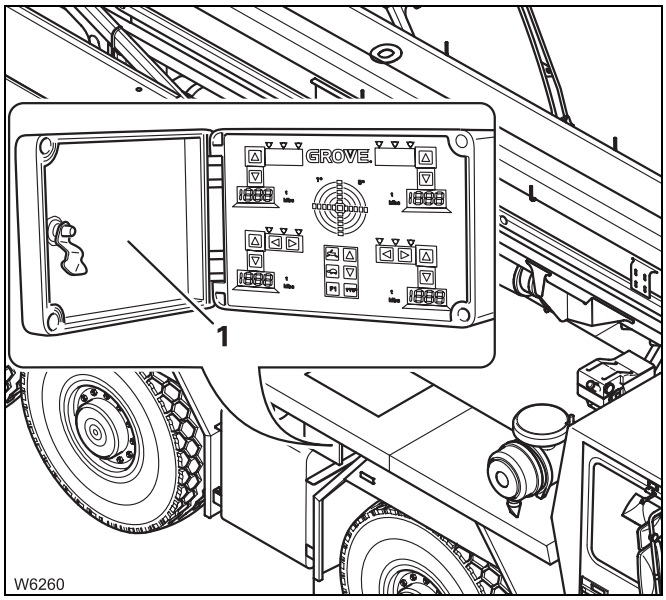
**On the switch boxes**

For additional equipment with the *Outrigger/electronic level/outrigger pressure indicator* switch boxes there is an electronic level on either side of the carrier. There is another electronic level in the crane cab.




Both switch boxes are located on either side of the carrier behind the 1st axle line.

- Open the switch box door (**1**).

When you have opened the door, only the LED in the *Switch on 2nd level* button lights up (F1). None of the other buttons are lit.

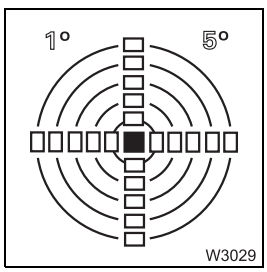
To switch on the lighting, press the *Switch on 2nd level* button once or any other button (F1).

F1 All the other buttons are lit. If you do not press any button for ten seconds, the lighting is automatically switched off and only the LED in the *Switch on 2nd level* button remains lit.

The display fields on the carrier are only active during crane operation if they were switched on in the *Crane control* display; ➠ *Switching on/off display field on the carrier*, p. 13 - 43.

**Switching the measuring range**

1°/5° The *Switch measuring range* button is located under the display.




The currently set measuring range lights up above the display (e.g. 1°).

- Press the *Switch measuring range* button once.
  The other measuring range is switched on and lights up above the display (e.g. 5°).

The graduated rings are categorised as follows in the different measuring ranges:

**5°** lights up above the display: **Measuring range 0° to 5° inclination**
One graduated ring corresponds to 1° inclination.

**1°** lights up above the display: **Measuring range 0° to 1° inclination**
One graduated ring corresponds to 0.2° inclination.

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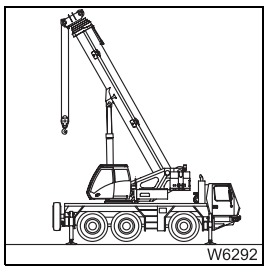
**During crane work**

If the truck crane is already in the *Free on wheels* work position and the suspension is blocked, then do not switch off the suspension locking system under any circumstances.
You must therefore align the truck crane as follows.

**Risk of overturning when switching off the suspension locking system**
As long as the rigged truck crane is on wheels, you may not turn off the suspension locking system for any reason. The suspension is no longer under pressure and when the suspension locking system is switched off, the suspension struts would be pressed together, damaged and the truck crane could tip over.




- Extend the outrigger cylinders until all wheels are just above the ground.
- Align the truck crane horizontally with the outrigger cylinders.

**Risk of crushing when switching off the suspension locking system**
When the suspension locking system is switched off, the wheels drop down suddenly. Ensure that nobody is in close proximity to the wheels when you are releasing the suspension locking system.

- Switch off the suspension locking system. To do this, push in the *Suspension locking system* rocker switch at the top.
  The *Suspension locking system* indicator lamp goes out and all wheels lower to the ground.

Now the wheels are in the correct position for horizontal alignment.

- Switch the suspension locking system on. To do this, push the *Suspension locking system* rocker switch at the bottom.
  The *Suspension locking system* indicator lamp should light up.
- Retract the outrigger cylinders until the outrigger pads are approx. 10 cm above the ground.

**Risk of overturning**
To reduce the risk of the crane overturning, do not raise the outrigger pads more than 5 to 10 cm off the ground. Leave the outrigger beams extended.

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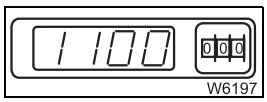
## 13.7.4 CHECKLIST: Rigging the counterweight

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.**

**Danger – free on wheels truck crane may overturn**
For a free on wheels truck crane, the superstructure may only be rotated if there is a maximum of 7.6 t counterweight on the turntable and the radius permitted in the working area is maintained according to the *Lifting capacity table* (at least 3.0 m).

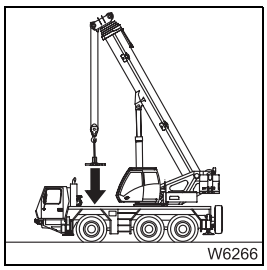
**Risk of overturning with an outrigger span of 6.825 x 2.32 m!**
With an outrigger span of 6.825 x 2.32 mthe superstructure may only be rotated if there is a maximum of 8.6 t counterweight on the turntable and the radius permitted in the working area is maintained according to the *Lifting capacity table* (at least 3.0 m).

1. The truck crane is stabilized with the outrigger span required for crane work according to the *Lifting capacity table*; ➠ *Permissible outrigger spans*, p. 13 - 39.

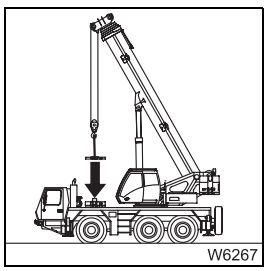


W6197

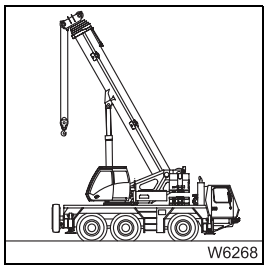
2. Set the current rigging mode with the currently rigged counterweight on the SLI; ➠ *Entering the rigging mode*, p. 12 - 45.


W6266

3. 1Lift t base plate from the separate vehicle and place it onto the counterweight platform; ➠ *Placing the 1 t base plate*, p. 13 - 97.


W6267

4. Depending on the desired counterweight version, place the required counterweight sections one after another onto the 1 t base plate; ➠ *Assembling the counterweight versions*, p. 13 - 95.


W6268

5. Slew the superstructure to the rear.

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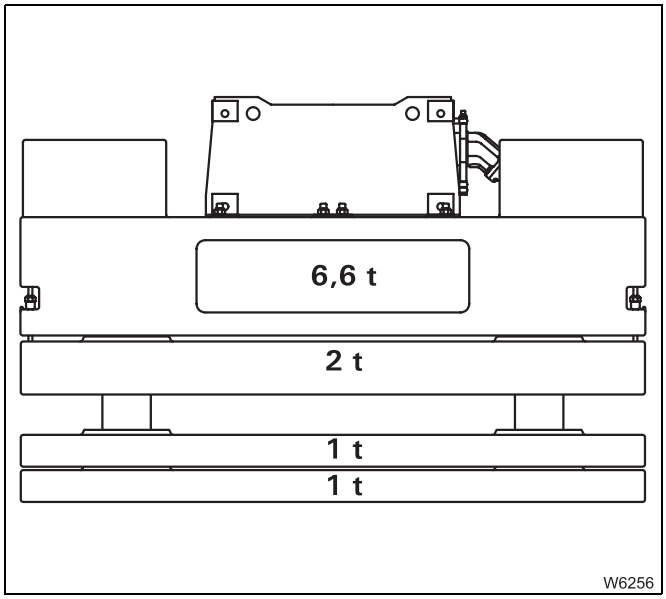
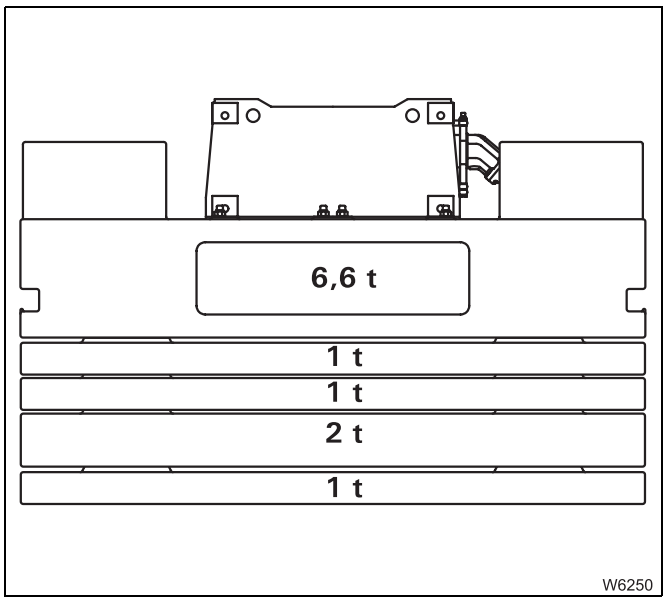



**10.6 t counterweight version (8.6 t installed on the turntable)**

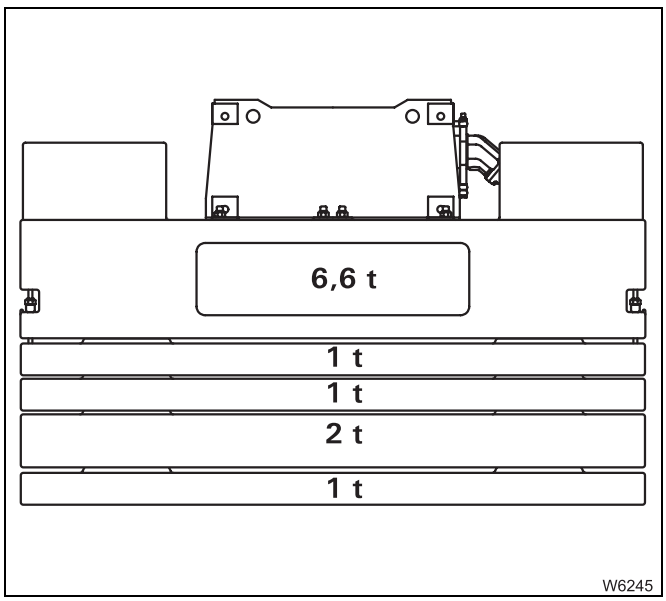
- Lift the 1 t base plate onto the counterweight platform; ➠ p. 13 - 97.
- Lift a 1 t counterweight section onto the 1 t base plate.




**11.6 t counterweight version (6.6 t installed on the turntable)**

- Lift the 1 t base plate onto the counterweight platform; ➠ p. 13 - 97.
- Lift the 2 t counterweight section onto the 1 t base plate.
- Lift both 1 t counterweight sections onto the 2 t counterweight section one after another.

You can vary the sequence of the 1 t and 2 t counterweight sections as you wish.




**11.6 t counterweight version (7.6 t installed on the turntable)**

- Lift the 1 t base plate onto the counterweight platform; ➠ p. 13 - 97.
- Lift the 2 t counterweight section onto the 1 t base plate.
- Lift the 1 t counterweight section onto the 2 t counterweight section.

You can also first lift the 1 t counterweight section and then the 2 t counterweight section onto the 1 t base plate.

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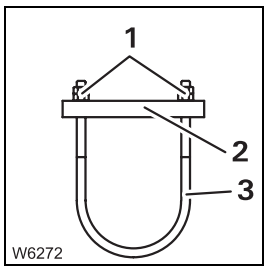
**Installing**

- Assemble the 11.6 t counterweight version on the counterweight platform in such a manner that the counterweight section that is to be locked on the turntable (1 t or 2 t) is on the top; ➠ p. 13 - 101.

**Risk of accidents due to excessive load on the tyres**
The connection eyes are only designed for the dead weight of the counterweight section. For this reason do not install two 1 t counterweight sections on the turntable under any circumstances.
In such a way you avoid the weight of both counterweight sections affecting the connection eyes of the lower counterweight section, the connection eyes becoming overloaded and the counterweight sections falling off.

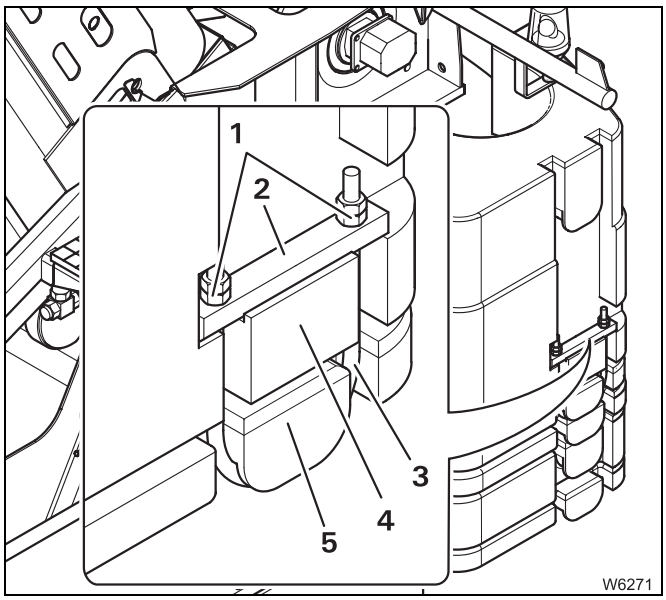
- Lift the counterweight onto the turntable and precharge it; ➠ *Retracting lifting cylinders*, p. 13 - 107.




Turn the nuts (**1**) so far to the ends of the brackets (**3**) that the locking bar (**2**) for the lifted counterweight sections has enough play.

To install the 2 t counterweight section you must turn the nuts (**1**) until they almost reach the ends of the brackets (**3**).

**Risk of damage to the slinging points**
Tighten the nuts only enough so that the bracket is at the slinging points and has no more play. Tightening the nuts too much damages the slinging points.




- Push the locking bar (**2**) as far as the nuts (**1**).
- Suspend the bracket (**3**) on the slinging point (**5**) from below.
- Fold the bracket on the 6.6 t counterweight section in such a way that the locking bar is behind the stop (**4**).
- Tighten the nuts (**1**) only enough so that the bracket is at the stop and has no more play.
- Lock the nuts in place with the locknuts (**1**).
- Secure the bracket on the other side in the same way.

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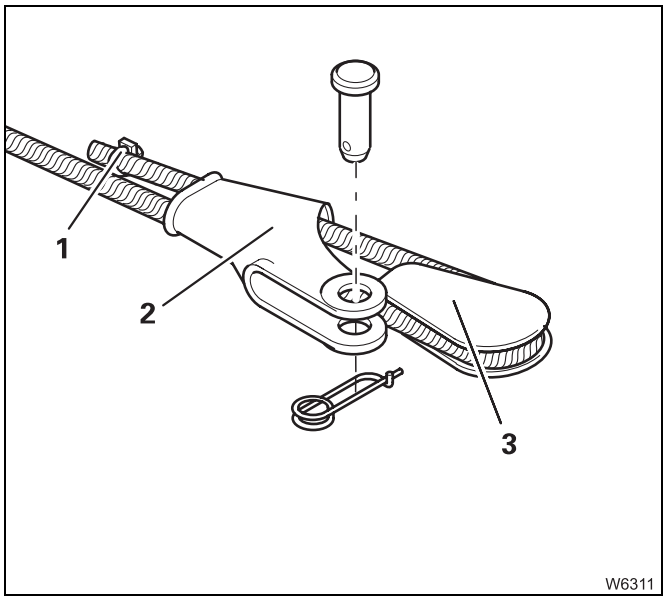
A rope wedge is needed for attaching the rope end clamp. The rope end clamp and rope wedge are labelled with their respective sizes and corresponding rope diameters. Ensure that the rope wedge inserted into the rope end clamp is labelled with the same size and rope diameter as the rope end clamp.

**Risk of accidents if the load falls**
If you use a rope wedge which does not belong to the rope end clamp, the hoist rope slips out of the rope end clamp during crane operation and the load crashes uncontrolled to the ground.




**Attaching the rope end clamp**

- Insert the hoist rope and rope wedge (**3**) into the rope end clamp (**2**).
- Secure the rope clamp (**1**) to the loose end of the rope.

The rope clamp provides additional safety and prevents the hoist rope from slipping out of the rope end clamp.

- Pull the rope end taut until the hoist rope fits snugly in the rope end clamp.

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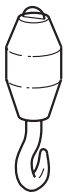
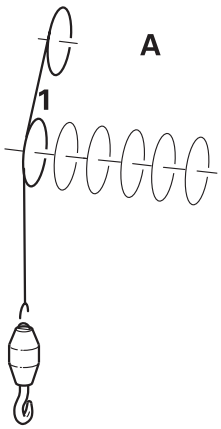


Hook tackle
maximum lifting capacity of the hook tackle 5 t
**maximum lifting capacity with the GMK 3055:**

**A** Reeving 1-fall 5 t

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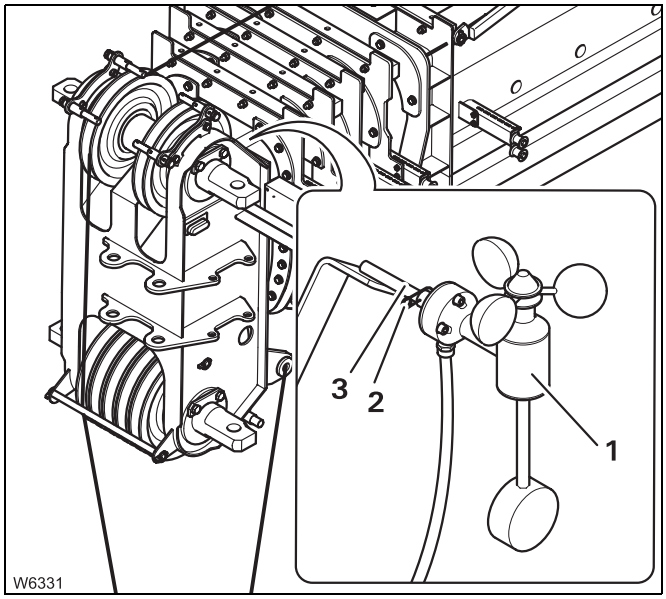
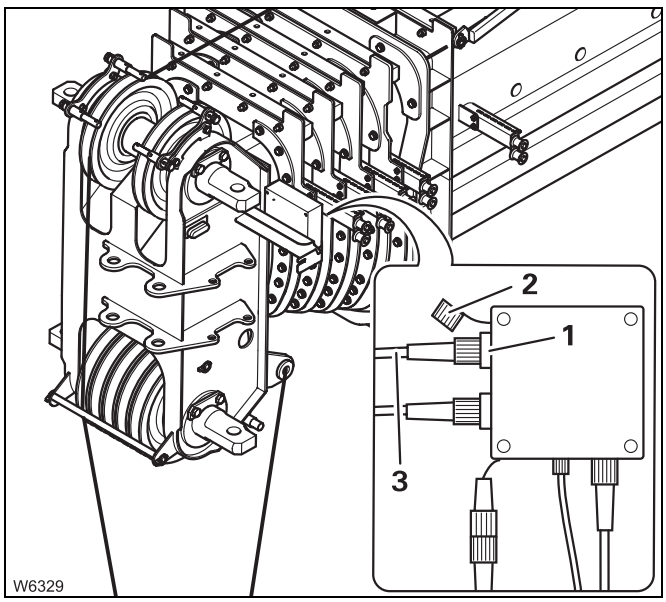
## 13.8.8 Installing/removing the anemometer

**Installing the anemometer**

For operation with the main boom you should install the anemometer on the holder on the main boom head.




- Remove the retaining pin (**2**) from the bracket (**3**).
- Insert the anemometer (**1**) onto the stowing bracket (**3**).
- Secure the anemometer using the retaining pin (**2**).
- Swivel out the anemometer and let it go. It has to place itself in the vertical position again after being swivelled out. The anemometer also has to hang in a vertical position when the boom is raised.




- Lay the connecting cable (**3**) in such a way that it is not damaged during crane operation.
- Remove the protective cap (**2**) from the socket (**1**).
- Insert the plug of the connecting cable (**3**) into the socket (**1**).

You have to remove the anemometer before driving on-road.

**Risk of damage to the anemometer**
Remove the anemometer for on-road driving.
This will prevent the anemometer from being damaged by winds or air currents (e.g. by suction current or oncoming traffic in a tunnel).

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**If it is not possible to lower the load**

- Secure the danger area using barriers and warning signs.
- Notify the repair crew or the local ***CraneCARE***.

**Danger of accidents due to improper emergency operations!**
Only trained, qualified personnel may carry out emergency operations if solenoid valves have to be operated by hand while unrigging the crane.

## 14.3 Electrical system

This section contains information on the electronics of the superstructure which you will require to assign identifiers and designations in the electrical circuit diagram to parts of the truck crane and to allocate individual functions to particular fuses. In particular:

– The allocation of the inserts in the crane cabin to the designations on the electrical circuit diagram and their functions.

– The position of the fuses at the superstructure, how they correspond to the designations in the electric circuit diagram and which functions are protected by the respective fuses.

– The position of the input/output circuit boards (I/O boards) at the superstructure.

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# 14.4 Finding and eliminating malfunctions at the power units

## 14.4.1 Malfunctions to the diesel engine during crane operation

| Malfunction | Cause | Remedy |
|---|---|---|
| **Engine is unable to be started from the crane cab (starter does not rotate).** | Battery master switch not switched on | Switch on the battery master switch; ➠ p. 5 - 5. |
| | F 1/1,F 1/2,F 1/6 Carrier or F 5/6 Carrier fuse defective | Check the fuses and replace them if necessary; ➠ p. 8 - 32. |
| | The *driving mode/crane operation* rocker switch is in *crane operation position* | Press in the *driving mode / crane operation* rocker switch at the top, in *driving mode* position; ➠ p. 12 - 29. |
| | Not all bridging plugs are plugged into the sockets for the hand-held control or an attempt is being made to start the diesel engine from the crane cab with the hand-held control connected. | Remove the hand-held control or insert the bridging plug; ➠ p. 13 - 34. |
| | An emergency-stop switch is engaged. | Check the emergency-stop switch (➠ p. 14 - 1) and reset it; ➠ p. 14 - 3. |
| | F 5/1 Carrier fuse defective | Check the fuses and replace them if necessary; ➠ p. 8 - 32. |
| **Engine is unable to be started from the crane cab (starter does not rotate).** | The *general warning lamp* symbol is displayed in red in the *Warning message* submenu. | Check the indicator lamps in the driver's cab and keep on looking for the error there. |
| **The *engine electronic system* warning lamp goes on during driving and the diesel engine output is reduced continuously.** | The output of the diesel engine falls continuously in the event of malfunctions to the engine electronics. The diesel engine is not switched off however, to ensure the load is able to lowered and the truck crane unrigged. For remedial measures; ➠ p. 8 - 39. | |

If you still face problems while starting the diesel engine, proceed according to the diesel engine malfunctions table; ➠ p. 8 - 39.

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| Malfunction | Cause | Remedy |
|---|---|---|
| **Left and right slewing functions not working** | An SLI code has been entered for the 0° or 180° position. | Enter the SLI code for a slewing range. |
| | The corresponding function is disabled by the crane control (error message is displayed). | Acknowledge the error message once; ⇛ p. 12 - 154. If the error message recurs, note down the information displayed in the error menu; ⇛ p. 14 - 49 and notify ***CraneCARE***. |
| | The corresponding function is disabled by the crane control (no error message is displayed). | Switch off the ignition briefly and then turn it on again. If the error message recurs, note down the information displayed in the error menu; ⇛ p. 14 - 49 and notify ***CraneCARE***. |
| **Slewing only possible in one direction** | Shutdown angle of a limited slewing range reached (additional equipment) | Enter the SLI code for a slewing range of 360° or slew in the opposite direction to leave the shutdown angle. |
| **Slewing not possible, or only at a very low speed** | Maximum speed set too low | Increase the maximum speed in the *Power unit speeds* submenu; ⇛ p. 12 - 142. |
| **Slewing gear no longer responds to the control lever** | Failure of the crane control for the operating elements in the crane cab | Carry out the crane operations required for the unrigging process with the hand-held control; ⇛ p. 14 - 105. |
| **Slewing function cannot be switched off** | Malfunction to the crane control | Stop the operation with the *crane control* emergency-stop switch; ⇛ p. 14 - 1. |

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## 14.5 Finding and eliminating malfunctions at the SLI

This section contains general malfunctions for which no error code is displayed at the *LMB* insert and malfunctions for which errors are displayed at the *LMB* insert. There is furthermore information on the monitoring of supply lines and connections.

**Danger of accidents!**
You must cease operating the crane immediately as soon as any error message is displayed.
Repairs to the SLI may only be carried out by trained, qualified personnel.

**Danger of accidents in the event of a defective or overridden SLI!**
In the event of a defective SLI, first try to eliminate the error using the information in this section. Only override the SLI if it becomes unavoidable in the event of an emergency in order to lower the load.
Do not carry out any movements which increase the load moment in the event of a defective or overridden SLI.
The crane operations are not monitored and no shutdown procedures are initiated when leaving the working range if the SLI is overridden.

### 14.5.1 General malfunctions

| Malfunction | Cause | Remedy |
|---|---|---|
| **SLI is not working (dark displays, no buzzer signal).** | **Power supply not switched on** | **Switch on the ignition.** |
| | F 2/6 SS fuse defective | Check the fuse and replace it if necessary; ➠ p. 14 - 8. |
| | The F6 fuse at the SLI control system is defective. | Check the fuse and replace it if necessary; ➠ p. 14 - 13. |

If there are further malfunctions at the crane control, the corresponding error messages are displayed at the *SLI* insert.

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**Table for error group 7**

This table does not contain all possible error codes. If other error codes are displayed, you must get in touch with ***CraneCARE***.

| Error group 7, software | | | | |
|---|---|---|---|---|
| **Error code/ error definition display** | | | **Cause** | **Remedy** |
| **7.** | **7.** | **All** | Software error | Notify ***CraneCARE***. |

**Table for error group 8**

This table does not contain all possible error codes. If other error codes are displayed, you must get in touch with ***CraneCARE***.

| Error group 8 , operation | | | | |
|---|---|---|---|---|
| **Error code/ error definition display** | | | **Cause** | **Remedy** |
| **8.** | **01.** | **1** | The newly entered value for reeving or for the rigging mode has not yet been confirmed. | Confirm the reeving and/or rigging mode; ➠ p. 12 - 49. |
| **8.** | **02.** | **2** | SLI is overridden. | Error message disappears after override has been cancelled; ➠ p. 12 - 65. |
| **8.** | **14.** | **1** | Maximum permissible overall height exceeded with active working range limiter | Retract or lower the main boom. Lower the lattice extension (additional equipment). |
| **8.** | **14.** | **2** | Maximum permissible working radius exceeded with active working range limiter | Raise or retract the main boom. Raise the lattice extension (additional equipment). |
| **8.** | **14.** | **3** | Maximum permissible slewing range exceeded with active working range limiter | Slew to the right (after reaching slewing angle A). Slew to the left (after reaching slewing angle B). |
| **8.** | **14.** | **4** | Shutdown range of a monitored object reached | Move into a permissible working range. |
| **8.** | **1...** | **9** | Other errors | Notify ***CraneCARE***. |

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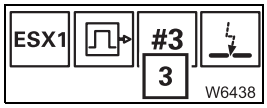
**Allocation of the**




This section shows the significance of the indices in the various groups. The group index is displayed at place **3**.

The index is always displayed with a **#** symbol and a serial number (e.g. **#1**). Depending upon the device and the group, the various indices represent certain components or signals where the error is present or which are the cause of the error.

These components are referred to in the following tables with **Y3403**. Whereby:

**Y:** Stands as a letter for a component or signal (e.g. valve)

**3403:** Stands for the designation in the circuit diagram

The following letters are used for the components and signals:

**A:** Installation (e.g. length indicator)

**B:** Horn

**H:** Lamp/Light

**J:** Control lever

**K:** Relay

**M:** Mechanical switch

**N:** Proximity switch

**S:** Switch

**Y:** Valve

**IN:** Signal from two variables

**OUT:** General output

**in:** Connection can be used either as an input or output but is currently being used as an input.

**out:** Connection can be used either as an input or output but is currently being used as an output.

You can use the following tables in combination with the error messages to find out by means of the index which component is defective and, depending on the type of error, rectify the cause (e.g. if a cable is loose at a valve).

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**Table of errors at the control levers**

The table in this section shows various error displays with possible remedies.

| Device symbol | Group symbol | Symbol for type of error | Index | Possible remedy |
|---|---|---|---|---|
|  | CAN | 0 | 0 | All crane operations on the displayed control lever axis can no longer be carried out.<br>This function can now only be carried out with the hand-held control;<br>➠ *Emergency operation in the event of a failure of the operating elements in the crane cab*, p. 14 - 105. |
| |  | 1 | | |
| |  |  | | |
| | x | 2 | | |
| | y | | | |
|  | x | 1 | 0 | Release the control level function.<br>Notify ***CraneCARE*** if the error occurs after each restart. |
| | y | | | |
|  | CAN | 0 | 0 | All crane operations on the displayed control lever axis can no longer be carried out.<br>This function can now only be carried out with the hand-held control;<br>➠ *Emergency operation in the event of a failure of the operating elements in the crane cab*, p. 14 - 105. |
| |  | 1 | | |
| |  |  | | |
| | x | 2 | | |
| | y | | | |
|  | x | 1 | 0 | Release the control level function.<br>Notify ***CraneCARE*** if the error occurs after each restart. |
| | y | | | |

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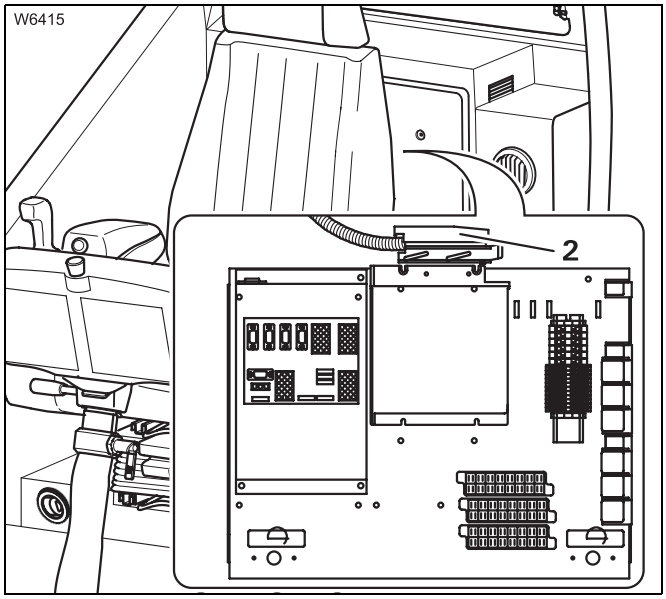
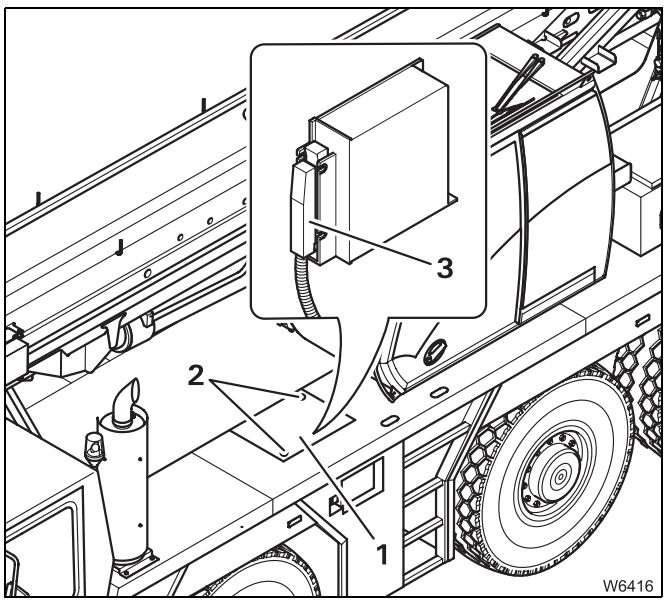



Connection **2** is at the back, on the back of the plate.

For crane operation or driving, you must:
– Fold in the plate and fasten it with the screws.
– Apply the cover and fasten it with the screws.




Connection **3** is under the cover (**1**).

To access connection **3**, you have to open the locks (**2**) and remove the cover (**1**).

For crane operation or driving, you must apply the cover (**1**) and secure it with the locks (**2**).

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**If the SLI allows lowering to the horizontal position,**

it is impossible for any danger to be caused by the raised truck crane and you can:

– Carry out **emergency operations** without using an auxiliary crane with the personnel transporter, since you can reach the locking points with a ladder; ➠ p. 14 - 86.

**If the SLI switches off before you are able to lower the main boom into the horizontal position, you must:**

– Have two auxiliary cranes available for **mechanical emergency operations**, of which one of them has a registered personnel transporter; ➠ p. 14 - 86.

**Retraction procedure**

Various retraction procedures are possible in emergency mode. The procedure which is the most appropriate for your specific case depends both on which functions are still working and on the circumstances at the site. You can, for example:

– If the locking head mechanism at the telescoping cylinder head is mechanically defective, unlock the telescopic sections in mechanical emergency mode and retract them with an auxiliary crane (up to the section in which the telescoping cylinder is locked) or

– Retract the main boom with one or two auxiliary cranes until it is possible to lower the main boom into a horizontal position and then retract the remaining telescopic sections into a horizontal position.

Select the procedure best suitable for your particular case and consult your local ***CraneCARE***.

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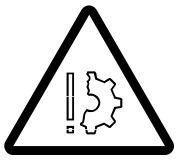
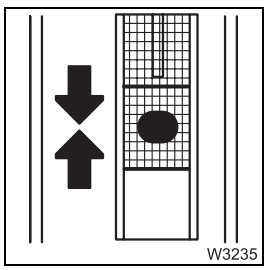
**Extending the telescoping cylinder without the telescopic section**

You can now move the telescoping cylinder into the next telescopic section.

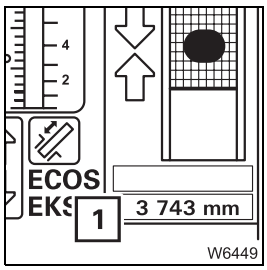


**Risk of damage to the main boom!**
You may under no circumstances press the button next to the *Lock selection* symbol while retracting or extending the telescoping cylinder. If you press the button, the locking pins at the telescoping cylinder are immediately pushed out and can cause damage or tear off electrical or hydraulic components in the main boom.

- Only extend the telescoping cylinder slowly.




- Move the telescoping cylinder to the locking point of the nearest foot section. The locking point is reached, once the *Telescoping cylinders at locking point* display shows the two **green** arrows pointing in each other's direction.




When the telescoping cylinder is at the locking point, the display (**1**) shows the corresponding value for the extended length of the telescoping cylinder (e.g. 3 743 mm for the locking point of telescopic section II at 49%).
Values for approaching the locking points; ➠ *Locking points for the telescoping cylinder*, p. 14 - 99.

- Lock the telescoping cylinder once you have reached the locking point. To do so, press the button next to the *Lock selection* symbol.

After the locking process, the *Lock selection*symbol is displayed on a **yellow** background and

the *Unlock telescoping cylinder* symbol is displayed on a **grey** background.

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## 14.7.4 Emergency operation in the event of a failure of the operating elements in the crane cab

If, due to a malfunction, it is no longer possible to operate the power units from the crane cab, you can operate the power units with the hand-held control in order to set down the load and secure the truck crane in order to unrig it (e.g. if the control lever is not working or the crane control breaks down).

**Danger of overturning when driving in the shutdown ranges!**
The power units may only be operated with the hand-held control in cases of emergency, in order to secure the truck crane. The **SLI is switched off** and the crane operations are not monitored when operating with the hand-held control. The truck crane will overturn if you drive in a critical range.
Make sure the maximum permissible working radius according to the *Lifting capacity table* is not exceeded for the current rigging mode.
Check before slewing, whether slewing in the current rigging mode is permissible with the currently rigged counterweight; ➠ *Slewing with the rigged counterweight*, p. 13 - 112.

**Prerequisites**

Depending on the power unit, one, two or three two control units must still be intact in order to operate the power units with the hand-held control:

- A control unit must be connected to connection **0** in order to operate the main hoist, auxiliary hoist and superstructure lock.
- A second connection is required at connection **1** for the operation of the telescoping mechanism, derricking gear and counterweight hoist unit.
- A third control unit is required at connection **3** for the operation of the slewing gear.

Whenever a defective control unit has to be replaced, you can use the control unit at connection **2** to operate the power units with the hand-held control;

➠ *Position of the control unit connections*, p. 14 - 74,
➠ *Required connections*, p. 14 - 76,
➠ *Replacing control units*, p. 14 - 80.

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## 14.8.3 Connecting/disconnecting hoses

Before operating in emergency mode, you must establish a connection between the hydraulic tank and the console on the superstructure. This connection is established via hydraulic hoses. This procedure varies depending on whether you carry out the emergency operation:

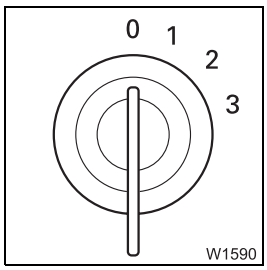
– With a transformer (p. 14 - 115)

**or**

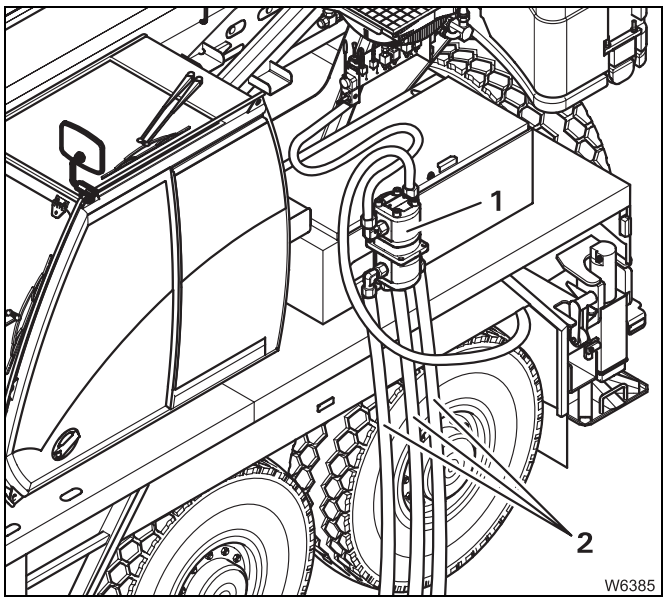
– With the hand pump (p. 14 - 117).

**For emergency operation with the transformer**

For emergency operation with the transformer, you must connect the connecting hoses of the transformer. The hoses are connected with the diesel engine switched off.




- Switch off the diesel engine.




**Establishing hose connections**

- Attach the transformer (**1**) to the superstructure.
- Connect the three connecting hoses (**2**) to a hydraulic power source (e.g. to another crane with hydraulic emergency function according to ZH1/461 or to a hydraulic system with diesel drive).

To slew the superstructure in emergency mode, attach the transformer in a position suitable for the direction of slewing in order to fully utilise the hose lengths.

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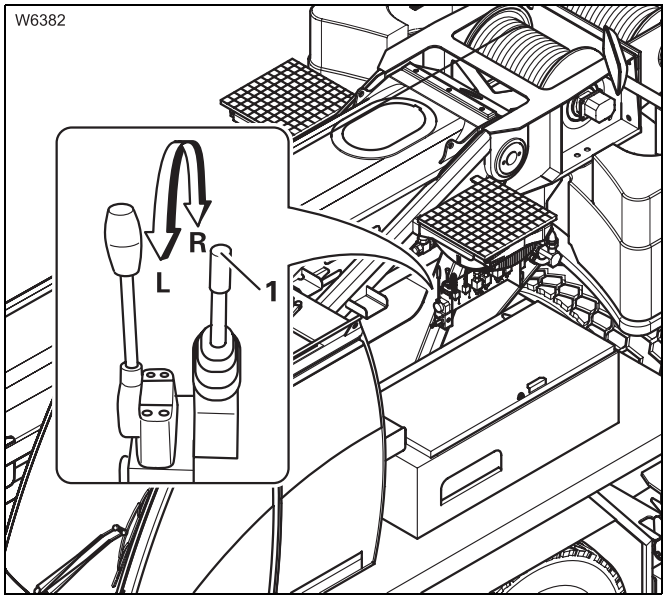


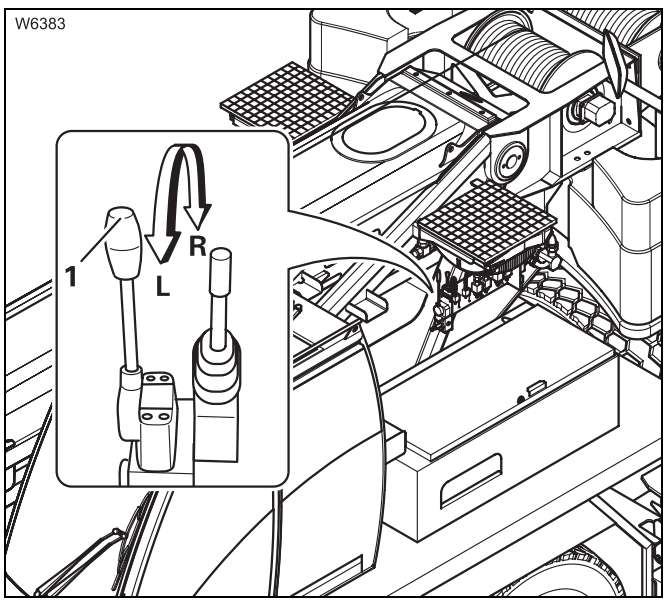

You only need the small control lever (**1**) for lowering operations in emergency mode.

**For lowering operations:** Press the lever to the **right** (**R**)

**Emergency slewing gear operation**

**Risk of damage to the hoses and transformer!**
Make sure that the connecting hoses do not get caught and torn off while carrying out slewing operations.

It is not possible to control the slewing operations with the control lever for emergency operation with the same degree of sensitivity as with the control lever in the crane cab. Therefore only move the control lever slowly.




Only the large lever is used to operate the hoist in emergency mode (**1**).

**To the right:** Pull the lever to the **left** (**L**)

**To the left:** Press the lever to the **right** (**R**)

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## 15.1.8 Slewing gear

The turntable is equipped with a slewing gear. The slewing gear unit is located on the right side of the turntable and affects the external teeth of the ball slewing ring through the meshing of a pinion. A multiple-disk brake is used as a slewing gear brake.

To brake a slewing movement, the slewing gear brake is actuated with a footoperated switch during crane operation.
When switching off the slewing gear, the slewing gear brake is automatically closed (slewing gear braked).
When switching on the slewing gear, the slewing gear brake is automatically opened (slewing gear unbraked).

In addition to the slewing gear brake, the superstructure can be locked mechanically with the superstructure lock.
– For standard equipment with the pin of the locking of turntable in the positions *0° to the rear* and *180° to the front*.
– For additional equipment, also with the houselock in any superstructure position.

## 15.1.9 Houselock

The truck crane can be fitted with a houselock as additional equipment. In addition to the superstructure lock, the houselock enables the superstructure to be locked to the carrier in any position.

The houselock consists of a lockable, form-fitting locking unit, which is installed between the slewing motor and the slewing gear transmission. When the houselock is switched on, the slewing gears are mechanically locked by a locking pin.

The houselock is operated from the crane control insert.

## 15.1.10 Derricking cylinder

The angle of the main boom is adjusted by means of a double action hydraulic cylinder. The cylinder is connected to the turntable and the basic section of the main boom.

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## 15.2.5 Technical data for superstructure

**Main hoist**

| | |
|---|---|
| Make: | Siebenhaar |
| Type: | 4033 |
| Drum diameter: | 300 mm (rope center to rope center) |
| Rope diameter: | 16 mm |
| Rope length: | 170 m |
| Max. rope pull: | 50 kN/rope (≅ 5 t) |
| Power unit group: | M 3 (acc. ISO 4301 - 2) |
| Load spectrum: | L 1 |
| Collective load factor | Km = 0.125 |
| Theoretical service life: | D = 3 200 h |

**Auxiliary hoist (additional equipment)**

| | |
|---|---|
| Make: | Siebenhaar |
| Type: | 4033 |
| Drum diameter: | 300 mm (rope center to rope center) |
| Rope diameter: | 16 mm |
| Rope length: | 170 m |
| Max. rope pull: | 50 kN/rope (≅ 5 t) |
| Power unit group: | M 3 (acc. ISO 4301 - 2) |
| Load spectrum: | L 1 |
| Collective load factor | Km = 0.125 |
| Theoretical service life: | D = 3 200 h |

**Slewing gear**

| | |
|---|---|
| Make: | Siebenhaar |
| Type: | 01 DD |
| Power unit group | M2 (acc. ISO 4301 - 2) |

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