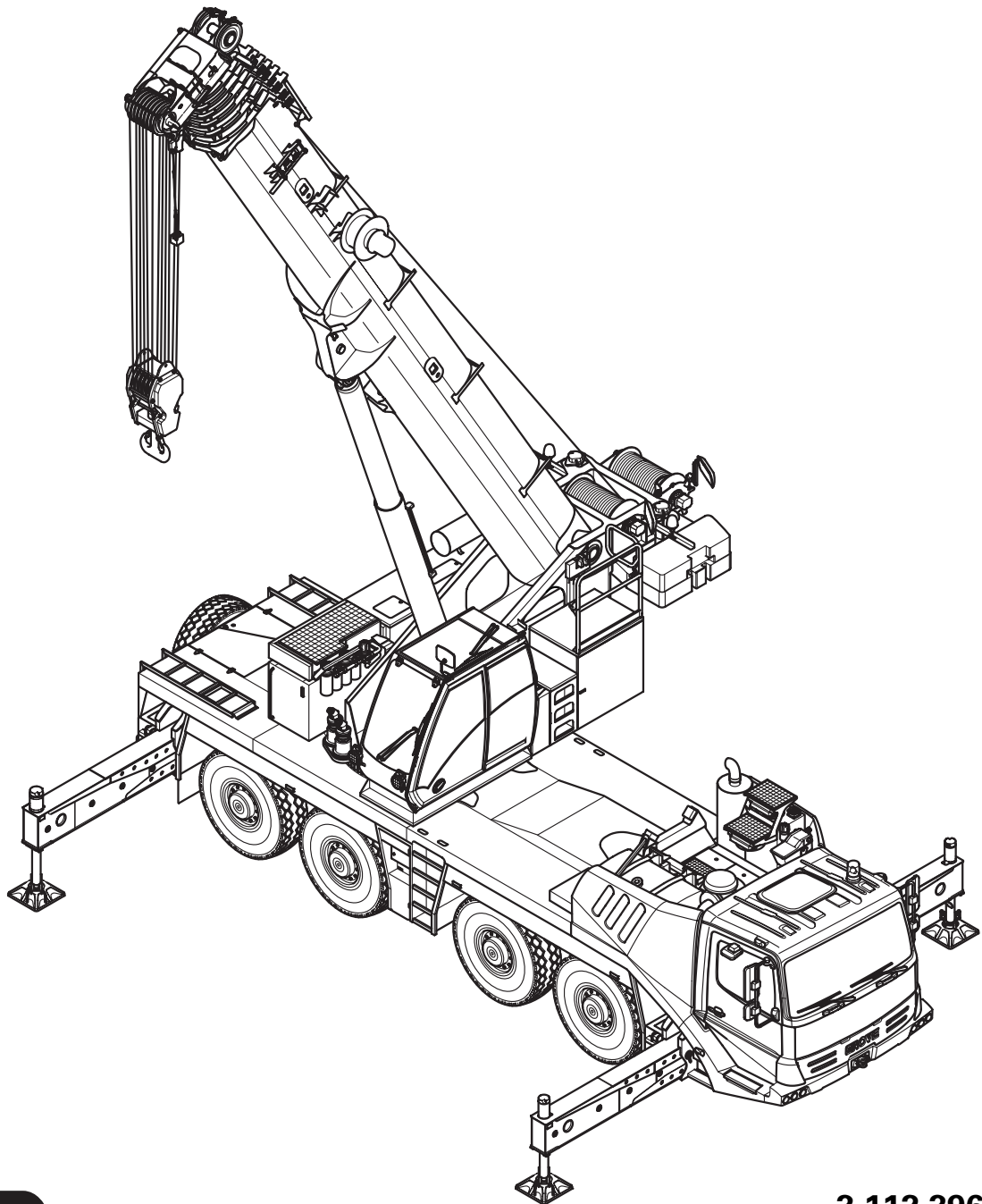


GROVE[®]

GMK 4100-L



Operating instructions Part 1 – Driving



Serial number

3 112 396 en
16.05.2007

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1.2

EC Declaration of Conformity

Operators of truck cranes which are delivered to EU member countries receive a declaration of conformity as a supplement to the delivery protocol. An example of the declaration of conformity is illustrated below.

CE-Maschinenherstellung			
<p>Ich erkläre hiermit, dass die nachfolgend beschriebene Maschine aufgrund ihrer Konfiguration und Bauweise in der von mir in Verkehr gebrachten Ausführung den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der nachfolgenden CE-Maschine entspricht. Bei einer nicht mit mir abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.</p>			
<p>1) Maschinenfamilie GMK4100 und Anbaue 2) Elektrische Hauptkabel-Verbindungen GMK4100 und Anbaue 3) Gesundheitskabel GMK4100 (Gesundheitsverfahren nach Anhang VI)</p>			
Bezeichnung der Maschine	Modell		
Hersteller:	Deutsche GROVE GmbH		
Typ	GMK4100		
Fabrik-Nr.	4100001		
Fabrikations-Nr.	W00000000000000000000		
Baujahr	2004		
Motorart	GMK41 LAMM		
Maximale Schallleistung	100 dB(A) pK		
Maximale Schwingleistung	100 dB(A) pK		
Angegebene Kennzahl	EN 280-4; EN 280-5; EN 280-6; EN 280-7		
Angegebene Normen	in Übereinstimmung mit EN 280-4, EN 280-5, EN 280-6, EN 280-7		
Angegebene Normen und technische Spezifikationen	EN 12010 Teil 1-3, EN 12010 Teil 2, EN 12010-7		
Ort:	Wittenberg,		
Hersteller-Unterschrift:	_____ Lutz Helm		_____ Gerd Hartmann
Angaben zum Unterschriften:	Geschäftlicher Vertreter		Leiter Maschinen
Funktion:			
- Ausführung in Druck- oder Vakuumzustand		- Original der Deutsche GROVE GmbH	
- Ausführung des Herstellers		- Kopie an Kunden	
- Nachvollziehbare Hersteller-Unterschrift			
CE-Zertifizierung GMK4100-0001			
<p>Bezug: Grob, 100 Wittenberg, 04109 Wittenberg, 04109 Wittenberg, 04109 Wittenberg Am 10.05.2007 Typ: Elektrische Hauptkabel-Verbindungen</p>			
<p>Ich erkläre hiermit, dass die nachfolgend beschriebene Maschine aufgrund ihrer Konfiguration und Bauweise in der von mir in Verkehr gebrachten Ausführung den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der nachfolgenden CE-Maschine entspricht. Bei einer nicht mit mir abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.</p>			
W12258			

16.05.2007

1.5**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

2.5

Safety instructions for crane operation

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

Walk around the truck crane and inspect it before beginning crane operation. Check the condition of the truck crane carefully using the checklists in the operating instructions. Do not assume everything is in working order simply because it was in working order at the end of the last shift.

Check daily that all covers and safety devices are fitted properly and are in good condition before crane operation.

Check the safety devices (SLI, lifting limit switch, dead man's switch, emergency stop switches) every day before you start work.

Use the appropriate access aids when carrying out overhead rigging or maintenance work. Do not use parts of the crane as access aids.

Walk only on those parts of the truck crane which are equipped with appropriate steps and railings and therefore guarantee safety.

Always use a ladder for work above head height.

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

Check all operating and control elements in the crane cab before starting the engine.

After starting the engine, take note of all the lights and control elements.

Make sure that there are no unauthorized people in the vicinity of or on the truck crane when rigging or during crane operation. Cordon off the danger zone clearly and mark the zone as such.

When lifting a load, raise the boom to balance out the increase in radius caused by the boom bending so that the load is lifted up vertically and does not drag, injure helpers or fall into the hoist rope diagonally (e.g. from a vehicle or scaffolding). Inform any banksmen and helpers about this issue as well.

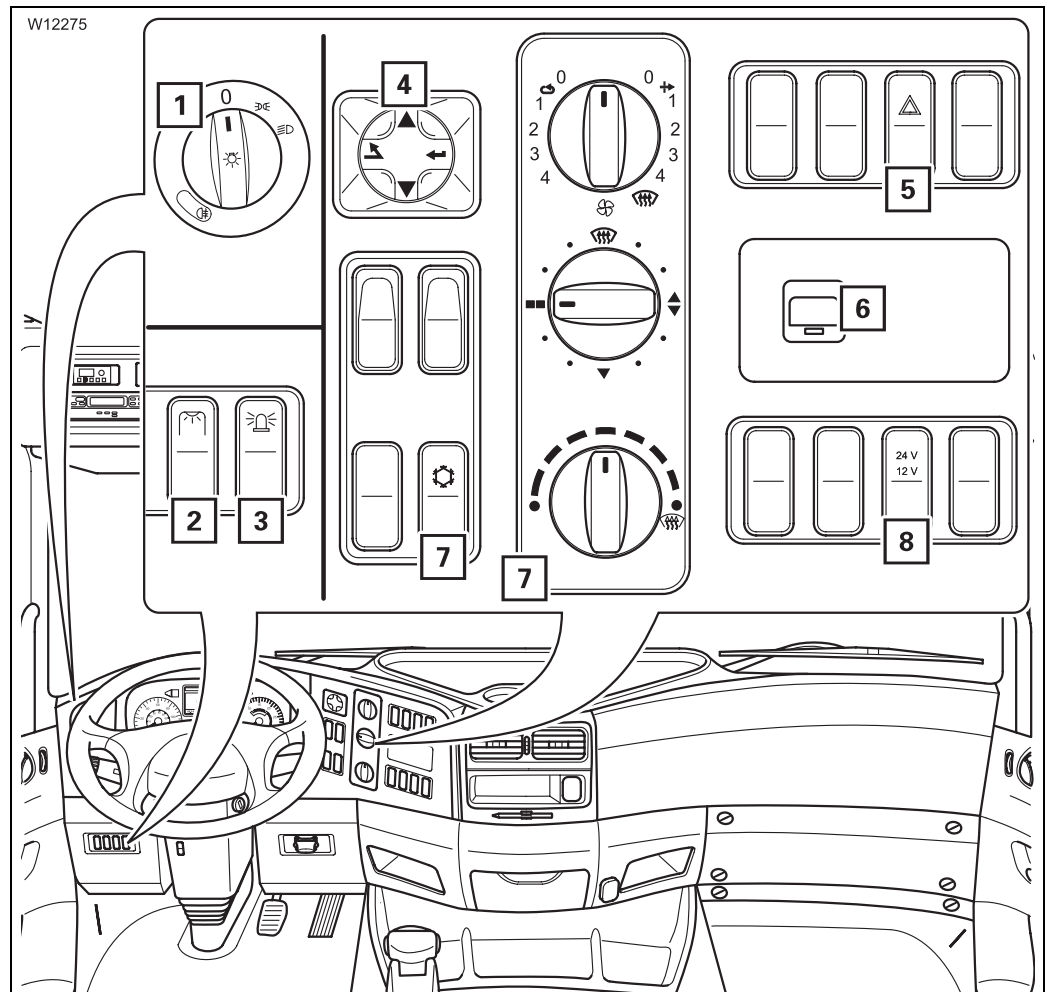
Support the truck crane with the outrigger span required for the currently rigged counterweight before turning the superstructure.



3.1.3

Instrument panel

Left / right



- | | |
|---|-------------|
| 1 Lighting on / off | ➡ p. 3 - 49 |
| 2 Outrigger lighting on / off | ➡ p. 3 - 49 |
| 3 Rotating beacon on / off | ➡ p. 3 - 49 |
| 4 Operating the on-board computer | ➡ p. 3 - 54 |
| 5 Hazard warning system on / off | ➡ p. 3 - 49 |
| 6 Data logger ^{1), 2)} | |
| 7 Heating / Air-conditioning system ¹⁾ | ➡ p. 3 - 24 |
| 8 Voltage 12 V on / off | ➡ p. 3 - 35 |

¹⁾ Additional equipment

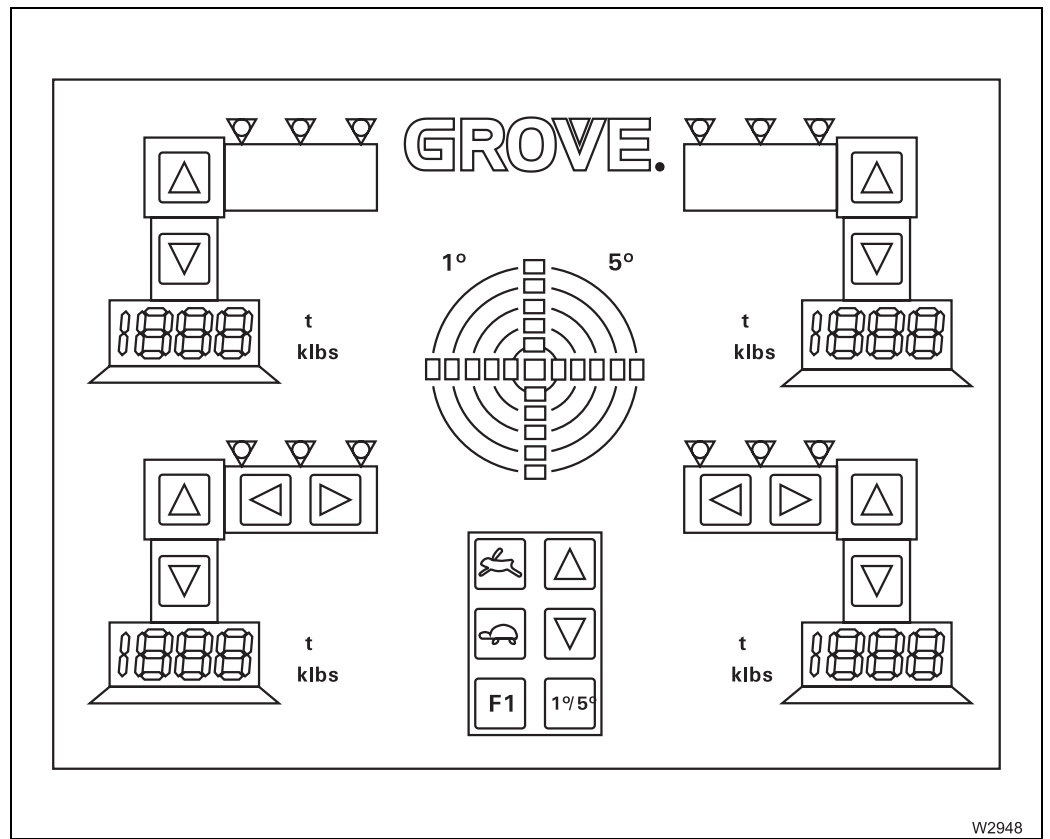
²⁾ ➡ *Separate operating instructions*




1 Transfer case for off-road gear on / off	▣▣▣▣▶ p. 3 - 41
Transfer case display	▣▣▣▣▶ p. 3 - 41
2 Displaying the vehicle height ¹⁾	▣▣▣▣▶ p. 5 - 8
3 Suspension display	▣▣▣▣▶ p. 3 - 47
4 Level adjustment system submenu	▣▣▣▣▶ p. 3 - 18
5 Warning, steering circuit 1 and steering circuit 2	▣▣▣▣▶ p. 3 - 46
6 Transverse differential locks display	▣▣▣▣▶ p. 3 - 42
Transverse differential locks on / off	▣▣▣▣▶ p. 3 - 42
7 Longitudinal differential locks display	▣▣▣▣▶ p. 3 - 42
Longitudinal differential locks on / off	▣▣▣▣▶ p. 3 - 42
8 Settings submenu	▣▣▣▣▶ p. 3 - 20
9 Hydraulic oil temperature display	▣▣▣▣▶ p. 4 - 18
10 Steering locking status display	▣▣▣▣▶ p. 3 - 46
Separate steering on / off	▣▣▣▣▶ p. 3 - 46
11 Combined operation display off	▣▣▣▣▶ p. 3 - 34
12 Combined operation display on	▣▣▣▣▶ p. 3 - 34
Starting/turning off the engine	
13 Serial number / program version display	▣▣▣▣▶ p. 3 - 37
14 Warning display	▣▣▣▣▶ p. 3 - 37


¹⁾ Additional equipment

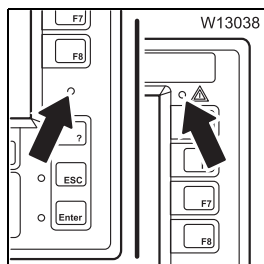
3.1.13 Outrigger control units



Contain operating elements for crane operation;  *Outrigger control units*, p. 10 - 54.

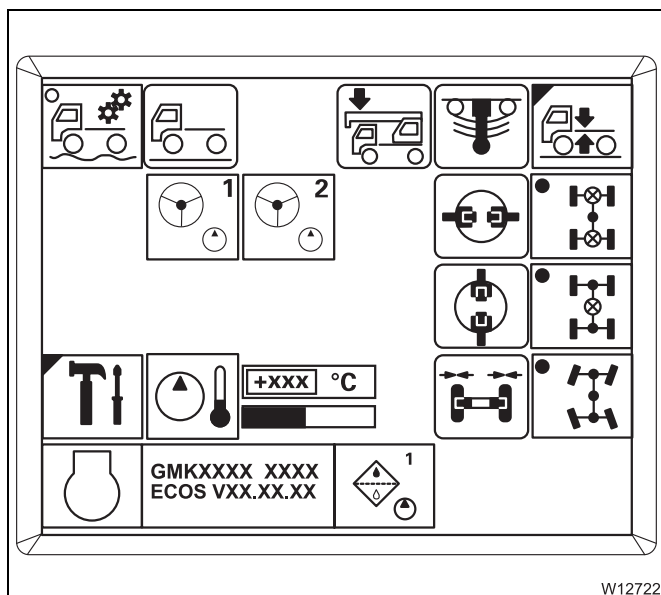


When driving, error messages relating to the carrier electronics can be read on this display;  p. 7 - 33.



Sensor for brightness

Registers the brightness of the operating environment. The brightness of all displays is automatically adjusted.
Manual input; p. 4 - 12.

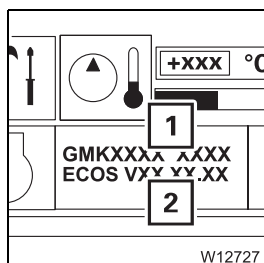


ECOS display

The main menu appears after switching on the ignition.

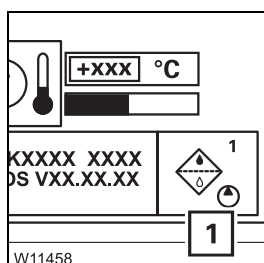
Symbols which represent submenus are indicated at the top left by a blue corner.

Submenus are opened by pressing the button next to or under the respective symbol.



Serial number / program version display

- 1 Current ECOS program version – always state in the event of malfunctions; p. 7 - 30.
- 2 Serial number



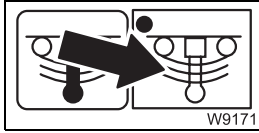
Warning display

- 1 Shows the symbol of a current warning message – for several warning messages, the displays are shown one after the other in continuous sequence; p. 5 - 48.

3.2.12

Suspension

▣▣▣▣ Switching the suspension on / off, p. 5 - 14.

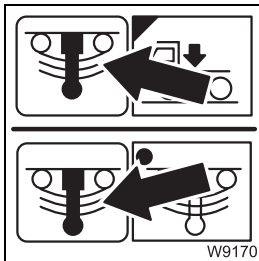


Suspension on / off

– **To switch on:** Press button once – dot green

– **To switch off:** Press button once – dot black

▣▣▣▣ p. 5 - 15



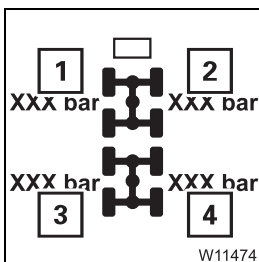
Suspension display

In the main menu and in the *level adjustment system* submenu

– **Green:** suspension on – enabled for on-road driving

– **Red:** suspension off – blocked for crane operation

▣▣▣▣ p. 5 - 15



Suspension operating pressure gauge

1 Suspension pressure, first and second axle lines, left-hand side

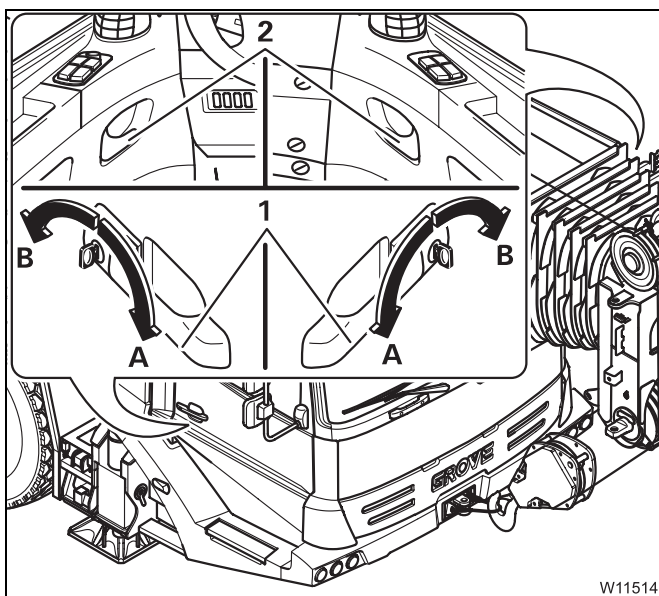
2 Suspension pressure, first and second axle lines, right-hand side

3 Suspension pressure, third and fourth axle lines, left-hand side

4 Suspension pressure, third and fourth axle lines, right-hand side

Doors

The same key is used for the driver's and passenger's door.



Lock

- Turn the key in the **B**, or
- Press in the handle (**2**)

Unlock

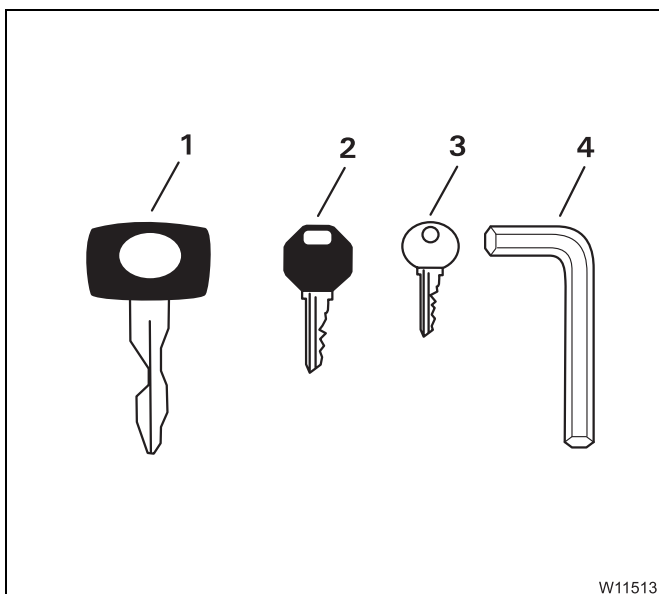
- Turn the key in the **A**, or
- Pull the handle (**2**)

Open

- Pull the handle (**1**), or
- Pull the handle (**2**)

Keys

Different keys are supplied.




- 1 Door locks / ignition lock of driver's cab
- 2 Control unit, outriggers¹⁾
- 3 Fuel tank¹⁾
- 4 Covers

¹⁾ Additional equipment

4.1.4

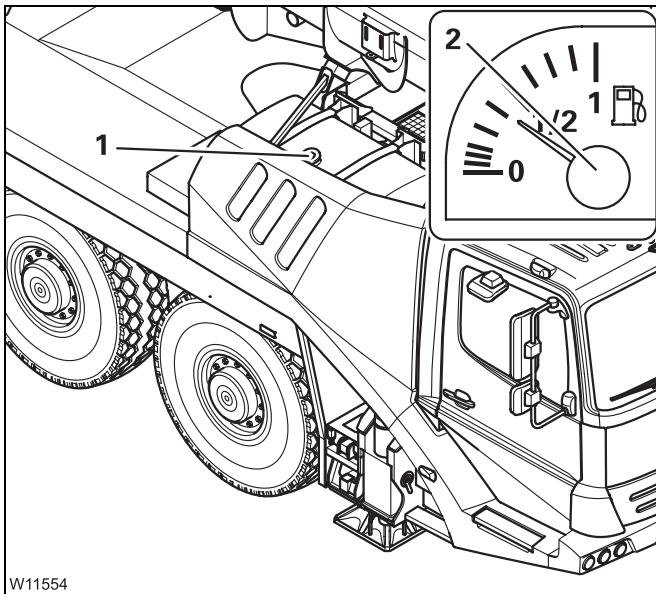
Refuelling

Only use permitted fuels;  *Separate engine operating instructions, provided by the manufacturer.*



Danger of fire due to inflammable gases

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



The display (2) shows the fuel supply in the tank (1).

- Refill the fuel in due time, and close the tank (1) with the lid.



Risk of accidents if the tank is not closed!

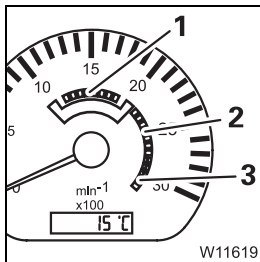
Close the tank each time you have refuelled.

In this way you can prevent other vehicles from being endangered by the cap falling off or fuel escaping.

4.1.11

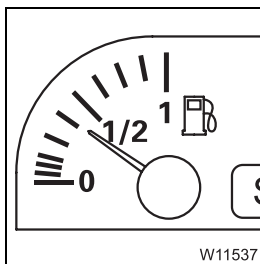
Control elements

Instrument panel



Tachometer

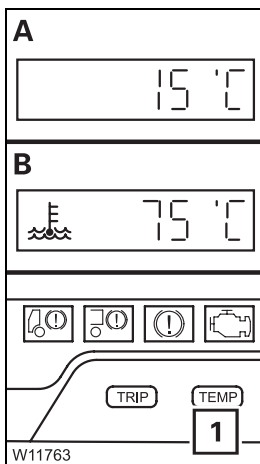
- 1 Green:** appropriate consumption
- 2 Yellow:** engine brake active
- 3 Red:** engine speed to high – danger;
 ▶ *Inspections when driving downhill*, p. 5 - 44



Fuel level display

Never run the fuel tank completely dry; always refuel in due time;
▶ p. 4 - 7.

If the fuel tank is almost empty, air can be sucked in and the fuel system must be bled; ▶ *Maintenance manual*.



Temperature of the coolant / outside air display

Switch over the display:

- Press the button (1) repeatedly until the desired temperature is shown.

Temperature display.

A: outside air

B: coolant is shown automatically when the limit value is exceeded;
 ▶ *Messages on the on-board computer display*, p. 5 - 50.

Set the temperature unit (°C / °F); ▶ p. 5 - 25.



5 Driving

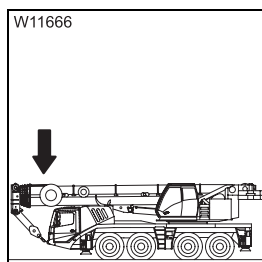
5.1 Before driving

5.1.1 CHECKLIST: inspections before on-road driving



This checklist is not a complete set of operating instructions. There are accompanying operating instructions which are referred to by cross-references.

Observe the warnings and safety instructions specified there.

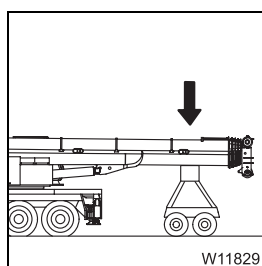


1. If the boom is on the boom rest

- All telescopic sections are interlocked; the telescoping cylinder is locked with telescopic section I
- The slewing gear is switched off; p. 12 - 92,



- The symbol (1) is displayed (if present); p. 5 - 8.



2. When the main boom is resting on a trailer

- All telescopic sections are locked
- The slewing gear is switched off; p. 12 - 92,
- The boom floating position is switched on; p. 6 - 9
- The slewing gear freewheel is switched on; p. 6 - 8
- The boom pre-tensioning may be switched on; p. 6 - 10
- The houselock may be switched off; p. 12 - 14

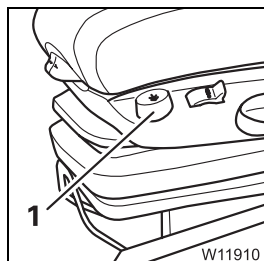


5.1.3

Adjusting the seats and steering column

Driver's seat

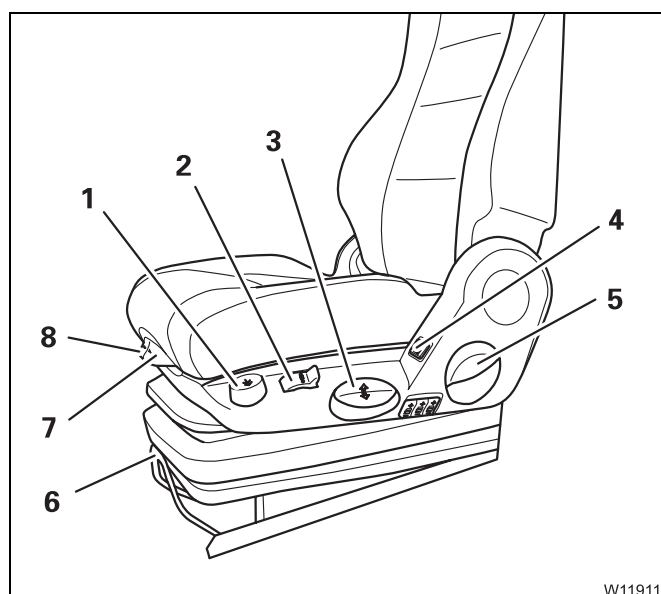
The seat height and lumbar support are adjusted pneumatically. You can only carry out these adjustments when



- The switch (1) is switched off on the driver's seat (not pressed in)
- Sufficient air pressure is available in the secondary consumer circuit.
You may have to build up the supply pressure; ►► p. 5 - 9.

- Sit on the driver's seat; the seat will rise to the last position set.

You can make adjustments to suit your body size and shape.



Settings for body size

- 1 Suspension on / off
Lower to lowest position
- 2 Spring hardness
- 3 Seat – height
- 4 Seat heating on / off¹⁾
- 5 Angle of the back rest
- 6 Length adjustment of the seat
- 7 Seat cushion angle
- 8 Length adjustment of the seat cushion

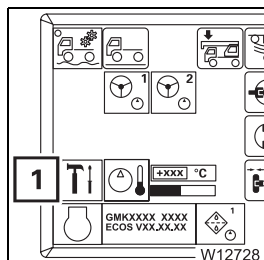
¹⁾ Additional equipment




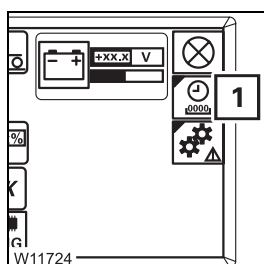
5.1.6

Displaying the operating hours

You can view the operating hours for all power units in the *Operating Hours* submenu.

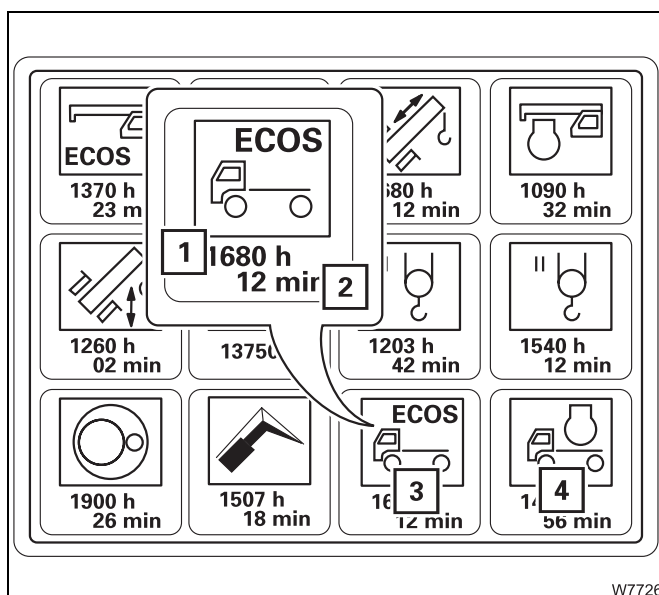


- If necessary, open the main menu  and press the button (1) once.



The *Settings* submenu opens.


- Press the button (1) once.



The *Operating hours* submenu opens.

When driving, the ECOS operating hours (3) for the carrier and the engine (4) for driving are recorded:

- The value (1) indicates the hours, e.g. 1680 hours
- The value (2) indicates the minutes, e.g. 12 minutes

The other displays relate to crane operation;  *Displaying the operating hours*, p. 12 - 101.

5.2.4

Display of the selected gears

Example:



In initial position, the fifth gear is engaged as half gear. The gear **5** selected is shown with an arrow pointing downwards.



If you shift down half a gear, the fourth gear is engaged as a full gear. The gear **4** selected is shown with an arrow pointing upwards.



If you shift down half a gear again, the fourth gear is engaged as a half gear. The gear **4** selected is shown with an arrow pointing downwards. If you shift down from the initial position by a full gear, the fourth gear will be selected as a half gear directly and displayed.

5.2.5

Selecting the direction of travel and starting gear

Selecting the driving direction

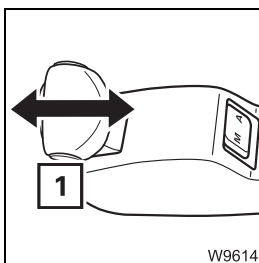
The following conditions must be met:

- The parking brake is applied
- The vehicle engine is switched on and
- The accelerator is not operated



Risk of accidents due to the truck crane moving unintentionally

When starting the truck crane, always use the service brake to stop the crane from moving until the starting gear has been engaged.



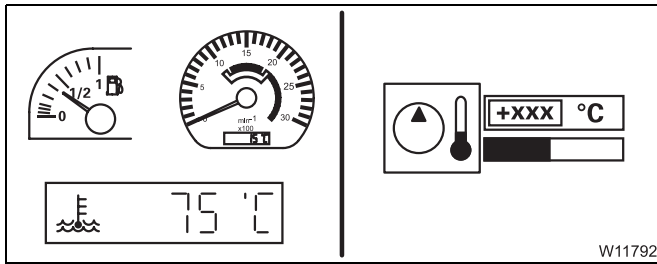
For forward travel

- Press the button **(1)** and additionally push the switch lever forwards once.

For reverse travel

- Press the button **(1)** and additionally push the switch lever backwards once. Depending on the equipment, an acoustic signal can be heard.





- Also note the control elements for fuel supply, engine speed, coolant temperature and hydraulic oil temperature; p. 4 - 17.

5.3.2 Tempomat

The Tempomat enables you to drive at a constant speed without pressing the accelerator.

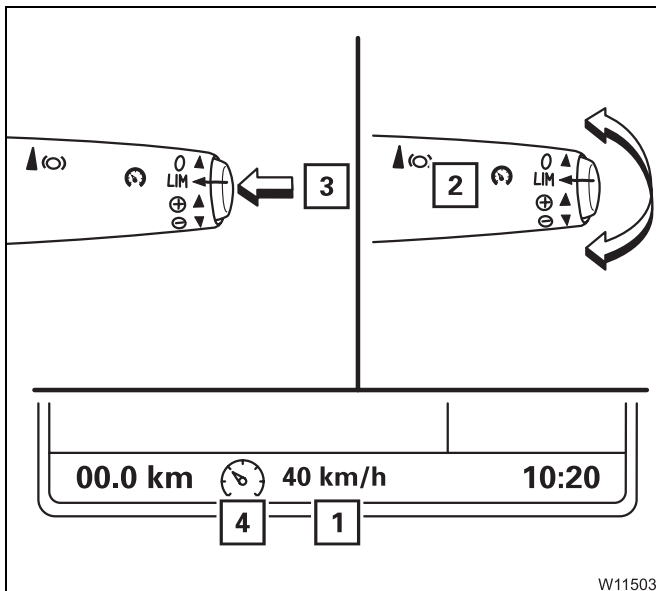


Risk of accidents due to carelessness

Be ready to brake at all times when the tempomat is switched on. Only switch the tempomat on if the traffic situation permits a constant speed.

Switching on

You can only switch on the tempomat at speeds of over 15 km/h.

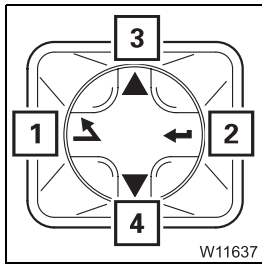


- With the (3) button, switch the tempomat on – symbol (4) is shown.
- Press the switch (2) upwards / downwards once.

The tempomat is switched on. The current speed (1) is shown and maintained, e.g. 40 km/h.

You can exceed the speed (1) with the accelerator. After the accelerator is released, the tempomat goes back down to the speed (1)





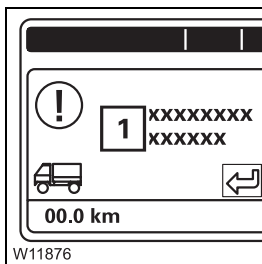
Acknowledging a message

- Press (1) once – the message disappears.

You can retrieve all existing messages in the *Error info* submenu;
▮▮▮▮ p. 5 - 22.

Warnings

This section does not include all messages. The messages shown here can also appear with additional or different texts.



If in doubt, the current text (1) shown in your truck crane always applies. Follow the requests to stop immediately and conduct the measures given in good time.

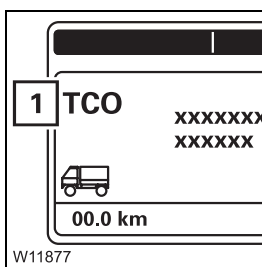


Risk of damage if messages are not observed

For all messages, always take note of the text shown.

Follow the requests to stop immediately, taking the traffic situation into account. Complete the remedial measures shown, and described here, in good time.

This avoids errors, and slight damage leading to more serious problems.



If an abbreviation (1) is shown, you can read off the error codes for the corresponding control device.

Always read off the error codes before contacting **CraneCARE**.

For an overview of the control devices and reading off the error codes;
▮▮▮▮ p. 5 - 26.



5.4

Off-road driving

This section describes adjustments, connections and procedures for adapting the vehicle handling to off-road conditions.

Adjustments to the transmission

If you drive continuously, for short periods of time with different loads or on a slippery surface, the transmission may switch gears too late or too early. In this case you can make the following adjustments:

- Shift to a lower starting gear; ■■■▶ p. 5 - 32.
- Step on the accelerator as far as it will go when starting – starting mode for load on.
- Select the *Manual* operating mode. In this way you will be able to drive carefully and shift gears on time; ■■■▶ *Changing the operating mode*, p. 5 - 30.

Connections

If the adjustments to the transmission are insufficient on their own, you can additionally connect the following one after the other:

- First, you can switch on the **off-road gear** in the transfer case; ■■■▶ p. 5 - 62.
- Then switch on the **longitudinal differential locks**; ■■■▶ p. 5 - 63.
- Then switch on the **transverse differential locks**; ■■■▶ p. 5 - 63.

Changing the vehicle level

You can also adapt the truck crane to the off-road inclination using the level adjustment system, or lift and lower the truck crane; ■■■▶ p. 5 - 65.

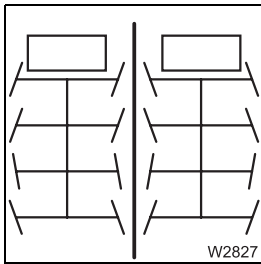
Rocking the vehicle free and towing

If the truck crane is stuck in terrain; ■■■▶ *Freeing the truck crane stuck in terrain*, p. 5 - 69.

5.4.5

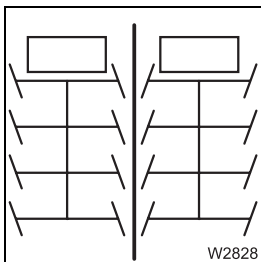
Separate steering

There are two types of steering with separate steering.



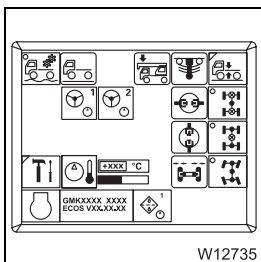
– Driving around corners:


When the separate steering is switched on, the steering angle is larger than for normal steering mode, and the turning circle is smaller.



– Crab travel:

When the separate steering is switched on, the truck crane drives sideways if you turn the wheels of the front and rear axle lines in the same direction.



- If required, open the main menu .


Switching to separate steering

Always switch to separate steering when

- Driving with the rigged truck crane or
- Steering at low speed



Risk of accidents when driving on the road with unlocked steering

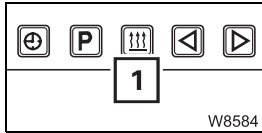
After driving with separate steering, change over immediately to normal steering. The locking status for normal steering mode is only restored once the green *Locked* symbol  is displayed.

You can only change over to separate steering when the current speed is below approx. 5 km/h.





This section describes how to switch on the heater manually. You can also have the auxiliary heater switch on automatically; *Storing the heating start*, p. 5 - 82.



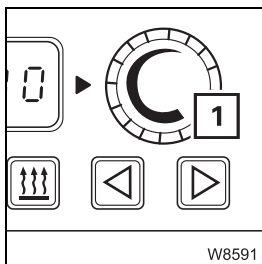
- Turn on the ignition; *Switching on the ignition*, p. 4 - 9.
- Press the button (1) once.
The auxiliary heating switches itself on and the control field lights up.



Always switch off the auxiliary heater when you turn off the truck crane when the battery master switch is switched on. In this way, you prevent the auxiliary heater from restarting and running down the batteries after the engine has cooled down.

Temperature

You can preselect a temperature. The preselected temperature is automatically set and maintained.



Increasing the temperature:

- Turn the switch (1) clockwise

Reducing the temperature:

- Turn the switch (1) anti-clockwise

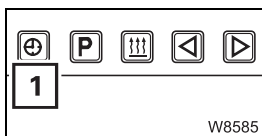
The higher the selected temperature is, the faster the fan of the auxiliary heater runs.

Setting the day and time

Always set the current time and weekday. These settings are required for the correct activation point of the automatic heating start.



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



- Press the button (1) for longer than 2 seconds.
The displayed time flashes, e.g. 10.00 hrs.



Set the current time on the flashing display, e.g. 14.00 hrs.



6 Driving modes

6.1	Driving modes	6 - 1
6.1.1	Information on how to use the tables	6 - 2
6.1.2	Table for a maximum axle load of 12 t	6 - 3
6.1.3	Maximum permitted speeds with an axle load of over 12 t	6 - 5
6.2	Rigging work for driving with a trailer	6 - 7
6.2.1	Switching on the slewing gear freewheel	6 - 8
6.2.2	Switching on boom floating position	6 - 9
6.2.3	Switching on boom pre-tensioning	6 - 10
6.2.4	Switching the superstructure driving lights on / off	6 - 12

6.2.2

Switching on boom floating position

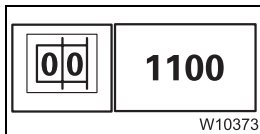
If the main boom has been placed on a trailer, the boom floating position must be switched on so that the main boom can move up and down.



Risk of accidents when the boom floating position is switched off

Always switch on the boom floating position when the main boom is on a trailer.

This prevents the trailer hanging briefly with its full weight on the main boom on uneven ground, the axle loads from rising suddenly, or the truck crane from tipping when driving around corners.



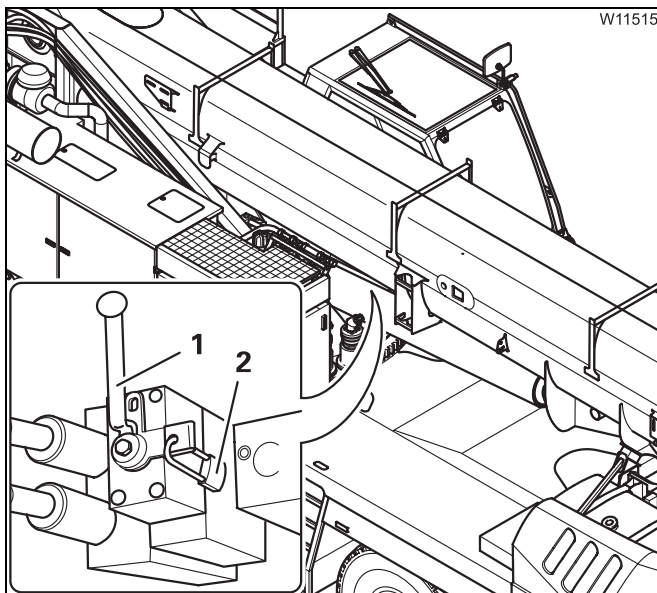
- Enter the SLI code for the current rigging mode.
- Fully retract the main boom.
- Raise the main boom to a permitted angle within the working range.
- Turn the superstructure to the 0° to the rear working position and place the main boom on a trailer.



Risk of accidents due to the main boom falling down

You may only switch on the boom floating position when the main boom is already set down on the trailer.


In this way, you prevent the raised main boom from falling down.



- Remove the padlock (2)
- Switch the valve I over – and position the lever (1) vertically, moving it either upwards or downwards depending on its fitting position
- Secure the lever (1) with the padlock (2)

The boom floating position is now switched on.



Switching off the boom floating position;  p. 13 - 17.

7.3

Towing the truck crane

Observe the following when towing the truck crane:


- The truck crane may only be towed away with a tow bar. Attach the tow-bar to the tow-rod coupling on the front bumper.
- The statutory regulations in the country of use concerning the overall length of the towing and towed vehicle, including the towing bar, must be observed.
- If the engine, the steering and the service brake still work, you can tow the truck crane with a lorry.
- If the engine, the steering or the service brake no longer function properly, the truck crane must be towed with a special breakdown truck.

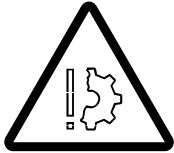
The front towing coupling is designed for a maximum tractive force of 10 t. The tractive force may only be applied forwards or at an angle of 45° to both sides from the longitudinal axle of the truck crane.

7.4.2

Filling the tyres yourself

In emergencies you can fill the tyres with the compressed air system of the truck crane if an appropriate filling hose is available.

The tyres can be filled up to a maximum pressure of about 8 bar. This pressure might not correspond to the prescribed tyre pressure, depending on the tyres;  *Tyres*, p. 8 - 5.

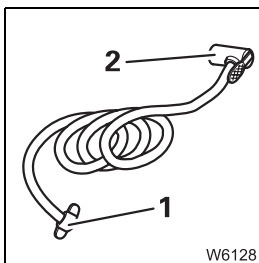


Risk of accidents due to impermissible tyre pressure

If the maximum pressure is above the specified tyre pressure, fill the tyres up to the maximum specified pressure.

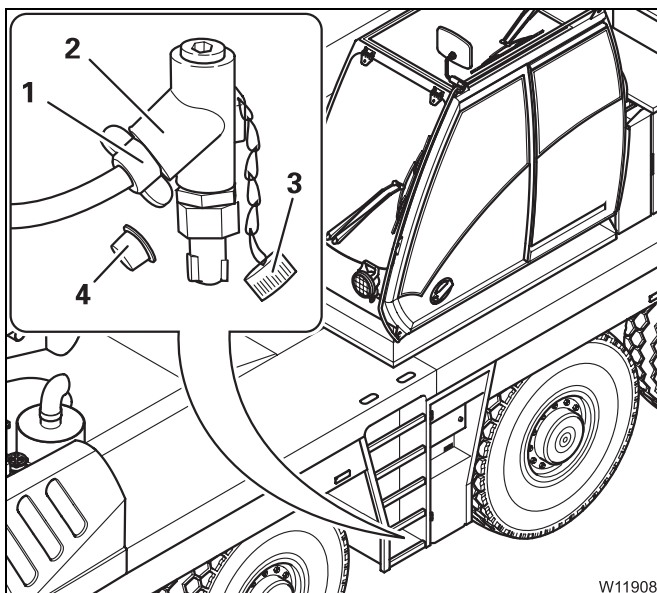
In this way you prevent the tyres from becoming damaged during driving, and bursting.

Always drive directly to a service station or garage and adjust the tyre pressure as soon as you have filled the tyres yourself.



The filling hose has a tyre inflator connection (2) and a connection (1).

Connecting the filling hose




- Remove the caps (3) and (4).
- Fasten the connection (1) to the filler connection (2).

You can now fill the tyres.



7.6.2 Malfunctions on the transmission

Malfunction	Cause	Remedy
Neutral position cannot be activated	Transmission switch lever or two-stop rocker not in home position	Switch the transmission switch lever and two-stop rocker to home position.
Transmission not shifting automatically	Operating mode <i>Manual</i> switched on	Change-over to <i>Automatic</i> ; ▣▣▣▣▶ p. 5 - 30
	Fuse F15, F29, A1F13 defective	Replace blown fuses; ▣▣▣▣▶ p. 7 - 17
Starting gear cannot be engaged	Supply pressure in secondary consumers too low	Build up supply pressure; ▣▣▣▣▶ p. 5 - 9
Transmission no longer upshifts at speeds over 20 km/h	A locking procedure is not yet completed	Lock the differential locks or steering
	Off-road gear on	Switch off the off-road gear; ▣▣▣▣▶ p. 5 - 62
Transmission does not respond to the transmission switch lever or the two-stop rocker	Fuse F15, A1F13 defective	Replace blown fuses;▣▣▣▣▶ p. 7 - 17
	Electronic gear system is no longer connected to the transmission	Switch to <i>Transmission emergency program</i> ; ▣▣▣▣▶ p. 7 - 36
 Lights up	Transmission cannot downshift since the maximum permissible engine speed would otherwise be exceeded.	Slow down the truck crane until the symbol goes out
Engine / transmission diagnostics plug not working	Fuse F39, F10 defective	Replace blown fuses; ▣▣▣▣▶ p. 7 - 18
The transmission is not in neutral position after switching on the ignition.	The parking brake was released when the ignition was switched off	
	Mechanically switch the transmission to neutral position if the engine cannot be started because a gear has been selected and the air pressure is below 5.5 bar; ▣▣▣▣▶ p. 7 - 41	

7.7

Procedure in the event of malfunctions

7.7.1

Switching on emergency operation in coolant circuit

For cooling purposes, the fan wheel of the engine is switched on and off automatically. When this automatic system fails, you can switch on emergency operation so that the fan wheel always runs when the engine is switched on.

- Switch off the engine and secure against unauthorized use – lock the hand-held control in the driver's cab and the doors.



Risk of accidents due a turning fan wheel

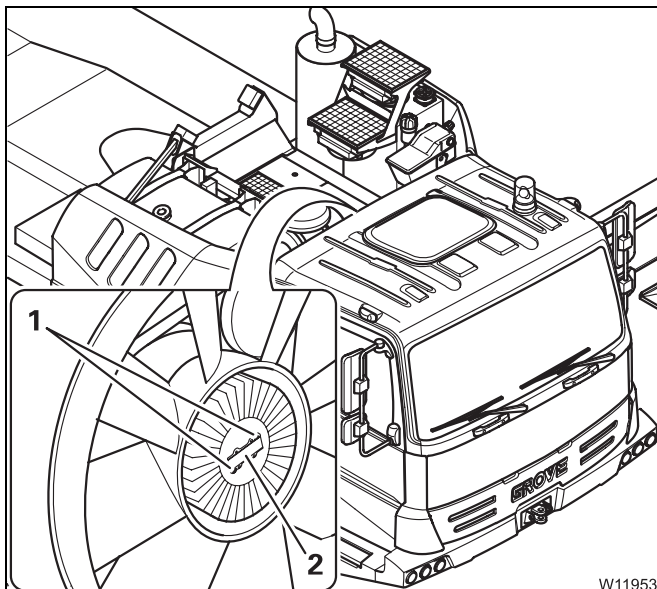
Always switch off the engine and secure against unauthorized use before switching on emergency operation.

This prevents the fan wheel from starting to turn suddenly, and injuring you.



Risk of burning yourself when the engine is hot

During operation, the engine and the add-on parts heat up to a great extent. Wear appropriate protective gloves and be careful not to touch hot parts.



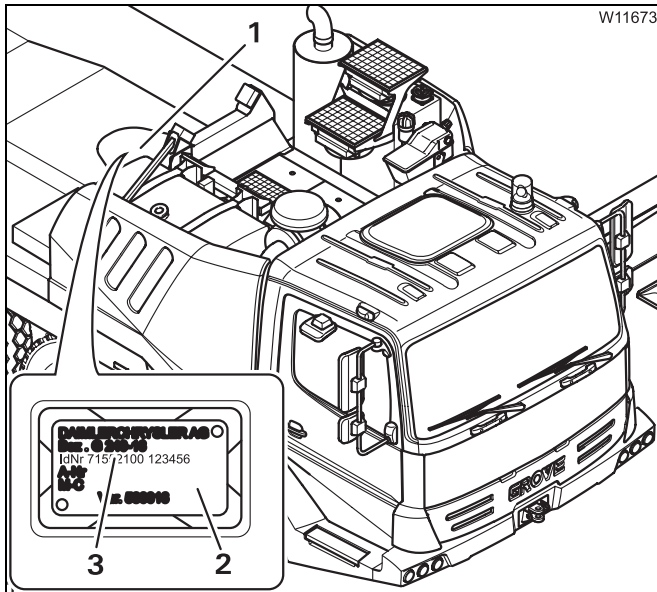
Emergency operation is switched on at the fan wheel's hub.

- Undo the screws (1).
- Turn the metal plate (2) and remove it.
- Press in the pin under the metal plate.
- Emergency operation is activated and the fan wheel will run continuously as long as the engine has been switched on.

With a blocked fan wheel, you may only drive up to 1000 km.

ID number of the transmission

The ID number of the transmission is on the model plate.



- Remove the rear cover plate (1).

The model plate (2) is on top of the transmission.

The ID number (3) consists of an eight-digit number and a six-digit number. You must add the digits 00 to the first number on the model plate if it only consists of six digits.

In this example the ID number is 71552100 123456

- Note down the ID number, on this page for example, so that you can find it at a later time.

Driving speeds At an engine speed of 1800 min^{-1}

Forwards: max. 85.0 km/h

Reverse: approx. 7 km/h depending on the tyres

Climbing ability Transport weight 48 t

14.00 R25 tyres: 70%

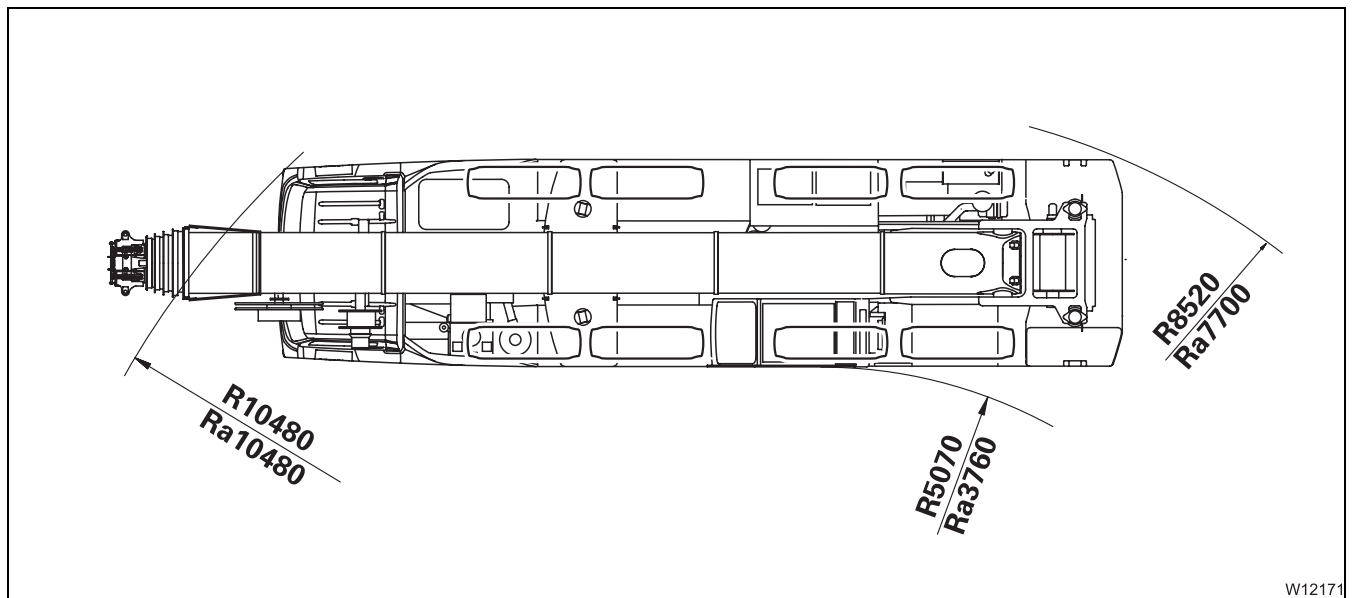
16.00 R25 tyres: 63%

20.5 R25 tyres: 63%

Turning circle radiuses The dimensions in the illustration are given in mm.

R = values for normal steering mode

Ra = values for all-wheel steering



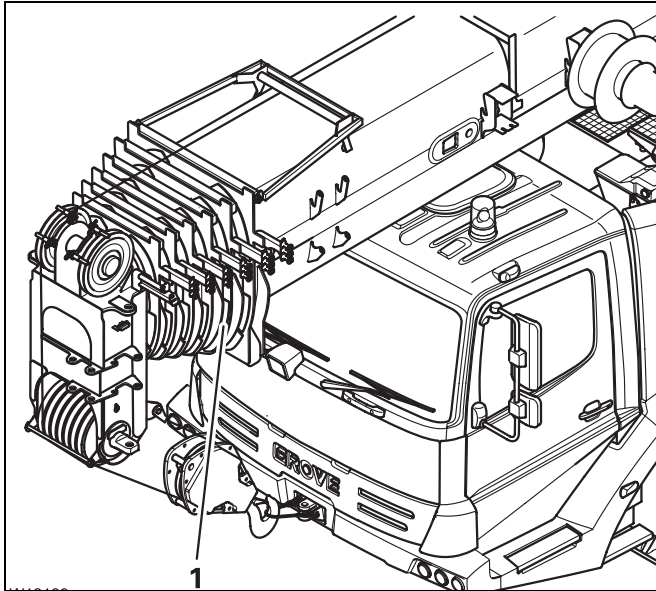
using the tables	6 - 2
Driving the rigged truck crane	14 - 1
E Earthing	
of the truck crane	13 - 13
the load	12 - 12
ECOS	
adjusting the brightness of the display – in the crane cab	11 - 11
adjusting the brightness of the display – in the driver's cab	4 - 12
operating elements in the crane cab	
brief description	10 - 63
in counterweight submenu	10 - 22, 10 - 36
in submenu for outriggers	10 - 24
in the driving submenu	10 - 38
in the Error submenu	12 - 105
in the main menu	10 - 20
in the monitoring submenu	10 - 29
in the power unit speed submenu	10 - 28
in the Settings submenu	
operating hours	12 - 101
in the settings submenu	10 - 30
in the slewing gear/Houselock submenu	10 - 23
in the telescoping submenu	10 - 26
in the Warning submenu	12 - 102
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brief description	3 - 35
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in the level adjustment system submenu	3 - 18
in the main menu	3 - 16
in the Settings submenu	3 - 20
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in the Warning submenu	3 - 21, 5 - 48
on the control unit	3 - 14
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inspections in the driver's cab	5 - 6
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forwards	5 - 70
turning off	5 - 58
Tyres	
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V Voltage indicator lamp	
carrier	4 - 18
superstructure	10 - 103
W Warning plates for vehicle width	5 - 8
Welding work	
safety instructions	2 - 4
Wheels and tyres	
filling the tyres yourself	7 - 15
wheel change	7 - 11
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tank – driver's cab	5 - 6
Windscreen wiper	3 - 48
crane cab	10 - 105
driver's cab	3 - 48
Windscreen wiper / washing system	10 - 103
Windscreen, washing system	
tank – driver's cab	12 - 5
Work break	12 - 121
short work breaks	12 - 121

10

Operating elements for crane operation

All operating elements for driving are described in chapter 3.



This operating manual contains illustrations of the GMK 4100.

The GMK 4100-L is distinguished by its additional telescope section (1).

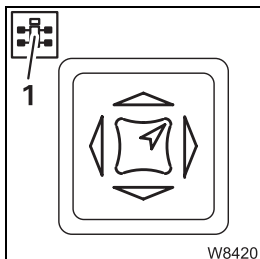
10.1

Overview of the operating elements

This section shows the position and designations of the operating elements for crane operation. This also includes display elements such as lights or displays.

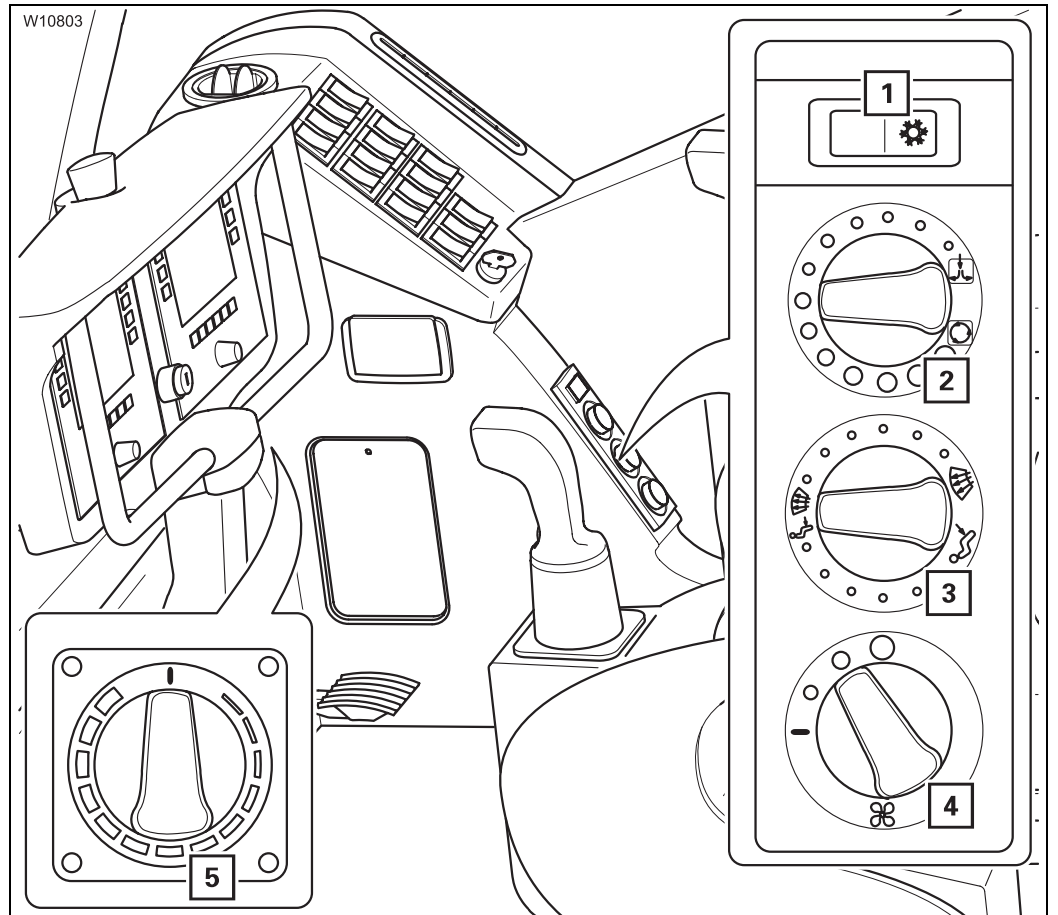


Operating elements which are only available for additional equipment are designated accordingly. These designations are made in this section only and are not repeated in the following sections.



Some figures show details from a different perspective than the total view. The perspective is indicated by the symbol (1).

Standard heating system



1 Air-conditioning system¹⁾

▣ p. 12 - 125

2 Setting fresh air / recirculated air / mixed air

▣ p. 12 - 123

3 Air distribution

▣ p. 12 - 124

4 Setting the fan

▣ p. 12 - 123

5 Setting the temperature

▣ p. 12 - 124

¹⁾ Additional equipment



1	Combined operation display Combined operation on	➡ p. 10 - 60
2	Display of current inclination	➡ p. 10 - 71
3	Anemometer display ¹⁾	➡ p. 10 - 72
4	Telescoping submenu	➡ p. 10 - 26
5	Monitoring submenu	➡ p. 10 - 29
6	Counterweight submenu ¹⁾	➡ p. 10 - 22
7	Power unit speeds submenu	➡ p. 10 - 28
8	Outriggers submenu	➡ p. 10 - 24
9	Remote control display ^{1), 3)}	
10	Settings submenu	➡ p. 10 - 30
11	Power units display	
	Slewing gear	➡ p. 10 - 79
	Main hoist	➡ p. 10 - 76
	Auxiliary hoist	➡ p. 10 - 78
	Derricking gear	➡ p. 10 - 81
	Telescoping mechanism	➡ p. 10 - 82
	Derricking the lattice extension ^{1), 2)}	
12	Slewing gear / Houselock submenu ¹⁾	➡ p. 10 - 23
13	Working range limitation submenu ¹⁾	➡ p. 10 - 36
14	Serial number and program version displays	➡ p. 10 - 65
15	Driving submenu ¹⁾	➡ p. 10 - 38

¹⁾ Additional equipment

²⁾ ➡ *Operating Instructions Lattice Extension*

³⁾ ➡ *Separate operating instructions*

1	Outrigger control units on / off¹⁾	▶▶▶▶▶ p. 10 - 68
2	Lamp test	▶▶▶▶▶ p. 11 - 9
3	Telescoping cylinder pressure display	▶▶▶▶▶ p. 10 - 89
4	Slewing gear hydraulic circuit pressure display	▶▶▶▶▶ p. 10 - 89
5	Setting the characteristic curve for the control levers	▶▶▶▶▶ p. 12 - 98
6	Operating hours submenu	▶▶▶▶▶ p. 10 - 32
7	Set brightness of display	▶▶▶▶▶ p. 11 - 11
8	Critical load control on / off	▶▶▶▶▶ p. 10 - 89
9	Hydraulic circuit pressure display	▶▶▶▶▶ p. 10 - 89
10	Telescoping emergency program access	▶▶▶▶▶ p. 10 - 87
11	Current telescoping mechanism status display	▶▶▶▶▶ p. 10 - 88
12	Adjusting the wiper stroke interval	▶▶▶▶▶ p. 10 - 105
13	Entering the current telescoping	▶▶▶▶▶ p. 15 - 51

¹⁾ Additional equipment

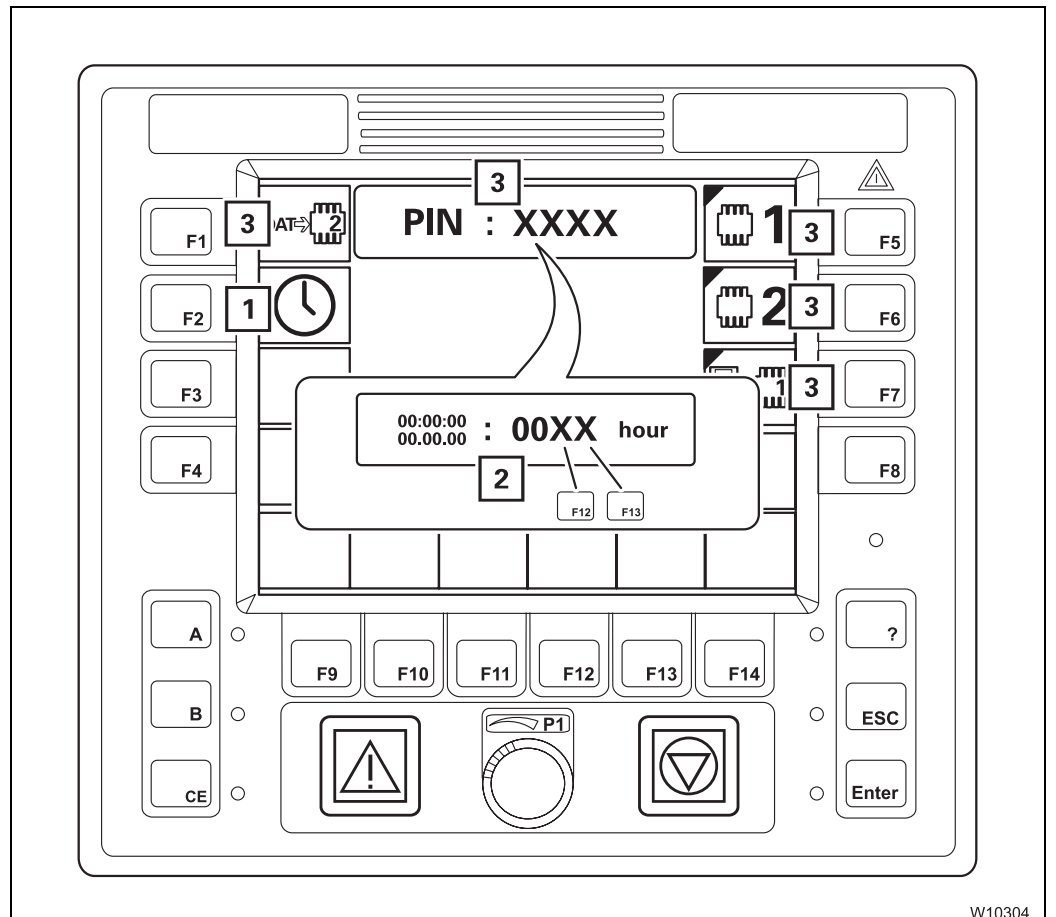


1 SLI display	▣▣▣▣▶	p. 10 - 93
Main menu overview	▣▣▣▣▶	p. 10 - 42
2 Sensor for brightness ¹⁾	▣▣▣▣▶	p. 10 - 92
3 Error / warning message	▣▣▣▣▶	p. 10 - 63
4 Buttons F1 to F14	▣▣▣▣▶	p. 10 - 63
5 Sensor for brightness ¹⁾	▣▣▣▣▶	p. 10 - 92
6 Opening the error submenu	▣▣▣▣▶	p. 10 - 63
Submenu overview	▣▣▣▣▶	p. 10 - 49
7 Exiting the submenu / input mode	▣▣▣▣▶	p. 10 - 64
8 Acknowledge	▣▣▣▣▶	p. 10 - 92
9 SLI early warning	▣▣▣▣▶	p. 10 - 92
10 Entering values	▣▣▣▣▶	p. 10 - 64
11 SLI shutdown	▣▣▣▣▶	p. 10 - 92
12 Confirming an entry	▣▣▣▣▶	p. 10 - 92

¹⁾ Either **2** or **5**



Settings submenu



W10304

1 Entering the time / date

➡ p. 12 - 40

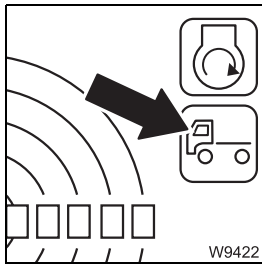
2 Enter time / date display

➡ p. 12 - 40



Displays / buttons **(3)** are only shown if a service device is connected. Therefore, these functions are not described in these operating instructions.

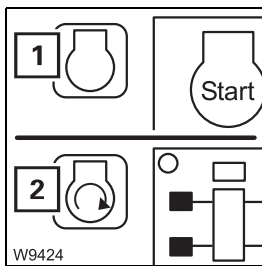
Outriggers sub-menu



Carrier ignition display

- **Red:** ignition off – engine start not possible
- **Green:** ignition on – engine start possible

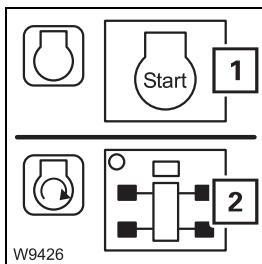
➡ p. 13 - 23



Display for engine for driving on / off

- 1 Red:** engine off
- 2 Green:** engine on

➡ p. 13 - 23



Start engine for driving

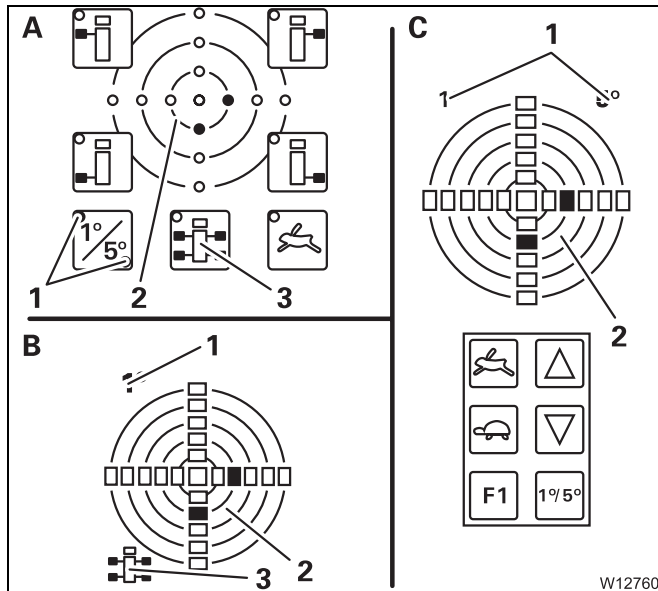
- 1 Starting the engine:** press button once
- 2 Motor running:** button has function *Pre-select all supporting cylinders*

Turning off the engine: switch off the carrier ignition

➡ p. 13 - 23

10.2.8 Inclination displays

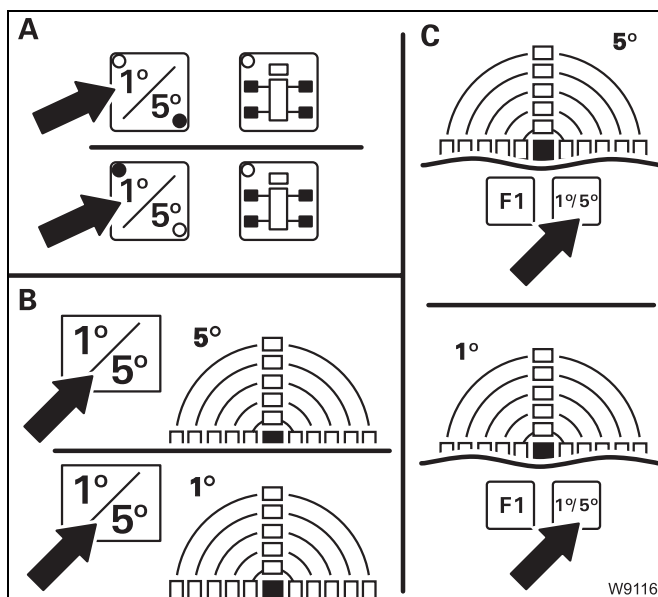
▣▣▣▣ Inclination displays, p. 13 - 46



Display of current inclination

- A** On the hand-held control
- B** In the main menu
In the *Outriggers submenu*
- C** On the *Outrigger control units*

- 1** Measuring range display
- 2** Inclination display
- 3** Directional indicator



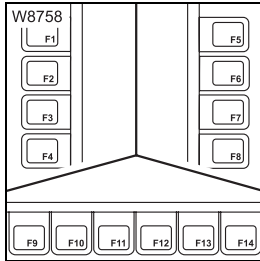
Switching over the measuring range

- A** On the hand-held control
Press button once – lamp for current measuring range 1° or 5° lights up
- B** In the *Outriggers submenu*
- C** On the *Outrigger control units*
Press button once – the current measuring range 1° or 5° is shown

10.2.19 Safe load indicator (SLI)

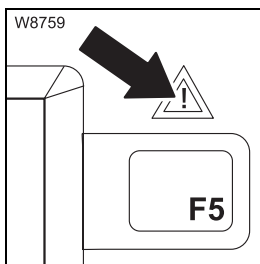
Control unit

This section contains the operating elements that are the same for all menus opened.



Buttons F1 to F14

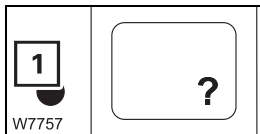
The function of buttons F1 to F14 is shown on the symbol next to or above the button. After the button is pressed, the function displayed is executed if it has been released.



Error

- On: error present
- Off: no error present

➡ p. 12 - 36



Opening the Error submenu

The lamp (1) lights up or flashes.

- **Press button once:** the *Error* submenu opens

➡ p. 15 - 28



Exiting the submenu / input mode

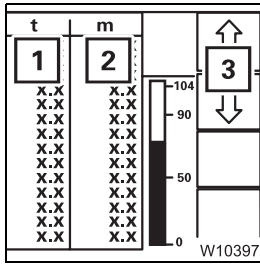
The lamp (1) lights up.

- **Press button once:**
 - the opened submenu closes – the menu from the next level up opens
 - input mode is deactivated



Lifting capacity table submenu

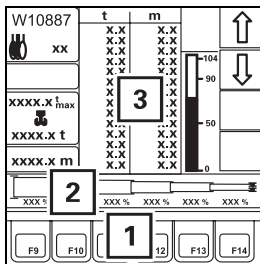
▣▣▣▣▶ *Displaying the lifting capacity tables, p. 12 - 38*



Lifting capacity table display

Values for displayed SLI code and displayed telescoping

- 1 Lifting capacity in tons (t) or in kilopounds (klbs)
- 2 Working radius in metres (m) or feet (ft)
- 3 Show other values given in the table



Telescoping display / input

- **Display:** telescoping (2) in percent
- **Enter:** press button (1)
 - display (2) new telescoping
 - display (3) corresponding table or all values 0 = no table available

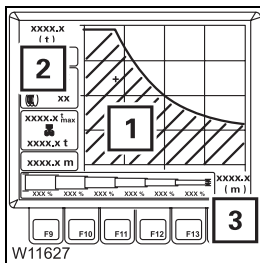
Other displays

Function like in the *Monitoring* submenu:

- SLI code display ▣▣▣▣▶ p. 10 - 97
- Reeving display ▣▣▣▣▶ p. 10 - 97
- Maximum load display ▣▣▣▣▶ p. 10 - 99
- Current load display ▣▣▣▣▶ p. 10 - 98
- Current working radius display ▣▣▣▣▶ p. 10 - 100
- Current degree of utilization display ▣▣▣▣▶ p. 10 - 99

Working range submenu

▣▣▣▣▶ *Displaying the lifting capacity tables, p. 12 - 38*



Permissible working range display

Applies to displayed SLI code and displayed telescoping

- 1 Permissible working range – surface under the curve
- 2 Maximum possible load
- 3 Maximum possible working radius



CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

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- You can download the complete manual from: www.heydownloads.com by clicking the link below



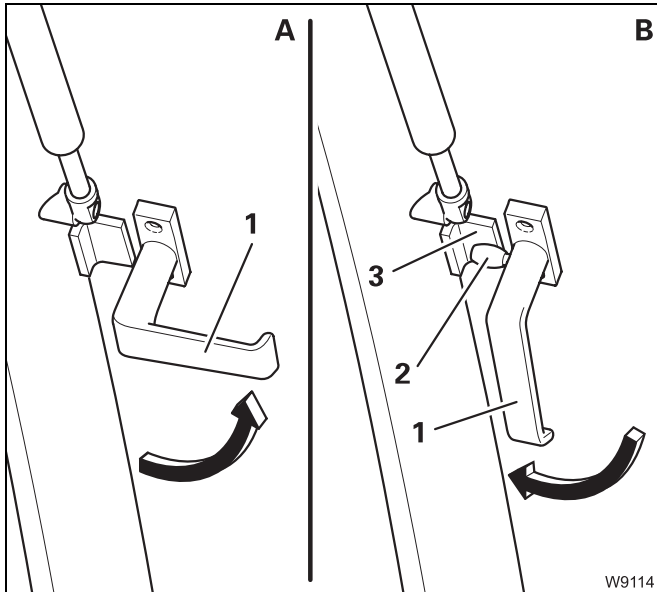
- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

10.2.24 Windows, doors, keys

Windows

The handles on the windscreen and the rear window have the same function.



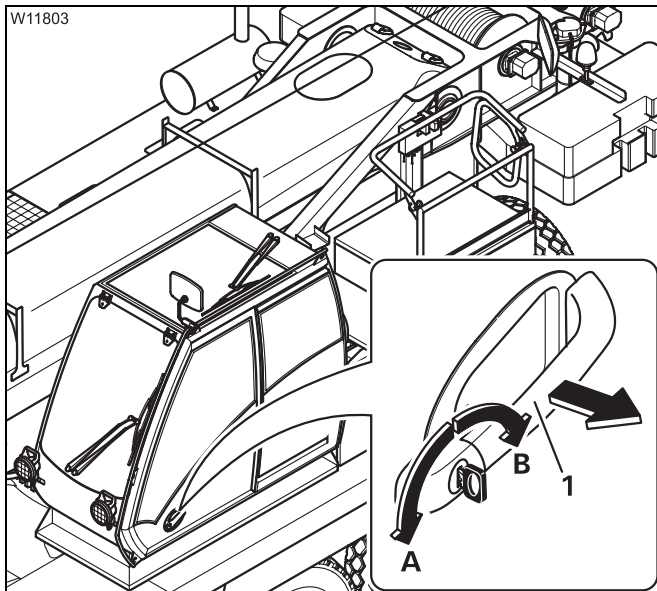
Open window (A)

- Turn both handles (1) inwards
- Push window forward

Close window (B)

- Pull window in
- Turn both handles down – pegs (2) located behind the holder (3)

Crane cab door



From outside

Unlock

- Turn the key in direction A

Lock

- Turn the key in direction B

Open / Close

- Pull the handle (1).
- Push the door



11 Starting / turning off the engine – for crane operation

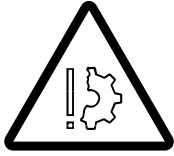
11.1	Starting the engine – from the crane cab	11 - 1
11.1.1	CHECKLIST: Starting the engine	11 - 1
11.1.2	CHECKLIST: If the temperature is low.	11 - 4
11.1.3	Refuelling.	11 - 5
11.1.4	Inspections before starting the engine	11 - 7
11.1.5	Switch on the ignition	11 - 8
11.1.6	Lamp test / equalisation of the switching states	11 - 9
11.1.7	Set brightness of display	11 - 11
11.1.8	To start the engine	11 - 12
11.1.9	Inspections after starting the engine.	11 - 14
11.1.10	Monitoring submenu	11 - 15
11.1.11	Setting the idling speed	11 - 16
11.2	Starting the engine – with the hand-held control	11 - 17
11.3	Turning off the engine.	11 - 19
11.3.1	During normal operation, with the ignition lock / with the hand-held control	11 - 19
11.3.2	In emergencies, with the emergency-stop switches	11 - 20
11.4	Air intake inhibitor.	11 - 21

11.1.6

Lamp test / equalisation of the switching states

Lamp test

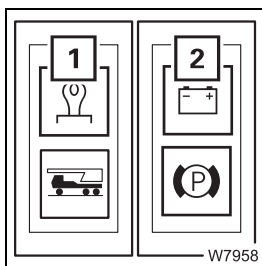
After the ignition has been switched on, a lamp test is conducted.



Risk of accidents due to faulty lamps

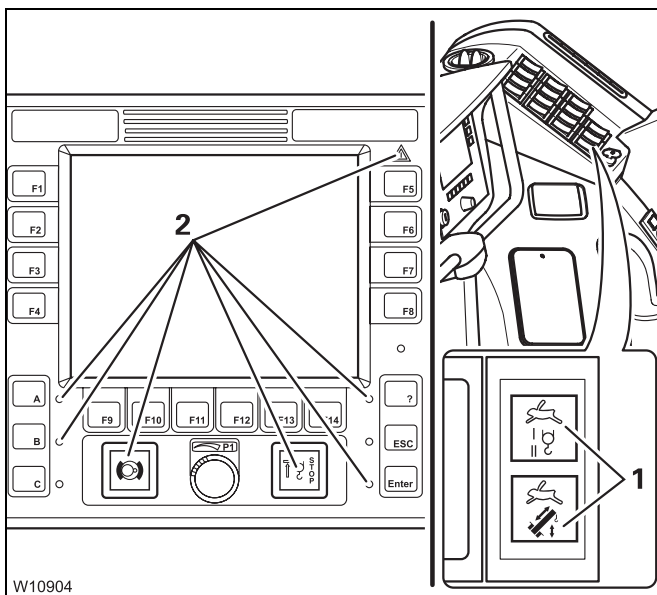
The lamps that are used to provide warnings and information during operation go on for control purposes whenever the ignition is switched on. Always perform the following lamp tests and immediately replace faulty lamps or have them replaced.

In this way, you will avoid accidents and damage that occur when malfunctions are not identified in time.



- Check whether the lamps (1) and (2) light up briefly

If the specified time is insufficient, switch on the ignition again.



- Check whether the lamps (1) and (2) light up briefly

Contact **CraneCARE** if one or more lamps do not go on.

If the specified time is insufficient, you can carry out the lamp test again as follows.



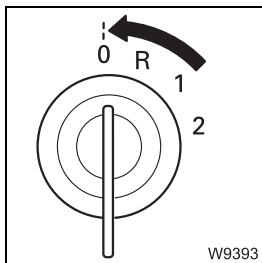
11.3 Turning off the engine

11.3.1 During normal operation, with the ignition lock / with the hand-held control



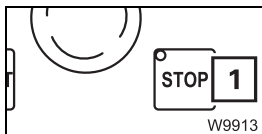
Risk of accidents due to suspended loads

Never turn off the engine with a load suspended. You must have the control levers at hand in order to intervene at any time.
Always set down the load before you leave the crane cab.



If the hand-held control unit is not connected up:

- Turn the ignition key to position **0** – the engine will stop



If the hand-held control unit is connected up:

- Press the button **(1)** once – the engine goes off

In this case it is not possible to switch off the engine with the ignition lock.

After parking

Observe the warnings in the appropriate sections;

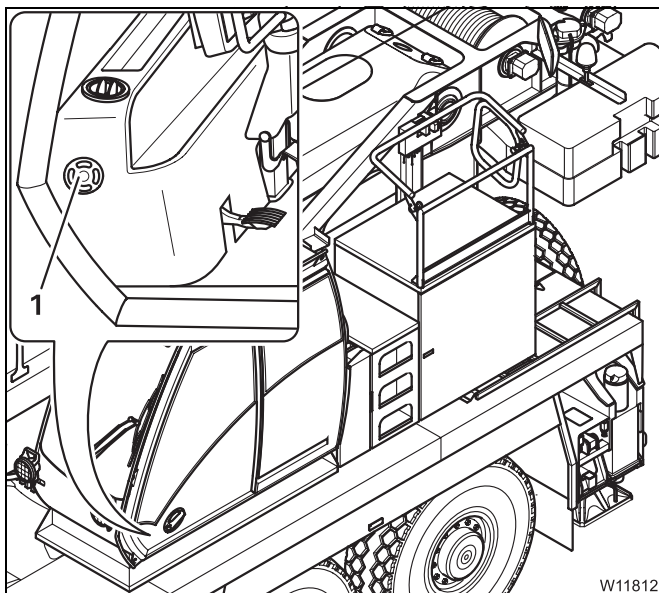
- ▣▶ *Short work breaks*, p. 12 - 121,
- ▣▶ *Work breaks of more than 8 hours*, p. 12 - 122.

12.1.2

Checking the condition of the truck crane

Tank for wind- screen washing system

Use a windscreen washing agent and, at low temperatures, an appropriate antifreeze.



- Check the level in the tank (1).
- Top up water in due time, and close the tank (1) with the cap.

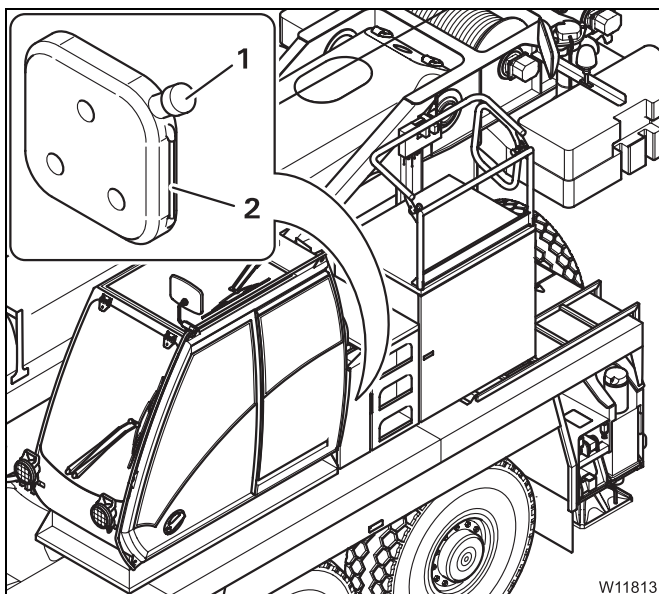
Auxiliary heater – tank

Only use the same fuel as for the engine or use EL heating oil for refuelling.



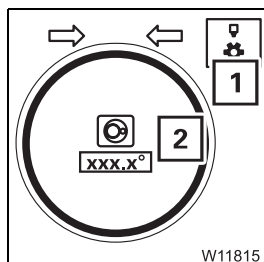
Danger of fire due to inflammable gases

Turn off the engine and heaters before refuelling.



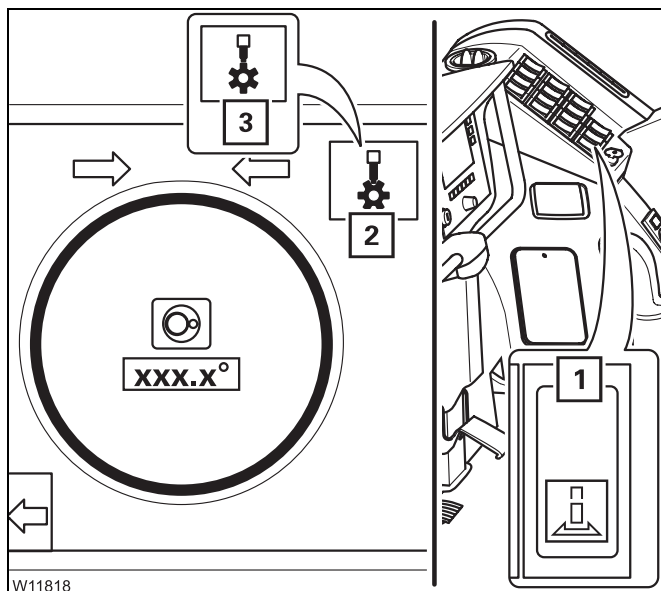
- The display (2) shows the fuel supply in the tank (1).
- Refill the fuel in due time, and close the tank (1) with the lid.
- If a fuel tank is available on the superstructure, then tank (1) is not applicable.






Switching on the houselock

The slewing ring (2) is displayed in the same colour as the displayed symbol (1) during the entire procedure.



- Press the button (1) in at the top until the symbol (2) turns **green**.


The display first shows the symbol  in **yellow** and when the houselock is switched on, it shows the symbol (2) in **green**.

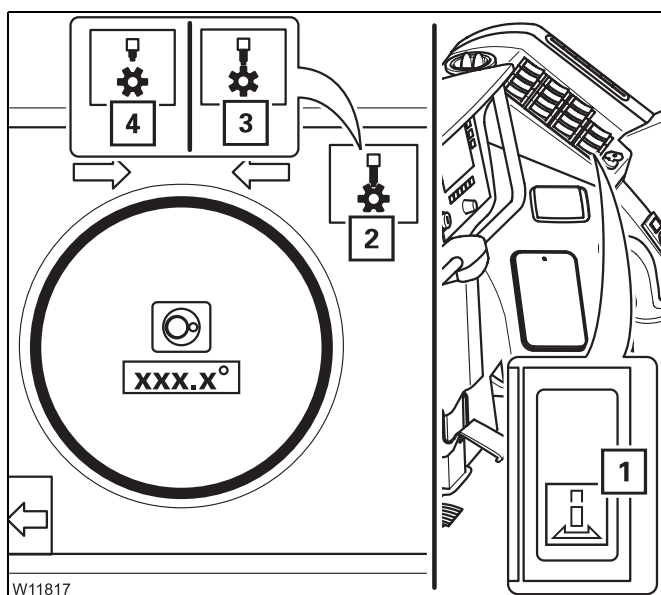
When the symbol (3) is **red / yellow**:

- Let go of the button (1).
The lock is blocked and you need to correct the position of the superstructure as follows:



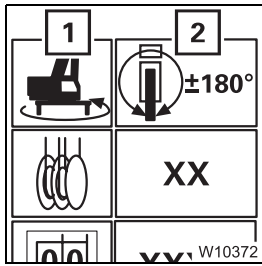
Risk of damage due to slewing with blocked lock

Before slewing, make sure the symbol  is displayed in **red** (houselock off). Otherwise the system will be damaged during slewing.



- Switch the houselock off – press the button (1) in at the bottom until the symbol (4) turns **red**.
- Apply the slewing gear brake.
- Switch on the slewing gear and slew the superstructure a little further (minimal).
- Switch off the slewing gear.
- Press the button (1) in at the top until the symbol (2) turns **green**.
- If the symbol (3) is still displayed, you must correct the position of the superstructure once more.





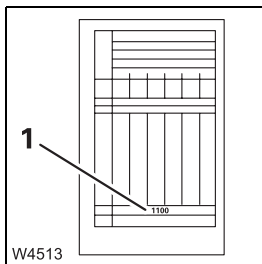
- Slewing range

Symbol (1) is green. Press the buttons repeatedly until the display (2) indicates the required slewing range, e.g. 360°.

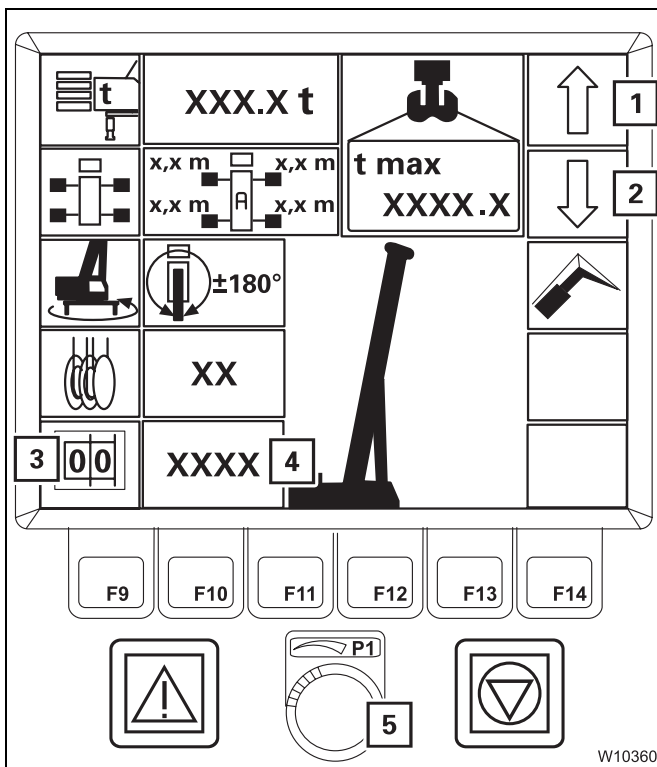
You can only confirm rigging modes for slewing ranges other than 360°
 - if the slewing gear is switched off in the 0° / 180° working position.
 - if the superstructure is in the entered slewing range. If necessary, first enter the 360° slewing range and slew the superstructure into the required position.

Entering the SLI code

You must enter the SLI code for the rigging mode according to the *Lifting capacity table*.



- Refer to the *Lifting capacity table* for the current rigging mode. The corresponding SLI code (1) is specified at the bottom of the table (e.g. 1100).

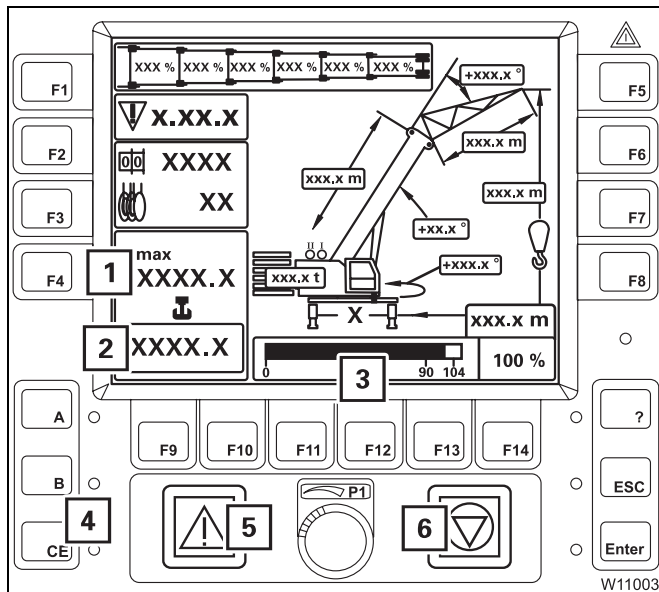


- Press the button (3) once – symbol **green**.
 - Press the button (1) or (2) repeatedly until the display (4) shows the required SLI code.
- or**
- Select the SLI code with the switch (5).

The other displays show the corresponding rigging mode.

Now you can enter the reeving and accept the rigging mode.





- All crane movements that increase the load moment are switched off.
- A continuous buzzer tone sounds. After five seconds, you can switch off the buzzer tone using the button (4).
- Lamps (5) and (6) light up.
- The display (3) shows the current degree of utilisation, e.g. 100%; the bar is red.
- The value on display (2) is the same or greater than the value on display (1).

labelling="Section-Header">Cancelling a shutdown

- Turn off the buzzer tone if necessary.
- Leave the shutdown range by carrying out the crane movements according to the following table.

Deactivated crane movements	Permitted crane movements
Lifting loads	Lowering loads
Lowering the main boom	Raising the main boom
Extending the main boom	Retracting the main boom ¹⁾
Slewing to the left	Slewing to the right
Slewing to the right	Slewing to the left
Lowering the lattice extension	Raising the lattice extension



¹⁾ In some cases the SLI also switches off boom retracting. In this case, leave the shutdown range by raising the boom. If this is not possible, set down the load, telescope to the next fixed length and raise the load again.



If you have left the shutdown range, the lamp (1) goes out. After pressing the button CE all crane movements are enabled.

12.3.3

Main hoist

You can reeve the hoist rope of the main hoist on the main boom or on the lattice extension.



Risk of accidents from accidentally operating a hoist

Always switch off the hoist that is not in use.

Never operate the hoist if the hook block is unreeved and the hoist rope is completely wound onto the drum.

- Slack rope forms in the course of the *Lower* movement. Rope loops form, which can cause the load to slip and destroy the hoist rope.
- The switch-off point of the lowering limit switch shifts in the course of the *Raise* movement. The lowering limit switch loses its function as a safety device.



Risk of accidents when raising loads at a slant

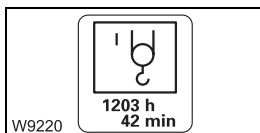
Loads can bend the main boom, resulting in the hoist rope no longer being aligned in a vertical position. Compensate the deflection by lowering the boom in order to raise the load vertically. In this way, you can prevent the load from dragging and helpers from being injured.


Inform all helpers about this issue.



Danger posed by rope slack


Only use hook blocks and sling gear of the minimum weight prescribed in the *Lifting capacity table*, depending on the reeving and boom length. That way you prevent slack rope developing at large heights when lifting without a load. This can result in the load slipping during subsequent lifting procedures.



You can have the operating hours of the hoist displayed;  p. 12 - 101.



Raising and lowering the boom

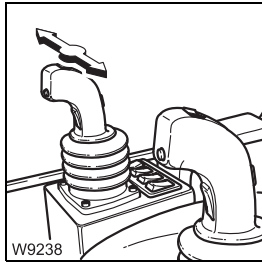
You can adjust the sensitivity of the control levers to the operating conditions;  *Setting the characteristic curve for the control levers*, p. 12 - 98.



Risk of accidents due to unexpected crane movements

In the case of multiple configuration, check whether the control lever function *Derricking* is switched on before you move the control lever for derricking.

This way, you avoid accidents due to unexpected crane movements.



To lower:

- push the control lever to the right – the main boom is lowered.

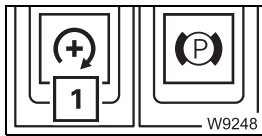
To raise:


- push the control lever to the left – the main boom is raised.

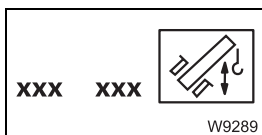
You can regulate the speed by moving the control lever and changing the engine speed with the accelerator.




The maximum derricking speed is automatically reduced as the system length is increased. If you now reduce the working radius (e.g. by retracting the telescoping), the derricking speed is automatically increased again.



You can set the desired engine speed (idling speed) with the button (1);  p. 11 - 16.



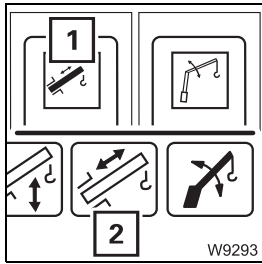
You can limit the maximum derricking speed;  p. 12 - 96.



For higher speeds, you can also switch to high-speed mode;  p. 12 - 86.



Switching on the telescoping mechanism



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

- Press button (1) once.
 - The lamp in button (1) lights up brightly.
 - The symbol 2 is **green** if the telescoping mechanism is switched on.

If the control lever is assigned more than one function, all other power units which are assigned the same control lever operation are switched off; *Control lever assignment*, p. 10 - 16.



You can have the operating hours of the telescoping mechanism displayed; p. 12 - 101.

Function of the control lever

This section only describes the function of the control lever. Before telescoping, a number of prerequisites need to be fulfilled as well.

- Before manual telescoping; p. 12 - 68.
- Before telescoping with teleautomation; p. 12 - 80.

You can adjust the sensitivity of the control levers to the operating conditions; *Setting the characteristic curve for the control levers*, p. 12 - 98.



Risk of accidents due to unexpected crane movements

In the case of multiple configuration, check whether the control lever function *Telescoping* is switched on before you move the control lever for telescoping.

This avoids accidents caused by unexpected derricking.



Risk of accidents due to incomplete monitoring

Boom extension is only monitored completely if

- the lifting limit switch is correctly rigged; p. 13 - 100
- the lifting limit switch is not overridden, p. 12 - 51.



Risk of damage to the hoist rope

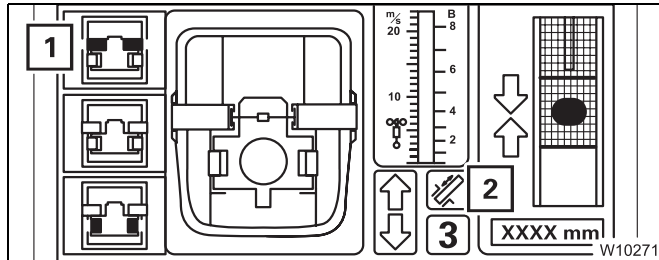
The rope can become slack if the hook block touches the ground during retraction operations. Rope loops form, which can cause the load to slip and destroy the hoist rope.



Unlocking the telescopic section

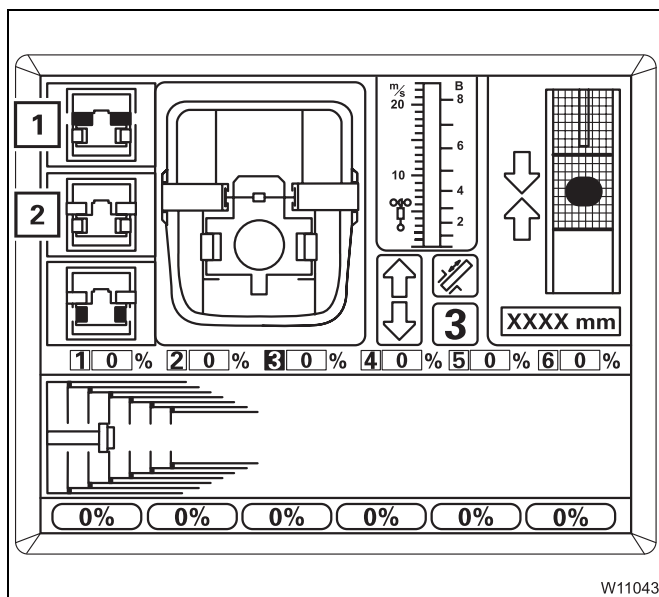
Unlocking a telescopic section is required for the telescopic section to be telescoped.

The telescoping cylinder and the telescopic section cannot be unlocked simultaneously.



Prerequisites

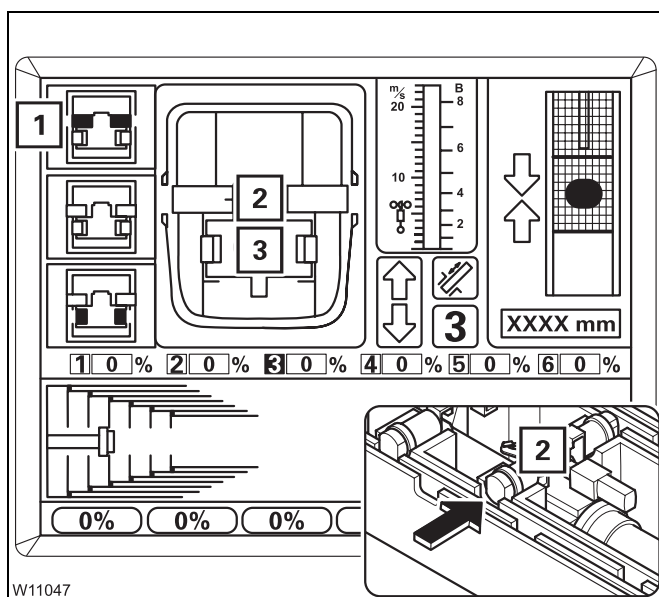
- Telescoping mechanism on – symbol (2) green
- Telescopic section locked – symbol (1) grey



To select Unlock

- Press button (1) once.
- If the telescoping cylinder is locked: symbol (1) flashes – *Unlock telescopic section* is selected.
- If the telescoping cylinder is unlocked: symbol (2) flashes – selected are
 1. *Lock telescoping cylinder*
 2. *Unlock telescopic section*

In the next step, both selections are carried out one directly after the other.



Unlocking the telescopic section

- Move the control lever for telescopic extension.

The locking pins (3) may extend first, as required.

The locking pins(2) retract.


- **Yellow:** intermediate position
- **Red:** unlocked


In the *Unlocked* position the symbol (1) is yellow.

If the control lever is moved, the telescopic section is telescoped immediately.



Telescoping the main boom in horizontal position

- Derrick the main boom to the horizontal position as described in section Lowering the main boom to a horizontal position;  p. 12 - 56.

The SLI automatically switches to the corresponding rigging table. It specifies the maximum permissible telescoping where extending is deactivated (shutdown values  *Lifting capacity table*).

- Set down the load.
- Extend the main boom only until the SLI switches off the extension procedure.



If you continue to extend the main boom after an SLI shutdown, you may enter ranges in which you can neither perform retraction operations nor raise the boom.

12.4

Settings and displays for crane operation

This section only describes settings and displays needed during crane operation. Operating elements that can be assigned to other procedures are described with the corresponding procedures.

12.4.1

Inclining the crane cab

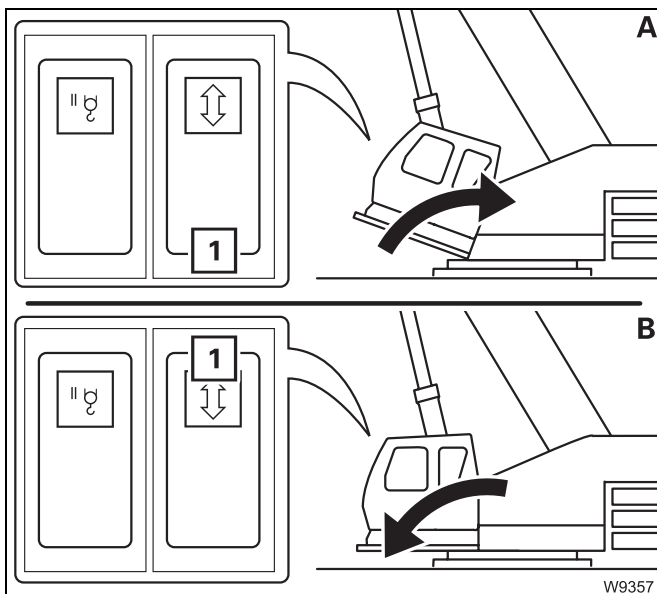
With the relevant equipment, you can incline the crane cab to the rear in order to attain a better sitting position when working at great heights.



Risk of accidents due to objects overturning in the crane cab

Close the crane cab door before inclining and remove all loose objects (e.g. bottles) from the crane cab.

In this way you prevent objects from tipping over, the crane cab door opening by itself, and unintended operational accidents caused by fright.



(A) – To incline to the rear

- Close the crane cab door.
- Press the button (1) down.

(B) – To incline to the front

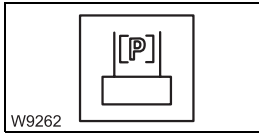
- Close the crane cab door.
- Press the button (1) up.

The crane cab is inclined as long as you hold the button down or the end position is reached.

12.4.2

Setting the idling speed

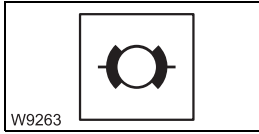
▣▣▣▣▶ *Setting the idling speed*, p. 11 - 16.



Pre-tensioning the counterweight

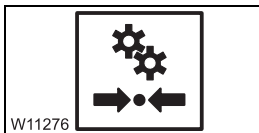
The pre-tensioning pressure on the counterweight has dropped too much.

- Pre-tension the counterweight; p. 13 - 74.



Supply pressure in the brake circuit too low

The pressure in a brake circuit is below approx. 5.5 bar. Stop the truck crane and try to find the cause; *Brake supply pressure too low*, p. 5 - 52.



Supply pressure in secondary consumers too low

The supply pressure is below approx. 6.0 bar; *Building up supply pressure*, p. 5 - 9.

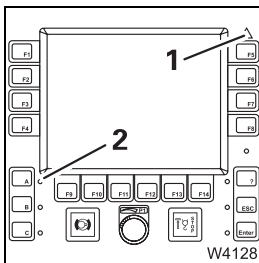
Exiting the submenu

You can exit the submenu at any time.



- Press button (1) once.

The menu that was open before you opened the *Warning* submenu opens.



If the same warning messages are still present, the lamps (1) and (2) light up.

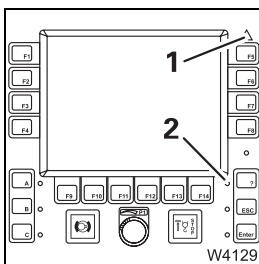
If no warning message is present, both lamps will have gone out.

Both lamps start to flash again as soon as a new warning message occurs.

12.4.10

Error submenu

ECOS differentiates between error messages and warning messages (warning messages p. 12 - 102).



In the event of an error message the lamps (1) and (2) flash.

More information on error messages; *Error messages*, p. 15 - 35.

Deleting points

You can delete selected, individual points or delete all points at once.

A

	α [°]	R[m]
1 +	2.0	20.0
2 +	90.0	20.0
3 +	140.0	20.0
4 +	0.0	0.0
5 +	0.0	0.0
6 +	0.0	0.0
7 +	0.0	0.0
8 +	0.0	0.0
-	90.0	20.0

B

	α [°]	R[m]
1 +	0.0	0.0
2 +	0.0	0.0
3 +	0.0	0.0
4 +	0.0	0.0
5 +	0.0	0.0
6 +	0.0	0.0
7 +	0.0	0.0
8 +	0.0	0.0
-	90.0	20.0

W11103

(A) – Selected points

- Press button (1) once.

The selected point is deleted, e.g. point (4) – point data 0.0.

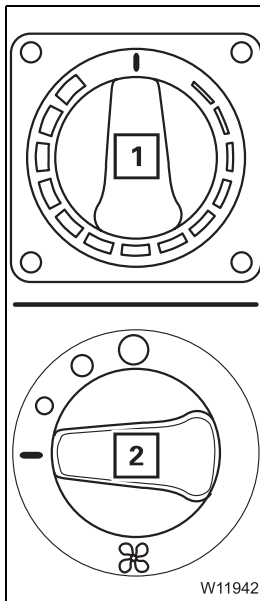
(B) – All points

- Press the button (2) once – symbol (3) appears.

You can cancel the process with the button .

- Press button once – all points are deleted.

Switching off



Switching off the heater

- Turn the switch (1) as far as it will go in an anti-clockwise direction, to *Cold*.

Switching off ventilation

- Turn the switch (2) to the level 0.

12.7.2

Air-conditioning system

You can use the air-conditioning system to cool and dry the air in the crane cab.

Warnings

Do not cool the air in the crane cab too much.

The difference between the outside temperature and the inside temperature should be at the most 10 °C to 14 °C.

If cooling is too severe, you may frequently feel physically uncomfortable, usually only after you leave the cool room.

Avoid having cold air blowing directly onto your body.

When using recirculated air, you should switch over to fresh air mode to ensure a fresh supply of oxygen at the same time. Adjust the cooling output to your actual needs:

if the truck crane has been exposed to strong sunlight for a long period of time, for example, the air conditioning system should initially be operated at the highest blower level with the engine running.

The door or at least the windows should be left open for a short while to air thoroughly. The cooling-down procedure can be accelerated by increasing the engine speed.

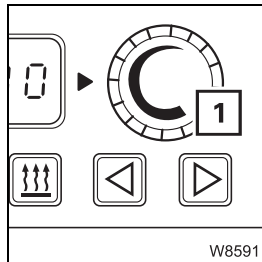
If the air-conditioning system is operated continuously, close the windows and doors to ensure sufficient cooling.

Set the fan to a lower level once the inside temperature has reached the desired temperature.



Temperature

You can preselect a temperature for the crane cab. The preselected temperature is automatically set and maintained.



Increasing the temperature:

- turn the switch (1) clockwise.

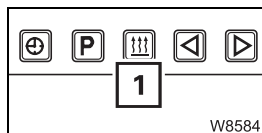
Reducing the temperature:

- turn the switch (1) anti-clockwise.

The higher the selected temperature is, the faster the fan of the auxiliary heater runs.

Switching off

You can switch off the auxiliary heater manually at any time.

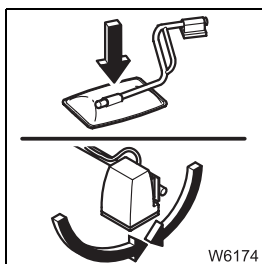


- Press button (1) once. The auxiliary heater is switched off immediately.

Additional functions

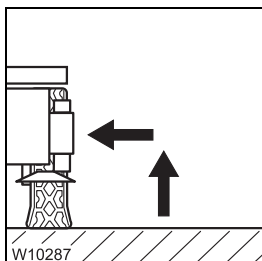
The auxiliary air heater has the same functions as the auxiliary water heater.

- Setting the time / day ▮▮▮▮ p. 12 - 130
- Storing the heating start ▮▮▮▮ p. 12 - 131
- Switching heating start on / off ▮▮▮▮ p. 12 - 132
- Setting the heating period ▮▮▮▮ p. 12 - 132
- Setting the remaining time ▮▮▮▮ p. 12 - 133

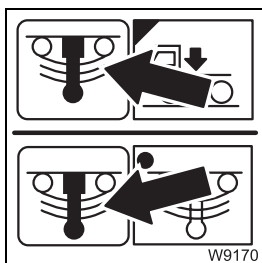


10. Fold in all mirrors for crane operation; *Mirror for crane operation*, p. 13 - 112.

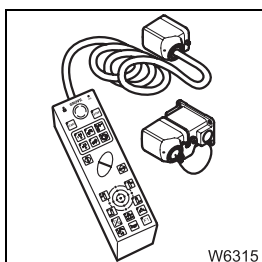
Lower the slewable spotlights; p. 12 - 100.



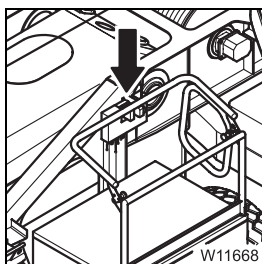
11. Retract the outriggers; *CHECKLIST: Retracting the outriggers*, p. 13 - 27.



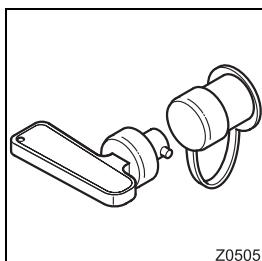
12. Activate (unlock) the suspension.
The symbol must be **green** (suspension on); p. 5 - 15.



13. Turn off the engine and, if necessary, remove the hand-held control and stow it away in the driver's cab; *Disconnecting the hand-held control*, p. 13 - 20.



14. Fold in the tread grid on the turntable; p. 13 - 111



15. When the truck crane is no longer being used; *Work breaks of more than 8 hours*, p. 12 - 122.

13.3

Rigging work after driving with a trailer

If the main boom was resting on a trailer (dolly) while driving the truck crane, you must perform the following before working with the crane:

- Switch off the slewing gear freewheel; ■■■▶ p. 13 - 18,
- Switch off the boom floating position; ■■■▶ p. 13 - 17,
- Switch off boom pre-tensioning, if necessary; ■■■▶ p. 13 - 19.

13.3.1

Switching off the boom floating position

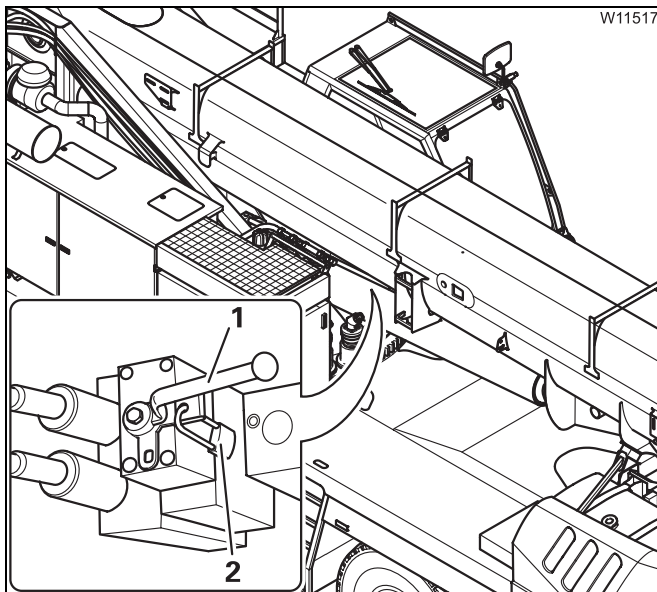
You must switch off the boom floating position before you raise the main boom off the trailer.



Risk of accidents due to the main boom falling down

Always secure the lever with the padlock after switching off the boom floating position.

This prevents the raised main boom from falling down when actuating the lever.



- Remove the padlock (2)
- Switch the valve I over – lever (1) positioned vertically pointing outwards or inwards, depending on its fitting position.
- Secure the lever (1) with the padlock (2)

The boom floating position is now switched off.

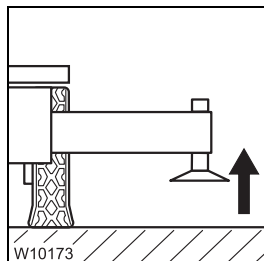
13.6.2

CHECKLIST: Retracting the outriggers

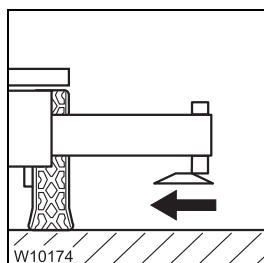


This checklist is not a complete set of operating instructions. There are accompanying operating instructions which are referred to by cross-references.

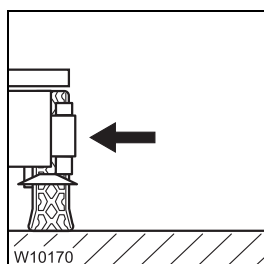
Observe the warnings and safety instructions specified there.



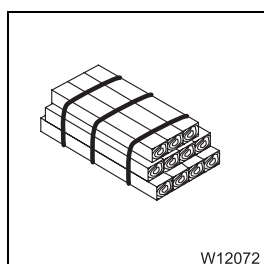
1. Retract the outrigger cylinders as far as possible; p. 13 - 41.



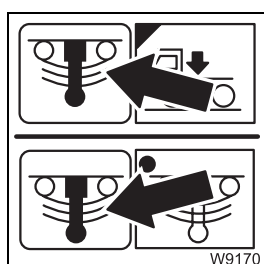
2. Move the outrigger pads into driving position and secure them; *Moving them into driving position*, p. 13 - 38.



3. Fully retract and secure all outrigger beams;
 - Permissible outrigger spans*, p. 13 - 28,
 - For on-road driving*, p. 13 - 31,
 - Extending / retracting outriggers*, p. 13 - 32.

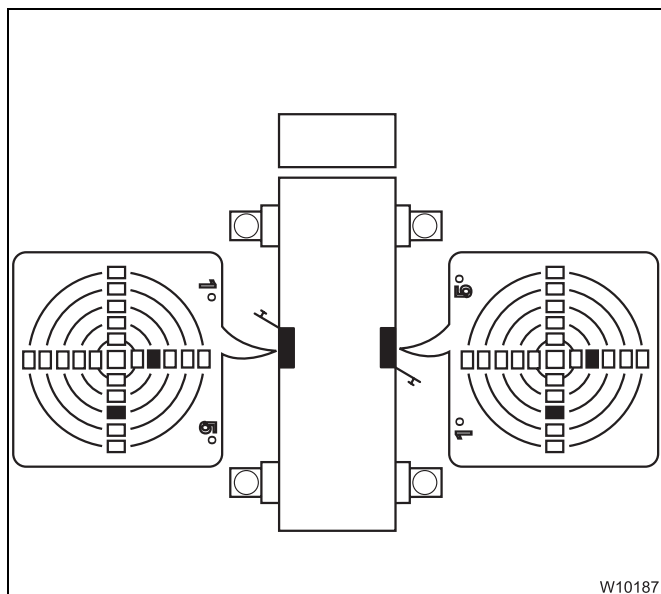


4. Stow away packing material safely, if applicable.



5. Activate (unlock) the suspension.
The symbol must be **green** (suspension on); p. 5 - 15.





– *Outrigger* control units

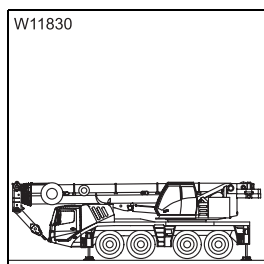
The assignment to the carrier corresponds to the top view.

Due to the position of the control units, the displays on both sides differ.

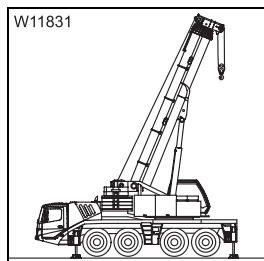
In this example, the carrier would be standing higher to the rear on the right hand side.

Prerequisites

The following prerequisites apply to manual and automatic alignment.



The main boom must be resting on the boom rest



Or

- The main boom must be raised **and**
- the load has been set down **and**
- the superstructure is in the 0° or 180° position.



Risk of overloading the main boom

Always slew the superstructure to the 0° or 180° position and set down the load before levelling the truck crane.

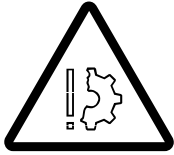
In other positions the deformation of the carrier will create incorrect results for the inclination and the truck crane will be at an angle. This could cause the outrigger beam to become overloaded during crane operation.



13.7.2

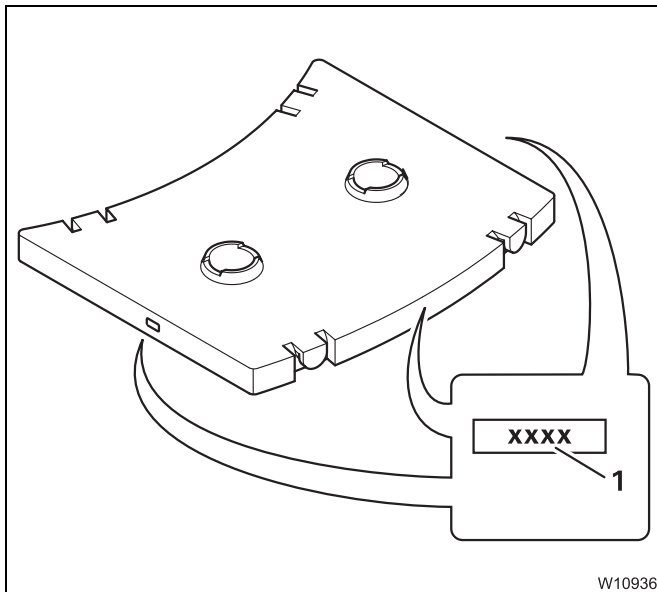
Identification

The truck crane and its corresponding counterweight sections are labelled with the same serial number.

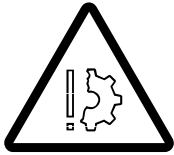


Danger if counterweight sections are interchanged

Use only counterweight parts that belong to your truck crane. The truck crane and counterweight sections are labelled with the same serial number. Other or additional counterweight sections may not be rigged.



The serial number (1) of all sections is either on the back or indicated together with the weight.



Risk of damage to the counterweight

With the 23.9 t and 26.1 t counterweight combinations, two 2.2 t plates **2** must always be placed on top.

This prevents the lifting cylinders and counterweight from being damaged while rigging.

Counterweight sections	Counterweight version in t					
	4.1	6.3	8.5	10.7	12.9	15.1
4.1 t on the turntable	4 + 6 or 4 + 5					
4.4 t section	-	-	-	3 ¹⁾	3 ¹⁾	2 x 3 ¹⁾
2.2 t section	-	-	2	-	2	-
2.2 t base plate	-	1	1	1	1	1

Counterweight sections	Counterweight version in t				
	17.3	19.5	21.7	23.9	26.1
4.1 t on the turntable	4 + 6 or 4 + 5				
4.4 t section	2 x 3 ¹⁾	3 x 3 ¹⁾	3 x 3 ¹⁾	3 x 3	3 x 3
2.2 t section	2	-	2	2 x 2	3 x 2
2.2 t base plate	1	1	1	1	1

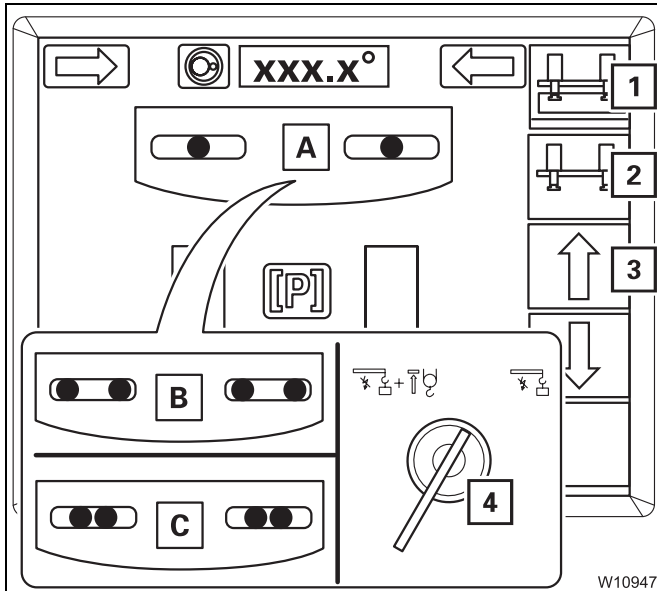
¹⁾ For 1 x **3** 2 x **2** can also be used





Risk of damage to the counterweight

With the key-operated switch actuated, the functions are always released. Never move the lifting cylinder to the *Intermediate position* rigging range. Only slew the superstructure when the lifting cylinders are fully extended (or fully retracted).



If the symbols (1) and (2) are **grey**, you must retract the lifting cylinders:

In the event of position (A) or (B)

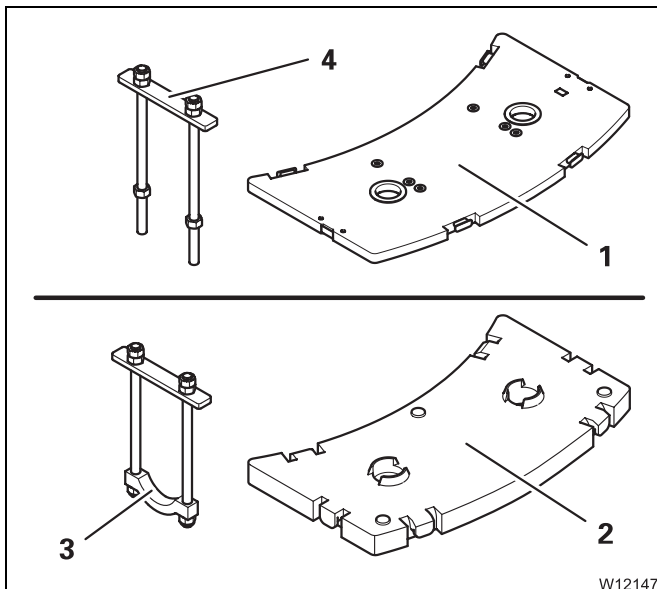
- Fully retract the lifting cylinders – button (3).

In the event of position on display (C)

- Turn the key-operated switch (4) to the right. The following movements are now no longer monitored.
- Slew the superstructure to position (A) or (B) – caution: no monitoring.
- Fully retract the lifting cylinders.

13.7.8

Removing / installing the counterweight on the turntable

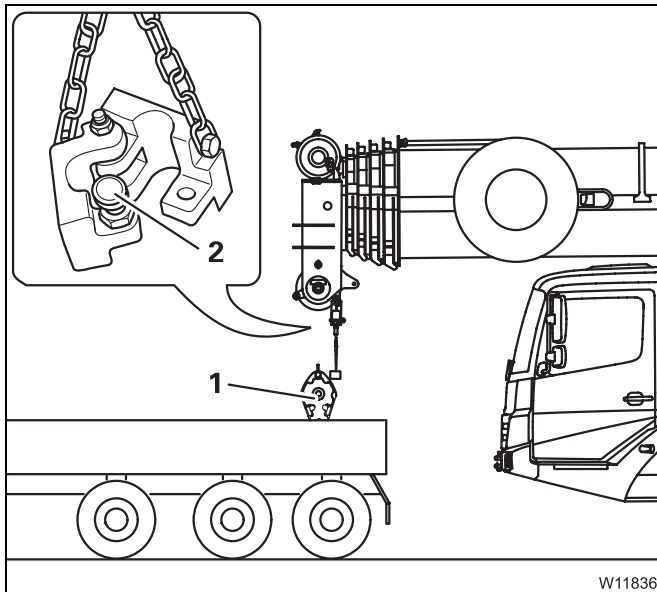




With version **C** the 2.2 t plate (1) or the 4.4 t plate (2) can be mounted on the turntable.

- Two clamps (4) are provided for the plate (1).
- Two brackets (2) are also provided for the plate (3).

In order to lift the plates, you will require suitable lifting gear, e.g. a forklift truck.

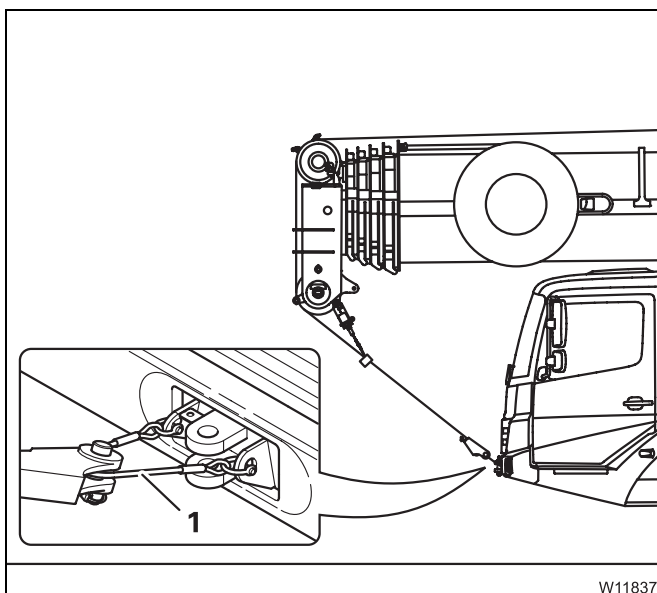




- Detach the lifting limit switch weight (2) from the hoist rope;  p. 13 - 103.
- Unreeve the hoist rope;  p. 13 - 93.
- Secure the hook block (1) for transport.
- Set down the main boom on the boom rest

Fastening the hoist rope to the bumper


Do not attach the rope end clamp to the front towing coupling. The towing coupling must be free for a tow-rod in emergencies.

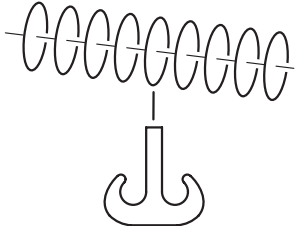


- Attach the rope end clamp to the retaining rope (1).
- Pull the hoist rope slightly taut.
- Fasten the lifting limit switch weight to the hoist rope.

The hoist rope and lifting limit switch weight are now secured for driving.

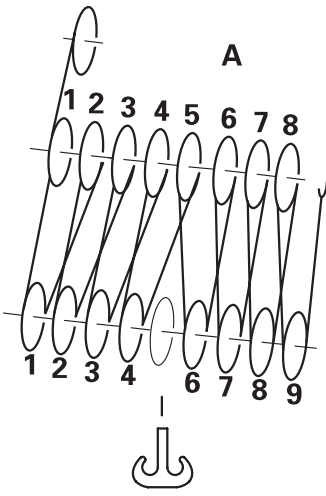
With 8 head sheaves

With additional equipment, 8 head sheaves may be provided. If 7 head sheaves are provided;  p. 13 - 94.

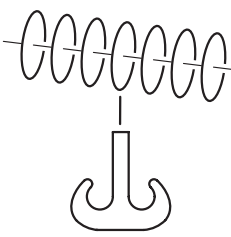


9 sheave hook block
Max. lifting capacity of the hook block 125 t
Max. lifting capacity with the GMK 4100:

A With 16-fall reeving	85.0 t
-------------------------------	--------

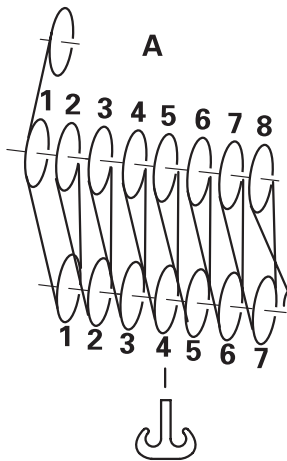


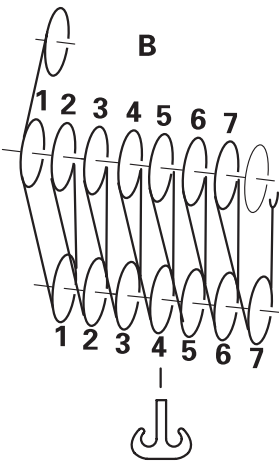
W11955

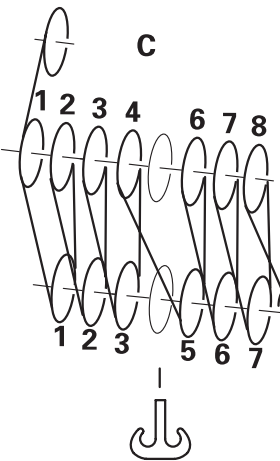


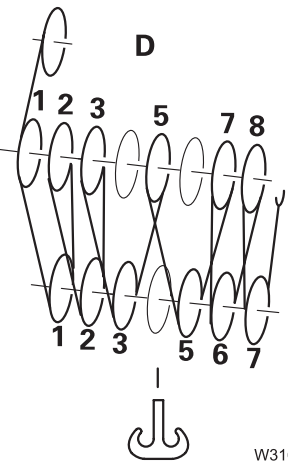
7 sheave hook block
Max. lifting capacity of the hook block 100 t
Max. lifting capacity with the GMK 4100:

A With 15-fall reeving	82.3 t
B With 14-fall reeving	77.0 t
C With 13-fall reeving	71.7 t
D With 12-fall reeving	66.3 t










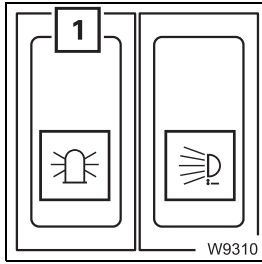
W3165

16.05.2007

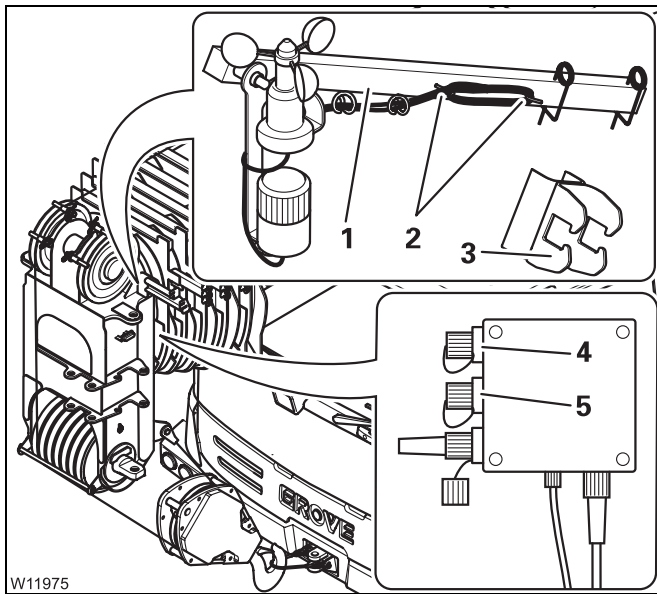


Removing

You must remove the rod with the anemometer / air traffic control light before driving on the road.  p. 13 - 111



- Switch off the air traffic control light – press the switch (1) upwards and inwards.



- Remove the plug and close the sockets (4) and (5) with the protective caps.
- Wind the cables onto the holders (2).
- Take the rod (1) out of the holder (3).
- For transportation, attach the retaining pins to the rod (1).

14.2

Route

The route must be even. Uneven surfaces cannot be compensated with the level adjustment system.

The ground of the route must be stable enough to bear the axle loads.


If the surface pressure of the tyres exceeds the permissible load on the ground, the surface area of the tyres must be increased with packing of stable material (e.g. wooden planks).

14.3

Before driving the rigged truck crane

14.3.1

Checking the tyre pressure and the wind speed

- Check that the tyres are all at the prescribed pressure levels;  *Tyres*, p. 8 - 5.




Risk of damage to the tyres

Only drive the rigged truck crane if the tyres are at the prescribed pressure level.

Never reduce the tyre pressure in order to increase the bearing surface of the tyres.

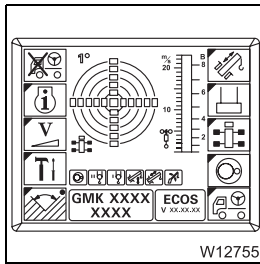
The wind speeds apply for driving the truck crane as stated in *Lifting capacity table* for the entered SLI code.

- Check the wind speed;  p. 12 - 42.



Risk of accidents due to excessively high wind speeds

You may not drive the rigged truck crane if the wind speed exceeds the maximum permissible values specified in the *Lifting capacity table*. In this case you must bring the truck crane into a safe condition.



The main menu opens.

The accelerator now takes effect on the engine for crane operation.



The lamp next to the button **Esc** also lights up if you turn the ignition key in the driver's cab away from position **1**.

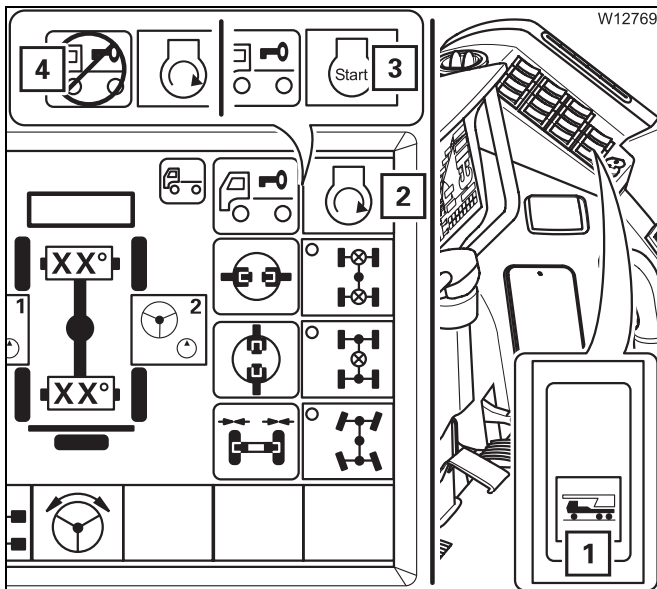
14.6.3

Starting / turning off the engine for driving

To start the engine

All activities and inspections required to start the engine must be carried out before starting the engine; p. 4 - 1.

- All the requirements listed in the section on preparing to drive have been fulfilled; p. 14 - 9.
- The *Driving mode* submenu opened automatically; p. 14 - 10.



- Press button **(3)** once. The engine starts.

When the engine is running

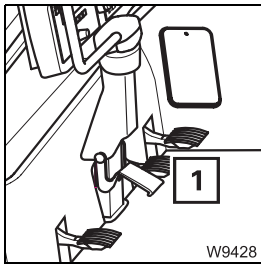
- The symbol **(2)** is displayed.
- The lamp in the button **(1)** lights up.

When the symbol **(4)** is displayed, you might be actuating the accelerator and the brake pedal at the same time - otherwise;

Warning messages, p. 14 - 20.

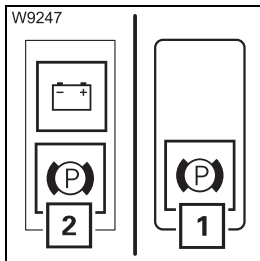


14.6.10 After driving



- Bring the truck crane to a halt with the brake pedal (1).
- Turn off the engine for driving, if necessary; ►►► p. 14 - 14.

- Restore the original condition:
 - switch off the longitudinal differential locks
 - switch off the transverse differential locks
 - switch to normal steering mode.



- Engage the parking brake
- Press the button (1) down once until the lamp (2) lights up.

- Remove the ignition key from the ignition lock in the driver's cab and lock the driver's cab to prevent unauthorised access.

Put the truck crane on outriggers if you do not intend to work in the *Free-on-wheels* working position.

15

Malfunctions during crane operation

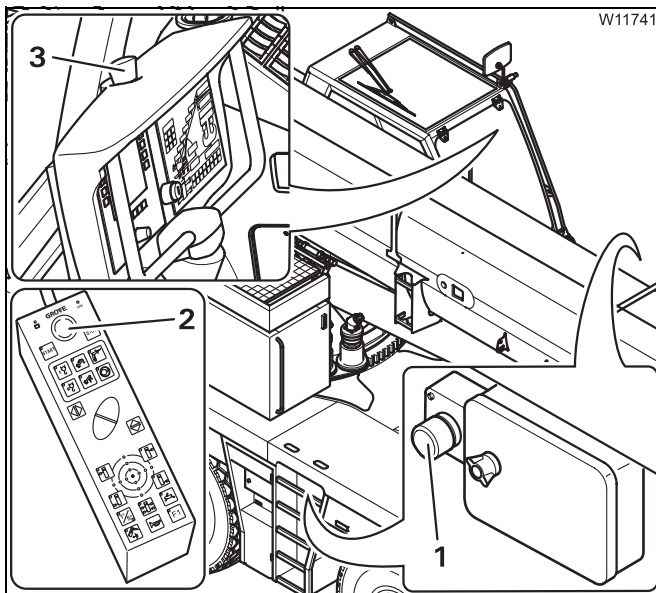
15.1

Emergency stop switch



Risk of overloading if used improperly

Only actuate the emergency stop switch if it is no longer possible to stop the crane movements with the normal operating elements. The emergency stop switch stops the crane movements suddenly. This may overload the truck crane, e.g. in the event of high working speeds and large working radiuses.



- Stop all crane movements.

Four emergency stop switches are provided for an emergency:

- 1 On the carrier
- 2 On the hand-held control
- 3 In the crane cab

- Press one of the emergency switches (1), (2) or (3). The switch engages.

The engine goes out.


After activating an emergency stop switch;

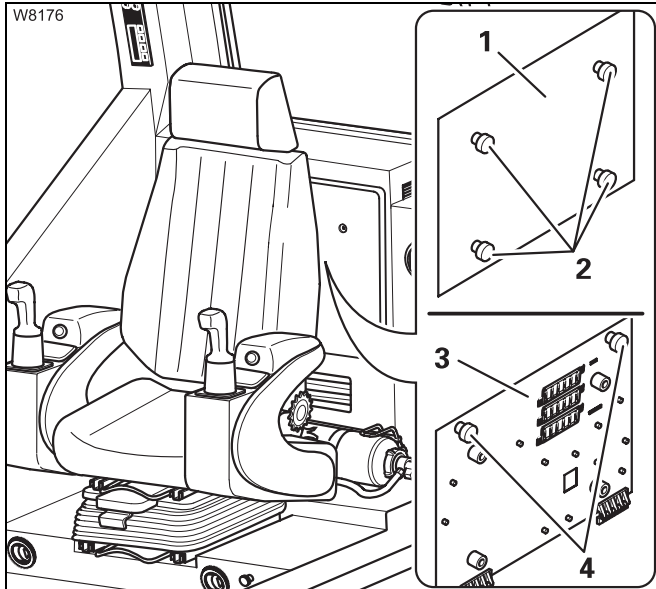
- *Resetting the emergency stop switch, p. 4 - 22.*




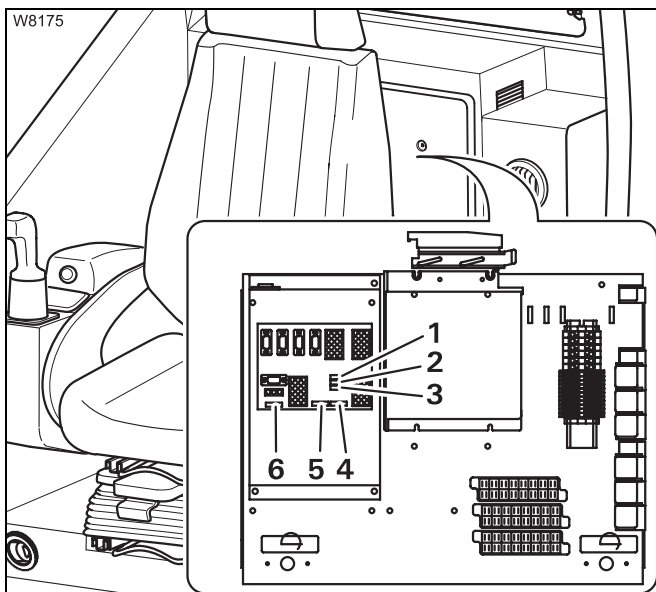
The battery master switch cannot be used as an emergency stop switch for the engine. The engine continues to run after the battery master switch has been switched off.

15.3.4 SLI fuses

When a fuse is blown, a corresponding error code is displayed;  *Table of error codes*, p. 15 - 30.



- Undo the screws (2) and remove the cover (1).
- Undo the screws (4) and fold down the plate (3) to the front.
- Observe the instructions regarding fuse changes;  p. 15 - 5



Arrangement of the fuses on the SLI control unit.

Pos.	Designation	Amperage (A)
1	Fuse F1	5
2	Fuse F2	5
3	Fuse F3	5
4	Fuse F11	5
5	Fuse F12	5
6	Fuse F6	5

15.4.6

Malfunctions on the counterweight hoist unit

Malfunction	Cause	Remedy
Counterweight hoist unit not working	Emergency stop switch actuated	▣▣▣▣▶ <i>Resetting the emergency stop switch</i> , p. 11 - 20
	Fuse F1/1, F1/7	Replace blown fuse; ▣▣▣▣▶ p. 15 - 6
	Control unit faulty, error message displayed	Acknowledge error message once; ▣▣▣▣▶ p. 15 - 35 – if it occurs again, notify CraneCARE .
	Function disabled by ECOS	If required, acknowledge error message once and briefly turn off the ignition – if it occurs again, notify CraneCARE .
Error symbol (!) is displayed	Electronics has identified an error	
Retract / extend lifting cylinder not working	Superstructure in the <i>intermediate position</i> rigging range	Slew to <i>Move lifting cylinders</i> or <i>Lift / lower counterweight</i> position; ▣▣▣▣▶ p. 10 - 73
Extend lifting cylinder not working	Superstructure outside of rigging range	Slew into the rigging range
	Counterweight rigged and <i>Move lifting cylinders</i> position reached	Slew to <i>Lift / lower counterweight</i> position
	Counterweight unrigged and <i>Lift / lower counterweight</i> position reached	Slew to <i>Move lifting cylinders</i> position
Retract / extend lifting cylinder and slewing not working	Automatic mode cancelled	Meet requirements for automatic mode; ▣▣▣▣▶ p. 13 - 76



15.5.2

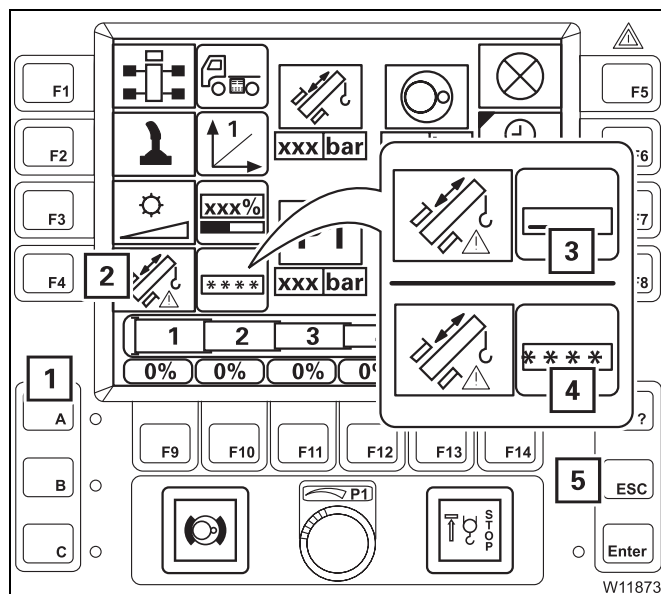
Telescoping emergency program

In the event of a malfunction in the telescoping mechanism you can retract the main boom with the *Telescoping* emergency program.

The emergency program is not intended for crane operation and is therefore restricted to a certain amount of time.

Starting the emergency program

Only start the emergency program when the  symbol is displayed;  *Telescoping mechanism error messages*, p. 15 - 18.



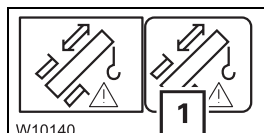
- Press the right-hand dead man's switch.
- Additionally press the button (2) once – symbol (3) appears.
- Press the buttons (1) in the order:



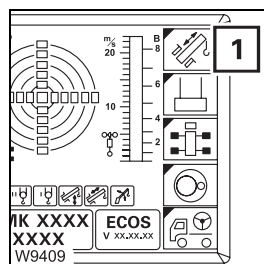
The symbols (4) confirm the entry.


If your input was incorrect, all the symbols (4) go out and you need to repeat the input.

You can cancel the entry at any time using button (5).



After correct input, the symbol (1) is displayed – the emergency program *Telescoping* starts.



- If necessary, open the main menu  and press the button (1) once. The *Telescoping* submenu opens.

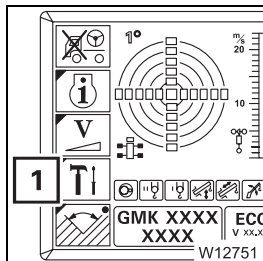


15.5.3 Entering the current telescoping

ECOS no longer displays the current telescoping

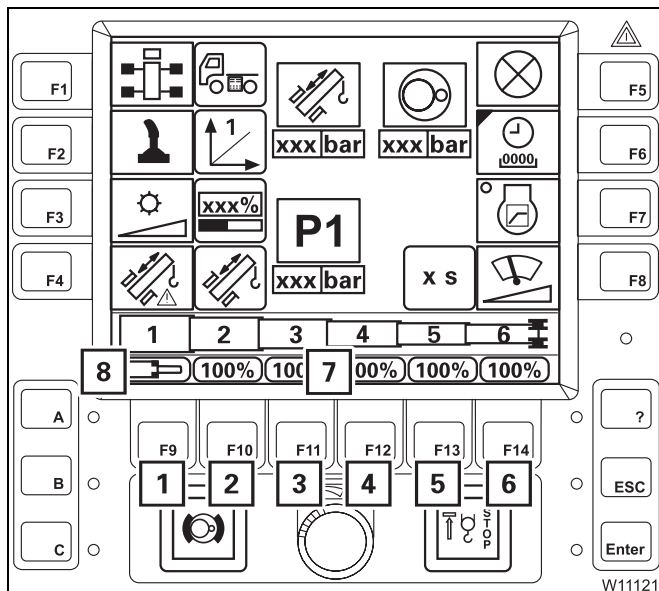
- if you telescoped in emergency mode or
- if the power supply was interrupted in the course of saving data.

In these cases you must enter the current telescoping, e.g. the values from the SLI display.



- If necessary, open the main menu **Esc** and press the button **(1)** once.

The *Settings* submenu opens.



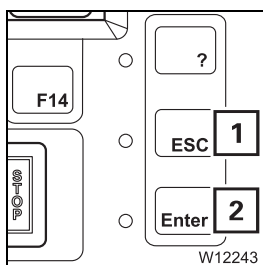
To enter set values

The display **(7)** shows the values for telescopic sections I to VI.

- Press one of the buttons **(1)** to **(6)** – the values in the display **(7)** turn yellow.

Each time you press a button, the corresponding value in the display **(7)** switches continuously between the fixed lengths and the symbol **(8)** for *Unlocked*.

- Enter the desired set values for all telescopic sections, e.g. unlocked, 100%, 100%, 100%, 100%, 100%.

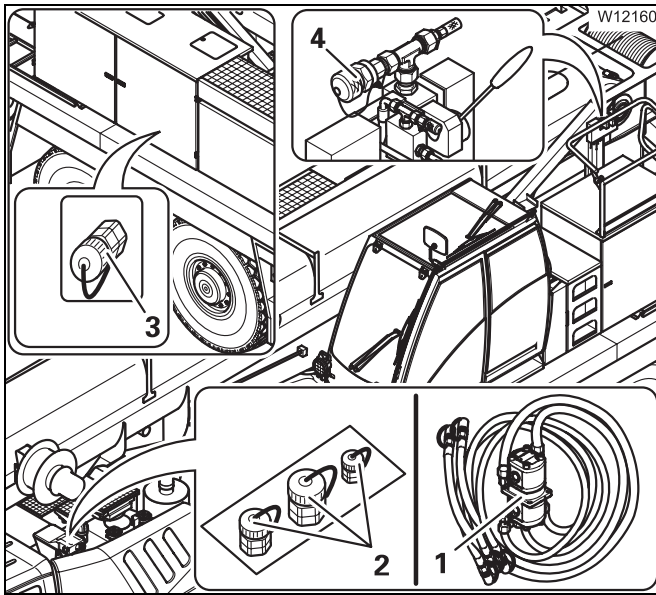


You can cancel the entry at any time using button **(1)**.

- Confirm the entered required values – press button **(2)** once.

You must now accept the values.





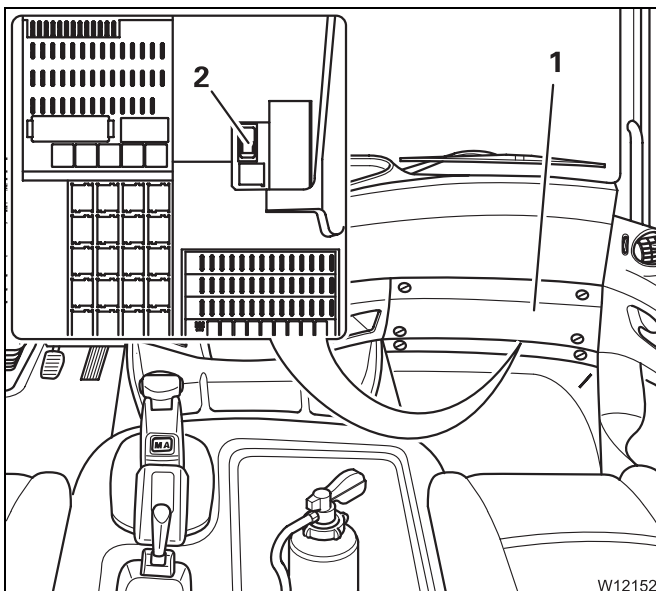
Disconnecting

- Remove the hoses from the connections (2), (3), and (4).
- Close the hoses and the connections with the caps.
- Remove the transformer (1).

15.6.3

Activating/deactivating emergency operation

The emergency operation (or emergency supply of another crane) is activated and deactivated in the driver's cab.



- Remove the cover (1).
- Start the engine for driving.

Switching on

- Press switch (2) down.

Switching off

- Press switch (2) up.

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To avoid making the index unnecessarily long and unclear, we have not included every single element from the instrument panel. Those elements, such as switches and buttons, lamps and displays are described and named in detail in the overviews of chapter 3 and chapter 10, *Description of the truck crane*. You are referred to more detailed descriptions of these elements from there as usual.

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