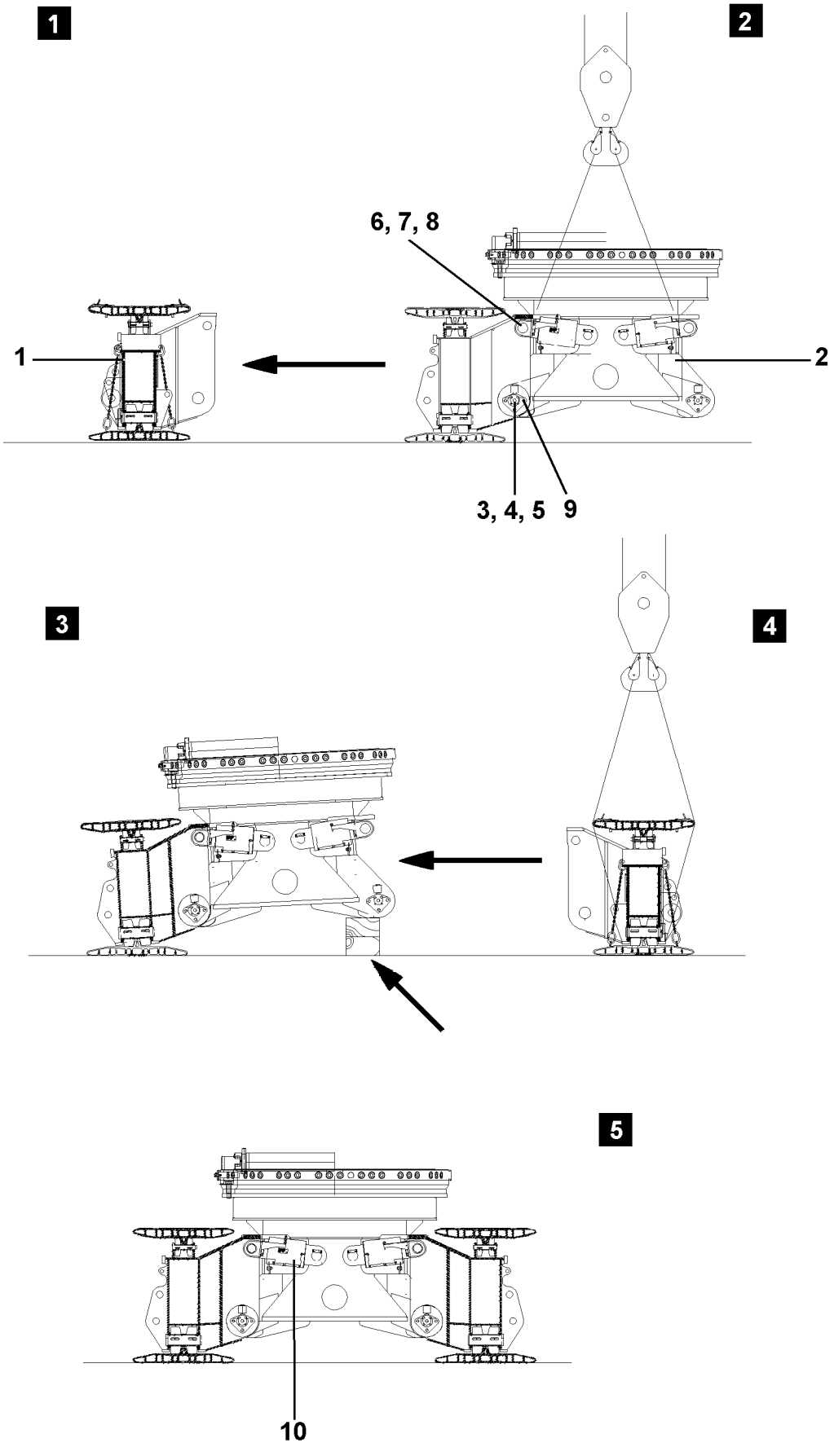
6.02 NARROW CRAWLER TRAVEL GEAR LR 1400/2 025833-06

pages 1 up to 53



195596

1. Installation of crawler carriers

Weight
Crawler carrier (1) approx. 28,0 t
Crawler center section (2] approx. 10,8 t

Components
1 Crawler carrier
2 Crawler center section
3 Connector pins - bottom , ∅140mm
4 Retaining pins
5 Spring retainer ∅4
6 Connector pins - top, ∅100mm
7 Retaining pins
8 Spring retainer ∅4
9 Pin pulling device
10 Hydraulic cylinder,adjustment of crawler carrier

Fig. 1, 2

1.1 Installation of 1. crawler carrier

Park the crawler carrier (1). Detach the auxiliary crane.
Hang the crawler center section (2) on the auxiliary crane. Use the 4 eyehooks in the crawler center section.
Swing the crawler center section (2) to the receptacle on the crawler carrier and move it in carefully to the stop.
Pin and secure the crawler center section (2) on the crawler carrier (1).

Pin the lower connector pins (3) with the hydraulic pin pulling device (9) and secure with retaining pins (4) and spring retainer (5).

Insert the upper connector pins (6) on the hydraulic cylinder (10) by hand and secure with retaining pins (7) and spring retainer (8).

Fig. 3, 4, 5

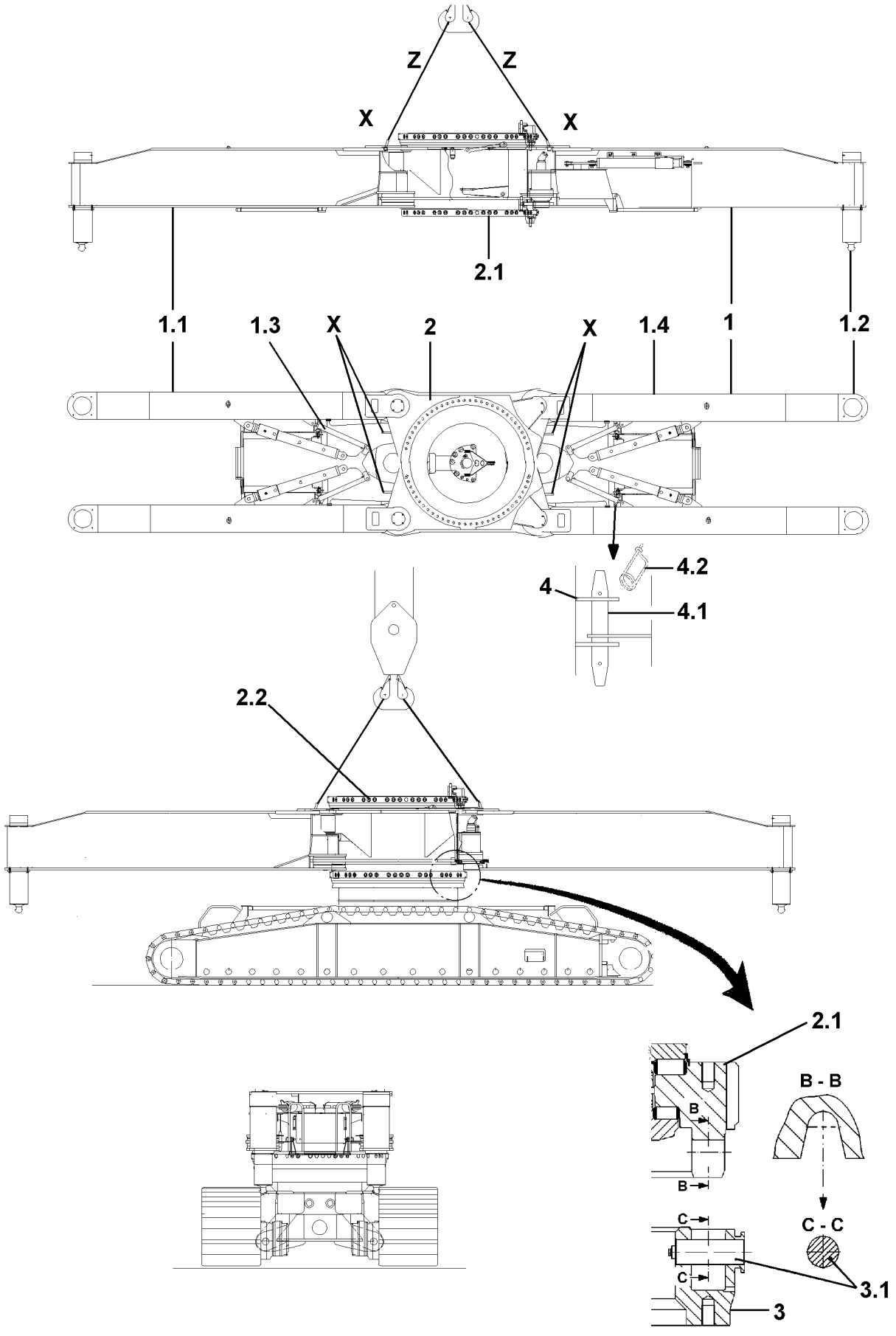
1.2 Installation of 2. crawler carrier

Support the crawler center section, so that the second crawler carrier can be installed.
Carefully swing the crawler carrier (1) to the receptacle on the crawler center section (2) and move it in carefully to the stop.
Pin and secure the crawler carrier (1) on the crawler center section (2)

Pin the lower connector pins (3) with the hydraulic pin pulling device (9) and secure with retaining pins (4) and spring retainer (5).

Insert the upper connector pins (6) on the hydraulic cylinder (10) by hand and secure with retaining pins (7) and spring retainer (8).

Remove the support and lower onto the crawler tracks.


Z
Z
X
X
2.1
1.1
1.3
X
2
X
1.4
1
1.2
4.2
4
4.1
2.2
2.1
B - B
B
B
C
C - C
C
3.1
3
195606

2. Installation of crane support

Components

1 Crane support
1.1 Support arm
1.2 Support cylinder
1.3 Hydraulic cylinder to swing the support arms out and in
1.4 Rod to mark the support base
2 Center section with slewing gear and rotary connection
2.1 Slewing ring
2.2 Bolt ring for connection with slewing platform
3 Bolt ring for connection with crawler center section
3.1 Centering pin
4 Transport retainer
4.1 Pin, also used to hold the rod (1.4)
4.2 Spring retainer

Prerequisites:
Clean the mating or contact surface of the slewing ring.

Installation procedure:
- Attach the tackle (Z) on the tackle points (X) of the crane support .

Note: The weight of the crane support is approx. 44 t

D A N G E R : **It must be ensured that the tackle (Z) is correctly attached on the tackle points (X) and secured sufficiently to prevent it from coming loose. There is a danger of accidents !**

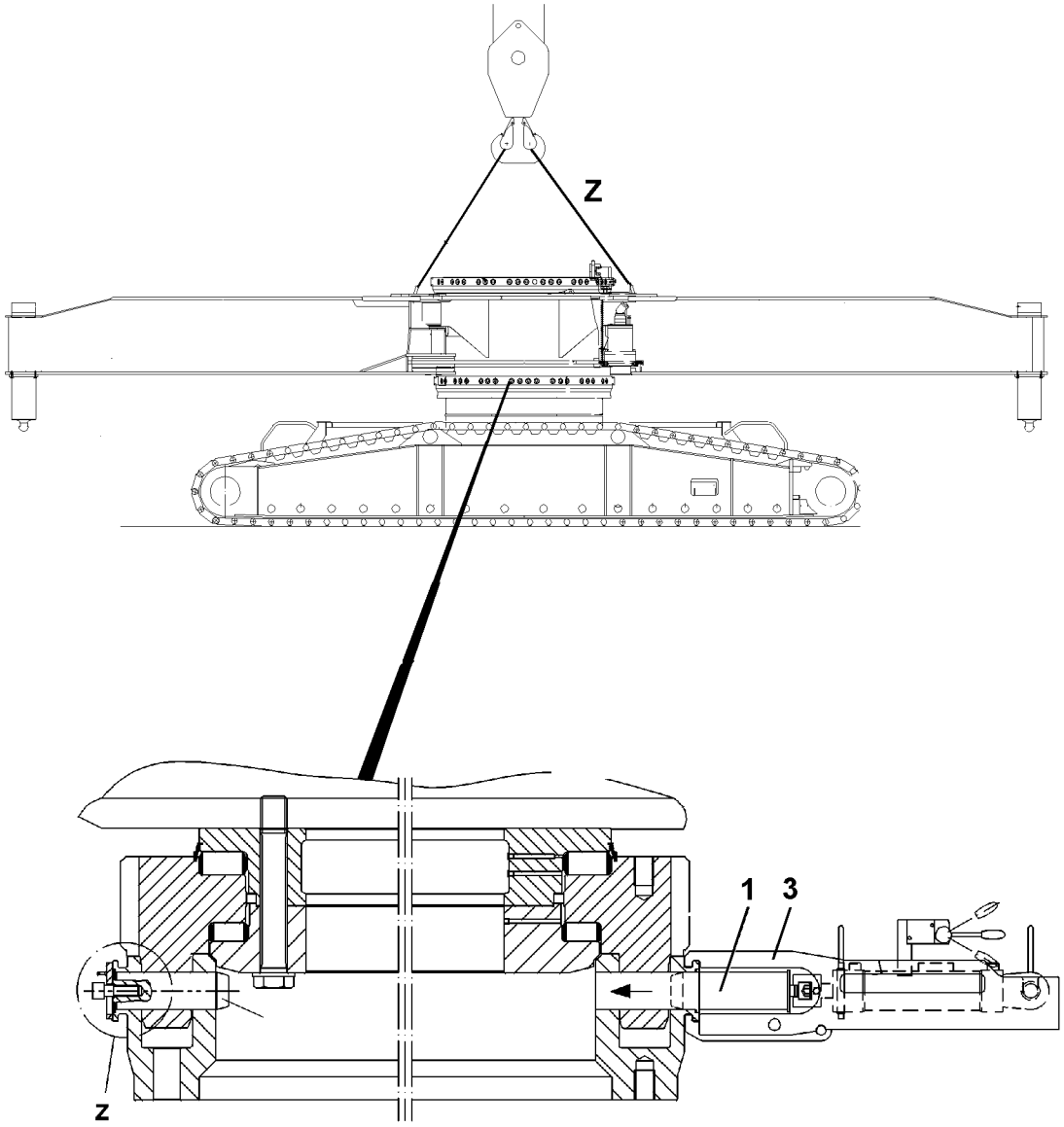
- With the auxiliary crane, slowly swing in the crane support (1) over the crawler center section.
- Lower the crane support slowly.

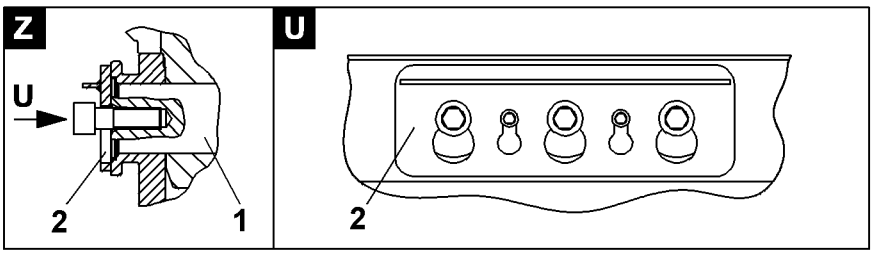
Note: Before lowering it, position the crane support in such a way that the centering pins (3.1) (C-C) **"pair up"** on the bolt ring (3) and on the pocket receptacles (B-B) on the slewing ring (2.1).
Due to the design of the centering pins, it is not possible to place the crane support **"incorrectly"** on the crawler center section.

C A U T I O N : **Make sure that the crane support or the pocket receptacles are aligned properly to the centering pins.**

D A N G E R : **No one may remain within the slewing range and under the crane support during the swing in and lowering procedure! This is strictly prohibited! There is a danger of accidents !**

- Carefully place the crane support on the crawler center section .
- The crane support must be lowered all the way until it stops on the bolt ring (3) .





195607

2.1 Pin the crane support with Quick Connection

Prerequisite:
- The crane support is centered on the crawler center section .
- The tackle (Z) between the crane support and the auxiliary crane is **"tensioned" .**
- The pin bores on the circumference of the slewing ring are clear.

Installation procedure:
- Grease all connectors pins (1) with waterproof grease
- Insert all connector pins (1) by hand all the way into the pin bores and bolt the crane support with the crawler center section .
- If it is too difficult to do by hand, use the pin pulling device (3) for the pinning procedure
- Attach the retaining bar (2) and secure the connector pin (1).

D A N G E R : The connector pins must be secured immediately after pinning the slewing platform with the crawler center section.
If this is not observed, there is a danger of accident!

- After the slewing ring connection is pinned and secured, remove the tackle .

2.2 Establish the hydraulic connection to the slewing platform .

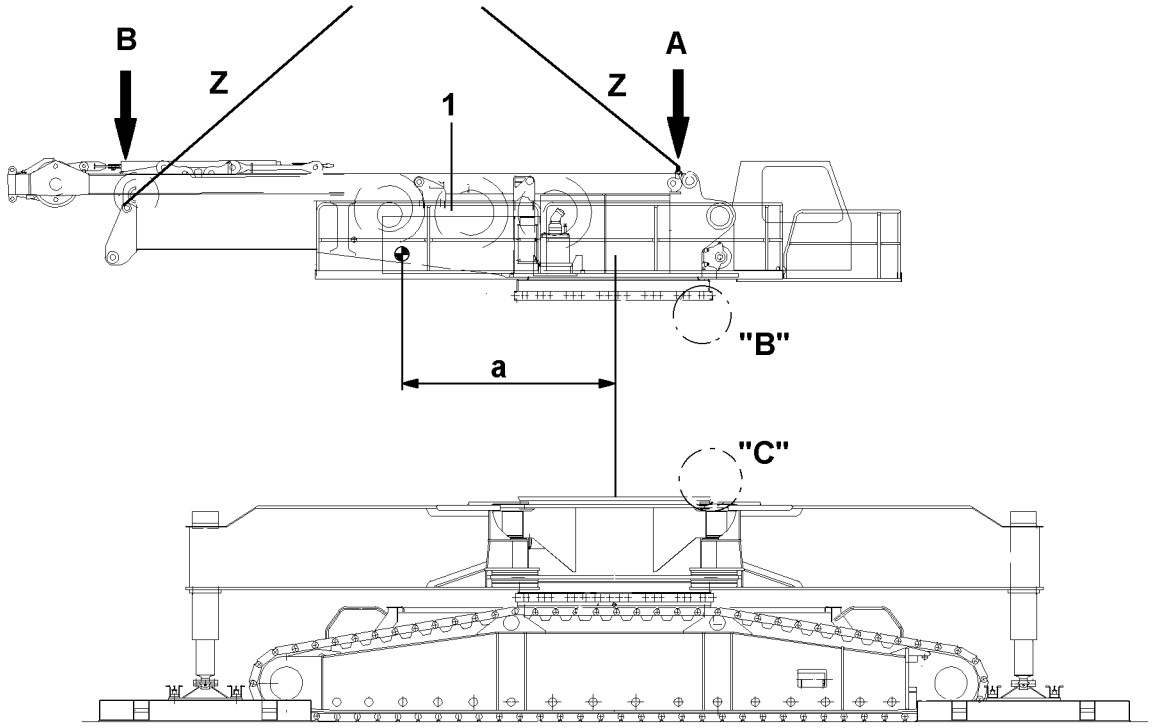
The hydraulic connection from the rotary connection in the crawler center section to the slewing platform is established with quick connection couplings.

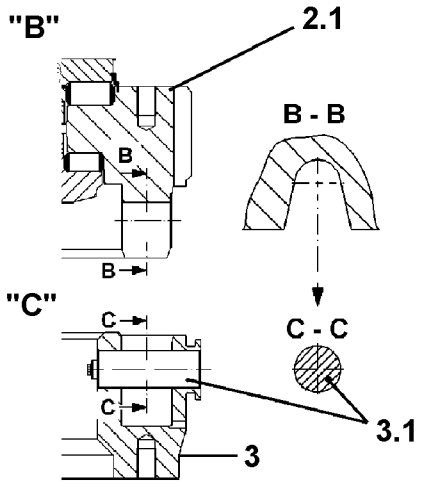
Note: The quick connections which belong together are marked.

Connecting or disconnecting hydraulic lines with quick connections

D A N G E R : When connecting or disconnecting hydraulic lines with quick connections, it must be ensured that the coupling procedure is carried out correctly.

Prerequisite for a correct coupling connection is:
- **The pressure in the hydraulic system must be relieved before connection or disconnection. (Turn the engine off - then wait 5 minutes).**
- **Connect the coupling sections (sleeve and socket) and screw them together by hand with the nut .**
- **Turn the nut past the O-ring until you feel a noticeable, firm stop.**
- **The couplings may only be tightened by hand - without using any tools (to avoid damage to the couplings).**
- **Improperly connected couplings could cause loss of pressure or sudden leakage and result in serious accidents.**





195608

3. Transport weights and center of gravity of slewing platform

Slewing platform
- Winch IV incl. cable
- A-bracket incl. pulley set
- Installation winch incl. cable
- Upper section of slewing ring with Quick Connection

Weights and center of gravity

Condition with Q.C	Weight (t)	Center of gravity **a** (mm)	A (t)	B (t)
with winch IV + cable	31.3	2672	17.1	14,2
with winch I+IV + cable	35.5	2510	20,1	15,4
with winch I, II+IV + cable	39.7	2456	22,9	16,8
with winch VI, I, II IV + cable	43.9	2180	26,9	17,0

4. Installation of slewing platform

Prerequisite :
Clean the mating or contact surface of the slewing ring -

Installation procedure:
- Attach the tackle (Z) on the slewing platform .

D A N G E R : **It must be ensured that the tackle (Z) is correctly attached on the tackle points and secured sufficiently to prevent it from coming loose. There is a danger of accidents!**

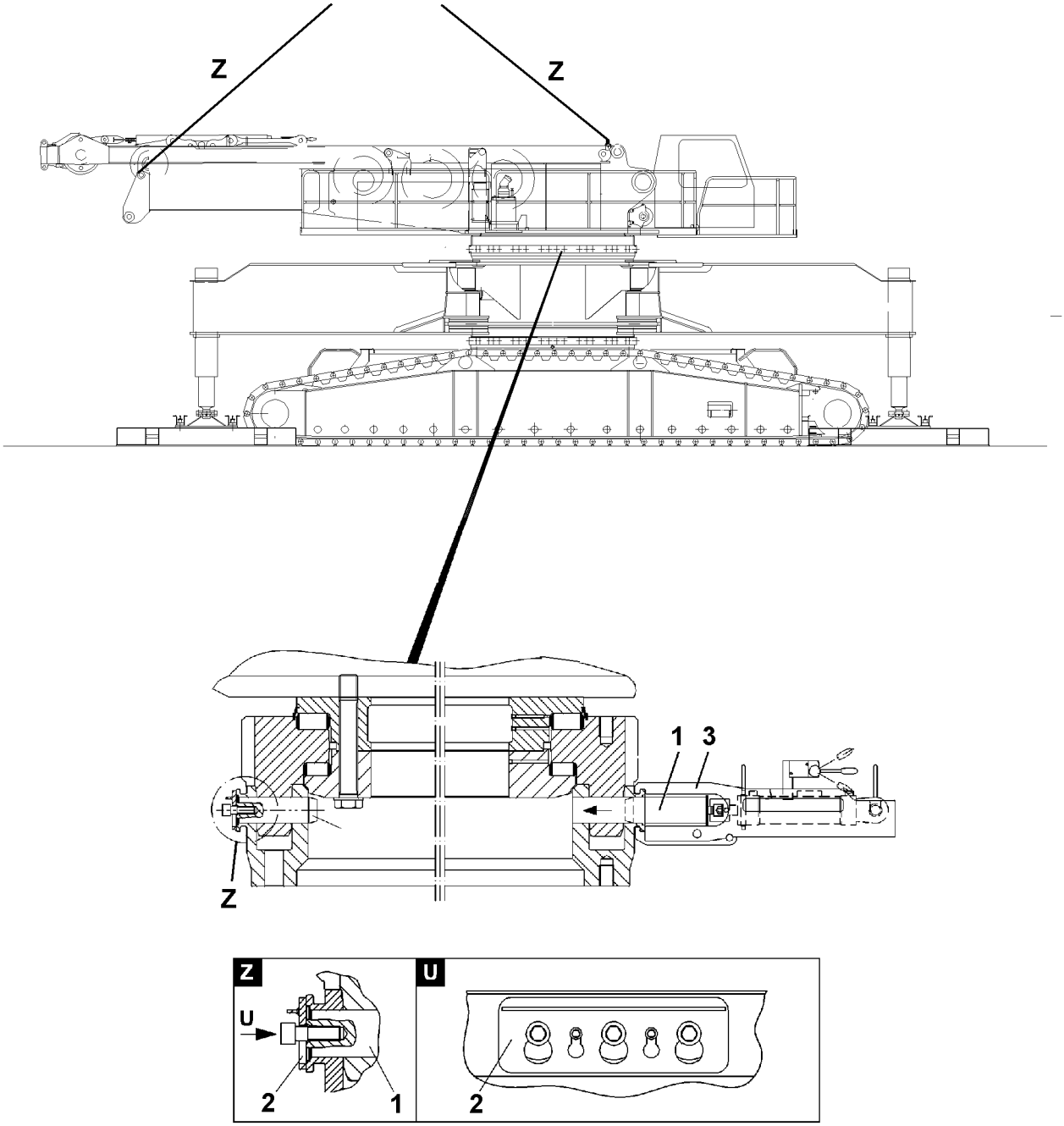
- With the auxiliary crane, slowly swing in the slewing platform (1) over the crane support.
- Slowly lower the slewing platform.

Note: Before lowering it, position the crane support in such a way that the centering pins (3.1) (C-C) **"pair up"** on the bolt ring (3) and on the pocket receptacles (B-B) on the slewing ring (2.1).
Due to the design of the centering pins, it is not possible to place the crane support **"incorrectly"** on the crawler center section.

C A U T I O N : **Make sure that the crane support or the pocket receptacles are aligned properly to the centering pins.**

D A N G E R : **No one may remain within the slewing range and under the crane support during the swing in and lowering procedure! This is strictly prohibited! There is a danger of accidents !**

- Carefully place the slewing platform on the crane support .
- The slewing platform must be lowered until it stops on the bolt ring (3).



195609

4.1 Pin the slewing platform with Quick Connection

Prerequisite:
- The slewing platform (1) is centered on the crane support .
- The tackle (Z) between the slewing platform and the auxiliary crane is **"tensioned."**
- The pin bores on the circumference of the slewing ring are clear.

Installation procedure:
- Grease all connectors pins (1) with waterproof grease
- Insert all connector pins (1) by hand all the way into the pin bores and bolt the slewing platform with the crane support .
- If it is too difficult to do by hand, use the pin pulling device (3) for the pinning procedure.
- Attach the retaining bar (2) and secure the connector pin (1).

D A N G E R : The connector pins must be secured immediately after pinning the slewing platform with the crane support.
If this is not observed, there is a danger of accident!

- After the slewing ring connection is pinned and secured, remove the tackle.

4.2 Establish the hydraulic connection to the slewing platform .

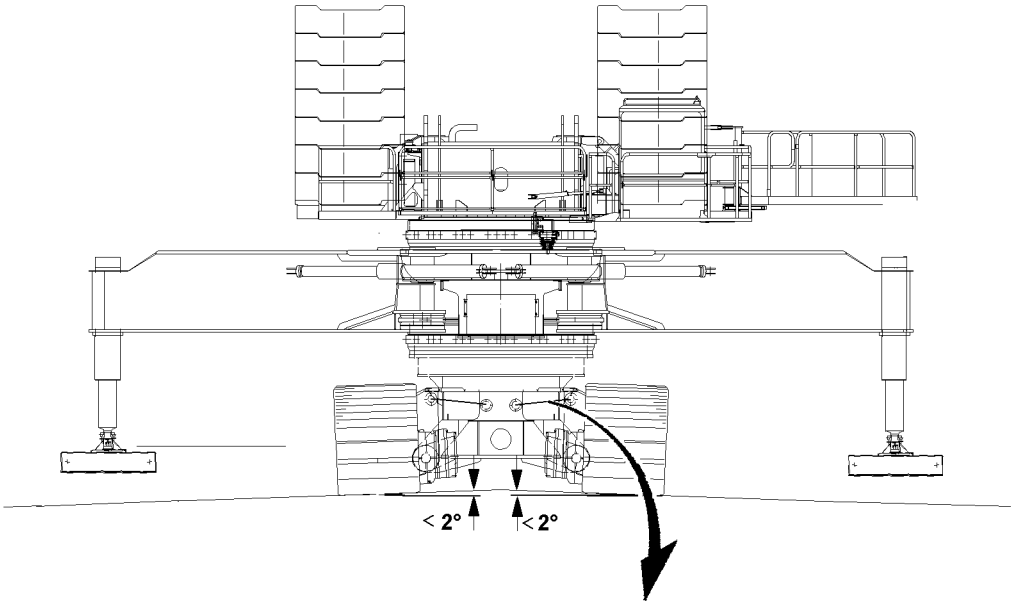
The hydraulic connection from the rotary connection in the crawler center section to the slewing platform is established with quick connection couplings.

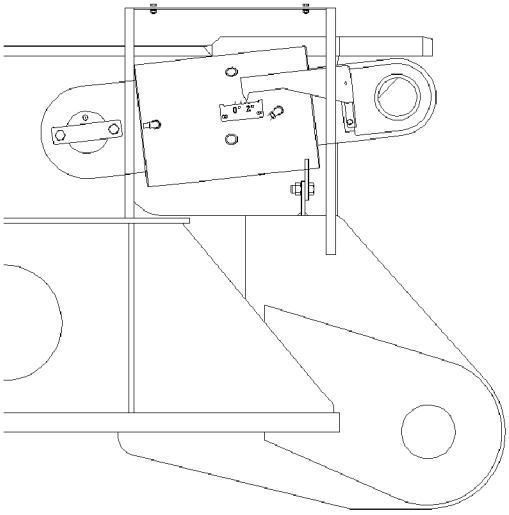
Note: The quick connections, which belong together, are marked.

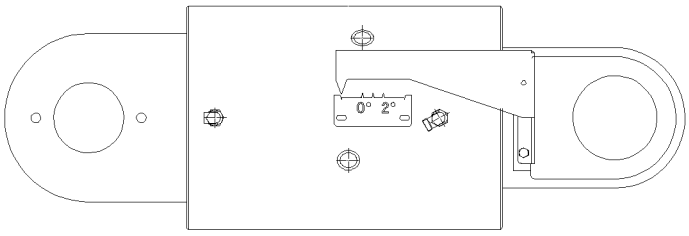
Connecting or disconnecting hydraulic lines with quick connections

D A N G E R : When connecting or disconnecting hydraulic lines with quick connections, it must be ensured that the coupling procedure is carried out correctly.

Prerequisite for a correct coupling connection is:
- **The pressure in the hydraulic system must be relieved before connection or disconnection. (Turn the engine off - then wait 5 minutes).**
- **Connect the coupling sections (sleeve and socket) and screw them together by hand with the nut .**
- **Turn the nut past the O-ring until you feel a noticeable, firm stop.**
- **The couplings may only be tightened by hand - without using any tools (to avoid damage to the couplings).**
- **Improperly connected couplings could cause loss of pressure or sudden leakage and result in serious accidents.**







195932

5. Description

The crawler crane with narrow track can be driven with the complete equipment between installation locations, even on narrow and curvy roads.
Due to two slewing rings, the crawler travel gear, the crane support and the slewing platform can be turned to each other, as desired, so that the crawler crane can even pass through the tightest curves without damaging the ground with the crawler travel gear.
When changing travel direction, the crane is supported and raised and the crawler travel gear is turned into the new travel direction, as desired.
Turn the slewing platform until it is parallel to the crawler travel gear.
Then retract the support cylinders until the crane is on crawlers.
Turn the crane support parallel to the slewing platform and the crawler travel gear.

5.1 Crawler incline

On off road - road inclines up to 2°, the crawler travel gears can be leveled with the hydraulic cylinders.

D A N G E R : During the crawler travel gear adjustment, make sure that the crane is in horizontal position ± 2° .
If this is not observed, there is a danger of accidents!

Note: As soon as the indicator value (INCLI.X: +0.0 °, Y: +0.0 °) for the x- and y-axle is out of the **±2°** range, an acoustical warning sounds on the remote control panel.

Display indicators

CRAWLER L: 40BAR >0 ° Crawler carrier left, pressure in bar.
Incline position of crawler
>0°/ <0°/ >2°/ ><

Possible conditions:
1. < 0° Crawler incline 0° to - 1,5°
2. > 0° Crawler incline 0° to < 2°
3. > 2° Crawler incline 2° to 3,5°
4. >< Crawler incline< - 1,5° or >3,5°
or limit switch erroneous = Block position

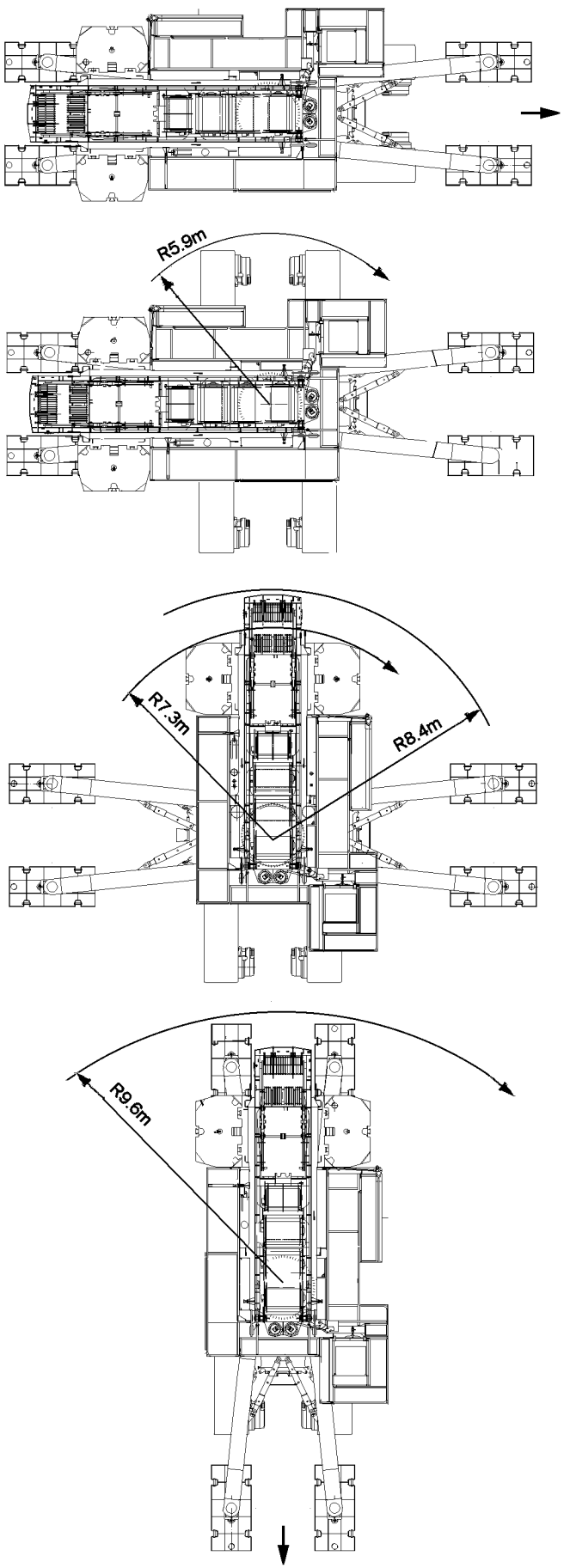
If "><" is shown, crawler block position, then the releases to turn the slewing platform or the crawler are removed.

CRAWLER R: 40BAR >0 ° Crawler carrier right, pressure in bar.
Incline position of crawler
>0°/ <0°/ >2°/ ><

Possible conditions:
1. < 0° Crawler incline 0° to - 1,5°
2. > 0° Crawler incline 0° to < 2°
3. > 2° Crawler incline 2° to 3,5°
4. >< Crawler incline< - 1,5° or >3,5°
or limit switch erroneous = Block position

If "><" is shown, crawler block position, then the releases to turn the slewing platform or the crawler are removed.

INCLI. X: +0.0 ° Y: +0.0 ° Incline sensor, x-axle +6,3° to -6,3°
y-axle +6,3° to -6,3°



195610

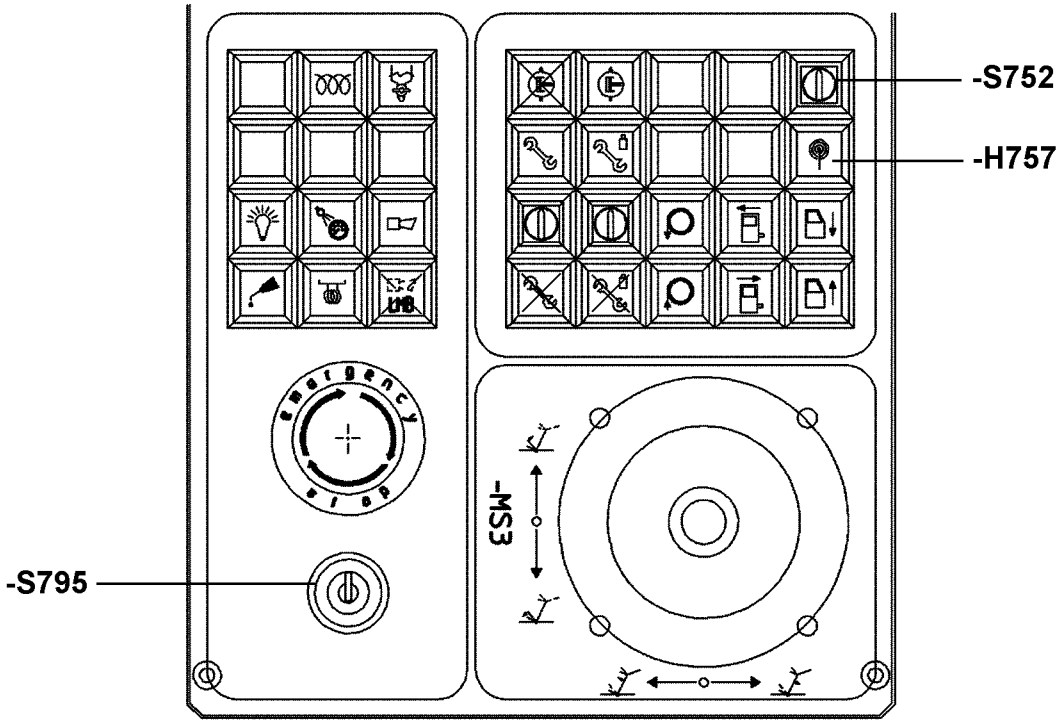
5.2 Procedure for change of travel direction

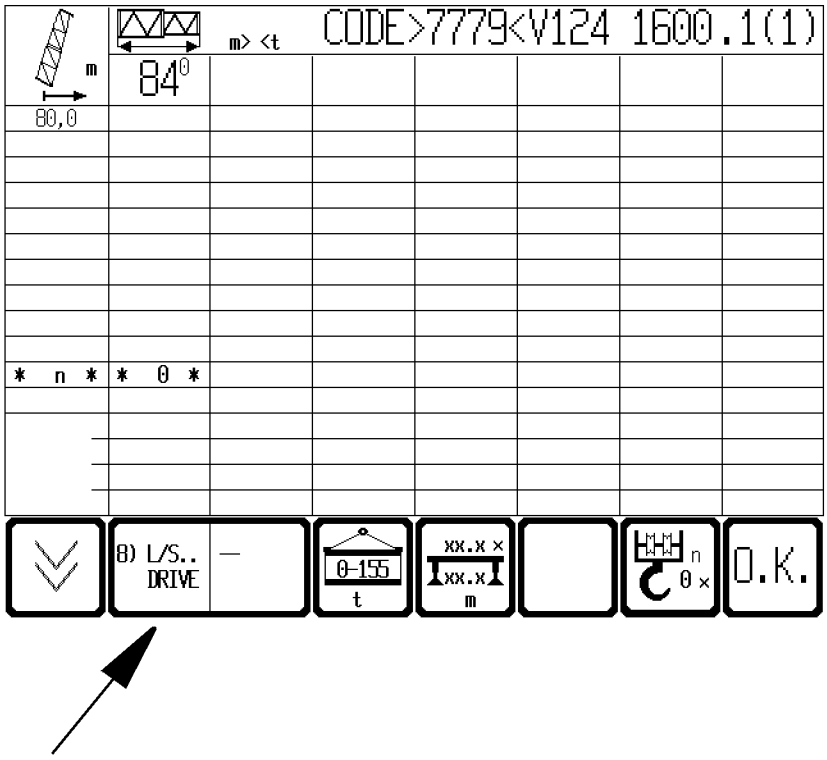
Fig. 1
Initial position
- On crawler
- Support clear

Fig. 2
Turn the crawler travel gear into a new travel direction
- On outrigger supports
- Crawler clear
- Turn crawler travel gear into the desired new travel direction

Fig. 3
Turn the slewing platform parallel to the crawler travel gear
- On outrigger supports with a minimum of 8t support force per support
- On crawler with a minimum of 5bar per tracks on the ground
- Turn the slewing platform until it is parallel to the crawler travel gear, +/- 5°.

Fig. 4
Turn the crane support parallel to the slewing platform and the crawler travel gear
- On crawlers
- Support clear
- Turn the crane support by simultaneously turning the slewing platform and the support until it is parallel to the crawler travel gear and the slewing platform.


-S752
-H757
-S795
-MS3
emergency stop


m> <t
CODE>7779<V124 1600.1(1)
m
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80,0
* n * * θ *
8) L/S..
DRIVE
0-155
t
xx.x
xx.x
m
n
θ
O.K.

195914

6. Remote control

Prerequisite:
- The ignition is turned on (-S795 in the cab).
- The remote control in the cab is turned on, keyed switch -S752 turned on, the indicator light -H757 lights up.
- The keyed switch (14) on the remote control panel is turned on.
- The crane engine is running, started with button (9) "Engine start" from the remote control panel.

- In the LICCON equipment configuration view, the operating mode **[8) L/S..DRIVE]** was preselected and confirmed with the "OK" key.

Turn on the remote control:
1. First, turn on the keyed switch (14) for the radio transmitter.
2. Then press the button (9) Engine start, this switches on the radio transmitter, now the indicators appear on the radio display.
3. Then press the button (9) Engine start again, the engine can be started.

Note: To control a crane via remote control makes working significantly easier. However, the crane operator must first get used to the remote control !

When the remote control is turned on , the master switches MS4, MS5 and MS2x in the crane cab as well as the coasting function of the slewing platform (foot switch) are always deactivated.

In addition, the switches "Crawler On" and "Crawler rapid gear" and the throttle control for the Diesel engine are also changed over to the remote control panel.

Note: The remaining control elements in the crane operator's cab continue to be active when the remote control is turned on.

D A N G E R : **Crane operation with turned on remote control is not permitted! In this operating condition, no other person may remain in the crane operator's cab or use any control elements in the crane operator's cab! THIS IS STRICTLY PROHIBITED!**

C A U T I O N : **The monitoring of the turn angle of crawler and slewing platform to support is always active when the remote control is turned on, except:**
- **if the crane is supported at 11,5 × 11,5m support base and a corresponding load chart is set in the equipment configuration view and confirmed with the "OK" key.**
  This is only permissible to be able to control the support. In this condition it is possible to turn the slewing platform with the aid of the remote control panel, despite the shutoff of the slewing gear slewing platform, as shown in the display.

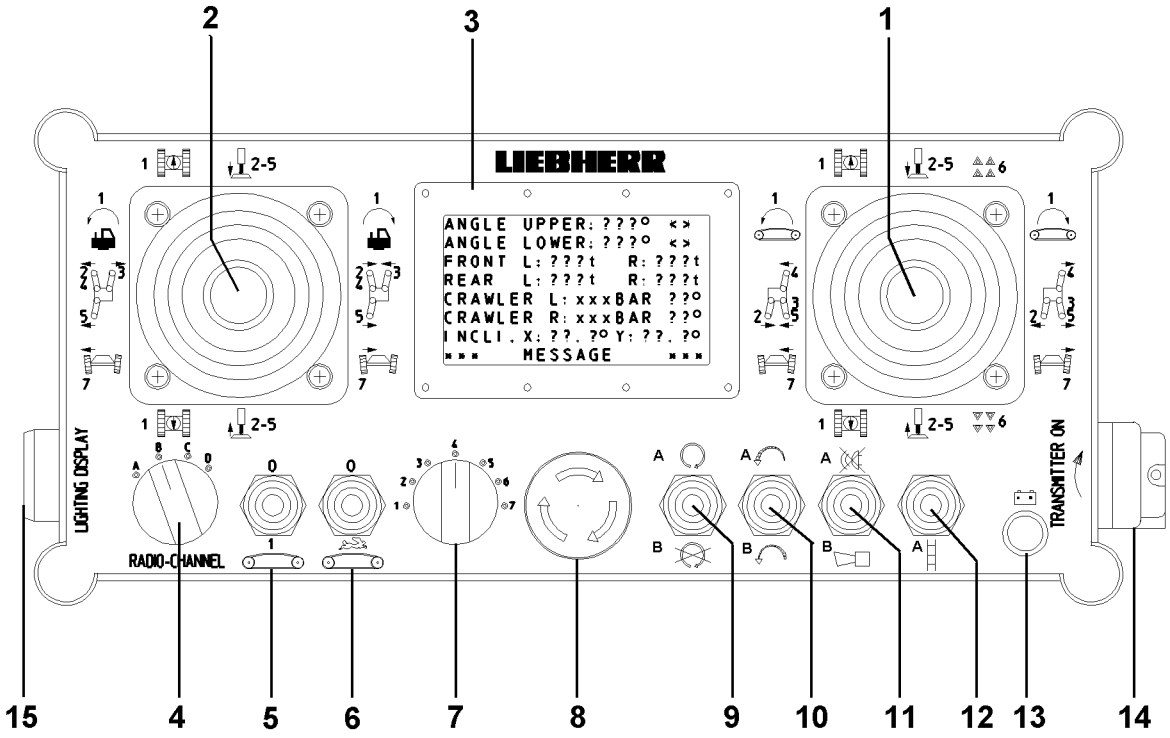
Shut off / release

Monitor the display during operation. When a crane movement is carried out, the changing condition and the change of forces / pressures should be seen . The danger condition should be recognized early and the crane movement should be slowed down accordingly or shut off .

The crane operator must constantly determine if the data shown in the display can even be correct. The crane operator may not blindly trust the system, he must think for himself and be able to recognize an eventual error in time.

Drive crawler	-	No shut off
Support	-	No shut off
	-	when the slewing platform and the crawler are not parallel (+/-5°), then an acoustical warning is given when you want to actuate the function "retract support " .
Slewing	-	Shut off , release
-	-	The support force threshold is a minimum of 8t "for crane is supported", a maximum of 1t for "crane is not supported"
	-	The track pressure is a minimum of 5bar "for crane is standing on tracks", a maximum of 1bar for "crane is standing on outrigger supports"
	-	Window +/- 5°

D A N G E R : The shut offs do not relieve the operator from his obligation to be careful. If the crane operator does not fulfill his obligation to take care, then the crane can topple over or be destroyed, despite a functioning shut off system. The shut off cannot register all operating conditions which might possible occur.


2
3
1
LIEBHERR
ANGLE UPPER: ???° « »
ANGLE LOWER: ???° « »
FRONT L: ???t R: ???t
REAR L: ???t R: ???t
CRAWLER L: xxxBAR ??°
CRAWLER R: xxxBAR ??°
INCLI. X: ??.?° Y: ??.?°
*** MESSAGE ***
LIGHTING DISPLAY
RADIO-CHANNEL
TRANSMITTER ON
15
4
5
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7
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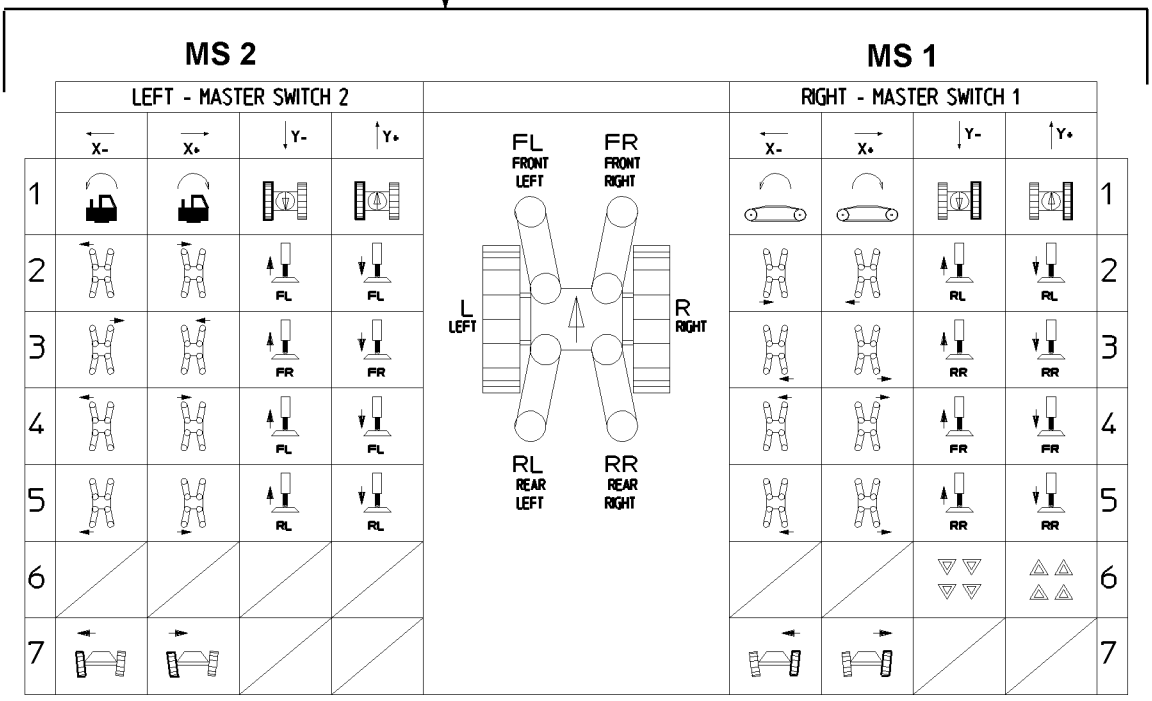
10
11
12
13
14


MS 2
LEFT - MASTER SWITCH 2
X-
X+
Y-
Y+
FL
FRONT LEFT
FR
FRONT RIGHT
L
LEFT
R
RIGHT
RL
REAR LEFT
RR
REAR RIGHT
MS 1
RIGHT - MASTER SWITCH 1

195706

6.1 Remote control panel, indicators and control element

1 Master switch MS 1
2 Master switch MS 2
Note: Up to 80% max. deflection of the master switch = slow gear.
If the master switch is deflected by more than 80% = rapid gear.

3 Display
4 Switch - Radio - Channel "A/B/C/D"
5 Switch - Crawler operation ON/OFF
6 Switch - Rapid gear Crawler ON/OFF

7 Preselector switch **see Fig.**

8 Button - **NOT "AUS"**

9 Button - Engine START/STOP
A = START
B = STOP

10 Button - Engine RPM regulation
A = Increase
B = Decrease

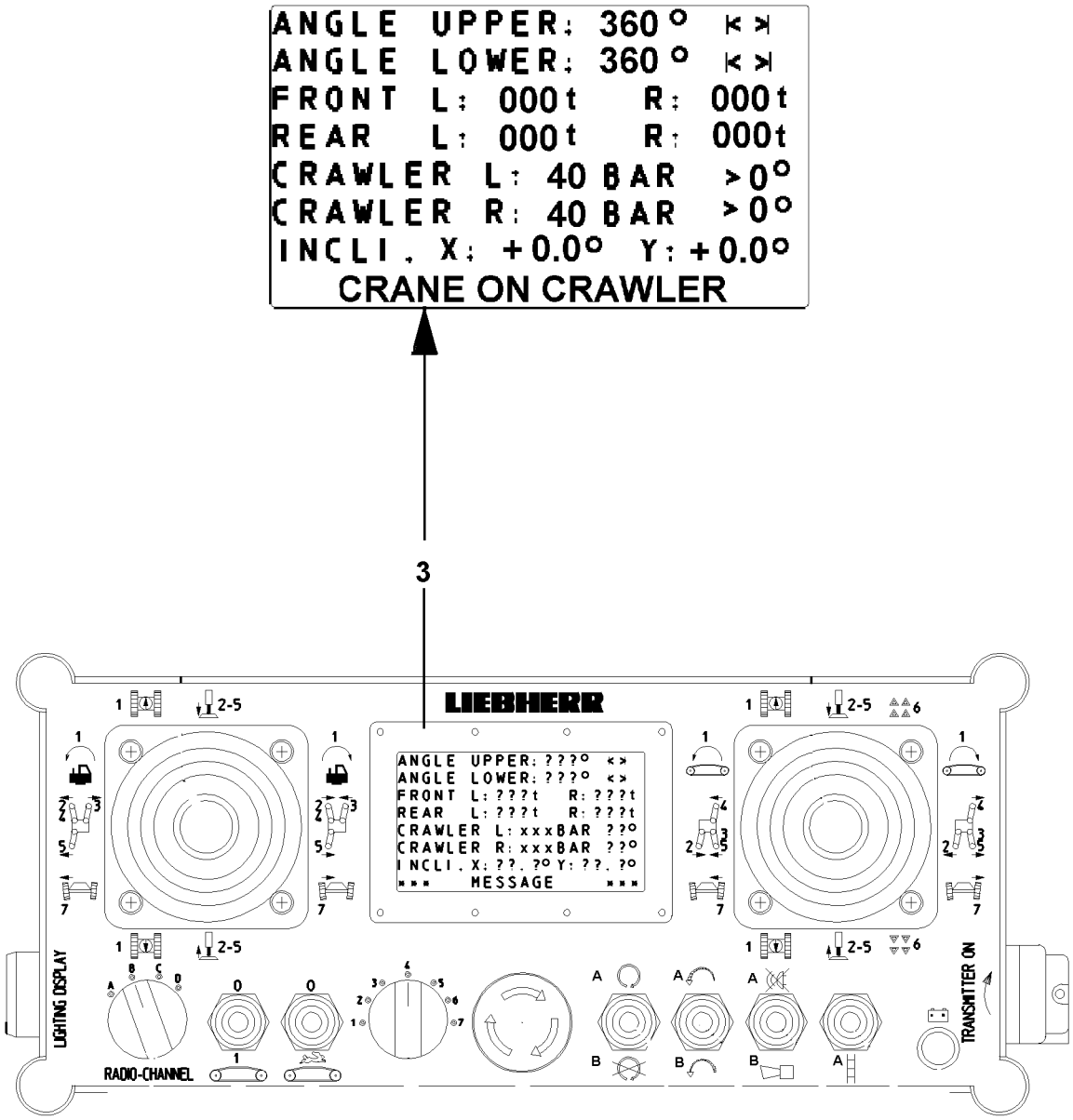
11 Button - Acoustical warning
A = Buzzer remote control panel or bell slewing platform turn off
B = Horn at engine start

12 Button - Ladder
A = Ladder down - up

13 Indicator light - Blinks green, transmitter ON
- Blinks red, charge battery

14 Keyed switch - Remote control transmitter ON/OFF

15 Button - Display illumination ON/OFF


ANGLE UPPER: 360°
ANGLE LOWER: 360°
FRONT L: 000t R: 000t
REAR L: 000t R: 000t
CRAWLER L: 40 BAR >0°
CRAWLER R: 40 BAR >0°
INCLI. X: +0.0° Y: +0.0°
CRANE ON CRAWLER
3
LIEBHERR
ANGLE UPPER: ???° <>
ANGLE LOWER: ???° <>
FRONT L: ???t R: ???t
REAR L: ???t R: ???t
CRAWLER L: xxxBAR ??°
CRAWLER R: xxxBAR ??°
INCLI. X: ??.?° Y: ??.?°
MESSAGE
LIGHTING DISPLAY
RADIO-CHANNEL
TRANSMITTER ON

195915

6.2 Display (3), Indicators

Note: The display shown is **only an example.**
The number values in the individual symbols and charts do not always match the crane.

ANGLE UPPER: 360 ° |← →| Turn angle of slewing platform,
0°-360°. Turn right / left, clear / locked
Possible conditions:
1. ← → turn left/ right clear
2. ← →| turn left clear, right locked
3. ← →| turn left locked, right clear
4. |← →| turn left/right locked

ANGLE LOWER: 360 ° |← →| Turn angle of crawler travel gear,
0°-360°.Turn right / left, clear / locked
Possible conditions:
1. ← → turn left/ right clear
2. ← →| turn left clear, right locked
3. ← →| turn left locked, right clear
4. |← →| turn left/right locked

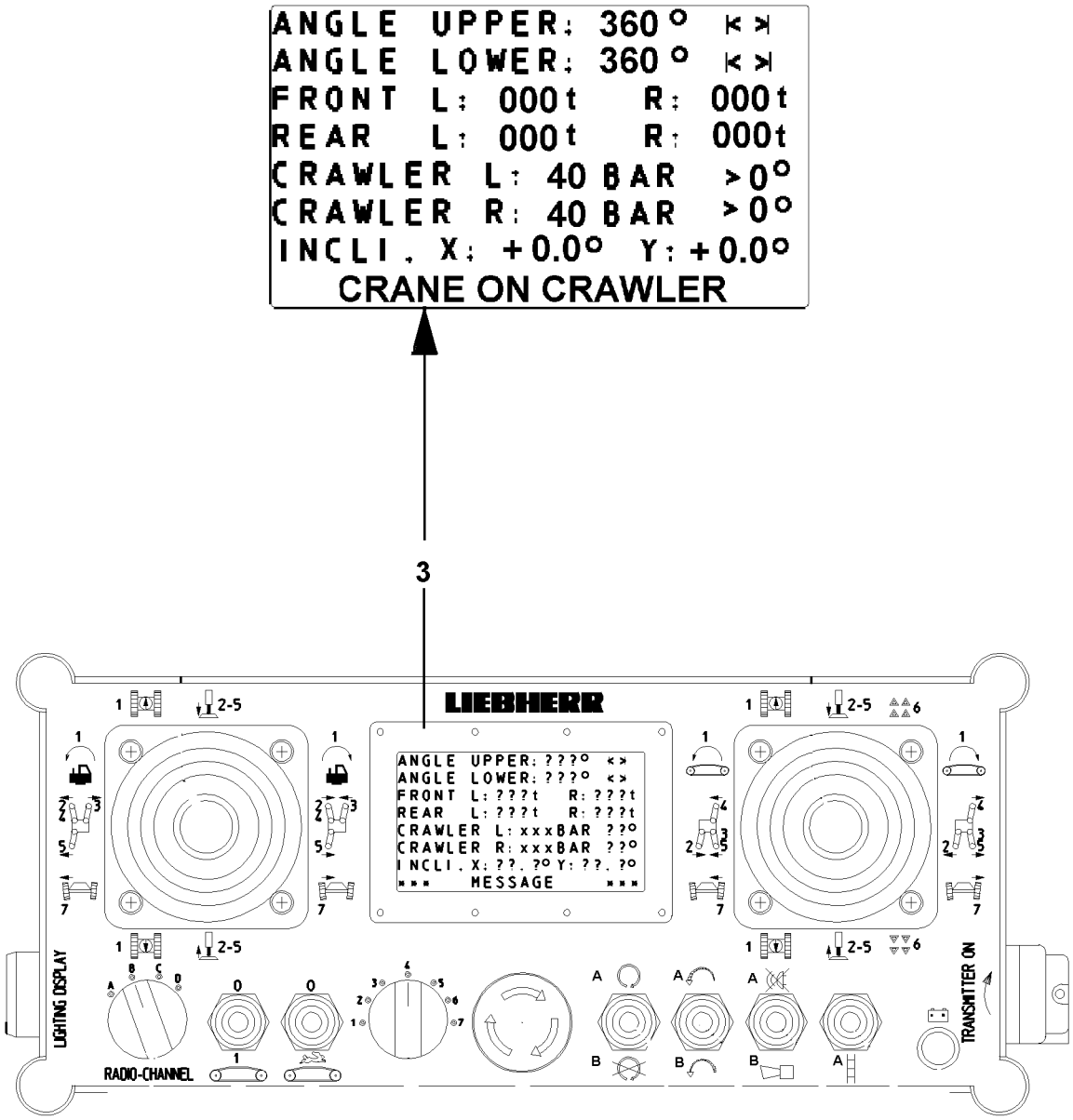
FRONT L: 0 t R: 0 t Support front left / right, support force indication in tons
REAR L: 0 t R: 0 t Support rear left / right, support force indication in tons

CRAWLER L: 40BAR >0 ° Crawler carrier left, pressure in bar. incline position crawler
>0°/<0°/>2°/><
Possible conditions:
1. < 0° Crawler incline 0° to - 1,5°
2. > 0° Crawler incline 0° to < 2°
3. > 2° Crawler incline 2° to 3,5°
4. >< Crawler incline< - 1,5° or >3,5°
or limit switch erroneous = Block position
If the indication "><" Crawler Block position appears, then the releases for turning the slewing platform or tracks are removed.

Note: As soon as one or several of the indicated values are invalid (shown by "???"), except the incline indication, then the release for turning the slewing platform and tracks are removed. Same for CRAWLER R.

CRAWLER R: 40BAR >0 ° Crawler carrier right, pressure in bar. incline position crawler
>0°/<0°/>2°/><
Possible conditions:
1. < 0° Crawler incline 0° to - 1,5°
2. > 0° Crawler incline 0° to < 2°
3. > 2° Crawler incline 2° to 3,5°
4. >< Crawler incline< - 1,5° or >3,5°
or limit switch erroneous = Block position
If the indication "><" Crawler Block position appears, then the releases for turning the slewing platform or tracks are removed.

INCLI. X: +0.0 ° Y: +0.0 ° Incline sensor, x-axle +6,3° to -6,3°
y-axle +6,3° to -6,3°
As soon as the indicator value of the x- and y- axle is outside the range of ±2°, an acoustical warning is given on the remote control panel. This warning can always be turned off with button "Turn remote control buzzer off " .


ANGLE UPPER: 360°
ANGLE LOWER: 360°
FRONT L: 000t R: 000t
REAR L: 000t R: 000t
CRAWLER L: 40 BAR >0°
CRAWLER R: 40 BAR >0°
INCLI. X: +0.0° Y: +0.0°
CRANE ON CRAWLER
3
LIEBHERR
ANGLE UPPER: ???° <>
ANGLE LOWER: ???° <>
FRONT L: ???t R: ???t
REAR L: ???t R: ???t
CRAWLER L: xxxBAR ??°
CRAWLER R: xxxBAR ??°
INCLI. X: ??.?° Y: ??.?°
MESSAGE
LIGHTING DISPLAY
RADIO-CHANNEL
TRANSMITTER ON

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CRANE ON CRAWLER

Possible reports:

"CRANE ON CRAWLER" = Crane is only standing on tracks.
All outrigger supports report ≤1t Support force and crawler pressure left / right both >5bar.

"CRANE ON OUTRIGGER" = Crane is only standing on outrigger supports.
All outrigger supports report >8t Support force and crawler pressure left / right both≤1bar.

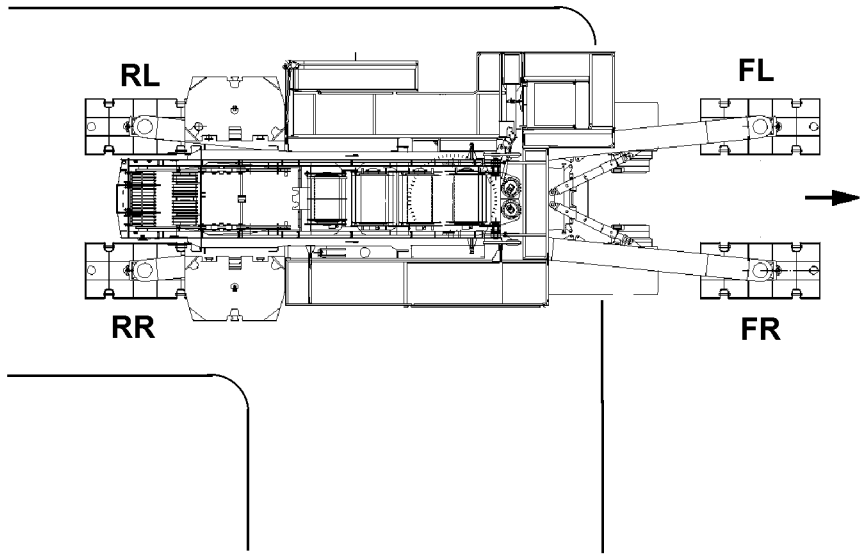
"CRANE ON CRAWL.+OUTRI" = Crane is standing on tracks and outrigger supports.
All outrigger supports report >8t Support force and track pressure left / right both >5bar.

"CRANE POS. NOT DEFINED" = Support condition of crane is not permitted.
None of the above conditions is met.

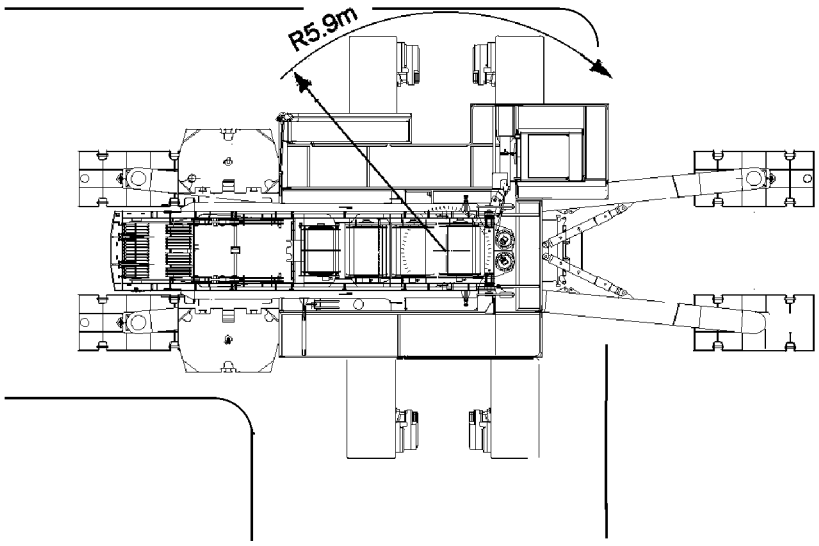
"DANGER OUTRIGGER IN?" = Danger , retract outrigger supports ?
This message appears when the crawler and slewing platform are not parallel (±5°) to each other, the crane is no longer on outrigger supports and the outrigger supports are being retracted.

D A N G E R : If the outrigger supports are too far retracted, then the crane will topple over!

"LICCON ERROR MESSAGE" = An error is found in the control of the outrigger supports .
If this message appears, then the error message can be read in the error determination view of the monitor in the switch box - outrigger supports.



1



2

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7. Change of travel direction

Initial position (Fig. 1)

- The crane is standing on crawlers and is not supported.

C A U T I O N : The pins on the struts for the support base must be inserted and secured!

- The main boom is set to the angle from **TAB 14700023**, **Driving with the boom**.

7.1 Turn the crawler travel gear into a new travel direction

7.1.1 Support

- Place the support pads on the ground, by manually extending the support cylinders .

Note: Extend the cylinders, preselector switch position 2 -5:
- individually /as a pair, right (3) or left (2)
- individually /as a pair, front (4) or rear (5)

By carefully actuating the master switch MS1 (1) or MS2 (2) in y-direction, the outrigger supports are extended or retracted.
Up to a master switch deflection of maximum 80%, the outrigger supports run in slow gear.
If the master switch is deflected by more than 80% , the outrigger supports run in rapid gear.

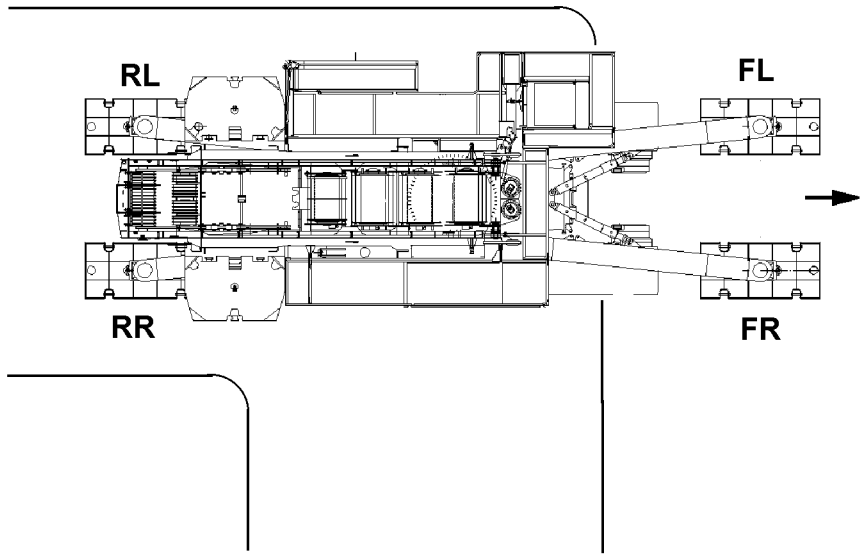
D A N G E R : The rapid gear may only be used as long as the outrigger supports are not on the ground.
During the support procedure, the slewing platform must be parallel to the crawler travel gear - aligned in lengthwise direction !
The support cylinder extend / retract is not monitored.
There is no shut off of the function extend / retract.
The operator alone must decide if it is possible to extend / retract the outrigger supports safely.

- When the support pads are placed on the ground, then the crane support can be switched over in preselector switch position 6 "Leveling" . Now the crane can be automatically supported and leveled by deflecting the master switch MS1 (1) in y-direction. To be able to ensure the proper function of the automatic support function, the master switch may only be deflected up to a maximum of 80% - slow gear.

- Continue to extend the support cylinder until the crawlers are clear, i.e. no longer subjected to a load. All supports report $>$8t Support force and crawler pressure left / right are both $\leq$ 1bar, the message **"CRANE ON OUTRIGGER"** is shown in the display of the remote control panel.
  It must be ensured that the crawler is relieved and can turn freely.

D A N G E R : Make sure that there are no obstacles within the turning range of the crawler!

Release to turn the crawler travel gear.
The function to extend and retract the outrigger supports remains always.



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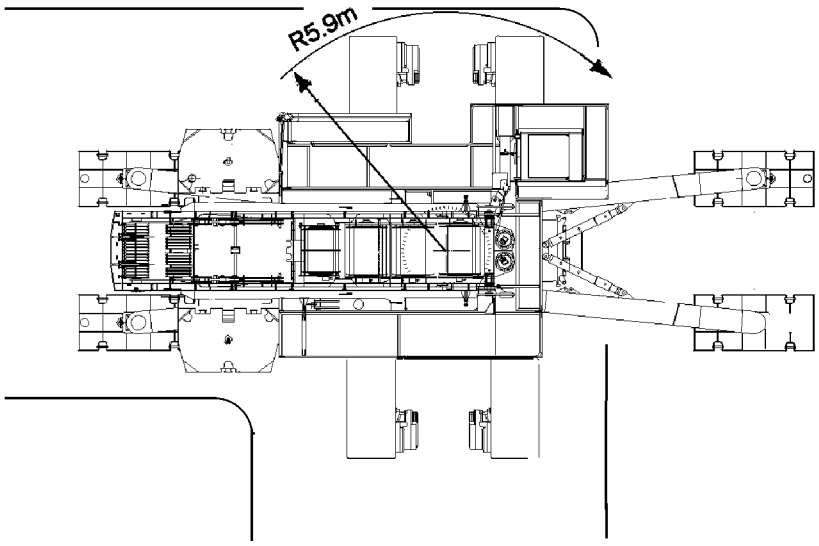

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7.1.2 Turn the crawler

Preselector switch (7) set to position 1.

- Actuate the master switch (MS1) in x-direction and turn the crawler travel gear into the new travel direction.
  The new travel direction depends on the path, which is to be traveled.

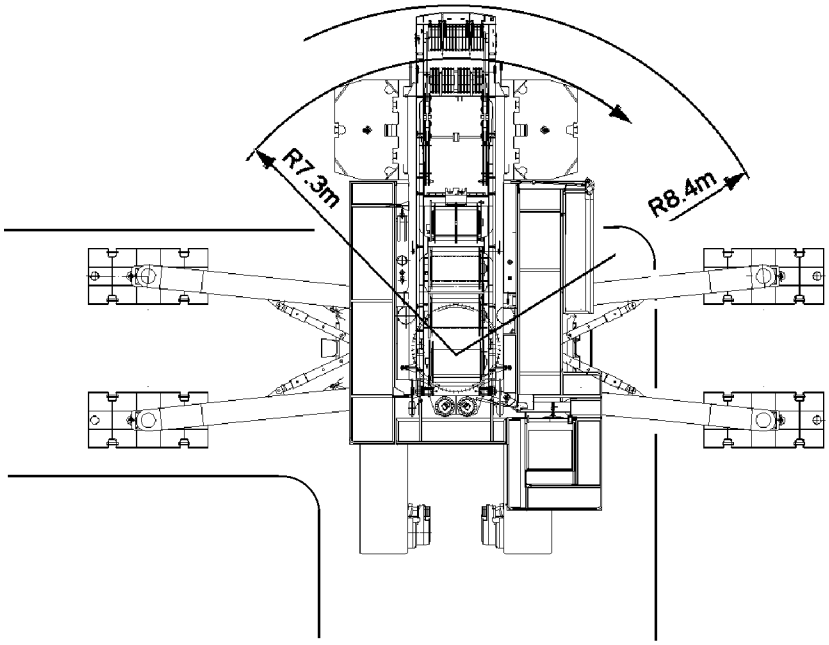
Note: The function to turn the slewing platform is shut off.

The crane can also be lowered onto the crawler travel gear, in addition to being placed on the outrigger supports, by retracting the support cylinders.

D A N G E R : The supports may only be retracted to the point where the crawler pressure left / right is at least 5bar but 8 t per support remain. The support force in the support cylinders may not be smaller than 8 t, and the crawler pressure must be at least 5 bar!
If the supports are retracted further, the crane can topple over!

In all intermediate positions where the support pressure and the crawler pressure are not within the permissible support conditions, the message **"CRANE POS. NOT DEFINED"** is shown.
Turning the slewing platform and the crawler to the right / left is shut off .
The function to extend and retract the outrigger supports remains .

D A N G E R : For that reason, it must be checked with utmost care if it is even possible to move the outrigger supports in this condition in or out without any danger.



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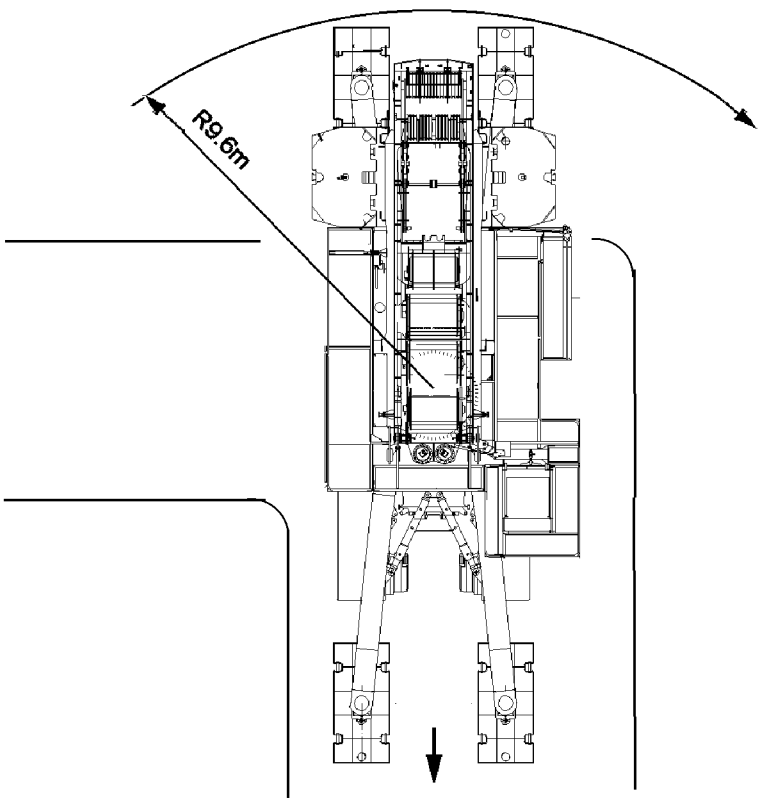

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7.2 Turn the slewing platform

It must be ensured that a support force of at least 8 t per support cylinder and a crawler pressure of at least 5 bar is available. The message "CRANE ON CRAWLER+OUTR." appears in the display of the remote control.

D A N G E R : **There must be a support force of at least 8 t per support cylinder and a crawler pressure of at least 5 bar !**
Otherwise there is a danger of accidents as the crane may tip over!

Turn the slewing platform, Preselector switch (7) set to position 1.

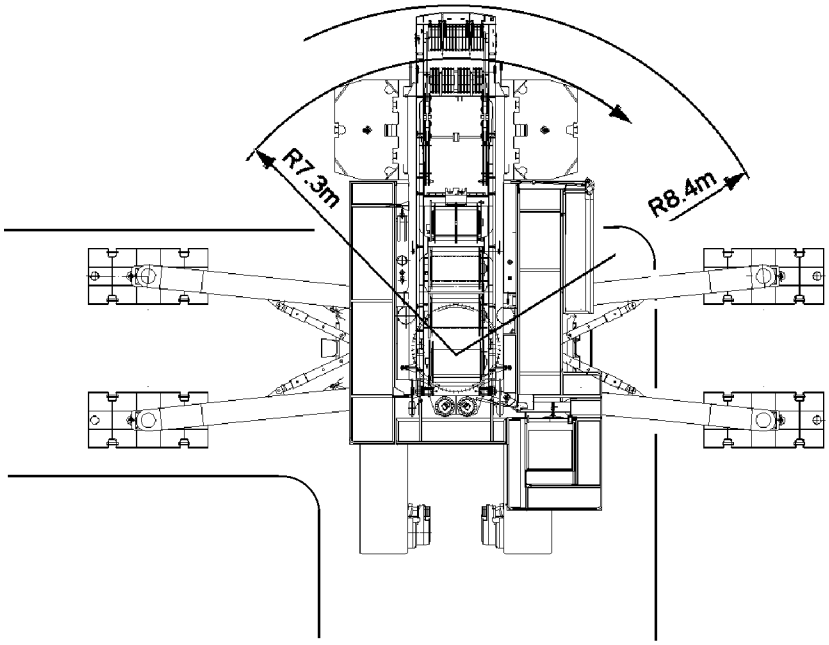
Note: Turning the crawler right / left is shut off in this condition.

The slewing platform can now be turned in the direction in which the slewing platform must pass the shortest way to be parallel to the crawler .

Move the master switch (MS2) in X-direction and turn the slewing platform in lengthwise direction (parallel) to the crawler travel gear.

Note: Due to the weight change when turning, it is possible that the message **"CRANE POS. NOT DEFINED"** appears and the release for turning the slewing platform is shut off.
In this case, reestablish the condition **"CRANE ON CRAWL+OUTR"** by actuating the support.

It must be ensured that the slewing platform is aligned parallel to the crawler travel gear before lowering it onto the crawler. Maximum deviation : ±5°



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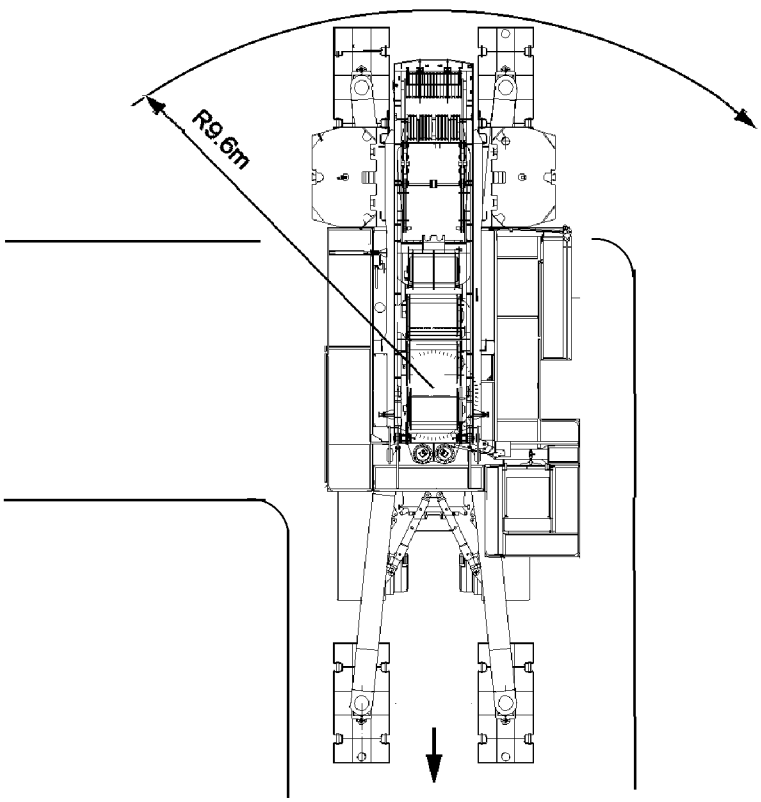

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7.3 Turn the crane support in travel direction

It must be ensured that the slewing platform is aligned parallel to the crawler travel gear.
Lower the crane with its complete weight onto the crawler travel gear by retracting the support cylinders. As soon as the crawler pressures on the left / right are >5bar and all support forces are ≤ 1t, the message **"CRANE ON CRAWLER"** appears.
Now the slewing platform and the crawler may be turned as long as the crawler and the slewing platform are parallel to each other by $\pm 5°$.

C A U T I O N: **Since the release for turning is already issued from a support pressure of 1 t per support, it is necessary to check that the support pads do not hit an obstacle when the support cylinders are further retracted and the crane supports are turned. For that reason, it is only permitted to turn, despite previous release, if the support can freely turn without running into an obstacle.**

Turn the slewing platform and crawler , Preselector switch (7) set to position 1.

Move the master switch (MS1) in X- direction and turn the crane support until it is in lengthwise direction of the crawler travel gear.

Note: Shut off of the turning movement is given when the deviation of the slewing platform to the crawler travel gear exceeds $\pm 5°$ (window) .
For this condition not to occur, the slewing platform must be turned into the opposite direction when turning the crane support by moving the MS 2 in X-direction .

As soon as the crawler and the slewing platform are within $\pm 5°$ parallel to each other, the crane can continue to drive in the new direction.
Drive the crawler , preselector switch (7) set to position 1 and move the switch crawler operation ON/OFF (5) to position ON.
Move the master switch (MS1) and master switch (MS2) in Y-direction to drive the crane into the desired direction.

Note: In preselector switch position 1 , it is neither possible to turn the crawler /slewing platform nor to drive the crawler right / left.
The turning and driving functions cannot be carried out simultaneously.
The movement ,which was initiated first, has priority.

8. Guidelines for driving with the boom

Remarks:

- The boom incline always refers to the horizontal!
- It must be ensured, before lowering to the narrow track crawler and during the procedure, that the superstructure is aligned parallel to the crawler carriers.
  Maximum deviation: +/- 5°
- Positive length incline - uphill slope in direction of the boom
  negative length incline - downhill slope in direction of the boom
- If crawler operation is turned on, the slewing brake is closed and the slewing platform is secured to prevent it from turning when driving the crane.

D A N G E R :

- **Maximum length incline: +/- 8°**
- **Maximum cross incline: +/- 2°**
- **Check the center of gravity position of the crane constantly with the LICCON job planer while driving, and correct it by adjusting the boom, as necessary.**
  If this is not observed, there is an increased chance of having an A C C I D E N T !

- The given max./min. boom angles correspond to a distribution of the support forces of approx. 60% : 40% or 40% : 60% of the total weight distributed on two outrigger supports each.
  - Keep the supports during the driving procedure to a support base of 11,50m x 11,50m, if possible, while keeping the support pads directly above the ground level.

D A N G E R : **The crane may only be driven according to the data in the chart!**

- **The ground must be able to absorb the ground pressures, which occur.**
- **The friction coefficient between the travel route and the ground must be large enough to absorb any drive forces, which occur. Slippery ground can cause the crane to slip sideways and cause the crane to incline sideways, which is not permitted. There is a danger of accidents!!**
- **The slewing platform must be aligned parallel to the crawler carriers.**
- **Crawler operation must be turned on.**
- **Slow travel speed, all acceleration and delay procedures must be carried out very carefully.**
- **Any ground pressures, which occur, must be determined with the job planer before the driving procedure.**
- **The transfer from the horizontal into an uphill incline and from an uphill incline into the horizontal must be very even, i.e. there may be no edges which could cause the crane to tip over! This is not permitted! The incline change must be gradually and continuously.**
  If this is not observed, there is an increased chance of having an A C C I D E N T !

8.1 Driving with the boom SF2 - operation

TAB 14700023
System: S 2620.20
NI/F 1812.10

On narrow crawler 7,80 m × 3,60 m × 1,20 m
with installed supports 11,50m × 11,50 m
Equipment **S - 73,5 / F - 10,5 / 10°** intermediate angle
without hook block on S - boom, with 3,5 t hook block on F - boom

Length incline	**Cross incline**	**Boom incline to the horizontal for slewing platform ballast**	
(°)	(°)	155 t	135 t
+8	-2...+2	58° - 71°	61° - 73°
+5	-2...+2	59° - 72°	63° - 75°
0	-2...+2	62° - 75°	65° - 77°
- 5	-2...+2	65° - 78°	68° - 80°
- 8	-2...+2	67° - 79°	71° - 79°

Driving with the boom SF2 - operation

TAB 14700046
System: S 2620.20
NI / F 1812.10

On narrow crawler 7,80 m × 3,60 m × 1,20 m
with installed supports 11,50m × 11,50 m
Equipment **S - 73,5 / F - 17,5 / 10°** intermediate angle
without hook block on S - boom
with 3,5 t hook block on F - boom

Length incline (°)	**Cross incline** (°)	**Boom incline to the horizontal for boom** 155 t
+8	-2 ...+2	66° - 74°
+5	-2 ...+2	67° - 72°
0	-2 ...+2	66° - 75°
- 5	-2 ...+2	71° - 76°
- 8	-2 ...+2	70° - 78°

D A N G E R : **It must be ensured, before lowering to the narrow track crawler and during the procedure, that the superstructure is aligned parallel to the crawler carriers. Maximum deviation: +/- 3°**

Note: The crane must stand on load-bearing ground. The maximum ground pressure is 466 kN/m2. Maximum permissible wind speed: 9m/s.

Driving with the boom SDB - operation **TAB 14700037**
System: S 2620.20

Taken down S-boom
Suspended ballast guide pinned on or off
with Derrick D = 28 m, 11,0 m Derrick radius, 135 t DB
on narrow crawler 7,80 m × 3,60 m × 1,20 m
with installed supports 11,50m × 11,50 m
Ausleger **S - 76,4** m bzw. **S - 83,4 m,** with S 14 m intermediate section for flying assembly
Wind speed **up to 12,5 m / s**
No hook block possible

Length incline (°)	**Cross incline** (°)	**Boom incline to the horizontal for boom**	
		76,4 m	83,4 m
+8	-2...+2	28° - 50°	46° - 62°
+5	-2...+2	25° - 53°	49° - 64°
0	-2...+2	35° - 60°	54° - 69°
- 5	-2...+2	45° - 67°	59° - 73°
- 8	-2...+2	48° - 71°	62° - 73°

D A N G E R : In SDB - operation, the suspended ballast including the pallet must be unpinned. The ballast frame is placed on the slewing platform.

Driving with the boom S - operation

TAB **14700038**
System: S 2620.20

Taken down S-boom (S = 55,4 m)
on narrow crawler 7,80 m × 3,60 m × 1,20 m
with installed supports 11,50m × 11,50 m
boom S - 55,4 m, with S 14 m intermediate section for flying assembly
Wind speed **up to 12,5 m / s**
No hook block possible

Length incline (°)	**Cross incline** (°)	**Boom incline to the horizontal for slewing platform ballast**	
		55 t	95 t
+8	-2...+2	20° - 66°	20° - 35°
+5	-2...+2	23° - 69°	20° - 44°
0	-2...+2	28° - 74°	20° - 55°
- 5	-2...+2	37° - 77°	20° - 63°
- 8	-2...+2	46° - 77°	20° - 70°

Driving with the boom SDF2 (B) - operation

TAB **14700041**
System: S 2620.20
NI / F 1812.10

S - boom (S = 98 m / F = 10,5 m / 10° intermediate angle)
with Derrick D = 28 m; 11,0 m Derrick radius
Suspended ballast guide pinned on or off
with installed supports 11,50m × 11,50 m
on narrow crawler 7,80 m × 3,60 m × 1,20 m
Wind speed **up to 5,0 m / s**
without hook block on S - boom, with 3,5 t hook block on F - boom

Length incline (°)	**Cross incline** (°)	**Boom incline to the horizontal for slewing platform ballast**	
		155 t	135 t
+8	-1,5...+1,5	69° - 74°	71° - 75°
+5	-1,5...+1,5	70° - 75°	72° - 77°
0	-1,5...+1,5	73° - 78°	74° - 80°
- 5	-1,5...+1,5	75° - 81° *	77° - 81° *
- 8	-1,5...+1,5	77° - 79° *	78° - 79° *

D A N G E R : *** The upper limit shut off of the angle window is no longer possible via the angle sensor. It must be observed that the limit switches on the relapse cylinders cannot be triggered. Relative angles beween slewing platform and boom of > 85³ must be avoided!**
If this is not observed, there is an increased chance of having an A C C I D E N T !

Driving with the boom SDF2 (B) - operation

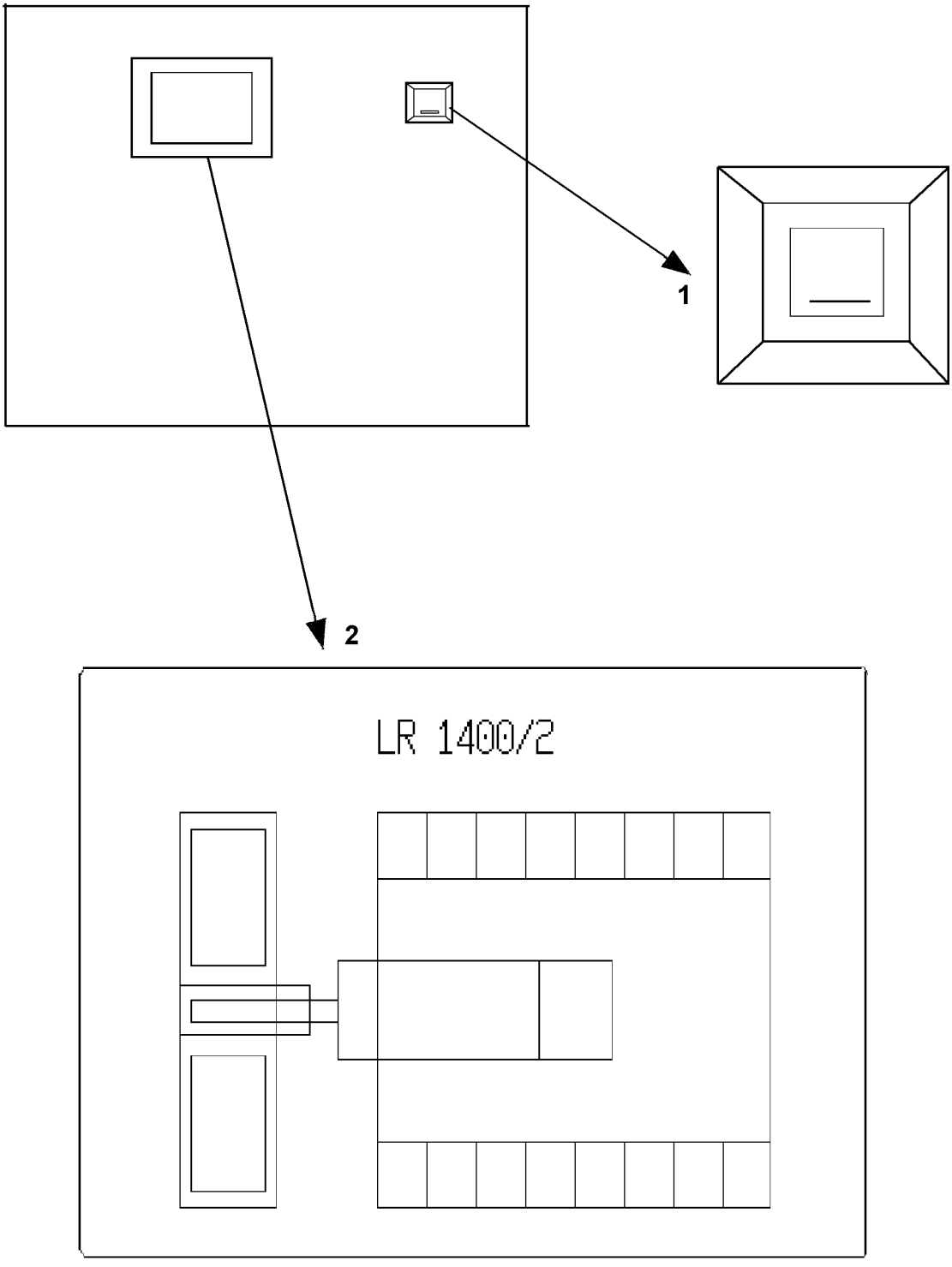
TAB 14700047
System: S 2620.20
NI / F 1812.10

Suspended ballast guide pinned on or off
with Derrick D = 28 m; 11,0 m Derrick radius
on narrow crawler 7,80 m × 3,60 m × 1,20 m
with installed supports 11,50m × 11,50 m
Equipment **S - 77 / F - 17,5 / 10°** intermediate angle
without hook block on S - boom
with 3,5 t hook block on F - boom

Length incline (°)	**Cross incline** (°)	**Boom incline to the horizontal for slewing platform ballast** 135 t
+8	-2 ...+2	66° - 74°
+5	-2 ...+2	67° - 75°
0	-2 ...+2	69° - 77°
- 5	-2 ...+2	71° - 79°
- 8	-2 ...+2	73° - 77°

D A N G E R : **It must be ensured, before lowering to the narrow track crawler and during the procedure, that the superstructure is aligned parallel to the crawler carriers. Maximum deviation: +/- 3°.**
In SDF2 (B) - operation, the suspended ballast including the pallet must be unpinned. The ballast frame is placed on the slewing platform.

Note: Maximum permissible wind speed: 9m/s.



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9. The ”Test system” program

The switch box for the outrigger supports is equipped with a test system . The test system is a service and diagnostics tool, which makes it possible, without having to use additional test units, to quickly and simply located and remedy possible problems in the outrigger support system.

Note: Some safety relevant functions of the test system can only be utilized by competent expert personnel, i.e. they are protected from access by **unauthorized** users.

LICCON in Standard operation

Note: The programs and program run of the LICCON computer system are not affected, i.e. the support control is still fully functioning and the control can be checked with the extensive aids of the test system.
For the support control with LICCON, the LICCON monitor is used just for the functions of the test system.

9.1 Starting the Test system

In case of function problems, such as the message "LICCON ERROR MESSAGE" in the display of the remote control panel, the monitor (2) in the switch box for the outrigger supports can be turned on for diagnostic purposes.

- Turn the crane engine off;
- Open the switch box
- actuate the switch (1);

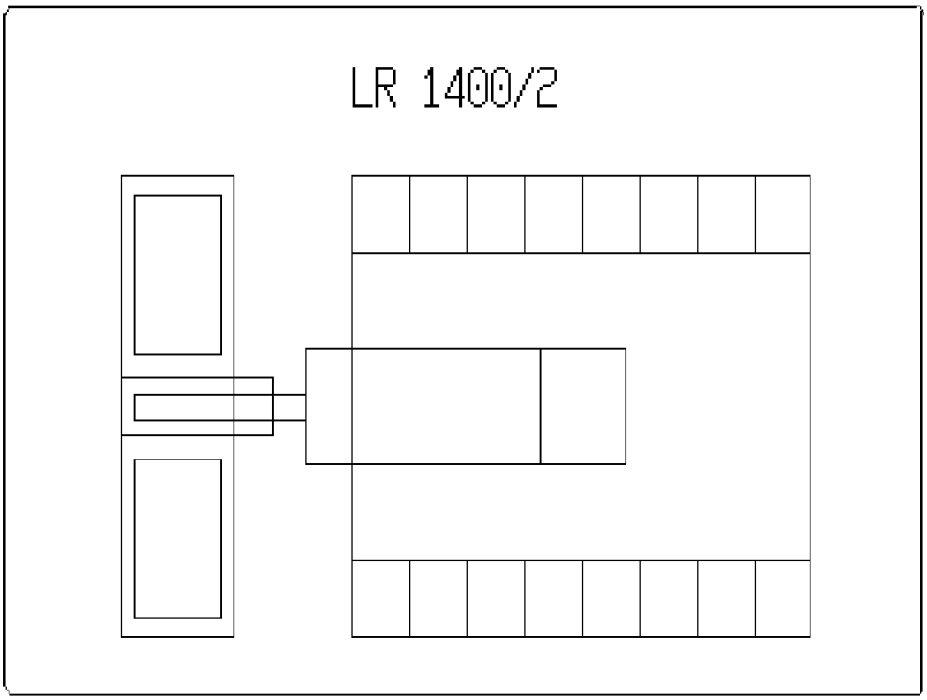
Note: The switch (1) may only be actuated if the crane engine is "OFF" .

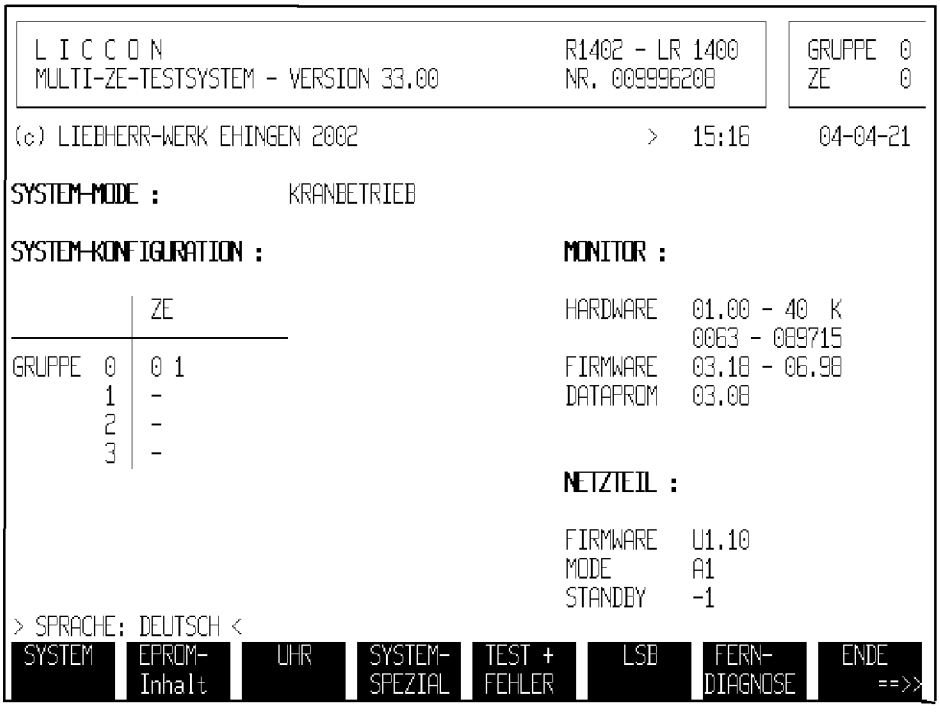
- Turn the crane engine on and wait until the monitor shows the view **"LR1400/2"** ;
- Call up the test system with the "i"-key.
  ⇒ MULTI-ZE-TESTYSTEM - VERSION XX.XX

9.1.1 The message "LICCON ERROR MESSAGE",

appears as soon as the LICCON system finds an error in the control of the support system and narrow track crawler , for example :

- erroneous or missing sensors and limit switch
- Error on output and inputs of CPU and I/O modules
- Error in safety circuit


LR 1400/2


L I C C O N
MULTI-ZE-TESTSYSTEM - VERSION 33.00
R1402 - LR 1400
NR. 009996208
GRUPPE 0
ZE 0
(c) LIEBHERR-WERK EHINGEN 2002
> 15:16 04-04-21
SYSTEM-MODE : KRANBETRIEB
SYSTEM-KONFIGURATION :
ZE
GRUPPE 0 0 1
1 -
2 -
3 -
MONITOR :
HARDWARE 01.00 - 40 K
0063 - 089715
FIRMWARE 03.10 - 06.98
DATAPROM 03.08
NETZTEIL :
FIRMWARE U1.10
MODE A1
STANDBY -1
> SPRACHE: DEUTSCH <
SYSTEM
EPROM-Inhalt
UHR
SYSTEM-SPEZIAL
TEST + FEHLER
LSB
FERN-DIAGNOSE
ENDE ==>>

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9.2 Main menu

After the start of the LICCON Test system appears the main menu, after the program has started, where the basic data of the system is stored. All sub functions can be called up via the function keys "F1" to "F8" .

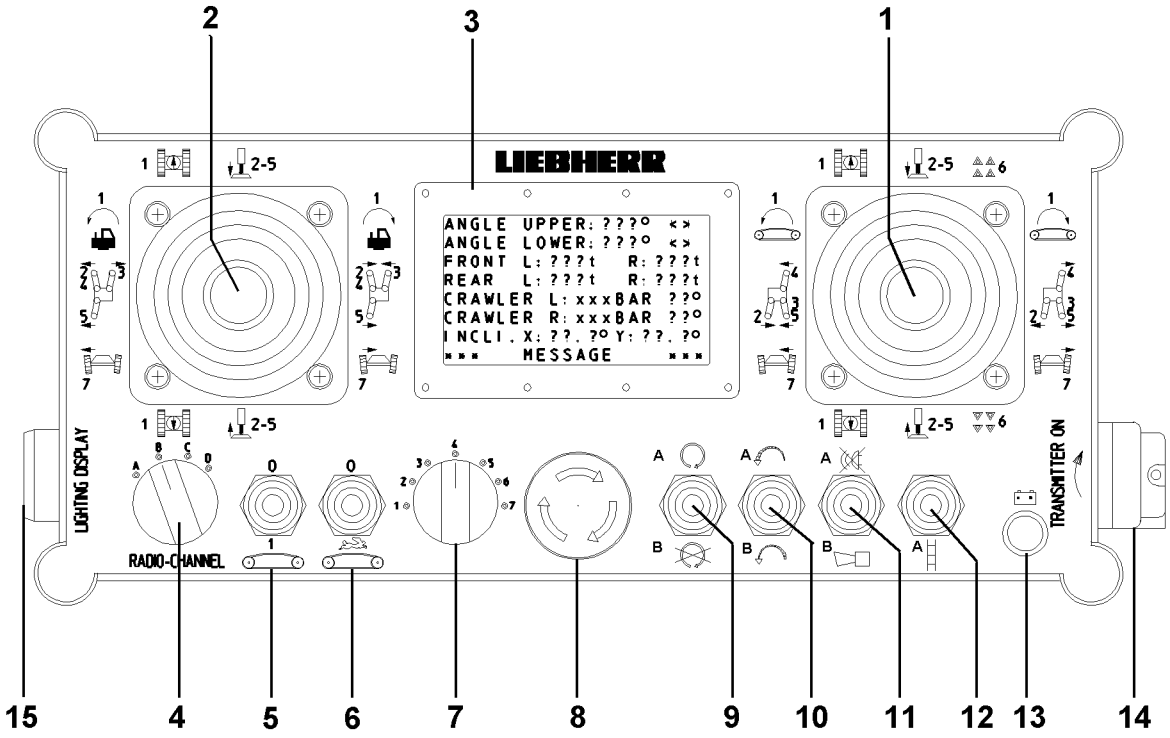
9.2.1 Selection of CPU or group

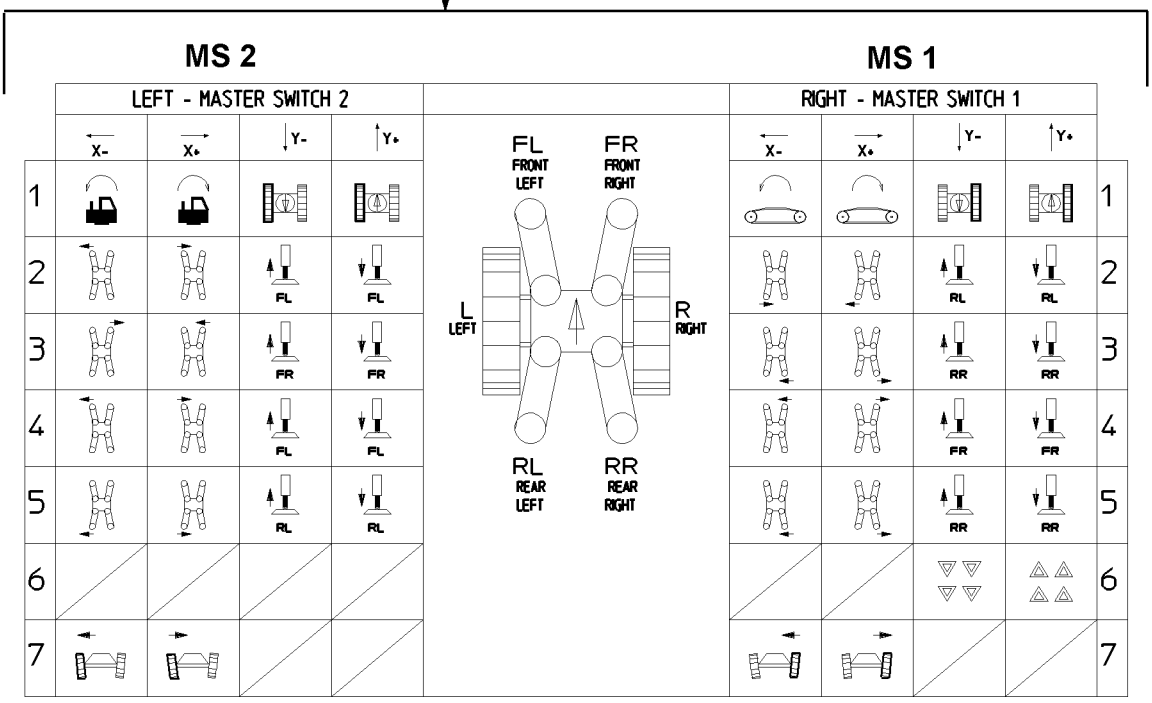
In the upper right selection window, the curser blinks to request the selection of the desired CPU.
- With the "ENTER" key, the curser changes from "CPU" to "Group" or back.
- Enter the desired group or CPU from the installed units with the number keys on the alpha-numeric keypad.

Note: The Test system can only access installed units (group, CPU) .

9.2.2 Function key bar- Main menu

"F1"	**SYSTEM**	Access to input and outputs, AWL-Operands, system internal "Specialties".
"F2"	**EPROM-Inhalt**	Software of LICCON CPUs.
"F3"	**UHR**	Access protected function used to set or stop or start the battery buffered real time clock.
"F4"	**SYSTEM-SPEZIAL**	To check complete function units of ballast trailer.
"F5"	**TEST**	
"F6"	**EXTERN**	Start the remote diagnostics
"F7"	**EXTERN**	
"F8"	**ENDE intern**	Program end


2
3
1
LIEBHERR
ANGLE UPPER: ???° « »
ANGLE LOWER: ???° « »
FRONT L: ???t R: ???t
REAR L: ???t R: ???t
CRAWLER L: xxxBAR ??°
CRAWLER R: xxxBAR ??°
INCLI. X: ??.?° Y: ??.?°
*** MESSAGE ***
LIGHTING DISPLAY
RADIO-CHANNEL
TRANSMITTER ON
15
4
5
6
7
8
9
10
11
12
13
14


MS 2
LEFT - MASTER SWITCH 2
X-
X+
Y-
Y+
FL
FRONT LEFT
FR
FRONT RIGHT
L
LEFT
R
RIGHT
RL
REAR LEFT
RR
REAR RIGHT
MS 1
RIGHT - MASTER SWITCH 1

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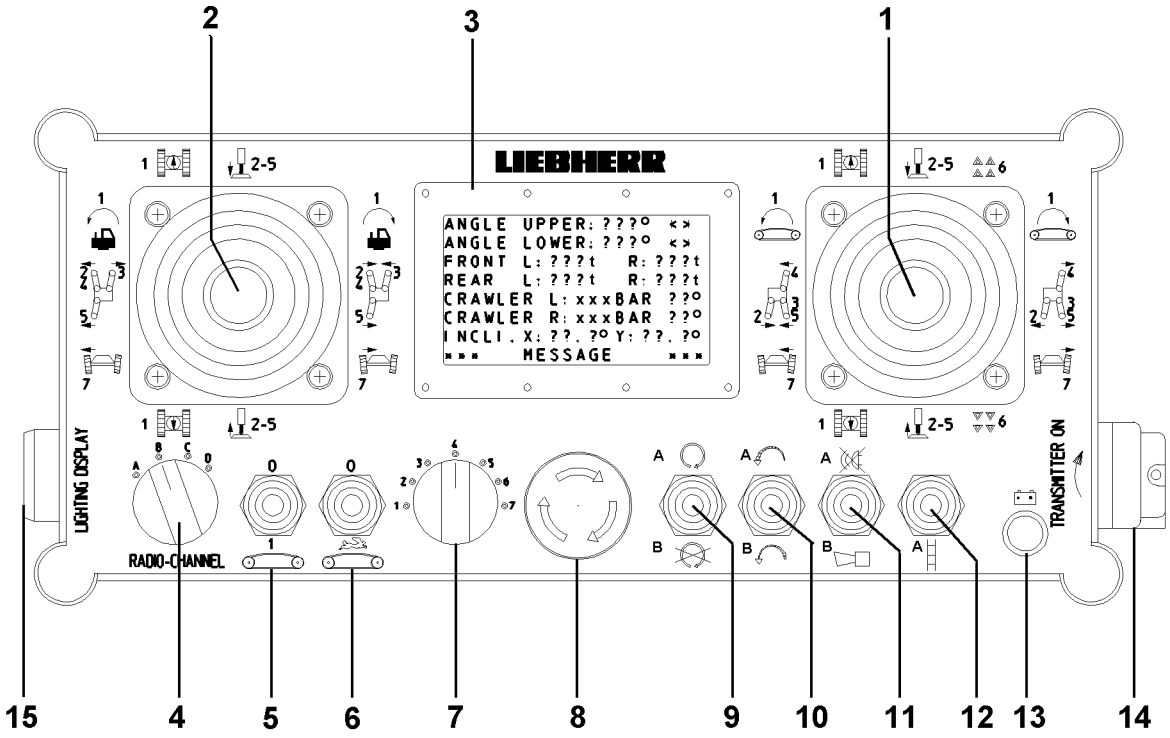
10. Crane operation on supports

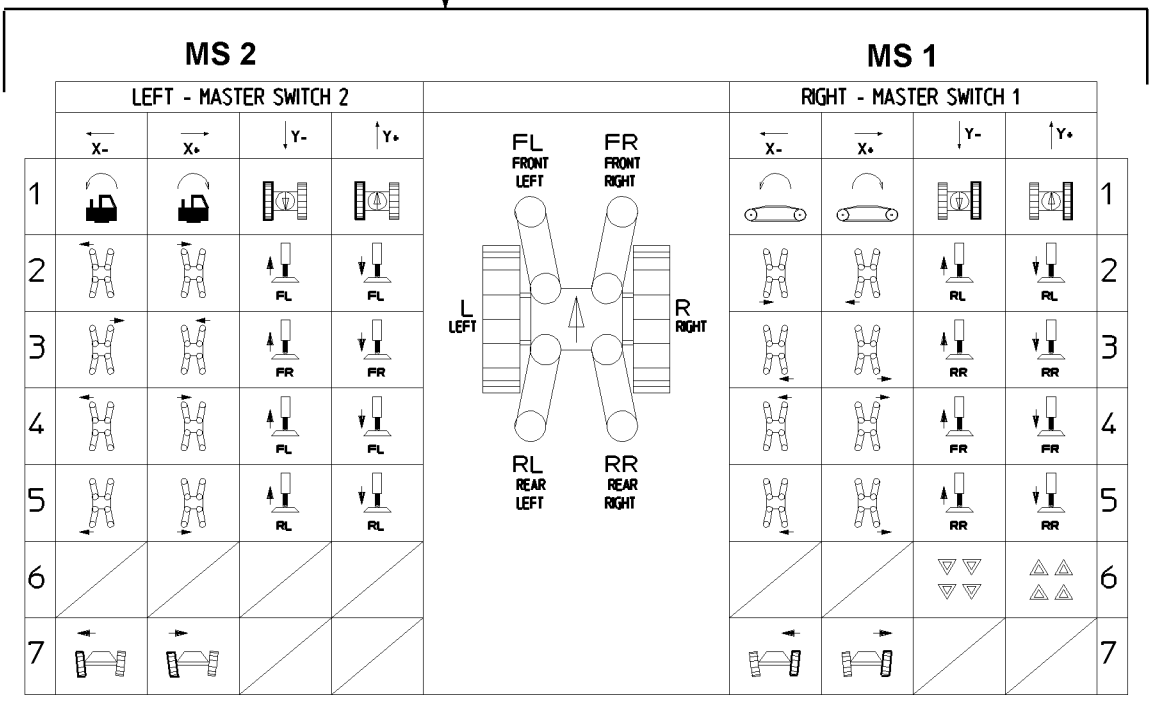
10.1 Swing out the support arms

Release and unpin the transport retaining pins.
Swing out the support arms to the desired support base and insert and secure the struts with the transport retaining pins.
Carefully deflect the master switch MS1 (1) or MS2 (2) in x-direction to swing out the support arms.
Up to 80% max. deflection of the master switch, the support arms move in slow gear.
If the master switch is deflected by more than 80%, they move in rapid gear.

Note: Swing out the support arms, preselector switch in position 2 -5:
- individually / in pairs, right (position 3) or left (position 2)
- individually / in pairs , front (position 4) or rear (position 5)

D A N G E R : When swinging out, the slewing platform must be aligned parallel to the crawler travel gear - in lengthwise direction!
The swinging in / out of the support arms is not monitored.
There is no shut off for the swinging out / in function.
The operator alone must decide if it is possible to swing the support arms in or out.
The swung out folding arms must be secured on the struts with the transport retainer pins and with the spring retainers, otherwise there is a danger of accidents!


2
3
1
LIEBHERR
ANGLE UPPER: ???° « »
ANGLE LOWER: ???° « »
FRONT L: ???t R: ???t
REAR L: ???t R: ???t
CRAWLER L: xxxBAR ??°
CRAWLER R: xxxBAR ??°
INCLI. X: ??.?° Y: ??.?°
*** MESSAGE ***
LIGHTING DISPLAY
RADIO-CHANNEL
TRANSMITTER ON
15
4
5
6
7
8
9
10
11
12
13
14


MS 2
LEFT - MASTER SWITCH 2
X-
X+
Y-
Y+
FL
FRONT LEFT
FR
FRONT RIGHT
L
LEFT
R
RIGHT
RL
REAR LEFT
RR
REAR RIGHT
MS 1
RIGHT - MASTER SWITCH 1

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10.2 Support

When the support arms are all swung out, pinned and secured, the crane can be supported.
Support the support pads from below with sufficiently sized materials, such as wood, steel or concrete plates, according to the ground conditions.

Note: Observe the safety notes and the permissible ground pressures (chapter 2.04) .

D A N G E R : **Only suitable materials may be used for the support under the pads. The support must be placed under the center of the support pads.**
If this is not observed, there is a danger of accidents!

Place the support pads on the ground, by manually extending the support cylinders.

Note: Extend the support cylinders, preselector switch position 2 -5:
- individually / in pairs, right (position 3) or left (position 2)
- individually / in pairs , front (position 4) or rear (position 5)

Carefully deflect the master switch MS1 (1) or MS2 (2) in y-direction to extend or retract the support cylinders.
Up to 80% max. deflection of the master switch, the support cylinders move in slow gear.
If the master switch is deflected by more than 80%, they move in rapid gear.

D A N G E R : **The rapid gear may only be used as long as the support cylinders are not on the ground.**
The extension and retraction of the support cylinders is not monitored.
There is no shut off of the extension and retraction function .
The operator alone must decide if it is possible to extend and retract the support cylinders safely.

10.3 Automatic support and horizontal alignment (leveling)

- When all support pads are placed on the ground, the crane support can be switched via the preselector switch position 6 to "leveling"
- by deflecting the master switch MS1 (1) in y-direction, all support cylinders are extended and the crane is automatically horizontally aligned.

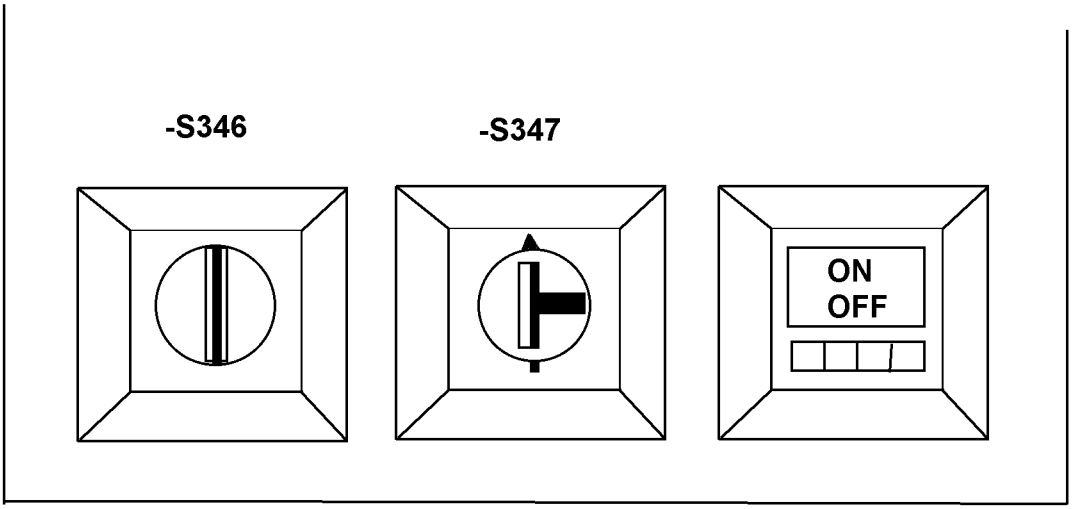
D A N G E R : **The crane is automatically horizontally aligned by actuating the automatic support. However, the operator must still check if the alignment is within the permissible tolerance and if all four support pads are in contact with the ground. If this is not the case, there is a danger of accidents.**

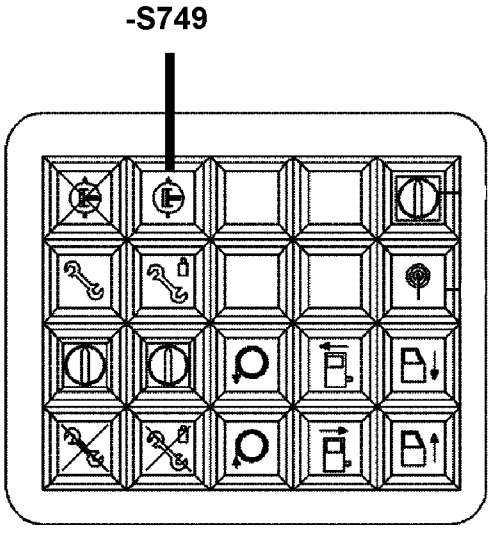
Continue to extend the support cylinders until the crawlers are clear, i.e. no longer subjected to a load.

Note: All supports report $>$8t support force and crawler pressure left / right are both $\leq$1bar, the message **"CRANE ON OUTRIGGER"** is shown in the display of the remote control panel.

D A N G E R : **The crane operator is obligated to set the corresponding load chart in the LICCON overload safety system, which corresponds to the current support base.**
The support cylinders must be properly supported from below .

C A U T I O N : **When lifting a load with the crane supported, the crawlers may not be subjected to the load. The crane operator must constantly monitor the crawler tracks, to ensure they do not come in contact with the ground, because the narrow track crawler travel gear is not designed to lift a load!**





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11. EMERGENCY OPERATION

11.1 Keyed switch -S346 - Emergency operation:

Prerequisites for emergency operation
- the crane engine is running
- the radio remote control is functioning
- the hydraulic system is functioning
- the keyed switch -S346 (switch box crane support) is turned on.

Emergency operation - General
The emergency operation is turned on via the keyed switch -S346 (switch box crane support) .
In emergency operation, the LICCON outputs (slewing gear bottom, incline crawler carriers) are switched off by the control valves via the CPU ok relay contacts .
The control valves for the lower slewing gear (turn left / right) are controlled via a fixed resistance, in connection with the corresponding directional contacts of the master switch (manual control lever) .
The control valves for the lower slewing brake and the incline cylinders for the crawler control are only controlled with the corresponding directional contacts of the master switch (manual control lever) .
The control of the valves is made in ”black - white operation”.

Slewing gear

D A N G E R : Before initiating the ”slewing”crane movement, the operator must ensure that there are no persons or obstacles within the slewing range. If this is not observed, there is a danger of accidents.

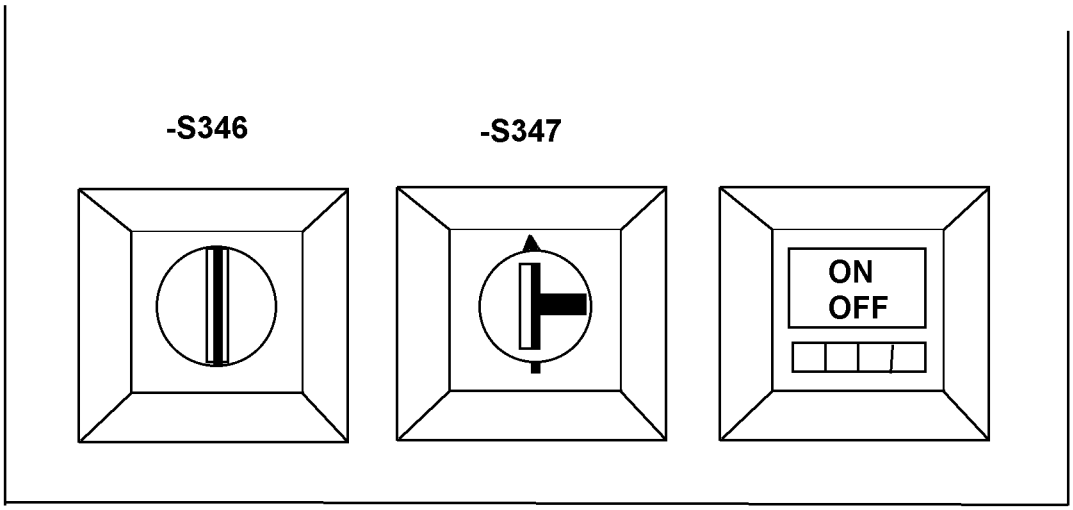
Deflect the manual control lever (MS1 - radio remote control) to the left (X-) = to turn to the left
Deflect the manual control lever (MS1 - radio remote control) to the right (X+) = to turn to the right
Deflect the manual control lever (MS1 - radio remote control) into zero position = the brake is applied, the slewing gear slows down softly (due to hydraulic accumulator)

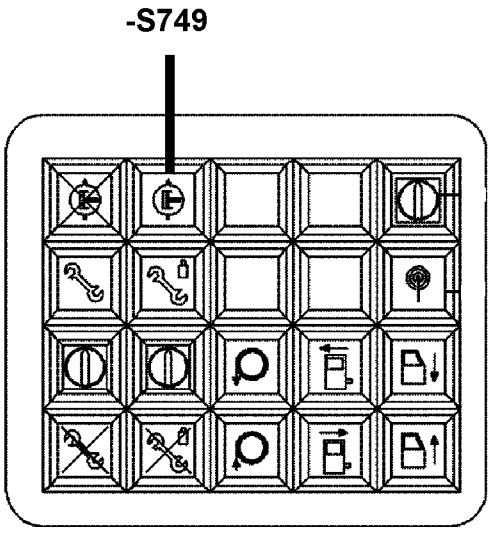
Note: The slewing gear turns at reduced speed.

Incline crawler carrier

D A N G E R : Before initiating the ”incline crawler carrier”crane movement, the operator must ensure that there are no persons or obstacles within the incline range. If this is not observed, there is a danger of accidents.

Deflect the manual control lever (MS1 - radio remote control) to the left (X-) = the crawler carriers incline to the right inside
Deflect the manual control lever (MS1 - radio remote control) to the right (X+) = the crawler carriers incline to the right outside
Deflect the manual control lever (MS2 - radio remote control) to the left (X-) = the crawler carriers incline to the left outside
Deflect the manual control lever (MS2 - radio remote control) to the right (X+) = the crawler carriers incline to the left inside





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11.2 Switch -S347 - Emergency operation pressure supply:

Emergency operation - General
In case of failure or defect of one or both CPUs, the valves for the crane support for the crawler adjustment and for the lower slewing gear can no longer be actuated.

By actuating the switch -S347 and -S749, the CPUs can be bypassed.
The manual pressure supply (-Y201) is turned on with switch -S347.
In addition, the switch -S749 (manual pressure supply) must be turned on in the crane operator's cab to actuate the pressure supply valves -Y15, -Y17 and -Y18 in the slewing platform.
Now the required valves for the crane function can be manually actuated.

The following crane movements can be carried out:

Support	Fold out / fold in
Support	Up / down
Crawler carrier	Incline
Slewing gear support	Turn left / right, brake

D A N G E R : The following points must be observed in emergency operation :
The emergency operation may only be carried out by authorized personnel.
There may be no persons within the danger zone of the crane.
Each individual crane movement may only be carried out with utmost care and caution.
The keyed button -S346 and the switch -S347 may only be actuated if the electronic failed.

Note: In crane operation (no emergency operation) , the keyed switch -S346 and the switch -S347 must be turned off.

D A N G E R : Under no circumstances may the operator use the emergency operation to bypass safety shut offs of the LICCON if the crane is functioning.
There is a danger of accidents!

If a movement cannot be slowed down or shut off by taking back the manual control lever or by releasing the corresponding button, then the crane must be shut down immediately with the EMERGENCY OFF button.