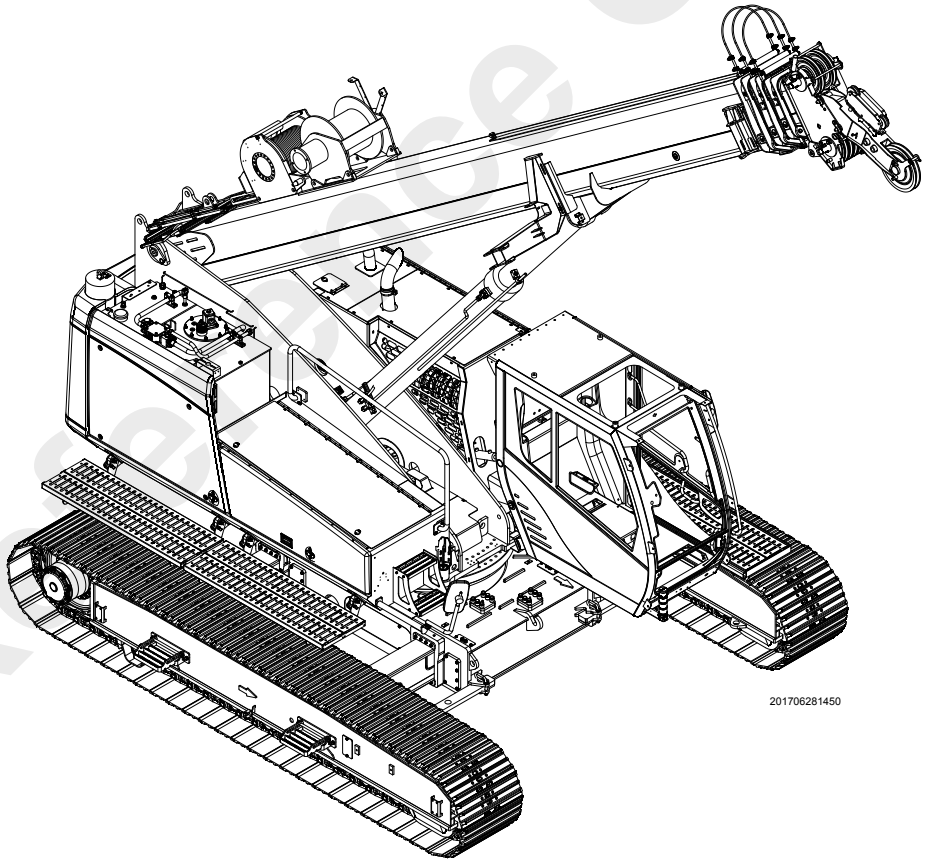
Operation manual

GHC 30

Telescopic crane



Before commissioning read the manual completely!

1.2 undercarriage

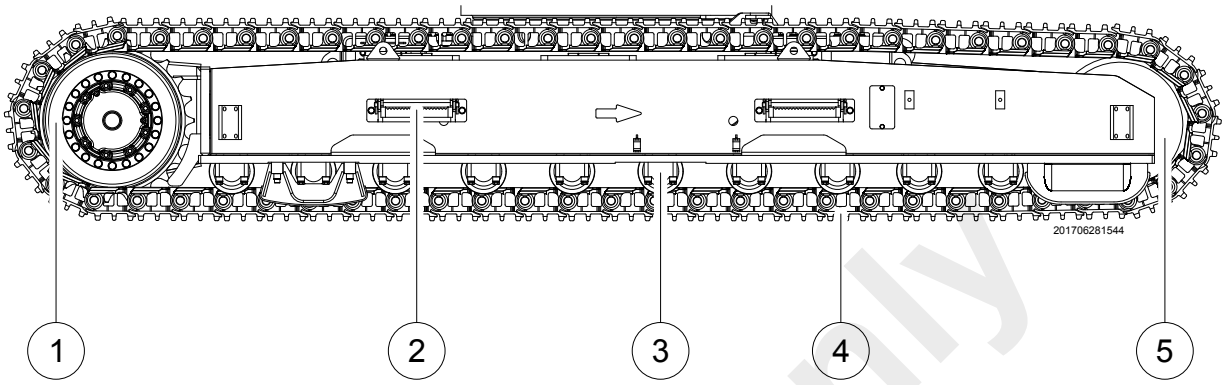


Fig. 2: Components of the undercarriage

1 Idler (forward direction of travel)
2 Access ladder, folding
3 Track roller
4 Drive wheel (rear, in direction of travel)
5 Crawler track

⚠ WARNING

Danger to life from fire and explosion caused by highly inflammable liquids!

- **Do not handle near open flame, fire or any source of ignition.**
- **Take steps to prevent electrostatic discharge.**
- **Keep appropriate extinguishing agents (fire blanket, fire extinguisher with CO^2, powder or foam) on hand.**
- **Take steps to prevent the buildup of flammable vapors in lower-lying or enclosed areas.**
- **In case of fire, stop working immediately. Leave the danger area and notify the fire department. Stay out until you are told it is safe to return.**
- **Keep the machine clean. Remove soiling, especially from fuels and lubricants, as soon as possible.**
- **Have damaged fuel and hydraulic lines replaced. Do not start the machine.**

Fluids used and their emissions can form an explosive mixture when in contact with air and, if ignited, can cause death or serious injury.

⚠ DANGER

Risk of death from electric shock!

- **Only qualified electricians may work on the electrical system.**
- **If there is damage to insulation, disconnect power immediately and arrange for repairs.**
- **Make sure live parts in electrical systems and equipment are dead before working on them and secure them for the duration of repairs. Follow the five safety rules:**
  - **Disconnect power.**
  - **Secure against reconnection.**
  - **Verify that the system is dead.**
  - **Ground and short-circuit the system.**
  - **Provide protection from adjacent live parts.**
- **Never bypass or disable fuses. When replacing fuses, be sure to use the correct amperage.**
- **Keep live parts dry. Damp live parts can result in a short-circuit.**

Touching live parts can result in death or serious injury from electric shock. Damage to insulation or individual parts can be fatal.

2.6 Danger zone

⚠ WARNING

Risk of injury inside machine danger zone.

- **Make sure no one is in the danger zone.**
- **Keep a safe distance from the danger zone.**
- **The operator should warn persons of any hazards.**
  - **Shut down the machine if persons do not leave the danger zone despite this warning.**
- **Only the operator should be on the machine while it is in operation.**
- **If the operator's view is restricted while driving and working, a banksman should be used. The communication between the banksman and the machine operator must be ensured.**
- **Cordon off the area between solid structures and the work area of the machine.**
- **Observe the instructions of the operating manual.**

Persons in the danger zone can be crushed by the machine while it is in operation or struck by falling parts. This can result in serious injury or even death.

⚠ WARNING

Risk of death when exceeding configured working range.

- **Keep an extra safe distance from persons, machinery and structures near the configured working range.**
- **Move the machine slowly and carefully.**

If machine motions are executed quickly when an optional work area limitation is used, the set work area can be exceeded. This can cause death or serious injury. The machine or nearby structures may be damaged.

⚠ WARNING

Risk of injury due to the machine overturning.

- **Particularly observe the instructions of this operating manual as regards the following areas:**
  - **Load-bearing capacities**
  - **The required condition and safe load-bearing capacity of the ground**
  - **Ground inclination**
  - **Distance from embankments and excavations**
  - **Concealed deficiencies of the ground (old basement, vault, etc.)**
  - **Maximum wind speeds**
  - **Travel with and without load (permissible incline, ground conditions, uppercarriage and boom position)**

Persons can be caught and injured by a machine that is overturning. The danger zone corresponds to the height of the equipped machine with the boom at a steep angle.

The danger zone is the area in which persons can be injured or tools, attachments or loads can be damaged. The danger zone shifts with the travel movements.

Possible danger zones include:

The use of sulfur-free fuel in accordance with EN 590 or ASTM D975 S15 is strictly required for engines subject to EU Stage IV and US EPA Tier 4 Final emission standards. The fuel quality requirements are indicated on an information sign on the diesel tank filler neck. Observe the information in the operating manual for the engine.

NOTICE

Risk of engine damage due to use of high-sulfur fuels.

– Only use fuel with a sulfur content of up to 15 mg/kg.

Fuels with increased sulfur content can cause serious damage to the engine and the exhaust aftertreatment system. This can invalidate the emission certification of the diesel engine and can result in legal consequences for the owner.

The use of fuels with a sulfur content greater than 15 mg/kg is permitted under certain circumstances for engines subject to EU Stage II or IIIa and US EPA Tier 2 or 3 emissions standards. This however requires the use of an engine oil with special properties matched to this requirement. Engine oil filled at the SENNEBOGEN factory is not suitable for this use and must be replaced. Observe the instructions in the operating manual provided by the engine manufacturer.

2.12 Engine oil

The SENNEBOGEN factory filling of engine oil is selected for use with sulfur-free diesel fuel with a sulfur content of <15 mg/kg.

For engines at the EU exhaust level Stage IV and US EPA Tier 4 final the use of low-ash engine oil of the specifcications ACEA E9-08 or API CJ-4 is stricktly required. Observe the instructions in the operating manual for the engine.

NOTICE

Engine damage due to use of wrong engine oil!

– Only use engine oils with the specifications ACEA E9-08 or API CJ-4 for engines of exhaust level EU Stage IV and US EPA Tier 4 final.

The use of not permitted engine oils by motors of the exhaust level EU Stage IV and US EPA Tier 4 final damage the exhaust aftertreatment system. This can invalidate the emission certification of the diesel engine and can result in legal consequences for the owner.

The use of engine oils with a specification other than ACEA E9-08 or API CJ-4 is permissible for engines of exhaust level EU Stage II or IIIA and US EPA Tier 2 or 3.

Fig. 15: Sticker, speed limitation

The speed limitation sticker of the diesel engine must be undamaged and free from soiling.

Permitted diesel engine inclinations

Left	Right	Front	Rear
30°	30°	30°	30°

Sufficient oil levels in the engine cannot be guaranteed at greater inclinations. Additional information on the diesel engine is available in the manufacturer's operating manual.

3.6 Electrical system

Battery voltage	24 V
Batteries	2 x 155 AH

3.7 Work speed

Travel speed	2,5 km/h (1,55 mph)
Slewing speed - uppercarriage	2 U/min, infinitely variable

3.8 Hydraulic system

Delivery rate	max. 74 US.lig.gal./min (max. 280 l/min)
Operating pressure	4786.2 psi (330 bar)

3.9 Vibration

The alarm values for hand-arm vibration (2.5 m/s^2) and for full-body vibration (0.5 m/s^2) are not exceeded.

Check if...	For example:
... the forthcoming usage corresponds with the technical machine data.	In the case of forthcoming crane usage, the required load capacity, reach and hook height must be determined.
... there are external requirements for work in the work site.	In the case of wind, snow, unfriendly temperatures and/or bad visibility, check the effects of these on the machine and its use in the work site.
... all machine parts are fit for operation.	
... the ground conditions are viable for the maximum machine load.	
... in the area of application and during the forthcoming period of use, particular dangers may arise which require special safety measures and/or particular equipment. ■ Toxic gas ■ Overhead power lines ■ pits ■ High-voltage lines ■ Ground wires	
... all danger areas marked and secured in the work site.	

4.2.2 Pontoon operation

Safety instructions

- Only operate the machine on a pontoon after first consulting with your SENNEBOGEN Service Partner.
- Prevent the machine from slipping on the pontoon.
- All safe working loads only apply for free hanging loads and for the specified wind speeds.
- Traveling with a load is **not** permitted.
- The pontoon must have sufficient load bearing capacity and sufficient dimensions. This is the responsibility of the machine owner.

5.2 Overview of the operating elements

5.2.1 Overview

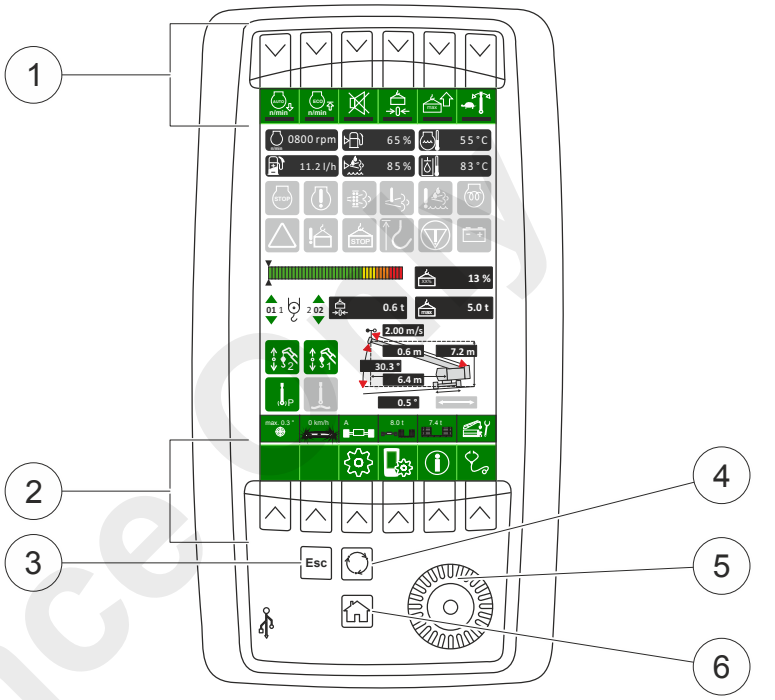


Fig. 26: SENCON control elements

	Control element	Explanation
1	Quick-select buttons and quick-select icons	Quick-select icons are activated or deactivated by the corresponding quick-select buttons.
2	Menu buttons and menu icons	Menus are opened by the corresponding menu button.
3	ESC button	Cancel action. Return to higher-level menu.
4	SET button	Confirm settings.
5	SCROLL wheel	Turning the SCROLL wheel selects between individual windows and menu items, and scrolls through lists.
6	HOME button	Return to start screen.

Icon	Possible statuses	Explanation
		Gray: ■ No error.
		Orange: ■ Check error number in Diagnostics window. ■ Contact your SENNEBOGEN-Service Partner.
		Orange: ■ Check error number in Diagnostics window. ■ Contact your SENNEBOGEN-Service Partner.
		Red: ■ Check error number in Diagnostics window. ■ Contact your SENNEBOGEN-Service Partner.
		The emergency stop is deactivated. All machine functions are available.
		The emergency stop is activated. The machine is shut down.

5.3.7 Working diagram

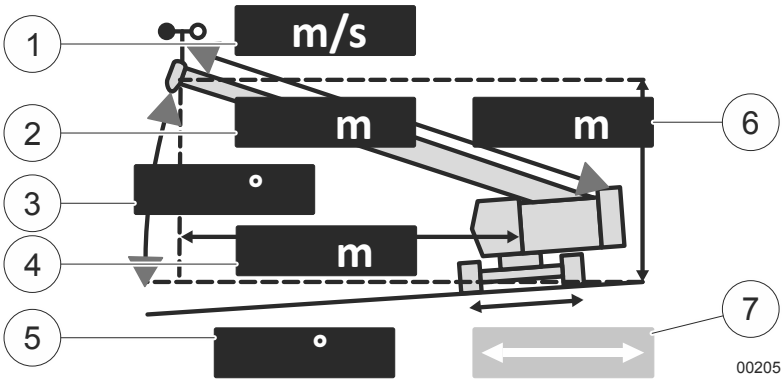


Fig. 28: Working diagram

1 Wind speed (option)
2 Telescopic boom length
3 Telescopic boom angle
4 Working radius
5 Machine inclination
6 Telescopic boom height
7 Outrigger monitoring/track width monitoring

5.7 Setting brightness

In the window **Set brightness** the brightness of the display and the buttons are selected.

Opening the brightness settings

1. Press the **Device settings** menu button.
2. Move the SCROLL wheel one position to the right.

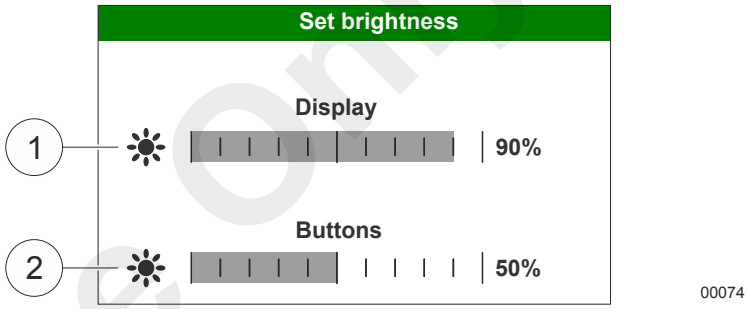
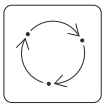


Fig. 39: Set brightness

1 Display
2 Buttons

Setting brightness

1. Press the SCROLL wheel.
   ⇨ A black frame indicates the selected brightness setting.
2. Turn the SCROLL wheel to the required brightness setting.
   - 1 Display
   - 2 Buttons
3. Press the SCROLL wheel to set the brightness.
   ⇨ The selection box is green. The brightness can be adjusted.
4. Turn the SCROLL wheel to adjust the brightness.



5. Press the SET button.

5.8 Setting date and time

The date and time are set in the **Date and time** window.

Opening date and time settings

1. Press the **Device settings** menu button.
2. Move the SCROLL wheel two positions to the right.

5.16.4 Opening

The current fault of the whole machine is indicated in the window **Active Faults Machine**.

Opening Active faults machine

1. Press the **Diagnostics** menu button.
2. Move the SCROLL wheel two positions to the right.

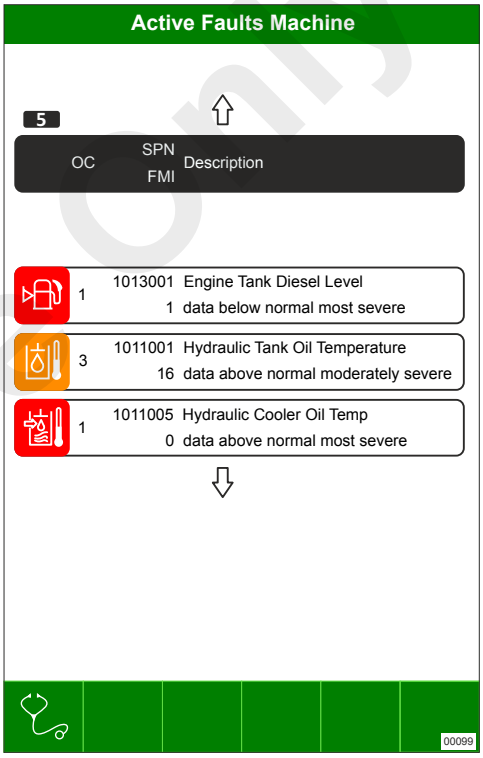


Fig. 51: Active Faults Machine diagnostics window

6.3 Start-up

Safety instructions

⚠ WARNING

Danger of serious injury and machinery damage if machine not checked!

– **Perform routine inspections of the machine according to the maintenance schedule before start-up.**

Failure to properly perform routine maintenance can result in unexpected functioning. As a result, people in the danger zone could be seriously injured.

⚠ WARNING

Danger of serious injuries to people in the machine's danger zone!

– **Ensure that there is no one located in the danger zone of the machine before startup.**

People in the machine's danger zone could be caught by machine movements and seriously injured.

→ Before starting up the control activites in accordance with section *Engeine and attachments controlls*. See section *↳ Chapter 4.3.3 “Check machine and accessory equipment” on page 65*.

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6.4 Shift position of the ignition lock

The ignition lock will only function once the battery disconnect switch (option) has been turned on. See section ↳ Chapter 6.3 “Start-up” on page 111. The ignition lock cannot function when the battery disconnect switch is off.

Fig. 56: Ignition lock

Ignition key position	Meaning
P	Enable fuel pump
0	Ignition OFF
I	Ignition ON
position	Starting the diesel engine

6.5 Adjusting the driver seat

The machine is equipped with an air-suspended driver seat that can be adjusted to the operator's individual requirements.

The following description of the driver seat contains optional functions.

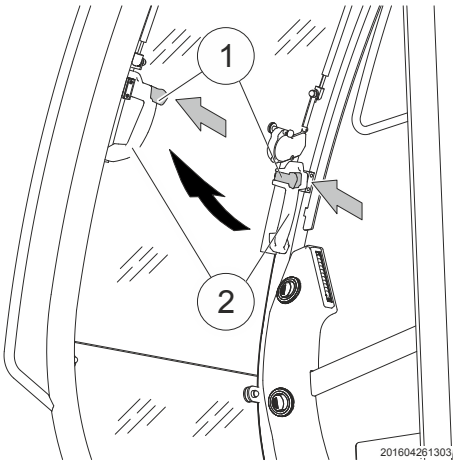


Fig. 74: Opening the windshield

1. Press locking mechanism (1).
2. Push grapple (2) forward.

6.9.2 Closing front windshield

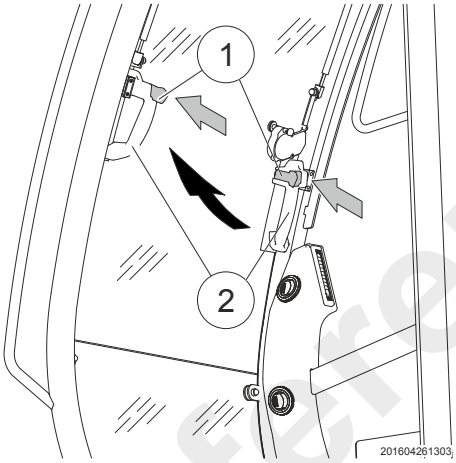


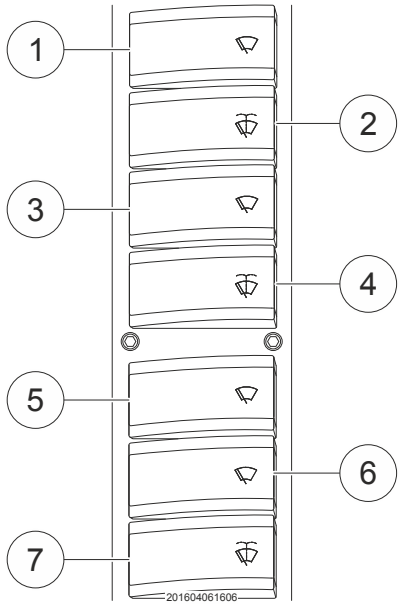
Fig. 75: Windshield

Raise grapple (2).

⇨ Make sure the windshield audibly locks into both locking mechanisms (1).

The windshield wiper switch has three settings.

6.15.2 Overview of windshield wiper switches



1 Windshield wiper, upper windshield
2 Washer system, upper windshield
3 Windshield wipers, glass roof panel
4 Washer system, glass roof panel
5 Windshield wiper, lower windshield
6 Windshield wipers, rear window
7 Washer system, rear window

Fig. 82: Windshield washer system

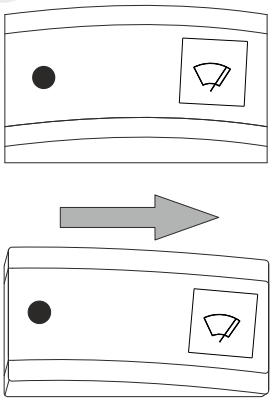
6.15.3 Switching windshield wiper on and off

NOTICE

Damage to windshield wiper arm due to incorrect operation.

– **Never activate the windshield wiper with the windshield open.**

If the windshield wiper is activated with the windshield open, the windshield wiper arm can be damaged.



1. Turn the ignition key to the position **I**.
2. Turn the switch to the middle setting.
   ⇨ The windshield wiper wipes slowly.
3. Turn the switch to the right.
   ⇨ The windshield wiper wipes quickly.

- The weight of the load handling devices must be subtracted from the maximum safe working loads. Load-handling devices are:
  - Suspension gear
  - Traverses
  - Load hook
  - Bottom hook blocks
  - Hoisting ropes between bottom hook block and pulley head
- Have the malfunction remedied as quickly as possible.

6.20.2 Mode of operation

The LML gives the operator information needed to operate the machine within the operating ranges specified by the manufacturer.

The operator's experience, prudence and judgment are required to ensure safe operation of the LML.

Using sensors, the LML monitors machine functions and continuously provides the performance data of the machine to the operator. This data changes continuously as the machine moves. When the machine approaches the maximum load rating, the LML warns the operator via a warning tone and a visual signal.

If the machine reaches the inadmissible area of operation, any machine movements which increase the machine load moment are shut down. In order to unload the machine after the LML is tripped, the **Lower loads** and **Retract telescopic boom** movements can still be executed.

Joystick assignment

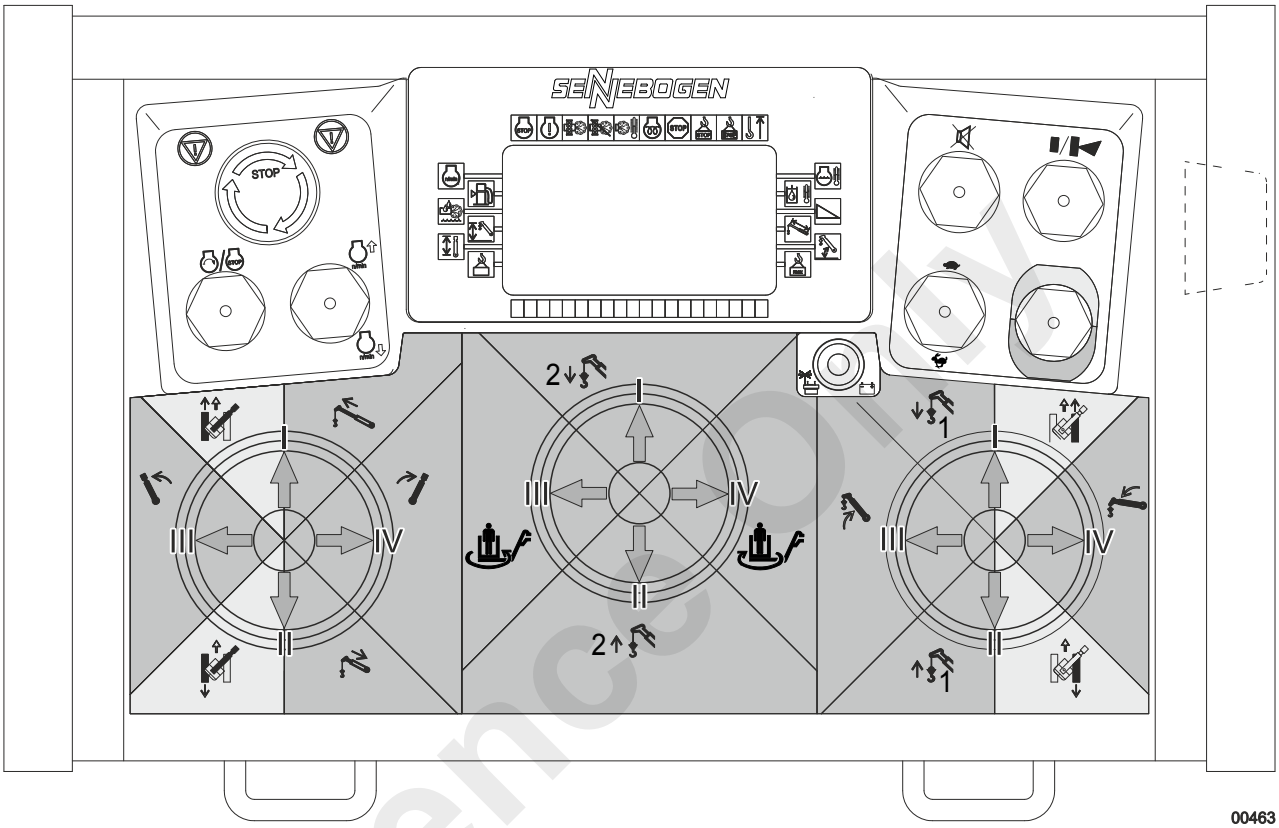


Fig. 92: Joystick assignment of remote radio control

Left joystick		Center joystick		Right joystick	
I	Extend boom Drive left crawler forward	I	Lower winch 2	I	Lower winch 1 Drive right crawler forward
position	Retract boom Drive left crawler backward	position	Raise winch 2	position	Raise winch 1 Drive right crawler backward
III	Slew uppercarriage left	III	Slew elevating work platform right	III	Lift boom
IV	Slew uppercarriage right	IV	Slew elevating work platform left	IV	Lower boom

*The switch **telescopic switching - winch 2** and **switching winch 1 - winch 2** on the control panel in the cab are not functioning when the remote radio control is in use. The radio remote control of traveling drive is disabled when the lifting working platform is attached.*

6.28 Drive mode

6.28.1 Uppercarriage locking mechanism

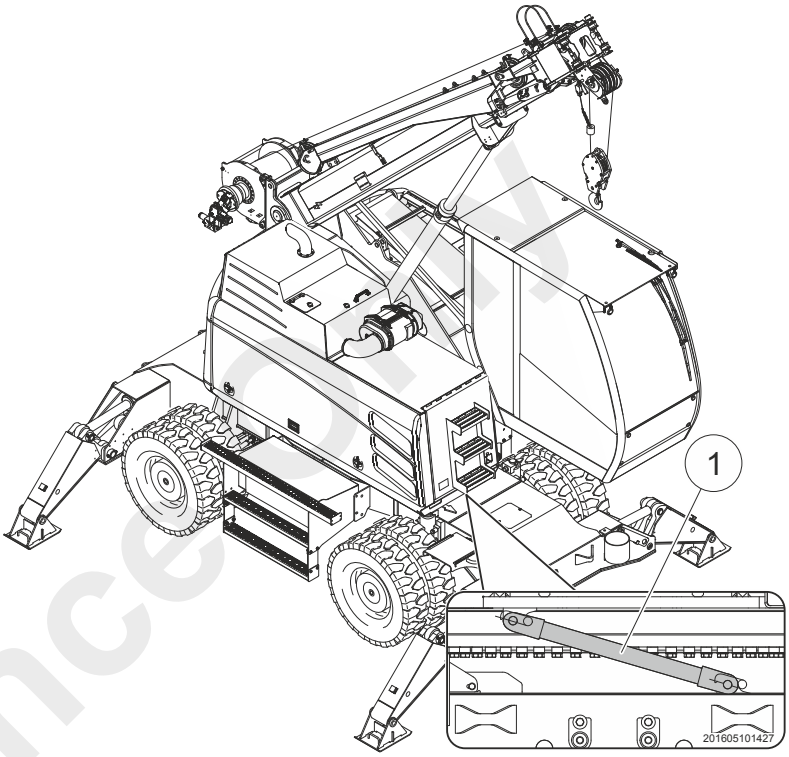


Fig. 99: Uppercarriage locking (example representation)

→ Bolt and secure the locking bar (1) to the undercarriage and the uppercarriage.

6.28.2 Securing the bottom hook block to the undercarriage

NOTICE

Risk of damage to the machine due to bottom hook block swinging while driving.

– Secure the bottom hook block.

If the bottom hook block begins swinging while driving, machine components may be damaged.

NOTICE

Risk of damage to machine due to too much tension in hoist rope.

– Slowly and carefully tension the hoist rope.

If the hoist rope tension is too high when securing the bottom hook block, machine components may be damaged.

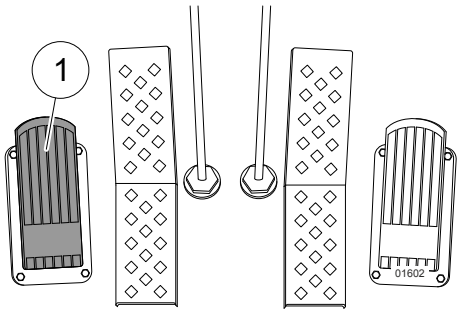


Fig. 105: Slewing gear service brake

1. Release the joysticks in middle position.
2. Step on the slewing gear brake pedal (1).

Tactful steering in the opposite direction with the left joystick strengthens the breaking action.

Slewing gear freewheeling

The slewing gear freewheel is not suitable for work where space is limited.

When the slewing gear freewheel is engaged and the slewing uppercarriage of the left joystick is released, the uppercarriage slews itself again with uninterrupted speed.

The slewing gear freewheel protects the slewing gear from excessive strain. T

When the slewing gear freewheel is engaged, the slewing gear service brake remains disengaged.

When the slewing gear freewheel is engaged, uppercarriage slewing can be stopped with the slewing gear brake pedal or by moving the left joystick in the opposite direction.

When the **load moment limitation** of a uppercarriage incline is set at more than 0.3° in the SENCON window, the slewing gear freewheel is not available.

Slewing gear freewheel statuses

Icon	Explanation
	Slewing gear freewheel disengaged.
	Slewing gear freewheel engaged.
	Slewing gear freewheel not available. If an uppercarriage inclination of more than 0.3° is set in the **Load moment limitation** window, the slewing gear freewheel cannot be engaged.

Avoiding rope slack

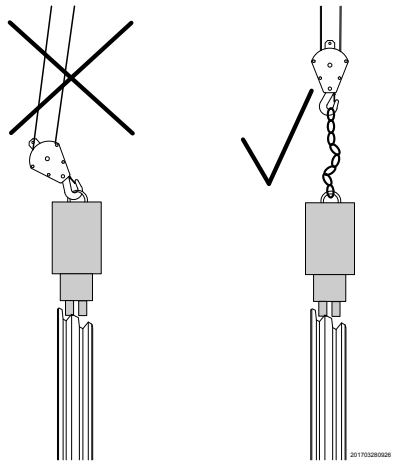


Fig. 114: Avoiding rope slack when driving pile elements

NOTICE

Rope slack

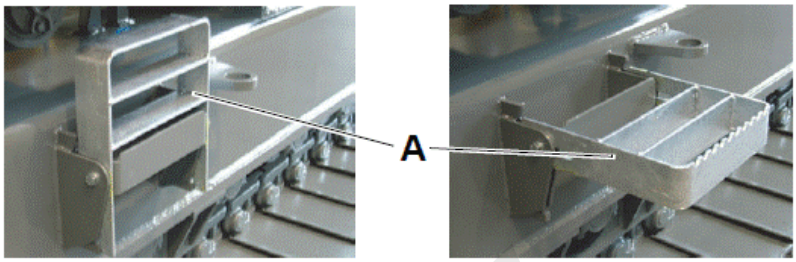
- **There is a risk of the rope becoming slack as soon as the load hook / bottom hook block - as minimum weight - is no longer freely suspended by the hoisting rope.**
- **If the hoisting rope is slack, it is no longer ensured that it is wound tightly onto the rope drum.**
- **If the hoisting rope is not wound tightly, it may be subject to load jerks and uncontrolled load when being led out, causing damage to the rope.**
- **Do not let the load hook rest on the load / pile driving equipment.**
- **Fit hoisting equipment (chain) between the load hook of the carrier and the pile driving equipment for length adjustment in order to avoid rope slack as well as tensile force on the pile driving equipment during driving operation.**
- **Never suspend the full weight of the pile from the load hook while driving or removing piles.**
- **The load suspension device must not be subject to tensile force when driving piles by means of vibrator implement.**

Avoiding rope slack when driving pile elements

6.30 Parking the machine

1. Park the machine on level, solid ground.
2. Align the uppercarriage with the undercarriage.
3. Lower attached loads.
4. If necessary, fully lower the cab.

Machines with inclinable cabs Set inclinable cab to 0°.



There are access ladders (A) on both sides of the machine. These must be folded out while working.

Folding out a step

1. Pull step A upward.
2. Slowly lower step A until it rests in horizontal position.

Stowing a step

1. Lift the lowered step (A) until it is completely against the side wall.
2. Pull step A upward and then lower it.

7.5 Setup mode

Operating modes are selected on the SENCON.

The operating mode **Setup** is used for the following setup tasks:

- Reeving.
- Setting up the auxiliary jib.
- Setting up the (SA 6,5 / SA 13) fly boom.
- Setting up the elevating work platform

Certain operating parameters must be configured on the SENCON in order to use operating mode **Setup 1**.

Once setup is complete, the operating parameters must be set according to the machine configuration.

The operating mode is outlined at linktarget [pdfID_946fc6ab5d6611e78689d0fb5356eb2e-c6a41f361b3502100a0000260e1fd02f-en-US] doesn't exist but @y.link.required='true'.

7.13 Attaching the fly boom (6.5 m)

⚠ WARNING

Risk of falling.

- **Use a ladder with a minimum height of 1.40 m (4.6 ft) to insert/remove the bolts.**
- **Do not climb onto the boom.**

Climbing on the boom can result in a fall causing serious injury or death.

1. Enter the cab.
2. Start the diesel engine.
3. Fully extend the undercarriage.
4. Select **Setup 1** operating mode on the SENCON.
5. Push the safety lever forward.
6. Place the bottom hook block on the ground.
7. Unreeve the hoist rope from the pulley head and bottom hook block and wind it into the winch.
8. Lower the telescopic boom to 0° and retract it.
9. Switch off the diesel engine and pull the safety lever towards you.
10. Attach the fly boom to an auxiliary crane with suitable lifting gear.

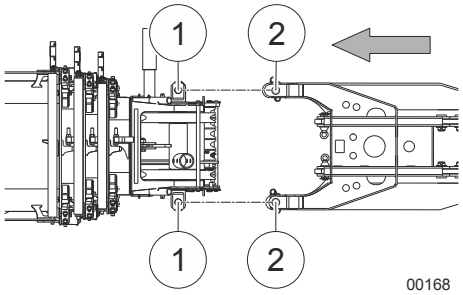
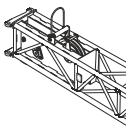


Fig. 134: Lifting the fly boom to the telescopic boom

11. Lift the fly boom to the head of the telescopic boom.
12. Align the fly boom to the telescopic boom head.
    ⇨ The bores of the fly boom (2) and the telescopic boom (1) must be in line.



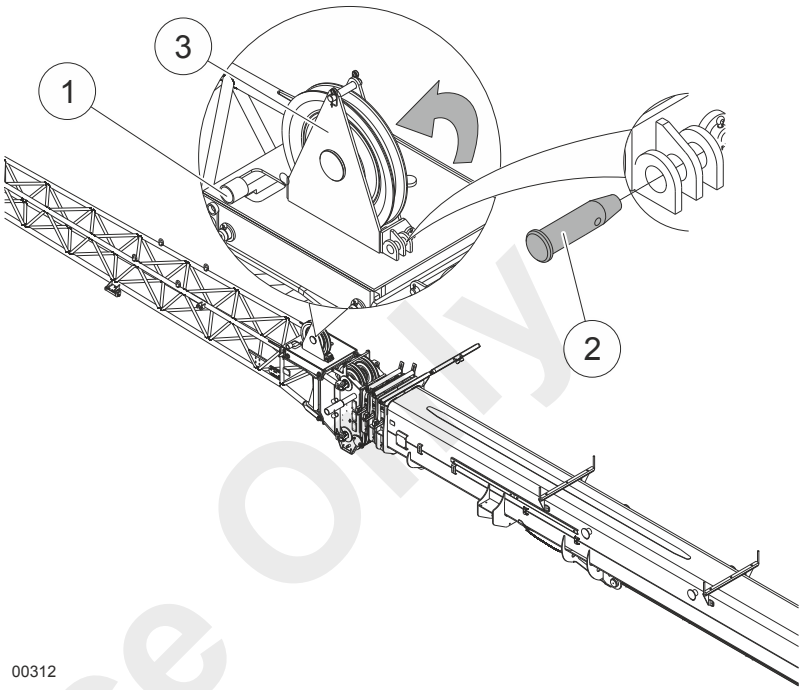


Fig. 153: Folding up the deflection sheave

23. Remove the bolt (2) from the retainer (1).

24. Fold up the deflection sheave (3).

25. Bolt down and secure the deflection sheave with the bolt (2).

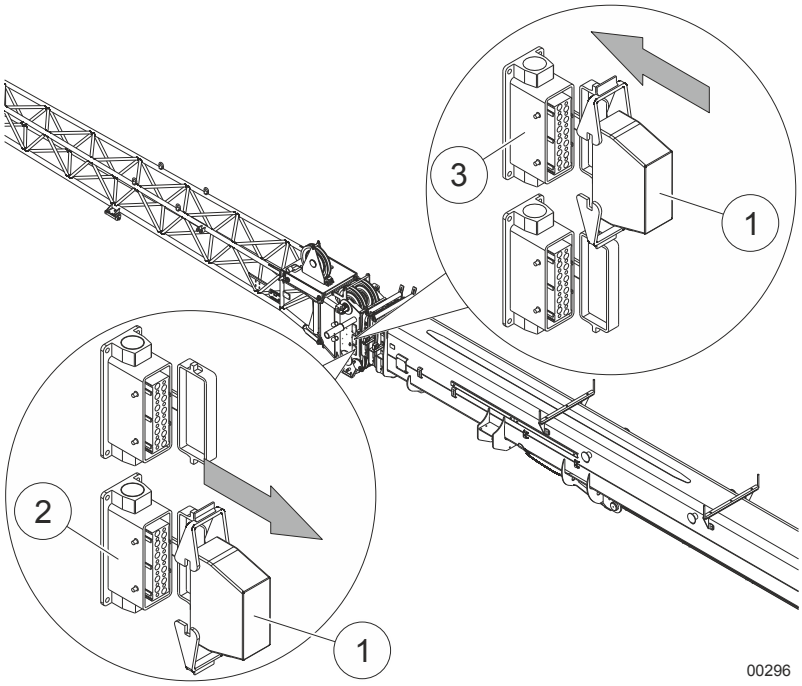


Fig. 154: Inserting the bypass plug on the telescopic boom

26. Remove the bypass plug (1) from the lower bush (2) and insert it into the upper bush (3).

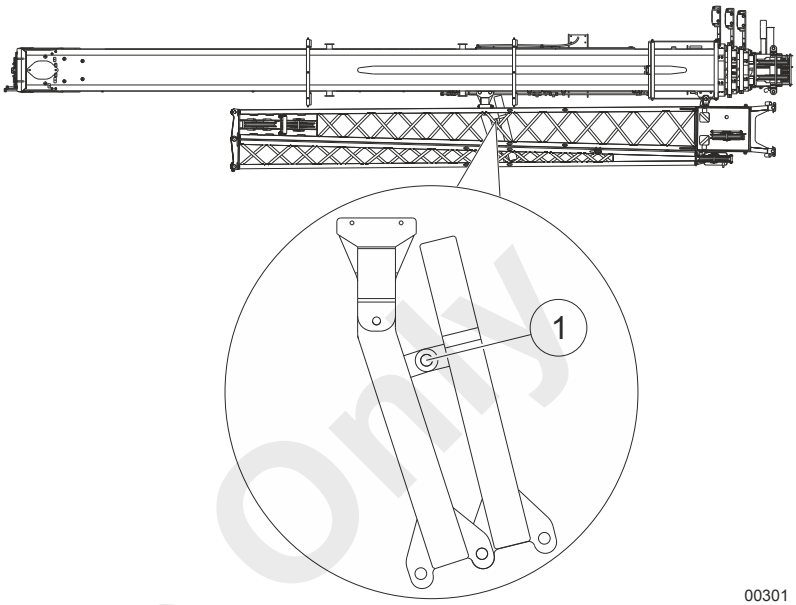


Fig. 173: Bolting the ramp in transport position

30. Insert and secure the bolt (1) on the ramp.
31. Release the rope from the fly boom.
32. Reeve the hoist rope on the telescopic boom.
33. Attach and secure the lifting limit switch to the telescopic boom.
34. Reeve the bottom hook block.

7.16 Folding the fly boom from 0° to 40°

When folding in the fly boom, it slides approx. 1.5 m (4.9 ft) on the support toward the machine.

5. Place the bottom hook block on the ground.
6. Unreeve the hoist rope from the pulley head and bottom hook block and wind it into the winch.
7. Lower the telescopic boom to 0° and retract it.
8. Switch off the diesel engine and pull the safety lever towards you.
9. Remove the lifting limit switch of the fly boom extension from the fly boom and insert it in the storage socket of the fly boom extension.

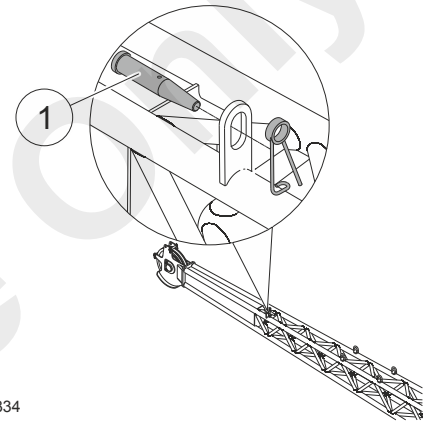


Fig. 190: Releasing the bolt on the fly boom extension

10. Release and remove the bolt (1) on the fly boom extension.

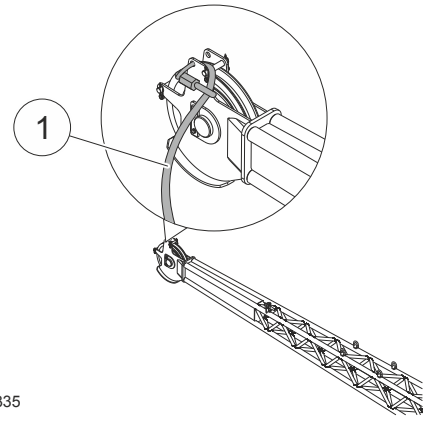


Fig. 191: Attaching a rope for pulling the fly boom extension around

11. Attach a rope (1) to the boom head of the fly boom extension.

⚠ WARNING! Risk of death from swinging fly boom.

- **Observe the deadweight of the fly boom.**
- **Ensure that no one is in the danger zone. The pivot radius must be at least 10 m (32.8 ft).**

The fly boom can swing off its support at high speed and severely injure anybody in its swing range.

12. Check the boom angle. The angle of the boom must be 0°.

⚠ WARNING

Risk of serious injury due to improper driving or unloading of the transport vehicle!

- **Only drive and unload transport vehicles with the help of a busman.**
- **Only drive straight on the loading area and ramps of the transport vehicle and do not swivel the uppercarriage.**
- **Lock the uppercarriage at 0°.**

If the transport vehicle is driven incorrectly, this can lead to uncontrolled machine movements or the machine tipping over. This can cause serious injury.

Dimensions and weights, see ↳ Chapter 3 “Technical data” on page 47.

- Keep loading area and ramps of the transport vehicle, as well as, in particular, the undercarriage of the machine, free from mud, snow, and ice.
- Select a suitable transport vehicle. Observe the machine's loading dimensions.
- If needed, remove or unfold the fly boom, completely secure.
- Secure the bottom hook block against swinging.
- Take note of the transport vehicle's load capacity.
- Secure machine and work tools to the transport vehicle.
- Secure the machine, work equipment, and required auxiliary equipment, such as ramp parts and wooden planks, against unplanned movement during loading and transportation.
- Completely lower cab.
- Only load the machine on flat and sufficiently load-bearing ground.
- Only transport the machine on the designated lashing points and lifting points.
- Before transporting, ensure that the route is suitable for the weight and size of the machine to be transported.
- Adjust the minimum track width of the undercarriage.
- Stow or remove the walkways and deploy the railings.
- Only have authorized personnel execute loading and transport tasks.
- Observe the applicable regulations on securing loads.

The respective transport company is always responsible for the transport of machine and accessories. In every case, ensure that the machine does not pose any hazards to other traffic participants.

8.2 Unloading the machine

8.2.1 Setup mode

Operating modes are selected on the SENCON.

9 Maintenance schedule

Interval	Maintenance work	Personnel
Particular interval: during hydraulic oil change	Change the hydraulic tank's oil leakage filter	Service Technician
Particular interval: after the 5th Change the air filter’s primary element	Change the filter element (secondary element) of the air filter	Service Technician
Particular interval: in accordance with the display	change the air filter's filter element (main element)	Service Technician
	Check water separator (fuel) and drain if necessary	Service Technician The machine operator
Particular interval: as required	clean the DEF tanks filling filter	Service Technician The machine operator
Particular interval: before/after long usage periods,	check the pressure roller on the winch	Service Technician The machine operator
	change the DEF supply module return filter	Service Technician
	change the DEF supply module inlet filter	Service Technician
Every 10 OH / daily	Check winch gear oil	The machine operator
	Lubricate the track and gears of the slewing ring.	The machine operator
	Carry out a visual and functional check of the entire machine (in accordance with the manual): In particular, visually check the safety-relevant bolts, screw connections, rope, and cylinder, for general damage to the steelwork	The machine operator
	Check diesel fuel level	The machine operator
	Check fill level of the windshield washer system	The machine operator
	Checking the diesel engine oil level	The machine operator
	Checking the coolant level	The machine operator
	Check DEF fill level	The machine operator