Operating Instructions

KMK 6200

Vehicle Identification Number:

15.12.1997
(18.06.1993)

2 085 940 en

1.2 Contents

This section (**Section 1**) contains a **general drawing** of the truck crane with the terms used for the main assembly groups. A short technical description explains how the most important units work.

We have placed particular emphasis on the description of **how to work safely** with the truck crane. This advice, which concerns driving and working with the truck crane, is given together with general notes regarding safety in **Section 2**.

Section 3 contains the operating instructions for **driving the truck crane**. This section gives a description of the condition in which the truck crane may be driven on roads (the transport condition), preparing to drive the truck crane and driving.

Section 4 describes **operation of the crane** starting with preparation of the job on the site and including rigging and unrigging the crane.

Section 5 gives instructions for **working with the two-stage swing-away lattice extension** (optional equipment). Installation, operation, removal and transportation are described in this section.

Section 6 gives instructions on the action which should be taken if the **crane is not working** properly and contains notes on how to rectify some malfunctions.

Section 7 lists the **technical data** of the truck crane.

Care and maintenance of your truck crane are described in the **Maintenance Manual**. This does not include care and maintenance of parts manufactured by our suppliers (e.g. engine, gearbox) which are described in their own manuals supplied as part of the documentation.

Even if you are completely familiar with your KMK 6200 and can operate it without difficulty you will need to consult the **lifting capacity tables** frequently.

The **lifting capacity tables** contain the **lifting capacities**, **hook heights** and **SLI codes** for your crane, depending on how it is rigged.

Electric, hydraulic and compressed-air circuit diagrams are supplied with each copy of the operating instructions in addition to operating instructions for the diesel engines. Maintenance booklets with the identification cards for the diesel engines are also supplied with your crane.

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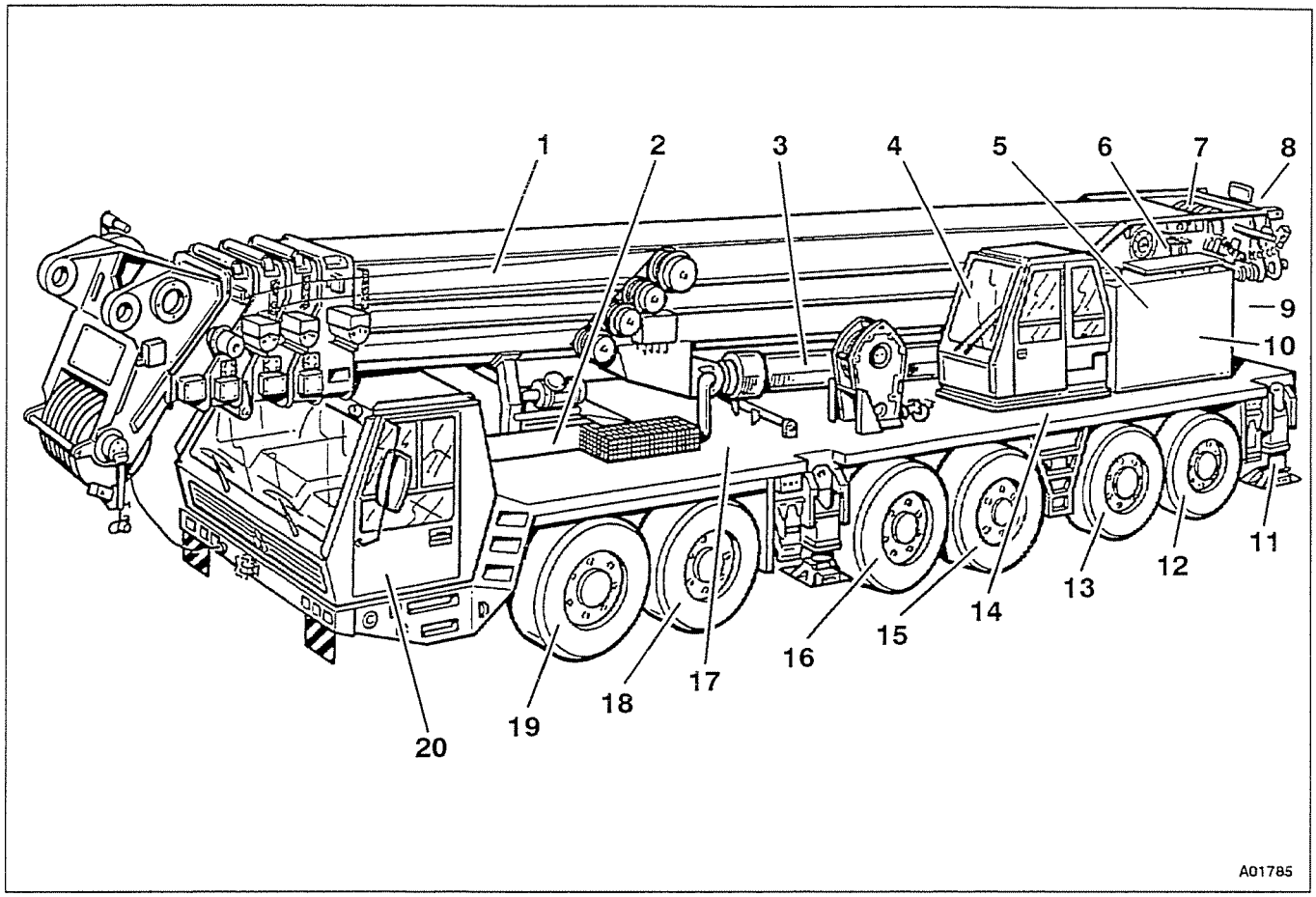
1.5 General drawing of the truck crane



1	Main boom	11	Outrigger
2	Carrier engine	12	Sixth axle line, steered
3	Derricking cylinder	13	Fifth axle line, steered and driven
4	Crane operator's cab	14	Slewing gear
5	Crane engine	15	Fourth axle line, driven
6	Hydraulic oil cooler (optional equipment)	16	Third axle line, steered
7	Main hoist	17	Carrier
8	Auxiliary hoist (optional equipment)	18	Second axle line, steered and driven
9	Counterweight	19	First axle line, steered and driven (drive can be activated)
10	Tank for crane's hydraulic system	20	Driver's cab

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2 Safety instructions

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Hand signals for the banksman

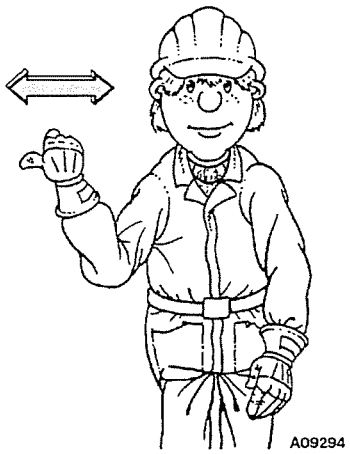
Banksmen and crane operators can also communicate using hand signals.
The banksman thereby indicates the movement to be carried out with the truck crane by giving the appropriate hand signal. The crane operator carries this movement out until the banksman gives the hand signal "stop" indicating that the movement is to be stopped.

All hand signals must be easily recognized even if the banksman is at some distance from the crane. For this reason the banksman has to have his arms next to his body for a number of the signals. If the banksman has his arms in front of his body the signals cannot be seen from a distance.

To prevent misunderstandings it is suggested that the banksman should use the following hand signals:

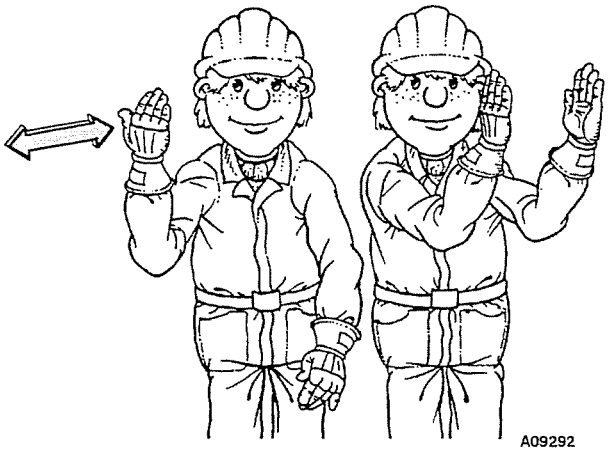
Hand signals for driving the truck crane
The banksman must stand in front of the truck crane.

Drive to the right
Sideways movements with arm bent.



Drive to the left
Sideways movements with arm bent.

Drive backwards
Hand movements with arm bent.



Drive forwards and indicating distance
Hand movements with arm bent. Where necessary indicate distance using both hands.

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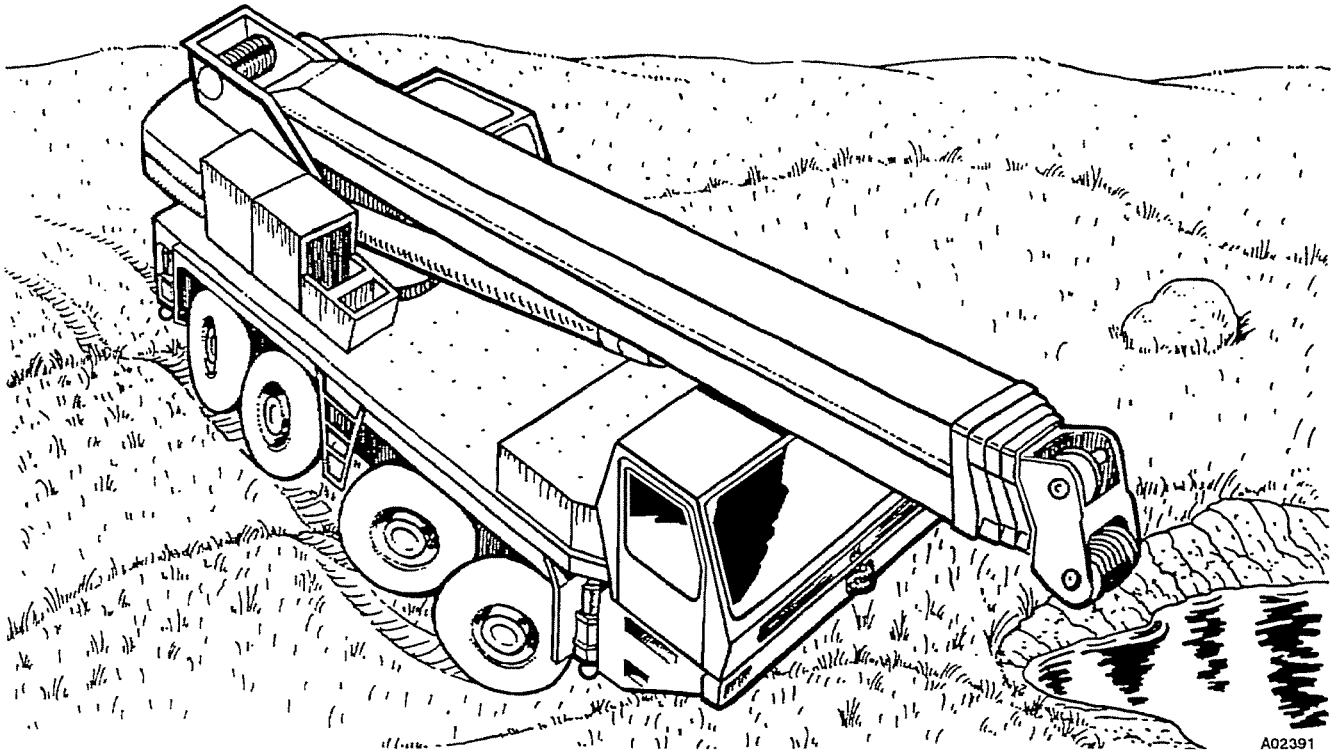
Driving off-the-road

You may only drive the truck crane off-the-road:
- with the boom placed on the boom support
- with the superstructure locked to prevent it from turning
- with the hook block secured so that it cannot swing



For driving off-the-road you must know the load-bearing capacity of the terrain and the axle loads of the truck crane. You must also know when the truck crane is no longer stable when it is on an incline. You may only drive over an obstacle (such as a large hump or step in the ground) in a straight line if you can be sure that the bottom of the truck crane will not touch the obstacle. If the obstacle cannot be driven over in a straight line you must drive over it diagonally.

Do not forget that if you are driving a rigged crane the total weight and individual axle loads may be higher than the weight and loads of the truck crane when it is driven on roads (please see "Driving the truck crane when it is rigged" in this section).

Use all the equipment on your truck crane designed to facilitate off-the-road driving.
Remember that driving too fast in uneven terrain may damage the truck crane. Do not take this risk. The more uneven the terrain, the more slowly you should drive.

The truck crane may only be towed free in the "backwards" direction.
Only attach the towing cable to the towing points provided on the truck crane. The truck crane may only be towed free by pulling it backwards in a straight line in its own tracks. It is forbidden to pull it jerkily or to the side. Towing can be assisted using the truck crane's own engine.

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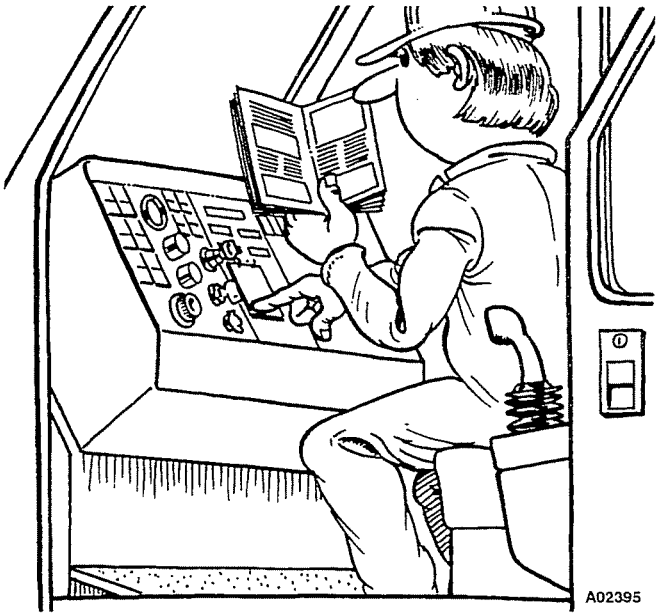
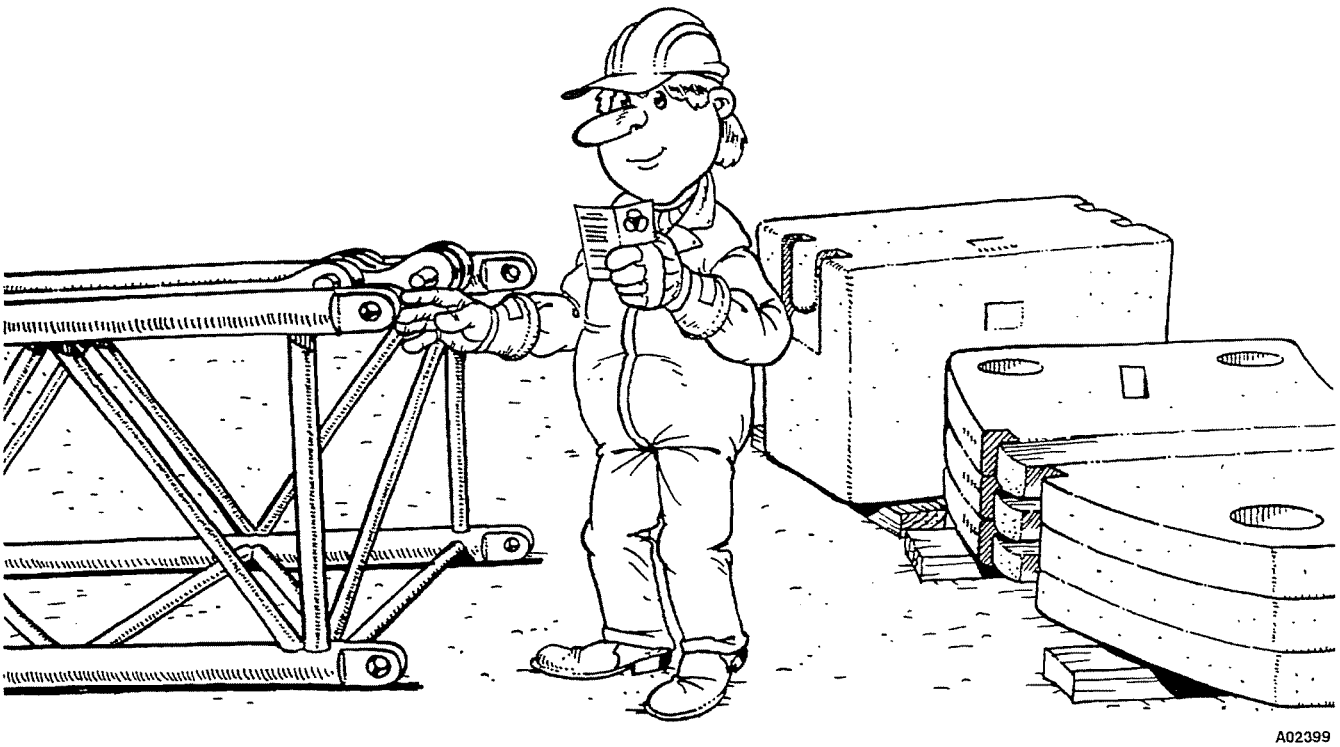


After starting the engine check all warning lights, control lamps and and instruments.
Carry out this check consulting the Operating Instructions.

Do not commence rigging the crane or working with the crane until the hydraulic oil is at operating temperature and you have checked all the crane functions.
Without a load on the hook, check that all crane functions (e.g. raising, lowering and telescoping the boom, slewing the superstructure, the hoists, fast speed, engine speed adjustment and brakes) are in perfect working order.

In particular check all safety equipment (e.g. SLI, lifting limit switch). Do not commence rigging the crane or working with the crane unless all the safety equipment is in perfect working order.



Only install the equipment belonging to your crane on your crane (e.g. boom extensions, counterweight sections).
Your truck crane and the equipment belonging to it have been designed to be used together. The crane and equipment belonging to it are marked with the same serial number. The truck crane may only be used with these parts.

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2.5 Using the crane under particular operating conditions

The following safety instructions for using the truck crane under particular operating conditions are supplementary to those given in the relevant sections of these Operating Instructions.

2.5.1 In winter

In extremely cold weather, ensure that moist or wet skin does not come into contact with any metal surfaces, otherwise the skin will freeze fast.

Before commencing crane operations remove any ice or snow from the truck crane.
The boom and load must also be cleared of ice and snow. The additional weight might overload your truck crane.

Never store either full or empty containers of agents to assist cold starts or any other inflammable liquids on your truck crane. Keep such containers away from heat, sparks and naked flames. Do not smoke when handling cold start agents or other inflammable liquids. If empty containers are pierced or burned they may explode.

When driving and working with the crane you may only wear gloves with fingers made of soft leather and with a lining which is not too thick. If you wear mittens or thick working gloves you will not be able to operate the controls properly. With gloves made of wool, cloth or synthetic material your hands might slip off the controls.

Consult these Operating Instructions for the recommended procedures for starting the engine at low temperatures. Do not start crane operations until the hydraulic oil is at operating temperature.

Before lifting a load make sure that it is not frozen to the ground or base it is resting on. Never attempt to pull free a load which is frozen fast, otherwise the crane may overturn.

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3 Driving

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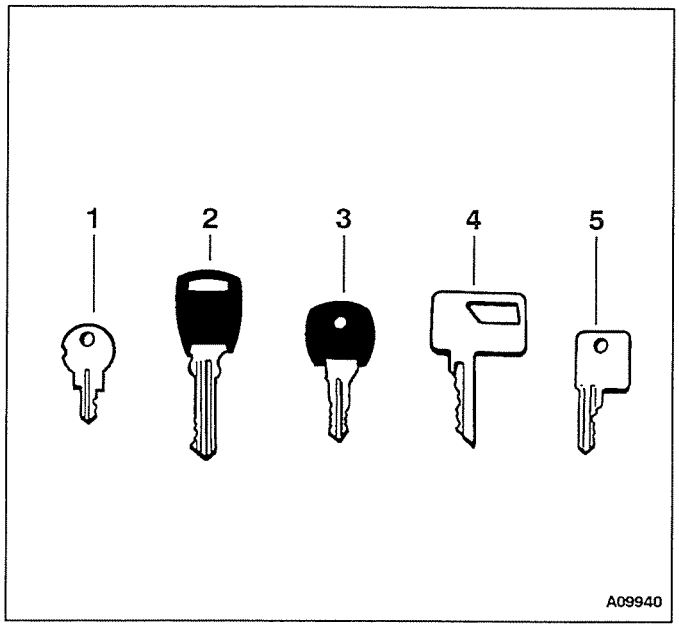
3.2 Driver's cab on the carrier

3.2.1 Doors and keys

Keys



The following keys are supplied for the carrier:

1 Key for locking trip recorder

2 Key for glove compartment

3 Door keys, driver's cab

4 Ignition key, driver's cab

5 Key for carrier level adjustment system

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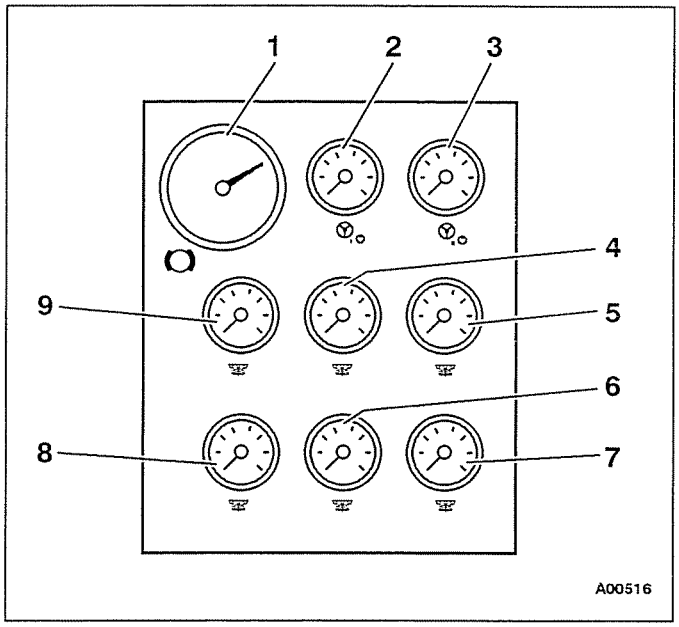


1 Pressure gauge "compressed air supply"

2 Oil pressure "steering circuit I"

3 Oil pressure "steering circuit II"

4 Operating pressure "suspension, right-hand side, third and fourth axle lines"

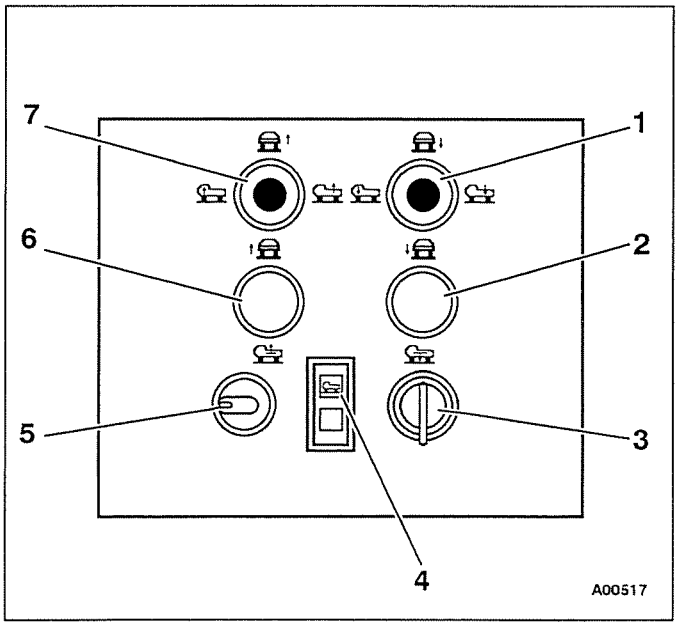
5 Operating pressure "suspension, right-hand side, fifth and sixth axle lines"

6 Operating pressure "suspension, left-hand side, third and fourth axle lines"

7 Operating pressure "suspension, left-hand side, fifth and sixth axle lines"

8 Operating pressure "suspension, left-hand side, first and second axle lines"

9 Operating pressure "suspension, right-hand side, first and second axle lines"



1 Joystick "carrier level adjustment system, lower vehicle"

2 Push button "lower vehicle"

3 Key-operated switch

4 Warning light "carrier not at on-the-road level"

5 Knob "on-the-road level"

6 Push button "raise vehicle"

7 Joystick "carrier level adjustment system, raise vehicle"

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3.4.9 Checking the tyres

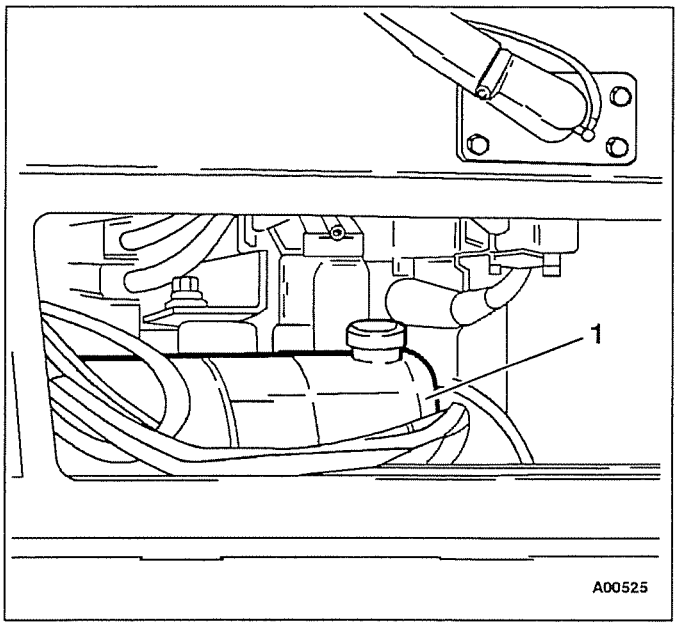
- Check the air pressure when the tyres are cold and check the tyres for damage and sufficient tread (see Maintenance Manual).

Caution: The tyres become become hot during driving, increasing the air pressure. If the air pressure is higher because the tyres are hot after driving, do not release air.

Tyres:	Air pressure (bar)
14.00 R 25	10.0
16.00 R 25 (optional equipment)	9.0
17.50 R 25 (optional equipment)	7.0

3.4.10 Checking the fluid level in the windscreen washing system

Ensure that the reservoir is always filled and add a cleaning agent and antifreeze to the water.



The reservoir (**1**) for the windscreen washing system is behind the front grille.

- Unlock the front grille (turn the seven locking pins at the edge of the grille to the left) and fold the grill upwards.

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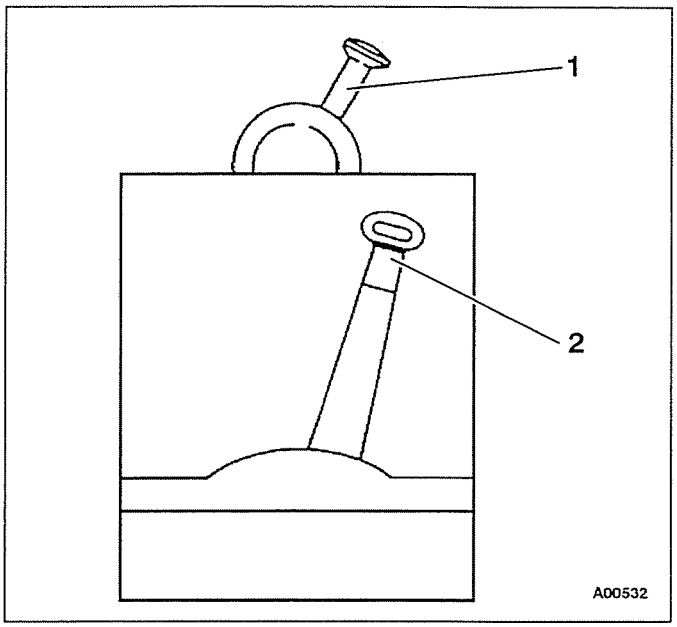
3.4.20 Starting the driving engine

Mercedes Benz's operating instructions supplied with these operating instructions apply with regard to the engine.

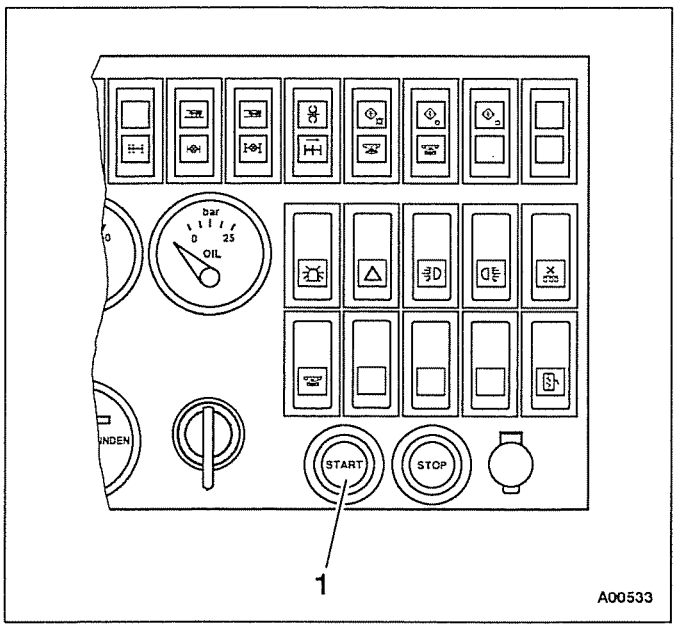


When the parking brake (**1**) is on, the lever is pointing to the back of the crane. To put on the parking brake pull the grip of the lever out as far as it will go and turn the lever so that it is pointing to the back of the crane as far as it will go. Make sure that the lever is properly engaged in this position.

Move the gear lever (**2**) to neutral **N**. The engine can only be started in this gear.

When outdoor temperatures are low the engine can be started more easily if you heat the engine coolant with the additional water heating system (optional equipment).
How to operate the additional water heating system is described in Section 3.3.4 "Additional water heating system", p. 3 - 21.

Starting the engine when it is cold



- Press the accelerator approx. 1/4 of the way.
- Press the starter button (**1**) as far as it will go.
- Release the accelerator when the engine has started.
- If the engine has not started after 15 seconds, stop the starting procedure and wait one minute before trying to start it again.

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To stop:

- release the accelerator
- press the service brake

For a short stop with the engine still running you can leave the selected gear range engaged.

Caution: If you release the service brake the vehicle will immediately start to roll and **accidents may occur**.

For longer stops with the engine running you must:

– release the accelerator

– press the service brake

– engage the parking brake

– change the gearbox into neutral

Note: The engine can only be started in neutral. If one of the two gear ranges is engaged the starting lock will not be released.

3.5.6 Changing gear manually

When driving under load you can change gear ranges manually. It is not necessary, however, to change gear manually during normal on-the-road driving.

By changing into a lower gear you can prevent the gearbox from changing into a higher gear when this is not desirable and thus losing power or braking power, e.g. when driving uphill or downhill.

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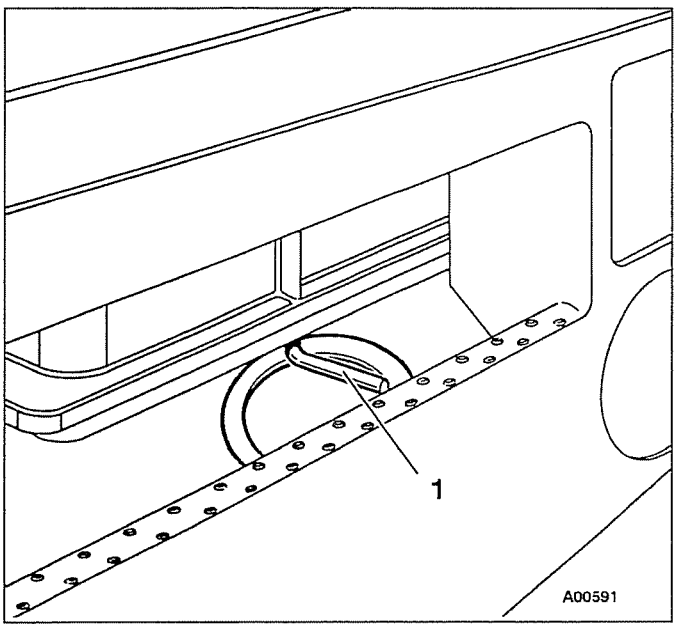
You cannot, however, change gear directly manually. The gear does not change until the travelling speed and the engine speed permit a change of gear.

Please note Sections 3.5.8 "Driving downhill", p. 3 - 53, and 3.5.9 "Driving uphill, p. 3 - 54.

3.6.2 Switching off the battery master switch for long stops

Caution: You must never switch the battery master switch off while the vehicle engine is running or interrupt the cable connection from the batteries to the alternator.

For every stop lasting more than 8 hours switch off the battery master switch:



- switch off all current consumers
- turn off the vehicle's engine
- remove the ignition key
- switch off the battery master switch (**1**) and remove the switch handle.

The battery master switch is under the battery box. It can be reached through the upper step under the right-hand cab door.

Note: The cooling down phase of the engine-independent heating system is not interrupted when the battery master switch is turned off.

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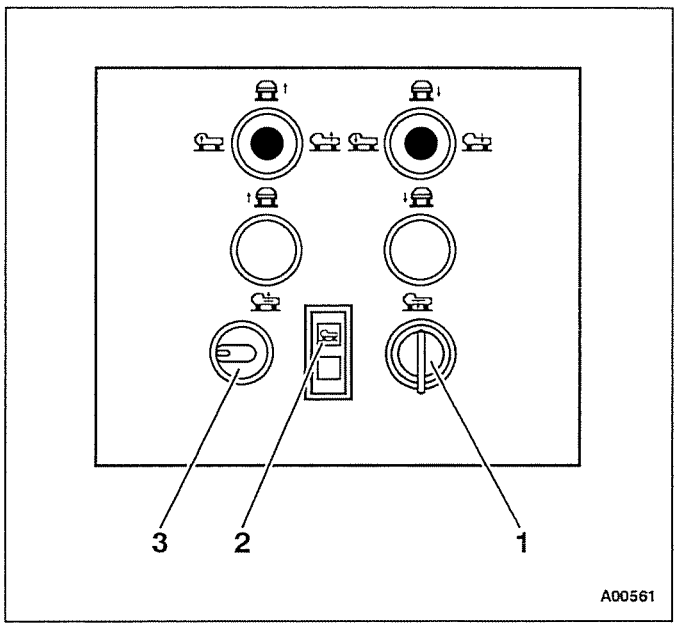
Setting the carrier level adjustment system to "on-the-road"

- Park the truck crane on level ground.

Note: If the wheels are braked while the carrier level is being changed the tyres will wear more quickly and the suspension cylinder assemblies will be subjected to high loads. If possible, therefore, release the parking brake and let the truck crane roll while the level is being changed.



- Turn the knob (**3**) to the top position until the warning light (**2**) goes out. The warning light goes out as soon as the on-the-road level is reached.
- Switch off the level adjustment system.

Switching off the carrier level adjustment system

Caution: Do not switch the carrier level adjustment system off until the carrier is at the on-the-road level.

- Turn the key-operated switch (**1**) to the right until it disengages and remove the key.

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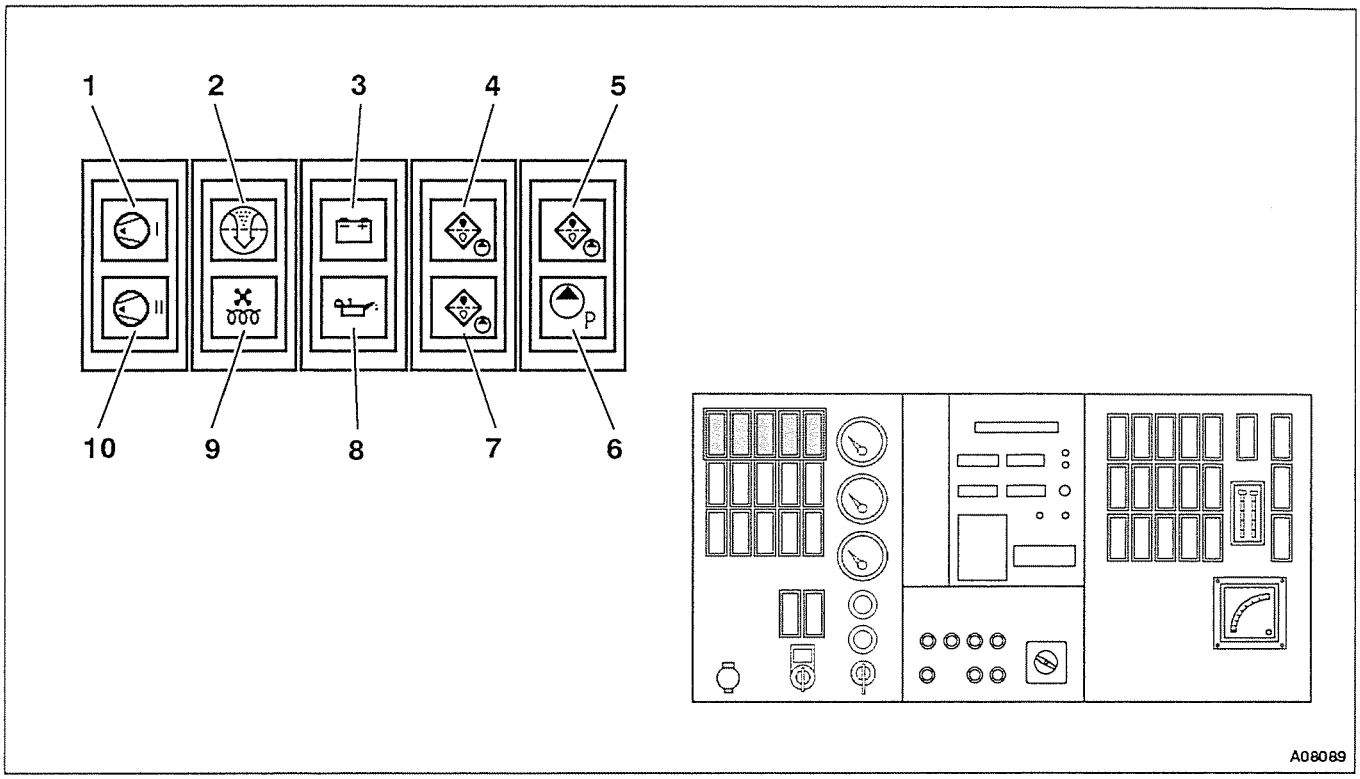
4.2.3 Front instrument panel



1 Warning light "carrier's compressed air circuit I"

2 Warning light "crane engine's air filter"

3 Battery charge indicator lamp

4 Indicator lamp "feed pump filter"

5 Indicator lamp "return line filter"

6 Warning light "hydraulic oil pressure of feed pump"

7 Indictor lamp "control pressure pump"

8 Warning light "crane engine's oil pressure"

9 Indicator lamp "additional heating system" (optional equipment)

10 Warning light "carrier's compressed air circuit II"

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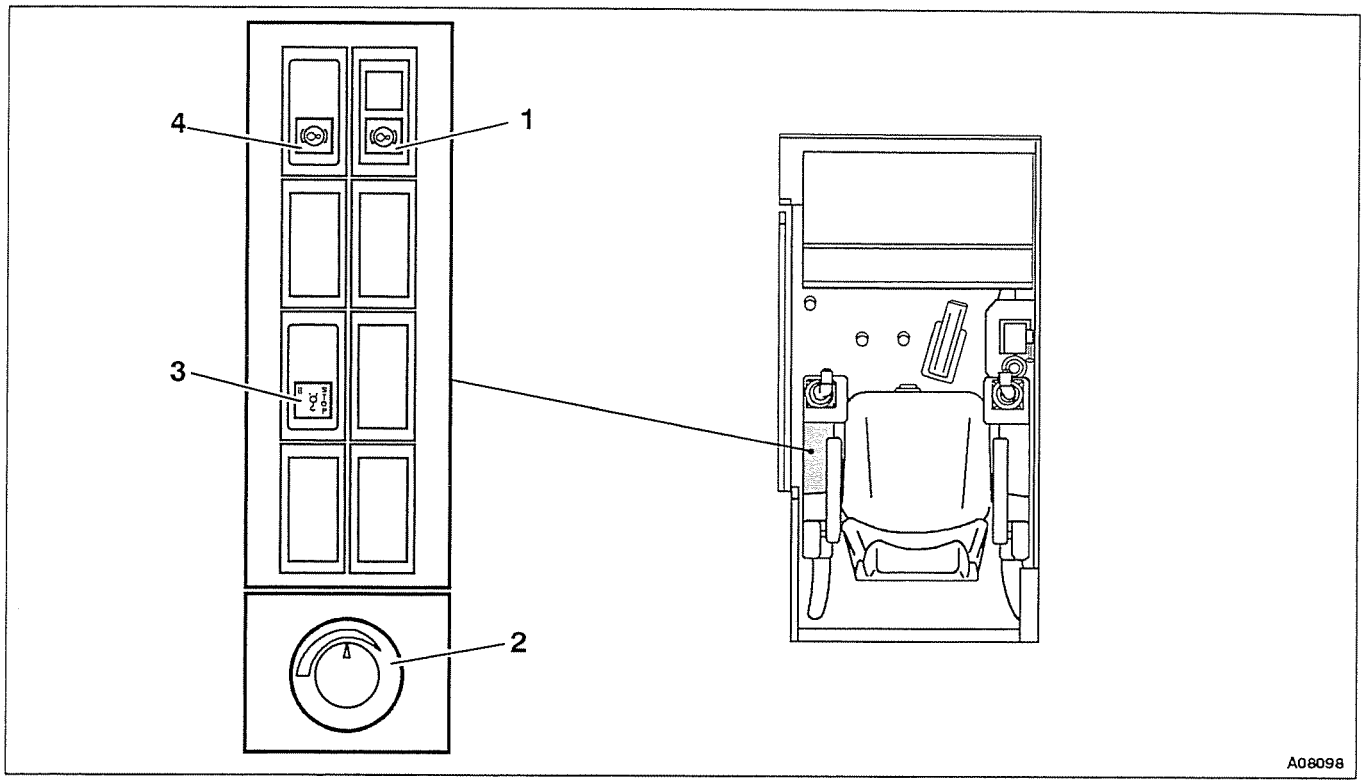
Under left-hand arm rest



1 Indicator lamp "slewing gear permanent brake"

2 Push button "slewing gear speed"

3 Rocker switch "auxiliary hoist ON / OFF"

4 Rocker switch "slewing gear permanent brake"

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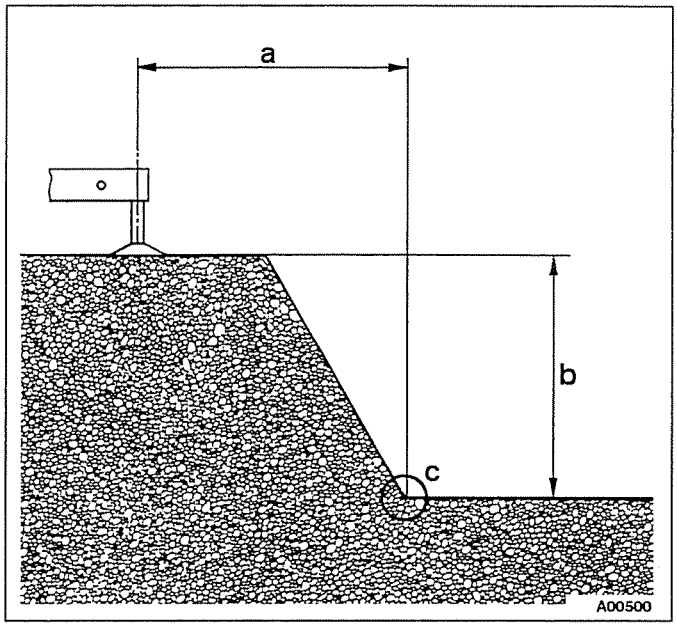
4.4.3 Safe distance from slopes and pits

Set up the crane at a safe distance from slopes and pits. In the case of unsupported slopes and pits this distance also depends on the type of ground.



Rule of thumb:

- For *loose or backfilled ground* the distance (**a**) must be twice the depth of the pit (**b**).

  a = 2 x b

- For *grown, cohesive ground* the distance (**a**) must be equal to the depth of the pit (**b**).

  a = 1 x b

The distance is measured from the base of the pit (**c**).

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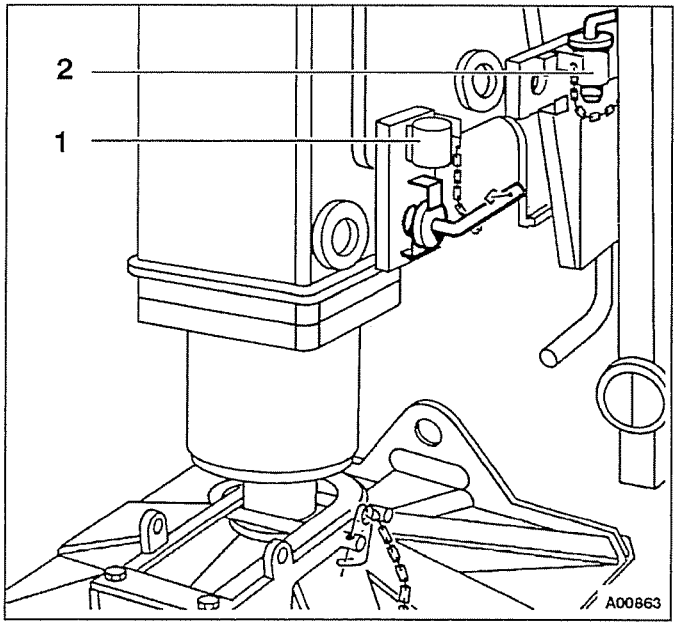
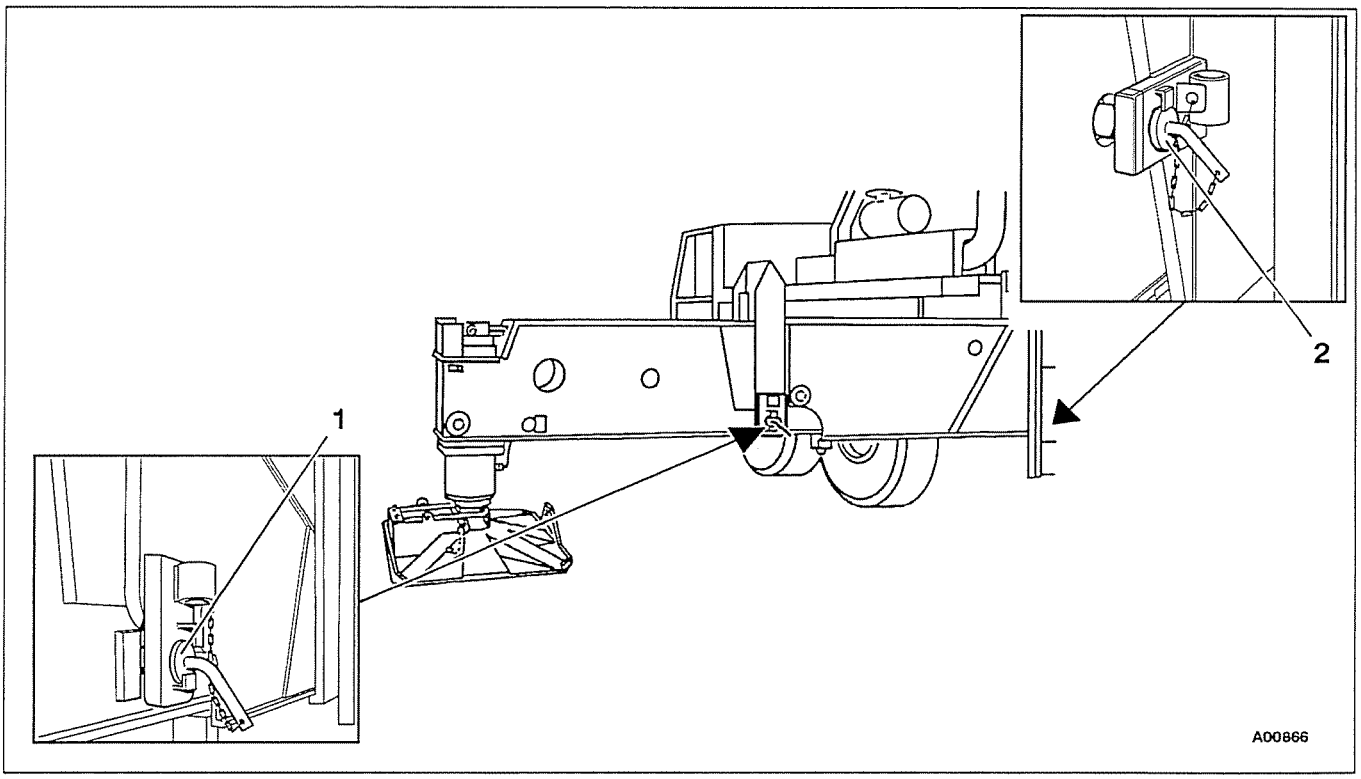
Extending the outrigger beams to a span of 8.6 m

Extend all four outrigger beams to a span of 8.6 m:



- Pins (**1**) and (**2**) stay in the holders.
- Extend the outrigger beam to the stop.



- Insert pins (**1**) and (**2**) into the bore so that they are in the **locked position**.

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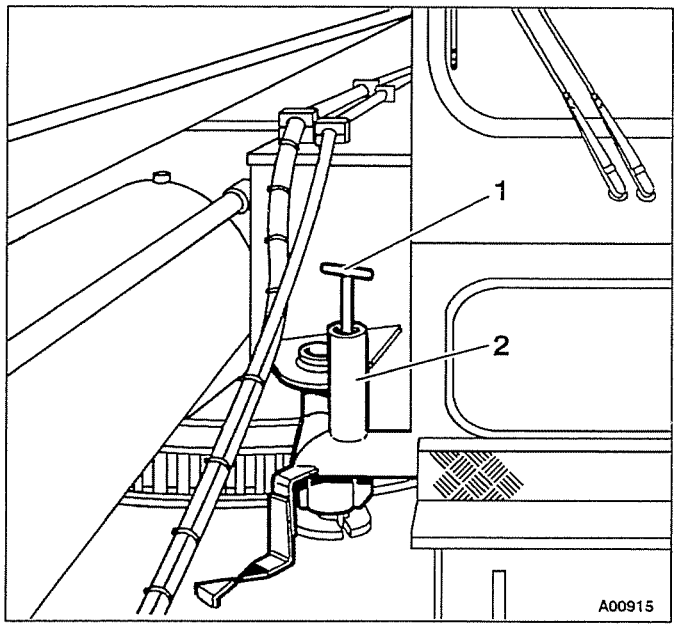
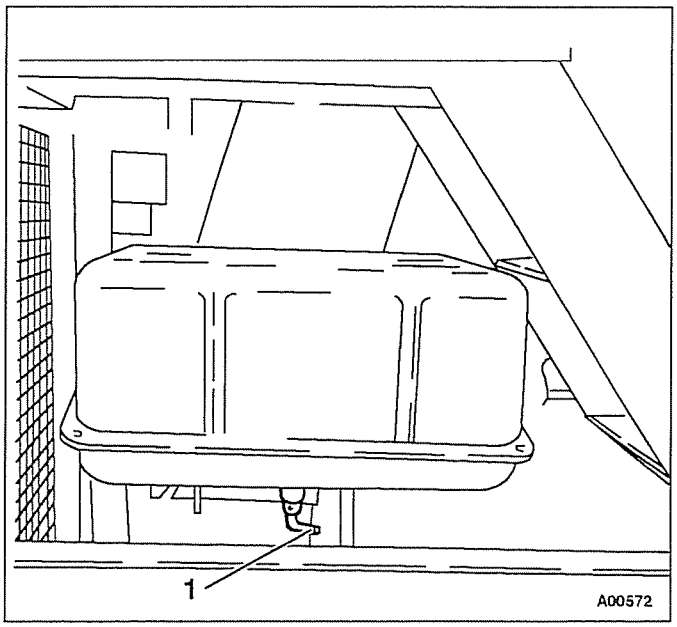
4.4.16 Releasing the superstructure lock

For driving the crane on roads the superstructure is locked to the carrier. So that the superstructure can be turned this lock has to be released.



- Insert pin (**1**) into holder (**2**).
  The superstructure can then be turned.

4.4.17 Switching on the battery master switch



The battery master switch (**1**) for the superstructure's electric power supply is under the battery box. The battery box is on the right-hand side of the superstructure under the steps.

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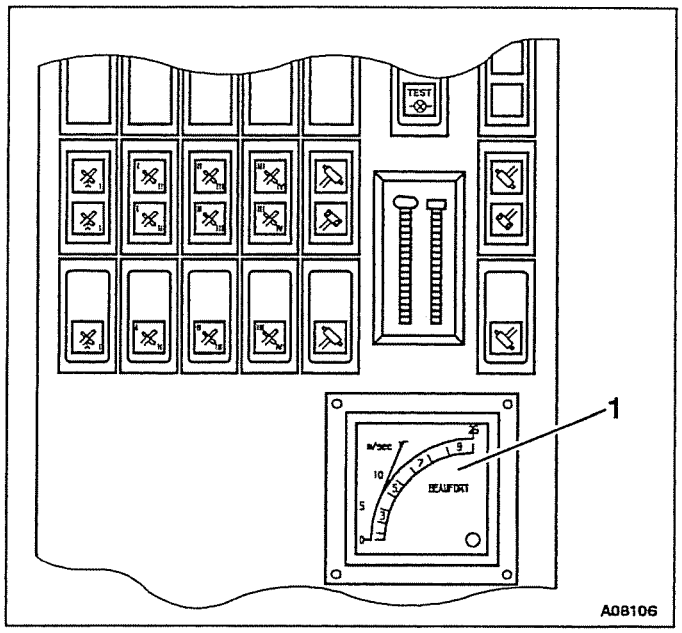
4.6.4 Effect of wind on crane operations

Strong winds can overload the truck crane



Check the wind speed continually on the anemometer (**1**) while you are working with the crane.

Maximum permissible wind speed with the crane fully loaded

The maximum permissible wind speed when the crane is fully loaded is listed in the **lifting capacity tables.**

Action if wind speed exceeds maximum permissible value

Wind speed below 20 m/s	**Wind speed above 20 m/s**	
Operation with main boom or boom extension or luffing jib	**Operation with main boom**	**Operation with boom extension or luffing jib**
• Put down load. • Turn superstructure into wind.	• Put down load. • Retract (telescope in) main boom fully. • Turn superstructure to front (180° position) or rear (0° position) of truck crane and lock superstructure. If possible rest main boom on boom support.	• Put down load. • Retract (telescope in) main boom fully. • Lower main boom to horizontal position.

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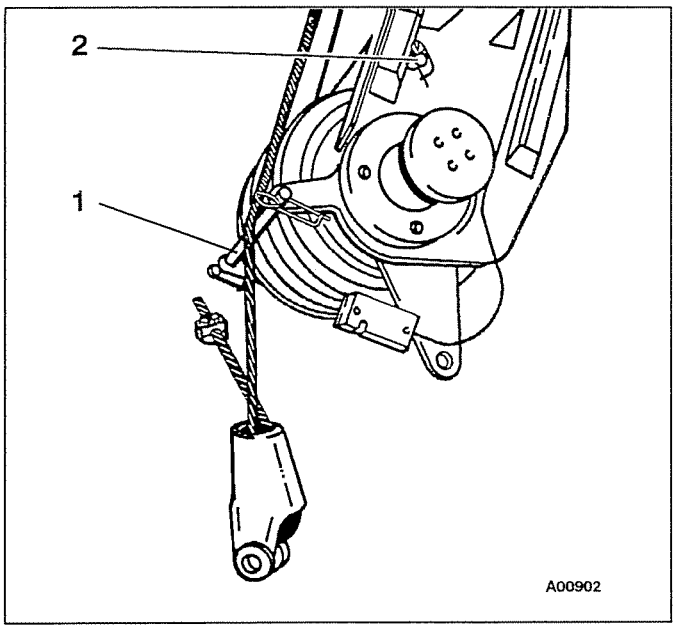
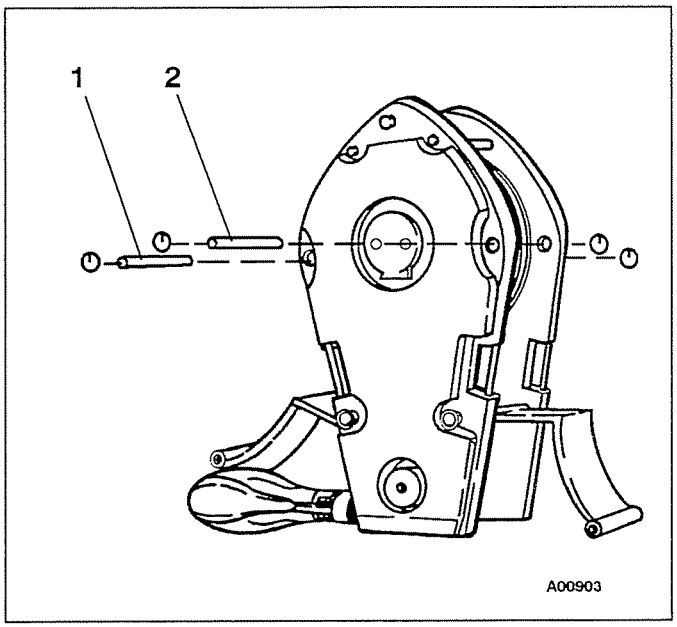
Reeving the hoist rope

To reeve the hoist rope with the rope end clamp attached to it the rope holding rods must be removed from the head of the boom. The rods prevent the hoist rope from coming out of the sheaves. Both guards at the sides of the hook have to be folded down.



- Remove the retaining pins and remove the rope holding rods (**1**), and (**2**) from the bores.



- Remove the spring cotters and remove the holding rods (**1**) and (**2**) from the bores in the hook block.
- Fold the guards on both sides of the hook block down.

The hoist rope can then be reeved.

Depending on the number of falls required the rope end clamp has to be attached to the head of the boom or to the hook block (see sub-section "Reeving modes" in this section).
With an even number of falls (e.g. 2 falls, 4 falls, 6 falls, etc.) the rope end clamp is attached to the head of the boom. With an odd number of falls (e.g. 3 falls, 5 falls, 7 falls, etc.) it is attached to the hook block.

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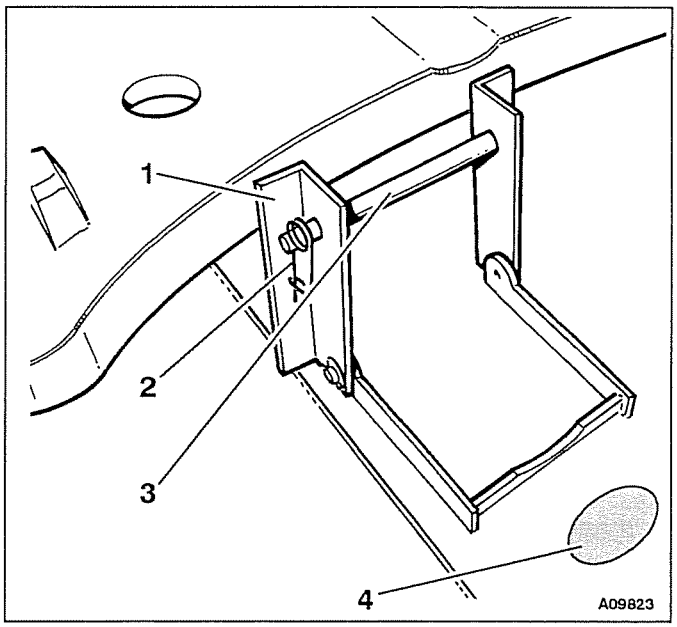
Placing the 30-t hook block in the hook block holder and securing the hoist rope for driving the truck crane on roads

Danger: Ensure that there are no persons on the carrier when you lower the hook block, otherwise **accidents may occur**.

- Raise the main boom and slew the superstructure until the hook block is exactly vertical above the hook block holder.

Caution: Do not lower the hook block until it has stopped swinging to and fro. This avoids damage being caused to the truck crane, and particularly to the engine cooler.

- Unreel the hoist rope and lower the hook block until it is approx. 1.5 m above the holder.



- Fold up the hook block holder (**1**) as far as it will go. Remove the retaining pin (**2**) and pull the holding rod (**3**) out of the holder.
- Lower the hook block further until the hook is touching the carrier at the point marked (**4**).

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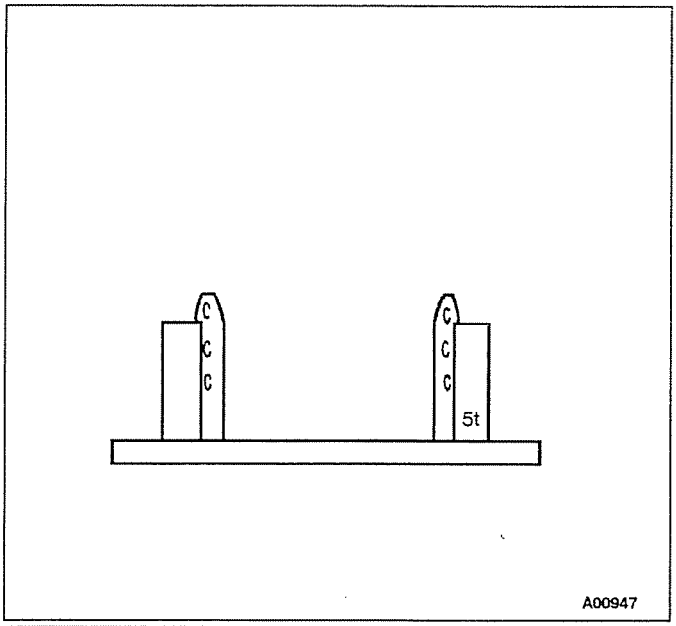
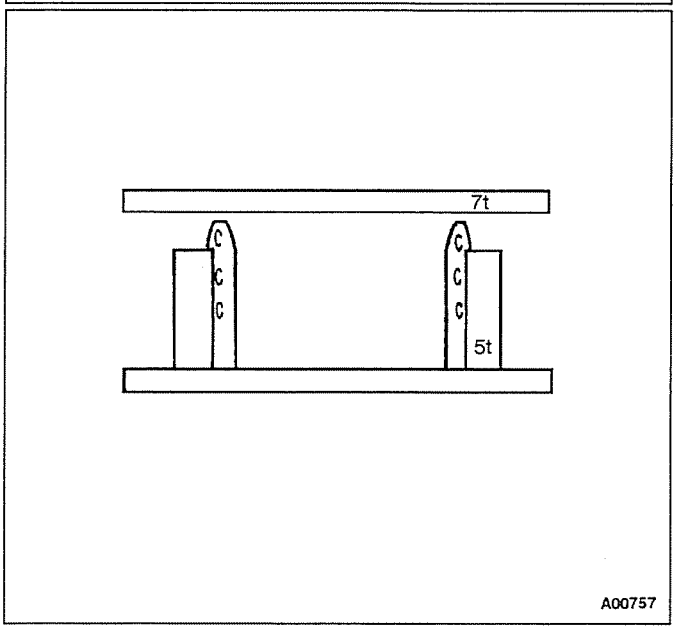


5-t counterweight

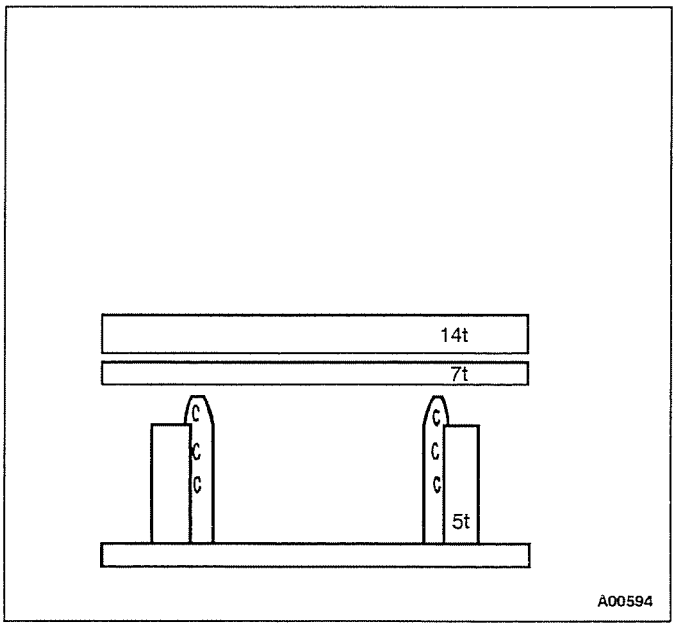
Only the 5-t base plate is used.



12-t counterweight

The following section is stacked on the 5-t counterweight section:

1. the 7-t counterweight section.



26-t counterweight

The following sections are stacked on the 5-t counterweight section:

1. the 7-t counterweight section
2. the 14-t (with no attachment points at the side).

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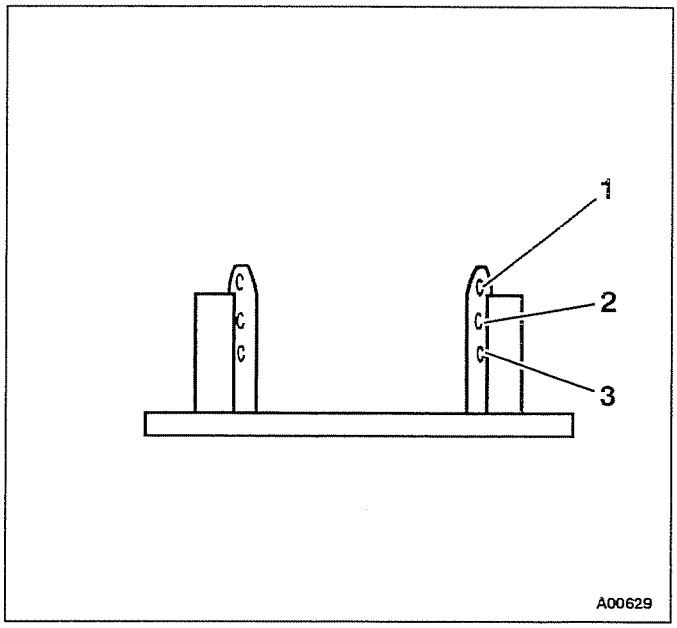
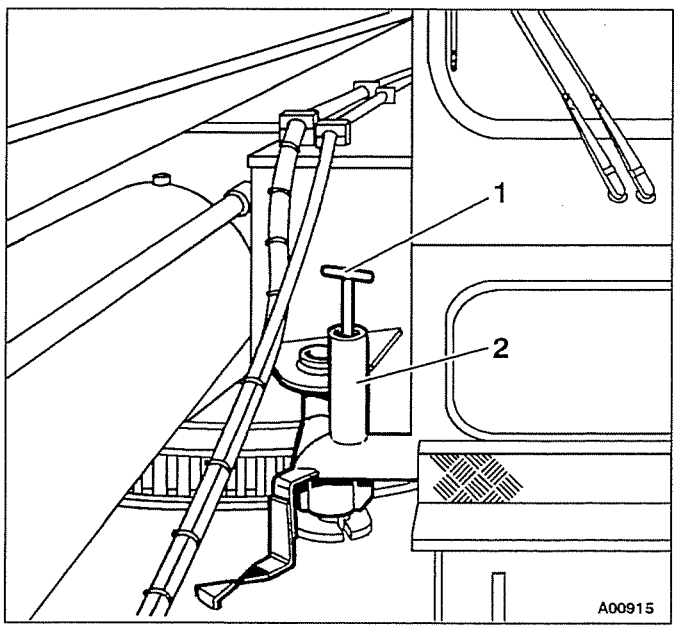


- Depending on the counterweight version the pins engage in bores (**1**), (**2**) or (**3**).

- Retract the hydraulic cylinders on the 5-t counterweight section from the portable control unit. Carry out the function: lower counterweight / retract cylinder.
- Remove the hoses from the hydraulic cylinders. Unscrew the couplings on the hoses from the connections on the hydraulic cylinder.

Caution: Screw the caps back onto the connections on the hydraulic cylinder to prevent the connections from getting dirty or the thread being damaged.

- Wind the hydraulic hoses back onto the holder.
- Screw the hose couplings back into the dummy connections.
- Put the portable control unit back into the holder.



- Insert the pin (**1**) into the holder (**2**) to unlock the superstructure so that it can be turned.

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Status messages

Collective error	Individual fault	Fault (countermeasures)
a	1	Incorrect operating mode (check set operating mode and actual operating mode)
	2	Operating mode selector switch faulty (repair)
	6	Telescope locking system (check telescope locking)
	7	Reeving mode (enter reeving condition)
	8	Operating mode not set on SLI (cf. fault a1)
b	2	Additional switch for setting the operating mode is not set correctly (check position of additional operating mode switch)
	3	
c	1	Telescope section I not locked (lock telescope section I)
	2	Telescope section II not locked (lock telescope section II)
	3	Telescope section III not locked (lock telescope section III)
	4	Telescope section IV not locked (lock telescope section IV)
	7	Slewing angle restriction (return to restricted slewing range)
	8	Turntable locking system (pin not inserted)
d	1	Data transmitter "hydr. pressure ring area in derricking cylinder" (repair)
	2	Data transmitter "angle of main boom" (repair)
	3	Data transmitter "length of telescope sec. III" (repair)
	4	Data transmitter "length of telescope sec. II" (repair)
	5	Data transmitter "hydr. pressure piston area in derricking cylinder" (repair)
	6	Data transmitter "length of telescope sec. I" (repair)
	7	Data transmitter "angle - boom extension / luffing fly jib angle" (repair)
	8	Data transmitter "load - boom extension / load - luffing jib" (repair)
e	1	Incorrect telescope section lengths (check set operating mode and actual operating mode)
	2	Radius (raise boom)
f	1	Main boom angle (raise boom)
	2	Incorrect luffing fly jib angle (raise/lower main boom or luffing fly jib)
	3	Slewing angle (return to restricted slewing range)
g	6	Data transmitter "length of telescope section IV"
t	4	Below minimum radius (lower main boom)

Message	Cause
L	Overload (leave shutdown range)
M	Shutdown (leave shutdown range, and reset/repair SLI)
N	Warning (shutdown level reached)

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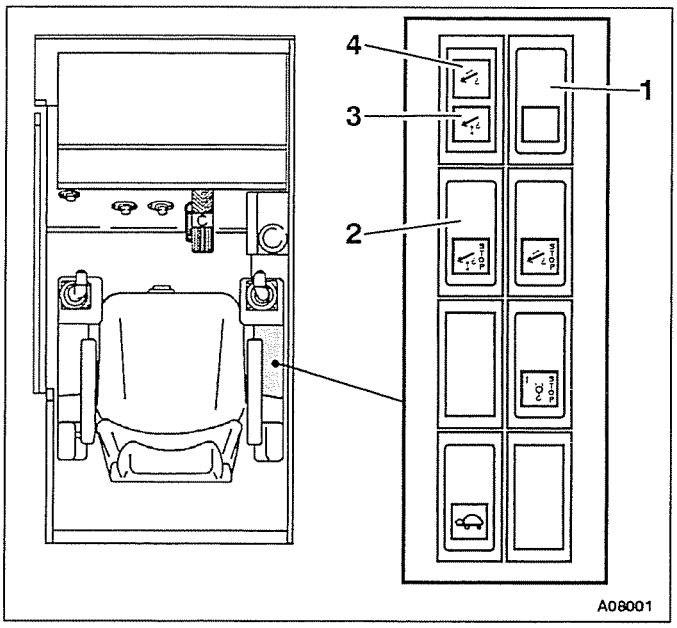
4.7.15 Raising/lowering the boom (derricking) (main boom only)

The angle of the main boom can be varied between –1.2° and +85° from the horizontal by raising or lowering it. Depending on the size of the load and the length of the main boom the SLI shuts down the lowering procedure before the horizontal is reached. With a luffing fly jib attached to the main boom this shutdown takes place at an earlier stage.

The boom must be fully retracted (telescoped in) before it is raised from or lowered into the horizontal position (telescope status 0/0/0/0).

Note: If a shutdown occurs by the SLI and the telescoped (extended) boom cannot be raised out of a position with the hook block hanging free, the hook block can be lowered onto the ground to facilitate raising the boom.

Caution: It is strictly forbidden to raise loads by raising the main boom as the SLI does not then function and **the crane may overturn**.



The derricking gear can be switched off with toggle switch (**2**) to prevent it from being actuated accidentally.

The right-hand control lever is selected with rocker switch (**1**). Indicator lamps (**3**) and (**4**) indicate the selected function.

Press rocker switch (**1**) in at the bottom. Indicator lamp (**3**) indicates "derricking".

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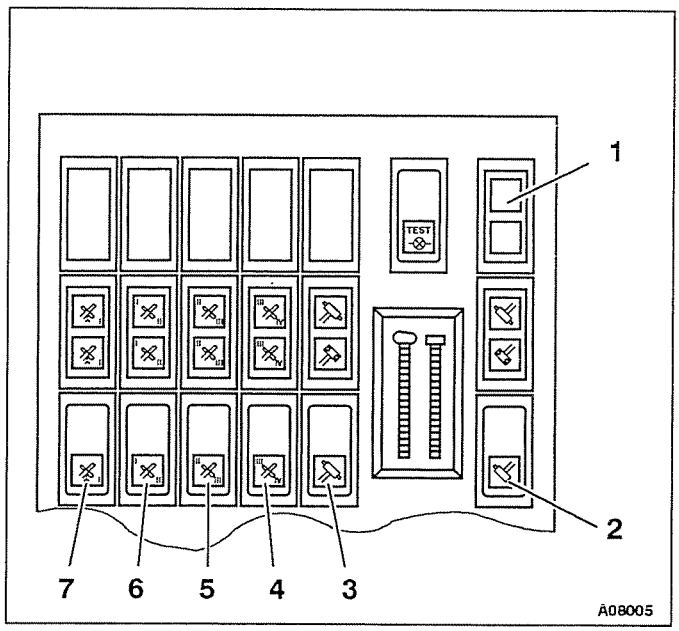
Warning systems



Warning light (**1**) lights up whenever there is a malfunction in the electronic system.

Caution: Crane operations must be stopped immediately when the warning light (**1**) is on. The Telecontrol is no longer functioning properly **and accidents may occur**. Inform the after-sales service.

The **alarm horn** is sounded when:

- two or more of the rocker switches (**2**) to (**7**) are simultaneously pressed in at the bottom (releasing the locking pins),
- one of the rocker switches (**2**) to (**7**) is pressed in at the top (inserting the locking pin) although the green indicator lamp in the corresponding rocker switch is out (telescope section or telescoping cylinder is not locked),
- the telescope section is extended/retracted too far while searching for the locking position.

Caution: Never release more than one locking pin at a time, **otherwise accidents may occur**.

Do not lock a telescope section or the telescoping cylinder before the green indicator lamp in the corresponding rocker switch lights up (section has reached locking position).

If a telescope section or the telescoping cylinder is locked before the green indicator lamp lights up, the locking pins are pressed against the boom section (the section/cylinder has not yet reached locking position) and the **boom may be damaged**.

Note: The sound of the Telecontrol horn differs from the sound produced by the SLI buzzer.

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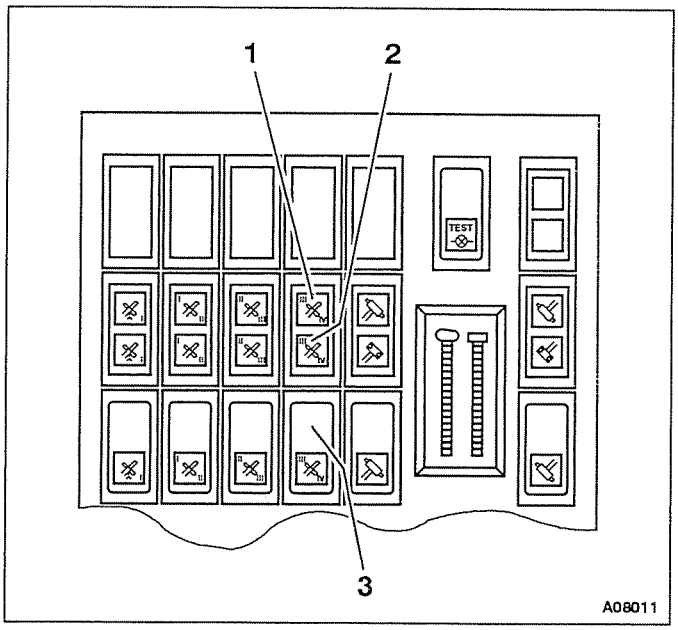
Extending/retracting telescope section IV

To extend/retract telescope section IV the green light in rocker switch (**3**) must be on.



Telescope section IV is extended/retracted in exactly the same way as telescope section I.

The green indicator lamp (**1**) is on when telescope section IV is locked to telescope section III.

The locking pins are released by pressing rocker switch (**3**).

The red indicator lamp (**2**) starts to flash as soon as the pins start to move. It stops flashing and is on permanently when telescope section IV is unlocked from telescope section III.

The green indicator lamp in rocker switch (**3**) lights up when a position is reached in which telescope section IV can be relocked to telescope section III (locking position). This is possible at telescope status **0 or 0.5 or 1**.

Caution: Telescope section IV is not locked to telescope section III until the green indicator lamp (**1**) lights up and the red indicator lamp (**2**) has gone out.

Caution: Only one locking pin may be released (rocker switch pressed in at the bottom). Before a locking pin is released check that all other locking pins are inserted. Whenever a locking pin is released none of the red indicator lamps may be on or flashing; the corresponding green indicator lamp must be on (please see item "Warning systems" in this Section).

Caution: Do not lock telescope section IV to telescope section III before the locking position is reached (green indicator lamp in the rocker switch is on - please see item "Warning systems" in this Section), **otherwise the boom may be damaged**.

Danger: The Telecontrol must never be put out of operation. It is strictly forbidden to extend/retract the boom manually, **otherwise accidents may occur**.
Please see item "Actions to be taken in case of malfunctions" in this Section.

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5 Boom extension/luffing fly jib

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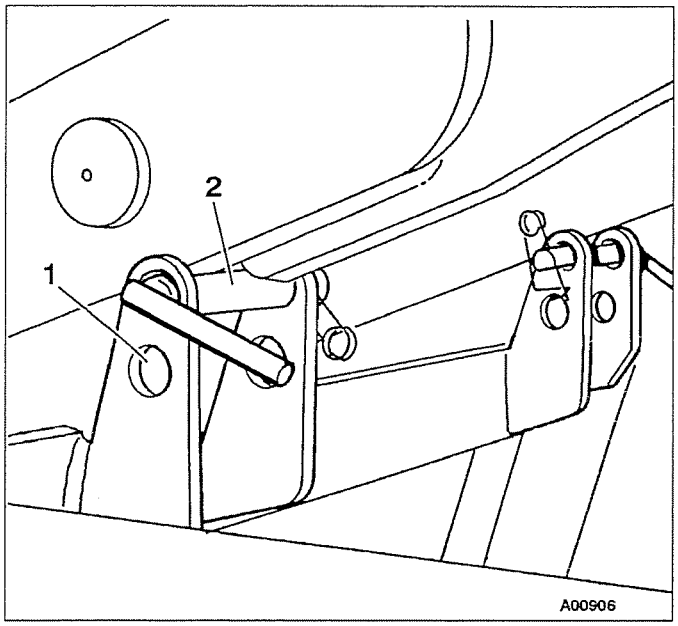

- Remove the retaining pins and remove the pins (**2**) from the bore.
- Insert the pins into bore (**1**).

Caution: Insert the pins into the **lower** bore.
This prevents the pins from being sheared off when the foot section is removed.

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Checking that the SLI, anemometer and lifting limit switch are working

- Check that the SLI is working (please see Section 4.7.8 "Safe Load Indicator (SLI)", p. 4 - 98).
- Set the correct operating mode (SLI code) for working with the boom extension on the SLI (please see Section 4.7.8 "Safe load indicator (SLI)", p. 4 - 98). The correct SLI code for working with the boom extension is listed in the **lifting capacity tables.**

The SLI must indicate an actual load value between **0.0** and **0.2**.

- Check that the anemometer is working. When the anemometer turns on the head section a value must be indicated on the indicator in the crane operator's cab (please see Section 4.6.4 "Effect of wind on crane operations", p. 4 - 55).
- Check that the lifting limit switch is working. The warning light "lifting limit switch" in the crane operator's cab must go out when the chain for the lifting limit switch weight on the head section is pulled (please see Section 4.7.9 "Limit switches", p. 4 - 107).

5.1.2 Raising the boom

- Check that the correct operating mode (SLI code) is set on the SLI for working with the boom extension (please see Section 4.7.8 "Safe Load Indicator (SLI)", p. 4 - 98). The SLI code for working with the boom extension is listed in the **lifting capacity tables.**
- Set the reeving mode (number of hoist rope falls) on the SLI (please see Section 4.7.8 "Safe Load Indicator (SLI)", p. 4 - 98).
- Set the operating mode on the additional switch for setting the operating mode. Turn the switch to position **A** (please see Section 4.7.6 "Setting the additional switch for the operating mode", p. 4 - 83).

Caution: **Risk of malfunction!**

Only telescope the main boom with mounted boom extension at the following angles. This prevents overloading of the telescoping gear.

- Raise the main boom to the following angles:
  - 10 m to 45 m Boom extension: minimum 75°
  - 52 m Boom extension: minimum 84.0°.

  Check the main boom angle on the current main boom angle display. Do **not** raise to the steepest position (derricking cylinder end stop), otherwise this will lead to operation malfunction when subsequently telescoping.

Note: You will find the 84.0° main boom position without difficulty, by raising the boom to the steepest position (derricking cylinder end stop) and then by slightly lowering it.

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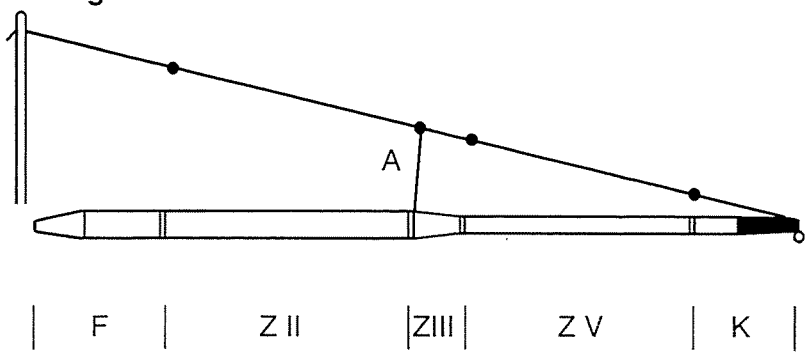
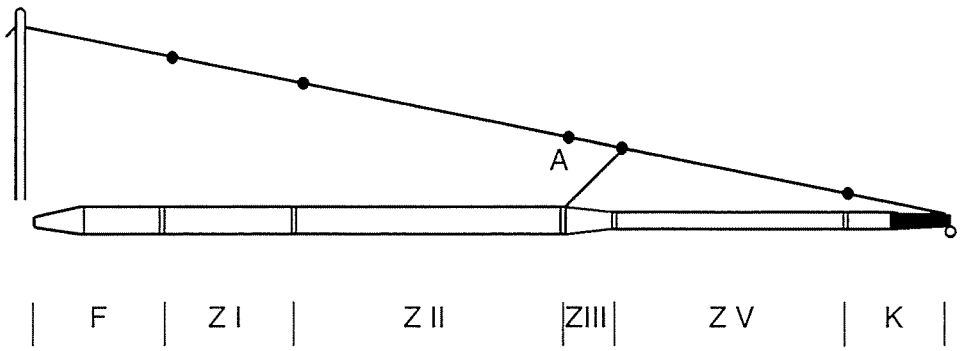
- Telescope out the main boom to the lengths listed in the relevant lifting capacity table.

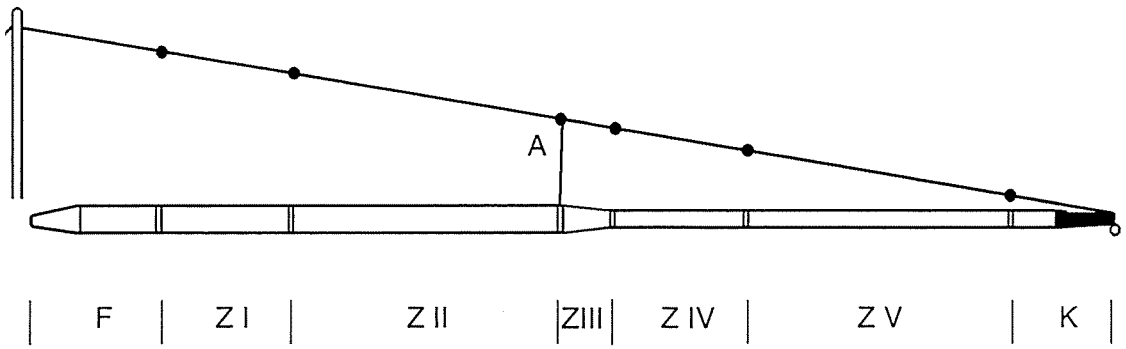
Length: 42 m



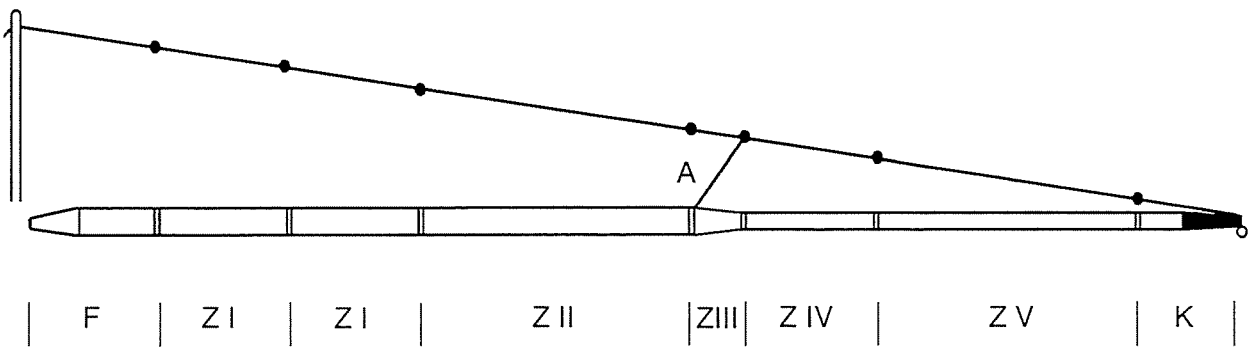
Length: 49 m



Length: 56 m



Length: 63 m (optional equipment)



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The upper sheave block is pulled to the strut member with the main hoist rope by carrying out the function "main hoist - lifting" (please see Section 4.7.12 "Main hoist", p. 4 - 110).

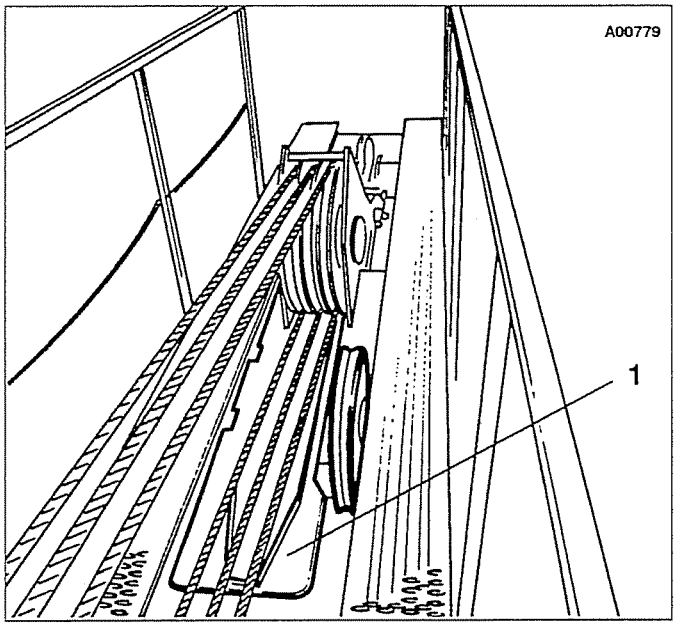
While the upper sheave block is being pulled to the strut member the auxiliary hoist rope must be unreeled from the drum by carrying out the function "auxiliary hoist - lowering" (please see Section 4.7.13 "Auxiliary hoist", p. 4 - 111).

Caution:

Hold the upper sheave block over the boom by carrying out the functions "main hoist - lifting" and "auxiliary hoist - lowering". The sheave block must not be dragged over the boom. Move the sheave block slowly.

Danger:

Do not raise the strut member while the upper sheave block is being pulled to the strut member. If the strut member is raised beyond a certain angle it will tip backwards **and accidents may occur.**



- Move the upper sheave block in the slide rails (**1**) in the strut member. The slide rails guide the sheave block to the correct position for installation.

Danger:

Take care that no persons are in the danger area while the upper sheave block is being pulled to the strut member. **Take care that no accidents occur.**

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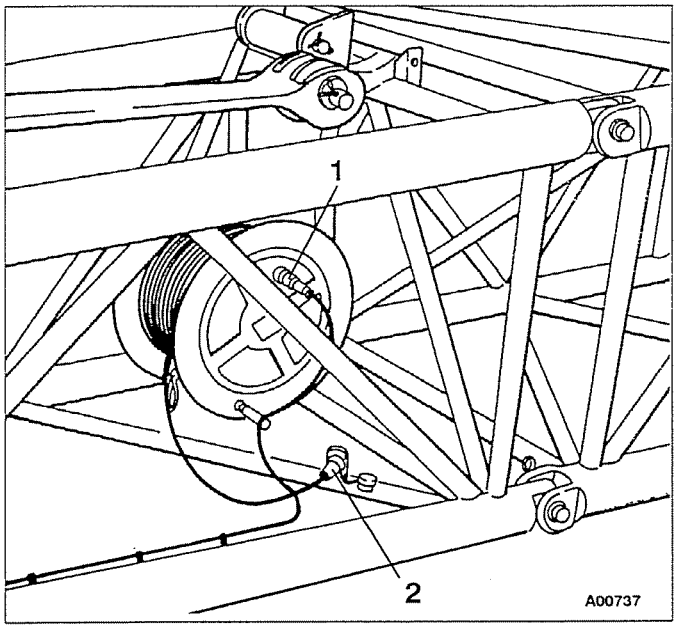
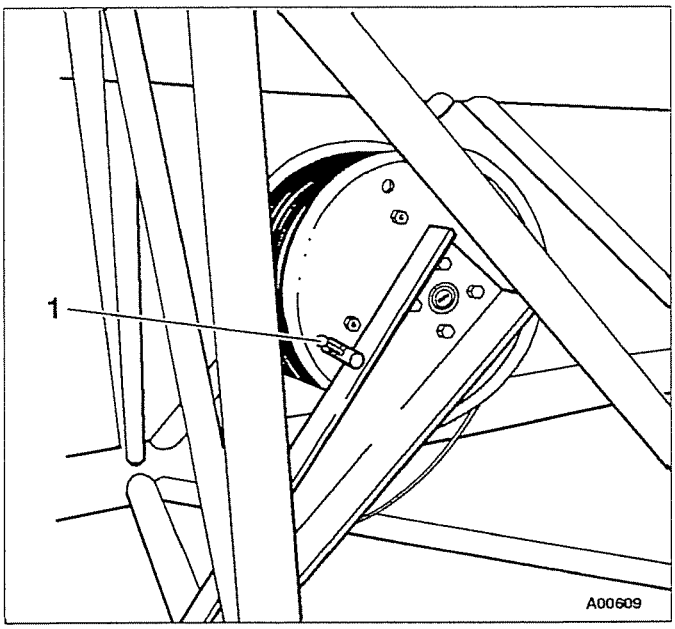


- Unscrew the plug (**1**) from the socket on the cable drum.
- Unscrew the plug (**2**) from the dummy socket.
- Unreel the cable far enough to reach the boom head.
- Screw the plug (**1**) back into the socket on the cable drum.



- Secure the cable drum with the lock to prevent it from turning (**1**).

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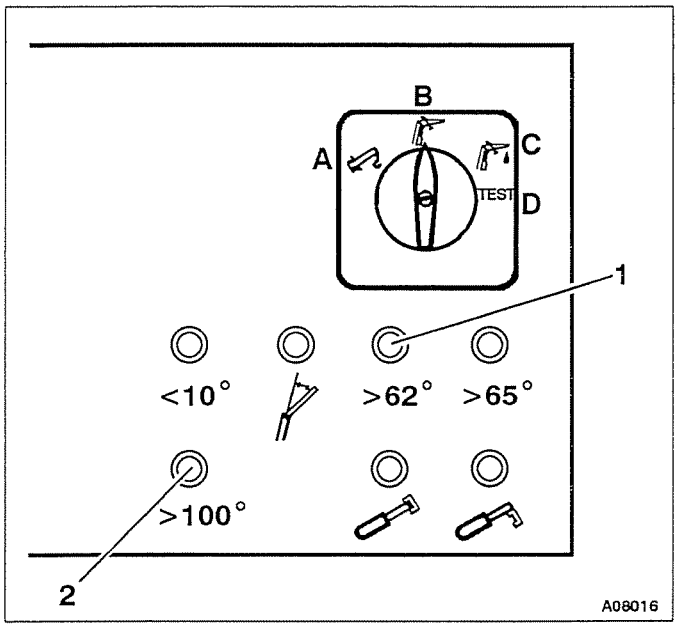
- Bolt the rope end clamp to the load measuring strip. Secure the pin with the retaining pin.

Caution: When the crane is operated with the luffing fly jib the rope end clamp must be attached to the load measuring strip, otherwise the SLI will not register any load.

- Raise the main boom to an angle of 84° from the horizontal (the highest position of the main boom).
- Check the angle between the luffing fly jib and the main boom on the SLI while the boom is being raised. The angle should always be 90°.
- Raise the luffing fly jib with the auxiliary hoist if the angle between the luffing fly jib and main boom is not 90°.



Shutdown of the movement "raising the boom" at an angle of 98°

When the angle between the main boom and luffing fly jib is 98° the function "raising the boom" is shut down. Warning light (**2**) lights up.

- Raise the luffing fly jib with the auxiliary hoist to leave the end position.

Shutdown of the movement "raising luffing fly jib" at an angle of 62°

When the angle between the main boom and luffing fly jib is 62° the function "raising the luffing fly jib" is shut down. Warning light (**1**) lights up.

- Lower the luffing fly jib with the auxiliary hoist to leave the end position.

Danger: Avoid shutdowns by checking the angle between the main boom and luffing fly jib continually on the SLI. When movements are stopped suddenly due to shutdowns oscillation is produced which can lead to overloading of the crane,
and accidents may occur.

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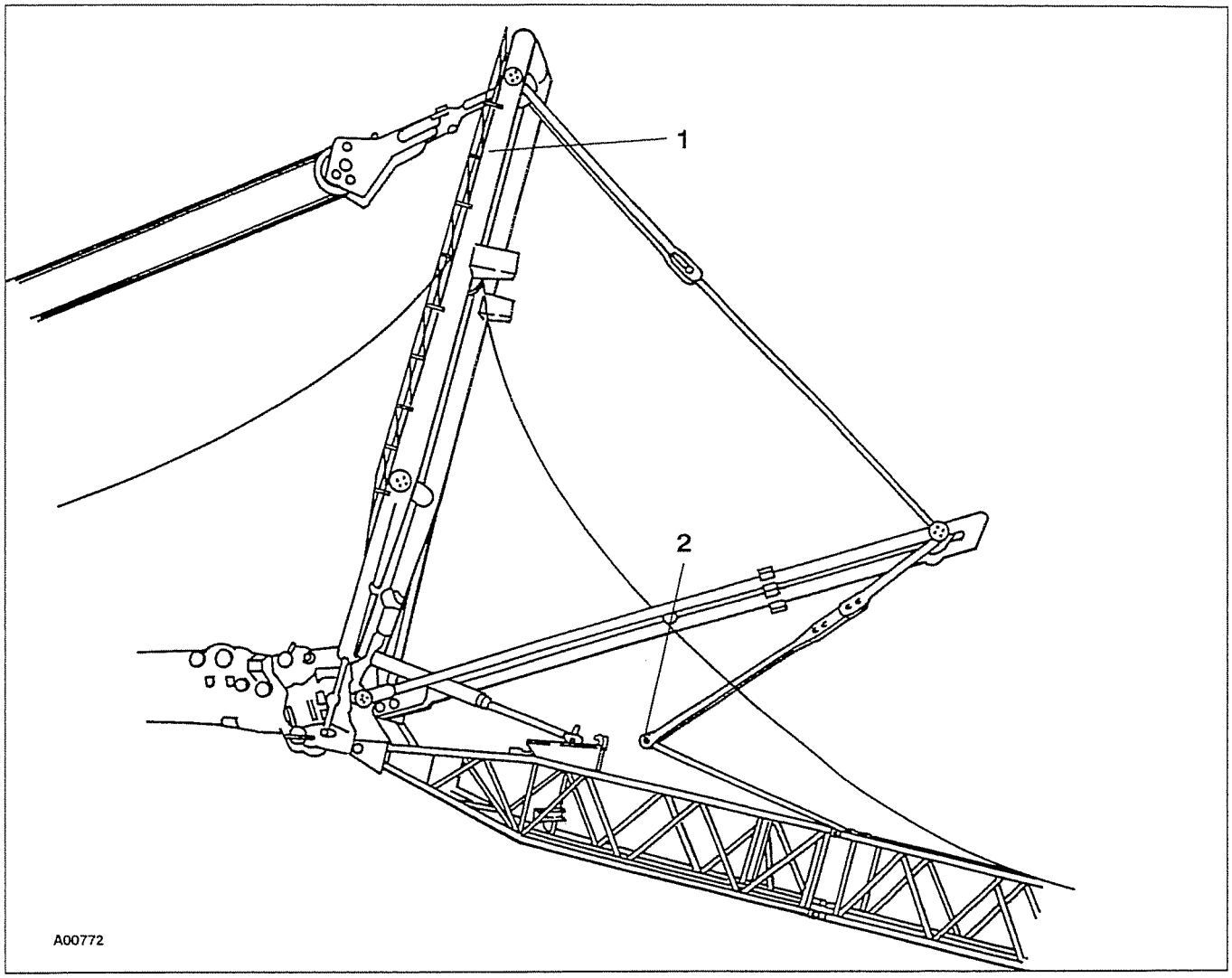
Lowering the main boom



- Lower the main boom until the angle between the main boom and luffing fly jib is approximately 40°.
- While the main boom is being lowered, lower the strut member (**1**) with the auxiliary hoist. Lower the strut member until the articulation (**2**) is approximately 1 m above the foot section.
- Check the position of articulation (**2**). The articulation must be pointing in the direction of the boom.

Caution: Lower the strut member when the main boom is lowered. When the strut member is at an angle of 80° from the horizontal it tips backwards. The articulation (**2**) must not press against the lattice part of the foot section or the foot section may be damaged beyond repair.

Caution: Check that the hoist rope and guy ropes are not squashed by the stay bars when the strut member is lowered or they will be damaged.

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6 Procedure in case of malfunctions

The measures described in this section are intended to help the crane operator. They do not require special tools and can be carried out without specialist knowledge.

Caution:

Only carry out the measures described in this section. If further troubleshooting is necessary, this must be carried out by persons with the appropriate qualifications and training or by a Krupp Service centre.

If there is any doubt about whether the crane is working properly or is safe to drive you must stop work, or driving, immediately.

6.1 Malfunctions on the carrier

6.1.1 Procedures in the event of a breakdown in road traffic

Road Traffic Regulations stipulate that if a vehicle breaks down due to mechanical failure or any other cause while it is in a traffic lane, on a verge or hard shoulder this must be indicated by means of the warning procedures prescribed by law.

In the event of a breakdown observe the following procedures:

- Remain calm
- Decelerate the vehicle, paying close attention to the traffic behind you
- Bring the vehicle to a halt where it is safe to do so for you, the vehicle and the traffic behind you

Danger:

If possible avoid stopping in a tunnel or directly behind a bend in the road, **otherwise accidents may occur**.

- Secure the vehicle
- Turn on the hazard warning lights
- Cordon off the breakdown area:
  – Set up a warning triangle.
  – Set up a signal lamp or torch.

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6.1.5 Tipping system for the driver's cab

Caution: Before tipping the driver's cab the following must be carried out:

Any loose objects must be removed from the driver's cab.

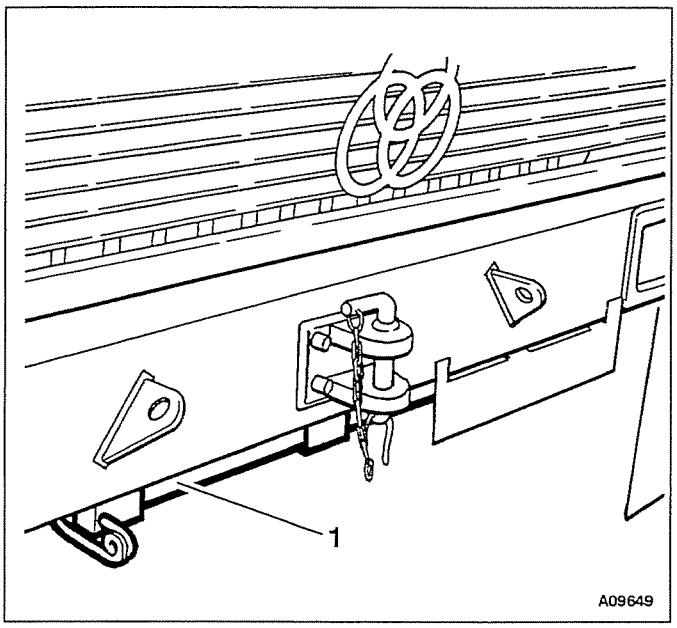
The main boom must be raised approx. 1.5 m for the cab to clear it when it is tipped.

It must be ensured that the hook block is at a safe distance from the windscreen when the cab is tipped.

Before tipping the driver's cab, remove the front grille.

The manual pump for tipping the driver's cab is in front of the steps underneath the door on the right-hand side of the driver's cab. The cab locking system unlocks automatically when the cab is tipped.

Tipping the driver's cab



- Remove the front grille, please see Section 3.4.4 "Checking the oil level in the vehicle engine", p. 3 - 24.
- Remove the pump lever (**1**) from the holder.

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6.1.10 Malfunctions – differential locks

This section applies to malfunctions of all differential locks:
- transverse differential locks in all driven axle lines
- longitudinal differential locks in transfer case
- drive for second axle line
- drive for fourth axle line (optional equipment)

Malfunction	Cause	Action
Differential locks cannot be engaged	Off-the-road gear not engaged	Engage off-the-road gear, see Section 3.7.1.
	Carrier level adjustment system not switched on	Switch on carrier level adjustment system, see Section 3.7.6.
	Suspension locked	Unlock suspension, see Section 3.4.17.
	Stress in transmission system	Change the automatic gearbox into neutral
	Compressed air system not filled sufficiently	Let engine run in neutral; circuit No. 4 for secondary consumers is filled approx. 10 min after indicator lamp for air pressure in circuit No. 3 has gone out, see Section 3.4.23; test whether lock can be engaged
	Fuse F5/2 UW (carrier) blown	Check fuse and replace if necessary, see Section 6.1.6.
Differential locks cannot be disengaged	Stress in transmission system	Drive truck crane backwards and forwards slowly without turning the wheels

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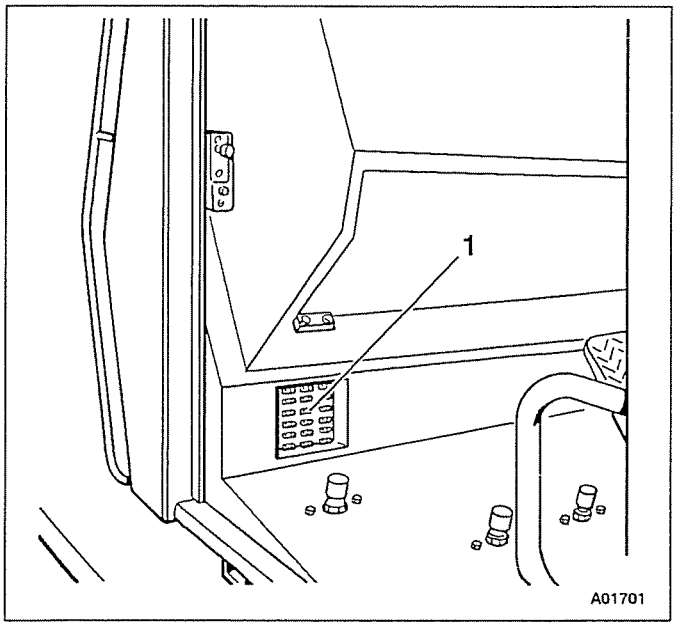
Fuse groups F1 to F3



The fuses (**1**) are on the left under the instrument panel. The fuses are divided into three groups **F1** to **F3**.

Designation in electric circuit diagram: F1	Size (A)	Function
1	20	Oil cooler (optional equipment)
2	20	Oil cooler (optional equipment)
3	10	Cab lighting, Socket, Reading lamp
4	20	Start/stop engine, Additional (optional) heating system
5	3	Instrument lighting, Position lights for indicator lamps
6	3	Indicator lamps

Designation in electric circuit diagram: F2	Size (A)	Function
1	20	Spotlight for working area
2	15	Windscreen wipers, Windscreen washing system, Washer pump, Intermittent wipers, Oil cooler (optional equipment)
3	15	Blower for heater, Additional (optional) heating system
4	10	Horn, Line for horn push button, Control lever, Free position of slewing gear, Proportional valves for slewing gear, Slewing gear brake
5	10	Air drier, Flow sensor
6	15	Proximity switch for main boom, Motor for luffing fly jib

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6.2.9 Malfunctions – slewing gear

Malfunction	Cause	Action
Slewing gear not functioning	Superstructure lock engaged	Release superstructure lock, see Section 4.7.16.
	Permanent brake for slewing gear engaged	Release permanent brake for slewing gear, see Section 4.7.14.
	Dead man's switch not activated	Press dead man's switch, see Section 4.7.11.
	Fine regulation for slewing gear set very low	Turn knob on the left arm rest to the left, see Section 4.7.14.
	Counterweight lifting gear switched on	Switch off counterweight lifting gear, see Section 4.7.7
	Fuses F3/5 OW, F2/4 OW or F2/6 OW (superstructure) blown	Check fuses and replace if necessary, see Section 6.2.2.

6.2.10 Malfunctions – counterweight lifting gear

Malfunction	Cause	Action
Counterweight lifting gear not functioning	Fuse F2/6 OW (superstructure) blown	Check fuse and replace if necessary, see Section 6.2.2.

6.2.11 Malfunctions – hydraulic oil cooler

Malfunction	Cause	Action
Hydraulic oil temperature above 80 °C Fan in hydraulic oil cooler running	Hydraulic system under severe strain	Stop crane operations and allow the crane engine to tick over until the oil has cooled down.
Hydraulic oil temperature above 80°C Fan in hydraulic oil cooler not running	Fuse F1/1 OW (superstructure), F1/2 OW (superstructure) or F1/6 OW (superstructure) blown	Check fuses and replace if necessary, see Section 6.2.2.

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7.2 Carrier

7.2.1 Chassis

KRUPP 6-axle special vehicle with welded, torsion-resistant, rigid, large box-type chassis of high-strength fine-grained steel

Four double-telescoping outrigger sliding beams

7.2.2 Driving engine

Make:	Mercedes Benz
Model:	OM 444 A
Rating:	405 kW (551 HP) at 2100 min^{-1} (DIN 6271, IFN) 390 kW (530 HP) at 2100 min^{-1} (80/1269/EEC)
Torque:	2357 Nm at 1100 to 1500 min^{-1}
Type of combustion:	Diesel, direct injection
Bore:	128 mm
Stroke:	142 mm
No. of cylinders:	12 (90° V)
Cubic capacity:	21 927 cm^3
Supercharger:	DB exhaust-driven turbocharger
Cooling system:	Water, fan driven hydraulically by vane-type fixed displacement motors
Fuel tank:	Volume approx. 500 litres

7.2.3 Power shift gear

Allison automatic gearbox CLBT 755 with retarder.
Gearbox with 2 gear modes and 5 forward gears and 1 reverse gear in each mode.

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