Operating instructions

KMK 6160

Crane identification number:

15.04.91

2 085 625 en

1. Introduction

These operating instructions are intended for the KRUPP truck crane KMK 6160.

1.1 Instructions for use

Please read through sections 1 to 6 before starting work with your truck crane.

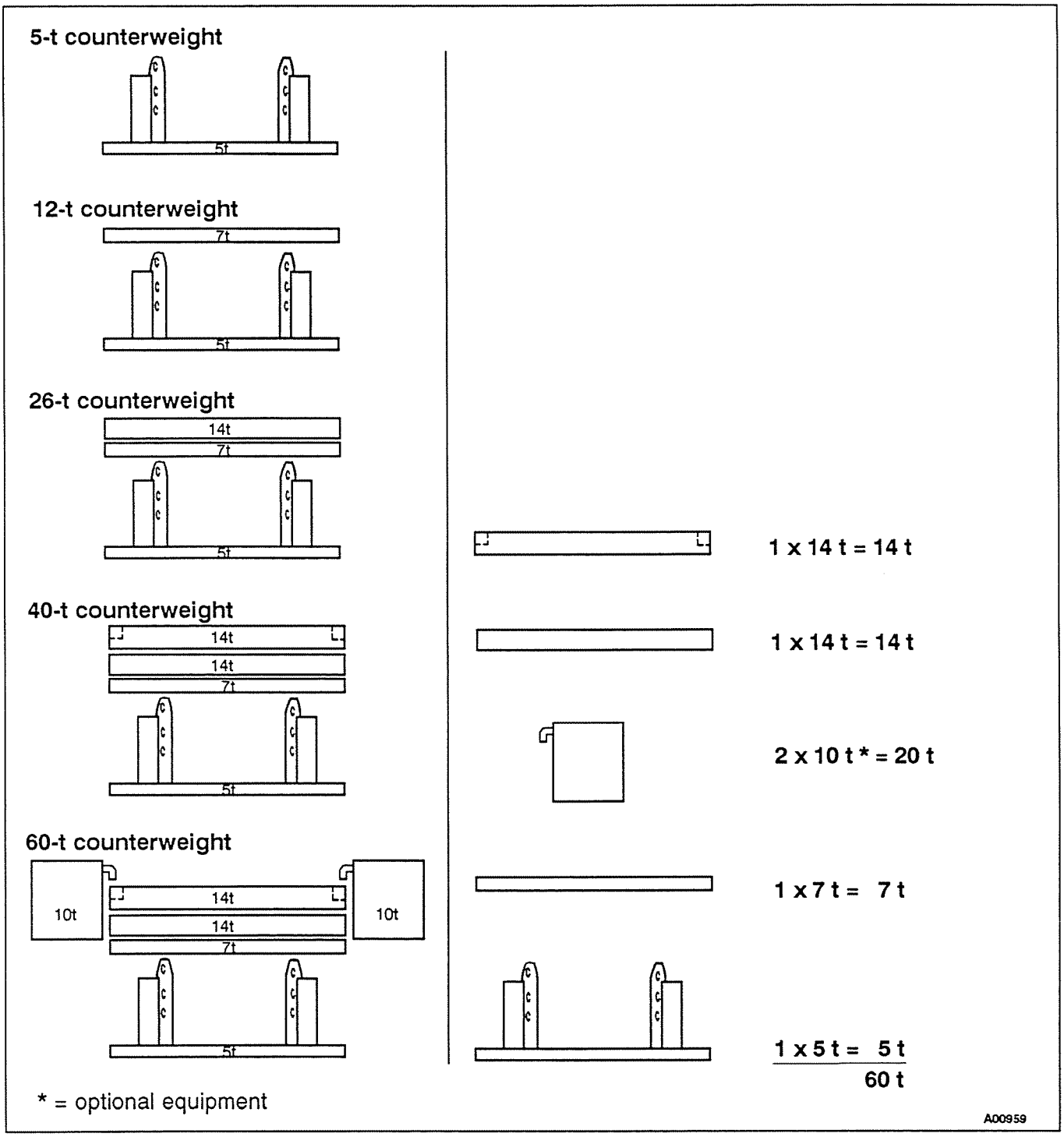
Your attention is drawn in particular to the following notes in the operating instructions:

Danger: Dangers are pointed out which are connected with the described procedure and may **endanger persons.**

Caution: Dangers are pointed out which are connected with the described procedure and may first and foremost lead to **damage to objects**, e.g. to the truck crane or the load which is lifted.

Note: **Further notes and tips** are given regarding the handling of the truck crane.

Counterweight



The counterweight sections can be assembled to form four different counterweights.
As part of the optional equipment the counterweight can be extended to form a 60-t counterweight. This is only possible with two 10-t counterweight blocks (optional equipment).

For driving on roads the entire counterweight must be removed from the truck crane. For installing the counterweight the counterweight sections are stacked on the carrier with the crane.

Hydraulic lifting cylinders are fitted to the 5-t counterweight section. The counterweight is lifted off the carrier with the lifting cylinders and then locked on the superstructure.

2.4.7 Safe distance from electric cables

Always keep a safe distance from electric cables in the working area of the truck crane. This is particularly important if there are overhead cables in the danger area which have not been disconnected or covered by electrical specialists.

Voltage	Minimum distance (m)
up to 1000 V	1
over 1 kV to 110 kV	3
over 110 kV to 220 kV	4
over 220 kV to 380 kV	5

Danger:

Always keep a safe distance from overhead cables.
Observe the regulations in the country in which you are working.

If the nominal voltage of a cable is not known always maintain a minimum distance of **5 m**.

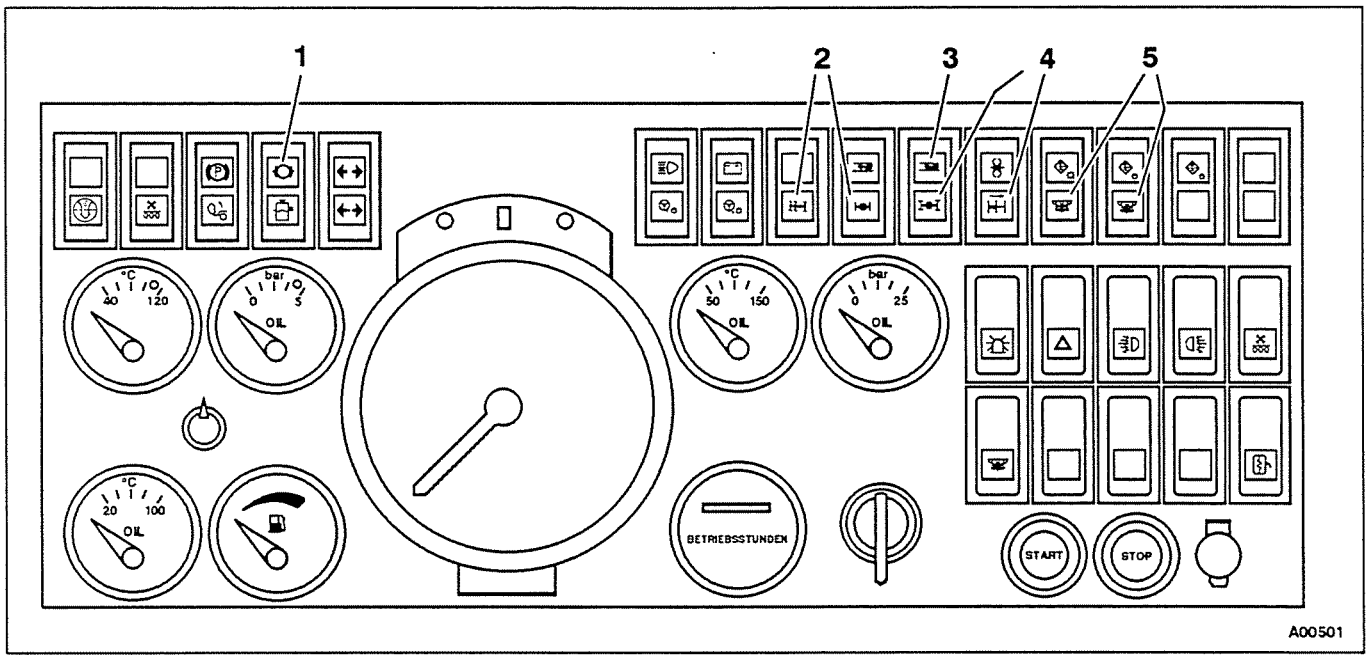
If despite due care you have touched a cable with the crane:

- keep calm
- do not leave the operator's cab
- warn all persons outside to stay where they are and not to touch the crane
- move the crane out of the danger area
- if you have to get out of the crane you must not touch the crane and the ground at the same time - so jump out of the cab and do not climb down.

3. Driving

The truck crane may only be driven on public roads if it is in the prescribed transport condition. Details applying specifically to the transport condition of truck crane KMK 6160 are given below. In addition all laws, stipulations and regulations applying to the road safety of motor vehicles and to the use of public roads must of course be complied with.

3.1 Prescribed condition for driving the truck crane on roads



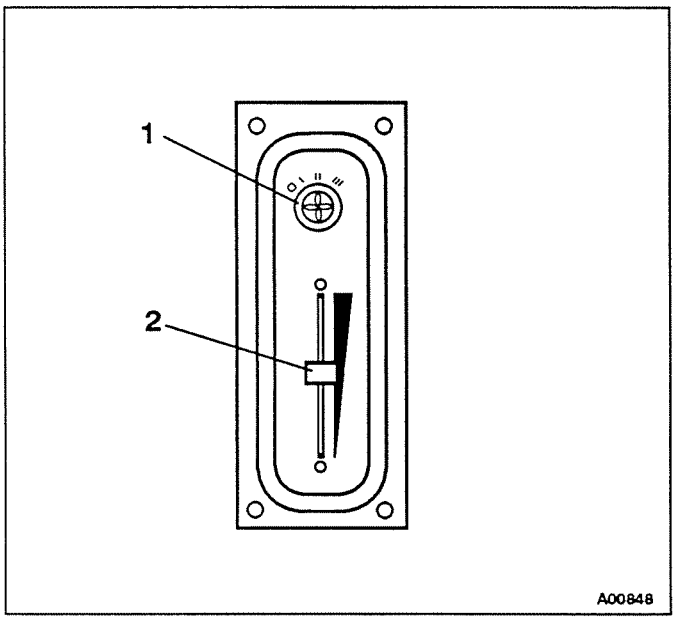
The compressed-air and brake system must be filled; warning light (**1**) must be off (please see Section 3.4.20 "Checking the compressed air system and brake system").

The transfer case is switched to the on-the-road mode; indicator lamp (**3**) must be on (please see Section 3.4.13 "Changing the transfer case to the on-the-road gear").

All differential locks and driving of the first axle line must be disengaged; indicator lamps (**2**) and (**4**) must be off (please see Section 3.4.15 "Checking that the level of the carrier is correct for driving on roads").

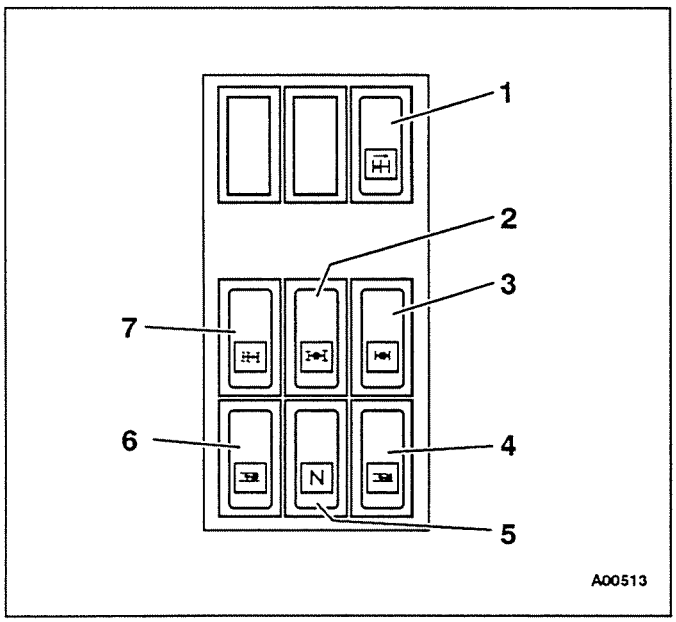
The suspension must be unlocked, indicator lamps (**5**) must be off (please see Section 3.4.14 "Checking the suspension system").

3.2.2 Side instrument panel



1 Knob for blower

2 Heating regulator



1 Rocker switch activation of driving of the first axle line

2 Rocker switch "longitudinal differential lock in transfer drive axle, fourth axle line"

3 Rocker switch "transverse differential lock in all driven axle lines"

4 Rocker switch "transfer case, on-the-road gear"

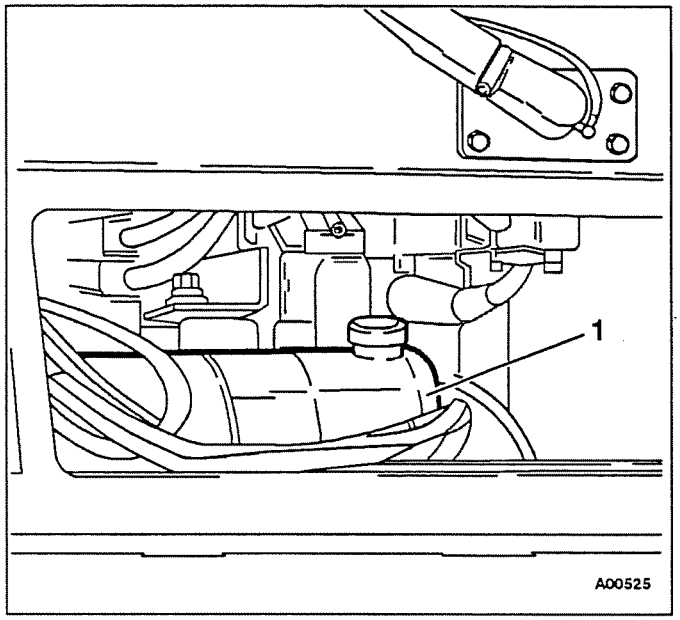
5 Rocker switch "transfer case, neutral position"

6 Rocker switch "transfer case, off-the-road gear"

7 Rocker switch "longitudinal differential lock in transfer case"

3.4.8 Checking the windscreen washing system reservoir

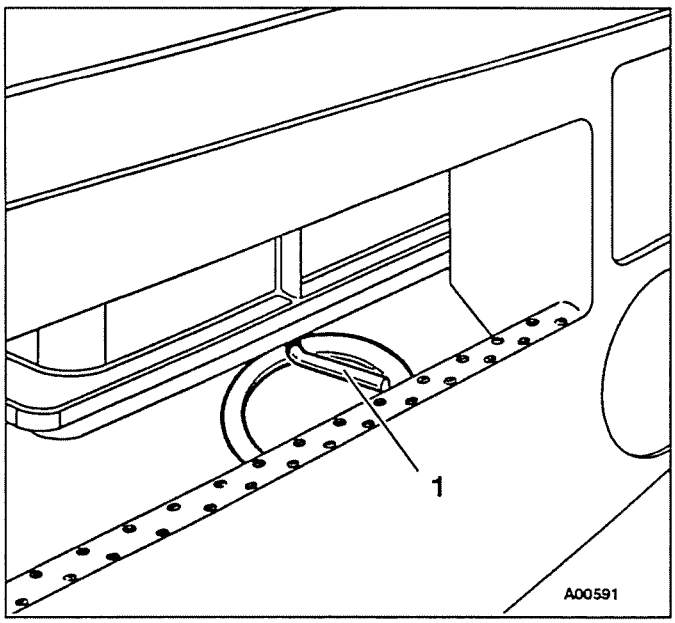
Ensure that the reservoir is always filled and add a cleaning agent and antifreeze to the water.



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.

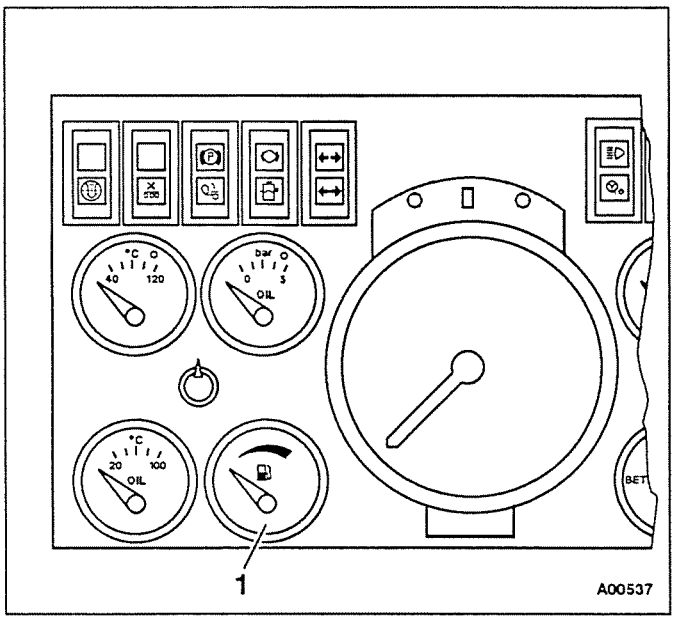
3.4.9 Switching on the battery master switch



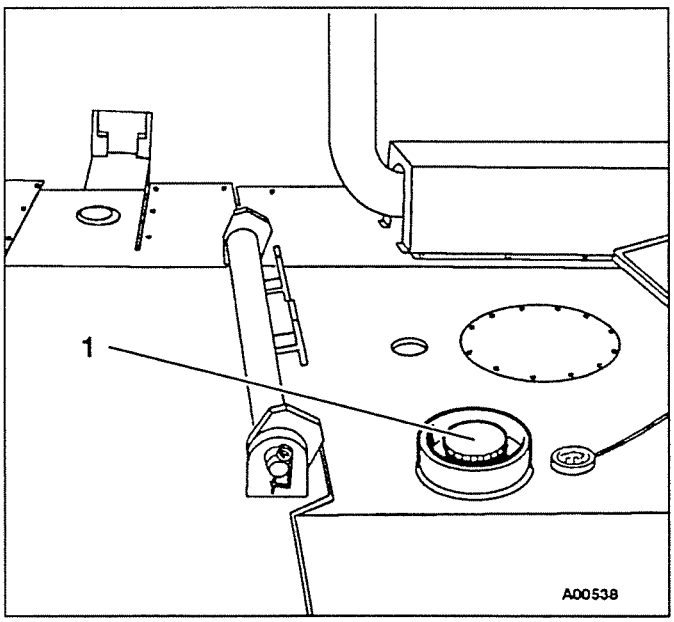
The battery master switch (**1**) is under the battery box.
Access to the master switch is through an opening in the base plate in the driver's cab on the right-hand side.

- Engage the switch lever in the bore in the battery box and turn it to the position shown in the picture. This switches on the power supply to the carrier.

3.4.21 Refuelling



Check the fuel gauge (**1**) at regular intervals and refuel with diesel in good time.

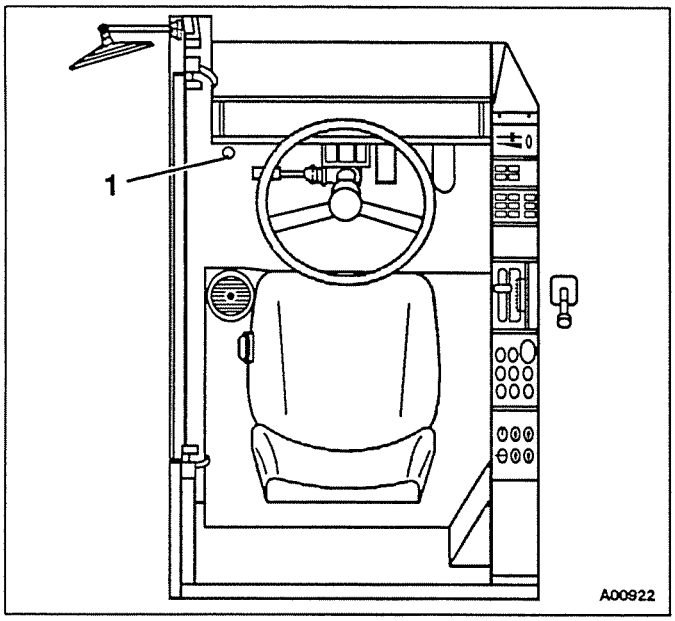


The filler neck for the fuel tank for the driving engine (**1**) is in the middle of the carrier behind the boom support.

Note: The fuel tank for the crane engine must also be filled up (please see Section 4.3.17). When filling the tank always use a funnel with a filter.

Caution: The fuel specification for the driving engine is given in Mercedes Benz's operating instructions, supplied with these operating instructions.

3.5.7 Driving downhill



When driving downhill the retarder of the automatic gearbox can be used within any gear range.

To engage the retarder the accelerator should be released and the retarder switch (**1**) presssed.

To increase the braking force you can change into a lower gear and select gear mode **P** (hill) (please see Section 3.5.3 "Automatic gearbox - alternative modes").

As long as the retarder is engaged the gearbox can not change into a higher gear.

Note: If you press the accelerator while the retarder switch is pressed the retarder will be switched off and the gearbox can change into a higher gear. When driving downhill you should therefore select a lower gear range to ensure that the gearbox does not change into a higher gear when this is not desirable.

Caution: When driving downhill for long stretches with the retarder on pay particular attention to the gear oil temperature (please refer to Section 3.5.6 "Gear oil temperature gauge").

3.7.6 Carrier level adjustment

To improve the off-the-road handling of the truck crane its ground clearance and the angle of its chassis can be altered with the carrier level adjustment system.

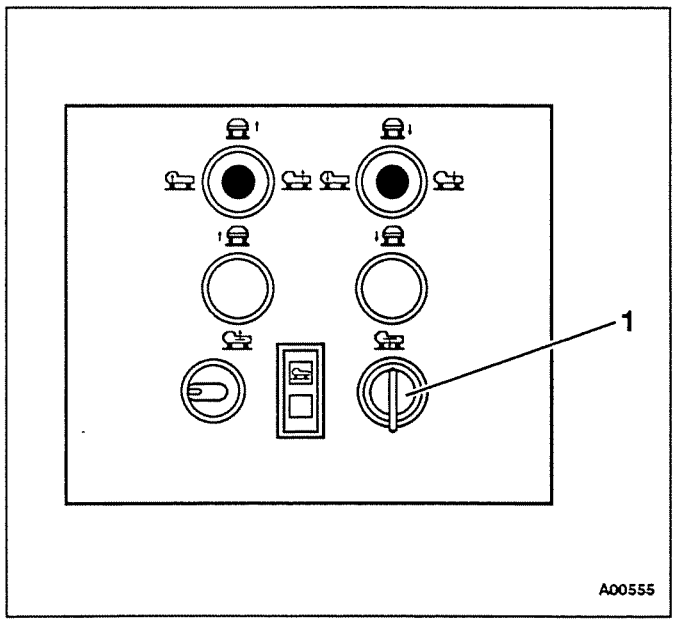
Activation of the carrier level adjustment system is blocked with a key switch. When this key switch is turned on, the following functions can also be activated:

- Driving of the first axle line
- Longitudinal differential lock in the transfer case
- Longitudinal differential lock on the transfer drive axle, fourth axle line
- Transverse differential locks in the driven axle lines
- Blocking of gears 3, 4 and 5 of the automatic gearbox (the truck crane can then only be driven in gears 1, 2 and R)

Switching on the carrier level adjustment system

The vehicle is stationary, the parking brake is on, the gear lever is in the neutral position **N**.

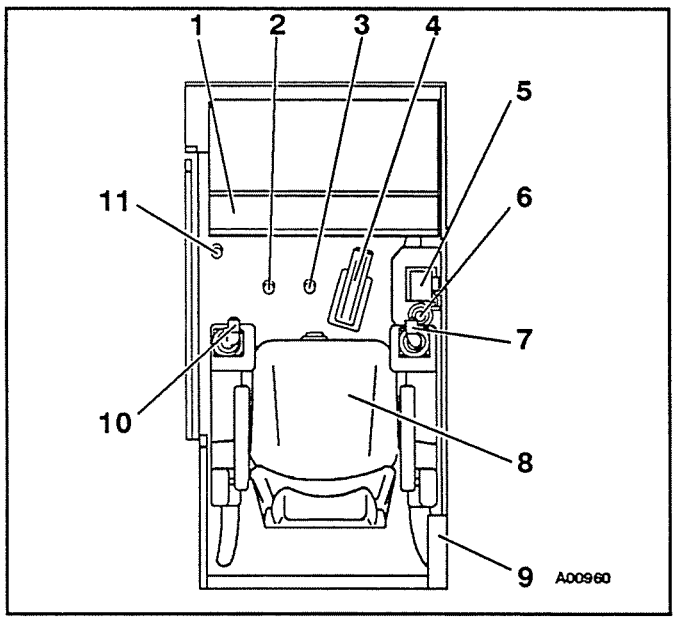
Caution: Whenever the level of the carrier is adjusted the suspension locking system must be switched off on all axle lines. All differential locks and the first axle line drive must also be disengaged.



- Insert the key into the key switch (**1**) in the driver's cab, and turn it to the right.
  Push the key in in this position and with it still pushed in turn it back to the left.
- For changing the level of the carrier keep the engine speed at 1000 to 1300 min $^{-1}$ by pressing the accelerator .

4. Crane Operation

4.1 Crane operator's cab on superstructure



1 Front instrument panel

2 Foot-operated switch for fast speed for derricking gear and telescope gear

3 Foot-operated switch for fast speed for main hoist and auxiliary hoist

4 Accelerator

5 Throttle

6 Circular spirit level

7 Control lever for main hoist, telescope gear and derricking gear with horn button and dead man's button

8 Crane operator's seat with dead man's switch for seat and instrument panels on the right and left-hand sides under the arm rests

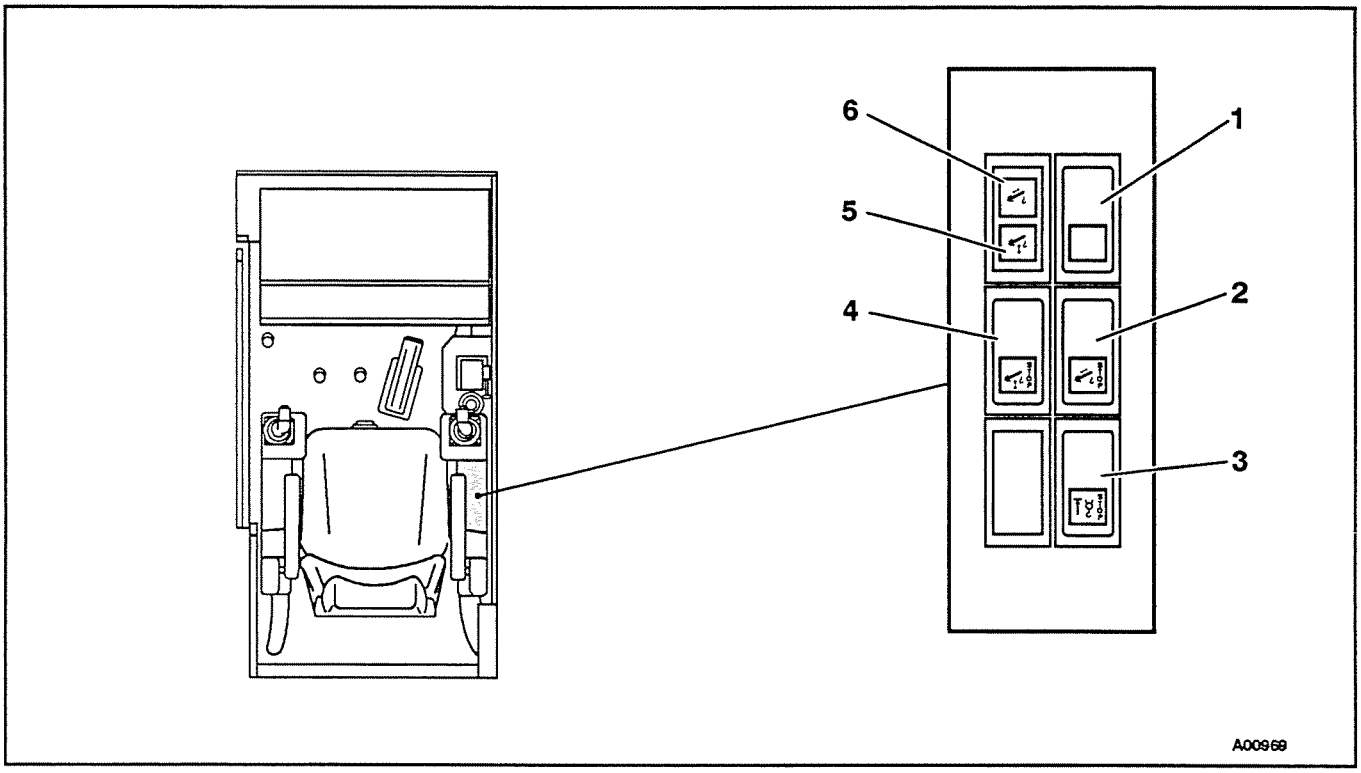
9 Side instrument panel

10 Control lever for auxiliary hoist and slewing gear with horn button and dead man's button

11 Foot-operated switch "free movement position for slewing gear"

4.1.3 Instrument panels at crane operator's seat

Under the right-hand armrest



1 Rocker switch for changing the function of the right-hand control lever
pressed in at top: telescoping
pressed in at bottom: derricking

2 Rocker switch "telescoping, on/off"

3 Rocker switch "main hoist, on/off"

4 Rocker switch "derricking, on/off"

5 Indicator lamp "control lever switched to derricking mode"

6 Indicator lamp "control lever switched to telescoping mode"

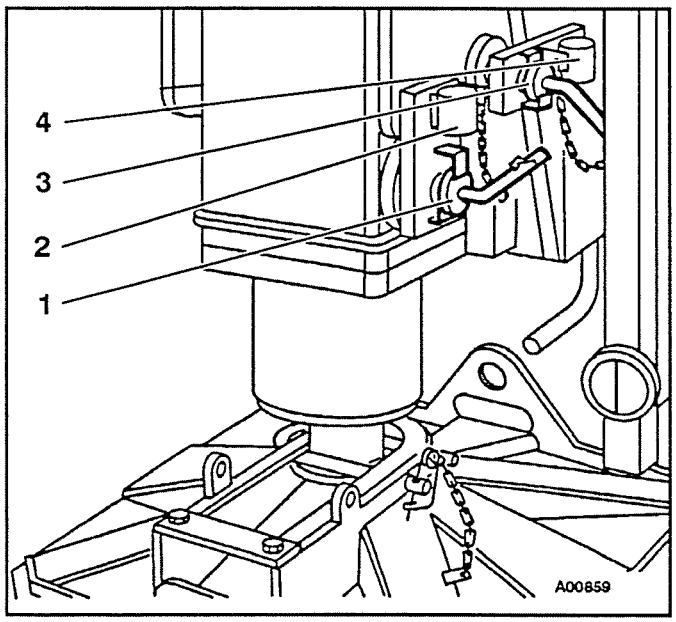
Extending the outrigger beams

Two outrigger beams can be extended at a time. There are two pins on the side of each outrigger beam. The pins have to be inserted in different positions so that the outriggers can be extended to the spans stipulated in the lifting capacity tables.

Caution: Always extend all four outrigger beams to the same span.
The stipulated span is listed in the **lifting capacity tables.**

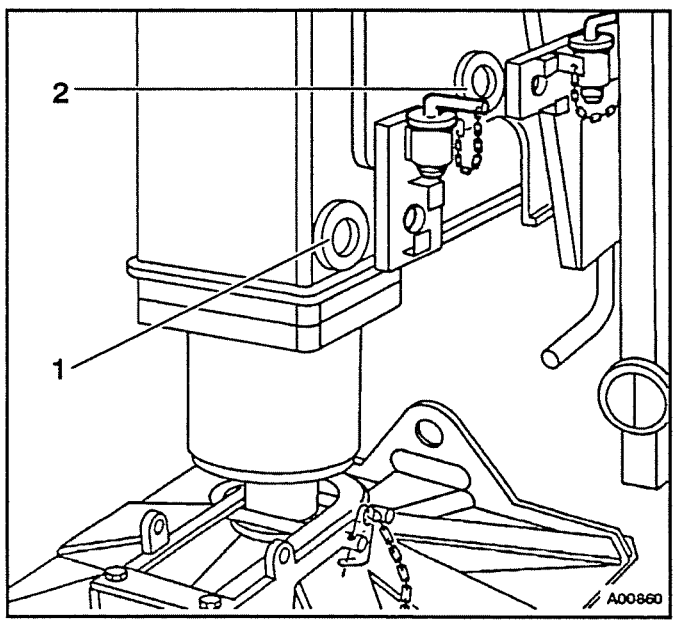
Danger: Only move two outrigger beams at a time. Only operate the outrigger beams from the side of the crane where they are in view, otherwise **accidents may occur.**

The outriggers may only be operated from one control unit at a time.
If they are operated from both control units at once they will not work properly.



- Remove the pins (**1**) and (**3**) out of the bores in both outrigger beams and insert the pins into holders (**2**) and (**4**).

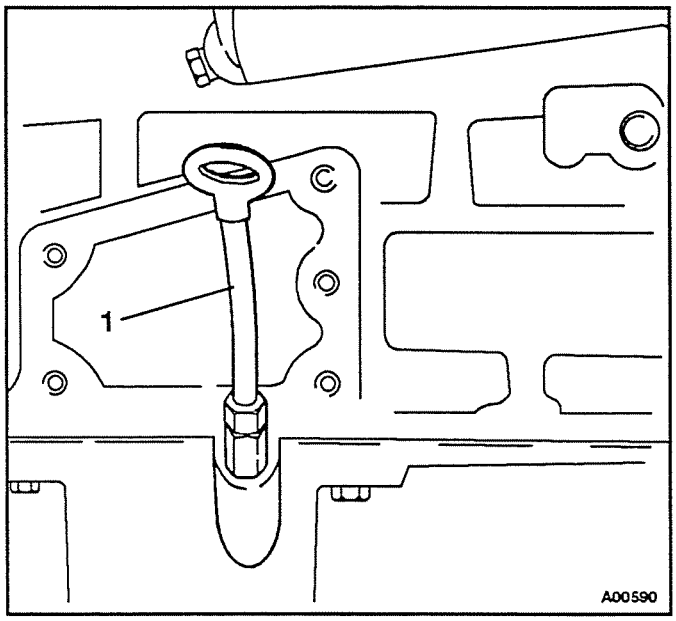
Note: Turn the handle of the pin to remove the pin from the bore.



- Extend the outrigger beam a little until the two round, welded lugs (**1**) and (**2**) are visible.

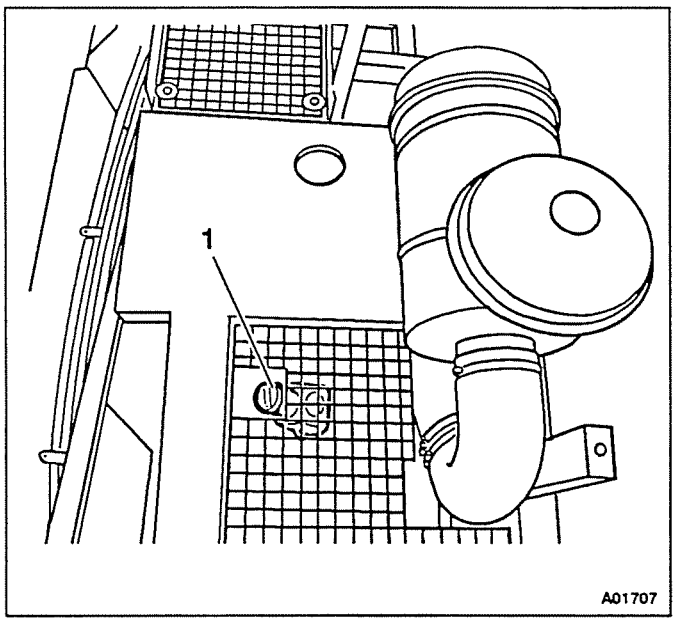
4.3.7 Checking the oil level in the crane engine

The prescribed oil specification and required oil fill are listed in Mercedes Benz's operating instructions supplied with these operating instructions



The dipstick (**1**) is behind the crane engine cover plates.

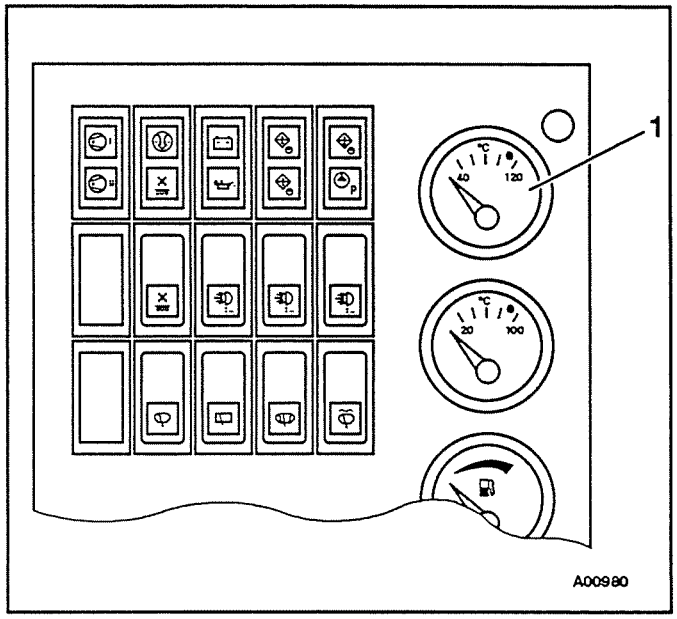
The crane engine cover plates are on the side of the turntable opposite the crane operator's cab.



The oil filler neck (**1**) for the crane engine is on the opposite side of the crane operator's cab under the grille.

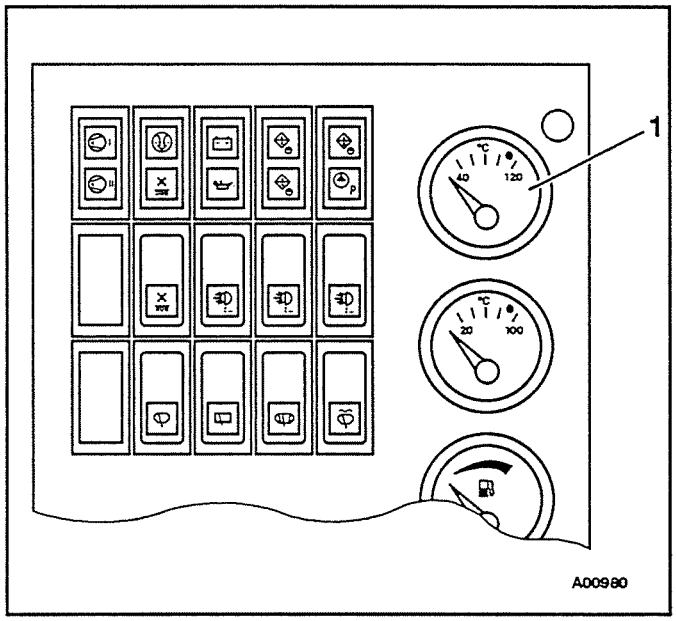
4.5.2 Cooling the hydraulic oil

During normal crane operation, the temperature of the oil should not exceed 70°C.



- The hydraulic oil temperature gauge (**1**) must be checked regularly while working with the crane.
- If the temperature of the hydraulic oil reaches 80°C work must be stopped and the oil allowed to cool down with the pump idling.

Cooling the hydraulic oil with an oil cooler (optional equipment)



- The hydraulic oil temperature gauge (**1**) must be checked regularly while you are working with the crane.

The oil cooler is controlled by a thermostat. It is switched on at an oil temperature of 40°C.

4.6.3 Putting down the hook block

Placing the hook block on the accompanying transport vehicle and securing the hoist rope for driving on roads.

- Place the hook block on the transport vehicle.
- Pull the rope holding rods on the boom head out of the bores.

Caution: When lowering the main boom reel up the hoist rope so that it does not slacken.

- Pull the holding rods out of the bores in the hook block and fold down the guard plates.
- Remove the rope end clamp from the boom head or hook block and take the hoist limit switch weight off the hoist rope.
- Unreeve the hoist rope.
- Place the main boom on the boom support.
- Insert the rope holding rods into the bores on the boom head. Fold the guard plates on the hook block up and insert the holding rods into the bores on the hook block.
- Fasten the rope end clamp with an endless rope to the front towbar coupling on the truck crane.
- Reel up the hoist rope until it is taut.

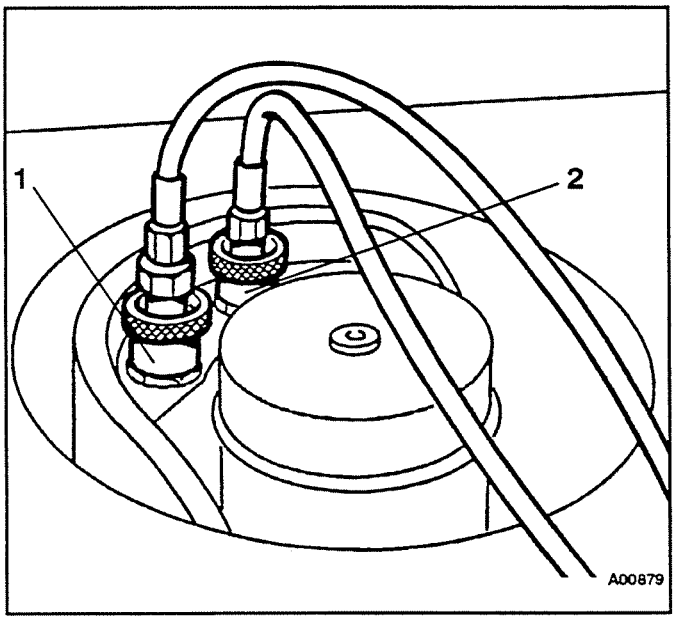
The hoist rope is now secured for driving on roads.

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

- Raise the main boom and turn the superstructure until the hook block is hanging above the holder.

Danger: **To avoid accidents**, check that nobody is on the carrier before you raise the boom and turn the superstructure.

Caution: Be careful not to damage the truck crane with the hook block when raising the boom and turning the superstructure.
Ensure that the hook does not swing.



- Unscrew the caps from the connections (**1**) and (**2**) on the lifting cylinder.
- Screw the hose couplings onto the connections on the lifting cylinder.

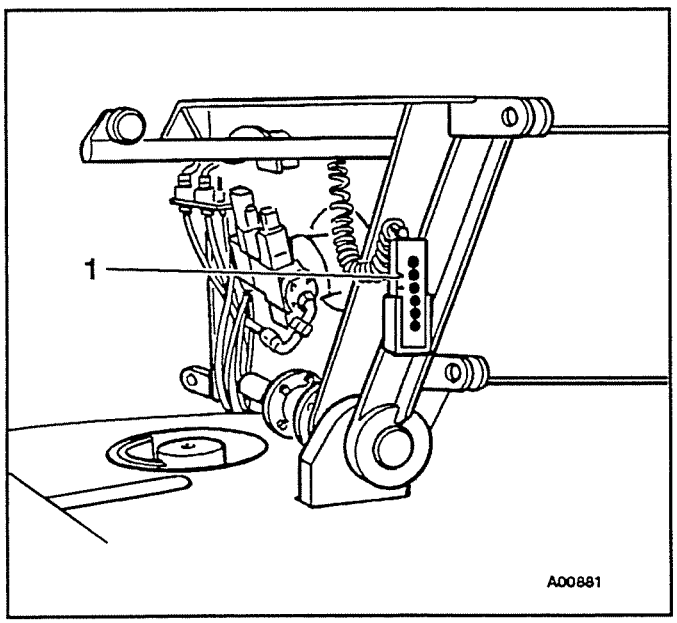
Note: Screw couplings and their corresponding connections have the same thread.

- Screw the screw couplings tight. There is a shut-off valve in both connections which is opened when the coupling is screwed in.

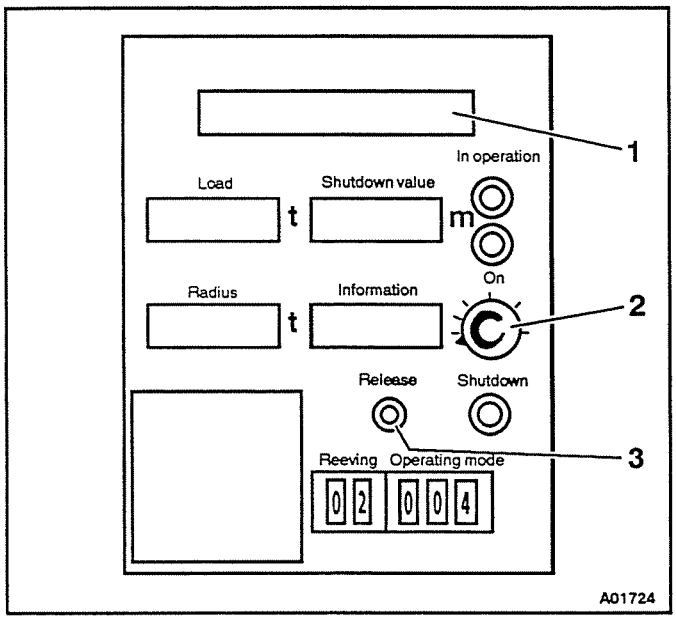
Caution: Screw the screw couplings tight. If they are not screwed in far enough the shut-off valve will not be opened fully.

- Set the engine to a speed of 1000 to 1200 min^{-1} with the manual throttle in the crane operator's cab.

The hydraulic cylinder can then be controlled from the portable control unit.



The control unit is in the holder (**1**) on the main hoist on the left-hand side of the superstructure.



If you do not know why the shutdown has occurred, hold the release button (**3**) down.

After approximately 1 second, the status display (**1**) will change:

. . . . . f . . . . M b = ...

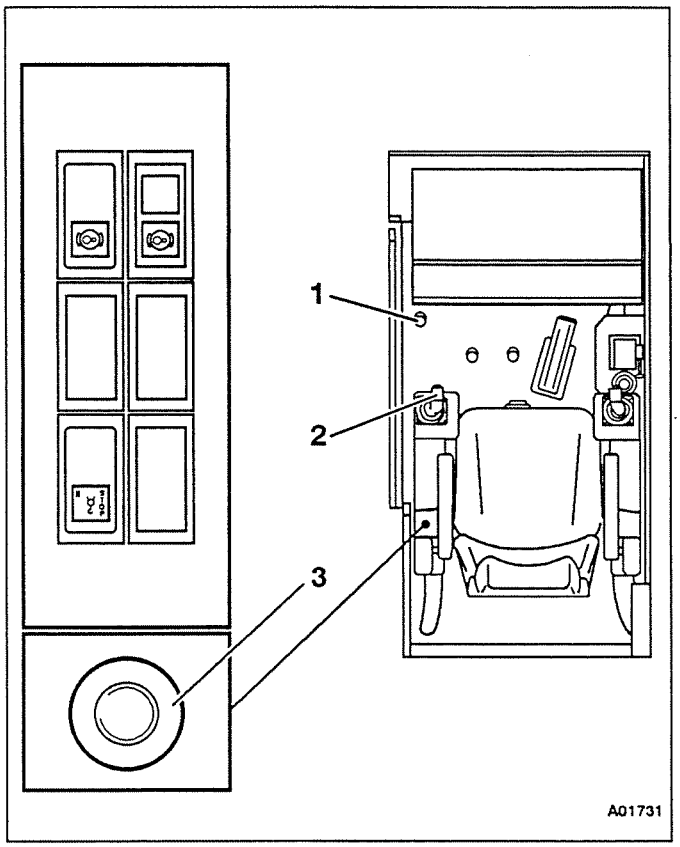
If, for example, the information switch (**2**) is in position **b**:

continue to hold down the release button and turn the information switch to position **f**.

. . . . . f . . . . M f = 1 . . . .

In the table *"status messages"* you will find under **f=1** that the angle of the main boom is below the minimum value.

Slewing



Slewing to the left:
Move the left-hand control lever (**2**) to the left.

Slewing to the right:
Move the left-hand control lever (**2**) to the right.

The slewing speed can be regulated with the control lever or by altering the engine speed.

Note: Maximum speed is only reached at an engine speed of approx. 1200 min^{-1}. Below 1200 min^{-1} the maximum speed of the slewing gear corresponds to the engine speed.

The maximum slewing speed can be regulated with knob (**3**), allowing the slewing speed to be adjusted more finely
- Turn the knob to the left to increase the maximum slewing speed,
- Turn the knob to the right to reduce the maximum slewing speed.

When the control lever is moved out of the centre position the permanent brake is released and the superstructure is slewed. The further the lever is moved out, the higher the slewing speed. The slewing movement is braked by moving the lever back to the centre position. When the lever is in the centre position and the superstructure has stopped turning the slewing gear permanent brake is engaged.

Caution: Accelerate and brake the slewing movement slowly so that the load does not start to swing, **otherwise you may bend the boom**.

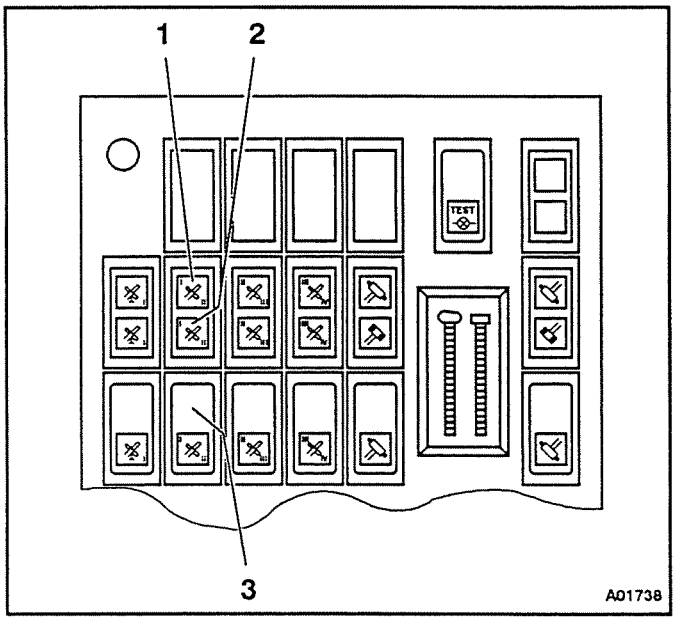
Free movement of slewing gear

The slewing gear's free movement position is engaged by pressing foot-operated switch (**1**). This position is engaged when the superstructure has to be able to turn freely (e.g. so that the boom can turn into the wind or when working with a second crane).

Note: The free movement position may only be engaged when the superstructure has stopped turning.

Extending/retracting telescope section II

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



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

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

The pins are operated 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 II is unlocked from telescope section I.

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

Caution: Telescope section II is not locked to telescope section I until the green indicator lamp (**1**) lights up.

4.6.15 Movements which can be carried out simultaneously

Raising/lowering with the main hoist (without fast speed) can be carried out simultaneously with:

- Raising/lowering with the auxiliary hoist
- Slewing
- Telescoping
- Lifting/lowering the boom

Raising/lowering with the main hoist (with fast speed) can be carried out simultaneously with:

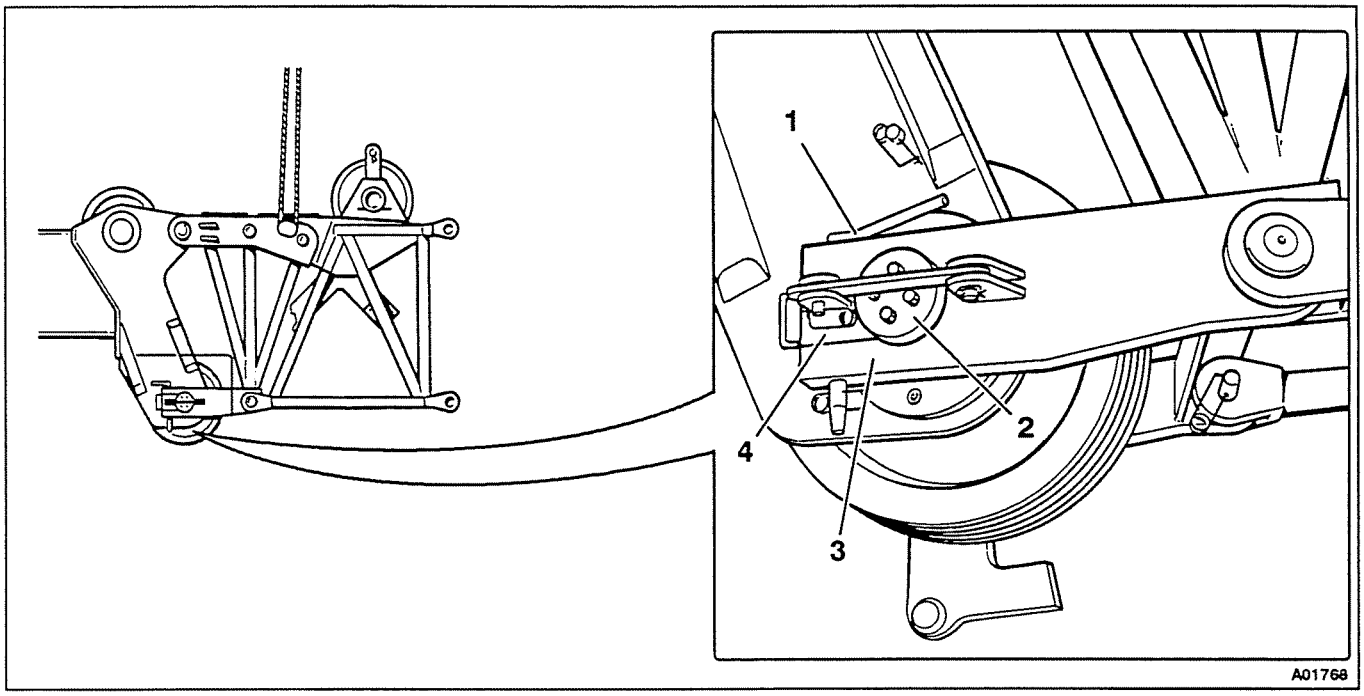
- Lifting/lowering the boom or telescoping
- Slewing

Raising/lowering with the auxiliary hoist (with fast speed) can be carried out simultaneously with:

- Lifting/lowering the boom or telescoping
- Slewing

Lifting/lowering the boom or telescoping (with fast speed) can be carried out simultaneously with:

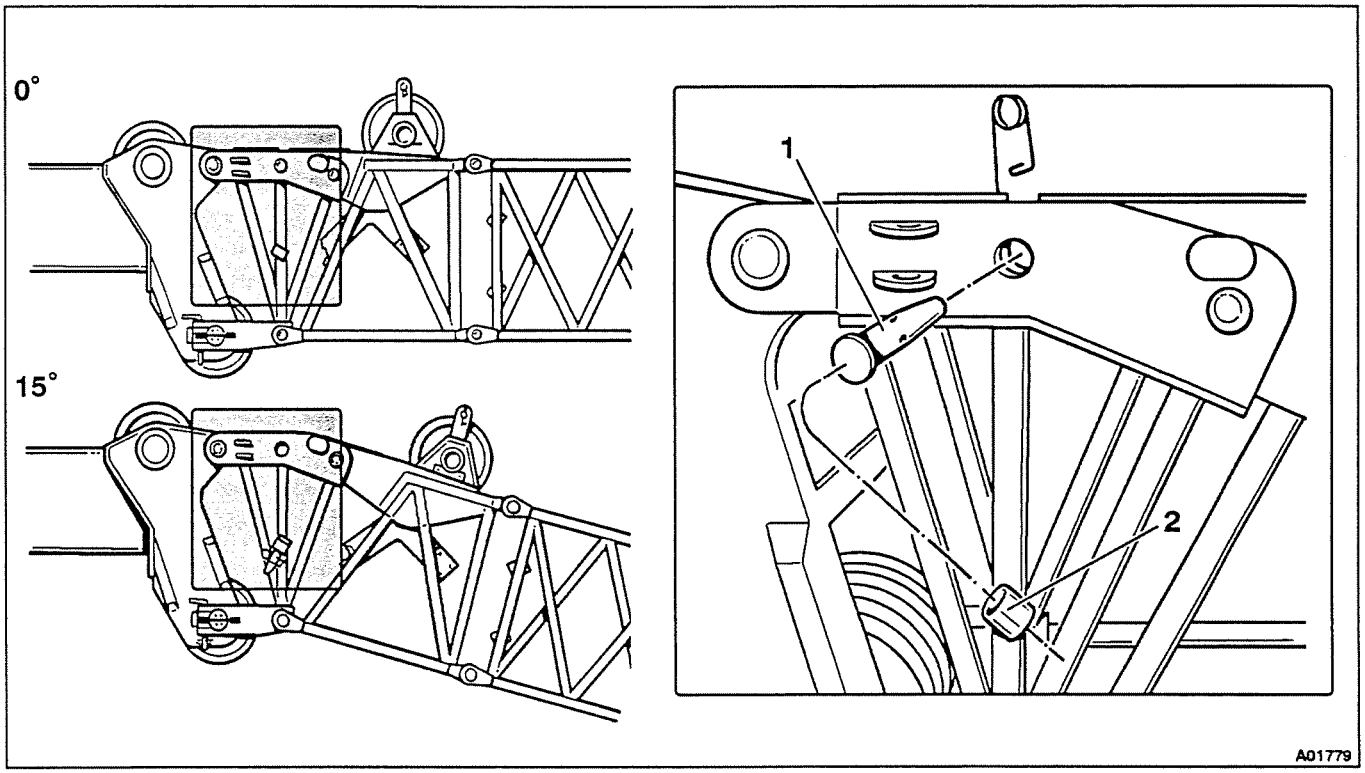
- Raising/lowering with the main hoist
- Slewing



- Attach the lifting tackle to the tee on both sides of the foot section and raise the foot section in front of the main boom with the second crane.
- Slip the forked sections (**3**) on the lower part of the foot section over the head sheave axle (**2**) on the main boom on each side. Hold the foot section in this position with the second crane.
- Fold the clamp (**4**) inwards.
- Insert the pin (**1**) and secure it with a retaining pin.
- Connect the lower part of the foot section to the head sheave axle on the other side.

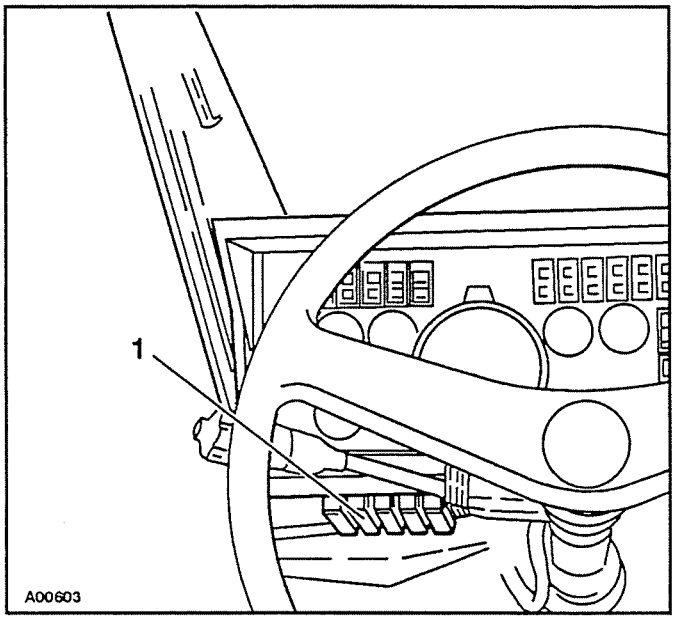
Adjusting the angle of the boom extension from 15° to 0°

When the boom extension is in the 15° position, pin (**1**) is not inserted on both sides of the foot section. To adjust the angle of the boom extension to 0°, both pins have to be inserted.



- Attach the lifting tackle to the two tees on the head section and lift the boom extension until the bores in the foot section are aligned.
- Remove the pin (**1**) from the holder (**2**) and insert it into the bore.
- Secure the pin with a retaining pin. The pin is accessible from above.
- Insert the pin into the bore on the other side of the foot section. Secure the pin with a retaining pin.

Fuse groups F1 to F5



The fuses (**1**) are on the left next to the steering column under the instrument panel. The fuses are divided into five groups **F1** to **F5**.

Designation in electric circuit diagram: F1	Size (A)	Function
1	3	Tachograph
2	10	Voltage converter, Additional heating system run on (optional equipment)
3	10	Start/stop engine, Suspension locking system
4	10	Gauges
5	10	Mirror heating, Additional (optional) heating system
6	3	Indicator lamps

Designation in electric circuit diagram: F2	Size (A)	Function
1	10	Socket, Hazard warning lights
2	15	Rotating warning lights
3	10	Cab lighting, Brake lights
4	10	Horn, Windscreen wipers, Windscreen washing system
5	10	Flasher system
6	10	Heating system blower, Air drier

- The Krupp telescopic crane KMK 6160 is designed for erection work and not under any circumstances for loading and unloading duties.

  If jobs of a similar nature to loading and unloading are carried out occasionally, e.g. pouring concrete from buckets, inspection and maintenance work must without fail be carried out every 1000 operating hours. The hoist gear unit must be checked during this inspection to find out whether it has been affected by the dynamic loads.

7.3 Routine work

7.3.1 Daily inspection and maintenance work

- Check the oil level in both engines with the dipsticks (please see Mercedes Benz's operating and maintenance instructions).
- Check the cooling water (radiators) (reservoirs on the right-hand side behind the driver's cab and on the right-hand side of the turntable).
- Check that the lights and the individual switches are working.
- Check the dry air filters in the engines.
  If the indicator lamps are on, clean or replace the filters (please see Mercedes Benz's operating and maintenance instructions).
- Check the oil level in the automatic gearbox with the dipstick (under the right-hand gear unit cover plate behind the boom support).
- Check the oil level in the pump distributor gear (dipstick on the right-hand side of the superstructure behind the engine).

7.3.2 Weekly inspection and maintenance work

- Look at the engines, axle lines, gearbox and transfer case, checking for leaks and inspecting their general condition.
  Repair any leaks and check the oil level.
- Check that all axle lines are functioning correctly.
- Check the compressed-air and hydraulic systems for leaks.
  Repair any leaks.
- Drain moisture from the compressed-air reservoir.
- Check the oil level in the crane's hydraulic oil tank on the superstructure through the inspection glass (the truck crane must be in the **correct condition for driving on roads (transport condition)**).
- Check the oil level in the carrier's hydraulic oil tank through the inspection glass (the truck crane must be in the **correct condition for driving on roads (transport condition)**).

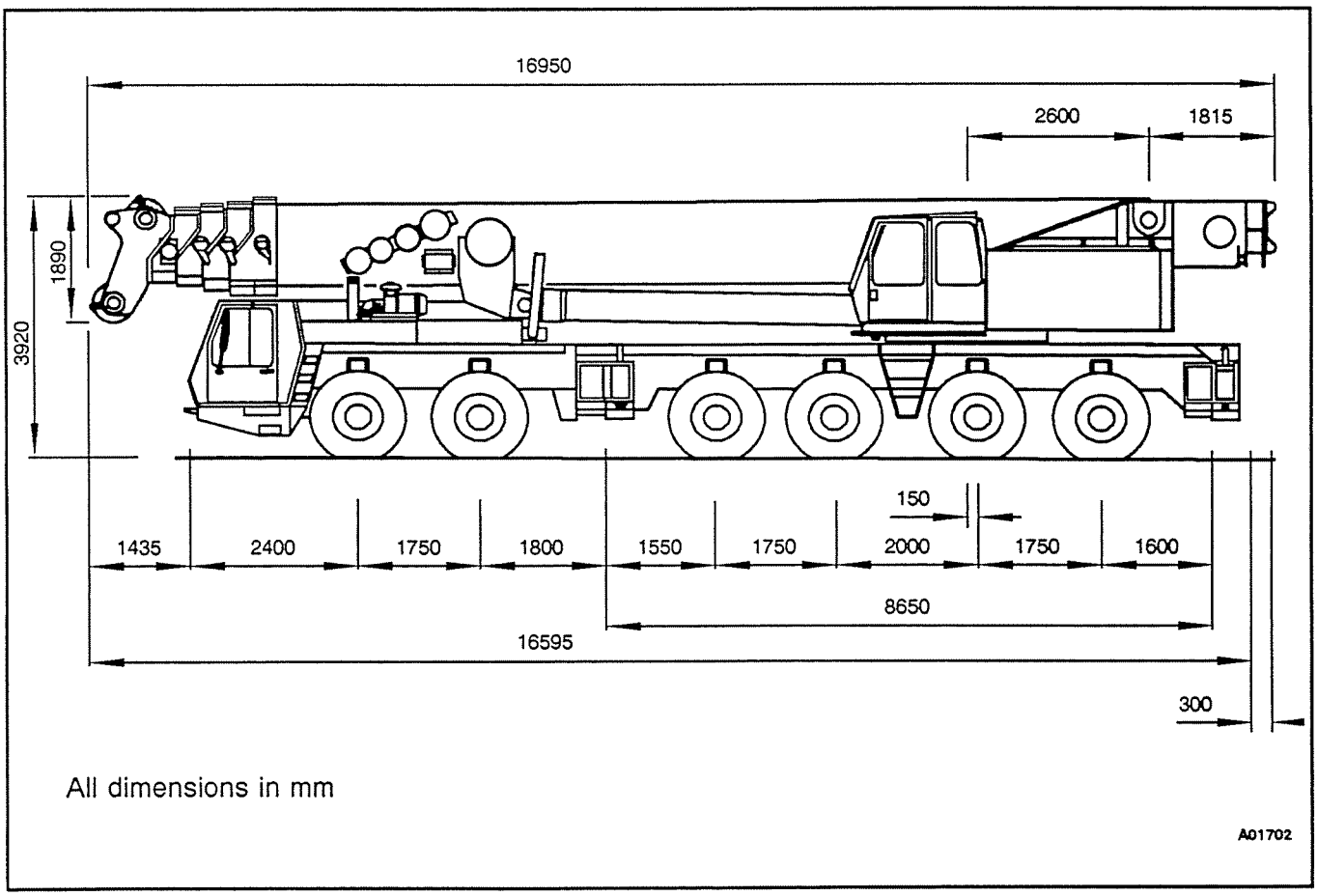
8. Technical data

KRUPP TRUCK CRANE KMK 6160

Max. lifting capacity:	160 t according to DIN 15019.2
Permitted temperature range:	- 25°C to + 40°C

8.1 Dimensions

Length:	17.90 m
Width:	3.00 m
Height:	4.00 m with -130/+170 mm suspension range (on-the-road level)
Max. angle of negotiable banks:	20° (at on-the-road level)



8.2.16 Climbing ability

Climbing ability with 14.00 R 25 tyres:

47% at a transport weight of 72 t in stall ratio torque converter and in off-the-road gear

8.2.17 Turning circle radii

External turning circle radius:	14.3 m
External turning circle radius at boom head:	15.25 m
Internal turning circle radius:	8.50 m