Product advantages mobile crane

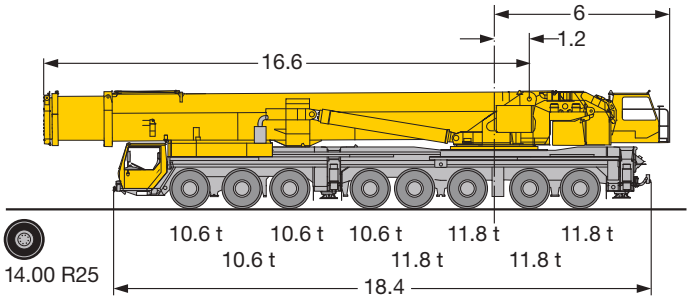
LTM 1500-8.1

Max. lifting capacity: 500 t at 3 m radius
Max. height under hook: 145 m with lattice luffing jib
Max. radius: 108 m with lattice luffing jib

LIEBHERR

The variable telescoping boom system

- 96 t total weight incl. 50 m telescopic boom and permanent outrigger system
- Boom change device with hoisting and displacement mechanism on low loader
- Quick Connection for the dismantling of the telescopic boom (10 t axle load)
- Quick Connection for the dismantling of the superstructure (6 t axle load)



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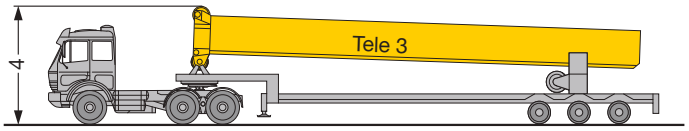
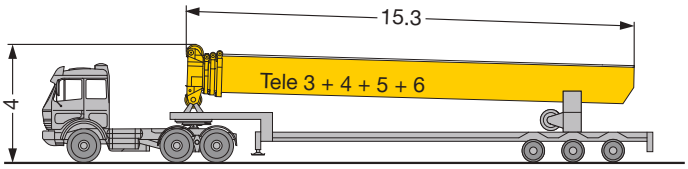
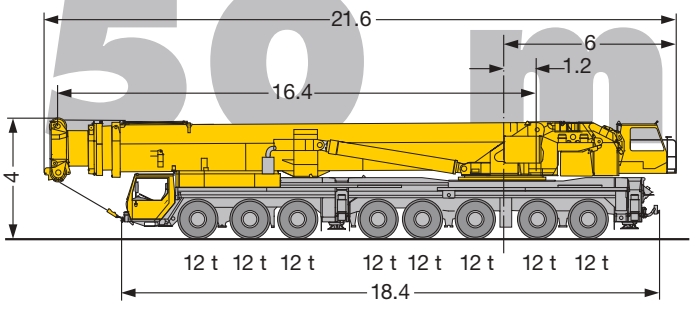


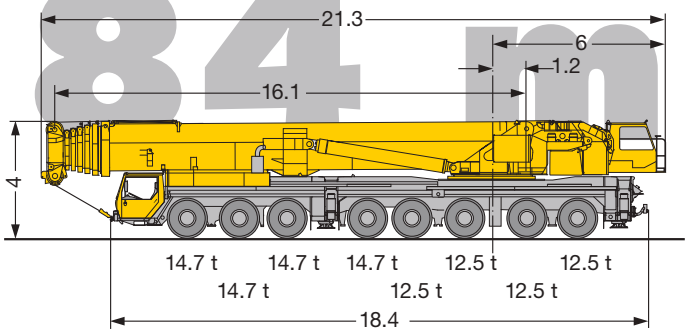


= =

50 m

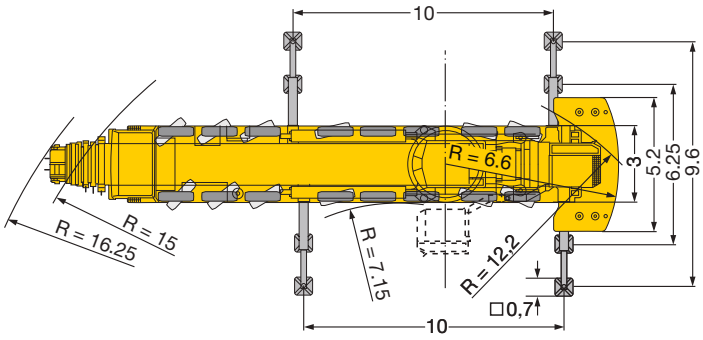


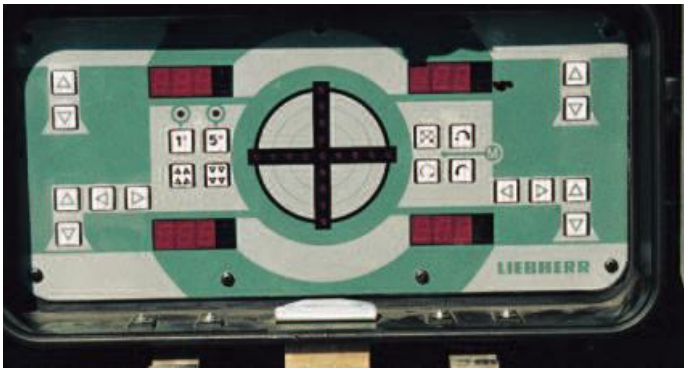
84 m

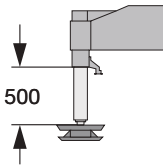


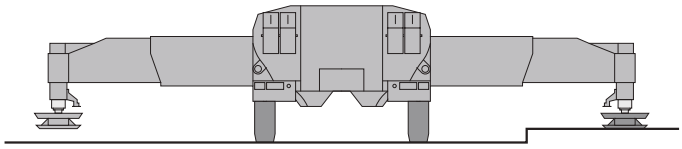
Setting on outriggers – quick, convenient and safe

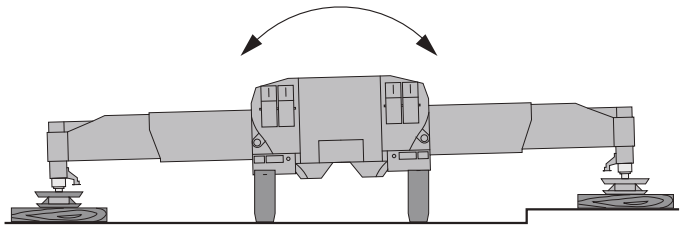
- Permanent supporting pads
- Supporting rams with 500 mm travel
- Automatic levelling of the crane during the supporting procedure
- 2 x 9° lateral inclination, even with locked suspension
- Inclinometer (electronic display of inclination) with two indicators on the carrier and one display on the LICCON monitor
- Indicators of supporting forces on the carrier and on the LICCON monitor
- Control of sliding outriggers with display of the state of extension on the LICCON monitor (optional)

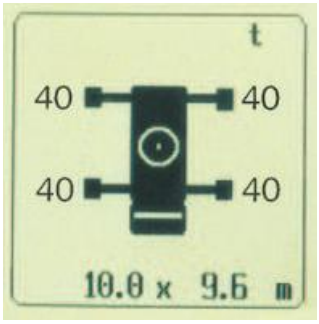






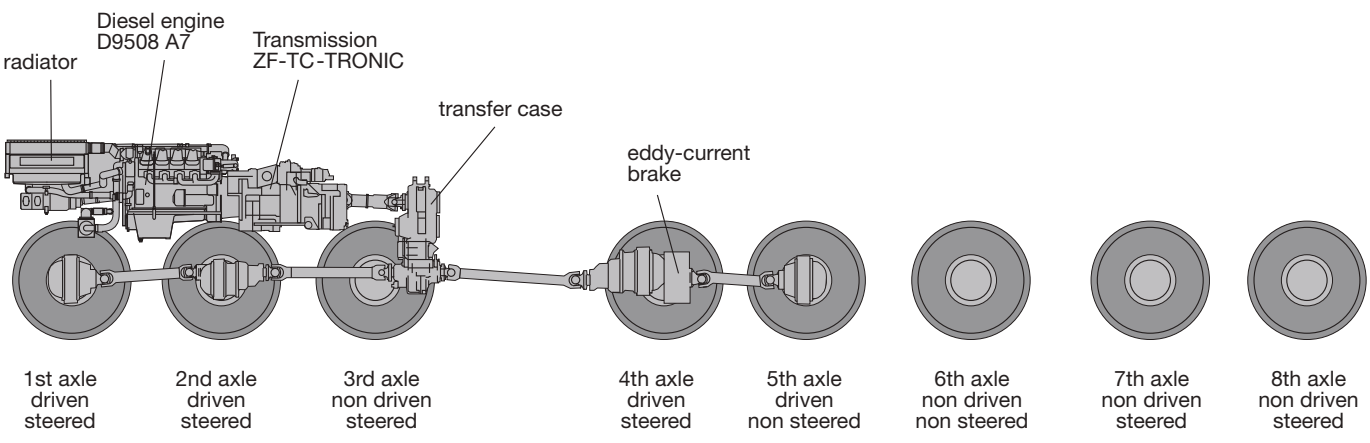






Robust drive concept

- 4 axles permanently driven (1st, 2nd, 4th and 5th axle)
- 6 axles are steered; independent steering of axles 7 and 8
- Automated gear system ZF-TC-TRONIC with converter and retarder, 12 forward and 2 reversed speeds, automated control
- Transfer case
- Driving axles with longitudinal differential locks



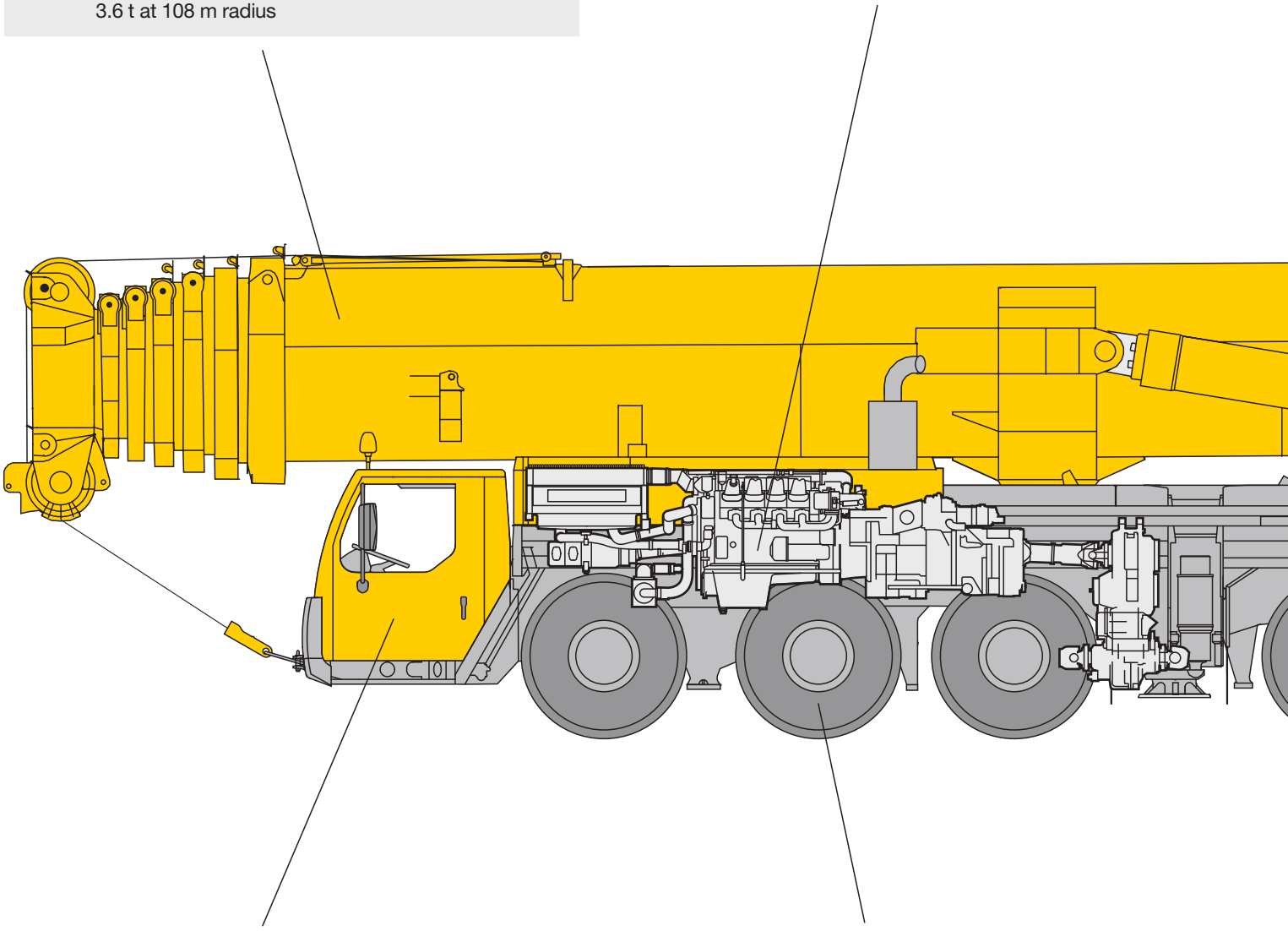
Outstanding boom technology

- Focal points of the new boom technology:
  - oviform boom profile
  - patented internal interlocking system of the telescopes
  - automatic telescoping system
- Telescopic boom with electronically controlled telescoping system
- Boom bearings of low maintenance polyamide slide blocks
- Outstanding lifting capacities, e.g.

161 t at	10 m radius
77 t at	20 m radius
37.4 t at	40 m radius
21.4 t at	60 m radius
13 t at	80 m radius
3.6 t at	108 m radius

Powerful carrier drive

- 8-cylinder Liebherr turbo-charged Diesel engine D9508 A7 of 500 kW/680 hp, exhaust emissions acc. to 97/68/EG stage 3 and EPA/CARB Tier 3, energy-saving, emission-optimized, robust and reliable, electronic engine management
- Automated gear system ZF-TC-TRONIC with converter and retarder, 12 forward and 2 reversed speeds, automated control
- Transfer case
- Robust crane axles, welded design
- Max. driving speed 80 km/h
- In addition to the service and parking brakes, the following sustained-action brakes: Exhaust brake with Liebherr auxiliary brake system by valve control, intarder filled to transmission, Telma-type eddy current brake on 4th axle



Data bus technique revolutionizes crane electric system

- The data transmission to the individual functional blocks is realized digitally by just a few data cables instead of the traditional electrical wiring. Thus, increased functional reliability and essentially less contacts
- Self-manufactured bus systems, especially adapted to the requirements of a mobile crane
- The vehicle and crane electrics with all cockpit functions, the outrigger system and the boom sensor system are interconnected by 6 Liebherr system busses
- Comprehensive diagnostic facilities, quick localization of errors
- The new data bus technique provides a distinctive increase in functionality and efficiency

Outstanding carrier technology for road and off-road application

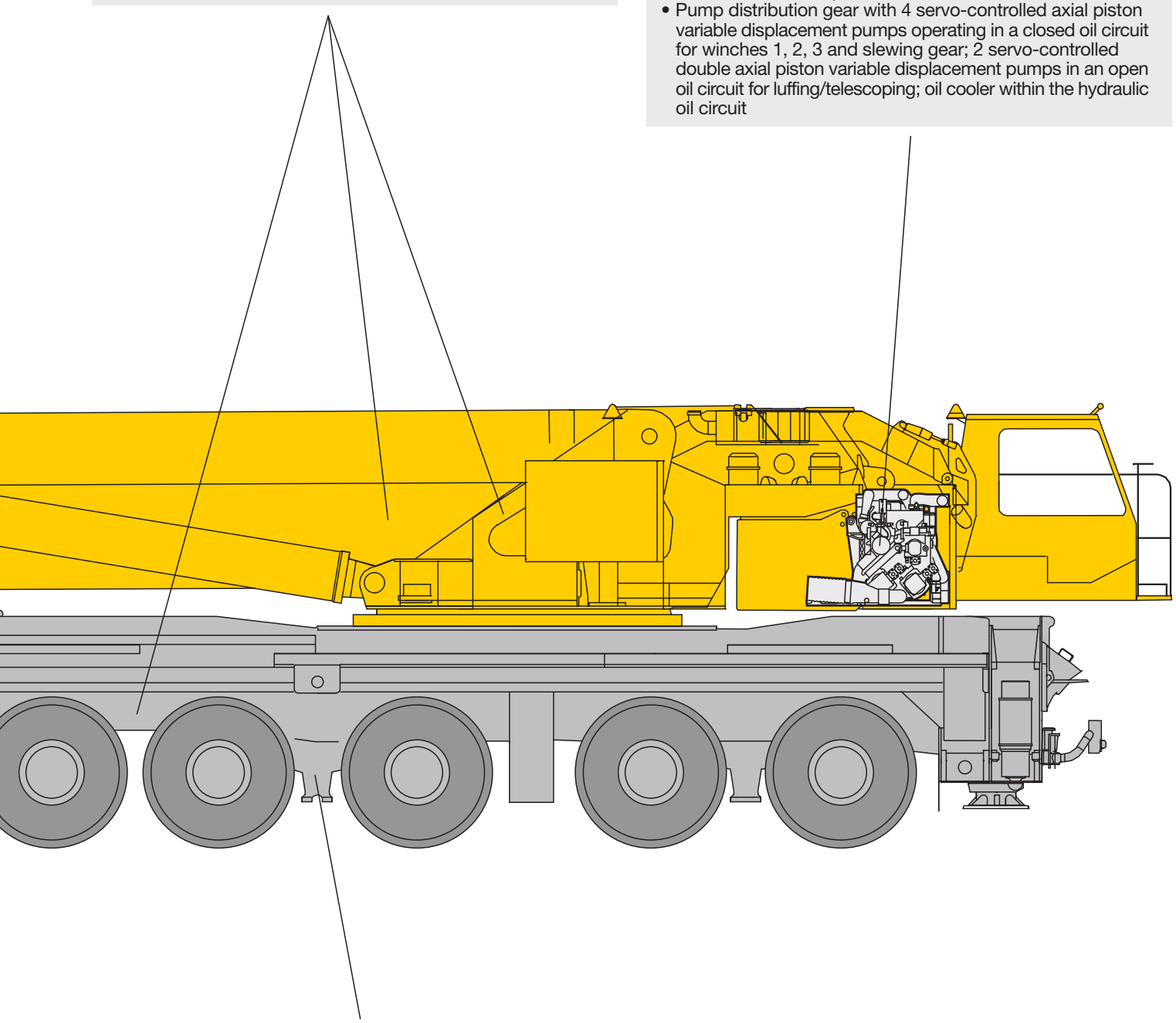
- Weight optimized and low maintenance axles of high-tensile steel; perfect track keeping and lateral stability due to special control linkage arrangement
- Steering knuckles mounted on steel bearings, thus bearing failures are practically ruled out
- The perfected and robust axles are manufactured in large series and are part of the trouble-free components of a mobile crane
- The cardan shafts in the axles are maintenance-free and are safely located within the axle body. 70° diagonal toothing enables easy and fast fitting by just a few screws.

Weight-optimized steel structure

- Carrier, superstructure and telescopic boom in light-gauge design, calculated by the F.E.M. method, weight-optimized and of particular torsional rigidity
- Tensile property of material with high safety factors through the application of STE 960 (960 N/mm2) for all supporting members

Crane drive with proved components

- 6-cylinder Liebherr turbo-charged Diesel engine type D936L A6 of 240 kW/326 h.p, exhaust gas emissions in accordance with the directives 97/68/EG stage 3 and EPA/CARB Tier 3, electronically controlled engine speed, engine located laterally to the rear of the superstructure
- Pump distribution gear with 4 servo-controlled axial piston variable displacement pumps operating in a closed oil circuit for winches 1, 2, 3 and slewing gear; 2 servo-controlled double axial piston variable displacement pumps in an open oil circuit for luffing/telescoping; oil cooler within the hydraulic oil circuit



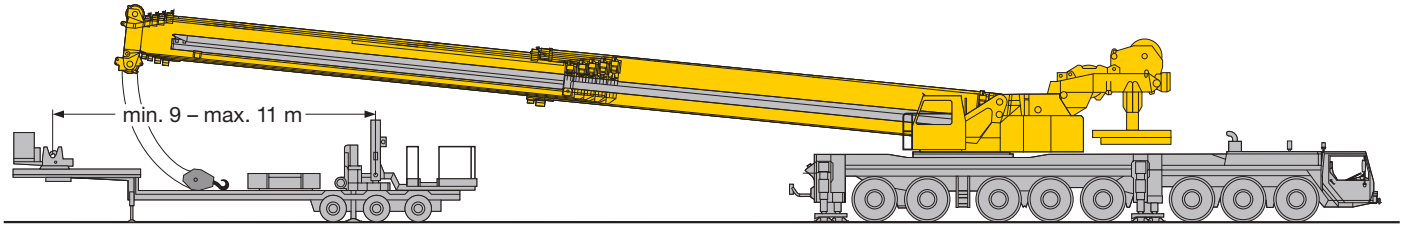
Crane and road-preserving Niveaumatik suspension

- Maintenance-free suspension rams, free of lateral forces and protected by synthetic tubes
- Level adjustment (suspension set to ”travel mode”) can be performed automatically by push-button control from any position
- Stable cornering ability due to cross mounting of the hydraulic suspension
- Axle locking system (locking of the suspension for travelling with equipment) integrated into the suspension ram and controllable from the driver’s cabin

Dismantling of telescopes 2 - 6 or 3 - 6 respectively over the vehicle's rear, front or side

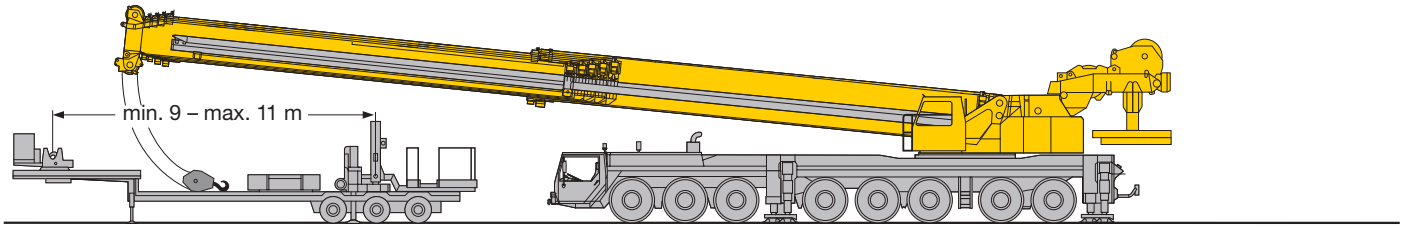
Variant 1

Crane on outriggers, dismantling over the vehicle's rear
Minimum counterweight with 2 – 6 telescopes 30 t
3 – 6 telescopes 15 t



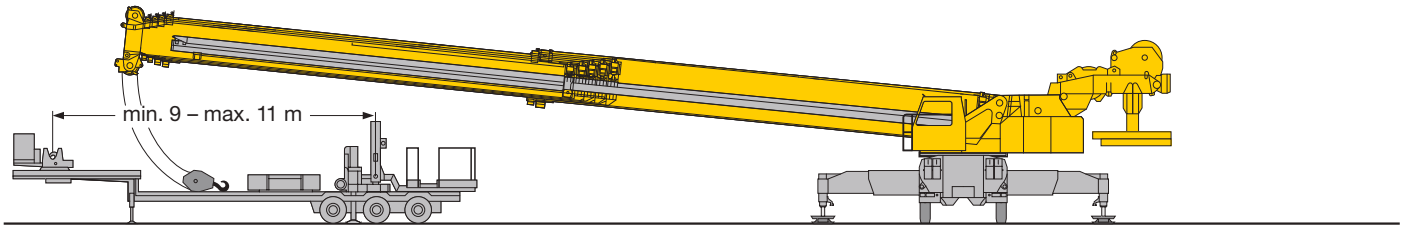
Variant 2

Crane on outriggers, dismantling over the vehicle's front
Minimum counterweight with 2 – 6 telescopes 30 t
3 – 6 telescopes 30 t



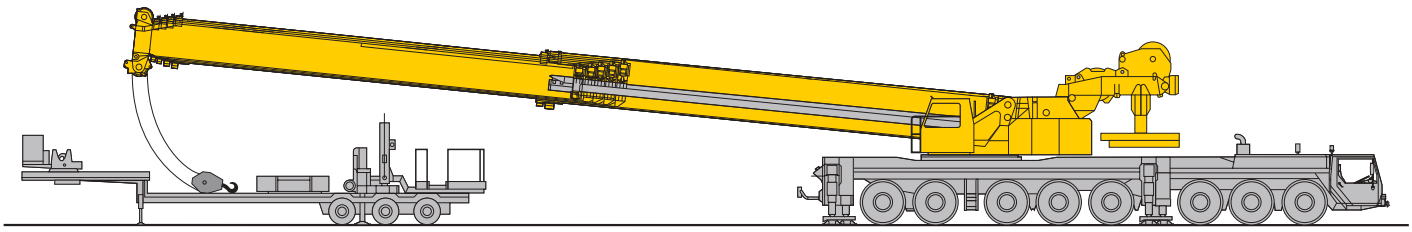
Variant 3

Crane on outriggers, dismantling over the side
Minimum counterweight with 2 – 6 telescopes 30 t
3 – 6 telescopes 15 t

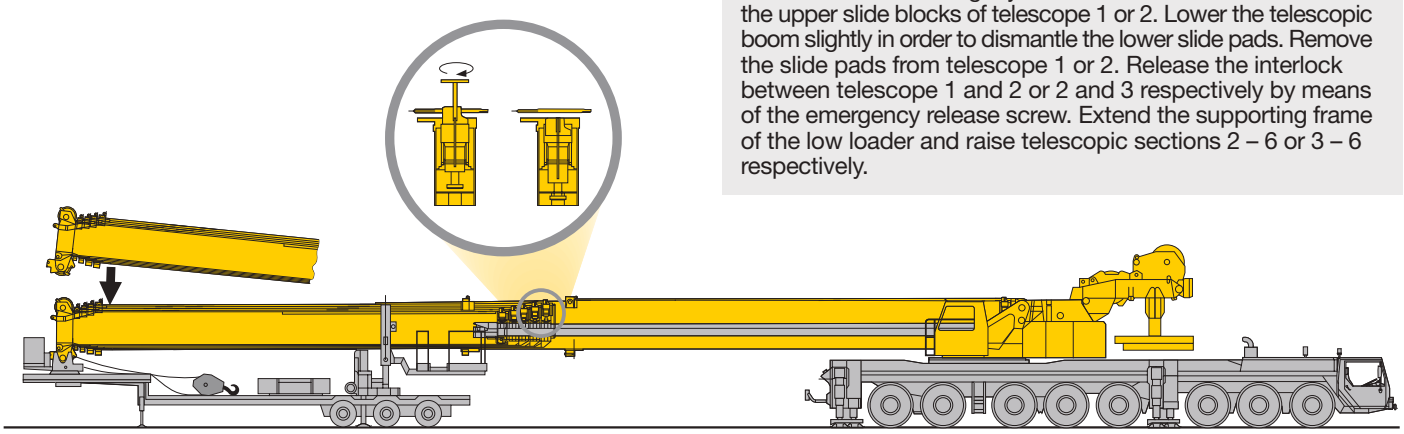


Sequence

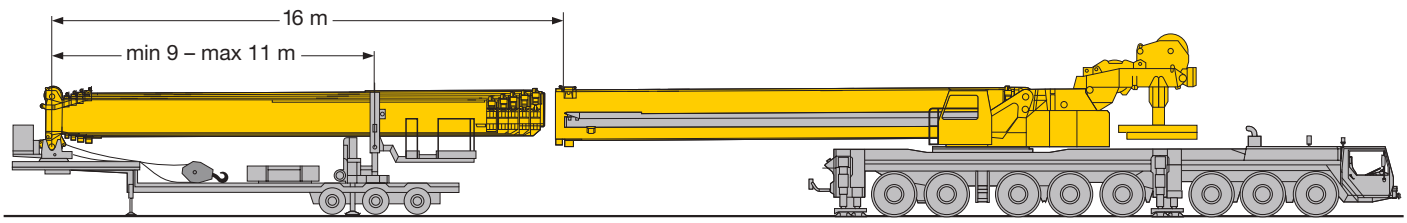
Extend telescopes 2 or 3 to 100 %.
Retract telescoping ram and interlock it with telescopes 1 or 2.



Extend telescopes 1 or 2 until the interlocking pin is accessible. Put the boom head slightly on the low loader and dismantle the upper slide blocks of telescope 1 or 2. Lower the telescopic boom slightly in order to dismantle the lower slide pads. Remove the slide pads from telescope 1 or 2. Release the interlock between telescope 1 and 2 or 2 and 3 respectively by means of the emergency release screw. Extend the supporting frame of the low loader and raise telescopic sections 2 – 6 or 3 – 6 respectively.

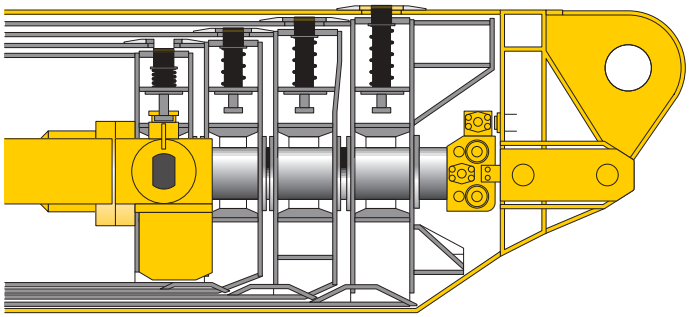


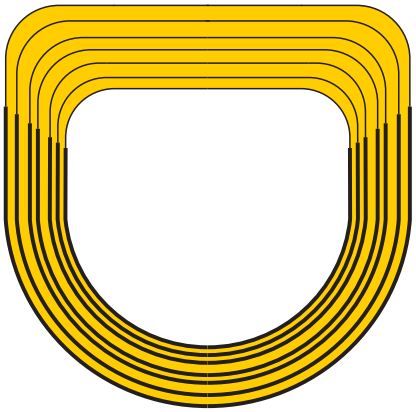
Retract telescope 1 or 2 and lower the boom on to the low loader.
Lock the boom to the supporting frame by the lateral pressure plates. Lock the boom head in the supporting device by the ratchet.

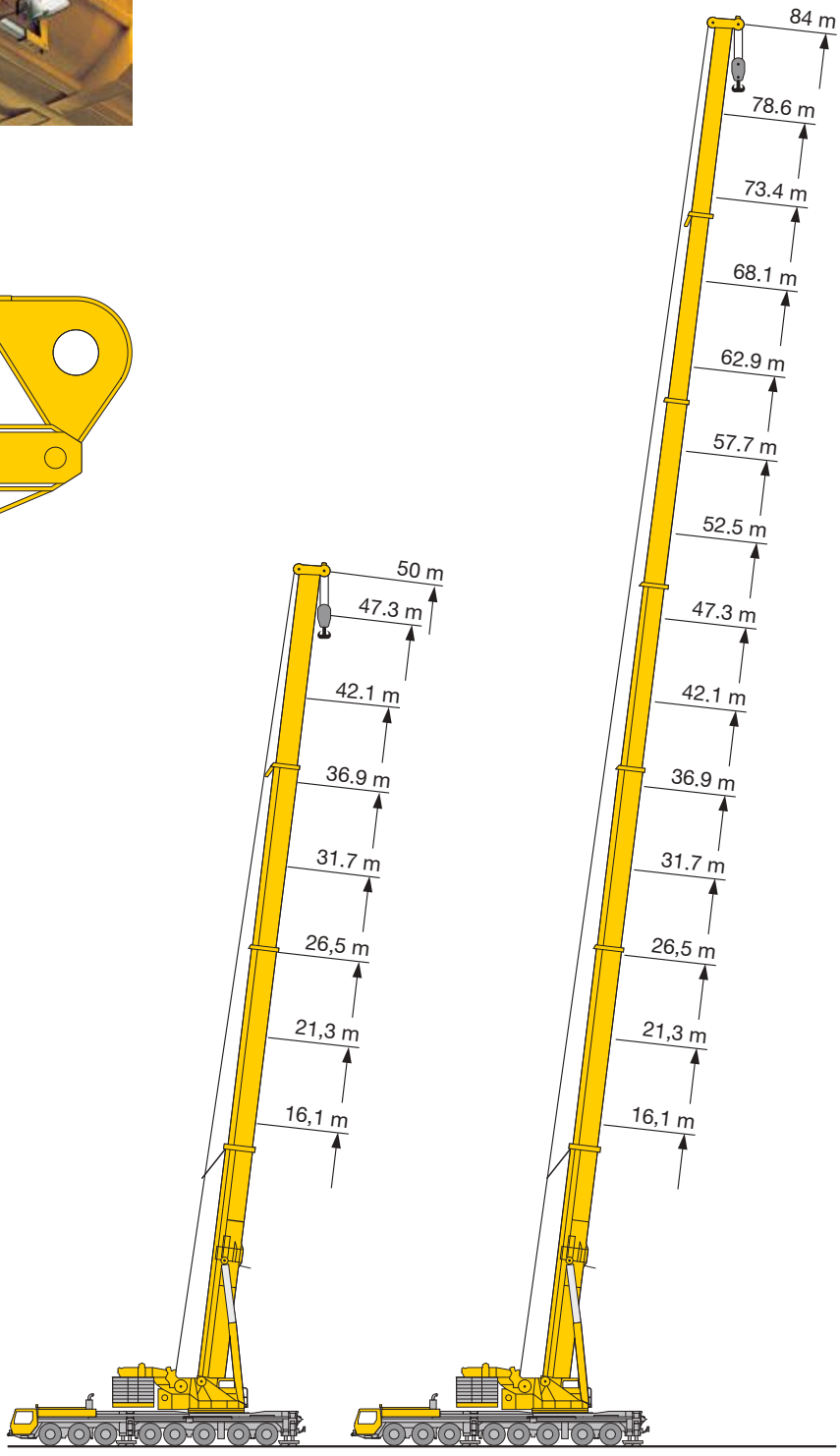


Load handling – precise and safe

- 7-section, 84 m long telescopic boom for 84 m height under hook and 74 m radius
- Considerable gain in lifting height and reach due to the exceptionally long boom
- 4-section, 50 m long telescopic boom for 50 m height under hook and 48 m radius
- Oviform boom profile of particular torsional rigidity and for the highest capacities
- Patented internal interlocking system of the telescopes - of functional reliability and maintenance-free
- High functionality of the boom system due to the automatic telescopic system "Telematik"
- Optimal utilization of the telescopic boom through numerous telescoping variants

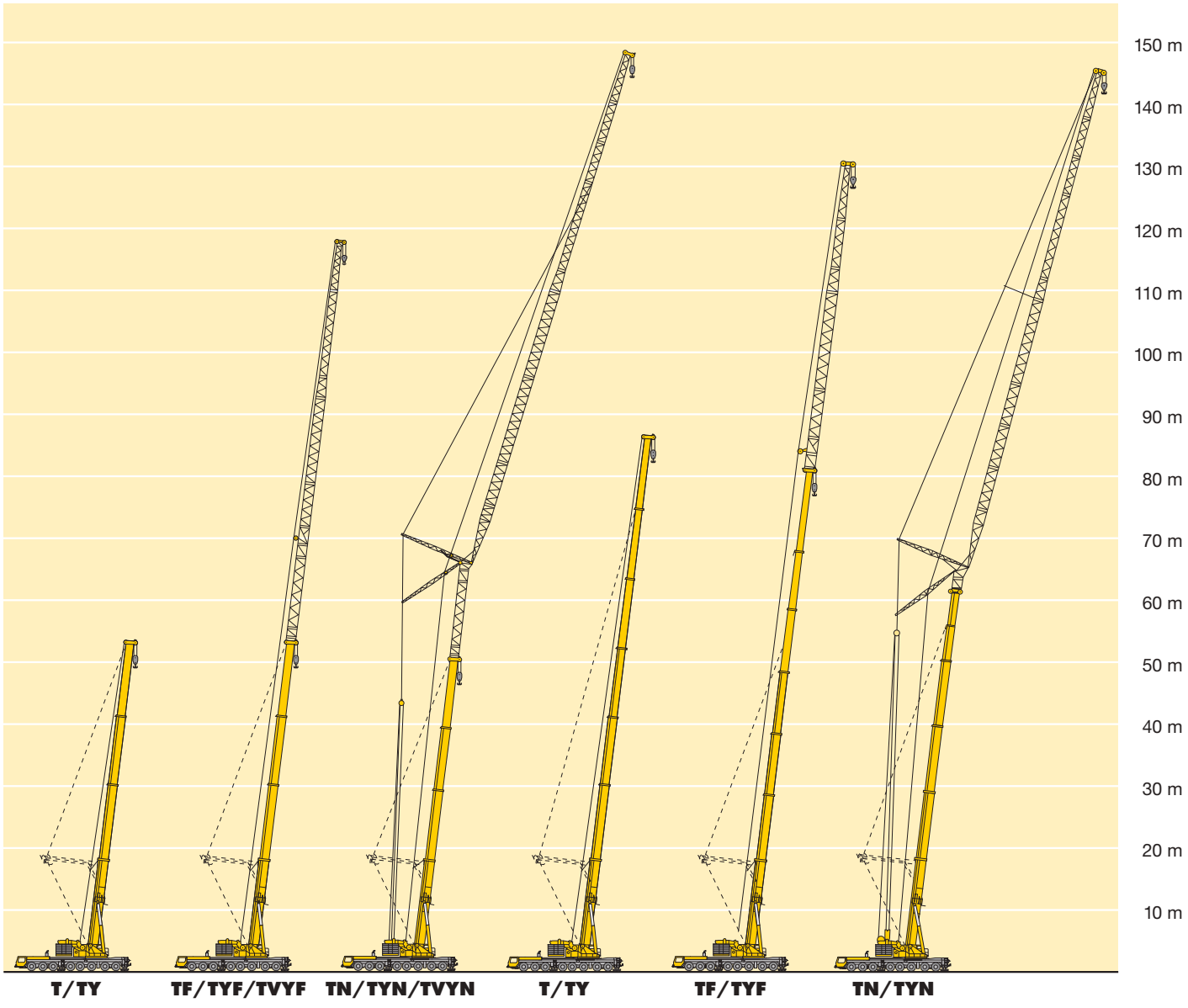




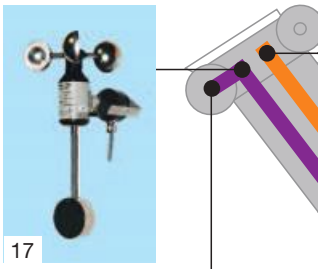


Multi-variable boom configuration system

- Telescopic boom T, 16.1 m - 84 m, also with additional guying system TY and with boom extension TV
- Fixed lattice jib TF, 14 m - 63 m, mountable at 0° or 20°, also with additional guying system TYF
- Luffing lattice jib TN, 21 m - 91 m, mountable to the 16.1 m - 78.8 m long telescopic boom at an inclination of 83°, 75° and 67°, also with additional guying system TYN
- Intermediate sections of the TF and TN configuration are identical and can be slid into one another for transportation
- Jib A-frames with T-adapter and N-base section form a complete mounting/transport unit and can be mounted with 4 pins only
- Easy-to-rig stay rods which remain on the intermediate sections during transportation
- Standard auxiliary winch for easy reeving of the hoist and luffing ropes
- Rigging of the jib is practicable in suspended condition on restricted sites
- Winch 2 for 2-hook operation or for operation with mast nose
- Winch 3 for luffing of the jib

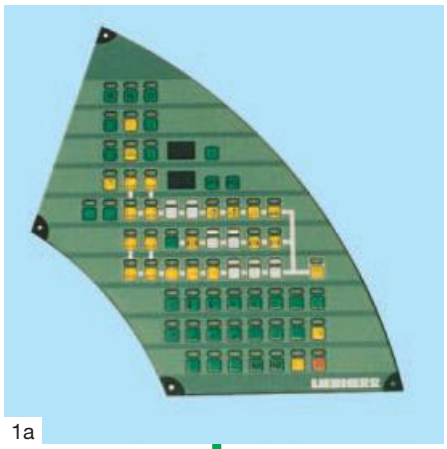


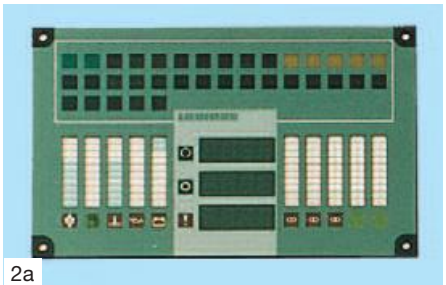
- The electrical and electronical components are interconnected by the most modern data bus transmission technique
- Self-manufactured bus systems, especially adapted to the requirements of a mobile crane
- Diesel engine and automatic transmission are controlled by a CAN data bus system. The fully electronic drive management reduces fuel consumption and improves the emission of exhaust gases
- The electric systems of the vehicle and crane as well as all cockpit functions, the systems of the outriggers and sensors of the boom are interconnected by 6 Liebherr system busses
- Digital data transmission to the individual functional blocks by only a few data cables instead of the traditional electrical wiring; thus increased functional reliability and essentially less contacts
- The control of the functional blocks is realized by I/O modules, the programming of which is performed by means of the Liebherr system busses. The control intelligence is integrated into the LICCON central units
- Comprehensive diagnostic facilities, quick error localization
- The new data bus technique distinctively increases functionality and efficiency


17

18

6


1a


2a

7

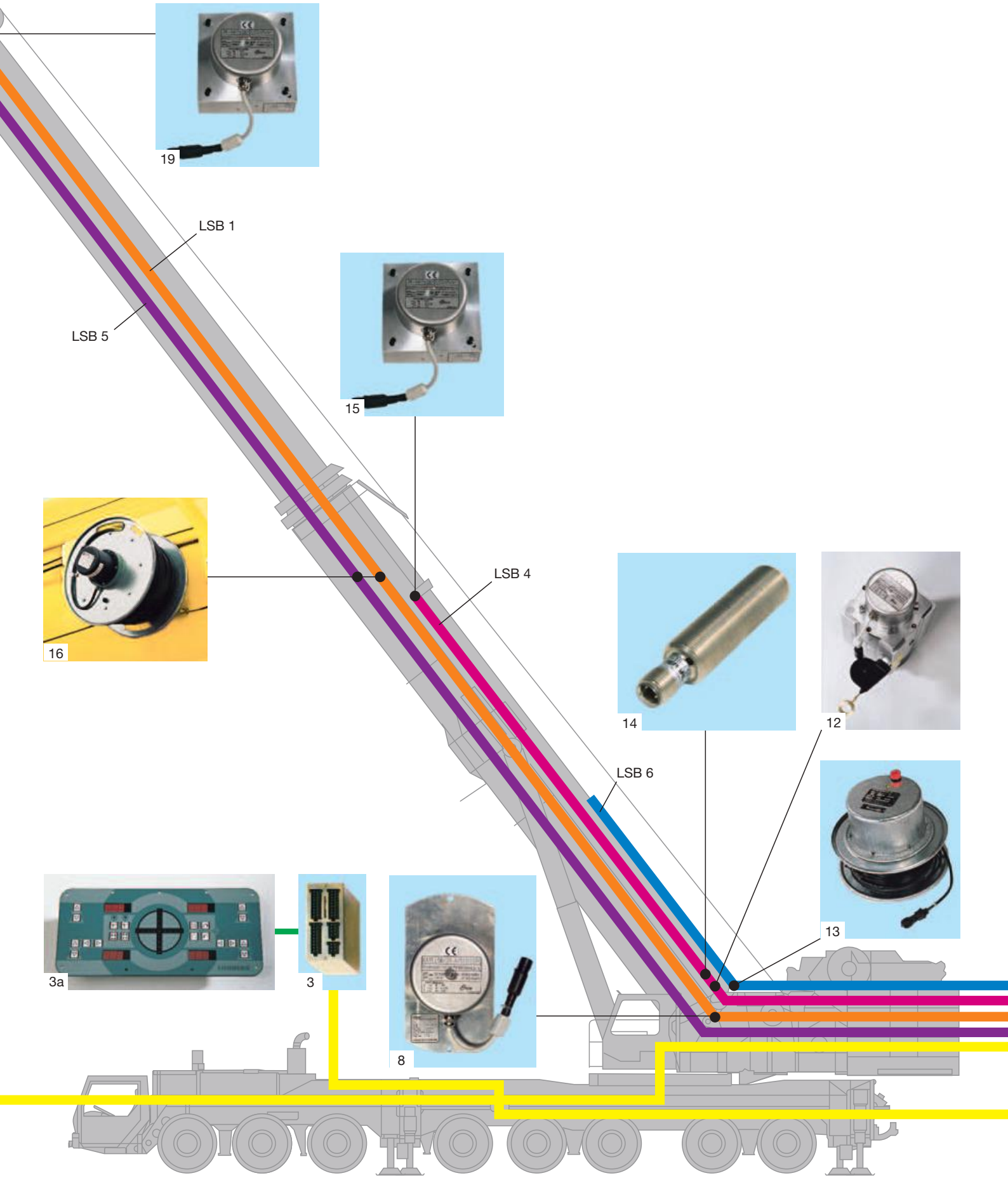
5

CAN-Bus

1

2

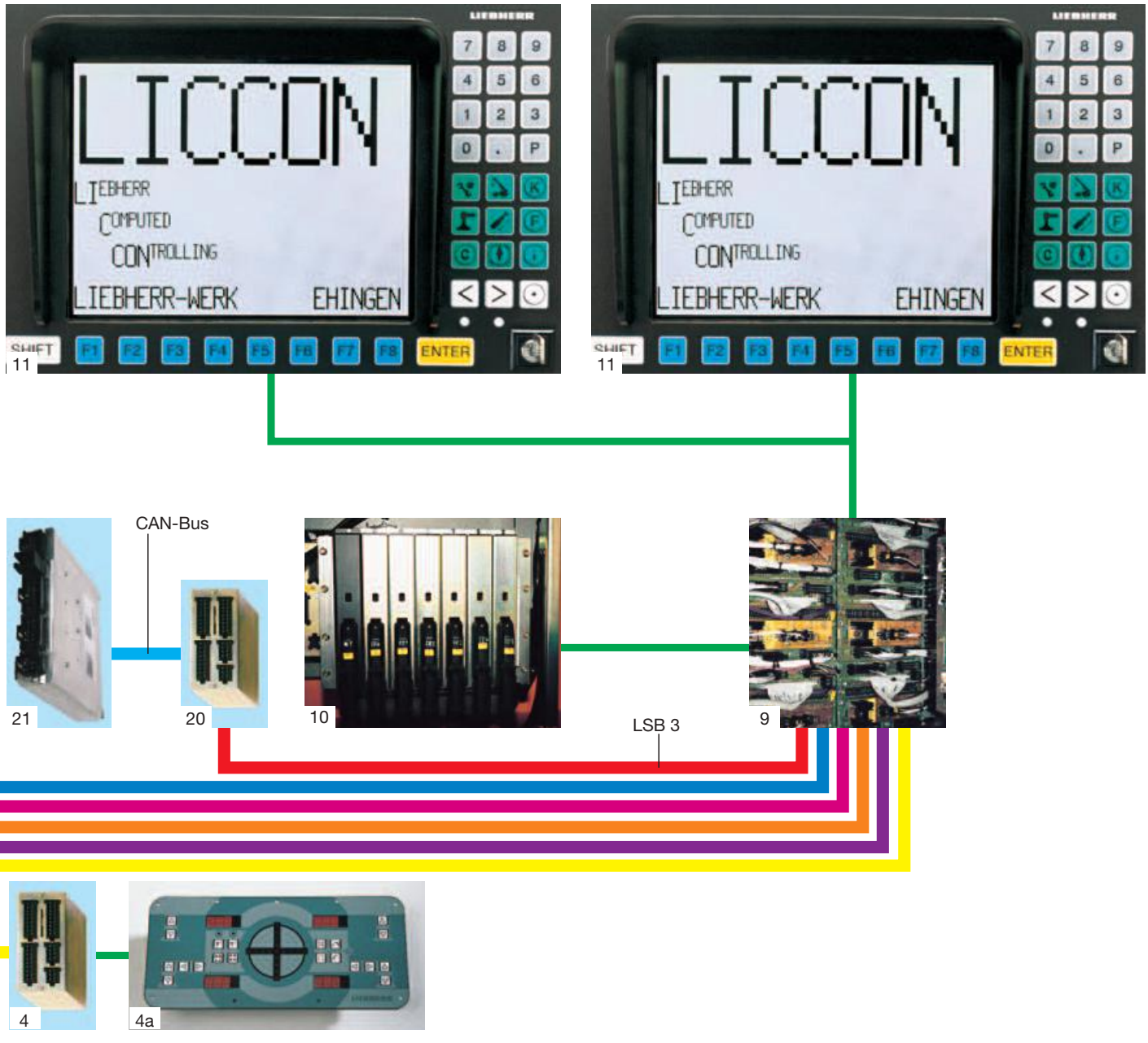
LSB 2


19
LSB 1
LSB 5
15
16
LSB 4
14
12
LSB 6
13
3a
3
8

Legend

- LSB Liebherr system bus 1
- LSB Liebherr system bus 2
- LSB Liebherr system bus 3
- LSB Liebherr system bus 4
- LSB Liebherr system bus 5 (also for TN mode)
- LSB Liebherr system bus 6 (also for TA mode)
- CAN busse
- SCI serielle communication interface

1 Input/output modules for electronic control of suspension, Liebherr Diesel engine, automatic transmission, operating functions, compressed air control for brake function
1a Instruments-key board unit in driver's cabin
2 Input/output module for differential locks, display functions
3 Input/output module for outriggers - right
3a Control unit for outriggers - right
4 Input/output module for outriggers - left
4a Control unit for outriggers - left
5 Input/output module for engine brake, tempostat, temposet, electronic control of Diesel engine (steering column switch, right) and automatic transmission
6 Control of Allison automatic transmission
7 Control of injection pump Liebherr Diesel engine/carrier
8 Slewing sensor slipring unit
9 Connection Liebherr system bus (LSB 1, 2, 3, 4, 5, 6)
10 LICCON central unit
11 LICCON monitors in the crane cabin
12 Length sensor
13 Cable drum/energy cable for interlocking gripper/telescopic boom
14 Inductive sensors (12 x)
15 Angle sensor on the base section
16 Cable drum for items 17, 18, 19 and jib
17 Wind sensor
18 Hoist limit switch
19 Angle sensor
20 Input/output module for electronic control of Diesel engine/superstructure, air flap, ventilator clutch, exhaust flap
21 Control of injection pump Liebherr Diesel engine/superstructure



Comfortable driver's cabin of outstanding functionality

- Modern and comfortable driver's cab of high functionality and convincing design
- Heat and sound absorbing internal panelling
- Ergonomically arranged operating and display elements for safe and convenient handling at permanent operation
- Digital display and keyboard units interconnected with the functional blocks by data bus technique
- Air-cushioned driver's and co-driver's seats, headrests, driver's seat with pneumatic lumber support
- Height and inclination adjustable steering wheel
- Heated and electrically adjustable rear mirrors
- Side panes with electrical lifters
- Engine independent auxiliary warm water heater
- Safety belts for driver and co-driver
- Green-tinted windows for heat absorption
- Automatic windscreen washers/wipers with intermittent control
- Delayed disconnection of interior lighting
- Various racks and boxes for crane documentation, etc.
- Optional equipment
  Air conditioning, seat heating, 3rd seat with headrest, sleeper berth, cassette radio

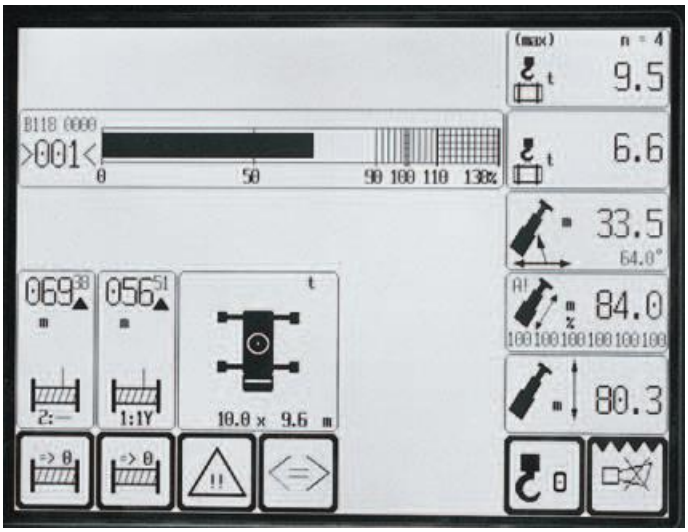
Comfortable and spacious crane cabin

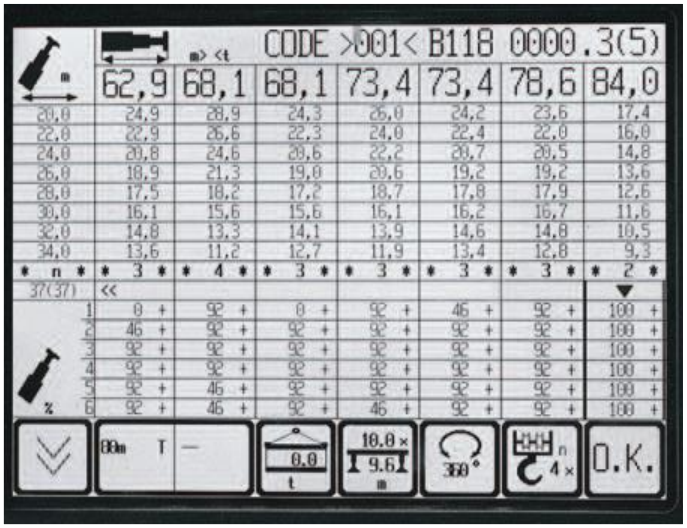
- Galvanized crane cab with tinted panes all-round, front knockout window with large parallel windscreen wiper, large skylight of bullet-proof glass with large parallel windscreen wiper, roller blind on skylight, space-saving sliding door, cabin inclinable backwards
- Green tinted front and side panes for heat absorption
- Wash/windscreen wiper for front window and skylight
- 2 working projectors, 70 watt each, at the front and rear of the cabin
- Engine independent additional warm water heater

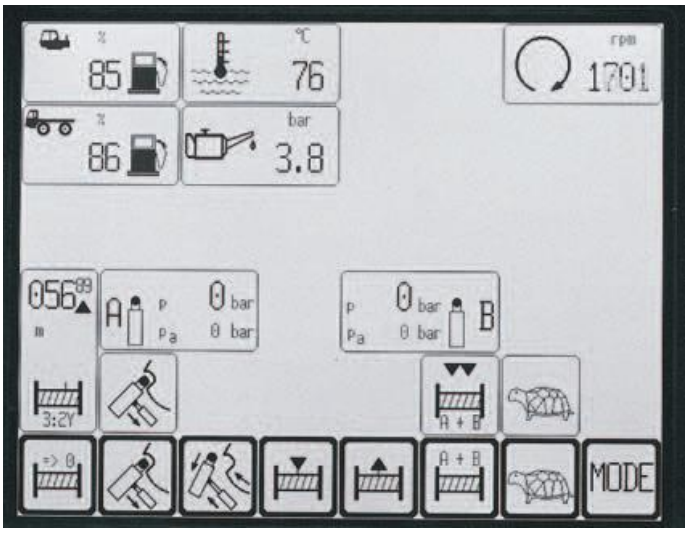
- Optional equipment
  Air conditioning, seat heating, roller blind on rear pane, cassette radio
- Spring-mounted and hydraulically cushioned crane operator's seat with pneumatic lumber support and headrest
- Convenient armrest-integrated controls, vertically and horizontally adjustable master switch consoles and armrests, ergonomically inclined operating consoles
- Heat and sound absorbing internal panelling
- Display of all essential operating functions on the LICCON monitor

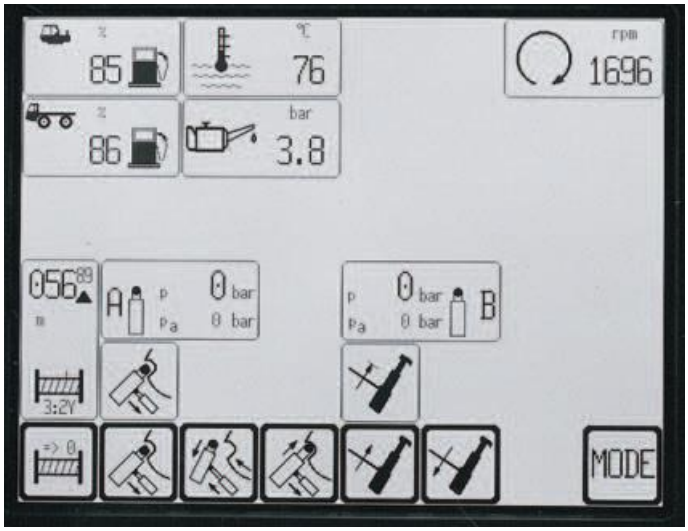
LICCON computer system with practical application programs

- Serial application programs: Safe load indicator, configuration program with configuration image, operating program with operating image, telescoping program with telescoping image, supporting pressure indication, control parameter program, test system; optional extra: work area limitation and LICCON work planner



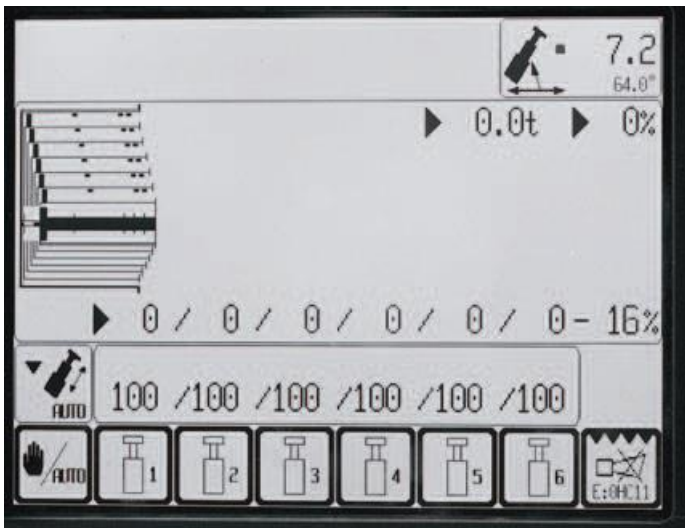


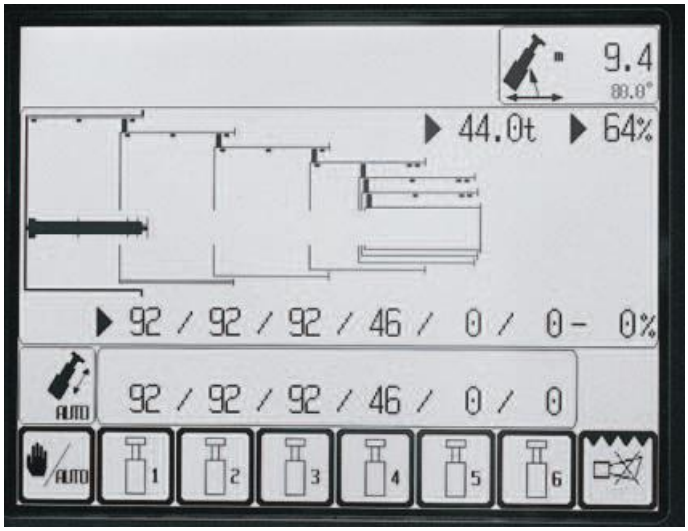


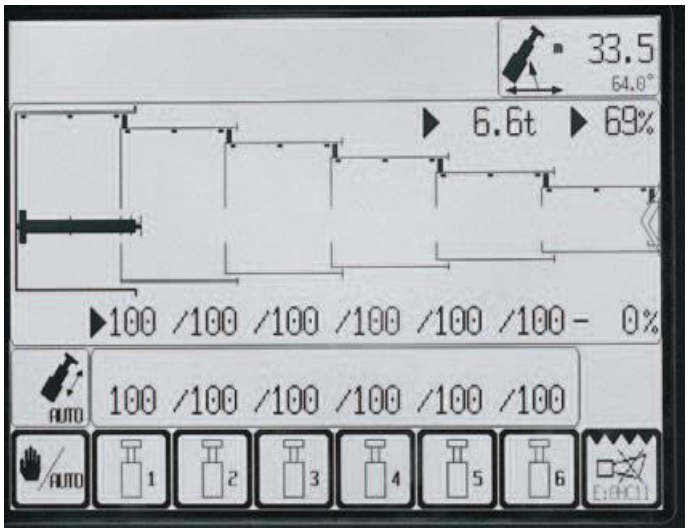


LICCON-assisted telescoping system

- Telescoping by single-stage hydraulic ram with hydraulic driving tenons
- Telescoping procedure controllable on the LICCON monitor, convenient and simple guide mode on the monitor, precise approach of the interlocking positions
- Telescopable loads are displayed on the LICCON operating image
- ”Automatic operation”, fully automatic telescoping to the desired boom length, rapid-cycle system with high working speeds
- Extremely light telescoping system, thus increases in lifting capacity with long booms and at large radii
- Automatic cushioning of telescopes in end positions during telescoping and retracting for preserving the structural members

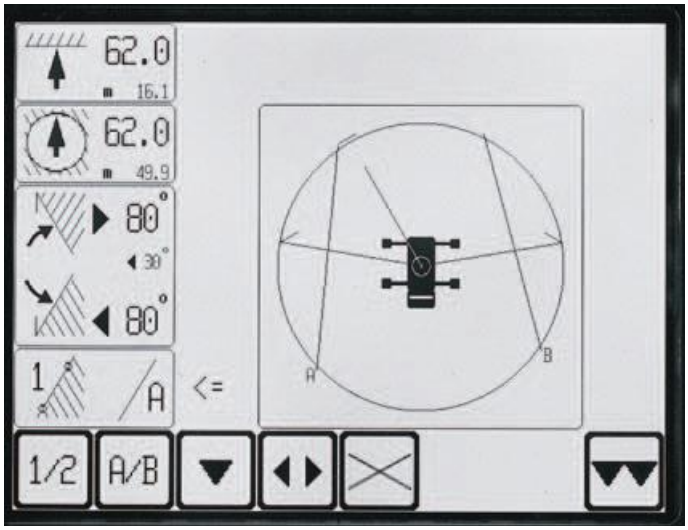






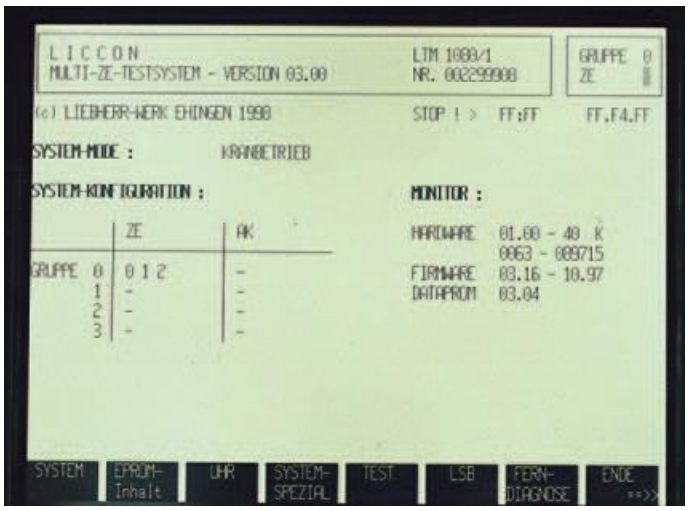
The LICCON work area limitation system

- It relieves the crane operator, especially in situations where the handling of loads requires his full attention, by controlling the work area limits. Work areas can be restricted by buildings, bridges, roofs, high-tension lines, pipe lines or adjacent cranes. The automatic work area limitation system can easily be programmed and is clearly understandable. Four different limitation functions are practicable:
- Height limitation of the pulley head
- Radius limitation
- Slewing angle limitation
- Limitation of edges



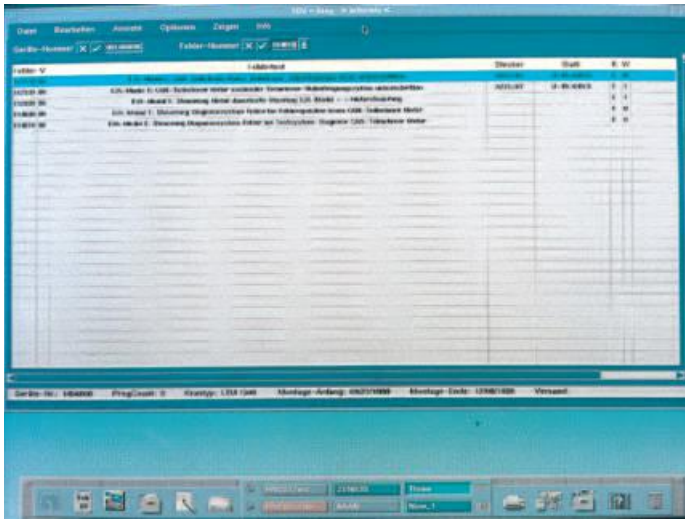
The LICCON test system

- The test system assists the servicing personnel in quickly localizing errors of the sensor system without needing any further measuring instruments
- Convenient interactive functions permit the observation of all in- and outputs of the general system by different displays on the monitor even during crane operation. It equally visualizes the allocation of the individual sensors to the system as well as their function and the terminals concerned in the control cabinet
- The table of contents enables the display of the contents and state of development of the program modules as well as the load charts on the monitor
- The service starts on the monitor, error detection becomes a matter of seconds



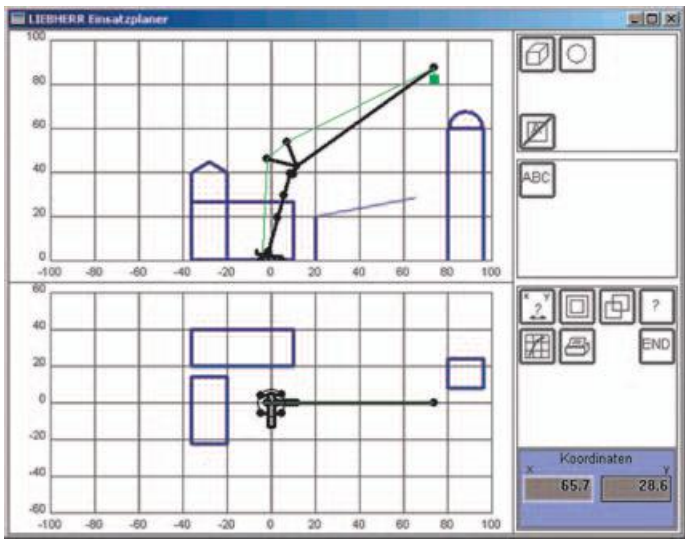
The service and diagnostic system LISSy

- This service and diagnostic system LISSy enables the data base-protected control of the programmed errors including error text, description of the cause of error as well as the measures to be taken for the elimination of those errors
- The system provides a quick diagnostic analysis due to the rapid online access to the service documentation such as electric circuit diagrams and workshop manual
- The possibility to memorize the experiences of the crane users in respect to the administrated errors contributes to a progressive growth of the service and diagnostic system LISSy to a data base of experience and knowledge



The LICCON work planner

- The LICCON work planner consists of a software program for planning, simulation and documentation of crane applications on the monitor
- The 2-D planner allows to draw buildings, to write texts and to represent a crane model true to scale including its entire motions within a fictional construction site
- The work planner enables the preparation of more transparent offers, it facilitates the briefing of the crane operators and it can be run on a laptop at the construction site

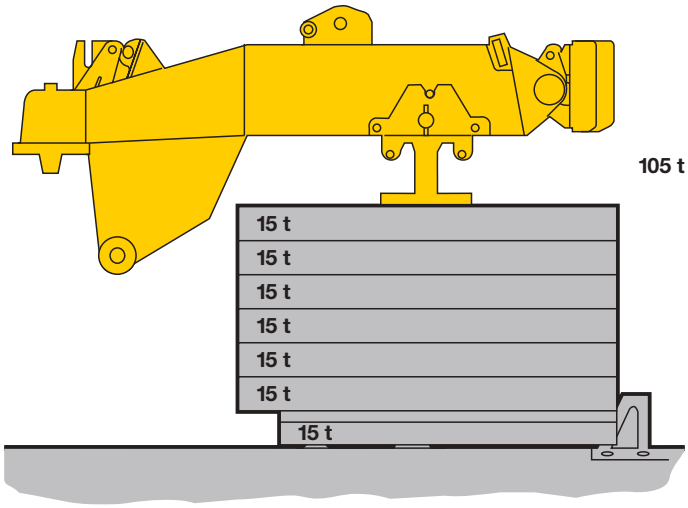


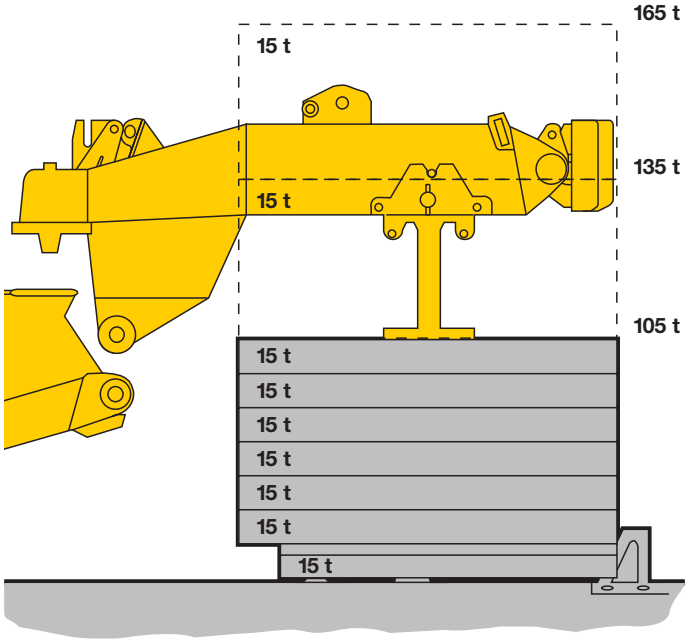
Multivariable counterweight system

- Ballast variants of 165 t, 135 t, 105 t, 90 t, 75 t, 45 t, 30 t and 15 t, thus a considerable application spectrum
- Counterweight slabs of ideal transport dimensions
- The counterweight base slab (15 t) and 6 counterweight slabs (15 t each) as well as the winch frame with winch 2 and 3 can be mounted as a complete unit

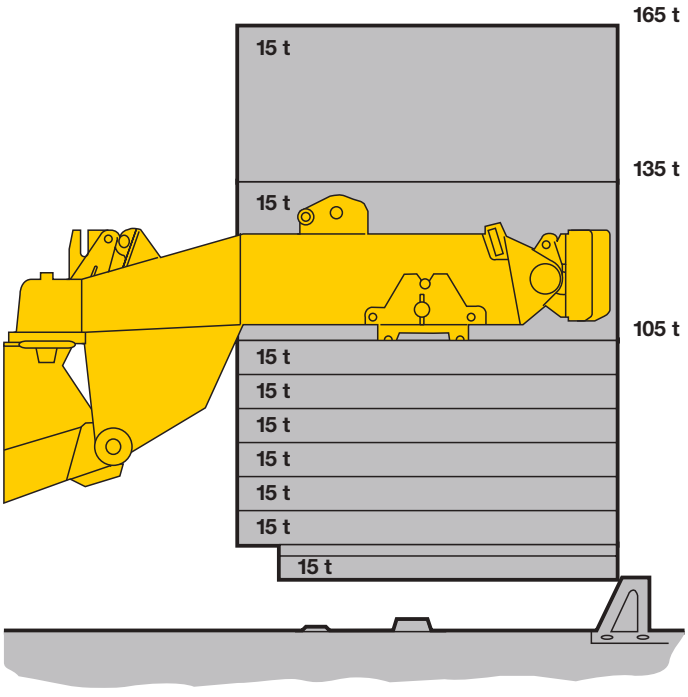
Counterweight erection:

- Pile up the counterweight slabs on the carrier frame, the base slab with the ballasting rams forms the carrying plate
- Pick up the winch frame including winch 2, and winch 3 if required, lower it into the fixing devices of the ballasting rams and bolt it





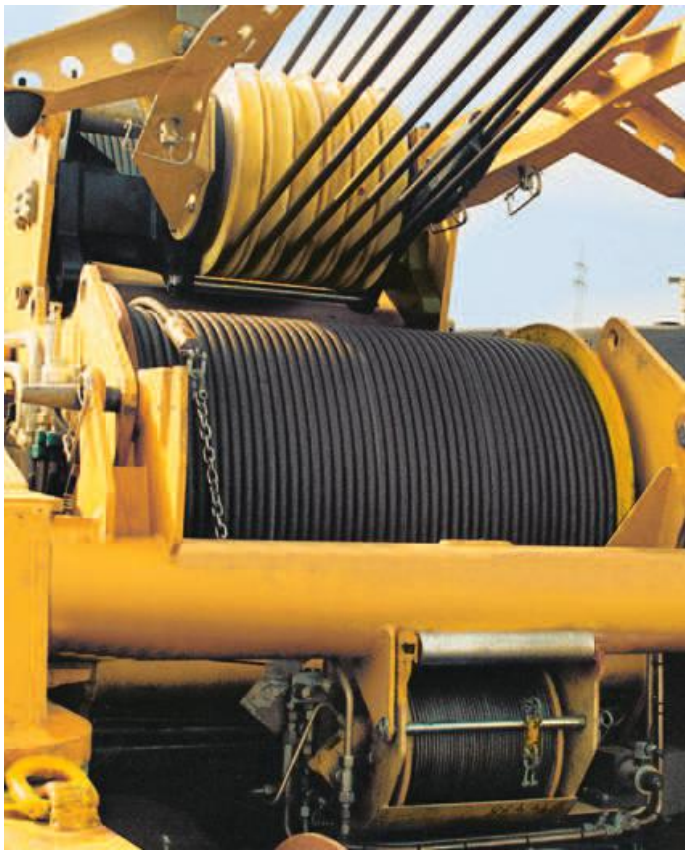
- Pile up the lateral counterweight slabs, depending on the requirement (a total of 4 slabs, 15 t each)
- Connect the hydraulic devices and the remote control panel.
- Extend the ballasting rams and push the winch frame including winches 2 and 3 upwards
- Swing superstructure into the longitudinal axis of the winch frame

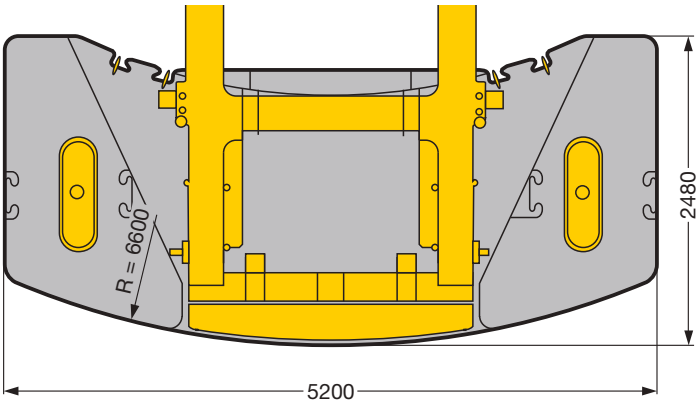


- Lower the winch frame by retracting the ballasting rams and enter the centering pins into the location holes of the superstructure. Continue to retract the ballasting rams and raise the counterweight slabs until they sit close to the winch frame
- Disconnect the hydraulic and electric connections

Counterweight frame – compact and quickly mountable

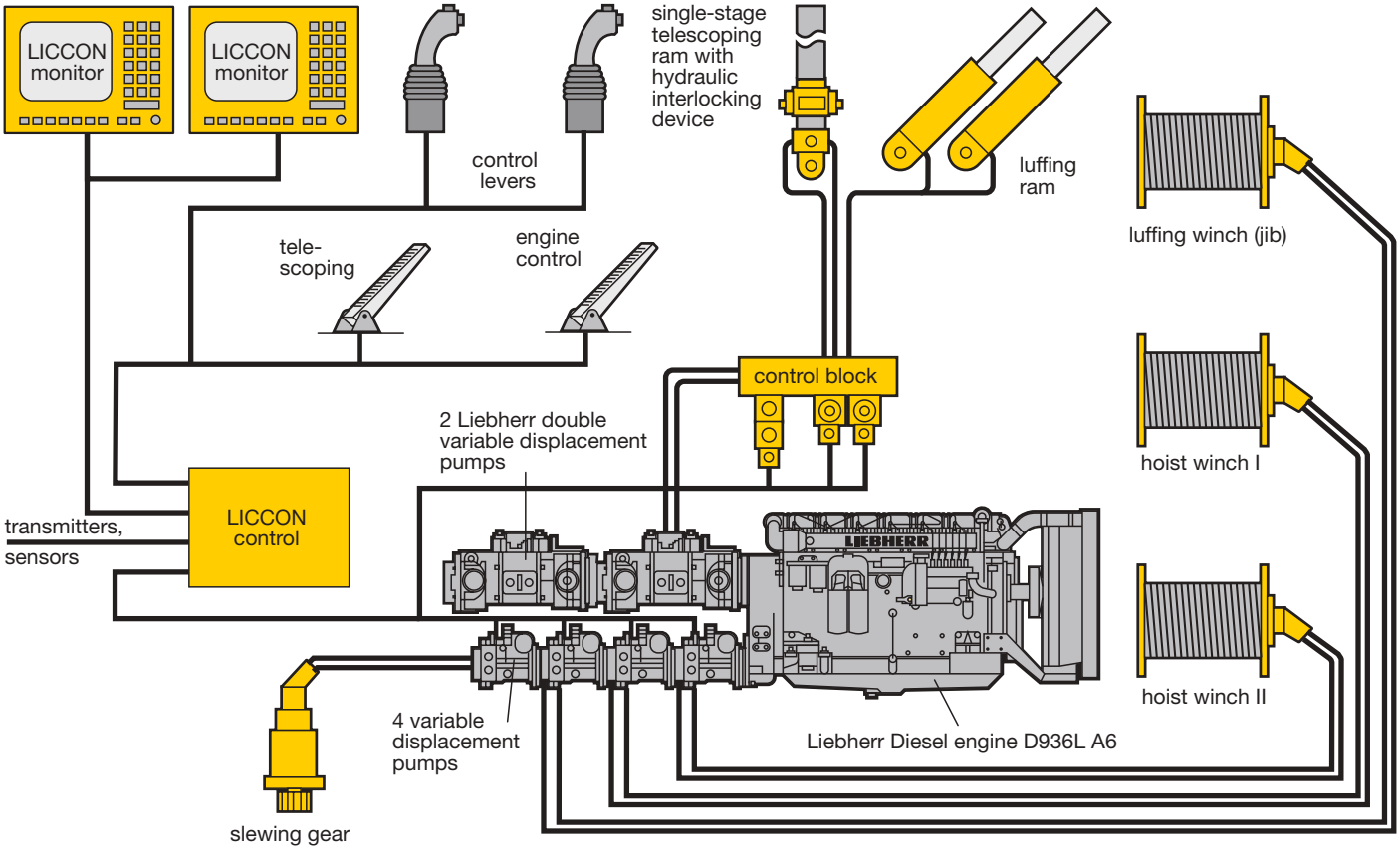
- Modular set-up of the counterweight frame, consisting of base frame and two winch packages, compact transport unit
- Winch 2 and winch 3 with luffing block are pinned and thus quickly interchangeable if required, e.g. for the application of a second LTM 1500-8.1
- The winches are connected to the hydraulic system of the crane by rapid action couplings
- Auxiliary winch with control panel for reeving of the hoist rope and luffing rope





Electric/electronic crane control with integrated safe load indicator

- Control of the winches, slewing gear as well as of the luffing and telescoping motions by the LICCON system (SPS control)
- Four working motions can be performed independent of one another
- Hoisting/lowering, slewing and luffing speeds are preselectable by 5 steps
- Luffing speed controlled automatically dependent on the boom length
- Very short response rate when initiating the crane motions
- Hoist gear and slewing gear are operating within a "closed oil circuit". This enables a particularly precise hoisting, lowering or slewing of the load. More-over, the potential energy generated during the lowering of a load is not converted into heat but can be re-employed for a 2nd motion. This offers the particular advantage in saving fuel and in a reduced thermal exposure of the oil than in an open circuit. No overheating of the oil.



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