Chapter 1

Description of the Crane
1.01 TERMINOLOGY

Abbreviation of boom systems

\[ T = \text{Telescopic boom} \]

**Boom combination:**

\[
\begin{align*}
T & \quad - \quad \text{Boom combination} \\
T & \quad = \quad 13.2 \text{ m} - 60.0 \text{ m} \\
T1 & \quad = \quad \text{Telescope 1} \\
T2 & \quad = \quad \text{Telescope 2} \\
T3 & \quad = \quad \text{Telescope 3} \\
T4 & \quad = \quad \text{Telescope 4} \\
T5 & \quad = \quad \text{Telescope 5}
\end{align*}
\]
1.01 TERMINOLOGY

Abbreviation of boom systems

TK 0° = Telescopic boom with folding jib adjusted to a fixed angle (0°)
TK 15° = Telescopic boom with folding jib adjusted to a fixed angle (15°)
TK 30° = Telescopic boom with folding jib adjusted to a fixed angle (30°)
TK 45° = Telescopic boom with folding jib adjusted to a fixed angle (45°)

Boom combination:

TK 0° - Boom combination
\[ T = 43.3 \text{ m} - 60.0 \text{ m}, \quad K = 12.2 - 22 \text{ m} \]
\[ T = 43.3 \text{ m} - 56.3 \text{ m}, \quad K = 12.2 \text{ m} - 36.0 \text{ m} \]

TK 15° - Boom combination
\[ T = 43.3 \text{ m} - 60.0 \text{ m}, \quad K = 12.2 - 22 \text{ m} \]
\[ T = 43.3 \text{ m} - 56.3 \text{ m}, \quad K = 12.2 \text{ m} - 36.0 \text{ m} \]

TK 30° - Boom combination
\[ T = 43.3 \text{ m} - 60.0 \text{ m}, \quad K = 12.2 - 22 \text{ m} \]
\[ T = 43.3 \text{ m} - 56.3 \text{ m}, \quad K = 12.2 \text{ m} - 36.0 \text{ m} \]

TK 45° - Boom combination
\[ T = 43.3 \text{ m} - 60.0 \text{ m}, \quad K = 12.2 - 22 \text{ m} \]
\[ T = 43.3 \text{ m} - 56.3 \text{ m}, \quad K = 12.2 \text{ m} - 36.0 \text{ m} \]
1.01 TERMINOLOGY

Component overview

1 Crane chassis
   1.1 5-axle chassis
   1.2 Tires, all axles with single wheels
   1.3 Travel motor
   1.4 Driver's cab
   1.5 Sliding arms with outrigger cylinders
   1.6 Support pads

2 Slewing platform
   I Winch 1 Hoist gear
   II Winch 2 Hoist gear
   or Replacement ballast

2.1 Crane engine
2.2 Crane operator's cab
2.3 Counterweight
2.4 Telescopic boom ram - luffing cylinder

3 Folding jib
   3.1 Adapter
   3.2 Pivot section
   3.2.1 Extension 7.75 m
   3.3 Intermediate section 7.00 m
   3.4 Head section 9.30 m
1.02 PRODUCT DESCRIPTION

The crane carrier

Frame
Liebherr designed and manufactured box type, torsion resistant construction made of high tensile structural steel.

Outriggers
4 sliding arms with hydraulic extension, with hydraulic outrigger cylinders and support pads. The front support box is installed between axles 1 and 2, the rear support box is located on the rear of the chassis.

Engine
8-cylinder Diesel engine, made by Liebherr, Type D 9408 TI, water cooled, Output per ECE 24.03: 400 kW (544 PS) at 2100 RPM, max. torque: 2250N.m at 1500 RPM, Fuel tank capacity: 350 l (92 gal.)

Transmission
Allison Type CLBT 755 automatic transmission with torque converter and hydro - dynamic brake system, 5 forward speeds, 1 reverse speed. Transfer gearbox with differential, off road gear and additional drive for front axle.

Axles
Heavy crane vehicle axles: All 5 axles suspended, axles 1 to 5 steerable. Axles 1,4 and 5 are planetary axles, axle 4 with intermediate axle differential, all driven axles with transverse differential.

Gear shafts
All gear shafts with t 70° cross gears.

Suspension
All axles are provided with hydro - pneumatic suspension with automatic leveling. Axle equalization between axles 1 + 2 and 4 + 5, axle suspension can be locked hydraulically.

Tires
10 wheels, all axles provided with single tires. Tire size 14.00 R 25 resp. 16.00 R 25

Steering
ZF half block hydro steering, with dual circuit system with hydraulic servo system and additional auxiliary steering pump, driven by the axle.

Brakes
Service brake: All wheel servo assisted air brakes, dual circuit. Manual brake: Spring loaded, acting on wheels of axles 2 to 5.

Driver's cab
Large size, all - steel cab with resilient mountings, safety glass windows, full range of control instruments.

Electrical system: 24 V DC, 2 batteries
The crane superstructure

Frame: Liebherr - made torsion resistant, welded construction of high tensile structural steel. Linked to crane carrier by a triple roller slewing ring.

Crane engine: 4 cylinder Diesel engine, made by Liebherr, Type D 924 TI - E, watercooled, Output according EPA/CARB and IMO 1 equivalent ISO 8178 C1: 149 kW (200 PS) at 1800 RPM, max. torque: 891 Nm at 1200 RPM
Fuel tank capacity: 300 l (79 gal.)

Crane drive: Diesel hydraulic with two axial piston double pumps with servo control and output regulation.
Crane control: Two 4-way manual, self centering manual control levers.

Hoist gear: Axial piston displacement motor, hoist drum with integrated planetary gear and spring loaded retaining brake.

Luffing gear: 1 differential cylinder with safety check valve

Slewing gear: Axial piston fixed displacement motor, planetary gear, slewing gear pinion and spring loaded slewing brake.

Crane cab: Torsion resistant, galvanized, all - steel construction with comfort interior, ergonomically located control and monitoring instruments, cab tiltable to the rear.

Safety devices: “LICCON” overload system, hoist limit, safety valves to protect hydraulic system against pipe and hose ruptures.

Telescopic boom: 1 pivot section and 5 telescopic sections, all telescopic section can be extended individually. Boom length: 13.2 m - 60 m (43 ft. to 196 ft.)

Electrical system: 24 Volt DC, 2 batteries

Additional equipment

Folding jib: 12.2 m to 36 m long dual folding jib

2. hoist gear: For two hook operation
1.03 TECHNICAL DATA

Measurements

Weights
- Axle loads (t)
- Lifting tackle

Working speeds
- Travel speeds
- Crane speeds

Lifting heights
- Telescopic boom
- Folding jib

Measurement (mm)

<table>
<thead>
<tr>
<th>Tires</th>
<th>A</th>
<th>A+</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>α</th>
<th>β</th>
<th>β1</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.00 R 25</td>
<td>3950</td>
<td>3800</td>
<td>2612</td>
<td>420</td>
<td>325</td>
<td>3020</td>
<td>2070</td>
<td>3705</td>
<td>21°</td>
<td>14°</td>
<td>9°</td>
</tr>
<tr>
<td>16.00 R 25</td>
<td>4000</td>
<td>3850</td>
<td>2660</td>
<td>470</td>
<td>375</td>
<td>3070</td>
<td>2120</td>
<td>3755</td>
<td>23°</td>
<td>16°</td>
<td>11°</td>
</tr>
</tbody>
</table>

* lowered by 150mm

Tires

<table>
<thead>
<tr>
<th>Tire size</th>
<th>Weight of each wheel [approx. in kg]</th>
<th>Tire pressure when driving on public roads [bar]</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.00 - 25</td>
<td>260</td>
<td>10</td>
</tr>
<tr>
<td>16.00 - 25</td>
<td>336</td>
<td>9, 13</td>
</tr>
</tbody>
</table>

* = optional

Noise emission values for location:

<table>
<thead>
<tr>
<th>Noise level at nominal engine RPM</th>
<th>Noise emission values $L_{pAeq}$ (db(A))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>left ear</td>
</tr>
<tr>
<td>Driver's cab, driver's side</td>
<td>76</td>
</tr>
<tr>
<td>Driver's cab, passenger side</td>
<td>75</td>
</tr>
<tr>
<td>Crane operator's cab</td>
<td>73</td>
</tr>
</tbody>
</table>

Note: Refer to the following pages for data
1.03 TECHNICAL DATA

Weights

Axle loads (t). Crane in travel position
- without folding jib
- with 3 sheave hookblock hooked to the front bumper.

<table>
<thead>
<tr>
<th>Axle</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>60</td>
</tr>
</tbody>
</table>

Load tackle

<table>
<thead>
<tr>
<th>Load (t)</th>
<th>Pulleys</th>
<th>Reevings</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>160</td>
<td>9</td>
<td>18</td>
<td>2400</td>
</tr>
<tr>
<td>137</td>
<td>7</td>
<td>14</td>
<td>1470</td>
</tr>
<tr>
<td>100</td>
<td>5</td>
<td>10</td>
<td>1350</td>
</tr>
<tr>
<td>68</td>
<td>3</td>
<td>6</td>
<td>430 / 900</td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>3</td>
<td>780</td>
</tr>
<tr>
<td>10</td>
<td>-</td>
<td>1</td>
<td>390</td>
</tr>
</tbody>
</table>

Max. supporting load per support:

<table>
<thead>
<tr>
<th>Max. supporting load [t]</th>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>per support</td>
<td>70</td>
<td>98</td>
</tr>
</tbody>
</table>
### 1.03 TECHNICAL DATA

#### Speeds

**Travel speeds in km/h at engine speed of 2100 RPM**

<table>
<thead>
<tr>
<th>Gear</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>R</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>On road</td>
<td>23</td>
<td>22</td>
<td>34</td>
<td>50</td>
<td>70</td>
<td>12</td>
<td>15</td>
<td>23</td>
<td>36</td>
<td>53</td>
<td>76</td>
<td>13</td>
</tr>
<tr>
<td>Off road</td>
<td>8</td>
<td>13</td>
<td>20</td>
<td>29</td>
<td>40</td>
<td>7</td>
<td>8</td>
<td>13</td>
<td>21</td>
<td>31</td>
<td>44</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Uphill driving ability, off road

<table>
<thead>
<tr>
<th></th>
<th>50%</th>
<th>45%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upright</td>
<td>14.00 R 25</td>
<td>16.00 R 25</td>
</tr>
</tbody>
</table>

**Crane speeds at engine speed of 1800 RPM**

<table>
<thead>
<tr>
<th>Drive</th>
<th>stepless</th>
<th>Cable Ø / cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main hoist gear</td>
<td>0 - 140 m/min for single reeving</td>
<td>23 mm / 295 m</td>
</tr>
<tr>
<td>Auxiliary hoist gear</td>
<td>0 - 140 m/min for single reeving</td>
<td>23 mm / 295 m</td>
</tr>
<tr>
<td>Slewing gear</td>
<td>0 - 1.5 RPM</td>
<td></td>
</tr>
<tr>
<td>Luffing gear</td>
<td>approx. 50 s to 83° boom position</td>
<td></td>
</tr>
<tr>
<td>Telescoping</td>
<td>approx. 400 s for boom length 13.2 m - 60 m</td>
<td></td>
</tr>
</tbody>
</table>
Lifting heights
Lifting heights
1.03 TECHNICAL DATA

Lifting heights

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