Declaration of Conformity

Manufacturer
Jungheinrich AG, 22039 Hamburg, Germany

Description
Industrial truck

<table>
<thead>
<tr>
<th>Type</th>
<th>Option</th>
<th>Serial no.</th>
<th>Year of manufacture</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFG 110k</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EFG 110</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EFG 113</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EFG 115</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On behalf of

Date

EU DECLARATION OF CONFORMITY
The undersigned hereby declare that the powered truck described in detail complies with the current versions of European Directives 2006/42/EG (Machinery Directive) and 2014/30/EU (Electromagnetic Compatibility - EMC). The manufacturer is authorised to compile the technical documentation.
Foreword

Notes on the operating instructions

The present ORIGINAL OPERATING INSTRUCTIONS are designed to provide sufficient instruction for the safe operation of the industrial truck. The information is provided clearly and concisely. The chapters are arranged by letter and the pages are numbered continuously.

The operator manual details different industrial truck models. When operating and servicing the industrial truck, make sure that the particular section applies to your truck model.

Our trucks are subject to ongoing development. We reserve the right to alter the design, equipment and technical features of the system. No guarantee of particular features of the truck should therefore be assumed from the present operating instructions.

Safety notices and text mark-ups

Safety instructions and important explanations are indicated by the following graphics:

⚠️ **DANGER!**
Indicates an extremely hazardous situation. Failure to comply with this instruction will result in severe irreparable injury and even death.

⚠️ **WARNING!**
Indicates an extremely hazardous situation. Failure to comply with this instruction may result in severe irreparable injury and even death.

⚠️ **CAUTION!**
Indicates a hazardous situation. Failure to comply with this instruction may result in slight to medium injury.

**NOTICE**
Indicates a material hazard. Failure to comply with this instruction may result in material damage.

Used before notices and explanations.

- Indicates standard equipment
- Indicates optional equipment
Copyright

Copyright of these operating instructions remains with JUNGHEINRICH AG.

Jungheinrich Aktiengesellschaft

Friedrich-Ebert-Damm 129
22047 Hamburg - Germany

Tel: +49 (0) 40/6948-0

www.jungheinrich.com
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A Correct Use and Application

1 General

The truck must be used, operated and serviced in accordance with the present instructions. All other types of use are beyond its scope of application and may result in damage to personnel, the industrial truck or property.

2 Correct application

NOTICE

The maximum load and load distance are indicated on the capacity plate and must not be exceeded. The load must rest on the load handler or be lifted by an attachment approved by the manufacturer. The load must be fully raised, see page 98.
The following operations are in accordance with regulations and are permitted:
– Lifting and lowering of loads.
– Stacking and retrieving loads
– Transporting lowered loads over short distances.
– The mast must be tilted back when transporting loads that are not secured against slipping and falling.
– Picking up and using attachments and accessories approved by the manufacturer; this may require additional approval from local authorities or an expert opinion.
– When travelling with a load, bring the mast into tilted-back position.
– The mast must be tilted back when transporting loads that are not secured against slipping and falling.
– The operator must adjust the travel speed so that the load does not slip off the load handler during acceleration and braking, changes in direction and when driving on ramps.
– Occasional towing of trailer loads with the trailer coupling.

When towing trailers, the load must be secured on the trailer. The permissible trailer load must not be exceeded.

The following operations are prohibited:
– Do not travel with a raised load (>30 cm).
– Carrying and lifting persons without approved attachments or optional equipment
  a) Pushing or pulling loads, with the exception of occasional towing of trailers with the trailer coupling
  – Transporting suspended loads without expert certification and without authorised optional equipment

If the truck is to be operated with suspended loads, proof of sufficient operational stability under local operating conditions must be obtained from a specialist assessor.

a) Lifting passengers with a working platform or a work basket may be permitted in some countries. This must be verified by the owner.

Germany: DGUV information 208-031 (BGI/GUV-5183) Use of Working Platforms on Industrial Trucks with Masts

Australia: AS 2359.1 Powered Industrial Trucks, General Requirements; AS 2359.2 Powered Industrial Trucks, Operations
3 Approved application conditions

⚠️ WARNING!
Do not exceed the permissible surface and point loading limits on the travel paths.
A second person is required as a lookout at blind spots.
The operator must ensure that the loading ramp/dock cannot move or come loose
during loading/unloading.

⚠️ WARNING!

Use under extreme conditions
Using the truck under extreme conditions can result in malfunctions and accidents.
▶ Special equipment and authorisation are required if the truck is to be constantly
used in extreme conditions, especially in dusty or corrosive atmospheres.
▶ The truck cannot be used in areas at risk of explosion.
▶ In adverse weather conditions (thunder, lightning) the industrial truck must not be
operated outside or in endangered areas.

– Operation in industrial and commercial environments.
– Permissible temperature range -20°C to 40°C.
– Operation only on secure, level surfaces with sufficient capacity.
– Do not exceed the permissible surface and point load limits on the travel routes.
– Operation only on travel paths that are visible and approved by the operating
company.
– Negotiating inclines up to a maximum of 15 %.
– Do not travel across or at an angle on inclines. Travel with the load facing uphill.

3.1 Internal Operation in Cold Stores with Cold Store Equipment (O)

In addition to the permissible operating conditions in industrial and commercial
environments, the truck remains primarily in cold stores. The truck should only leave
the cold store briefly to hand over a load.

– Permissible temperature range -30°C to +40°C.
– Maximum air humidity 95% non-condensing.
– Thawing is permissible only if the truck can be subsequently dried thoroughly.
– In cold store areas below -20°C the truck must be operated permanently and
should not be parked securely for more than 15 minutes.
– Do not charge the battery below +5°C.
4 Proprietor responsibilities

For the purposes of the present operating instructions the “operating company” is defined as any natural or legal person who either uses the industrial truck himself, or on whose behalf it is used. In special cases (e.g. leasing or renting) the proprietor is considered the person who, in accordance with existing contractual agreements between the owner and user of the industrial truck, is charged with operational duties.

The proprietor must ensure that the industrial truck is used only for the purpose it is intended for and that danger to life and limb of the user and third parties are excluded. Furthermore, accident prevention regulations, safety regulations and operating, servicing and repair guidelines must be followed. The operating company must ensure that all users have read and understood these operating instructions.

**NOTICE**

Failure to comply with the operating instructions invalidates the warranty. The same applies if improper work is carried out on the truck by the customer or third parties without the permission of the manufacturer.

5 Adding attachments and/or optional equipment

The mounting or installation of additional equipment which affects or enhances the performance of the industrial truck requires the written permission of the manufacturer. Local authority approval may also need to be obtained. Local authority approval however does not constitute the manufacturer’s approval.

6 Removal of components

It is forbidden to modify or remove truck components, particularly protective and safety equipment.

⇒ If in doubt, contact the manufacturer's customer service department.
B Truck Description

1 Application

The EFG 110 - 115 is a three-wheel electric sit-down forklift truck. It is a cantilever counterbalanced truck which can lift, transport and deposit loads using the load handler attached in front. Closed bottom pallets can also be lifted.

1.1 Truck models and rated capacity

The rated capacity depends on the model. The rated capacity can be derived from the model name.

**EFG110**

<table>
<thead>
<tr>
<th>EFG</th>
<th>Model name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Series</td>
</tr>
<tr>
<td>10</td>
<td>Rated capacity x 100 kg</td>
</tr>
</tbody>
</table>

The rated capacity is not generally the same as the permissible capacity. The capacity can be found on the capacity plate attached to the truck.
2 Assemblies and Functional Description

2.1 Travel direction definition

The following determinations have been made for travel direction specification:

The following conventions have been agreed for travel direction specification:

<table>
<thead>
<tr>
<th>Item</th>
<th>Travel direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Left</td>
</tr>
<tr>
<td>4</td>
<td>Reverse</td>
</tr>
<tr>
<td>2</td>
<td>Forward</td>
</tr>
<tr>
<td>3</td>
<td>Right</td>
</tr>
</tbody>
</table>
## 2.2 Assembly Overview

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Driver's seat</td>
</tr>
<tr>
<td>2</td>
<td>Overhead guard</td>
</tr>
<tr>
<td>3</td>
<td>Mast</td>
</tr>
<tr>
<td>4</td>
<td>Steering wheel</td>
</tr>
<tr>
<td>5</td>
<td>Control and display unit</td>
</tr>
<tr>
<td>6</td>
<td>Lifting mechanism control</td>
</tr>
<tr>
<td>7</td>
<td>Emergency Disconnect switch</td>
</tr>
<tr>
<td>8</td>
<td>Forks</td>
</tr>
<tr>
<td>9</td>
<td>Fork carriage</td>
</tr>
<tr>
<td>10</td>
<td>Battery cover</td>
</tr>
<tr>
<td>11</td>
<td>Drive</td>
</tr>
<tr>
<td>12</td>
<td>Trailer coupling</td>
</tr>
<tr>
<td>13</td>
<td>Counterweight</td>
</tr>
<tr>
<td></td>
<td>Standard equipment</td>
</tr>
</tbody>
</table>
2.3 Functional Description

Chassis
The chassis, in conjunction with the counterweight, forms the supporting base structure of the truck. It is used to support the main components.

Operator position and overhead guard
The overhead guard comes in a range of models and protects the operator from falling objects and other external influences. All the controls are ergonomically arranged. The steering column and driver's seat can be adjusted individually.

The controls and warnings on the control and display unit enable the system to be monitored during operation, thereby ensuring a very high level of safety.

Steering
A low steer effort of 15 N as well as a favourable transmission ratio of 5 steering wheel revolutions for an 180° steer angle. A hydraulic steer motor actuates the drive wheel via a gear wheel pair. Efficient energy deployment through the load sensing system. The steering column is adjustable.

Wheels
There is a choice of super elastic or fully rubber tyres as well as optional pneumatic tyres.

Brake System
The hydraulically activated drum servo brake acting on both front wheels provides effective deceleration with minimal pedal force. The truck also brakes to a halt regeneratively via the traction motor. This makes the foot brake virtually redundant, minimising energy consumption and brake wear.
**Drive system**

The entire drive unit is enclosed in the counterweight. The steered rear wheel is also the drive wheel. A fixed, low-noise three-phase motor is driven via a transmission. The electronic traction controller ensures the smooth rotation of the drive motor and as a result consistently smooth travel, powerful acceleration and electrically controlled braking with energy recovery. With steer angle detection (o) the system automatically reduces the travel speed as a function of the steer angle.

**Hydraulic system**

A multi-pilot valve allows for sensitive operation of the functions via the controls. A speed-controlled hydraulic pump ensures a proportionate and efficient supply to the hydraulic functions.

**Mast**

Two or three-stage masts, optionally with free lift function; narrow mast sections ensure excellent visibility of the forks and attachments. Fork carriage and mast run on permanently lubricated and hence maintenance-free support rollers.

**Attachments**

The trucks can be optionally fitted with mechanical and hydraulic attachments.
3 Technical Specifications

All technical details refer to standard trucks. Values indicated with *) may vary, depending on the types of equipment used (e.g. mast, cabin, tyres etc.).

The technical specifications comply with the German "Industrial Truck Data Sheet" Guidelines. Technical modifications and additions reserved.

Load centre distance

The load centre distance D of the load handler is specified as the horizontal distance from the front face and the vertical distance from the upper edge of the load handler.

The capacity plate for standard load handlers specifies valid load centre distances of 500 mm, 600 mm and 700 mm.

The distances d₁ and d₂ depicted in the illustration between the load handler and the actual centre of gravity G of the load must be smaller or equal to the load centre distance D (d₁ ≤ D and d₂ ≤ D) to avoid the risk of overturning, see page 98.
### 3.1 Performance data

<table>
<thead>
<tr>
<th>Model</th>
<th>EFG 110k</th>
<th>EFG 110</th>
<th>EFG 113</th>
<th>EFG 115</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q</strong> Rated capacity (where C = 500 mm)</td>
<td>1000</td>
<td>1000</td>
<td>1250</td>
<td>1500 kg</td>
</tr>
<tr>
<td><strong>C</strong> Load centre distance</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500 mm</td>
</tr>
<tr>
<td>Travel speed, w. / w.o. load *)</td>
<td>12/12.5</td>
<td>12/12.5</td>
<td>12/12.5</td>
<td>12/12.5 km/h</td>
</tr>
<tr>
<td>Lift speed, with / without load *)</td>
<td>0.28/0.50</td>
<td>0.29/0.50</td>
<td>0.25/0.50</td>
<td>0.24/0.50 m/s</td>
</tr>
<tr>
<td>Lowering speed with / without load *)</td>
<td>0.58/0.60</td>
<td>0.58/0.60</td>
<td>0.58/0.60</td>
<td>0.58/0.60 m/s</td>
</tr>
<tr>
<td>Gradeability (30 min) w. / w.o. load *)</td>
<td>8.5/12</td>
<td>8/11.5</td>
<td>7/11</td>
<td>6.5/10.5 %</td>
</tr>
<tr>
<td>Max. gradeability (5 mins) w / w.o. load *)</td>
<td>13/18</td>
<td>12.5/17.5</td>
<td>11/16.5</td>
<td>10/16 %</td>
</tr>
<tr>
<td>Acceleration (10 min) w / w.o. load *)</td>
<td>5.1/4.6</td>
<td>5.1/4.6</td>
<td>5.4/4.7</td>
<td>5.6/4.8 s</td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>160</td>
<td>160</td>
<td>185</td>
<td>210 bar</td>
</tr>
<tr>
<td>Oil flow for attachments</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14 l/min</td>
</tr>
</tbody>
</table>

1) for vertical mast.

2) The values shown represent the maximum gradeability to overcome short differences in height and surface unevenness (surface edges). The truck must not operate on inclines of more than 15%.
### 3.2 Dimensions

<table>
<thead>
<tr>
<th>Description</th>
<th>EFG 110k</th>
<th>EFG 110</th>
<th>EFG 113</th>
<th>EFG 115</th>
</tr>
</thead>
<tbody>
<tr>
<td>a/2 Safety distance</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>h&lt;sub&gt;2&lt;/sub&gt; Free lift *)</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>h&lt;sub&gt;3&lt;/sub&gt; Lift *)</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
</tr>
<tr>
<td>h&lt;sub&gt;4&lt;/sub&gt; Mast height extended *)</td>
<td>3550</td>
<td>3550</td>
<td>3550</td>
<td>3550</td>
</tr>
<tr>
<td>h&lt;sub&gt;6&lt;/sub&gt; Overhead guard height *)</td>
<td>2090</td>
<td>2090</td>
<td>2090</td>
<td>2090</td>
</tr>
<tr>
<td>h&lt;sub&gt;7&lt;/sub&gt; Seat height *)</td>
<td>900</td>
<td>900</td>
<td>900</td>
<td>900</td>
</tr>
<tr>
<td>h&lt;sub&gt;10&lt;/sub&gt; Coupling height</td>
<td>635</td>
<td>635</td>
<td>635</td>
<td>635</td>
</tr>
<tr>
<td>α Mast tilt, fwd.</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>β Mast tilt, back</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>L&lt;sub&gt;1&lt;/sub&gt; Length including forks *)</td>
<td>2719</td>
<td>2773</td>
<td>2881</td>
<td>2935</td>
</tr>
<tr>
<td>L&lt;sub&gt;2&lt;/sub&gt; Headlength *)</td>
<td>1569</td>
<td>1623</td>
<td>1731</td>
<td>1785</td>
</tr>
<tr>
<td>b Overall width *)</td>
<td>990</td>
<td>990</td>
<td>990</td>
<td>990</td>
</tr>
<tr>
<td>e Fork width *)</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>m&lt;sub&gt;1&lt;/sub&gt; Ground clearance with load below mast</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>m&lt;sub&gt;2&lt;/sub&gt; Ground clearance centre wheelbase</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Ast Aisle width for pallets 800 x 1200 longit.</td>
<td>3020</td>
<td>3074</td>
<td>3182</td>
<td>3236</td>
</tr>
<tr>
<td>Ast Aisle width for pallets 1200 x 1000 longit.</td>
<td>2898</td>
<td>2952</td>
<td>3060</td>
<td>3114</td>
</tr>
<tr>
<td>Wa Turning radius</td>
<td>1239</td>
<td>1293</td>
<td>1401</td>
<td>1455</td>
</tr>
<tr>
<td>x Load distance *)</td>
<td>330</td>
<td>330</td>
<td>330</td>
<td>330</td>
</tr>
<tr>
<td>y Wheelbase</td>
<td>984</td>
<td>1038</td>
<td>1146</td>
<td>1200</td>
</tr>
</tbody>
</table>
### 3.3 Weights

All dimensions in kg.

<table>
<thead>
<tr>
<th>Model</th>
<th>EFG 110k</th>
<th>EFG 110</th>
<th>EFG 113</th>
<th>EFG 115</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net weight *)</td>
<td>2490</td>
<td>2570</td>
<td>2760</td>
<td>2870</td>
</tr>
<tr>
<td>(including battery)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front axle load (without lifting load) *)</td>
<td>1095</td>
<td>1145</td>
<td>1235</td>
<td>1270</td>
</tr>
<tr>
<td>Front axle load (with lifting load) *)</td>
<td>2940</td>
<td>2945</td>
<td>3390</td>
<td>3805</td>
</tr>
<tr>
<td>Rear axle load (without lifting load) *)</td>
<td>1395</td>
<td>1425</td>
<td>1525</td>
<td>1600</td>
</tr>
<tr>
<td>Rear axle load (with lifting load) *)</td>
<td>550</td>
<td>625</td>
<td>620</td>
<td>565</td>
</tr>
</tbody>
</table>

### 3.4 Mast versions

All dimensions in mm.

<table>
<thead>
<tr>
<th>Mast table EFG 110k/110/113/115</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDI 3596 Designation</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td><strong>ZT</strong></td>
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<td><strong>ZZ</strong></td>
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<td><strong>DZ</strong></td>
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</tbody>
</table>

Special trucks are not included in this overview.
3.5 Tyre type

⚠️ WARNING!

The use of tyres that do not match the manufacturer’s specifications can result in accidents.

The quality of tyres affects the stability and performance of the truck.
Uneven wear affects the truck’s stability and increases the stopping distance.

➤ When replacing tyres make sure the truck is not skewed.
➤ Always replace tyres in pairs, i.e. left and right at the same time.

When replacing rims and tyres fitted at the factory, only use the manufacturer’s original spare parts. Otherwise the manufacturer’s specifications cannot be ensured. If you have any queries contact the manufacturer’s customer service department.

<table>
<thead>
<tr>
<th>Description</th>
<th>EFG 110</th>
<th>EFG 113</th>
<th>EFG 115</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front tyres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE *)</td>
<td>18 x 7-8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full rubber*)</td>
<td>18 x 6 x 12 1/8&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumatic*)</td>
<td>180 / 70-8; Diagonal, 16PR;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tyre pressure bar</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torque (Nm)</td>
<td>170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear tyres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE*)</td>
<td>18 x 7-8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full rubber*)</td>
<td>18 x 6 x 12 1/8&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumatic*)</td>
<td>180 / 70-8; Diagonal, 16PR;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tyre pressure bar</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torque (Nm)</td>
<td>170</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*) The models listed in the table correspond to the standard version. Other tyres can be used depending on the truck’s equipment.
### 3.6 Engine Data

<table>
<thead>
<tr>
<th>Designation</th>
<th>EFG110-115</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive motor</td>
<td>4 kW</td>
</tr>
<tr>
<td>Lift motor</td>
<td>6 kW</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Designation</th>
<th>EFG 110k</th>
<th>EFG 110</th>
<th>EFG 113</th>
<th>EFG 115</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy consumption according to EN cycle</td>
<td>2.6 kWh/h</td>
<td>2.7 kWh/h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO₂ equivalent according to EN 16796</td>
<td>1.40 kg/h</td>
<td>1.46 kg/h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Throughput performance</td>
<td>60 t/h</td>
<td>76 t/h</td>
<td>93 t/h</td>
<td></td>
</tr>
<tr>
<td>Energy consumption at max. throughput performance</td>
<td>3.2 kWh/h</td>
<td>3.3 kWh/h</td>
<td>3.5 kWh/h</td>
<td>3.7 kWh/h</td>
</tr>
</tbody>
</table>
3.7 EN norms

Noise emission level

- EFG 110-115: 63 dB(A)

*+/- 3 dB(A) depending on the truck's equipment

in accordance with 12053 as harmonised with ISO 4871.

The noise emission level is calculated in accordance with standard procedures and takes into account the noise level when travelling, lifting and when idle. The noise level is measured at the level of the driver's ear.

Vibration

- EFG 110-115: 0,62m/s²

in accordance with EN 13059.

The vibration acceleration acting on the body in its operating position is the linearly integrated, weighted acceleration in the vertical axis according to the standard. It is calculated when travelling over thresholds at constant speed (standard truck version). These recordings were taken on a single occasion for the truck and must not be confused with the human vibrations of the operator directive. The manufacturer offers a special service to measure these human vibrations, see page 171.

The internal accuracy of the measuring chain for at 21°C at 0,02 m/s². Further deviations may occur in particular through the positioning of the sensor and different driver weights.

Electromagnetic compatibility (EMC)

The manufacturer confirms that the truck adheres to the limits for electromagnetic emissions and resistance as well as the static electricity discharge test in accordance with EN 12895 as well as the standardised instructions contained therein.

No changes to electric or electronic components or their arrangement may be made without the written agreement of the manufacturer.

WARNING!

Medical equipment can be damaged by non-ionised radiation

Electrical equipment on the truck emitting non-ionised radiation (e.g. wireless data transmission) can affect operators' medical equipment (pacemakers, hearing aids etc.) and result in malfunctions. Consult a doctor or the manufacturer of the medical equipment to clarify whether it can be used near the industrial truck.
3.8 Conditions of use

Ambient temperature

- operating at -20°C to 40°C

Special equipment and authorisation are required if the truck is to be used continually in conditions of extreme temperature or condensing air humidity fluctuations.

3.9 Electrical Requirements

The manufacturer certifies compliance with the requirements for the design and manufacture of electrical equipment, according to EN 1175 "Industrial Truck Safety - Electrical Requirements", provided the truck is used according to its purpose.
### 3.10 Specifications according to RED guideline (Radio Equipment Directive) for radio units

The table contains any components installed according to the European Directive 2014/53/EU. The table shows the affected frequency range and the emitted transmission power for each component.

<table>
<thead>
<tr>
<th>Component</th>
<th>Frequency range</th>
<th>Transmission power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio module (ISM Online)</td>
<td>433.05 - 434.79 MHz</td>
<td>&lt; 10 mW</td>
</tr>
<tr>
<td>Access module (ISM Online)</td>
<td>13.56 MHz</td>
<td>&lt; 100 mW</td>
</tr>
<tr>
<td>EasyAccess StandAlone</td>
<td>13.56 MHz</td>
<td>&lt; 100 mW</td>
</tr>
<tr>
<td>Transponder reader (EasyKey)</td>
<td>2.4 GHz</td>
<td>≤ 67.6 mW</td>
</tr>
<tr>
<td>Transponder reader (EasyKey)</td>
<td>5.8 GHz</td>
<td>≤ 66.1 mW</td>
</tr>
<tr>
<td>Indoor/outdoor detection</td>
<td>24.00 - 24.25 GHz</td>
<td>100 mW</td>
</tr>
</tbody>
</table>
4 Identification points and data plates

4.1 Indication Points

→ Warnings and notices such as capacity charts, strap points and data plates must be legible at all times. Replace if necessary.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Capacity (or reduced capacity)</td>
</tr>
<tr>
<td>15</td>
<td>Wear seat belt</td>
</tr>
<tr>
<td>16</td>
<td>Do not travel with a raised load or operate the mast forward tilt with a raised load</td>
</tr>
<tr>
<td>17</td>
<td>Tipover warning</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>18</td>
<td>Attachment points for loading by crane</td>
</tr>
<tr>
<td>19</td>
<td>Do not step onto or beneath the load: risk of trapping with moving mast</td>
</tr>
<tr>
<td>20</td>
<td>Serial number, on chassis below the battery panel</td>
</tr>
<tr>
<td>21</td>
<td>Warning: optical radiation (Floor-Spot)</td>
</tr>
<tr>
<td>22</td>
<td>Max. body size</td>
</tr>
<tr>
<td>23</td>
<td>Inspection plaque (○)</td>
</tr>
<tr>
<td>24</td>
<td>Data plate</td>
</tr>
<tr>
<td>25</td>
<td>Jacking points</td>
</tr>
<tr>
<td>26</td>
<td>Model description</td>
</tr>
<tr>
<td>27</td>
<td>Do not carry passengers</td>
</tr>
<tr>
<td>28</td>
<td>Observe the operating instructions</td>
</tr>
</tbody>
</table>
4.2 Data plate

The illustration shows the standard version for EU member states. The data plate may differ in other countries.

For queries regarding the truck or when ordering spare parts, always quote the truck serial number (34).
4.3 Truck capacity plate

⚠️ CAUTION!

Accident risk from fork replacement
If you replace the forks with ones that differ from the originals, the capacity will change.
► When replacing the forks you must attach an additional capacity plate to the truck.
► Trucks supplied without forks are given a capacity plate for standard forks (length: 1150 mm).

The capacity plate (14) gives the capacity Q (in kg) of the truck for a vertical mast. A table indicates the maximum capacity with a given load centre distance D (in mm) and the required lift height \( h_3 \) (in mm).

The truck capacity plate specifies the type and serial number of the truck and indicates the capacity with the fork arms (●) (42) or the fork extensions (○) (43) in as-delivered condition.

Capacity plate version in accordance with Australian guidelines (44)
Example of how to calculate the maximum capacity

With a load centre distance (D) of 600 mm and a maximum lift height of (h₃) 3600 mm the max. capacity (Q) is 1105 kg.

Lift height limits

The arrow shaped markings (45 and 46) on the inner and outer masts show the operator when the prescribed lift limits have been reached.
4.4 Attachment capacity plate

The attachment capacity plate is next to the truck capacity plate and gives the truck capacity Q (in kg) in conjunction with the attachment and the specified fork arms (●) (47) and where applicable fork extensions (○) (48).

The model name and/or serial number for the attachment indicated on the attachment capacity plate must match the data plate of the attachment.

4.4.1 Attachment with More Than 100 mm Side Shift

The capacity plate of the attachment with more than 100 mm possible side shift for a current working position in the centre position (49) or pushed out offset to max. 100 mm side shift is affixed next to the truck capacity plate.
WARNING!

Risk of accident from offset load centre of gravity
The capacity of the truck is reduced when using side shifts that are more than 100 mm outside the truck centre.

Note the capacity plate with the reduced capacity.

The capacity plate of the attachment with more than 100 mm possible side shift for a current clear offset working position with 100 mm side shift pushed out (50) is affixed separately to the other capacity plates.

5 Stability

The truck’s stability has been tested according to latest technological standards. These take into account the dynamic and static tipover forces that can occur if used correctly.

Stability can also be affected by the following factors:
– Tyre type
– Mast
– Attachment
– Transported load (size, weight and centre of gravity)

WARNING!

Loss of stability can cause accidents
Changing the components can alter the stability.
5.1 Wind loads

Wind forces can affect the stability of a truck when lifting, lowering and transporting loads with large surface areas.

Light loads must be especially secured when they are subjected to wind forces. This will prevent the load from sliding or falling.

Stop the truck in both cases.
C Transport and Commissioning

1 Transport

Transport can be carried out in two different ways, depending on the height of the mast and the local conditions.

– Vertically, with the mast assembled (for low heights)
– Vertically, with the mast dismantled (for large heights), all mechanical connections and hydraulic lines between the basic truck and the mast separated.

2 Truck laden

2.1 Centre of gravity of the truck

⚠️ WARNING!
An altered centre of gravity can result in tipovers when cornering. The overall centre of gravity can vary depending on the truck’s equipment (especially the mast version).
For trucks without a mast the centre of gravity will move significantly in the direction of the counterweight.
► Drive carefully and with modified speed to avoid tipping over.

The picture shows the approximate centre of gravity location.
2.2 Lifting the truck by crane

**WARNING!**

All persons involved in loading by crane must be trained
Incorrect crane loading procedures due to untrained personnel can cause the truck to fall. There is a risk of injury to personnel and a risk of material damage to the truck.

- Loading must only be performed by specialist personnel trained for this purpose. The specialist personnel must be instructed in securing loads on road vehicles and handling load securing devices. In each case correct measurements must be taken and appropriate safety measures applied.

**DANGER!**

Crane slings can tear, resulting in accidents

- Only use crane lifting gear with sufficient capacity.
- Loading weight = Net weight of truck (+ battery weight for electric trucks).
- The mast must be tilted back fully.
- The crane lifting gear on the mast must have a minimum clear length of 2 m.
- Crane slings should be fastened in such a way that they do not come into contact with any attachments or the overhead guard when lifting.
- Do not stand under a swaying load.
- The truck should only be handled by people who are trained in using lifting slings and tools.
- Wear safety shoes when lifting the truck by crane.
- Do not walk into or stand in a hazardous area.
- Always attach the crane lifting gear to the prescribed strap points and prevent them from slipping.

Truck net weight: see page 32.
Lifting the truck by crane

Requirements
– Park the truck securely, see page 88.

Procedure
• Secure the crane slings to the attachment points (51) and (52).
• Raise and load the truck.
• Lower and deposit the truck carefully (see page 88).
• Secure the truck with wedges to prevent it from rolling away.

This concludes the loading by crane.
2.3 Loading with another industrial truck

⚠️ WARNING!

The truck can be damaged
The truck to be loaded can be damaged when loading with another industrial truck.
▶️ Only trained specialist personnel should load the truck.
▶️ Use only trucks with sufficient capacity for loading.
▶️ Only for loading and unloading.
▶️ The forks of the second industrial truck must be sufficiently long
▶️ Transporting over long distances prohibited.

NOTICE
Pick up the truck only from the left-hand side of the truck. Make sure that the truck is not picked up from the battery door.

Loading the truck with a second industrial truck

Requirements
– Park the truck securely, see page 88.

Procedure
• Raise the truck with the forks at the side between the axles.
• Raise the truck slightly and make sure it is securely positioned on the forks. If necessary adjust or secure the forks with stops.
• Carefully load/unload the truck, see page 98.
• Lower the truck slowly onto the ground and prevent it from rolling away.

The truck is now loaded.
3 Securing the truck during transport

**WARNING!**

Accidental movement during transport
Improper fastening of the truck and mast during transport can result in serious accidents.

- Loading must only be performed by specialist personnel trained for this purpose. The specialist personnel must be instructed in securing loads on road vehicles and handling load securing devices. In each case correct measurements must be taken and appropriate safety measures applied.
- The truck must be securely fastened when transported on a lorry or a trailer.
- The lorry or trailer must have fastening rings.
- Use wedges to prevent the truck from moving.
- Use only fastening belts with sufficient strength.
- Use non-slip materials to securing the load aids (pallet, wedges, ...) e.g. non-slip mats.

Securing with a mast Securing without a mast
Securing the industrial truck for transport

Requirements
– Position the industrial truck securely on a lorry or trailer, see page 88.

Tools and Material Required
– 2 fastening belts with a tensioner
– Retaining wedges.

Procedure
• Secure the truck with the fastening belt (53) at the top cross member of the mast (3) and the trailer coupling (12) or on the overhead guard (2) and the trailer coupling (12).
• Tighten the fastening belt (53) with the tensioner (54).

The truck is now secured for transport.
4 Using the Truck for the First Time

Safety instructions for assembly and commissioning

⚠️ **WARNING!**

Incorrect assembly can result in accidents

The assembly of the truck at the application site, commissioning and operator training must only be performed by the manufacturer’s customer service representatives who have been specially trained for these tasks.

⚠️ **WARNING!**

The use of unsuitable energy sources can be hazardous

Rectified AC current will damage the assemblies (controllers, sensors, motors etc.) of the electronic system.

Unsuitable cable connections (too long, insufficient wire cross-section) to the battery (tow cables) can overheat, setting the truck and battery on fire.

- The truck must only be operated with battery current.
- Cable connections to the battery (tow leads) must be less than 6 m long and have a minimum cross-section of 6 yd² (50 mm²).

*Preparing the truck for operation after delivery or transport*

*Procedure*

- Check the equipment is complete.
- Check the hydraulic oil level, see page 156.
- Check the transmission oil level, see page 157.
- Install the battery if necessary, see page 53.
- Charge the battery, see page 71.

*The truck can now be started*, see page 71.

➡️ To operate the truck without its own drive system, see page 134.
Battery - Servicing, Recharging, Replacement

1 General notes on handling batteries

Maintenance personnel

Batteries may only be charged, serviced or replaced by trained personnel. These operating instructions and the manufacturer's instructions concerning batteries and charging stations must be observed when carrying out the work.

Park the truck securely before carrying out any work on the batteries (see page 88).

Battery disposal

Batteries may only be disposed of in accordance with national environmental protection regulations or disposal laws. The manufacturer's disposal instructions must be observed.

1.1 Potential hazards

⚠️ WARNING!

Unsuitable batteries that have not been approved for the truck by the manufacturer can be hazardous

The design, weight and dimensions of the battery have a considerable effect on the operational safety of the truck, in particular its stability and capacity. The use of unsuitable batteries that have not been approved for the truck by the manufacturer can lead to a deterioration of the braking system during energy recovery operations and also cause considerable damage to the electrical control system. The use of batteries that have not been approved by the manufacturer can therefore affect the health and safety of personnel.

- Only manufacturer-approved batteries may be used on the truck.
- Battery equipment may only be replaced with the agreement of the manufacturer.
- When replacing/installing the battery, make sure the battery is securely located in the battery compartment of the truck.
- Do not use batteries that have not been approved by the manufacturer.
1.2 Touch voltage hazard

⚠️ WARNING!

Hazardous contact voltages only arise in the event of a technical or physical defect. The batteries are normally charged. There is still some residual voltage in a discharged battery. This must be considered as a hazardous contact voltage.

With this kind of defect the battery must not be touched and must not come into contact with metal objects see page 47.
2 Safety Regulations for Handling Lead-Acid Batteries

**WARNING!**

**Batteries can be hazardous**

Batteries contain an acid solution which is poisonous and corrosive. Avoid contact with battery acid at all times.

- Dispose of used battery acid in accordance with regulations.
- Always wear protective clothing and goggles when working with batteries.
- Do not let battery acid come into contact with skin, clothing or eyes. If necessary, rinse with plenty of clean water.
- In the event of physical damage (e.g. skin or eye contact with battery acid) call for a doctor immediately.
- Spilled battery acid should be neutralised immediately with plenty of water.
- Only batteries with a sealed battery container may be used.
- Follow national guidelines and legislation.

**Fire protection measures**

**WARNING!**

**Short circuits can result in fire**

Damaged cables can cause short circuits, setting the forklift truck and battery on fire.

- Before closing the battery cover make sure that the battery cables are not damaged.

**CAUTION!**

**The use of unsuitable fire-protection equipment can result in acid burns**

In the event of fire, a reaction with the battery acid can occur if water is used to extinguish the fire. This can lead to acid burns.

- Use powder extinguishers.
- Never extinguish burning batteries with water.

Do not smoke and avoid naked flames when handling batteries. Wherever an industrial truck is parked for charging, there must be no inflammable material or consumables capable of creating sparks within a minimum distance of 2.5 m from the truck. The room must be ventilated. Fire protection equipment must be on hand.

**Battery maintenance**

The battery cell covers must be kept dry and clean. Terminals and cable shoes must be clean, lightly greased with terminal grease and must be securely tightened. Batteries with non insulated terminals must be covered with a non slip insulating mat.

**CAUTION!**

Before closing the battery panel make sure that the battery cable cannot be damaged. There is a risk of short circuits with damaged cables.
3 Battery types

**CAUTION!**
Always use batteries with insulated covers or live components.

The battery weights are indicated on the battery data plate.

The truck will be equipped with different battery models, depending on the application. The following table shows which combinations are included as standard:

<table>
<thead>
<tr>
<th>Truck type</th>
<th>Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFG 110k</td>
<td>24 V - 4PzS</td>
<td>500 Ah</td>
</tr>
<tr>
<td>EFG 110</td>
<td>24 V - 5PzS</td>
<td>625 Ah</td>
</tr>
<tr>
<td>EFG 113</td>
<td>24 V - 7PzS</td>
<td>875 Ah</td>
</tr>
<tr>
<td>EFG 115</td>
<td>24 V - 8PzS</td>
<td>1000 Ah</td>
</tr>
</tbody>
</table>

4 Battery dimensions

<table>
<thead>
<tr>
<th>Truck type</th>
<th>Description</th>
<th>Dimension (mm)</th>
<th>Rated weight (-5/+8%) in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>L max.</td>
<td>B max.</td>
<td>H1 +/- 2mm</td>
<td>H2 +/- 2mm</td>
</tr>
<tr>
<td>EFG 110k</td>
<td>830</td>
<td>273</td>
<td>612</td>
</tr>
<tr>
<td>EFG 110</td>
<td>830</td>
<td>327</td>
<td>612</td>
</tr>
<tr>
<td>EFG 113</td>
<td>830</td>
<td>435</td>
<td>612</td>
</tr>
<tr>
<td>EFG 115</td>
<td>830</td>
<td>489</td>
<td>612</td>
</tr>
</tbody>
</table>

**DANGER!**
If the centre of gravity of the battery deviates from the geometrical centre of gravity of the battery, contact the manufacturer.
5 Exposing the battery

⚠️ CAUTION!

The drive motor operating temperature can cause injury
When you open the battery cover the high operating temperature of the drive motor > 80° can result in injuries.
►Do not touch the drive motor, and allow it to cool down.

Exposing the battery with the SOLO-PILOT

Requirements
– Park the truck securely, see page 88.
– Load handler lowered.
– Key switch set to OFF.
– Key removed.
– Set the Emergency Disconnect OFF.

Procedure
• Press the lever (56) to unlock the cover (55) and move it forward.
• Carefully lift back the battery cover and the driver’s seat as far as the stop (opening angle = 90°).

The battery is now exposed.
Exposing the battery with the MULTI-PILOT (O)

Requirements
– Park the truck securely, see page 88.
– Load handler lowered.
– Key switch set to OFF.
– Key removed.
– Set the Emergency Disconnect OFF.

Procedure
• Release the steering column lock (58), push the steering column forward and secure it in this position.
• Pull the panel (57) forward until it engages.
• Carefully lift back the battery cover and the driver’s seat (1) as far as the stop (opening angle = 90°).

The battery is now exposed.

→ On trucks with a rear window / canvas cover, open the rear window / canvas cover before opening the battery cover.
6 Battery removal and installation

⚠️ WARNING!

Accident risk during battery removal and installation
Due to the battery weight and acid there is a risk of trapping or scalding when the battery is removed and installed.
🔹 Note the "Safety regulations for handling acid batteries" section in this chapter.
🔹 Wear safety shoes when removing and installing the battery.
🔹 Use only batteries with insulated cells and terminal connectors.
🔹 Park the truck on a level surface to prevent the battery from sliding out.
🔹 Make sure the crane slings have sufficient capacity to replace the battery.
🔹 Use only approved battery replacement devices (battery roller stand, replacement trolley etc.).
🔹 Make sure the battery is securely located in the truck's battery compartment.

⚠️ CAUTION!

Trapping hazard
Trapping hazard when replacing the battery.
🔹 When replacing the battery do not reach between the battery and the chassis.
🔹 Wear safety shoes.
Battery Removal and Installation

Requirements
– Park the truck securely, see page 88.
– Battery exposed, see page 51.
– Battery disconnected.

Tools and Material Required
– Crane lifting gear

Procedure

• Strap the crane lifting gear vertically over the recess in the overhead guard to the battery tray.

Hooks must be fitted in such a way that when the crane lifting gear is slackened, it does not fall onto the battery cells.

• With the crane lifting gear raise the battery above the chassis in the right hand travel direction and then move it out sideways.

The battery is now removed.
7 Charging the battery

**WARNING!**

The gases produced during charging can cause explosions

The battery produces a mixture of oxygen and hydrogen (electrolytic gas) during charging. Gassing is a chemical process. This gas mixture is highly explosive and must not be ignited.

► Switch the charging station and truck off first before connecting/disconnecting the charging cable of the battery charging station to/from the battery connector.

► The charger must be adapted to the battery in terms of voltage and charge capacity.

► Before charging, check all cables and plug connections for visible signs of damage.

► Ventilate the room in which the truck is being charged.

► The battery cell surfaces must be exposed during charging to ensure adequate ventilation.

► Do not smoke and avoid naked flames when handling batteries.

► Wherever an industrial truck is parked for charging there shall be no inflammable material or lubricants capable of creating sparks within 2.5 m around the truck.

► Fire protection equipment must be on hand.

► Do not lay any metallic objects on battery.

► It is essential to follow the safety regulations of the battery and charger station manufacturers.

### 7.1 Charging the battery with a stationary charger

**WARNING!**

Risk of electric shock and fire due to lacking or inappropriate residual current devices

A lack of residual current devices or the use of inappropriate residual current devices can result in fatal injury due to electric shocks or electrical fires in the event of a fault.

► The owner must conduct an operational risk assessment of the usage location.

► An RCD switch (residual current device, circuit breaker) of type B or B+ must be used where necessary.

When charging, the battery door must be exposed by at least 200 mm to provide sufficient ventilation.

**Requirements**

– Park the truck securely, see page 88.
– Battery exposed.
– Charger switched off.
– Disconnect the battery connector (59) from the truck connector (51).

**Procedure**

• Connect the battery connector (59) to the charging cable (60) of the stationary charger and turn on the charger.
The battery is now charged.
8 Closing the battery cover

Closing the Battery Cover with the SOLO-PILOT

Requirements
– The battery cable is in the cable guide (61).

Procedure
• Close the battery cover with the driver's seat.
• Move the cover (55) back until it engages.

The battery cover is now closed.

Closing the battery cover with the Multi Pilot (optional)

Requirements
– The battery cable is in the cable guide (61).

Procedure
• Push the cover (57) back with force.
• Engage the lock (62).

The battery cover is now closed.
E  Operation

1  Safety Regulations for the Operation of Forklift Trucks

Driver authorisation

The truck may only be used by suitably trained personnel, who have demonstrated to the proprietor or his representative that they can drive and handle loads and have been authorised to operate the truck by the proprietor or his representative.

Operator's rights, obligations and responsibilities

The operator must be informed of his duties and responsibilities and be instructed in the operation of the truck and shall be familiar with the operating instructions.

Unauthorised use of truck

The operator is responsible for the truck during the time it is in use. The operator must prevent unauthorised persons from driving or operating the truck. Do not carry passengers or lift other people.

Damage and faults

The supervisor must be informed immediately of any damage or faults to the truck or attachment. Trucks which are unsafe for operation (e.g. wheel or brake problems) must not be used until they have been rectified.

Repairs

The operator must not carry out any repairs or alterations to the truck without authorisation and the necessary training to do so. The operator must never disable or adjust safety mechanisms or switches.
Hazardous area

⚠️ WARNING!

Risk of accidents/injury in the hazardous area of the truck
A hazardous area is defined as the area in which people are at risk due to travel or lifting operations of the truck, its load handler or the load. This also includes the area within reach of falling loads or lowering/falling operating equipment.
▶ Instruct unauthorised persons to leave the hazardous area.
▶ In case of danger to third parties, give a warning signal in good time.
▶ If unauthorised persons are still within the hazardous area, stop the truck immediately.

⚠️ WARNING!

Falling objects can cause accidents
Falling objects can injure the operator while the truck is being operated.
▶ The operator must remain within the protected area of the overhead guard while the truck is being operated.

Safety devices, warning signs and warning instructions
Safety devices, warning signs (see page 30) and warning instructions in the present operating instructions must be strictly observed.

⚠️ CAUTION!

Reduced headroom can cause injuries
Trucks with reduced headroom are equipped with a warning label within the operator's line of sight.
▶ The max. recommended body size indicated on this warning sign must be observed.
▶ The headroom is also reduced when you wear a protective helmet.
## Displays and Controls

<table>
<thead>
<tr>
<th>Item</th>
<th>Control/display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>Parking-brake lever</td>
<td><img src="image.png" alt="item" /> Applies/releases the parking brake.</td>
</tr>
<tr>
<td>64</td>
<td>Control panel with display unit</td>
<td><img src="image.png" alt="item" /> Displays the battery capacity, service hours, errors, key warning indicators, wheel position and travel direction.</td>
</tr>
<tr>
<td>65</td>
<td>Steering wheel</td>
<td><img src="image.png" alt="item" /> Steers the truck.</td>
</tr>
<tr>
<td>66</td>
<td>soloPILOT</td>
<td><img src="image.png" alt="item" /> Controls the following functions:</td>
</tr>
<tr>
<td></td>
<td>multiPILOT</td>
<td><img src="image.png" alt="item" /> Controls the following functions:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Fwd/rev. travel direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lifting/lowering load</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Mast forward/reverse tilt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Horn button</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Sideshifter left/right (○)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Auxiliary hydraulics (○)</td>
</tr>
<tr>
<td>Item</td>
<td>Control/display</td>
<td>Function</td>
</tr>
<tr>
<td>------</td>
<td>-----------------</td>
<td>----------</td>
</tr>
<tr>
<td>67</td>
<td>Key switch</td>
<td>● Switches control current on and off. Removing the key prevents the truck from being switched on by unauthorised personnel.</td>
</tr>
<tr>
<td></td>
<td>ISM access module</td>
<td>○ Switches the truck on.</td>
</tr>
<tr>
<td></td>
<td>Code lock</td>
<td>○</td>
</tr>
<tr>
<td>68</td>
<td>Side storage-facility control panel</td>
<td>● Switches electric options on and off</td>
</tr>
<tr>
<td>69</td>
<td>Brake pedal</td>
<td>● Provides infinitely variable braking control.</td>
</tr>
<tr>
<td>70</td>
<td>Accelerator pedal</td>
<td>● Provides infinitely variable travel speed control</td>
</tr>
<tr>
<td>71</td>
<td>Warning indicator for belt lock control system</td>
<td>If the seat belt is not fastened, the warning indicator for the belt lock control system illuminates.</td>
</tr>
<tr>
<td>72</td>
<td>Warning indicator for cab door monitoring</td>
<td>If the cab door is not closed, the warning indicator for the cab door monitoring illuminates.</td>
</tr>
<tr>
<td>73</td>
<td>&quot;Reverse&quot; accelerator twin pedal control</td>
<td>○ The truck reverses when the accelerator pedal is applied. Provides infinitely variable travel speed.</td>
</tr>
<tr>
<td>74</td>
<td>&quot;Forwards&quot; accelerator twin pedal control</td>
<td>○ The truck travels forwards when the accelerator pedal is applied. Provides infinitely variable travel speed.</td>
</tr>
<tr>
<td>75</td>
<td>Emergency disconnect switch</td>
<td>Switches power supply on and off.</td>
</tr>
</tbody>
</table>

*If the truck is equipped with an ISM access module or Can Code refer to the “ISM Access Module” or “CanCode” operator manuals.*
<table>
<thead>
<tr>
<th>Item</th>
<th>Control / Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>71</td>
<td>Warning indicator for belt lock control system</td>
<td>If the seat belt is not fastened, the warning indicator for the belt lock control system illuminates.</td>
</tr>
<tr>
<td>72</td>
<td>Warning indicator for cab door monitoring</td>
<td>If the cab door is not closed, the warning indicator for the cab door monitoring illuminates.</td>
</tr>
<tr>
<td>76</td>
<td>Travel direction switch (not available with twin-pedal control)</td>
<td>Selects travel direction or neutral.</td>
</tr>
<tr>
<td>77</td>
<td>&quot;Horn&quot; button</td>
<td>Activates an audible warning signal.</td>
</tr>
<tr>
<td>78</td>
<td>Lever</td>
<td>Lever for operating the hydraulic functions.</td>
</tr>
<tr>
<td>79</td>
<td>Button</td>
<td>Hydraulic auxiliary function control button.</td>
</tr>
<tr>
<td>80</td>
<td>Additional hydraulic function release button</td>
<td>Activates the additional hydraulic functions or hydraulics that require acknowledgement.</td>
</tr>
</tbody>
</table>
### 2.1 Control panel with display unit

The control panel display unit shows the operating data, the battery charge, the service hours and error details and information. Pictograms in the left top section of the control panel act as warning indicators.

#### Table: Control / Display Function

<table>
<thead>
<tr>
<th>Item</th>
<th>Control / Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>81</td>
<td>Warning indicator Controller overtemperature</td>
<td>– Lights up to indicate controller overtemperature&lt;br&gt;– Performance is continually reduced in relation to the temperature</td>
</tr>
<tr>
<td>82</td>
<td>Warning indicator Drive motor overtemperature</td>
<td>– Monitors the temperature of the drive motor&lt;br&gt;– Performance is reduced if the temperature is excessive</td>
</tr>
<tr>
<td>83</td>
<td>Parking brake indicator</td>
<td>Comfort feature, displayed when the parking brake indicator (83) lights up.&lt;br&gt;Truck prevented from rolling away but not parked securely.&lt;br&gt;Parking brake is automatically activated after a set time when the truck stops.&lt;br&gt;The parking brake is automatically released when the accelerator pedal is applied.</td>
</tr>
<tr>
<td>84</td>
<td>Truck in operation indicator</td>
<td>– Key switch ON</td>
</tr>
<tr>
<td>85</td>
<td>Insufficient brake fluid</td>
<td>– The brake fluid level can be checked through sensors on the brake fluid reservoir</td>
</tr>
<tr>
<td>86</td>
<td>Hourmeter / time toggle switch</td>
<td>– Truck key switch ON service hours&lt;br&gt;– &quot;Eff&quot; service hours can be switched ON or OFF via a code&lt;br&gt;– Time display</td>
</tr>
<tr>
<td>Item</td>
<td>Control / Display</td>
<td>Function</td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| 87   | Warning indicator Pump motor, power steering overtemperature | - Monitors the temperature of the pump motor and the power steering motor  
- Performance is reduced if the temperature is excessive |
| 88   | Seat switch warning indicator | Seat switch not closed  
- Truck operational, but driver's seat not occupied |
| 89   | Travel direction display indicator lamp | Right / left indicator lamps activated |
| 90   | Service display | Service interval exceeded (1000 operating hours) or annual FEM test due (flashing indicator). |
| 91   | WARNING          | WARNING  
- Flashes for faults, an audible warning sounds  
- Flashes when battery capacity is less than 10% |
| 92   | Slow travel button | Switches slow travel on and off |
| 93   | Program selector | Selects the travel program (moves up or down a level in the travel program list.) |
| 94   | Operating program display | Displays the selected travel program (1 to 5) |
| 95   | Set button       | Confirms the entries |
## 2.2 Side compartment control panel switch (○)

<table>
<thead>
<tr>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear window heating</td>
</tr>
<tr>
<td>Slow travel</td>
</tr>
<tr>
<td>Beacon</td>
</tr>
<tr>
<td>Seat heating</td>
</tr>
<tr>
<td>Work lights</td>
</tr>
<tr>
<td>Lift cutout override</td>
</tr>
<tr>
<td>Windscreen washer system</td>
</tr>
</tbody>
</table>

## 2.3 Instrument panel switches (○)

<table>
<thead>
<tr>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck lighting</td>
</tr>
</tbody>
</table>

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### 2.4 Display

![Display Diagram](image)

<table>
<thead>
<tr>
<th>Item</th>
<th>Function</th>
</tr>
</thead>
</table>
| 96   | Hourmeter display  
  Error display:  
  – If an error (Err) or a warning (Inf) occurs, the error or info code is displayed.  
  – If several errors occur they are displayed alternately at 1.5 second intervals. A warning is sounded. |
| 97   | Battery capacity display  
  – Battery discharge status |
| 98   | Travel direction and wheel position display  
  – Indicates the pre-selected travel direction (forward or reverse) or the position of the steered wheels.  
  – Flashing direction arrow = no travel direction selected |
### 2.4.1 Battery discharge indicator

**NOTICE**

**Full discharge can damage the battery**
The standard setting for the battery discharge indicator is based on standard batteries. When using maintenance-free batteries (gel batteries), the display must be reset.

- This adjustment should only be made by the manufacturer’s customer service department.
- The battery discharge indicator shows the battery’s residual capacity.
- Charge the battery, see page 55.

The battery charge status is shown through a battery icon (97) in the truck display in 10% increments (100% = 100% battery capacity, 0% = 20% battery capacity).

### 2.4.2 Battery discharge monitor

If the residual capacity falls below the required level, lifting is inhibited and the travel speed is reduced. An message appears in the display. Lifting is only released when the battery connected is at least 40% charged.

- In order to complete the lift cycle, the key switch must be turned off and on again. Lifting is then enabled for 30 to 40 seconds.

### 2.4.3 Hourmeter

The service hours are counted when the truck is switched on and the seat switch is closed.
3 Preparing the Truck for Operation

3.1 Checks and operations to be performed before starting daily operation

⚠️ WARNING!

Damage and other truck or attachment (optional equipment) defects can result in accidents.

If damage or other truck or attachment (optional equipment) defects are discovered during the following checks, the truck must be taken out of service until it has been repaired.

▸ Report any defects immediately to your supervisor.
▸ Mark defective truck and take out of service.
▸ Do not return the industrial truck to service until you have identified and rectified the fault.
Checks before daily operation

Procedure

• Visually inspect the entire truck (in particular wheels, wheel bolts and load handler) for damage.
• Check the fork stop (99) and fork retainer (100).
• Visually inspect the hydraulic system in the visible area for damage and leaks.
• Make sure the driver’s seat is locked in position.
• Test the horn and reversing buzzer (○) where applicable.
• Check that the capacity plate and warning labels are legible.
• Test the controls and displays.
• Test the steering.
• Check the steer angle display (○), turn the steering wheel in both directions as far as the stop and check that the wheel position is displayed on the control panel.
• Make sure the load chains are evenly tensioned.
• Test the seat belt. (The belt should jam when extracted suddenly.)
• Check the function of the restraint system monitor.
  • Test the function of the display unit. Belt lock control symbol (see page 61) lights up when the belt is not locked.
  • Test the function of the display unit. Cabin door monitoring symbol (see page 61) lights up when the summer door, the folding gate or the cabin door is not closed properly (○).
• Test the seat switch: when the driver’s seat is vacated, it should not be possible to activate the hydraulic functions.
• Test the restraint system (○).
• Test the driveCONTROL (○).
  • Raise the fork carriage without load beyond the reference point on the mast. The slow travel symbol lights up on the display.
  • Slowly apply the accelerator pedal on a clear route with good visibility. The maximum speed should be reduced to walking pace (3 km/h).
• Test the lift/lower, tilt and if applicable the attachment hydraulic control functions.
• Apply the accelerator pedal several times to test its freedom of movement with the parking brake applied (the parking brake indicator on the display (83) lights up and the parking brake lever (63) is applied) and to test the idling function.
• Visually inspect the battery attachment and cable connections.
• Check the battery latch is present and working.
• On trucks with lateral battery removal, check the left and right stops (101) in the battery compartment for damage.
• Check the fluid level of the windscreen washing system, see page 158.
3.2 Entry and exit

Requirements
– Truck stationary.

Procedure
• Cab door open (if applicable).
• To enter and exit the cab, hold onto the handle (102). Always face the truck when entering and exiting.

Always use the entry aid (102) provided to climb onto the truck.

An additional step is provided for the driver position extension (○).

3.3 Trucks with reduced headroom (○)

⚠️ CAUTION!

An unsuitable workplace can damage your health
Failure to observe the recommended body size can cause stress and endanger the operator and may lead to lasting ill health due to an unhealthy posture and excessive strain on the operator.

 ► The operating company must ensure that truck operators do not exceed the maximum body size indicated.

 ► The operating company must check that the operators can sit in a normal and upright position without having to strain.
3.4 Setting up the operator position

⚠️ WARNING!

Accidents can occur if the driver's seat, steering column and armrest are not engaged

The driver's seat, steering column and armrest can accidentally adjust during travel and therefore cannot be operated safely.

Do not adjust the driver’s seat, steering column or armrest while travelling.

Procedure

- Before starting to travel, adjust the driver’s seat, steering column and armrest (if necessary) so that all the controls are within reach and can be applied without having to strain.
- Adjust the visibility aid equipment (mirrors, camera systems etc.) so that the working environment can be clearly seen.

3.4.1 Adjusting the driver’s seat

⚠️ WARNING!

Risk of accidents and damage to health

An incorrectly adjusted driver’s seat can result in accidents and damage to health.

Do not adjust the driver’s seat while travelling.

The driver’s seat should lock in position after adjustment.

Check and adjust the individual driver's seat setting before starting up the truck.

Hold the weight setting lever only by the recess, do not reach through underneath the lever.
Setting the driver's weight

**NOTICE**

Incorrectly adjusted seat cushioning can damage your health

To achieve optimal seat cushioning, the driver's seat must be adjusted according to the driver's weight.

Set the driver's weight when the seat is occupied.

Hold the weight adjustment lever only by the recess; do not reach through underneath the weight adjustment lever.

**Procedure**

- Fold out the weight adjustment lever (103) as far as it will go in the arrow direction.
- Move the weight adjustment lever (103) up and down to set the seat to a higher weight.
- Move the weight adjustment lever (103) down and up to set the seat to a lower weight.

The driver's weight is correctly set when the arrow is in the middle of the display window (104). The minimum or maximum weight setting is reached when you can feel a return stroke on the lever.

- After setting the weight, fully fold back in the weight adjustment lever (103).

*The driver's weight is now set.*

Adjusting the backrest

**Procedure**

- Sit on the driver's seat.
- Pull the lever (105) to adjust the backrest.
- Adjust the backrest tilt.
- Release the lever (105) again. The backrest is locked.

*The backrest is now set.*

Hold the weight setting lever (103) only by the recess, never reach through underneath the lever.
Adjusting the seat position

⚠️ CAUTION!

An unsecured driver's seat can cause injury
An unsecured driver's seat can slide out of its guide during travel, resulting in accidents.
► The driver's seat must be locked in position.
► Do not adjust the driver's seat while travelling.

Procedure
- Sit on the driver's seat.
- Pull up the driver's seat locking lever 106 in the direction of the arrow.
- Push the driver's seat forwards or backwards to the desired position
- Engage the driver's seat locking lever (106) in position.

The seat position is now correctly set.
Adjusting the backrest extension (O)

**CAUTION!**

Accident risk when adjusting the backrest during travel

Do not adjust the backrest extension while travelling.

**Procedure**

- The backrest extension height can be adjusted by changing the detent.
- Pull the backrest up and lock it in place to extend the backrest.
- Push the backrest down and lock it in place to shorten the backrest.

Adjusting the swivel seat (O)

**Procedure**

- Pull the locking lever (107) back while simultaneously turning the seat to the required position.
- Allow the lock to engage.

The swivel seat is adjusted and locked in position.

Operate the truck only when the swivel seat is locked in position.
Adjusting the lumbar support (O)

Procedure
• Turn the hand wheel (109) to the required position.
  Position 0 = no warping in lumbar vertebrae area.
  Position 1 = increasing warping in upper lumbar vertebrae area.
  Position 2 = increasing warping in lower lumbar vertebrae area.

The lumbar support is now adjusted.

Switching the seat heating on and off (O)

Procedure
• Press the seat heating switch (108).
  Switch setting 1 = Seat heating on.
  Switch setting 0 = Seat heating off.
3.4.2 Adjusting the steering column

Adjusting the steering column

Procedure
• Release the steering column stop (58).
• Set the steering column to the required position (height and angle).
• Fix the steering column stop (58) in position.

The steering column is now positioned.

3.4.3 Adjusting the arm rest

Procedure
• Loosen the screw (110) and tilt the armrest up or down.
• Re-tighten the screw (110).
• Loosen the screw (111) and set the armrest vertical.
• Re-tighten the screw (111).
• Loosen the screw (112) and set the armrest horizontal.
• Re-tighten the screw (112).

The armrest is now positioned.

3.5 Restraint systems

Restraint systems

Approved restraint systems:
– Seat belt (see page 81)
– Folding gate ()
– Summer door (see page 123)

At least one of these restraint systems must be in place and monitored electrically. This applies to trucks from the production date 01/12/2020.
3.6 Seat Belt

**WARNING!**

**Travelling without a seat belt increases the risk of injury.**

Accidents or personal injury can result if the seat belt is not worn or is modified.
- Always put the seat belt on before starting the industrial truck.
- Do not modify the seat belt.
- Damaged or non-operational seat belts must be replaced by trained personnel.
- Seat belts must always be replaced after an accident.
- Only original spare parts must be used for retrofits or repairs.
- Report any defects immediately to your supervisor.
- Remove the truck from service until a functional seat belt has been fitted.

Protect the seat belt from contamination (e.g. cover it when the truck is idle) and clean it regularly. Frozen belt locks or pulleys must be thawed out and dried to prevent them from freezing up again. The temperature of the warm air should not exceed +60 °C!

**Belt lock control system**

The truck is fitted with a belt lock control system. If the belt is not locked properly, the following may occur:

- The warning indicator for the belt lock control system (see page 61) lights up.
- After max. 30 seconds, an acoustic signal sounds.

**Starting the industrial truck on steep slopes**

The automatic blocking system locks the belt in the retractor when the truck is positioned on a steep slope. This prevents the belt from being pulled out of the retractor.

Carefully drive the truck off the slope and then put on the belt.
**DANGER!**

**A faulty seat belt can cause injury**
Using a faulty seat belt can result in injury.

- Only operate the truck with the seat belt intact. A faulty seat belt should be replaced immediately.
- The truck must remain decommissioned until a functional seat belt has been fitted.

**Checking the seat belt**

**Procedure**
- Check the attachment points for wear and damage.
- Check the cover for damage.
- Pull the belt out fully from the retractor and check for damage (loose seams, fraying and nicks).
- Test the belt buckle and make sure the belt returns correctly into the retractor.

**Check the automatic locking system**

**Procedure**
- Park the truck on a level surface.
- Jerk the seat belt out suddenly.

❗ The locking system should prevent the belt from coming out.

*The seat belt has now been checked.*
4 Industrial Truck Operation

4.1 Safety regulations for truck operation

⚠️ WARNING!

Magnetic fields can cause accidents
Electronic components can be affected or damaged by external magnetic fields. This can lead to malfunctions or accidents.
► Do not use or keep magnets or clamping magnets in the immediate vicinity of the controls.

Travel routes and work areas

Only use lanes and routes specifically designated for truck traffic. Unauthorised third parties must stay away from work areas. Loads must only be stored in places specially designated for this purpose. The truck must only be operated in work areas with sufficient lighting to avoid danger to personnel and materials. Additional equipment is necessary to operate the truck in areas of insufficient lighting.

⚠️ DANGER!

Do not exceed the permissible surface and point loading on the travel lanes. At blind spots get a second person to assist. The driver must ensure that the loading dock/dock leveller cannot be removed or come loose during loading/unloading.

NOTICE

Loads must not be deposited on travel or escape routes, in front of safety mechanisms or operating equipment that must be accessible at all times.

Travel conduct

The operator must adapt the travel speed to local conditions. The truck must be driven at slow speed when negotiating bends or narrow passageways, when passing through swing doors and at blind spots. The operator must always observe an adequate braking distance between the forklift truck and the vehicle in front and must be in control of the truck at all times. Abrupt stopping (except in emergencies), rapid U turns and overtaking at dangerous or blind spots are not permitted. Do not lean out or reach beyond the working and operating area.

Do not use a mobile phone or walkie-talkie without a handsfree device while operating the truck.

Hazardous situations

The operator must not jump off the truck. The operator must lean his upper body over the steering wheel and hold on with both hands. Tilt your body in the opposite direction of fall.

Travel visibility

The operator must look in the direction of travel and must always have a clear view of the route ahead. If the truck is carrying loads that affect visibility, the truck must
travel against the load direction. If this is not possible, a second person must walk alongside the truck as a lookout to observe the travel route while maintaining eye contact with the operator. Proceed only at walking pace and with particular care. Stop the truck as soon as you lose eye contact.

At a distance (D) of 4000 mm between the rear of the load (Y) and a person or obstacle, the non-visible area (A) must not be larger than 1085 mm. If the height (C) impairs visibility to the extent that A 1085 mm is exceeded, the truck must travel in the opposite direction to the load direction.

Depending on the operating conditions and application of the truck, the operating company or its representative is obligated to define a visible area which is appropriate to the prevailing hazard(s).
Negotiating slopes and inclines

Negotiating slopes and inclines up to 15% is only permitted if they are specifically designed as travel routes, are clean and have a non-slip surface and providing they can be safely travelled along in accordance with the truck’s technical specifications. The truck must always be driven with the load facing uphill. The industrial truck must not be turned, operated at an angle or parked on inclines and slopes. Inclines must only be negotiated at slow speed, with the driver ready to brake at any moment. Particular care is required when travelling near slopes and quay walls.

⚠️ WARNING!

Danger of accidents due to regenerative braking fault

Regenerative braking faults can result in extended stopping distances and accidents, particularly when travelling on inclines. Other persons can be injured in the truck's hazardous area.

► Keep all persons out of the hazardous area during travel operations.
► Instruct other people to move out of the hazardous area of the truck. Stop using the truck immediately if people do not vacate the hazardous area.
► The truck must travel carefully and not faster than crawl speed when the "Regenerative braking fault" warning notice appears on the display unit.
► In emergencies, use the service brake via the brake pedal for braking.

Negotiating lifts, loading ramps and docks

Lifts may only be negotiated if they have sufficient capacity, are suitable for driving on and authorised for truck traffic by the owner. The driver must satisfy himself of the above before entering these areas. The truck must enter lifts with the load in front and must take up a position which does not allow it to come into contact with the walls of the lift shaft. Persons riding in the lift with the forklift truck must only enter the lift after the truck has come to a rest and must leave the lift before the truck. The driver must ensure that the loading ramp / dock cannot move or come loose during loading / unloading.

Type of loads to be carried

The operator must make sure that the load is in a satisfactory condition. Loads must always be positioned safely and carefully. Use suitable precautions to prevent parts of the load from tipping or falling down. Prevent liquid loads from sloshing out.

Inflammable liquids (e.g. molten metal etc.) may only be transported with suitable auxiliary equipment. Contact the manufacturer’s customer service department.

► For safety instructions on the nature of loads to be carried with attachments, see page 98.

Towing trailers

Only use the truck for towing lightweight trailers internally, see page 119.
4.2 Preparing the truck for operation

Switching on the truck

Requirements
– For checks and operations to be performed before starting daily operation, see page 71.

Procedure
• Unlock the Emergency Disconnect switch (75) to do this
  • Press the rocker in (1) and pull it up until you feel the Emergency Disconnect switch engaging.
• Insert the key in the key switch (67) and turn it clockwise as far as it will go to the “I” position.
• Test the brake pedal and parking brake (parking brake indicator (83) lights up and parking brake lever (63) applied).

Truck is operational. The display (113) shows the remaining battery capacity.

When you have pulled the Emergency Disconnect and turned the key switch to the right, the truck carries out a self test for approx. 3-4 seconds (tests the controllers and motors). During this time the truck cannot move or lift. If the accelerator or a lift mechanism lever is applied during this time, an information message will be displayed.
4.3 Setting the time

Setting the time

Procedure
- Press the “h/time” (86) and up (93) keys simultaneously.
- The time is displayed. The first digit flashes.
  Press the up/down key (93) to increase or decrease the flashing digit.
- Use the SET (95) key to toggle to the next digit. After the last digit the number is accepted.

The time is now set.

Keep pressing the Up and Down keys to set the time and to change between 24 hour and 12 display (SET HOUR 24 H <- SET HOUR 12 H).
4.4 Parking the truck securely

⚠️ WARNING!

An unsecured truck can cause accidents
Parking the truck on an incline, without the brakes applied or with a raised load / load handler is dangerous and is strictly prohibited.

▶ Always park the truck on a level surface. In special cases the truck may need to be secured with wedges.
▶ Always fully lower the mast and load handler.
▶ Tilt the mast forward.
▶ Always apply the parking brake lever before parking the truck.
▶ Choose a place to park where no other people are at risk of injury from lowering forks.
▶ Do not park and abandon a truck on an incline.

Parking the Truck Securely (with the Parking Brake Lever)

Procedure

• Pull the parking brake lever (114) back.
• Turn the key in the key switch (67) to the “0” position.
• Remove the key from the key switch (67).
• Press the Emergency Disconnect switch (75) down.

The truck is now parked securely.
4.5 Emergency Disconnect

⚠️ CAUTION!

Faulty or non-accessible emergency disconnect switches can cause accidents
A faulty or non-accessible emergency disconnect switch can cause accidents.
▶ The operation of the emergency disconnect switch must not be affected by any objects placed in its way.
▶ Report any defects on the emergency disconnect switch immediately to your supervisor.
▶ Mark the defective truck accordingly and take it out of service.
▶ Do not return the truck to service until you have identified and rectified the fault.

Operating the emergency disconnect switch

Procedure
• Press the emergency disconnect switch (75).

All electrical travel, steering and hydraulic functions are cut out.

Releasing the Emergency Disconnect

Procedure
• Press the rocker in (↓) and pull the Emergency Disconnect switch (75) up until you feel the Emergency Disconnect (75) switch engaging.

All electrical functions are enabled and the truck is operational again (assuming the truck was operational before the Emergency Disconnect was pressed).
4.6 Travel

⚠️ WARNING!

Improper travel can result in accidents
- Do not get up from the driver’s seat during travel.
- Do not drive the truck unless you are wearing a seat belt and the panels and doors are properly locked.
- Do not lean out of the truck while travelling.
- Make sure that the travel area is clear.
- Adapt your travel speed to the route conditions in the work area and the load.
- Tilt the mast back and raise the fork carriage approx. 200 mm.
- Make sure you have sufficient visibility when reversing.

Travel

Requirements
- Truck prepared for operation, see page 86.

Procedure
- Release the parking brake lever (63).
- Select the travel direction with the travel direction switch (76).
- Select the travel speed if necessary, to do this press the slow travel button (115).
- Raise the fork carriage approx. 200 mm.
- Tilt the mast back.
- Apply the accelerator pedal (70). The travel speed is governed by the accelerator (70).

The truck travels in the direction selected.
Dual pedal (optional equipment)

Requirements
– Truck prepared for operation, see page 86.

Procedure

For trucks with a dual pedal the travel direction is selected via the accelerator pedals (118;116). When the driver leaves the truck, the truck is automatically set to “Neutral”.

• Release the parking brake (63).
• Raise the fork carriage approx. 200 mm.
• Tilt the mast back.
• Apply the accelerator pedal (118) to travel forward. The travel speed is governed by the accelerator (118).
• Apply the accelerator pedal (116) to reverse. The travel speed is governed by the accelerator (116).

The truck travels in the direction selected.

Changing direction during travel

Procedure

• Set the travel direction switch (76) to the opposite direction while travelling.
• For the twin pedal version apply the accelerator pedal in the opposite direction to the travel direction (116 or 118).

The truck decelerates until it starts to travel in the opposite direction.

When the truck changes direction it can start travelling at high speed in the opposite direction unless the accelerator pedal is released in time. Changing direction results in braking deceleration.
4.7 Steering

Requirements
– Truck prepared for operation, see page 86.

Procedure
• To negotiate a right-hand bend:
  • Turn the steering wheel clockwise to match the desired steering radius.
• To negotiate a left-hand bend:
  • Turn the steering wheel anti-clockwise to match the desired steering radius.

The truck travels in the required travel direction.
4.8 **Brakes**

⚠️ **WARNING!**

**Accident risk**
The brake pattern of the truck depends largely on the ground conditions.
- The operator must take into account the travel route conditions when braking.
- Brake with care to prevent the load from slipping.
- Allow for increased braking distance when travelling with an attached load.
- Use the service brake in emergencies.

The truck can brake in three different ways:
- Coasting brake
- Service brake

...and for secure parking:
- Parking brake

### 4.8.1 Coasting Brake

⚠️ **WARNING!**

Immediately after the battery has been charged the brake power of the coasting brake may reduce of their own accord after long periods of application, e.g. ramp operation.
- The operator must instruct people to leave the hazardous area.
- The operator must perform test braking.

⚠️ **WARNING!**

**Danger of accidents due to regenerative braking fault**
Regenerative braking faults can result in extended stopping distances and accidents, particularly when travelling on inclines. Other persons can be injured in the truck's hazardous area.
- Keep all persons out of the hazardous area during travel operations.
- Instruct other people to move out of the hazardous area of the truck. Stop using the truck immediately if people do not vacate the hazardous area.
- The truck must travel carefully and not faster than crawl speed when the "Regenerative braking fault" warning notice appears on the display unit.
- In emergencies, use the service brake via the brake pedal for braking.

**Braking with the coasting brake**

**Procedure**
- Take your foot off the accelerator pedal (70).

*The truck decelerates.*
4.8.2 Service brake

**Braking with the service brake**

*Procedure*

- Depress the brake pedal (117) until you feel the brake pressure.

*The truck decelerates depending on the brake pedal position.*

4.8.3 Parking brake

⚠️ **DANGER!**

**Accident risk**

- The parking brake will hold the truck with maximum load on a clean ground surface, on inclines of up to 15%.
- Do not park and abandon the truck on an incline.
- Applying the parking brake during travel will cause the truck to decelerate. This may cause the load to slide off the fork arms. There is a greater risk of accidents and injury!

**The parking brake has the following function:**

- **Park the truck securely (parking brake lever (63) applied)**
  - Pulling the parking brake lever (63) disables travel, the truck is secured. Pushing the parking brake button (114) and the parking brake lever (63) forward releases the parking brake and enables travel. **This function of the parking brake ensures that the truck is parked securely. The truck will not accelerate when the accelerator pedal is depressed.**
Parking brake

Procedure

- Press the button (114) and push the parking brake lever (63) forward, the parking brake is now released.
- Pull the parking brake lever (63) back, the parking brake is now applied.

The truck is now secure.

The parking brake will hold the truck with maximum load on a clean ground surface, on inclines of up to 15%.
Do not park and exit the truck on inclines.
4.9 Adjusting the forks

⚠️ WARNING!

Unsecured and incorrectly adjusted forks can cause accidents
Before adjusting the forks make sure the retaining bolts (100) are fitted.

► Adjust the forks so that both forks are equidistant from the outside edge of the fork carriage.
► Engage the locking pin in a groove to prevent the forks from moving accidentally.
► The load centre of gravity must be located centrally between the forks.

⚠️ WARNING!

Trapping hazard
There is a trapping hazard when you perform this operation.
► Wear work gloves and safety shoes.

Adjusting the forks

Requirements
– Park the truck securely, see page 88.

Procedure
• Lift up the locking lever (119).
• Push the forks (120) into the correct position on the fork carriage (121).

To lift the load securely, the forks (120) must be spread as far apart as possible and positioned centrally with respect to the fork carriage. The load centre must lie centrally between the forks (120).

• Push the locking lever down (119) and move the forks until the locking pin engages in a slot.

The forks are now adjusted.
4.10 Replacing the forks

⚠️ WARNING!

Unsecured forks can cause injury
You can injure your legs when replacing the forks.
► Never pull the forks towards your body.
► Always push the forks away from your body.
► Secure heavy forks with lifting slings and a crane before pushing them down from the fork carriage.
► After replacing the forks fit the retaining bolts (100) and make sure the bolts are seated correctly. Retaining bolt torque: 85 Nm.

Replacing the forks

Requirements
– Load handler lowered and forks not touching the ground.

Procedure
• Disassemble the retaining bolts (100).
• Loosen the fork stop (99).
• Carefully push the forks off the fork carriage.

The forks are now dismantled from the fork carriage and can be replaced.
4.11 Lifting, transporting and depositing loads

⚠️ WARNING!

Risk of accident when the load centre is outside the load centre distance

If the centre of gravity $G$ of a raised load lies outside the load centre distance $D$ specified for the load handler in the horizontal or vertical planes, under unfavourable conditions the raised load and also the truck can tip over while working.

► Observe load centre distances and capacities of the load handler, see page 33.
► Pick up the load so that its centre of gravity lies between the load arms of the load handler.
► Arrange and pick up the load so that the load centre lies within the load centre distance of the load handler ($d_1 \leq D$ and $d_2 \leq D$, see area DD in the illustration).
► Do not pick up a load with a load centre outside the load centre distance of the load handler ($d_1 > D$ and/or $d_2 > D$), as this load case has not been checked on a truck tested according to the test guideline.

For loads with an even weight distribution, the load centre distance lies in the geometric centre of the volume.

For rectangular loads with an even weight distribution over the entire volume the load centre distance is in the middle, i.e. half the length, half the height and half the width of the load.

⚠️ WARNING!

Risk of accident due to unsecured and incorrectly positioned loads

Before lifting a load, the operator must make sure that it has been correctly palletised and does not exceed the truck's rated capacity.

► Instruct people to move out of the hazardous area of the truck. Stop using the truck immediately if people do not vacate the hazardous area.
► Only transport loads that have been correctly secured and positioned. Use suitable precautions to prevent parts of the load from tipping or falling down.
► Do not transport loads other than on the authorised load handler.
► Damaged loads must not be transported.
► If the stacked load obscures forward visibility, then you must reverse the truck.
► Do not exceed the maximum loads specified on the capacity plate.
► Check the fork spread before lifting the load and adjust if necessary.
► Insert the forks as far as possible underneath the load.
► Tilting the mast forward when the load handler is raised >300 mm beyond the vertical position is permissible only in front of or above the load/rack.
Lifting loads

Requirements
– Load correctly palletised.
– Fork spread for the pallet checked and adjusted if necessary.
– Load weight matches the truck's capacity.
– Forks evenly loaded for heavy loads.

Procedure
• Drive the truck carefully up to the pallet.
• Set the mast vertical.
• Slowly insert the forks into the pallet until the fork shank touches the pallet.
• Raise the load handler.
• Reverse carefully and slowly until the load is outside the storage area. Make sure you have enough clear space to reverse into.
NOTICE

Loads must not be deposited on travel or escape routes, in front of safety mechanisms or operating equipment that must be accessible at all times.

Transporting loads

Requirements
– Load raised correctly.
– Load handler lowered for transport (approx. 150 - 200 mm above the ground).
– Mast tilted back fully.

Procedure
• On slopes and inclines always carry the load facing uphill, never approach at an angle or turn.
• Accelerate and decelerate with care.
• Adapt your travel speed to the conditions of the route and the load you are transporting.
• Watch out for other traffic at crossings and passageways.
• Always travel with a lookout at blind spots.

Depositing a load

Requirements
– Storage location suitable for storing the load.

Procedure
• Set the mast vertical.
• Drive the truck carefully up to the storage location.
• Press the "Lower load handler" button until the forks are clear of the load.

Do not set down the load abruptly in order to avoid damaging the load and the load handler.

• Lowers the load handler.
• Carefully remove the forks from the pallet.

The load is deposited.
4.12 Operating the lift mechanism and integrated attachments

⚠️ WARNING!

Operating the lifting device and integrated attachments can be hazardous
Other people can be injured in the truck's hazardous area. The hazardous area is defined as the area in which people are at risk from the truck movement, the load handler, attachments etc. This also includes areas which can be reached by falling loads or lowering operating equipment. Apart from the operator (in the normal operating position) there should be no other people in the truck's hazardous area.
▶ Instruct other people to move out of the hazardous area of the truck. Stop working with the truck if people do not leave the hazardous area.
▶ If people do not leave the hazardous area despite the warning, prevent the truck from being used by unauthorised people.
▶ Only carry loads that have been correctly secured and positioned. Use suitable precautions to prevent parts of the load from tipping or falling down.
▶ Do not exceed the maximum loads specified on the capacity plate.
▶ Do not stand underneath a raised load handler.
▶ Do not stand on the load handler.
▶ Do not lift other people on the load handler.
▶ Do not reach through the mast.
▶ The controls should only be operated from the driver's seat, and never suddenly.
▶ The operator must be trained to handle the lift mechanism and the attachments.

⚠️ WARNING!

An offset load centre can result in accidents
The capacity of the truck is reduced when using side shifts that are more than 100 mm outside the truck centre.
▶ Observe the capacity plate with the reduced capacity.
4.12.1 Operating the lift mechanism with the SOLO PILOT

**Lifting and lowering**

*Requirements*
- To prepare the truck for operation, see page 86

*Procedure*
- Pull the Solo-Pilot lever (122) in direction H to raise the load.
- Push the Solo-Pilot lever (122) in direction S to lower the load.

*The load is now raised / lowered.*

 niños Cuando la posición límite de la operación ha sido alcanzada (se escuchará un ruido de la válvula de alivio de presión) suelte el palanca. La palanca volverá automáticamente a la neutral.

**Tilting the mast forward / backward**

*Requirements*
- To prepare the truck for operation, see page 86

*Procedure*
- Pull the Solo-Pilot lever (123) in direction R to tilt the mast back.
- Push the Solo-Pilot lever (123) in direction V to tilt the mast forward.

*The mast is now tilted back / forward.*

 niños Cuando la posición límite de la operación ha sido alcanzada (se escuchará un ruido de la válvula de alivio de presión) suelte el palanca. La palanca volverá automáticamente a la neutral.
**Positioning the integrated sideshifter (option)**

**Requirements**
- Truck prepared for operation, see page 86.

**Procedure**
- Pull the Solo-Pilot lever (124) in direction R to move the load handler to the right (from the operator’s viewpoint).
- Pull the Solo-Pilot lever (124) in direction V to move the load handler to the left (from the operator’s viewpoint).

*The sideshifter is now positioned.*

When the limit position for the operation has been reached (there will be a noise from the pressure relief valve) release the lever. The lever will revert automatically to neutral.

**Positioning the forks with an integrated fork positioner (option)**

**CAUTION!**
Do not use the fork positioner to clamp loads.

**Requirements**
- Truck prepared for operation, see page 86.

**Procedure**
- Press the toggle switch (125) and at the same time pull the SOLO-PILOT (122) in direction Z: the forks will move towards each other.
- Press the toggle switch (125) and at the same time push the SOLO-PILOT (122) in direction A: the forks will spread apart.

*The forks are now positioned.*

**Synchronising the alignment of the fork tines with an integrated fork positioner (optional equipment)**

**Requirements**
- Truck prepared for operation, see page 86.
- The fork tines are no longer aligned.

**Procedure**
- Press the toggle switch (125) and at the same time push the SOLO-PILOT (122) in direction A and spread the fork tines apart as far as they will go.
- Press the toggle switch (125) and at the same time pull the SOLO-PILOT (122) in direction Z and bring the fork tines as close to each other as they will go.
The fork tines are now synchronised.

When the limit position for the operation has been reached (there will be a noise from the pressure relief valve) release the lever. The lever will revert automatically to neutral.
4.12.2 Operating the lift mechanism with the Multi Pilot

**Lifting and lowering**

*Requirements*
- To prepare the truck for operation, see page 86

*Procedure*
- Pull the Multi-Pilot (126) in direction H to raise the load.
- Push the Multi Pilot (126) in direction S to lower the load.

*The load is now raised / lowered.*

When the limit position for the operation has been reached (there will be a noise from the pressure relief valve) release the lever. The lever will revert automatically to neutral.

**Tilting the mast forward / backward**

*Requirements*
- Truck prepared for operation, see page 86.

*Procedure*
- Push the Multi-Pilot lever (126) in direction V to tilt the mast forward.
- Push the Multi-Pilot lever (126) in direction R to tilt the mast back.

*The mast is now tilted back / forward.*

When the limit position for the operation has been reached (there will be a noise from the pressure relief valve) release the lever. The lever will revert automatically to neutral.
**Twin operation**

*Requirements*
- To prepare the truck for operation, see page 86

*Procedure*
- To lower the load handler and tilt the mast forward at the same time, push the Multi Pilot forward and to the right.
- To lift the load handler and tilt the mast back at the same time, push the Multi Pilot back and to the left.
- To lower the load handler and tilt the mast back at the same time, push the Multi Pilot forward and to the left.

*The mast is now tilted back / forward.*

**Positioning the integrated sideshifter (option)**

*Requirements*
- Truck prepared for operation, see page 86.

*Procedure*
- Press the (128) button to move the load handler to the right (from the driver's viewpoint).
- Press the (127) button to move the load handler to the left (from the driver's viewpoint).

*The sideshifter is now positioned.*

> When the limit position for the operation has been reached (there will be a noise from the pressure relief valve) release the lever. The lever will revert automatically to neutral.
Positioning the forks with an integrated fork positioner (option)

⚠️ CAUTION!

Do not use the fork positioner to clamp loads.

Requirements
– Truck prepared for operation, see page 86.

Procedure
• Press the (129) button and at the same time turn the MULTI-PILOT (126) anti-clockwise, the forks will spread apart.
• Press the (129) button and at the same time turn the MULTI-PILOT (126) anti-clockwise, the forks will move together.

The forks are now positioned.

Synchronising the alignment of the fork tines with an integrated fork positioner (optional equipment)

Requirements
– Truck prepared for operation, see page 86.
– The fork tines are no longer aligned.

Procedure
• Press the (129) button and at the same time turn the MULTI-PILOT (126) anti-clockwise, the forks will spread apart.
• Press the (129) button and at the same time turn the MULTI-PILOT (126) anti-clockwise, the forks will move together.

The fork tines are now synchronised.

When the limit position for the operation has been reached (there will be a noise from the pressure relief valve) release the lever. The lever will revert automatically to neutral.
4.13 Safety instructions for operating additional attachments

**DANGER!**

Attaching exchangeable equipment can result in accidents.

Other people can be injured when attaching exchangeable equipment. Use only exchangeable equipment that has been deemed safe after a risk analysis carried out by the owner.

- Only use attachments that have been designed by the attachment manufacturer for use with the respective industrial truck.
- Only use attachments that are suitable for the operating pressure and oil flow available at the hydraulic port, see page 20.
- Only use attachments that have been fitted for the purpose by the owner.
- Make sure the operator has been instructed in the use of the attachment and that he uses it for its correct purpose.
- Re-assess the residual capacity of the truck and, if it has been altered, attach an additional capacity plate to the truck.
- Note the attachment manufacturer’s operating instructions.
- Use only attachments that do not restrict visibility in the travel direction.

**WARNING!**

Risk of accident due to overload and failure of the attachment or the load falling or becoming damaged.

When using attachments that are not suitable for the operating pressure and oil flow available, overload may give rise to damage and failure of the attachment, as well as the load falling or becoming damaged.

- Only use attachments that are suitable for the operating pressure and oil flow available at the hydraulic port, see page 20.

**CAUTION!**

Risk of slipping and environmental damage due to leaked hydraulic oil

When using attachments that are not suitable for the operating pressure and oil flow available, overload may give rise to leaks or broken lines with the potential for hydraulic oil leaks.

Risk of slipping due to leaked hydraulic oil. The risk is greater when combined with water.

- Only use attachments that are suitable for the operating pressure and oil flow available at the hydraulic port, see page 20.

 Optionally, trucks can be fitted with one or more auxiliary hydraulic functions to operate attachments. The auxiliary hydraulics are indicated with ZH1, ZH2 and ZH3. Auxiliary hydraulic functions for exchangeable equipment are fitted with replacement couplings on the fork carriage. To fit exchangeable equipment see page 116.

 If visibility in the travel direction is impaired, the operating company must determine and apply suitable measures to ensure the safe operation of the truck. A lookout may have to be used or certain hazardous areas may have to be cordoned off. The truck can also be equipped with optional visual aids such as a camera system or mirrors. Travelling with visual aids requires plenty of practice at slow speed.
Safety instructions for sideshifter and fork positioner attachments

⚠️ WARNING!

Restricted visibility and reduced tilt resistance can cause accidents
When using sideshifters and fork positioners, the change in centre of gravity can result in reduced lateral tilt resistance and accidents. Note that this affects visibility as well.
► Adapt the travel speeds to the visibility and load.
► Make sure you have sufficient visibility when reversing.

Safety instructions for clamping attachments (e.g. baling clamps, barrel clamps, grabs etc.)

⚠️ WARNING!

Falling loads can cause accidents
This can result in malfunctions and the load can fall accidentally.
► Clamping attachments may only be added to trucks which have a button to enable additional hydraulic functions.
► Clamping attachments must only be operated on trucks with auxiliary hydraulics ZH1, ZH2 or ZH3.
► When connecting the attachment make sure that the hydraulic lines of the attachment are connected to the right ports, see page 116.

Safety instructions for rotary attachments

⚠️ WARNING!

A non-centred load centre of gravity can result in accidents
When using rotary devices and non-centred loads, the centre of gravity can be displaced from the centre with a high risk of accidents.
► Adapt the travel speed to the load.
► Lift the load from the centre.

⚠️ WARNING!

An offset load centre can result in accidents
The capacity of the truck is reduced when using side shifts that are more than 100 mm outside the truck centre.
► Observe the capacity plate with the reduced capacity.
Safety instructions for clamping attachments (e.g. baling clamps, barrel clamps, grabs, etc.)

⚠️ WARNING!

Risk of accidents due to falling loads
Operating errors can occur and the load can fall accidentally.
- Clamping attachments must only be used on trucks that feature a button for enabling additional hydraulic functions.
- Clamping attachments must only be operated on trucks with auxiliary hydraulics ZH1, ZH2 or ZH3 or ZH3.
- When connecting the attachment, make sure that the hydraulic lines of the attachment are connected to the correct ports – see page 116.
- Do not use clamping attachments for clamping purposes or in clamping operation while fork extensions are in use.

The highest auxiliary hydraulics after ZH2 must be released by the acknowledgement button.

Safety instructions for rotary attachments

⚠️ WARNING!

A non-centred load centre of gravity can result in accidents
When using rotary devices and non-centred loads, the centre of gravity can be displaced from the centre with a high risk of accidents.
- Adapt the travel speed to the load.
- Lift the load from the centre.

⚠️ WARNING!

Risk of accidents due to falling loads
As the rotation of the rotary device increases, the load acting on the forks changes from a vertical to a lateral force, until the load is only acting on one fork arm. If you overload the forks or use unsuitable forks, this can result in damage and the load may fall down accidentally.
- Do not use fork extensions to lengthen the forks on rotary devices.
- Only use forks that are approved for use with the relevant rotary device.
- Damaged forks must be marked accordingly and taken out of service.
Safety instructions for telescopic attachments

⚠️ WARNING!

Accident risk from increased tipover hazard and reduced residual capacity
There is a greater risk of tipover with extended telescopic attachments.
➤ Do not exceed the maximum loads specified on the capacity plate.
➤ Only use the telescopic function for stacking and retrieving.
➤ Retract the telescopic attachment fully during transport.
➤ Adapt the travel speed to changed load centre of gravity.

Safety instructions for attachments when transporting suspended loads

⚠️ WARNING!

Swinging loads and a reduced residual capacity can result in accidents.
Transporting hanging loads can reduce the stability of the truck.
➤ Adapt the travel speed to the load, less than walking pace.
➤ Secure swinging loads for example with lifting slings.
➤ Reduce the residual capacity and have it certified by an expert.
➤ If the truck is to be operated with hanging loads, proof of sufficient safety distance under local operating conditions must be obtained from a specialist assessor.

Safety instructions for using loading buckets as attachments

⚠️ WARNING!

Increased mast loading can cause accidents.
➤ When carrying out the daily checks and operations before starting, see page 71, check in particular check the fork carriage, mast rails and mast rollers for damage.
Safety instructions for fork extensions

⚠️ WARNING!

Unsecured and oversized fork extensions can cause accidents.

- Only use fork extensions that are suitable and have been approved for the base forks of the truck. Observe the data on the data plates of the fork extensions and truck.
- The basic fork length must be at least 60% of the length of the fork extension.
- Push out the fork extensions fully and lock onto the basic fork arms.
- Lay the load as close to the fork shanks as possible. The distance between the overall centre of gravity of the load and the fork shank must not exceed 50% of the length of the fork extension.
- When carrying out checks and operations before daily starting, see page 71, check the fork extension lock.
- Mark any fork extensions with an incomplete or faulty lock and take them out of service.
- Do not use trucks with an incomplete or faulty fork extension lock. Replace the fork extension.
- Only restore the fork extension to service when the fault has been rectified.
- Use only fork extensions which are free of dirt and foreign bodies near the entry opening point. Clean the fork extensions as required.

The weight of the fork extensions reduces the residual capacity of the truck. When determining the residual capacity, the increased load distance must be taken into account, see the data plate and capacity plate of the fork extension.

⚠️ WARNING!

Risk of accidents due to falling loads
In the case of an incorrect load or uneven load distribution, the fork extensions may be damaged and the load can fall down accidentally.

- Do not use clamping attachments for clamping purposes or in clamping operation while fork extensions are in use.
- Do not use fork extensions to lengthen the forks on rotary devices.
- Damaged fork extensions must be marked accordingly and taken out of service.

⚠️ WARNING!

Risk of accidents due to falling loads
In the case of an incorrect load or uneven load distribution, the fork extensions may be damaged and the load can fall down accidentally.

- Do not use clamping attachments for clamping purposes or in clamping operation while fork extensions are in use.
- Do not use fork extensions to lengthen the forks on rotary devices.
- Damaged fork extensions must be marked accordingly and taken out of service.
4.14 Operating additional attachments for the SOLO-PILOT

⚠️ WARNING!

Incorrect symbols can cause accidents
Symbols on controls that do not depict the function of the attachments can cause accidents.

▶ Mark the controls with symbols that indicate their function.
▶ Specify the attachments’ direction of movement in accordance with ISO 3691-1 so that they match the controls’ direction of movement.

4.14.1 Solo Pilot with control of ZH1 hydraulic port

➡ Depending on the attachments used the lever (124) is assigned the function of the attachment. Levers that are not required are void. For connections see page 116.

Procedure
• Operating the hydraulic port ZH1:
  Move the lever (124) in direction V or R.

*The attachment’s function is performed.*
4.14.2 Solo Pilot with control of ZH1 and ZH2 hydraulic ports

Depending on the attachments used the lever / button (122, 124, 125) is assigned the function of the attachment. Unused levers have no function. For connections see page 116.

Procedure

• Operating the hydraulic port ZH1:
  Move the lever (124) in direction V or R.

• Operating the hydraulic port ZH2:
  Press the toggle switch (125) and at the same time move the lever (122) in the V or R direction.

The attachment’s function is performed.
4.15 Operating additional attachments for the Multi Pilot

WARNING!
Incorrect symbols can cause accidents
Symbols on controls that do not depict the function of the attachments can cause accidents.
▶ Mark the controls with symbols that indicate their function.
▶ Specify the attachments’ direction of movement in accordance with ISO 3691-1 so that they match the controls’ direction of movement.

4.15.1 Multi Pilot with control of ZH1 hydraulic port

Depending on the attachments used the (128, 127) buttons are assigned the function of the attachment. Unused buttons have no function. For connections see page 116.

Procedure
• Operating hydraulic port ZH1:
  Press the (128) button or the (127) button.

The attachment performs its operation.

4.15.2 Multi Pilot with control of ZH1 and ZH2 hydraulic ports

Depending on the attachments used the buttons (128, 127) and the lever (126) are assigned the function of the attachment. Levers that are not required are void. For connections see page 116.

Procedure
• Operating hydraulic port ZH1:
  Press the (128) button or the (127) button.
• Operating hydraulic port ZH2:
  Set the MULTI-PILOT (126) to neutral and then turn it clockwise or anti-clockwise while at the same time pressing the button (129).

The attachment performs its operation.
4.16 Fitting additional attachments

⚠️ WARNING!

Incorrectly connected attachments can cause accidents.
Attachments with incorrectly connected hydraulic attachments can result in accidents.
▸ Attachments must only be assembled and commissioned by trained, specialist personnel.
▸ Observe the manufacturer’s operating instructions.
▸ Before starting, check the fasteners are positioned correctly and securely and make sure they are complete.
▸ Before starting, make sure the attachment is working correctly.

⚠️ WARNING!

Hydraulic ports for clamping attachments
▸ Clamping attachments may only be added to trucks which have a button to enable additional hydraulic functions.
▸ On trucks with auxiliary hydraulics ZH2 the clamping function should only be attached to the coupling pair marked ZH2.
▸ On trucks with auxiliary hydraulics ZH3 the clamping function should only be attached to the coupling pair marked ZH3.
**WARNING!**

**Unsecured hydraulic functions can cause accidents**

Failure to secure hydraulic functions for releasing functions on attachments that hold loads using force (e.g. paper clamps, load holder) can result in accidents.

- Hydraulic functions for releasing functions that hold loads using force must be secured such that they can be used only after actuation of the acknowledgement button.
- Before starting, make sure the pilot is set up correctly.

---

**WARNING!**

**Incorrectly labelled hydraulic functions can cause accidents**

Labels on the pilot that do not match the directions of movement and hydraulic functions on the attachment can result in accidents.

- Before starting, make sure the pilot is correctly labelled and adjust if necessary.

**Connecting attachments hydraulically**

**Requirements**

- Non-pressurised hydraulic hoses.
- The exchange ports on the truck are marked ZH1, ZH2 and ZH3.
- Attachment directions of movement defined to match the controls’ direction of movement.

**Procedure**

- Non-pressurised hydraulic hoses
  - Switch off the truck and wait a few minutes.
  - Attach the plug connector and engage it in position.
  - Mark the controls with symbols that indicate their function.

*The attachment is now hydraulically connected.*

Spilled hydraulic oil must be set using a suitable agent and disposed of in accordance with environmental regulations. If hydraulic oil comes into contact with the skin, wash it off immediately with soap and water. If it comes into contact with the eyes rinse them immediately with flowing water and call for a doctor.
The manufacturer's customer service department can correctly connect the attachment, adjust the controls and actuation directions on the pilot to the connections and directions of movement of the attachment, and label the pilot accordingly.
5 Towing trailers

⚠️ DANGER!

Inappropriate speeds and excessive trailer loads can be dangerous
If you do not adapt your speed and / or use an excessive trailer load, the truck can pull apart when cornering and braking.

► The truck should only be used occasionally to tow trailers.
► The overall weight of the trailer should not exceed the capacity indicated on the capacity plate, see page 30. If a load is also transported on the load handler, the trailer load must be reduced by the same amount.
► Do not exceed the maximum speed of 5 km/h.
► A special trailer coupling must be used for frequent trailer operation.
► Do not use supporting loads.
► Towing must only be performed on level, secure travel routes.
► The owner must test trailer operation with the permissible trailer load by means of a trial run under the applicable operating conditions on site.
► Special approvals on request.
Attaching the trailer

⚠️ CAUTION!

Trapping hazard
There is a trapping risk when you attach a trailer.

- Follow the instructions of the coupling manufacturer if using special trailer couplings.
- Secure the trailer to prevent it from rolling away before coupling it.
- Do not get caught between the truck and the tiller when coupling the trailer.
- The tiller must be horizontal, tilted down by no more than 10° and never facing up.

Attaching the trailer

Requirements
- Truck and trailer are on a level surface.
- Trailer prevented from rolling away.

Procedure
- Push the tow pin (130) down and turn it 90°.
- Pull the tow pin up and insert the tiller of the trailer into the opening.
  ❯ Reverse the truck for coupling until the tow pin of the coupling and the hole in the tiller are flush.
- Insert the tow pin, push it down, turn it 90 degrees and engage it.

The trailer is now attached to the truck.
6 Optional Equipment

6.1 Assistance systems
The Access, Drive and Lift Control systems help the driver operate the truck with regard to safety regulations, see page 83 of the present operating instructions.

Travel conduct
The operator must adapt the travel speed to local conditions. The truck must be driven at slow speed when negotiating bends or narrow passageways, when passing through swing doors and at blind spots. The operator must always observe an adequate braking distance between the forklift truck and the vehicle in front and must be in control of the truck at all times. Abrupt stopping (except in emergencies), rapid U turns and overtaking at dangerous or blind spots are not permitted. Do not lean out or reach beyond the working and operating area.

6.1.1 Access Control
The truck is only released for operation if:

– The operator is seated.
– He is wearing the seat belt.

⇒ If the driver vacates the seat for a short while, the truck can be operated again when he returns (seat occupied) and puts the seat belt back on again.

⇒ If travel is not enabled, an information message is issued. Items 1 to 3 must be carried out again.
6.1.2 Drive Control

This option restricts the travel speed of the truck as a function of the lift height. From a factory-set lift height the maximum travel speed is reduced to walking pace (approx. 3 km/h) and the slow travel indicator is activated. When the forks fall below this height, the truck accelerates at reduced levels to the speed prescribed by the accelerator pedal to prevent sudden acceleration when changing from slow travel to normal travel. Normal acceleration is only activated again when the speed prescribed by the accelerator pedal has been reached.

In addition to the daily checks before starting, see page 71 the driver must carry out the following checks:

- Lift the empty load handler beyond the reference lift height and check if the slow travel indicator lights up.

6.1.3 Lift Control

This option includes Drive Control and also monitors and controls the mast functions:

Tilt speed reduction as a function of the lift height (from approx. 1.5 m lift height).
- When the load handler is lowered below the limit height, the tilt speed increases again.

Optional:
- Tilt angle display, see page 127.

In addition to the daily checks before starting, the driver must carry out the following checks:

Procedure
- Lift the empty load handler beyond the reference lift height and check if the slow travel display lights up and the tilt speed is clearly reduced.
- Steering when the truck is stationary: check if the steering wheel display is working.
- Check the tilt angle display by tilting forward and back.
6.2 BODYGUARD

⚠️ CAUTION!

Open doors can result in accidents
▶ Do not travel with an open door. When opening the door make sure there is nobody in the door’s swing range.
▶ Always close the door tightly and make sure it is locked.

Procedure
• Pull the handle (131) towards the operator position, the door swings open.
• Pull the door (132) towards the operator; the door closes.

⚠️ CAUTION!

Risk of injury if the seat belt is not fastened
The following must be observed for trucks with approved restraint systems:
▶ The seat belt also protects against injuries as a result of a rear-end collision.
▶ In the case of trucks with multiple restraint systems, the use of the seat belt is not always mandatory. However, the manufacturer recommends the additional use of the seat belt, since the seat belt also prevents injuries caused by a rear-end collision for example.

Trucks with Bodyguard monitoring may experience the following situations if the Bodyguard is not locked:
– The warning indicator for cab door monitoring (see page 61) lights up.
– After max. 30 seconds, an acoustic signal sounds.
– Travel cut-off is activated (o).

6.3 Panel door

⚠️ CAUTION!

Open doors can result in accidents
▶ Do not travel with an open door. When opening the door, make sure there is nobody in the door's swing range.
▶ Always close the door tightly and make sure it is locked.
▶ After closing the summer door, fasten the seat belt, see page 81.


**CAUTION!**

**Risk of injury if the seat belt is not fastened**
The following must be observed for trucks with approved restraint systems:

- The seat belt also protects against injuries as a result of a rear-end collision.
- In the case of trucks with multiple restraint systems, the use of the seat belt is not always mandatory. However, the manufacturer recommends the additional use of the seat belt, since the seat belt also prevents injuries caused by a rear-end collision for example.

In the case of trucks with multiple restraint systems, the use of the seat belt is not always mandatory. However, the manufacturer strongly recommends the additional use of the seat belt, since the seat belt also prevents injuries caused by a rear-end collision for example.

Trucks with summer door monitoring may experience the following situations if the summer door is not locked:

- The warning indicator for cab door monitoring (see page 61) lights up.
- After max. 30 seconds, an acoustic signal sounds.
- Travel cut-off is activated (o).

**Procedure**

- Pull the handle (131) towards the operator position, the door swings open.
- Pull the door (132) towards the operator; the door closes.

---

**6.4 Removable load backrest**

**CAUTION!**

**Trapping hazard and heavy load backrest weight**

- Wear safety gloves and safety shoes when carrying out this operation.
- Two people are required to remove and attach the load backrest.
**Load backrest disassembly**

*Procedure*
- Loosen the screws (133).
- Remove the load backrest from the fork carriage and put it down securely.
- Fit the fork retaining screws.

**Load backrest assembly**

*Procedure*
- Attach the load backrest to the top rail of the fork carriage.
- Fit the bolts and tighten them with a torque wrench.

![Image of load backrest](image)

Tightening torque = 85 Nm
6.5 Lift cutout override

A lift cutout device can be factory fitted when working in areas of restricted height. This interrupts lifting.

To continue lifting:

Procedure
• Press the lift cutout override button (see page 68).
• Pull the control lever (122).

Lift cutout is deactivated until the button is pressed again or the fork carriage is lowered below the height limit setting.

6.6 Fire extinguisher

Procedure
• Open the fasteners (134).
• Pull the fire extinguisher out of its bracket.

To operate, refer to the illustrations on the fire extinguisher.
6.7 Tilt angle display

**NOTICE**
The current tilt angle is shown in an additional display that is attached on the right of the dashboard.

- The green LED (135) indicates the vertical position to the ground.

6.8 Rockinger coupling with hand lever or remote control

Refer to the instructions for towing trailers, see page 119.

**CAUTION!**
Incorrectly coupled trailers can cause accidents
- Make sure the coupling is engaged securely before starting the truck.
- The contro pin (138) must be flush with the control sleeve (139).

**Rockinger coupling operation (attaching trailers)**

**Procedure**
- Prevent the trailer from rolling away.
- Adjusting the trailer pull rod to the height of the coupling.
- Pull the hand lever (137) / remote control (136) (○) up.

The remote control (136) (○) is located in the overhead guard, depending on the truck model.
- Slowly reverse the truck until the coupling engages.
- Push the hand lever (137) / remote control (136) (○) down.

**Rockinger coupling operation (disconnecting trailers)**

**Procedure**
- Prevent the trailer from rolling away.
- Pull the hand lever (137) / remote control (136) (○) up.
- Drive the truck forward.
- Push the hand lever (137) / remote control (136) (○) down.
6.9 Camera system

⚠️ CAUTION!

Accident risk from hidden work areas
► The camera system acts as an aid to assist safe operation.
► Practice travelling and working with the camera system.
► Align the camera so that the hidden work area can be seen.

When using the camera to reverse, the monitor automatically switches on when you engage reverse gear.

Using the camera system
– Press the button (144) on the monitor to switch the camera system on or off.
– Press the button (143) to lighten or darken the screen (day / night settings).
– Press the button (140) to open the menu.

Pressing the button several times changes the menu item (contrast, brightness, colour saturation, language, video, light reflection) or quits the menu.

Adjusting the menu items
– Press the button (142) to go one step forward.
– Press the button (141) to go one step back.

Clean a dirty screen or vent slots with a soft cloth or brush.
6.10 Control layout “N”

⚠️ **WARNING!**

Persons standing under or on a raised load handler are at risk of accidents
Do not allow anyone to stand under or on a raised load handler.
► Do not stand on the load handler.
► Do not lift any persons on the load handler.
► Instruct other people to move out of the hazardous area of the truck.
► Do not stand underneath a raised and unsecured load handler.

➡️ With control layout “N”, the lift and tilt functions are swapped compared with the standard operation. The Pilot must only be operated from the driver’s seat. The operator must be trained to handle the lift mechanism and the attachments.

**NOTICE**
► The lift/lower and tilt speeds are determined by the inclination of the Multipilot. Do not deposit the load handler suddenly to avoid damaging the load and the racking.

**Lifting**

*Procedure*
• Push the Multipilot to the right (direction H) to raise the load.
• Push the Multipilot to the left (direction S) to lower the load.

**Tilting**

⚠️ **CAUTION!**

**Trapping hazard from inclined mast**
► When tilting the mast back, keep all parts of your body from between the mast and the front wall.

*Procedure*
• Push the Multipilot forward (direction V) to tilt the load forward.
• Pull the Multipilot back (direction R) to tilt the load back.

➡️ When the limit position for the operation has been reached (there will be a noise from the pressure relief valve) release the lever. The lever will revert automatically to neutral.
6.11 Floor-Spot

⚠️ CAUTION!

Risk of accident due to dazzling
Looking directly into the light beam of the Floor-Spot can dazzle and temporarily impair eyesight.
▶ Do not look directly into the light beam of the Floor-Spot.
▶ Do not adjust the position and alignment of the Floor-Spot on the truck.

The Floor-Spot serves as an auxiliary device and, with the travel direction selected, projects a coloured dot on the floor at a distance of 4-4.5 m. When the truck travels forward, the coloured dot is in front of the truck. When reversing, it is behind the truck.
6.11.1 Additional information on Floor-Spot blue

➤ Only for Floor-Spot blue (51466740/51631731)

The activated Floor-Spot gives persons advance warning of the travel path of the forklift truck by projecting a blue dot onto the ground at a set distance.

⚠️ CAUTION!

Risk of retinal damage due to blue light

The Floor-Spot on the truck is classified in risk group 2 according to the standard IEC 62471: medium risk. In the range of 400 nm to 780 nm, blue light can potentially damage the retina of the human eye.

▸ Check that the warning notice: "Caution! Potentially dangerous optical radiation" is present and legible, and replace if necessary.

▸ Do not look directly into the light beam of the Floor-Spot.

▸ When performing maintenance and repairs, take the Floor-Spot out of service, e.g. by disconnecting the battery, and secure it against unintentional recommissioning.

The warning notice "Caution! Potentially dangerous optical radiation" is attached to the side of the chassis or to the overhead guard. Small warning notices are attached to the side of the Floor-Spot.
7 Troubleshooting

7.1 Troubleshooting

This chapter enables the operator to localize and rectify basic faults or the results of incorrect operation himself. When trying to locate a fault, proceed in the order shown in the remedy table.

If, after carrying out the following remedial action, the truck cannot be restored to operation or if a fault in the electronics system is displayed with a corresponding error code, contact the manufacturer’s service department. Troubleshooting must only be performed by the manufacturer’s customer service department. The manufacturer has a service department specially trained for these tasks.

In order for customer services to react quickly and specifically to the fault, the following information is essential:
- Truck serial number
- Event message from the display unit (if applicable)
- Error description
- Current location of truck.

Info messages

<table>
<thead>
<tr>
<th>Display</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Info 03</td>
<td>Traction or lift controller temperature above 83°C</td>
</tr>
</tbody>
</table>
| Info 35 | Accelerator pedal zero position  
Message can be set via parameters: either the zero position is only checked after power up or after every change of seat switch status from open to closed. |
| Info 36 | Hydraulics zero position  
Message can be set via parameters: message displayed or not. |
| Info 40 | Overtemperature  
Traction or lift motor above 145°C. |
| Info 90 | Travel against parking brake  
Accelerator pressed while parking brake applied.  
Seat switch not occupied and parking brake not applied. |
| Info 96 | Hydraulics zero position on truck power up  
A hydraulic function applied during power up.  
The hydraulic function applied will not be performed. |
<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck does not start</td>
<td>– Battery connector not plugged in.</td>
<td>– Check battery connector and plug in if necessary.</td>
</tr>
<tr>
<td></td>
<td>– Emergency Disconnect switch pressed.</td>
<td>– Unlock the Emergency Disconnect</td>
</tr>
<tr>
<td></td>
<td>– Key switch set to O.</td>
<td>– Set the key switch to “I”.</td>
</tr>
<tr>
<td></td>
<td>– Battery charge too low.</td>
<td>– Check battery charge, charge battery if necessary.</td>
</tr>
<tr>
<td></td>
<td>– Faulty fuse.</td>
<td>– Check the fuses.</td>
</tr>
<tr>
<td>Load cannot be lifted</td>
<td>– Truck not operational.</td>
<td>– Carry out all measures listed under “Truck does not start”.</td>
</tr>
<tr>
<td></td>
<td>– Hydraulic oil level too low.</td>
<td>– Check hydraulic oil level.</td>
</tr>
<tr>
<td></td>
<td>– Battery discharge monitor has switched off.</td>
<td>– Charge the battery</td>
</tr>
<tr>
<td></td>
<td>– Faulty fuse.</td>
<td>– Check the fuses (○).</td>
</tr>
<tr>
<td></td>
<td>– Load is too heavy.</td>
<td>– Note the maximum capacity, see page 33.</td>
</tr>
<tr>
<td>Fault displays</td>
<td>– Truck not operational.</td>
<td>– Press the EMERGENCY DISCONNECT isolator or turn key switch to 0, after approx. 3 seconds try to perform the desired operation again</td>
</tr>
</tbody>
</table>
7.2 Operating the truck without its own drive system

7.2.1 Towing the truck

⚠️ WARNING!

Accident risk
Other people can be injured if the truck is towed incorrectly.

- Only use vehicles to tow the truck which have sufficient tow and brake forces for the trailer load without its own braking system.
- Always use a pull rod to tow.
- Always tow the truck at walking pace.
- Do not park the truck with the parking brake released.
- One person must be seated in the recovery truck to steer it and one person must be seated on the towed truck.

---

**Towing the truck**

**Requirements**
- Park the truck securely.
- Disconnect the battery.

**Procedure**
- Connect the pull rod to the trailer coupling (52) of the towing truck and attach it to the truck to be towed.
- Release the parking brake, see page 94.
- Tow the truck to its destination.
- Apply the parking brake, see page 94.
- Undo the tow connection.

*The truck has now reached its destination and is secure.*
7.3 Emergency lowering

The load handler can be lowered manually if a fault occurs in the hydraulic controller.

⚠️ WARNING!

Lowering the mast can result in injuries
▶ Instruct other people to move out of the hazardous area of the truck during emergency lowering.
▶ Never stand underneath a raised load handler.
▶ Only operate the emergency lowering valve when standing next to the truck.
▶ Emergency lowering of the mast cannot be applied when the load handler is in the rack.
▶ Report any defects immediately to your supervisor.
▶ Tag out and decommission a faulty lift truck.
▶ Only return the truck to service when you have identified and rectified the fault.

Emergency mast lowering - Solo Pilot

Requirements
– Load handler is not in the rack.
– Turn the Emergency Disconnect switch and key switch off.
– Disconnect the battery.
– Remove the panel, press the lever (56) to unlock the cover (55) and move the cover forward.

Procedure
• Slowly turn the emergency lowering valve (145); the mast and load handler will lower.
• Turn the emergency lowering valve (145) in the opposite direction as far as the stop; the lowering process stops.

The mast is now lowered.
**Emergency mast lowering - Multi Pilot**

**Requirements**
- Load handler is not in the rack.
- Turn the Emergency Disconnect switch and key switch off.
- Disconnect the battery.
- Remove the panel, push the steering column forward and pull the cover (57) forward until it engages.

**Procedure**
- Slowly turn the emergency lowering valve (145); the mast and load handler will lower.
- Turn the emergency lowering valve (145) in the opposite direction as far as the stop; the lowering process stops.

The mast is now lowered.

⚠️ **WARNING!**

Only return the truck to service when you have identified and rectified the fault.
1 Spare Parts

To ensure safe and reliable operation, use only the manufacturer's original spare parts.

The manufacturer’s original spare parts are consistent with the manufacturer’s specifications and guarantee the highest possible quality of safety, size accuracy and material.

The installation or use of non-original spare parts can negatively affect the specified properties of the product and impair safety. The manufacturer cannot be held liable for damage caused by the use of non-original spare parts.

The product-related electronic spare parts catalogue can be found at (www.jungheinrich.de/spare-parts-search) by entering the serial number.

The serial number can be found on the data plate, see page 32.
2 Operational Safety and Environmental Protection

The inspections and maintenance tasks listed in chapter "Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement" must be performed according to the defined service intervals (see page 173).

The manufacturer recommends the replacement of the maintenance parts also listed in chapter "Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement" according to the specified replacement intervals (see page 173).

⚠️ WARNING!

Risk of accidents and component damage
Any modification to the truck, in particular the safety mechanisms, is prohibited.

Exception: Operating companies should only make changes or have changes made to powered industrial trucks if the manufacturer is no longer operating in the field and there is no successor to the business; operating companies must however:
- Ensure that the changes to be made are planned, tested and performed by a specialist engineer in industrial trucks taking safety into account.
- Keep permanent records of the construction, tests and completion of changes
- Carry out and have authorised the respective changes to the capacity data plates, decals and stickers as well as the operating instructions and workshop manuals
- Attach a permanent and clearly visible marking to the truck indicating the types of changes made, the date of the changes and the name and address of the organisation responsible for the work.

NOTICE

Only original spare parts are subject to the manufacturer's quality control. To ensure safe and reliable operation, use only the manufacturer's spare parts.

On completion of inspection and service work, carry out the operations listed in the “Recommissioning the truck after cleaning or maintenance work” section (see page 166).
3 Maintenance Safety Regulations

Maintenance and repair personnel

The manufacturer has a customer service department specially trained for these tasks. A maintenance contract with the manufacturer will support trouble-free operation.

Truck maintenance, repair work and changing of parts requiring replacement must only be carried out by specialist personnel. The activities to be carried out are divided into the following target groups.

Customer Services

Customer Services are specially trained in the use of the truck and are able to carry out maintenance and repairs independently. Customer Services are aware of the relevant standards, guidelines and safety regulations as well as potential risks.

Operating company

The maintenance personal of the operating company has the technical expertise and experience to perform the activities in the maintenance check list for the operating company. The maintenance and repair work to be performed by the operating company are also written down, see page 137.
3.1 Consumables and used parts

⚠️ CAUTION!

Consumables and used parts are an environmental hazard

Used parts and consumables must be disposed of in accordance with the applicable environmental-protection regulations. Oil changes should be carried out by the manufacturer's customer service department, whose staff are specially trained for this task.

► Note the safety regulations when handling these materials.

3.2 Wheels

⚠️ WARNING!

The use of tyres that do not match the manufacturer's specifications can result in accidents.

The quality of tyres affects the stability and performance of the truck. Uneven wear affects the truck's stability and increases the stopping distance.

► When replacing tyres make sure the truck is not skewed.

► Always replace tyres in pairs, i.e. left and right at the same time.

► When replacing rims and tyres fitted at the factory, only use the manufacturer’s original spare parts. Otherwise the manufacturer’s specifications cannot be ensured. If you have any queries contact the manufacturer's customer service department.

3.3 Attachment Repairs and Inspection

⚠️ WARNING!

A faulty attachment can be hazardous

Check the attachment daily for external signs of damage or defects. Faulty attachments can cause the load to fall.

► Report any defects immediately to your supervisor.

► Tag out and decommission a faulty lift truck.

► Only return the truck to service when you have identified and rectified the fault.
3.4  Lift Chains

⚠️ WARNING!

**Risk of accident from non-lubricated and incorrectly cleaned lift chains**
Lift chains are safety-critical parts. Lift chains must not show signs of serious contamination. Lift chains and pivot pins must always be clean and sufficiently lubricated.

- The lift chains are cleaned by wiping or brushing. Significant contamination can be softened by a paraffin derivative such as petroleum.
- Do not clean lift chains with high-pressure steam jets or chemical cleaning agents.
- Immediately after cleaning, dry the lift chain with compressed air and apply a chain spray.
- Lift chains must be unloaded when lubricated; to do this, fully lower the load handler.
- Lubricate a lift chain with particular care around the pulleys.

⚠️ WARNING!

**Diesel fuel can be hazardous**
- Diesel fuel can cause irritation if it comes into contact with the skin. Rinse any affected areas thoroughly.
- If it comes into contact with the eyes rinse them immediately with flowing water and call for a doctor.
- Wear safety gloves when handling diesel fuels.
3.5 Hydraulic system

⚠️ WARNING!
Leaky hydraulic systems can result in accidents
Hydraulic oil can escape from leaky and faulty hydraulic systems.
► Report any defects immediately to your supervisor.
► Mark defective truck and take out of service.
► Do not return the industrial truck to service until you have identified and rectified the fault.
► Remove any spilled hydraulic immediately with an appropriate bonding agent.
► The bonding agent / consumable mixture must be disposed of in accordance with regulations.

⚠️ WARNING!
Faulty hydraulic hoses can result in injury and infection
Pressurised hydraulic oil can escape from fine holes or hairline cracks in the hydraulic hoses. Brittle hydraulic hoses can burst during operation. People standing near the truck can be injured by the hydraulic oil.
► Call for a doctor immediately in the event of an injury.
► Do not touch pressurised hydraulic hoses.
► Report any defects immediately to your supervisor.
► Mark defective truck and take it out of service.
► Do not return the industrial truck to service until you have identified and rectified the fault.

NOTICE
Testing and replacing hydraulic hoses
Hydraulic hoses can become brittle through age and must be checked at regular intervals. The application conditions of the industrial truck have a considerable impact on the ageing of the hydraulic hoses.
► Check the hydraulic hoses at least annually and replace if necessary.
► If the operating conditions become more arduous the inspection intervals must be reduced accordingly.
► In normal operating conditions a precautionary replacement of the hydraulic hoses is recommended after 6 years. The owner must carry out a risk assessment to ensure safe, prolonged use. The resulting protection measures must be observed and the inspection interval reduced accordingly.
4 Lubricants and Lubrication Schedule

4.1 Handling consumables safely

Handling consumables

Consumables must always be handled correctly. Follow the manufacturer's instructions.

⚠️ WARNING!

Improper handling is hazardous to health, life and the environment
Consumables can be flammable.
► Keep consumables away from hot components and naked flames.
► Always keep consumables in prescribed marked containers.
► Always fill consumables in clean containers.
► Do not mix up different grades of consumable. The only exception to this is when mixing is expressly stipulated in the Operating Instructions.

⚠️ CAUTION!

Spilled consumables can cause slipping and endanger the environment
Risk of slipping from spilled consumables. The risk is greater when combined with water.
► Do not spill consumables.
► Spilled consumables must be removed immediately with an appropriate bonding agent.
► The bonding agent / consumable mixture must be disposed of in accordance with regulations.
**WARNING!**

**Improper handling of oils can be hazardous**

Oils (chain spray / hydraulic oil) are flammable and poisonous.

- Dispose of used oils in accordance with regulations. Store used oil safely until it can be disposed of in accordance with regulations.
- Do not spill oil.
- Spilled oils must be removed immediately with an appropriate bonding agent.
- The mixture consisting of the bonding agent and oil must be disposed of in accordance with regulations.
- Observe national regulations when handling oils.
- Wear safety gloves when handling oils.
- Prevent oil from coming into contact with hot motor parts.
- Do not smoke when handling oil.
- Avoid contact and digestion. If you swallow oil do not induce vomiting but seek medical assistance immediately.
- Seek fresh air after breathing in oil fumes or vapours.
- If oil has come into contact with your skin, rinse your skin with water.
- If oil has come into contact with your eyes, rinse them with water and seek medical assistance immediately.
- Replace oil-soaked clothing and shoes immediately.

**CAUTION!**

**Consumables and used parts are an environmental hazard**

Used parts and consumables must be disposed of in accordance with the applicable environmental-protection regulations. Oil changes should be carried out by the manufacturer's customer service department, whose staff are specially trained for this task.

- Note the safety regulations when handling these materials.
### 4.2 Lubrication Schedule

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>▼</td>
<td>Contact surfaces</td>
</tr>
<tr>
<td>↓</td>
<td>Grease nipple</td>
</tr>
<tr>
<td>⌂</td>
<td>Hydraulic oil filler neck</td>
</tr>
<tr>
<td>●</td>
<td>Brake fluid filler neck</td>
</tr>
<tr>
<td>☉</td>
<td>Hydraulic oil drain plug</td>
</tr>
<tr>
<td>◆</td>
<td>Gear oil filler neck</td>
</tr>
<tr>
<td>○</td>
<td>Gear unit oil drain plug</td>
</tr>
<tr>
<td>◘</td>
<td>Gear oil control screw</td>
</tr>
</tbody>
</table>

![Diagram of forklift with lubrication points](image-url)
### 4.3 Consumables

<table>
<thead>
<tr>
<th>Code</th>
<th>Order no.</th>
<th>Package quantity</th>
<th>Capacity</th>
<th>Description</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>51 132 827*</td>
<td>5l</td>
<td>14.5 l</td>
<td>Jungheinrich hydraulic oil</td>
<td>Hydraulic system</td>
</tr>
<tr>
<td></td>
<td>50 426 072</td>
<td>20l</td>
<td></td>
<td>HLPD 32 1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 429 647</td>
<td>20l</td>
<td></td>
<td>HLPD 22 2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 124 051</td>
<td>5l</td>
<td></td>
<td>HV 68 3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51 082 888</td>
<td>5l</td>
<td></td>
<td>Plantsosyn 46 HVI (BIO hydraulic oil)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>29 201 570</td>
<td>1l</td>
<td>0.25 l</td>
<td>Brake fluid SAE J 1703 4) FMVSS 116 DOT 3 and DOT 4</td>
<td>Hydraulic brake system</td>
</tr>
<tr>
<td>E</td>
<td>50 157 382</td>
<td>1kg</td>
<td></td>
<td>Lubrication grease K-L 3N 3)</td>
<td>Front wheel bearings, steering transmission</td>
</tr>
<tr>
<td>G</td>
<td>29 201 280</td>
<td>400ml</td>
<td></td>
<td>Chain spray</td>
<td>Chains</td>
</tr>
<tr>
<td>N</td>
<td>50 468 784</td>
<td>1l</td>
<td>4.15 l</td>
<td>Transmission oil EP 80</td>
<td>Transmission</td>
</tr>
</tbody>
</table>

1) Valid for temperatures -5/+30 °C  
2) Valid for temperatures -20/-5 °C  
3) Valid for temperatures +30/+50 °C

*The trucks are factory-equipped with a special manufacturer's hydraulic oil (the Jungheinrich hydraulic oil with a blue colouration) or the Plantsosyn 46 HVI bio hydraulic oil. This special hydraulic oil can only be obtained from the manufacturer's customer service department. The use of named alternative hydraulic oils is not prohibited, but may lead to a decline in functionality. This hydraulic oil may be mixed with one of the named alternative hydraulic oils.*
**WARNING!**

Industrial trucks are factory-equipped with "HLP D22/32" hydraulic oil or "+ 2% Plantosyn 46 HVI" BIO hydraulic oil.

You cannot change from "Plantosyn 46 HVI" BIO hydraulic oil to the manufacturer's hydraulic oil. The same applies to changing from the manufacturer's hydraulic oil to "Plantosyn 46 HVI" bio hydraulic oil.

Do not mix the Plantosyn 46 HVI bio hydraulic oil with the manufacturer's hydraulic oil or one of the named alternative hydraulic oils.

---

**Grease guidelines**

<table>
<thead>
<tr>
<th>Code</th>
<th>Saponification</th>
<th>Dew point °C</th>
<th>Worked penetration at 25 °C</th>
<th>NLG1 class</th>
<th>Application temperature °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Lithium</td>
<td>185</td>
<td>265 - 295</td>
<td>2</td>
<td>-35/+120</td>
</tr>
</tbody>
</table>
5 Maintenance and repairs

5.1 Preparing the truck for maintenance and repairs

All necessary safety measures must be taken to avoid accidents when carrying out maintenance and repairs. The following preparations must be made:

Procedure

- Park the truck securely, see page 88.
- Fully lower the load handler.
- Disconnect the battery to prevent the truck from being switched on accidentally.
5.2 Lifting and jacking up the truck safely

⚠️ WARNING!

A truck tipover can cause accidents
In order to raise the truck, use only suitable lifting gear at the points specially provided for this purpose.

➤ Note the weight of the truck on the data plate.
➤ Always use a jack with a minimum capacity of 2500 kg.
➤ Raise the unladen truck on a level surface.
➤ When raising the truck, take appropriate measures to prevent it from slipping or tipping over (e.g. wedges, wooden blocks).

Raising and jacking up the truck securely

Requirements
– Prepare the truck for maintenance and repairs (see page 148).

Tools and Material Required
– Jack
– Hard wooden blocks

Procedure
• Place the jack against the contact point.

➤ Jack contact point, see page 30.

• Raise the truck.
• Support the truck with hard wooden blocks.
• Remove the jack.

The truck is now securely raised and jacked up.

➤ To lower the truck, proceed in reverse order.
5.3 Opening the battery panel

**Open the battery cover with the SOLO-PILOT**

**Requirements**
- Park the truck securely, see page 88.
- Load handler lowered.
- Key switch set to OFF.
- Key removed.
- Set the Emergency Disconnect OFF.

**Procedure**
- Press the lever (56) to unlock the cover (55) and move it forward.
- Carefully lift back the battery cover and the driver’s seat as far as the stop (opening angle = 90°).

*The battery cover is now open. The fuses and other electrical components can now be reached.*
Opening the battery cover with the MULTI-PILOT (O)

Requirements
– Park the truck securely, see page 88.
– Load handler lowered.
– Key switch set to OFF.
– Key removed.
– Set the Emergency Disconnect OFF.

Procedure
• Release the steering column lock (58), push the steering column forward and secure it in this position.
• Pull the panel (57) forward until it engages.
• Carefully lift back the battery cover and the driver’s seat (1) as far as the stop (opening angle = 90°).

The battery cover is now open. The fuses and other electrical components can now be reached.

On trucks with a rear window / canvas cover, open the rear window / canvas cover before opening the battery cover.
5.4 Checking the wheel attachments.

**WARNING!**

Using different tyres can cause accidents
The quality of the tyres affects the operational stability and performance of the truck.
- The diameter of the wheels must differ by no more than 15 mm.
- Always replace tyres in pairs, i.e. left and right at the same time. After replacing the tyres check the wheel nuts are secure after 10 service hours.
- Always use tyres of the same make, model and profile.

**Checking the mounting of wheels**

*Requirements*
- Prepare the truck for maintenance and repairs (see page 148).

*Tools and Material Required*
- Torque wrench

*Procedure*
- Torque the wheel nuts (146) crosswise with a torque wrench; tightening torques see page 25.

*The mounting of wheels is now checked.*

When using pneumatic tyres check the air pressure, for the air pressure see page 25
5.5 Replacing wheels

⚠️ **WARNING!**

A truck tipover can cause accidents
In order to raise the truck, use only suitable lifting gear at the points specially provided for this purpose.

- Note the weight of the truck on the data plate.
- Always use a jack with a minimum capacity of 2500 kg.
- Raise the unladen truck on a level surface.
- When raising the truck, take appropriate measures to prevent it from slipping or tipping over (e.g. wedges, wooden blocks).

⚠️ **WARNING!**

Falling wheels can cause injury
- The wheels of the truck are very heavy. A single wheel can weigh up to 150 kg.
- Always replace wheels with a suitable tool and protective equipment.

### Removing the wheels

**Requirements**
- Prepare the truck for maintenance and repairs (see page 148).

**Tools and Material Required**
- Jack
- Hard wooden blocks
- Mounting lever
- Torque wrench

**Procedure**

- Place the jack against the contact point.
  - Jack contact point, see page 30.
- Raise the truck.
- Support the truck with hard wooden blocks.
- Undo the wheel attachment (146).
- Remove the wheel, using a suitable mounting lever if necessary.

*The wheel has now been removed.*
Fitting the wheels

Procedure

• Fit the wheel using a suitable mounting lever if necessary.
• Fit the wheel attachment.
• Remove the hard wooden blocks.
• Lower the truck.
• Torque the wheel attachment (146) crosswise with a torque wrench; tightening torques see page 25.

The wheel has now been fitted.

When using pneumatic tyres check the air pressure, for the air pressure see page 25
5.6 Hydraulic system

⚠️ CAUTION!

The hydraulic oil is pressurised during operation and is a hazard to health and to the environment.

▶ Do not touch pressurised hydraulic lines.
▶ Dispose of used oil in accordance with regulations. Store used oil safely until it can be disposed of in accordance with regulations.
▶ Do not spill hydraulic oil.
▶ Remove any spilled hydraulic immediately with an appropriate bonding agent.
▶ The bonding agent / consumable mixture must be disposed of in accordance with regulations.
▶ Observe national regulations when handling hydraulic oil.
▶ Wear safety gloves when handling hydraulic oil.
▶ Prevent hydraulic oil from coming into contact with hot motor parts.
▶ Do not smoke when handling hydraulic oil.
▶ Avoid contact and digestion. If you swallow oil do not induce vomiting but seek medical assistance immediately.
▶ Seek fresh air after breathing in oil fumes or vapours.
▶ If oil has come into contact with your skin, rinse your skin with water.
▶ If oil has come into contact with your eyes, rinse them with water and seek medical assistance immediately.
▶ Replace oil-soaked clothing and shoes immediately.

⚠️ CAUTION!

Consumables and used parts are an environmental hazard

Used parts and consumables must be disposed of in accordance with the applicable environmental protection regulations. To change the oil contact the manufacturer’s customer service department, who have been specially trained for this task.

▶ Note the safety regulations when handling these materials.
5.6.1 Checking the hydraulic oil level

⚠️ CAUTION!

The use of unsuitable hydraulic oils can cause damage
Trucks with bio hydraulic oil have a warning notice on the hydraulic reservoir: “Add hydraulic oil only”.
► Use only BIO hydraulic oil.

Checking the hydraulic oil level and adding hydraulic oil

Requirements
– Park the truck on a level surface.
– Prepare the truck for maintenance and repairs (see page 148).
– Battery cover open, see page 150.

Procedure
• Unscrew the air filter and dipstick (147).
• Visually inspect the hydraulic oil level on the dipstick.

If the reservoir is sufficiently full, the hydraulic oil level will be at the top mark (max.). If necessary add hydraulic oil up to the level indicated (20 mm on the dipstick corresponds to approx. 1 l <hydraulic oil>.

The hydraulic oil level is now checked.
5.6.2 Replacing the hydraulic oil filter

**Replacing the oil filter**

**Requirements**
- Park the truck on a level surface.
- Prepare the truck for maintenance and repair work (see page 148).

**Procedure**
- Unscrew the hydraulic oil filter cap (148). The filter element is located on the cap.
- Replace the filter insert; if the O ring is damaged it will also need to be replaced. Apply a thin layer of oil to the O ring on assembly.
- Refit the cap with the new filter element in place.

5.7 Check the gear oil level

⚠️ **CAUTION!**

**Consumables and used parts are an environmental hazard**

Used parts and consumables must be disposed of in accordance with the applicable environmental protection regulations. To change the oil contact the manufacturer's customer service department, who have been specially trained for this task.

► Note the safety regulations when handling these materials.

**Check the gear oil level**

**Requirements**
- Park the truck securely, see page 88

**Tools and Material Required**
- Oil sump

**Procedure**
- Place the oil sump underneath the transmission
- Unscrew the oil dipstick (151).
- Check gear oil level, top up if necessary through the filler hole (150).

→ The oil level should reach the bottom mark of the oil check hole (151).

*The transmission oil level is now checked.*
**Draining the oil**

*Procedure*
- Drain oil at operating temperature.
- Place the oil sump underneath the transmission.
- Unscrew the oil drain plug (152) and drain the transmission oil.

To ensure swift and complete draining of the transmission oil, unscrew the oil dipstick (151).

*The oil is now drained.*

**Adding oil**

*Procedure*
- Insert the oil drain plug (152).
- Remove the cap (149).
- Turn the steering axle wheel until the filler bore (150) is visible.
- Unscrew the oil control screw (151) and add new gear oil in the filler hole (150).

*The oil has now been added.*

### 5.8 Adding window washer system fluid

*Procedure*
- Make sure there is sufficient window fluid in the container (153).
- If necessary top up with anti-freeze.
5.9 Checking electrical fuses

⚠️ WARNING!

Electric currents can cause accidents
Make sure the electrical system is voltage-free before starting work on it. Before starting maintenance on the electrical system:

- Park the truck securely (see page 88).
- Press the Emergency Disconnect.
- Disconnect the battery.
- Remove any rings or metal bracelets etc. before working on electrical components.

⚠️ CAUTION!

The use of incorrect fuses can cause fire and damage components
The use of incorrect fuses can damage the electrical system and result in fire. The safety and functionality of the truck cannot be ensured.

- Use only fuses with the prescribed rated current, see page 160.

Checking electrical fuses

Requirements
- Prepare the truck for maintenance and repairs (see page 148).

Procedure
- Open the battery panel, see page 150.
- Remove the electrical system cap.
- Check condition and rating of the fuses in accordance with the table.
- Replace any damaged fuses in accordance with the table.
- Close the electrical system cap.
- Close the truck’s battery cover.

The electrical fuses are now checked.
### 5.9.1 Fuse ratings

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Electric circuit</th>
<th>Rating / type</th>
</tr>
</thead>
<tbody>
<tr>
<td>154</td>
<td>1F</td>
<td>Drive motor fuse</td>
<td>250 A</td>
</tr>
<tr>
<td>155</td>
<td>2F1</td>
<td>Hydraulic motor fuse</td>
<td>250 A</td>
</tr>
<tr>
<td>156</td>
<td>F3.1</td>
<td>Control fuse 24 V</td>
<td>40 A</td>
</tr>
<tr>
<td>157</td>
<td>1F9</td>
<td>Travel / lift electronics fuse</td>
<td>10 A</td>
</tr>
<tr>
<td>158</td>
<td>4F1</td>
<td>Horn control fuse</td>
<td>10 A</td>
</tr>
<tr>
<td>159</td>
<td>F4</td>
<td>Main contactor control fuse</td>
<td>5 A</td>
</tr>
</tbody>
</table>
Fuses for optional equipment

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Electrical circuit</th>
<th>Rating/type</th>
</tr>
</thead>
<tbody>
<tr>
<td>160</td>
<td>5F3</td>
<td>Fuse, reversing lights or rear work lights</td>
<td>10 A</td>
</tr>
<tr>
<td>161</td>
<td>5F1</td>
<td>Fuse, front work lights</td>
<td>10 A</td>
</tr>
<tr>
<td>162</td>
<td>9F2</td>
<td>Control fuse, seat heating</td>
<td>10 A</td>
</tr>
<tr>
<td>163</td>
<td>4F6</td>
<td>Fuse, brake light</td>
<td>10 A</td>
</tr>
<tr>
<td>164</td>
<td>4F4</td>
<td>Control fuse, warning beacon</td>
<td>5 A</td>
</tr>
<tr>
<td>165</td>
<td>5F6</td>
<td>Control fuse, front/rear windscreen wiper and rear windscreen heater</td>
<td>10 A</td>
</tr>
<tr>
<td>166</td>
<td>F1.1</td>
<td>Fuse, indicator relay</td>
<td>5 A</td>
</tr>
<tr>
<td>167</td>
<td>5F5.2</td>
<td>Control fuse, reversing light</td>
<td>5 A</td>
</tr>
<tr>
<td>168</td>
<td>5F4</td>
<td>Control fuse, RH tail light</td>
<td>5 A</td>
</tr>
<tr>
<td>169</td>
<td>5F4.1</td>
<td>Control fuse, LH tail light</td>
<td>5 A</td>
</tr>
<tr>
<td>170</td>
<td>5F5</td>
<td>Control fuse, RH lighting</td>
<td>5 A</td>
</tr>
<tr>
<td>171</td>
<td>5F5.1</td>
<td>Control fuse, LH lighting</td>
<td>5 A</td>
</tr>
</tbody>
</table>
5.10 Cleaning

Cleaning tasks may only take place in the designated locations, which adhere to the stipulations of the country of use.

5.10.1 Cleaning the truck

⚠️ CAUTION!

Fire hazard
Do not use flammable liquids to clean the industrial truck.
► Disconnect the battery before starting cleaning work.
► Carry out all necessary safety measures to prevent sparking before cleaning (e.g. by short-circuiting).

⚠️ CAUTION!

Risk of component damage when cleaning the truck
Cleaning with a pressure washer can result in malfunctions due to humidity.
► Cover all electronic system assemblies (controllers, sensors, motors etc.) before cleaning the truck with a pressure washer.
► Do not hold the jet of the pressure washer by the marked points to avoid damaging them (see page 30).
► Do not clean the truck with pressurised water.

NOTICE

Risk of damage when cleaning the truck with a high-pressure cleaner
Cleaning with a high-pressure cleaner can cause discolouration or other damage on coated or painted surfaces.
► Do not clean the truck with hot water or steam jets.
► Do clean the truck using acidic or aggressive cleaning agents such as insect removers.
► Do not clean the truck with insufficiently diluted cleaning agents.
► Before using a cleaning agent, read the manufacturer’s instructions. Test an inconspicuous or concealed part of the coated or painted truck surface for potential reactions to the cleaning agent.
► Thoroughly rinse off any road salt before cleaning the truck.
► The counterweight of the truck should ideally be cleaned using cold water and a clean, soft cotton cloth.
Risk of damage to the roof window

Dry cleaning, cleaning with paper towels or cleaning with dirty or large-fibre cleaning cloths can scratch the polycarbonate roof window. The static charge caused by dry cleaning can attract more dust to the roof window. The use of unsuitable cleaning agents can also damage the roof window.

External influences such as aggressive vapours, liquids or condensates can cause discolouration and damage the roof window.

► Only clean the roof window with a damp, soft cotton cloth.
► Use only glass cleaner with a low alcohol content or clean water without cleaning additives.
► Do not dry clean or pre-wipe the roof window.
► If necessary, rub the roof window dry using a clean, soft cotton cloth.
► Replace the roof window in the case of damage, scratched surfaces, poor visibility or discolouration.

Cleaning the truck

Requirements
– Truck prepared for maintenance and repair work (see page 148).

Tools and Material Required
– Water-based solvents
– Sponge or cloth

Procedure
• Clean the surface of the truck with water-based solvents and water. Use a sponge or cloth to clean.
• In particular, clean the following areas:
  • Windscreens
  • All walk-on areas
  • Oil filler caps and their surroundings
  • Grease nipples (before lubrication)
• Dry the truck after cleaning, e.g. with compressed air or a dry cloth.
• Carry out all the tasks in the section "Recommissioning the truck after cleaning or maintenance work" (see page 169).

The truck is now clean.
5.10.2 Cleaning the electrical system assemblies

**CAUTION!**

**Risk of electrical system damage**

Cleaning the assemblies (controllers, sensors, motors etc.) of the electronic system with water can damage the electrical system.

▶ Do not clean the electrical system with water.
▶ Clean the electrical system with weak suction or compressed air (use a compressor with a water trap) and not a conductive, anti-static brush.

---

**Cleaning the electrical system assemblies**

**Requirements**

– Truck prepared for maintenance and repair work (see page 148).

**Tools and Material Required**

– Compressor with water separator
– Non-conductive, antistatic brush

**Procedure**

• Expose the electrical system, see page 150.
• Clean the electrical system assemblies with weak suction or compressed air (use a compressor with a water separator) and a non-conductive, anti-static brush.
• Fit the electrical system panel, see page 150.
• Carry out all the tasks in the section "Recommissioning the truck after cleaning or maintenance work" (see page 169).

*The electrical system assemblies are now clean.*
5.11 Working on the electrical system

⚠️ WARNING!

Electrical current can cause accidents

Ensure the electrical system is de-energised before starting work. The capacitors in the control must be completely discharged. The capacitors are fully discharged approx. 10 minutes after disconnecting the electrical system from the battery.

Before starting maintenance on the electrical system:

▶ Only suitably trained electricians may work on the truck's electrical system.
▶ Before working on the electrical system, take all precautionary measures to avoid electric shocks.
▶ Park the truck securely (see page 88).
▶ Disconnect the battery.
▶ Remove any rings, metal wristbands etc.
5.12 Restoring the truck to service after maintenance and repairs

Procedure

- Thoroughly clean the truck – see page 162.
- Lubricate the forklift truck according to the lubrication schedule – see page 145.
- Equipped with lead-acid battery (⚫): Clean the battery, grease the battery terminal screws with terminal grease and connect the battery.
- Equipped with lithium-ion battery (⚪) without interface converter on the battery: Insert the truck-side control line into the connection on the battery trough.
- Equipped with lithium-ion battery (⚪) with interface converter on the battery:
  - Pull the battery forward.
  - Insert the control line into the battery connection at the top of the battery or the inside of the trough.
  - Slide the battery back in.
  - Connect the battery to the truck.
  - Close the battery connector lock: Tighten the bolted bar.
  - Insert the truck control line into the interface converter on the battery.
- Charge the battery – see page 55.
- Commission the forklift truck – see page 71.
Decommissioning the industrial truck

If the truck is to be out of service for more than a month, it must be stored in a frost-free and dry room. All necessary measures must be taken before, during and after decommissioning as described hereafter.

When the truck is out of service it must be jacked up so that all the wheels are clear of the ground. This is the only way of ensuring that the wheels and wheel bearings are not damaged.

Jack up the truck, see page 149.

If the truck is to be out of service for more than 6 months, agree further measures with the manufacturer's customer service department.
6.1 Prior to decommissioning

Procedure
- Thoroughly clean the truck – see page 162.
- Prevent the truck from rolling away accidentally.
- Check the hydraulic oil level and replenish if necessary, see page 156.
- Apply a thin layer of oil or grease to any non-painted mechanical components.
- Lubricate the truck according to the lubrication diagram, see page 145.
- Charge the battery, see page 55.
- Disconnect and clean the battery.
- Clean the terminal screws, grease them with terminal grease and screw them into the connection thread to prevent short circuits.

In addition, follow the battery manufacturer’s instructions.

6.2 During decommissioning

NOTICE

Full discharge can damage the battery
Self-discharge can cause the battery to fully discharge. Full discharge shortens the useful life of the battery.
▶ Charge the battery at least every 2 months.

Charge the battery, see page 55.
6.3 Restoring the truck to service after decommissioning

Procedure

• Thoroughly clean the truck – see page 162.
• Lubricate the forklift truck according to the lubrication schedule – see page 145.
• Equipped with lead-acid battery (●): Clean the battery, grease the battery terminal screws with terminal grease and connect the battery.
• Equipped with lithium-ion battery (○) without interface converter on the battery: Insert the truck-side control line into the connection on the battery trough.
• Equipped with lithium-ion battery (○) with interface converter on the battery:
  • Pull the battery forward.
  • Insert the control line into the battery connection at the top of the battery or the inside of the trough.
  • Slide the battery back in.
  • Connect the battery to the truck.
  • Close the battery connector lock: Tighten the bolted bar.
  • Insert the truck control line into the interface converter on the battery.
• Charge the battery – see page 55.
• Commission the forklift truck – see page 71.
7 Safety tests to be performed at intervals and after unusual incidents

The truck must be inspected at least annually (refer to national regulations) or after any unusual event by a qualified inspector. The manufacturer offers a safety inspection service which is performed by personnel specifically trained for this purpose.

A complete test must be carried out on the technical condition of the truck with regard to safety. The truck must also be examined thoroughly for damage.

The operating company is responsible for ensuring that faults are rectified immediately.
Final de-commissioning, disposal

Final de-commissioning or disposal of the truck must be performed in accordance with the regulations of the country of use. In particular, regulations governing the disposal of batteries, consumables and electronic and electrical systems must be observed. The truck must only be disassembled by trained personnel in accordance with the procedures as specified by the manufacturer.

Human vibration measurement

Vibrations that affect the operator over the course of the day are known as human vibrations. Excessive human vibrations will cause the operator long term health problems. The European "2002/44/EC/Vibration" operator directive has therefore been established to protect operators. To help operators to assess the application situation, the manufacturer offers a service of measuring these human vibrations.
Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement

**WARNING!**

**Lack of maintenance can result in accidents**

Failure to perform regular maintenance and inspections can lead to truck failure and poses a potential hazard to personnel and equipment.

Thorough and expert maintenance and inspections are among the most important requirements for the safe operation of the industrial truck.

**NOTICE**

The application conditions of an industrial truck have a considerable impact on component wear. The following service, inspection and replacement intervals are based on single-shift operation under normal operating conditions. The intervals must be reduced accordingly if more stringent requirements are placed on the equipment, e.g., use in conditions of extreme dust, temperature fluctuations or multiple shifts.

To prevent damage due to wear, the manufacturer recommends an on-site application analysis to agree on appropriate intervals.

The following chapter defines the tasks to be performed, the respective intervals to be observed and the maintenance parts for which replacement is recommended.

During the truck run-in period, after approx. 100 service hours, the operating company must check the wheel nuts/bolts and re-tighten if necessary.
## 1 Maintenance Contents EFG 110-115

Issued on: 2020-10-05 08:00

### 1.1 Owner

To be performed every 50 service hours, but at least once a week.

### 1.1.1 Maintenance contents

#### 1.1.1.1 Standard equipment

<table>
<thead>
<tr>
<th>Brakes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test the function of the brakes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydraulic operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lubricate the load chains.</td>
</tr>
<tr>
<td>Correct the hydraulic oil level.</td>
</tr>
</tbody>
</table>
1.1.1.2 Optional equipment

**Fork adjuster**

<table>
<thead>
<tr>
<th>Hydraulic operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean and lubricate the attachment.</td>
</tr>
</tbody>
</table>

**Clamping device**

<table>
<thead>
<tr>
<th>Hydraulic operations</th>
</tr>
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<tbody>
<tr>
<td>Clean and lubricate the attachment.</td>
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**Sideshifter**

<table>
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<tr>
<th>Hydraulic operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean and lubricate the attachment.</td>
</tr>
</tbody>
</table>

**Telescopic forks**

<table>
<thead>
<tr>
<th>Hydraulic operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean and lubricate the attachment.</td>
</tr>
</tbody>
</table>

**Wiper/washer system**

<table>
<thead>
<tr>
<th>Chassis/structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct the fill level of the windscreen washer reservoir.</td>
</tr>
</tbody>
</table>

**Pneumatic tyres**

<table>
<thead>
<tr>
<th>Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct the tyre pressure.</td>
</tr>
</tbody>
</table>

**Lead-acid battery, international**

<table>
<thead>
<tr>
<th>Power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct the battery acid level using demineralised water.</td>
</tr>
</tbody>
</table>

**Lead-acid battery**

<table>
<thead>
<tr>
<th>Power supply</th>
</tr>
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<tbody>
<tr>
<td>Correct the battery acid level using demineralised water.</td>
</tr>
</tbody>
</table>
1.1.2 Inspection contents

1.1.2.1 Standard equipment

The following points must be checked:

<table>
<thead>
<tr>
<th><strong>Electrical system</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning and safety devices are in accordance with the operating instructions</td>
<td></td>
</tr>
<tr>
<td>Function of display and controls</td>
<td></td>
</tr>
<tr>
<td>The function of the emergency disconnect and for damage</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Power supply</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery and battery components for damage</td>
<td></td>
</tr>
<tr>
<td>The function and secure seating of the battery connector and for damage</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Travel</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheels for wear and damage</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Chassis/structure</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Labels are legible, complete and plausible</td>
<td></td>
</tr>
<tr>
<td>Doors or covers for damage</td>
<td></td>
</tr>
<tr>
<td>The function of the battery panel gas strut and for damage</td>
<td></td>
</tr>
<tr>
<td>The function of the driver's seat restraint system and for damage</td>
<td></td>
</tr>
<tr>
<td>The secure seating of the overhead guard and/or the cab for damage</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Hydraulic operations</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Check cylinders, hydraulic connections, pipes and hoses for leaks and damage</td>
<td></td>
</tr>
<tr>
<td>The function of the hydraulic system</td>
<td></td>
</tr>
<tr>
<td>The forks or load handler for wear and damage</td>
<td></td>
</tr>
</tbody>
</table>
1.1.2.2 Optional equipment

The following points must be checked:

**Wiper/washer system**

| Chassis/structure | The windscreen washer reservoir for leaks and damage |

**Road traffic approval**

| Electrical system | The function of the lighting and for damage |

**Work lights**

| Electrical system | The function of the lighting and for damage |

**Weather proofing**

| Chassis/structure | The function of the doors and for damage |

**Optional equipment**

| Chassis/structure | The function of optional equipment such as mirrors, storage compartments, grips, windscreen wipers and washing systems, etc. and for damage |

**Strobe light / beacon**

| Electrical system | Strobe light/warning beacon for function and damage |

**Lead-acid battery, international**

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Battery and battery components for damage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Battery cable connections are secure</td>
</tr>
</tbody>
</table>

**Lead-acid battery**

| Power supply | Battery cable connections are secure     |
1.2 Customer Service

In accordance with the EFG 110-115 service interval, to be performed every 1000 service hours, but at least once a year.

1.2.1 Maintenance contents

1.2.1.1 Standard equipment

<table>
<thead>
<tr>
<th>Brakes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test the function of the brakes</td>
</tr>
<tr>
<td>Adjust and lubricate the brake mechanism.</td>
</tr>
<tr>
<td>Measure the water content of brake fluid.</td>
</tr>
<tr>
<td>The brake fluid level in the expansion tank.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test the contactors and/or relays.</td>
</tr>
<tr>
<td>Clean the fan.</td>
</tr>
<tr>
<td>Carry out a chassis insulation-resistance test.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct the oil level or grease filling of the transmission.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydraulic operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjust the slide pieces.</td>
</tr>
<tr>
<td>Adjust the load chains.</td>
</tr>
<tr>
<td>Lubricate the load chains.</td>
</tr>
<tr>
<td>Lubricate the running surfaces of the mast.</td>
</tr>
<tr>
<td>Test emergency lowering.</td>
</tr>
<tr>
<td>Correct the hydraulic oil level.</td>
</tr>
<tr>
<td>Test and adjust the pressure relief valve.</td>
</tr>
<tr>
<td>Where two tilt cylinders with the same stroke are used, measure their relative adjustment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agreed services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carry out a test run with the rated load or a customer-specific load.</td>
</tr>
<tr>
<td>Demonstration after maintenance.</td>
</tr>
<tr>
<td>Lubricate truck according to the lubrication diagram.</td>
</tr>
</tbody>
</table>
1.2.1.2 Optional equipment

**Boom**

**Hydraulic operations**
Check that the attachment and retainer to protect against accidental displacement and unhinging are present and function correctly.

**Fork adjuster**

**Hydraulic operations**
Clean and lubricate the attachment.
The axial play of the front and rear rollers.

**Clamping device**

**Hydraulic operations**
Adjust the attachment.
Check that the attachment and retainer to protect against accidental displacement and unhinging are present and function correctly.
Clean and lubricate the attachment.
The axial play of the front and rear rollers.

**Sideshifter**

**Hydraulic operations**
Clean and lubricate the attachment.
Test the side shift adjustment.

**Telescopic forks**

**Hydraulic operations**
Clean and lubricate the attachment.

**Wiper/washer system**

**Chassis/structure**
Correct the fill level of the windscreen washer reservoir.

**Data radio**

**System components**
Clean the scanner and terminal.

**Video system**

**System components**
Clean the camera.
Clean the display.
**Weigher sensors / switches**

<table>
<thead>
<tr>
<th>Electrical system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test the weighing system.</td>
</tr>
</tbody>
</table>

**Automatic crawl speed**

<table>
<thead>
<tr>
<th>Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean the sensors/switches.</td>
</tr>
</tbody>
</table>

**Pneumatic tyres**

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<th>Travel</th>
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<tr>
<td>Correct the tyre pressure.</td>
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</table>

**Lead-acid battery, international**

<table>
<thead>
<tr>
<th>Power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean and grease the battery terminals.</td>
</tr>
<tr>
<td>Clean the battery.</td>
</tr>
<tr>
<td>Measure the acid density and battery voltage.</td>
</tr>
<tr>
<td>Correct the battery acid level using demineralised water.</td>
</tr>
</tbody>
</table>

**Lead-acid battery**

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<tr>
<td>Correct the battery acid level using demineralised water.</td>
</tr>
</tbody>
</table>
### 1.2.2 Inspection contents

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#### 1.2.2.1 Standard equipment

<table>
<thead>
<tr>
<th>Brakes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake mechanism for function and damage</td>
<td></td>
</tr>
<tr>
<td>Brake linings for wear and damage</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical system</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cables and engine are secure and for damage</td>
<td></td>
</tr>
<tr>
<td>Warning and safety devices are in accordance with the operating instructions</td>
<td></td>
</tr>
<tr>
<td>Function of display and controls</td>
<td></td>
</tr>
<tr>
<td>Microswitches for function and damage</td>
<td></td>
</tr>
<tr>
<td>The function of the emergency disconnect and for damage</td>
<td></td>
</tr>
<tr>
<td>Contactors and/or relays for wear and damage</td>
<td></td>
</tr>
<tr>
<td>The function of the fan and for damage</td>
<td></td>
</tr>
<tr>
<td>The electric wiring for damage (insulation damage, connections) and the fuse ratings</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power supply</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The function and secure seating of the battery connector and for damage</td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Travel</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drivetrain bearings for wear and damage</td>
<td></td>
</tr>
<tr>
<td>Transmission for noise and leaks</td>
<td></td>
</tr>
<tr>
<td>Wheel bearings and attachment for wear and damage</td>
<td></td>
</tr>
<tr>
<td>Wheels for wear and damage</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chassis/structure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The secure seating of the chassis and screw connections and for damage</td>
<td></td>
</tr>
<tr>
<td>Labels are legible, complete and plausible</td>
<td></td>
</tr>
<tr>
<td>Driver's seat for damage</td>
<td></td>
</tr>
<tr>
<td>The secure seating of the driver's seat and the function of the adjustment mechanism</td>
<td></td>
</tr>
<tr>
<td>Doors or covers for damage</td>
<td></td>
</tr>
<tr>
<td>The function of the battery panel gas strut and for damage</td>
<td></td>
</tr>
<tr>
<td>The counterweight is securely attached</td>
<td></td>
</tr>
<tr>
<td>The mast bearings for wear</td>
<td></td>
</tr>
<tr>
<td>The secure seating of the mast</td>
<td></td>
</tr>
<tr>
<td>The function of the trailer coupling or tow mechanism and for damage</td>
<td></td>
</tr>
<tr>
<td>Operator mat and steps are non-slip and free of damage</td>
<td></td>
</tr>
<tr>
<td>The function of the driver's seat restraint system and for damage</td>
<td></td>
</tr>
<tr>
<td>The secure seating of the overhead guard and/or the cab for damage</td>
<td></td>
</tr>
</tbody>
</table>
**Hydraulic operations**

- The function of the "hydraulic system" controls and for legibility, completeness and plausibility
- The hydraulic control elements for correct assignment.
- The secure seating of the cylinders and piston rods and for leaks and damage
- The function of the hose guide and for damage
- Lateral play of the mast sections and fork carriage
- Slides and stops for wear and damage
- Load chain mounting elements and chain pins for wear and damage
- The mast rollers and their running surfaces for wear and damage
- Running surfaces of the mast for wear and damage
- Check cylinders, hydraulic connections, pipes and hoses for leaks and damage
- The function of the hydraulic system
- The secure seating of the hydraulic connections, hoses and pipes and for leaks and damage
- The forks or load handler for wear and damage
- Piston rod screw depth and counter-fixing/clamping
- Tilt cylinders and mounting for leaks, wear and damage

**Steering**

- The function of the hydraulic steering and its components and for damage
- The mechanical parts of the steering column for wear and damage
- Steering block for wear and damage
### Optional equipment

#### Electrolyte circulation

<table>
<thead>
<tr>
<th>Power supply</th>
<th>The function of the hose connections and pump</th>
</tr>
</thead>
</table>

#### Aquamatik

<table>
<thead>
<tr>
<th>Power supply</th>
<th>The function of the Aquamatik plug, hose connections and float and for leaks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The function of the flow indicator and for leaks</td>
</tr>
</tbody>
</table>

#### Battery refill system

<table>
<thead>
<tr>
<th>Power supply</th>
<th>The function of the battery refill system and for leaks</th>
</tr>
</thead>
</table>

#### Fork adjuster

<table>
<thead>
<tr>
<th>Hydraulic operations</th>
<th>Attachment bearings, guides and stops for wear and damage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sliding blocks are complete and for wear and damage</td>
</tr>
<tr>
<td></td>
<td>The function of the attachment and for damage</td>
</tr>
<tr>
<td></td>
<td>The secure seating of the hydraulic connections and for leaks</td>
</tr>
<tr>
<td></td>
<td>Cylinder rods and their bushings for wear and damage</td>
</tr>
<tr>
<td></td>
<td>Cylinder seals for leaks and damage</td>
</tr>
</tbody>
</table>

#### Clamping device

<table>
<thead>
<tr>
<th>Hydraulic operations</th>
<th>The function of the acknowledgement button</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Attachment bearings, guides and stops for wear and damage</td>
</tr>
<tr>
<td></td>
<td>Sliding blocks are complete and for wear and damage</td>
</tr>
<tr>
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<tr>
<td></td>
<td>The secure seating of the hydraulic connections and for leaks</td>
</tr>
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<td></td>
<td>Cylinder rods and their bushings for wear and damage</td>
</tr>
<tr>
<td></td>
<td>Cylinder seals for leaks and damage</td>
</tr>
</tbody>
</table>
### Sideshifter

<table>
<thead>
<tr>
<th><strong>Hydraulic operations</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment bearings, guides and stops for wear and damage</td>
</tr>
<tr>
<td>Proper securing of the attachment to the truck and the load-bearing components for secure fit and damage</td>
</tr>
<tr>
<td>Sliding blocks are complete and for wear and damage</td>
</tr>
<tr>
<td>The function of the attachment and for damage</td>
</tr>
<tr>
<td>The secure seating of the hydraulic connections and for leaks</td>
</tr>
<tr>
<td>Cylinder rods and their bushings for wear and damage</td>
</tr>
<tr>
<td>Cylinder seals for leaks and damage</td>
</tr>
</tbody>
</table>

### Telescopic forks

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<thead>
<tr>
<th><strong>Hydraulic operations</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment bearings, guides and stops for wear and damage</td>
</tr>
<tr>
<td>Proper securing of the attachment to the truck and the load-bearing components for secure fit and damage</td>
</tr>
<tr>
<td>The function of the attachment and for damage</td>
</tr>
<tr>
<td>Cylinder seals for leaks and damage</td>
</tr>
<tr>
<td>Hydraulic connections, hoses and pipes are secure, and for leaks and damage</td>
</tr>
<tr>
<td>The pistons and piston rods for wear and damage</td>
</tr>
</tbody>
</table>

### Crane hook

<table>
<thead>
<tr>
<th><strong>Hydraulic operations</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper securing of the attachment to the truck and the load-bearing components for secure fit and damage</td>
</tr>
</tbody>
</table>

### Wiper/washer system

<table>
<thead>
<tr>
<th><strong>Chassis/structure</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The windscreen washer reservoir for leaks and damage</td>
</tr>
<tr>
<td>The function of the windscreen wipers and for damage</td>
</tr>
</tbody>
</table>

### Trailer coupling

<table>
<thead>
<tr>
<th><strong>Chassis/structure</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The function of the trailer coupling and for damage</td>
</tr>
</tbody>
</table>

### Seat heating

<table>
<thead>
<tr>
<th><strong>Electrical system</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connections and cables are secure and for insulation damage and other damage</td>
</tr>
<tr>
<td>Section</td>
</tr>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>Shock sensor / data recorder</td>
</tr>
<tr>
<td><strong>Data radio</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Road traffic approval</strong></td>
</tr>
<tr>
<td>Video system</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Work lights</strong></td>
</tr>
<tr>
<td><strong>Fire extinguisher</strong></td>
</tr>
<tr>
<td><strong>Weigher sensors / switches</strong></td>
</tr>
<tr>
<td><strong>Access module</strong></td>
</tr>
<tr>
<td><strong>Weather proofing</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Chassis/structure</strong></td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Electrical optional equipment**

<table>
<thead>
<tr>
<th><strong>Electrical system</strong></th>
<th>The function of the optional electrical equipment and for damage</th>
</tr>
</thead>
</table>

**Optional equipment**

<table>
<thead>
<tr>
<th><strong>Chassis/structure</strong></th>
<th>The function of optional equipment such as mirrors, storage compartments, grips, windscreen wipers and washing systems, etc. and for damage</th>
</tr>
</thead>
</table>

**Strobe light / beacon**

<table>
<thead>
<tr>
<th><strong>Electrical system</strong></th>
<th>Strobe light/warning beacon for function and damage</th>
</tr>
</thead>
</table>

**Overhead guard cover**

<table>
<thead>
<tr>
<th><strong>Chassis/structure</strong></th>
<th>Overhead guard cover is present and secure, and for damage</th>
</tr>
</thead>
</table>

**Audible warning devices**

<table>
<thead>
<tr>
<th><strong>Electrical system</strong></th>
<th>Buzzer/warning alarm is secure and functions correctly and for damage</th>
</tr>
</thead>
</table>

**Belt lock control**

<table>
<thead>
<tr>
<th><strong>Chassis/structure</strong></th>
<th>The function of the seat belt monitoring and for damage</th>
</tr>
</thead>
</table>

**Automatic crawl speed**

<table>
<thead>
<tr>
<th><strong>Travel</strong></th>
<th>Sensors/switches are secure and function correctly and for damage</th>
</tr>
</thead>
</table>

**Discharge strap**

<table>
<thead>
<tr>
<th><strong>Electrical system</strong></th>
<th>Electrostatic discharge strap or chain is present and for damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restraint system / SUN protector</td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Electrical system</strong></td>
<td></td>
</tr>
<tr>
<td>The secure seating of the electrical connections and for damage.</td>
<td></td>
</tr>
<tr>
<td>Restraint system is complete and functions correctly and for damage</td>
<td></td>
</tr>
<tr>
<td>Connections and cables are secure and for insulation damage and other damage</td>
<td></td>
</tr>
<tr>
<td><strong>Chassis/structure</strong></td>
<td></td>
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<tr>
<th>Lead-acid battery, international</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power supply</strong></td>
</tr>
<tr>
<td>The secure seating of the battery, battery cables and cell connectors and for damage</td>
</tr>
<tr>
<td>The presence of safety labels are present and for damage</td>
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</tbody>
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</tr>
</tbody>
</table>
1.2.3 Maintenance parts

The manufacturer recommends the replacement of the following maintenance parts at the specified intervals.

1.2.3.1 Standard equipment

<table>
<thead>
<tr>
<th>maintenance part</th>
<th>service hours</th>
<th>months</th>
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<tbody>
<tr>
<td>Brake fluid</td>
<td>2000</td>
<td>24</td>
</tr>
<tr>
<td>Hydraulic oil</td>
<td>2000</td>
<td>12</td>
</tr>
<tr>
<td>Hydraulic system - breather filter</td>
<td>2000</td>
<td>12</td>
</tr>
<tr>
<td>Hydraulic oil filter</td>
<td>2000</td>
<td>12</td>
</tr>
<tr>
<td>Hydraulic oil filter, seal kit</td>
<td>2000</td>
<td>12</td>
</tr>
<tr>
<td>Transmission oil</td>
<td>1000</td>
<td>12</td>
</tr>
</tbody>
</table>