Original instructions

Electric Truck

RCE 30
RCE 30 Li-Ion
RCE 35
RCE 35 Li-Ion



5454 5455 5456 5457

first in intralogistics

5001 801 1627 EN - 10/2023 - 04

Address of manufacturer and contact details

STILL GmbH
Berzeliusstraße 10
22113 Hamburg, Germany
Tel. +49 (0) 40 7339-0
Fax: +49 (0) 40 7339-1622
Email: info@still.de
Website: http://www.still.de

Made in China

Rules for the operating company of industrial trucks

In addition to these operating instructions, a code of practice containing additional information for the operating companies of industrial trucks is also available.

This guide provides information for handling industrial trucks:

- Information on how to select suitable industrial trucks for a particular area of application
- Prerequisites for the safe operation of industrial trucks
- Information on the use of industrial trucks
- Information on transport, initial commissioning and storage of industrial trucks

Internet address and QR code

The information can be accessed at any time by pasting the address **https://m.still.de/vdma** in a web browser or by scanning the QR code.

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1

Introduction

Your industrial truck

Technical description

This series of electrict trucks enables the loading and palletising of loads of up to 3.0 or 3.5 tonnes, depending on the model. Refer to each load capacity diagram for load centre of gravity data.

The truck benefits from a compact design and good visibility characteristics. It offers optimum stability and safe turning during hard cornering. The truck has an electric drive unit and an electric motor with a hydraulic pump for the steering and working hydraulics.

This forklift range includes the following models:

Electric forklift trucks in this range:
RCE 30,RCE 35, RCE 30 Li-Ion, RCE 35 Li-Ion

If you require further information on the different versions, contact your authorised dealer.

Drive

The front wheels are directly driven by the drive axle, which connects to the drive motor via the transmission gear.

The power required is supplied by the power battery installed in the truck.

Steering

Steering wheel operation effortlessly controls the steering cylinder of the power steering system, allowing the truck to turn.

A compact steering axle allows the truck to perform tight and stable corning on the spot.

Hydraulics

The hydraulic system consists of an electric motor with a hydraulic pump (for steering and mast lifting), tilt cylinders for the lift mast, a breather filter, oil return filter and hydraulic oil tank as well as a suction filter.

Operation

On single-pedal models, the drive motor is controlled by the forward pedal and reversing switch; on dual-pedal models, the drive motor is controlled by forward and reverse accelerator pedals. Forward and reverse speeds can be adjusted between standstill and maximum speed.

The driver uses both hands to control steering and various operations,

thereby enabling quick direction changes and efficient stacking.

A joystick is used to control the lifting, lowering and tilting movements.

There is also another joystick for operating other accessories.

If necessary, all operational movements (lifting, lowering and tilting) can also be controlled with single joystick operation.

Brakes

Service braking of the truck can be achieved using the brake pedal. When the accelerator pedal is released, the truck performs electrical braking using braking controls (LBC). This truck is equipped with an energy recovery system. When driving, braking, or when the accelerator pedal is not pressed, energy is transformed into electrical energy and recharges the power battery.

The parking brake is actuated using the foot brake.

Electrical system

The well-protected electronic system is located on the inside of the interior trim panel, on the right side of the truck.

The required power is supplied by the power battery built into the chassis.

General

The industrial truck described in these operating instructions conforms with the applicable standards and safety regulations.

The industrial truck is fitted with state-of-the-art technology. Following these operating instructions will allow the industrial truck to be handled safely. By complying with the specifications in these operating instructions, the functionality and the approved features of the industrial truck will be retained.

Get to know the technology, understand it and use it safely - these operating instructions provide the necessary information and help to avoid accidents and to keep the truck ready for operation beyond the warranty period.

Therefore:

– Before commissioning the industrial truck, read the operating instructions and follow the instructions.

– Always follow all the safety information contained in the operating instructions and on the industrial truck.

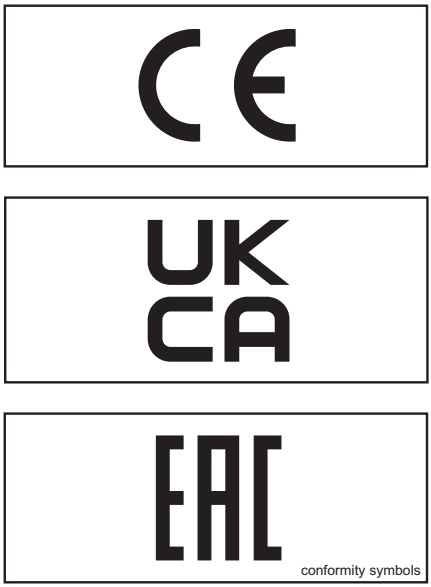
Conformity marking

The manufacturer uses the conformity marking to document the conformity of the industrial truck with the relevant directives at the time of placing on the market:

- CE: in the European Union (EU)
- UKCA: in the United Kingdom (UK)
- EAC: in the Eurasian Economic Union

The conformity marking is applied to the nameplate. A declaration of conformity is issued for the EU and UK markets.

An unauthorised structural change or addition to the industrial truck can compromise safety, thus invalidating the declaration of conformity.



conformity symbols

Declaration that reflects the content of the declaration of conformity

Declaration

STILL GmbH
Berzeliusstraße 10
22113 Hamburg Germany

We declare that the specified machine conforms to the most recent valid version of the directives specified below:

Industrial truck type	**corresponding to these operating instructions**
Model	**corresponding to these operating instructions**

– "Machinery Directive 2006/42/EC" [1)]
– "Supply of Machinery Safety Regulations 2008, 2008 No. 1597" [2)]

Personnel authorised to compile the technical documents:

See declaration of conformity

STILL GmbH

[1)] For the markets of the European Union, the EU candidate countries, the EFTA States and Switzerland.
[2)] For the United Kingdom market.

The declaration of conformity document is supplied with the industrial truck. The declaration shown explains the conformity with the provisions of the EC Machinery Directive and the Supply of Machinery Safety Regulation 2008, 2008 No. 1597.

An unauthorised structural change or addition to the industrial truck can compromise safety, thus invalidating the declaration of conformity.

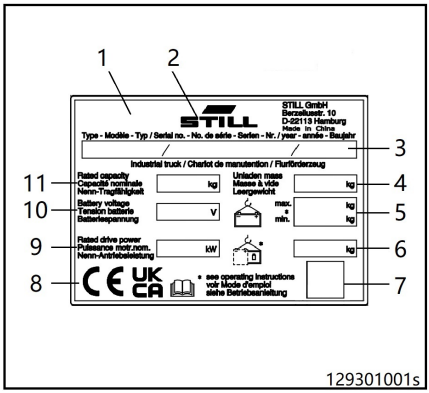
The declaration of conformity must be carefully stored and made available to the responsible authorities if necessary. It must also be handed over to the new owner if the industrial truck is sold on.

Declarations of conformity in accordance with directive RED 2014/53/EU

The manufacturers of the radio equipment installed in the industrial truck declare that the radio equipment corresponds to the Directive RED 2014/53/EU.

Nameplate

▷



1 Nameplate
2 Manufacturer
3 Model/Product no./Year of manufacture
4 Unladen mass
5 Battery weight (max./min.)
6 Service weight
7 Placeholder for "Data matrix code"
8 Conformity marking:
CE mark for the markets of the EU, the EU candidate countries, the EFTA States and Switzerland
UKCA mark for the United Kingdom market
EAC mark for the Eurasian Economic Union market
9 Rated drive power
10 Battery voltage
11 Rated capacity

NOTE

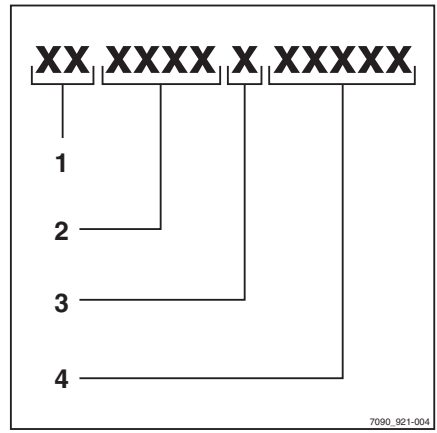
- *It is possible for there to be multiple conformity markings on the nameplate.*
- *The EAC mark may also be located in the immediate vicinity of the nameplate.*

Serial number

The serial number is used to identify the truck. The serial number is shown on the nameplate. Quote the serial number for all technical questions.

The serial number contains the following coded information:

1 Production location
2 Model
3 Year of manufacture
4 Sequential number



Using the truck

Commissioning

Commissioning is the initial intended use of the truck.

The necessary steps for the commissioning vary depending on the model and equipment of the truck. These steps require preparatory work and adjustment work that cannot be performed by the operating company. See also the chapter entitled "Definition of responsible persons".

– To commission the truck, contact the authorised service centre.

Intended use

The industrial truck may be used only for its intended purpose.

The industrial truck is intended for moving and lifting the loads specified on the capacity rating plate while observing the instructions given in these operating instructions.

Damage and faults

Report damage or other faults on the industrial truck or the attachment to supervisory personnel immediately. Industrial trucks and attachments that are not operationally safe must not be used until they are properly repaired.

Do not remove or deactivate safety systems and switches. Fixed set values may only be changed with the approval of the manufacturer.

Danger area

The danger area is the area within which people may be at risk due to the movements of the industrial truck, its working equipment, its lifting accessories (e.g. attachments) or the goods that are carried. This also includes the area that can be affected by falling cargo or by lowering or falling working equipment.

People must not stand in the danger area of an industrial truck.

Working area

It is only permitted to drive on routes authorised for traffic by the operating company or its representatives. Traffic routes must be free from obstacles. Loads may only be set down and stored in the designated areas provided for this purpose.

Roadways

Roadways must be sufficiently firm, level and free from objects. Drainage channels, level crossings and similar obstacles must be evened out and, if necessary, ramps must be provided so that trucks can drive over these obstacles with as few bumps as possible.

Industrial trucks may only be used on roadways that do not have bends that are too sharp, gradients that are too steep or entrances that are too narrow or low.

Gradients may not exceed the values given in the operating instructions and must have a sufficiently rough surface. The top and bottom of the gradient must feature smooth and gradual transitions to prevent the load from scraping the ground and the undercarriage from being damaged.

Industrial trucks must not be parked on surfaces with a gradient. If this cannot be avoided, the industrial truck must be secured using wheel chocks in addition to the activated parking brake.

Do not exceed the permitted area load and point load of the roadway. There must be sufficient distance between the highest points of the industrial truck or the load and the fixed elements of the surrounding area.

Within the EU, the current version of directive 89/654/EEC (minimum safety and health requirements for the workplace) must be observed. The respective national guidelines apply for areas outside the EU.

Hazardous areas on roadways must be secured or indicated by the customary road traffic signs and, if applicable, by additional warning signs.

When driving on public roads, the national regulations pertaining to drivers and industrial trucks must be observed. Observe country-specific restrictions for winter road conditions.

Fire protection

The operating company must ensure that suitable fire protection is available for the relevant application in the surroundings of the industrial truck. Depending on the application, additional fire protection on the industrial truck may be necessary. If in doubt, the responsible fire brigade can be contacted.

Attachments

Attachments may only be used for their intended purpose. Drivers must be taught how to operate the attachments.

Attachment operating instructions are enclosed for industrial trucks that are delivered from the factory with an attachment. Before commissioning an industrial truck with an attachment, check that loads are handled safely. Depending on the type of attachment, it may be necessary to make adjustments, e.g. pressure settings or adjusting stops and operating speeds. Corresponding instructions can be found in the operating instructions for the attachment.

If attachments are not supplied with the industrial truck, the specifications of the industrial truck manufacturer and the attachment manufacturer must be observed.

Mounting the attachment and connecting the energy supply for power-driven attachments must only be performed by competent persons in accordance with the information provided by the manufacturers. After each installation, the function of the attachments must be checked prior to initial commissioning.

The permissible load capacity of the attachment and the permissible load (load capacity and load moment) of the industrial truck must not be exceeded by the combination of attachment and payload, see additional capacity rating plate.

Modifications, in particular attachments or conversions, are not permitted to be made to the industrial truck without the manufacturer's approval.

Towing device

Industrial trucks are suitable for the occasional towing of trailers on the premises.

The permissible towed load for unbraked trailers specified in the operating instructions must not be exceeded.

The national regulations for the use of unbraked trailers on industrial trucks must be observed.

Software updates via radio transmission

Via radio, security updates can be transmitted, functions updated or new functions enabled wirelessly.

Security updates are provided to ensure the safety of the industrial truck. These must be actioned.

Newly enabled functions may only be put into operation if the operating instructions for the newly enabled functions have been downloaded from the manufacturer portal and read. If you require any support, contact your service partner.

Improper use

The operating company or driver, and not the manufacturer, is liable if the truck is used in a manner that is not permitted.

⚠ WARNING

One of the main causes of accidents is the driver ignoring or being unaware of the basic safe operating practices of the truck.

The following basic safe operating practices must be observed to ensure the safety of operators and others.

⚠ DANGER

High risk of injury, death and property damage.

Avoid the use of prohibited substances.

The list below is merely illustrative and not exhaustive.

Never operate the truck in environments with a potentially explosive atmosphere.

Do not carry another passenger (unless a "two-person seat" is installed).

Do not overload the truck (by exceeding the rated load indicated on the load designation plate). Overloading can affect braking distances, truck stability and the strength of the lift mast.

Do not pick up an off-centre load.

Do not stand on the fork arms when they are lifting.

Do not increase the load capacity of the truck, by adding extra weight, for example.

Do not stack loads or turn when driving on a ramp.

Do not operate the truck on loose or greasy surfaces.

Do not drive on uneven or obstructed surfaces.

Never park the truck in a place that may obstruct fire extinguishers, fire escapes or aisles.

Do not dismount from the truck while it is moving.

Do not leave the truck unattended when the load is raised.

Never leave the vehicle unattended on a ramp.

When driving, do not place any part of your body outside the confines of the truck, lean on the edge of the truck or attempt to jump onto another truck or object.

Do not use the forks or any other part of the truck to push, pull or support items, unless the design permits this.

Operating steps

Adjust your driving style based on the conditions of the route, especially in hazardous work areas and when transferring loads.

Always look in the direction of travel.

Look out for pedestrians, to prevent the possibility of them becoming trapped between the truck and fixed obstacles.

Always sound the horn when approaching blind spots.

The truck and attachments must only be used for authorised applications.

Follow the instructions in the user manual when transporting loads.

On a ramp: Ensure that the truck has sufficient ground clearance to avoid striking the surface of the ramp. • Fully raise the load to avoid striking the surface of the ramp.

Drive a loaded truck forward when going uphill.

Drive a loaded truck in reverse when going downhill.

When raising a spreader, ensure that there is enough clearance.

When working near overhead power lines, observe the safety distances set by the competent authorities.

Only travel on surfaces that can withstand the combined weight of the truck and load.

Before leaving the operator's driving position, turn off the ignition and make sure you have applied the parking brake.

When driving, maintain a safe stopping distance from any vehicle or pedestrians in front of you.

Drivers should move off, brake, turn and reverse smoothly. Avoid sudden stops, sharp turns and overtaking at dangerous or blind spots.

Ensure that there is adequate ventilation when using the truck in enclosed or partially enclosed areas.

Summary

A safe, competent operator is one who takes pride in the way they operate their truck, respects the goods they handle and follows the correct operating procedures. **They never take risks**.

Precautions

– Do not drive on steep slopes, to prevent the load from slipping off.

– The truck must be switched off when left unattended. Key (or key code) must be removed when the truck is unattended to prevent unauthorised use.

– When using this truck, pay attention to the surroundings and do not become distracted.

– Please pay attention to the moving parts of the truck to prevent your hands from being crushed.

Description of use and climatic conditions

Normal use

– Indoor and outdoor use.

– Ambient temperature ranging from-20 to + 40°C for truck with lead-acid batteries.

– Ambient temperature ranging from-10 to + 40°C for truck with lithium-Ion batteries.

– Use at up to 2000 metres above sea level.

Special uses (applies to trucks with special equipment)

– Ambient temperature in tropical regions up to +40°C.

– Cold store version reaches -25°C

Parking in temperatures below -10 °C

⚠ CAUTION

Batteries may freeze or switch off!

If the truck is parked in an ambient temperature of below -10°C for an extended period, the batteries will cool down.

For lead-acid batteries, the electrolyte can freeze and damage the batteries.

Some types of lithium-ion batteries switch off at a certain temperature. These batteries cannot be switched on again until the operating temperature is reached.

The truck is then not ready for operation.

– At ambient temperatures of below -10°C, only park the truck for short periods of time.
– Pay attention to the equipped battery and the corresponding operating instructions.

Using working platforms

⚠ WARNING

The use of working platforms is regulated by national law. The use of working platforms is only permitted by virtue of the jurisdiction in the country of use.

– Observe national legislation.
– Before using working platforms, consult the national regulatory authorities.

Information about documentation

Documentation scope

- Operating instructions
- Operating instructions for attachment parts (special equipment)
- Spare parts list

These operating instructions describe all measures necessary for the safe operation and proper maintenance of the truck in all possible variants at the time of printing. Special designs to meet customer requirements are documented in separate operating instructions. If you have any questions, please contact your service centre.

Enter the production number and the year of production located on the nameplate in the field provided:

Production no. .....

Year of production .....

Please quote these numbers for all technical enquiries.

Operating instructions are provided with each truck. These instructions must be stored carefully and must be available to the driver and operator at all times.

If the operating instructions are lost, the operator must immediately request a replacement from the manufacturer.

The spare parts list can be reordered there as a spare part.

Personnel responsible for operating and maintaining the equipment must be familiar with these operating instructions.

The operating company (see the chapter “Definition of responsible persons”) must ensure that all operators have received, read and understood these instructions.

Thank you for reading and complying with these operating instructions. If you have any questions or suggestions for improvements, or if you have found any faults, please contact your service centre.

Supplementary documentation

This industrial truck can be fitted with a **C**ustomer **O**ption (**CO**) that deviates from the standard equipment and the variants.

This CO may consist of:

- Special sensors
- A special attachment
- A special towing device
- Customised attachments

When fitted with a CO, the industrial truck is provided with additional documentation. This may take the form of an insert or separate operating instructions.

The original operating instructions for this industrial truck are valid for the operation of standard equipment and variants without restriction. The operational and safety

information in the original operating instructions continues to be valid in its entirety unless it is countermanded in this additional documentation.

The requirements for the qualification of personnel as well as the time for maintenance may vary. This is defined in the additional documentation.

– If you have any questions, contact your authorised service centre.

Issue date and topicality of the operating instructions

The issue date and the version of these operating instructions can be found on the title page.

STILL is constantly engaged in the further development of trucks. These operating instructions are subject to change, and any claims based on the information and/or illustrations contained in them cannot be asserted.

Please contact your authorised service centre for technical support relating to your truck.

Copyright and trademark rights

These instructions must not be reproduced, translated or made accessible to third parties—including as excerpts—except with the express written approval of the manufacturer.

Explanation of signal terms used

⚠ DANGER

Indicates procedures that must be strictly adhered to in order to prevent the risk of fatalities.

⚠ WARNING

Indicates procedures that must be strictly adhered to in order to prevent the risk of injuries.

⚠ CAUTION

Indicates procedures that must be strictly adhered to in order to prevent material damage and/or destruction.

NOTE

For technical requirements that require special attention.

ENVIRONMENT NOTE

To prevent environmental damage.

Date of edition and latest update of this manual

The publication date of these operating instructions is printed on the cover sheet.

The manufacturer makes continuous efforts to improve its industrial trucks, and therefore reserves the right to implement changes and to accept no claims concerning the information provided in this manual.

To receive technical assistance, please contact the service centre authorised by your closest manufacturer.

List of abbreviations

This list of abbreviations applies to all types of operating instructions. Not all of the abbreviations that are listed here will necessarily appear in these operating instructions.

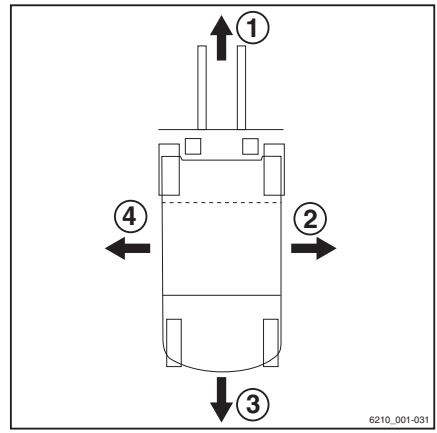
Abbreviation	Meaning	Explanation
ArbSchG	Arbeitsschutzgesetz	German implementation of EU occupational health and safety directives
Betr-SichV	Betriebssicherheitsverordnung	German implementation of the EU working equipment directive
BG	Berufsgenossenschaft	German insurance company for the company and employees
BGG	Berufsgenossenschaftlicher Grundsatz	German principles and test specifications for occupational health and safety
BGR	Berufsgenossenschaftliche Regel	German rules and recommendations for occupational health and safety
DGUV	Berufsgenossenschaftliche Vorschrift	German accident prevention regulations
CE	Communauté Européenne	Confirms conformity with product-specific European directives (CE labelling)
CEE	Commission on the Rules for the Approval of the Electrical Equipment	International commission on the rules for the approval of electrical equipment
DC	Direct Current	Direct current
DFÜ	Datenfernübertragung	Remote data transfer
DIN	Deutsches Institut für Normung	German standardisation organisation
EG	European Community	
EN	European standard	
FEM	Fédération Européene de la Manutention	European Federation of Materials Handling and Storage Equipment

Abbreviation	Meaning	Explanation
F_{max}	maximum Force	Maximum power
GAA	Gewerbeaufsichtsamt	German authority for monitoring/issuing regulations for worker protection, environmental protection, and consumer protection
GPRS	General Packet Radio Service	Transfer of data packets in wireless networks
ID no.	Identification number	
ISO	International Organization for Standardization	International standardisation organisation
K_{pA}	Uncertainty of measurement of sound pressure levels	
LAN	Local Area Network	Local area network
LED	Light Emitting Diode	Light emitting diode
L_p	Sound pressure level at the workplace	
L_{pAZ}	Average continuous sound pressure level in the driver's compartment	
LSP	Load centre of gravity	Distance of the centre of gravity of the load from the front face of the fork backs
MAK	Maximum workplace concentration	Maximum permissible air concentrations of a substance at the workplace
Max.	Maximum	Highest value of an amount
Min.	Minimum	Lowest value of an amount
PIN	Personal Identification Number	Personal identification number
PPE	Personal protective equipment	
SE	Super-Elastic	Superelastic tyres (solid rubber tyres)
SIT	Snap-In Tyre	Tyres for simplified assembly, without loose rim parts
StVZO	Straßenverkehrs-Zulassungs-Ordnung	German regulations for approval of vehicles on public roads
TRGS	Technische Regel für Gefahrstoffe	Ordinance on hazardous materials applicable in the Federal Republic of Germany
UKCA	United Kingdom Conformity Assessed	Confirms conformity with the product-specific directives that apply in the United Kingdom (UKCA labelling)
VDE	Verband der Elektrotechnik Elektronik Informationstechnik e. V.	German technical/scientific association
VDI	Verein Deutscher Ingenieure	German technical/scientific association

Abbreviation	Meaning	Explanation
VDMA	Verband Deutscher Maschinen- und Anlagenbau e. V.	German Mechanical Engineering Industry Association
WLAN	Wireless LAN	Wireless local area network

Definition of directions

The directions "forwards" (1), "backwards" (3), "right" (2) and "left" (4) refer to the installation position of the parts as seen from the driver's compartment; the load is to the front.

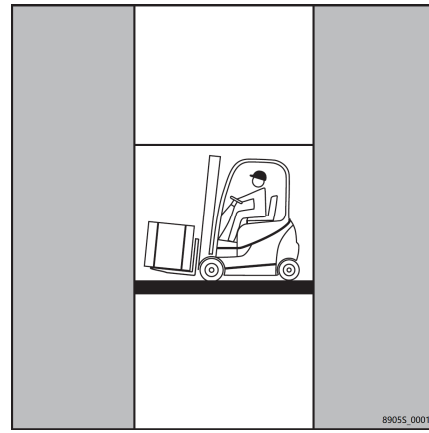


Illustrations

At many points in this documentation the (mostly sequential) operation of certain functions or operating procedures is explained. To illustrate these operations, schematic representations of an truck are used.

NOTE

These schematic representations do not represent the design state of the documented truck. They only serve to illustrate operating procedures.



Environmental considerations

Packaging

During delivery of the truck, certain parts are packaged to provide protection during transport. This packaging must be removed completely prior to initial start-up.

ENVIRONMENT NOTE

The packaging material must be disposed of properly after delivery of the truck.

Disposal of components and batteries

The truck is composed of different materials. If components or batteries need to be replaced and disposed of, they must be:

- disposed of,
- treated or
- recycled in accordance with regional and national regulations.

NOTE

The documentation provided by the battery manufacturer must be observed when disposing of batteries.

ENVIRONMENT NOTE

We recommend working with a waste management company for disposal purposes.

2

Safety

Safety guidelines

The operating company or the person it has commissioned must ensure that the driver understands all safety information and that all directives and safety regulations are observed.

During training, drivers must familiarise themselves with the following:

- The operating conditions of the working area
- The specific technical characteristics of the industrial truck
- The operation of attachments

Driving, control and steering operations must be practised with an unladen industrial truck until they are completely mastered. Only then may a laden industrial truck be used for practice.

Operating safely

⚠ DANGER

The industrial truck must not be used by unauthorised persons.

Only persons who are trained, authorised and commissioned to operate the industrial truck may have access to the industrial truck.

Controlled access is possible via the switch key or an input unit with a keypad or with a transponder.

⚠ DANGER

Risk of fatal injury due to insufficient visibility.

Trucks may only be operated if the driver has sufficient visibility.

– Ensure that there is sufficient light in the working area or use working spotlights.

– Glare caused by lighting (e.g. clipboard lighting). If necessary, adjust or switch off the lighting accordingly.

– The windscreen, rear window, roof panel and side windows as well as the rear-view mirror and lighting must be cleared of misting and, if necessary, dirt, ice and snow before driving off.

– For trucks with a driver's cab without a heating system or without air conditioning, the driver must ensure that they have a clear view by ventilating the cab during operation.

⚠ DANGER

Safety systems (e.g. the seat switch) are in place to ensure safety.

Under no circumstances may any safety systems be disabled.

⚠ DANGER

Risk of fire due to hot exhaust gases!

Exhaust gases become so hot that materials in the immediate vicinity may smoulder or burn.

Deposits of combustible materials may ignite in the vicinity of hot components, e.g. exhaust pipes.

– Observe the following courses of action!

– Maintain an appropriate safety distance between combustible materials and the exhaust gas outlet.

– If materials start to burn, take appropriate fire extinguishing measures immediately.

– Remove deposits on hot components.

– Keep away from flammable liquids.

⚠ WARNING

Risk of burns due to hot exhaust gases.

Exhaust gases and exhaust-gas-routing components become so hot that direct body contact can cause burns.

– Do not touch hot components.

⚠ CAUTION

Various pieces of special equipment are connected to the "speed reduction" special function. This is purely an assistance function, and the driver must not rely solely on this function during operation.

The driver is always responsible for safe operation.

NOTE

If the truck is equipped with a fire extinguisher, make sure that you familiarise yourself with how to use it in the event of an emergency. Instructions for use are provided on the fire extinguisher.

Working on the truck

⚠ DANGER

Any additional bores or welding on the overhead guard will compromise its rigidity.

It is therefore strictly prohibited to drill bores in the overhead guard or to perform welding work on it.



⚠ WARNING

Depending on the duration of use and operating time, components carrying exhaust gases and exhaust air may become hot.

Protective equipment must therefore be worn.

⚠ WARNING

In trucks with an accumulator, serious injuries may occur if the accumulator is handled incorrectly.

Before starting work on the accumulator, it must be depressurised.

Contact your service partner.

⚠ CAUTION

Welding operations on other parts of the truck can cause damage to the electronics.

Therefore, always disconnect the battery and all connections to the electronic controls before performing any welding work.

⚠ CAUTION

Various functions are supported by gas springs. Gas springs are subjected to a high internal pressure of up to 300 bar.

Gas springs may be removed only when they are not under tension, and must never be opened without prior instruction. Any kind of damage, lateral forces, buckling, temperatures in excess of 80°C and heavy contamination must be avoided under all circumstances.

Damaged or defective gas springs must be replaced immediately.

Contact your service partner.

Safety information for electromagnetic compatibility

⚠ WARNING

In operating areas with magnetic fields that have a magnetic flux density greater than 5 mT, unintentional truck movements and lift mast movements cannot be entirely excluded in unfavourable circumstances.

For magnetic fields with magnetic flux densities greater than 5 mT, components developed especially for this purpose must be used.

Contact your service partner.

Magnetic flux densities greater than 5 mT can occur in induction furnaces for metal smelting (e.g. aluminium), with resistance welders for seam or spot welding, or on strong demagnetisation coils, for example. However, as the flux densities reduce to a fraction as the distance increases by e.g. 50 cm, actual influences are not known to occur in practice.

Electromagnetic radiation emitted by the industrial truck is far below the permissible limit values in Europe. The immunity to electromagnetic radiation is above the minimum legal values.

⚠ WARNING

If a driver has active medical equipment such as a pace maker, defibrillator, cochlear implant, insulin pump or hearing aid, there is a possibility that the capabilities of the driver could be impaired.

The operating company must take drivers whose capabilities are restricted due to implanted or body-worn medical equipment into account in the hazard assessment. The instructions of the physician and of the manufacturer of the medical equipment must be followed.

⚠ WARNING

Risk from non-ionising radiation from retrofitted devices (e.g. radio transmitter).

Persons with active or non-active implanted medical equipment must not be exposed to excessive non-ionising radiation from the electromagnetic fields of retrofitted devices.

The guidelines from the respective device manufacturer must be followed. If necessary, fit a notice warning about non-ionising radiation within the field of vision of the driver.

Data security

Input unit with a transponder

For input units with a chip or a chip card, the access code is transmitted wirelessly.

The wireless technology for the transponder is not protected against manipulation. It is therefore possible that the access code could be read out without authorisation when commissioning the industrial truck.

Communication unit

The communication unit allows the position of the industrial truck to be determined via wireless communication with a global navigation satellite system.

Communication with a global navigation satellite system, such as GPS, can theoretically be interrupted or manipulated. As a result, the location data for the industrial truck could be unavailable or incorrect.

Special notes for using lithium-ion batteries

The following special features apply for the operating company and drivers when this truck is equipped with a lithium-ion battery (variant) in place of a conventional lead-acid battery.



⚠ DANGER

Risk of explosion!

Heating to over 80°C, mechanical stress and incorrect use may lead to the battery exploding.

- Never heat the battery to over 80°C or expose it to naked flames.
- Do not subject the battery to excessive mechanical loads.
- Do not climb on the battery.
- Avoid impacts.
- Do not open the battery.
- Never short-circuit the battery connectors.
- Do not connect the battery with the polarity reversed.

Permissible lithium-ion batteries

– Use only lithium-ion batteries that have been approved by STILL for use with this truck.

Declaring the use of lithium-ion batteries

We recommend that the operating company informs the local fire brigade of the planned use of trucks fitted with lithium-ion batteries.

The health and safety representative and the workforce must also be informed that trucks with lithium-ion batteries are being used.

Hazard assessment

In accordance with §3 of the German Ordinance on Industrial Safety and Health (BetrSichV), the operating company is obliged to perform a separate hazard assessment in order to assess the risks posed to the company by lithium-ion batteries.

– Observe the national regulations for the country in which the truck is being used.

Driver qualification

In addition to the prerequisites set out in the chapter entitled "Definition of responsible persons", in the section entitled "Driver", please observe the following:

- The driver must be instructed in how to operate the lithium-ion battery.
- This truck must only be driven by drivers who have received instruction on the operation and the dangers of the lithium-ion batteries.

Procedure in the event of a fire

Damaged lithium-ion batteries pose an increased fire hazard. In the event of a fire, large quantities of water are the best option to cool the battery.

– Evacuate the location of the fire as quickly as possible.

– Ventilate the location of the fire well, as the resulting combustion gases are corrosive if inhaled.
– Inform the fire brigade that lithium-ion batteries are affected by the fire.
– Observe the information provided by the battery manufacturer regarding the procedure in the event of a fire.

Water can be used to cool down an incipient fire.

Transport

In certain circumstances, transporting the lithium-ion battery outside the premises may require a special transport container.

– Contact the authorised service centre for more information.

Stability

Stability is guaranteed if your industrial truck is used according to its intended use.

The following actions may jeopardise stability:

- Driving with a raised load
- Cornering at excessive speeds
- Driving with a load that is protruding to the side (e.g. sideshift)
- Turning on and driving diagonally across descents or ascents
- Driving on descents or ascents with the load on the downhill side
- Loads that are too wide
- Driving with a swinging load
- Driving over ramp edges or steps

In the case of tip-over



d3921101

- Stay buckled up
- Don't jump
- Hold on tight
- Brace feet
- Lean away

The stability of your industrial truck is ensured if used properly and as intended. Should the industrial truck tip over during an unapproved application or due to incorrect operation, always follow the instructions depicted above.

Definition of terms used for responsible persons

Specialist

A qualified person is defined as a service engineer or a person who fulfils the following requirements:

- A completed vocational qualification that demonstrably proves their professional expertise. This proof should consist of a vocational qualification or a similar document.
- Professional experience indicating that the qualified person has gained practical experience of industrial trucks over a proven period during their career During this time, this person has become familiar with a wide range of symptoms that require checks to be carried out, such as based on the results of a hazard assessment or a daily inspection
- Recent professional involvement in the field of the industrial truck test in question and an appropriate further qualification are essential. The qualified person must have experience of carrying out the test in question or of carrying out similar tests. Moreover, this person must be aware of the latest technological developments regarding the industrial truck to be tested and the risk being assessed

Operating company

The operating company is the natural or legal person or group who operates the truck or on whose authority the truck is used.

The operating company must ensure that the truck is only used for its proper purpose and in compliance with the safety regulations set out in these operating instructions.

The operating company must ensure that all users read and understand the safety information.

The operating company is responsible for the scheduling and correct performance of regular safety checks.

We recommend that the national performance specifications are adhered to.

Drivers

This truck may only be driven by suitable persons who are at least 18 years of age, have been trained in driving, have demonstrated their skills in driving and handling loads to the operating company or an authorised representative, and have been specifically instructed to drive the truck. Specific knowledge of the truck to be operated is also required.

The training requirements under §3 of the Health and Safety at Work Act and §9 of the plant safety regulations are deemed to have been satisfied if the driver has been trained in accordance with BGG (General Employers' Liability Insurance Association Act) 925. Observe the national regulations for your country.

Driver rights, duties and rules of behaviour

The driver must be trained in his rights and duties.

The driver must be granted the required rights.

The driver must wear protective equipment (protection suit, safety footwear, safety helmet, industrial goggles and gloves) that is appropriate for the conditions, the job and the load to be lifted. Solid footwear should be worn to ensure safe driving and braking.

The driver must be familiar with the operating instructions and have access to them at all times.

The driver must:

- have read and understood the operating manual
- have familiarised himself with safe operation of the truck
- be physically and mentally able to drive the truck safely

⚠ DANGER

The use of drugs, alcohol or medications that affect reactions impair the ability to drive the truck!

Individuals under the influence of the aforementioned substances are not permitted to perform work of any kind on or with the truck.

Prohibition of use by unauthorised persons

The driver is responsible for the truck during working hours. He must not allow unauthorised persons to operate the truck.

When leaving the truck, the driver must secure it against unauthorised use, e.g. by pulling out the key.

Basic principles for safe operation

Insurance cover on company premises

The company premises are very often restricted public traffic areas.

NOTE

It is advisable to review the operational liability insurance so that insurance covers the truck with respect to third parties in the event of damage caused in restricted public traffic areas.

Modifications and retrofitting

If the industrial truck will be used for work that is not listed in the directives or in these instructions, the industrial truck must be converted or retrofitted for this purpose as required. Any structural modification can impair the handling and stability of the industrial truck, and can result in accidents.

Any modifications that adversely affect stability, load capacity and the circumferential view from the industrial truck require written approval by the manufacturer.

The following components may only be modified with prior written approval from the manufacturer:

- Brakes
- Steering
- Operating devices
- Safety systems
- Equipment variants
- Attachments

The industrial truck may be converted only with written approval by the manufacturer. If necessary, obtain approval from the relevant authorities.

– Only the authorised service centre is permitted to perform welding work on the industrial truck.

We warn against installing and using restraint systems that have not been approved by the manufacturer.

– Contact the authorised service centre before converting or retrofitting the truck.

Only the authorised service centre is permitted to perform welding work on the industrial truck.



⚠ DANGER

Risk of explosion from additional holes in the area surrounding the battery!

Explosive gases can escape and can lead to potentially fatal injuries if they explode. Sealing bores with plugs is not sufficient to prevent gas from escaping.

– Do not drill holes in the area surrounding the battery.

The operating company is permitted to make modifications to the industrial truck independently only if the manufacturer goes into liquidation and is not taken over by another legal person.

The operating company must also fulfil the following prerequisites:

- Design documents, test documents and assembly instructions associated with the modification must be permanently archived and remain accessible at all times.
- The capacity rating plate, the decal information, the hazard warnings and the operating instructions must be checked to ensure that they are consistent with the modifications and must be amended if required.
- Modifications must be designed, checked and implemented by a design office that specialises in industrial trucks. The design office must comply with the standards and directives valid at the time that modifications are made.

Decal information with the following data must be permanently affixed to the industrial truck so that it is clearly visible:

- Type of modification
- Date of modification
- Name and address of the company that carried out the modification

Changes to the overhead guard and roof loads

⚠ DANGER

In the event of the overhead guard failing due to a falling load or the truck tipping over, there are potentially fatal consequences for the driver. There is a risk to life!

Welding and drilling on the overhead guard changes the material characteristics and the structural design of the overhead guard. Excessive forces caused by falling loads or the truck tipping over may result in buckling of the modified overhead guard and no protection for the driver.

– Do not perform welding on the overhead guard.

– Do not perform drilling on the overhead guard.

⚠ CAUTION

Heavy roof loads damage the overhead guard!

To ensure the stability of the overhead guard at all times, a roof load may only be mounted on the overhead guard if the structural design has been tested and the manufacturer has given approval.

– Seek advice from the authorised service centre for the mounting of roof loads.

Warning regarding non-original parts

Original parts, attachments and accessories are specially designed for this truck. We draw your attention to the fact that parts, attachment parts and accessories supplied by other companies have not been tested or approved by STILL.

⚠ CAUTION

The installation or use of such products may have a negative impact on the design of the truck and thus impair active or passive driving safety.

We recommend that you obtain approval from the manufacturer and, if applicable, from the relevant regulatory authorities before installing such parts. The manufacturer accepts no liability for any damage caused by the use of non-original parts and non-original accessories.

Damage, faults

Any damage or faults observed on the truck or the accessories must be reported immediately to the responsible personnel. The truck and accessories must never be used before they are correctly reconditioned as they cannot be guaranteed to be safe for operating or driving.

The safety mechanisms and switches must never be removed or disabled. The predefined setpoint values must not be modified.

Work on the electric installation (e.g. connecting a radio, additional lights or other accesso-

ries) is permitted only with the approval of the manufacturer.

Medical devices

The operation of medical devices, for example pacemakers or hearing aids, can be impaired. Check with your doctor or manufacturer if the medical devices are sufficiently protected against electromagnetic interference.

Battery connection cables

⚠ CAUTION

Using sockets with NON-ORIGINAL battery connection cables can be dangerous (see purchase references in the parts catalogue)

Wheels and tyres

⚠ DANGER

Risk to stability!

Failure to observe the following information and instructions can lead to a loss of stability. The truck may tip over — risk of accident!

The following factors can lead to a loss of stability and are therefore **prohibited**:

- Wheels not approved by the manufacturer
- Excessive wear to the tyres
- Tyres of inferior quality
- Changes to the wheel rims
- Combination of wheels from different manufacturers

The following rules must be observed to ensure stability:

- Only use wheels with equal and permitted levels of wear to the tyres.
- Only use tyres of the original tyre type.
- Only use wheels approved by the manufacturer.
- Only use high-quality products.

When changing wheels, always ensure that this does not cause the truck to tilt to one side

(e.g. always replace right and left wheels at the same time). Changes must only be made following consultation with the manufacturer.

Wheels approved by the manufacturer can be found on the spare parts list. If other wheels are to be used, authorisation from the manufacturer must be obtained beforehand.

– Contact your authorised service centre regarding this matter.

Damage, defects and misuse of safety systems

Damage or other defects on the truck or attachment must be reported to the supervisor or responsible fleet manager immediately so that they can have the defect rectified.

Trucks and attachments that are not functional or safe to drive may not be used until they have been properly repaired.

Do not remove or deactivate safety systems and switches.

Fixed set values may only be changed with the approval of the manufacturer.

Work on the electrical system (e.g. connecting a radio, additional headlights etc.) is only permitted with the manufacturer's written approval. All electrical system interventions must be documented.

Even if they are removable, roof panels may not be removed, as they are designed to protect against small falling objects.

Length of the fork arms

⚠ DANGER

Risk of accident due to the incorrect selection of fork arms!

– The fork arms must match the depth of the load.

If the fork arms are too short, the load may fall off the arms after it has been picked up. In addition, be aware that the load centre of gravity may shift as a result of dynamic forces, such as braking. A load that is otherwise resting

safely on the fork arms may move forwards and fall.

If the fork arms are too long, they can catch on loading units behind the load that is to be picked up. These other loading units then fall over when the load is raised.

– For help with selecting the correct fork arms, contact the authorised service centre.

Exercise caution when handling gas springs and accumulators

⚠ WARNING

Gas springs are under high pressure. Improper removal results in an elevated risk of injury.

For ease of operation, various functions on the truck can be supported by gas springs. Gas springs are complex components that are subject to high internal pressures (up to 300 bar). They may under no circumstances be opened unless instructed to do so, and may be installed only when not under pressure. If required, the authorised service centre will depressurise the gas spring in accordance with the regulations before removal. Gas springs must be depressurised before recycling.

– Avoid damage, lateral forces, buckling, temperatures over 80°C and heavy contamination.
– Damaged or defective gas springs must be changed immediately.
– Contact the authorised service centre.

⚠ WARNING

Accumulators are under high pressure. Improper installation of an accumulator results in an elevated risk of injury.

Before starting work on the accumulator it must be depressurised.

– Contact the authorised service centre.

Residual risks

Residual dangers, residual risks

Despite working with care and complying with the standards and regulations, the possibility of other dangers arising when using the truck cannot be ruled out.

The truck and all other system components comply with current safety requirements. Even when the industrial truck is used in accordance with its intended use and all instructions provided are followed, some residual risk cannot be excluded.

A residual risk cannot be excluded even beyond the narrow limits of the danger area that the truck itself represents. In order to be able to react immediately in the event of a malfunction, an incident, a breakdown etc., persons in the danger area must pay increased attention to the truck.

⚠ WARNING

All persons in the danger area of the truck must be aware of the dangers posed by the truck.

In addition, your attention is drawn to the safety regulations given in these operating instructions.

Risks can include:

- Escape of consumables due to leakages, rupture of lines and containers etc.
- Risk of accident when driving over difficult ground such as gradients, very smooth or uneven surfaces, or with poor visibility etc.
- Falling, tripping etc. on the truck, especially in wet weather, with leaking consumables or on icy surfaces
- Risk of fire and explosion from the batteries and electrical voltages
- Human error resulting from failure to observe the safety regulations
- Unrepaired damage or faulty and worn components
- Insufficient maintenance and testing
- Use of incorrect consumables
- Exceeding test intervals

If the operating company negligently or intentionally fails to comply with these require-

ments, this can lead to an accident. In this case, the manufacturer is exempt from liability.

Stability

The stability of the truck has been tested to the latest technological standards. If the truck is used in the proper manner and in accordance with its intended use, the stability of the truck is guaranteed. These standards only take into account the dynamic and static tipping forces that can arise when used in accordance with the specified operating rules and intended use. The danger of exceeding the moment of tilt and losing stability due to improper or incorrect operation can never be ruled out.

The loss of stability can be avoided or minimised by complying with following principles:

- Always secure the load against slipping, e.g. by lashing.
- Always transport unstable loads in suitable containers.
- Always drive slowly when cornering.
- Drive with the load lowered.
- On trucks fitted with a sideshift, align and transport loads such that the load centre of gravity is positioned centrally to the truck.
- Avoid turning and diagonally driving across slopes or gradients.
- Never have the load facing downhill when travelling on slopes or gradients.
- Always take great care when transporting suspended loads.
- Do not drive over ramp edges or steps.

Special risks associated with using the truck and attachments

Approval from the manufacturer and attachment manufacturer must be obtained each time the truck is used in a manner that falls outside the scope of normal use, and in cases where the driver is not certain that he can

use the truck correctly and without the risk of accidents.

Overview of hazards and countermeasures

NOTE

This table is intended to help evaluate the hazards in your facility and applies to all drive types. It does not claim to be complete.

– Observe the national regulations for the country in which the truck is being used.

Hazard	Course of action	Check note √ done - Not applicable	Notes
Truck equipment does not comply with local regulations	Testing	O	If in doubt, consult the responsible factory inspectorate or employers' liability insurance association
Driver's lack of skills or qualifications	Driver training (sit-on and stand-on)	O	DGUV principle 308-001 VDI 3313 driver's licence
Usage by unauthorised persons	Access with key only for authorised persons	O	
Truck not safe for operation	Periodic inspection and rectification of defects	O	German Ordinance on Industrial Safety and Health (BetrSichV)
Risk of falling when using working platforms	Compliance with national regulations (different national laws)	O	German Ordinance on Industrial Safety and Health (BetrSichV) and employer's liability insurance associations
Impaired visibility due to load	Application planning	O	German Ordinance on Industrial Safety and Health (BetrSichV)
Contamination of breathable air	Assessment of diesel exhaust gases	O	Technical Regulations for Hazardous Substances (TRGS) 554 and the German Ordinance on Industrial Safety and Health (BetrSichV)
	Assessment of LPG exhaust gases	O	German threshold limit values list (MAK-Liste) and the German Ordinance on Industrial Safety and Health (BetrSichV)

Hazard	Course of action	Check note √ done - Not applicable	Notes
Impermissible usage (improper usage)	Provide operating instructions	O	German Ordinance on Industrial Safety and Health (BetrSichV) and German Health and labour protection law (ArbSchG)
	Written notice of instruction to driver	O	German Ordinance on Industrial Safety and Health (BetrSichV) and German Health and labour protection law (ArbSchG)
	German Ordinance on Industrial Safety and Health (BetrSichV), observe the operating instructions	O	
When fuelling			
a) Diesel	German Ordinance on Industrial Safety and Health (BetrSichV), observe the operating instructions	O	
b) LPG	DGUV regulation 79, observe the operating instructions	O	
When charging the drive battery	German Ordinance on Industrial Safety and Health (BetrSichV), observe the operating instructions	O	VDE 0510-47 (= DIN EN 62485-3): In particular - Ensure adequate ventilation - Insulation value within the permissible range
When using battery chargers	German Ordinance on Industrial Safety and Health (BetrSichV), DGUV rule 113-001 and observe the operating instructions	O	German Ordinance on Industrial Safety and Health (BetrSichV) and DGUV rule 113-001
When parking LPG trucks	German Ordinance on Industrial Safety and Health (BetrSichV),	O	German Ordinance on Industrial Safety and Health (BetrSichV) and DGUV rule 113-001

Hazard	Course of action	Check note √ done - Not applicable	Notes
	DGUV rule 113-001 and observe the operating instructions		
When operating driverless transport systems			
Roadway quality inadequate	Clean/clear roadways	O	German Ordinance on Industrial Safety and Health (BetrSichV)
Loading equipment incorrect/slipped	Reposition load on pallet	O	German Ordinance on Industrial Safety and Health (BetrSichV)
Unpredictable driving behaviour	Employee training	O	German Ordinance on Industrial Safety and Health (BetrSichV)
Routes blocked	Mark routes Keep roadways clear	O	German Ordinance on Industrial Safety and Health (BetrSichV)
Routes intersect	Announce right-of-way rule	O	German Ordinance on Industrial Safety and Health (BetrSichV)
No person detection when placing goods into stock and removing goods from stock	Employee training	O	German Ordinance on Industrial Safety and Health (BetrSichV)

Danger to employees

According to the German Ordinance on Industrial Safety and Health (BetrSichV) and labour protection law (ArbSchG), the operating company must determine and assess hazards during operation, and establish the labour protection measures required for employees (BetrSichVO). The operating company must therefore draw up appropriate operating instructions (§ 6 ArbSchG) and nominate a person who is responsible for these operating instructions. Drivers must be informed of the operating instructions that apply to them.

NOTE

Please note the definition of the following responsible persons: "operating company" and "driver".

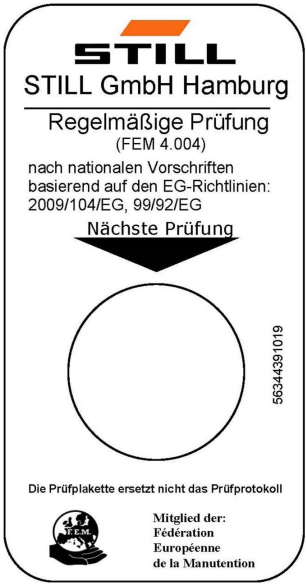
The design and equipment of the truck comply with the standards and directives required for CE conformity. The design and equipment also comply with the standards and directives necessary for the UKCA compliance that is required in the United Kingdom. The design and equipment are therefore not part of the required scope of the hazard assessment. The same applies to attachments with their own CE labelling and UKCA labelling. The operating company must, however, select the type and equipment of the trucks so as to comply with the local provisions for deployment.

The result of the hazard assessment must be documented (§ 6 ArbSchG). In the case of truck applications involving similar hazard situations, the results may be summarised. Refer to the chapter entitled "Overview of hazards and countermeasures", which provides advice on complying with this regulation. The overview specifies the primary hazards that, in the event of non-compliance, are the most frequent causes of accidents. If other major hazards are present as a result of the specific operating conditions, these hazards must also be taken into consideration.

The conditions of use for trucks are broadly similar in many plants, so the hazards can be summarised in one overview. Observe the information provided by the relevant employers' liability insurance association on this subject.

Safety tests

Regular safety inspection of the truck ▷



Safety inspection based on time and extraordinary incidents

The operating company must ensure that the truck is checked by a specialist at least once a year or after particular incidents.

As part of this inspection, a complete check of the technical condition of the truck must be performed with regard to accident safety. In addition, the truck must be thoroughly checked for damage that could potentially have been caused by improper use. A test log must be created. The results from the inspection must be retained until a further two inspections have been carried out.

The inspection date is indicated by an adhesive label on the truck.

– Arrange for the service centre to perform periodic safety inspections on the truck.

– Observe guidelines for checks carried out on the truck in accordance with FEM 4.004.

The operator is responsible for ensuring any defects are remedied without delay.

– Contact your service centre.

NOTE

Observe the national regulations for your country!

Insulation testing

The insulation of the truck must have sufficient insulation resistance. For this reason, insulation testing in accordance with DIN EN 1175 and DIN 43539, VDE 0117 and VDE 0510 must be conducted at least once yearly as part of the FEM testing.

The insulation testing results must be at least the test values given in the following two tables.

– For insulation testing, contact the authorised service centre.

The exact procedure for this insulation testing is described in the workshop manual for this truck.

NOTE

The truck's electrical system and drive batteries must be checked separately.

Test values for the drive battery

Component	Recommended test voltage	Measurements		Nominal voltage U_{Batt}	Test values
Battery	50 VDC	Batt+ Batt-	Battery tray	24 volts	> 1200 Ω
	100 VDC			48 volts	> 2400 Ω
	100 VDC			80 volts	> 4000 Ω

Test values for the entire truck

Nominal voltage	Test voltage	Test values for new trucks	Minimum values over the duration of the service life
24 volts	50 VDC	Min. 50 kΩ	> 24 kΩ
48 volts	100 VDC	Min. 100 kΩ	> 48 kΩ
80 volts	100 VDC	Min. 200 kΩ	> 80 kΩ

Safety regulations for handling consumables

Permissible consumables

⚠ WARNING

Consumables can be dangerous.

It is necessary to follow the safety regulations when handling these substances.

Refer to the maintenance data table for the permissible substances necessary for operation.

Hydraulic fluid



⚠ WARNING

During operation of the forklift truck, hydraulic fluids are pressurised and are hazardous to your health.

- Do not spill these fluids!
- Follow the statutory regulations
- Do not allow the fluids to come into contact with hot motor parts.
- Do not allow to come into contact with the skin.
- Avoid inhaling the spray
- Penetration of pressurised fluids into the skin is particularly dangerous if these fluids escape at high pressure due to leaks in the hydraulic system. In case of such injury, seek medical advice immediately.
- To avoid injury, use appropriate personal protective equipment (e.g. protective gloves, industrial goggles, skin protection and skin care products).



ENVIRONMENT NOTE

Hydraulic fluid is a water-polluting substance!

Always store hydraulic fluid in containers complying with the regulations.

Avoid spilling.

Spilt hydraulic fluid should be removed with oil-binding agents at once and disposed of according to the regulations.

Dispose of old hydraulic fluid according to regulations.

Battery acid



⚠ WARNING

Battery acid contains dissolved sulphuric acid. This is toxic.

- Avoid touching or swallowing the battery acid at all costs.
- In case of injury, seek medical advice immediately.



⚠ WARNING

Battery acid contains dissolved sulphuric acid. This is corrosive.

- When working with battery acid, use appropriate PSA (rubber gloves, apron, protection goggles).
- When working with battery acid, never wear a watch or jewellery.
- Do not allow any acid to get onto clothing or skin or into the eyes. If this does happen, rinse immediately with plenty of clean water.
- In case of injury, seek medical advice immediately.
- Immediately rinse away spilt battery acid with plenty of water.
- Follow the statutory regulations.

ENVIRONMENT NOTE

– Dispose of used battery acid in line with the applicable regulations.

Disposal of consumables

ENVIRONMENT NOTE

Materials that have to be disposed of following maintenance, repair and cleaning must be systematically collected and disposed of in accordance with regulations. Observe the national regulations for your country. Work may only be carried out in areas designated for this purpose. Take care to minimise, as far as possible, any impact on the environment.

- Any spillage of fluids such as hydraulic oil, brake fluid or gear lubricant oil must be immediately soaked up with an oil-binding agent.
- The regulations for disposal of used oil are applicable.
- Any spillage of battery acid must be neutralised immediately.

Noise level

This value has been determined based on EN12053 driving, lifting and idle test methods.

Noise level at the driver's ear:

3.0–3.5 tonne model (without driver's cab)	L_{pAZ} = 68.0 dB(A)
Uncertainty	K_{PA} = ±2 dB(A)

NOTE

The noise level may be higher or lower than this value when operating the forklift truck. Differing tasks and external factors may lead to an increase in noise levels.

Frequency characteristics for vibrations imparted to the human body

This value has been determined from experiments using standard equipment based on technical data in the EN13059 and EN12096 standards (driving over test course with bumps).

Whole-body vibration transmitted to driver with standard seat:

$a_{W,ZS}$ (m/s^2)	1.4
Uncertainty K (m/s^2)	0.2

NOTE

The indicated vibration frequency imparted to the human body cannot be used to determine the actual frequency load when operating the truck. This frequency load depends on operating conditions (road surface conditions, operating modes etc.) and must therefore be determined according to site conditions, if necessary.

Emergency exit from driver's cab with windows

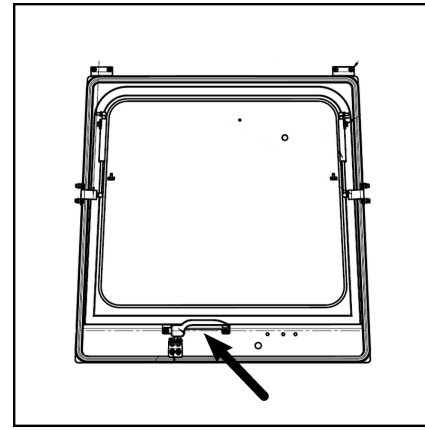
CAUTION

If the truck is equipped with a driver's cab with doors, DO NOT open the doors until the load is placed on the floor.

NOTE

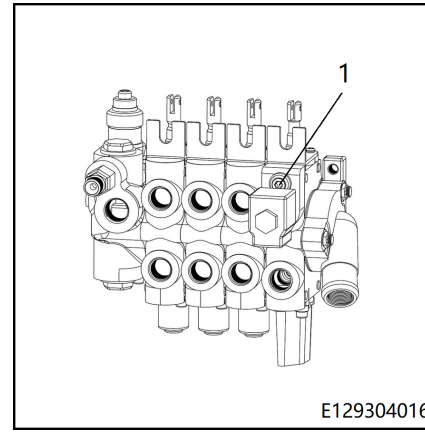
If the truck has a driver's cab with a door, a window and glass, it is difficult for the driver to open the door from the side when the truck encounters a fault in narrow passages. In the event of such dire danger, the driver can exit the truck via the rear window.

– Unlock the rear window of the driver's cab. ▷
– Push the window outwards until it opens.
– Climb out carefully.



Manually lowering the fork arms with ISO ▷

The control valve is equipped with an emergency lowering screw (1) for manual lowering of the fork carriage. This may be required if a malfunction occurs in the hydraulic system. The control valve is located under the control lever on the right-hand side of the truck and is equipped with an emergency lowering screw.



⚠ DANGER

Do not stand in the vicinity of the forks when the fork arms are being lowered.

During lowering, leave the socket wrench on the screw on the valve block to enable lowering to be stopped at any time.

– Remove the foot plate and the joystick base cover.

– Slowly turn the emergency lowering screw about 1.5 turns anticlockwise using a hexagon socket wrench.
– Gently push the joystick until the forks are completely lowered.
– After it is lowered, turn back the emergency lowering screw clockwise with 40 Nm tightening torque. Otherwise, you cannot use the joystick to operate the fork carriage.
– Refit the foot plate and the joystick base cover.

Safety Regulations Relative to Forklift Use

- The operator must familiarize himself with the forklift to be able to better describe any defects and assist maintenance personnel. The operator, trained and authorized to use the forklift, must be familiar with the controls and performances of the forklift.
- Any defect (squeaking, leaks, etc.) must be promptly reported because, if neglected, it could cause more serious failures/defects.
- Carry out the inspections indicated in the chapter on "Daily Inspections".

ENVIRONMENT NOTE

Report any oil and/or battery fluid leaks: they are dangerous and highly polluting.

⚠ CAUTION

If you notice a burning smell, stop the forklift and turn off the engine, then disconnect the battery.

Safety regulations when driving

Driving conduct

The driver must follow the public rules of the road when driving in company traffic.

The speed must be appropriate to the local conditions.

For example, the driver must drive slowly around corners, in tight passageways, when driving through swing-doors, at blind spots, or on uneven surfaces.

The driver must always maintain a safe braking distance from vehicles and persons in front, and must always have the truck under control. Stopping suddenly, turning quickly and overtaking at dangerous or blind spots must be avoided.

– Initial driving practice must be carried out in an empty space or on a clear roadway.

The following are forbidden during driving:

- Allowing arms and legs to hang outside the truck
- Leaning the body over the outer contour of the truck
- Climbing out of the truck
- Moving the driver's seat
- Adjusting the steering column
- Releasing the seat belt
- Disabling the restraint system
- Raising the load higher than 300 mm above the ground (with the exception of manoeuvring processes during the placement into stock/removal from stock of loads)
- Using electronic devices, for example radios, mobile phones etc.

⚠ WARNING

The use of multimedia and communication equipment as well as playing these devices at an excessive volume during travel or when handling loads can affect the operator's attention. There is a risk of accident!

– Do not use devices during travel or when handling loads.

– Set the volume so that warning signals can still be heard.

⚠ WARNING

In areas where use of mobile phones is prohibited, use of a mobile phone or radio telephone is not permitted.

– Switch off the devices.

Visibility when driving

The driver must look in the drive direction and have a sufficient view of the driving lane.

Particularly for reverse travel, the driver must be sure that the driving lane is clear.

When transporting goods that impair visibility, the driver must drive the truck in reverse.

If this is not possible, a second person acting as a guide must walk in front of the truck.

In this case the driver must only move at walking pace and with extra care. The truck must be stopped immediately if eye contact with the guide is lost.

Rear-view mirrors are only to be used for observing the road area behind the truck and not for reverse travel. If visual aids (mirror, monitor) are necessary to achieve sufficient visibility, it is necessary to practise using them. For reverse travel using visual aids, extra care should be taken.

When using attachments, special conditions apply; see the chapter entitled "Fitting attachments".

Any glass (variant, e.g. windscreen) and mirrors must always be clean and free of ice.

Safety regulations in case of accidental lateral tipping

If as a result of incorrect manoeuvring the truck appears to be tipping over sideways, carefully follow the instructions below:

a) Do not leave the forklift truck.

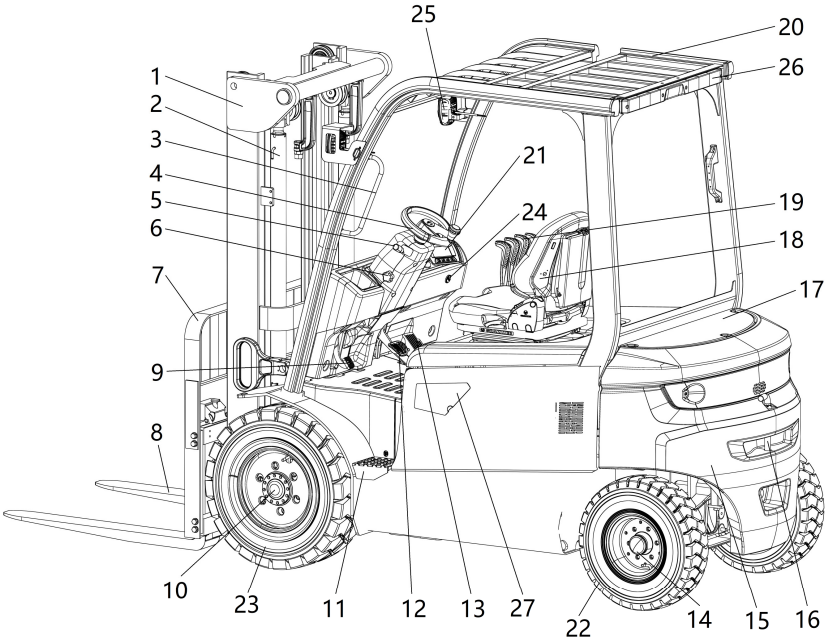
b) Tilt your head forward and move your body in the opposite direction to which the forklift is tipping.

c) Remain firmly seated, grip the steering wheel and dig your heels in. Wait until the truck has reached a stable position before leaving the truck.

3

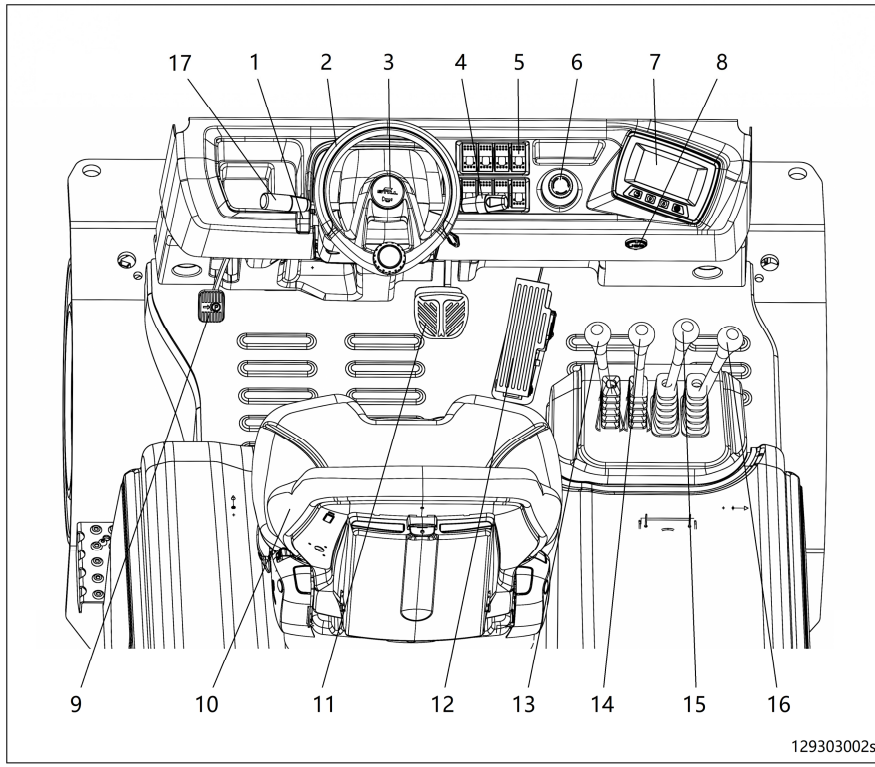
Overview

General view



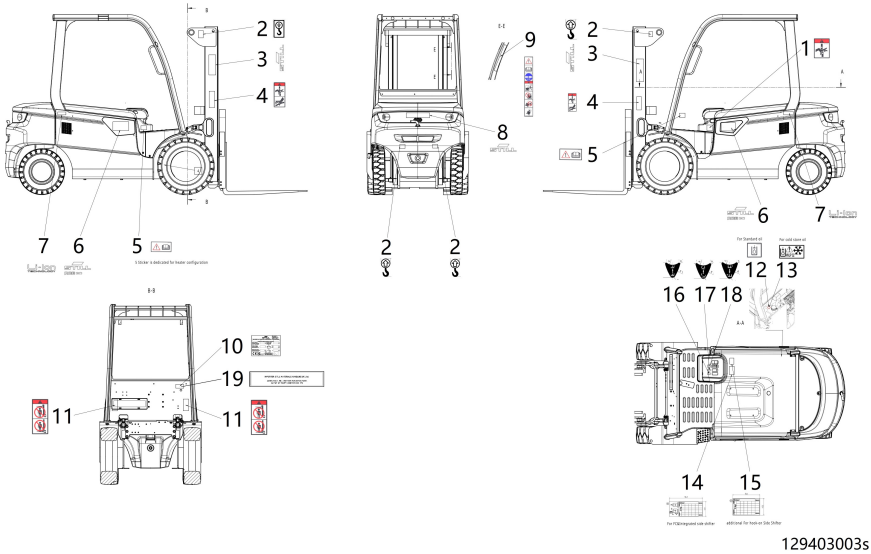
1	Lift mast
2	Lift cylinder
3	Handhold
4	Steering wheel
5	Reversing handle
6	Steering column adjustment screw
7	Fork carriage
8	Forks
9	Parking brake pedal
10	Drive axle
11	Non-slip tread
12	Brake pedal
13	Accelerator pedal
14	Steering axle
15	Counterweight
16	Towing pin
17	Rear cover
18	Driver's seat
19	Multilever
20	Overhead guard
21	Display unit
22	Rear wheel (steering wheel)
23	Front wheel (load wheel)
24	USB interface
25	Headlights, turn signal lights
26	Tail lights
27	Charging port (*for lithium-ion battery model)

Controller and display unit



1	Steering column adjustment screw	10	Driver's seat
2	Steering wheel	11	Brake pedal
3	Horn button	12	Accelerator pedal
4	Lighting control handle	13	Lifting device lever
5	Switch panel	14	Tilting device lever
6	Emergency off switch	15	Attachment lever (optional)
7	Display unit	16	Attachment lever (optional)
8	USB interface	17	Drive direction selection lever
9	Parking brake pedal		

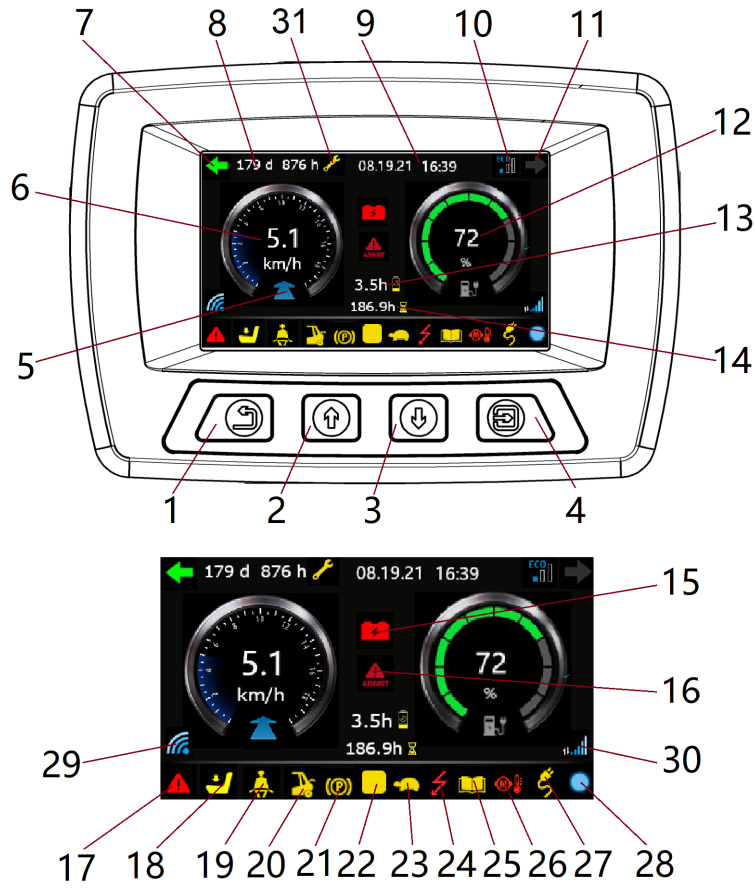
Warning Label Diagram



129403003s

1	Label, Anti-pinch	11	Label, Do not stand above or below the fork.
2	Label, Hoisting points	12	Label, Fill hydraulic oil (standard oil)
3	Label text, Still	13	Label, Fill hydraulic oil (cold store oil)
4	Label Anti-pinch / Prevent high pressure oil shooting injury.	14	Label, capacity rating plate (For FC&Integrated side shifter)
5	Label, Read the operating manual (For heater configuration)	15	Label, capacity rating plate (For hook-on side shifter)
6	Label text, Still + RCE30/RCE35	16	Label, Lifting/Lowering
7	Label,Li-ion technology (*Li-ion truck)	17	Label,Side shifting
8	Label text, Still	18	Label, Lifting/Lowering/Tilting
9	Label, Driving warning	19	Label, UK-Importer (for use in UK only)
10	Label, Nameplate	20	Chassis no.

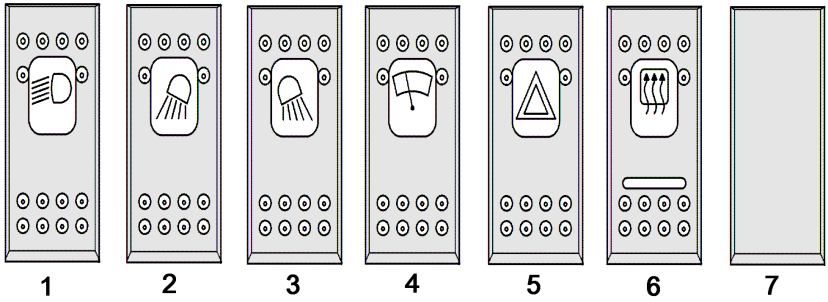
Display unit



1	Back button	13	Remaining battery run time
2	Up button	14	Hour meter
3	Down button	15	Low charge
4	Enter/modify button	16	Additional information
5	Direction	17	Error symbol
6	Speed	18	Operator symbol
7	Left turn	19	Fasten seat belt symbol
8	Maintenance time	20	Battery cover open symbol
9	Date	21	Parking brake symbol
10	Performance mode	22	Neutral yellow warning
11	Right turn	23	Creep speed mode
12	Battery	24	Control unit failure

25 Refer to truck documentation
26 Motor temperature too high (yellow)/overheated (red)
27 Battery charging symbol
28 CAN communication symbol (Blue - normal CAN communication; red - abnormal CAN communication)
29 KCDU connection symbol (for KEYS diagnostics)
30 KCCU cloud server connection symbol (allows normal data uploading)
31 Maintenance indicator (lights up when maintenance is due)

Switch panel



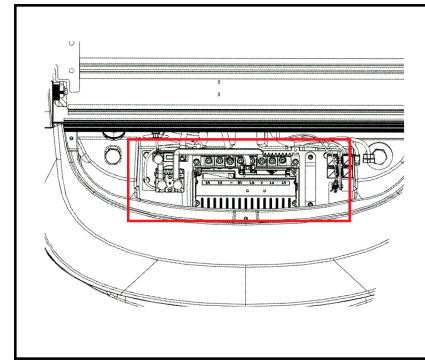
1 Standard or higher lighting
2 Working spotlight positions 3/4 or working spotlight positions 1/2 (for higher lighting)
3 Working spotlight position 7/8
4 Front windscreen wiper/rear window wiper - interval/on/wipe-wash
5 Warning lights
6 Screen heating push button
7 Others are unassigned

⚠ CAUTION

The above switches may be displayed, depending on your actual configuration.

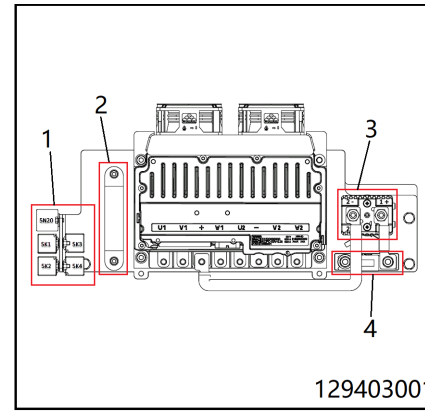
Relays and fuses overview

The relay and fuse box of the truck are installed above the counterweight and can be viewed by opening the cover above the counterweight.

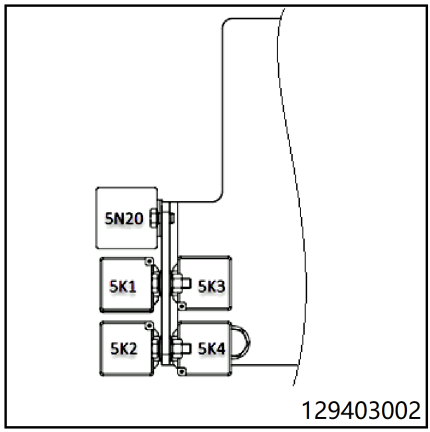


See figure on right:

- (1): Flashing relay, reversing relay, brake relay, motor fan relay, module fan relay
- (2): Fuse box
- (3): Main contactor
- (4): Main fuse

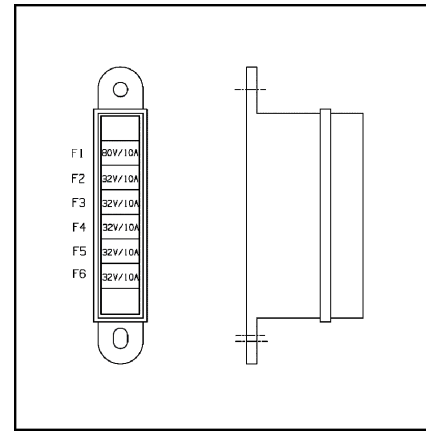


Relay



Signs	Function
5N20	Flashing light relay
5K2	Reversing relay
5K1	Parking relay
5K4	Motor fan relay
5K3	Module fan relay

Fuses



Signs	Specifications	Function
F1	80V/10A	Key and main contactor signal
F2	32V/10A	Module control unit and drive motor speed sensor
F3	32V/10A	Display unit, diagnostics
F4	32V/10A	Horn, fan, flasher, brake light, reversing light, reversing beeper
F5	32V/10A	USB charging port, combination switch
F6	32V/10A	Spare (lead-acid battery models), BMS auxiliary battery (lithium-ion battery models)

4

Operation

Service plan before first start

Drive mechanism and transmission system
Check the drive axle/transmission gear oil level.
Check and tighten the wheel nuts.
Check the tyre pressure (if fitted with optional pneumatic tyres).
Check the functionality of the service brake and parking brake.
Check the drive functions (forward and reverse).
Check steering system functionality.
Check the brake fluid level.
Electrical system
Check rechargeable battery condition, electrolyte level and specific gravity. For the lithium-ion battery (*option), refer to the lithium-ion battery operating instructions supplied with the forklift truck.
Check electrical systems (e.g. lighting, warning equipment and other special equipment).
Check the emergency off switch.
Hydraulics
Check the hydraulic oil level.
Lifting system
Check the functionality of the lift mast and attachments.

Instructions for running-in

The truck can be operated immediately.

However, when driving during the first 50 operating hours, avoid subjecting both the working hydraulics and the drive unit to high continuous loads.

Pre-shift checks

Carrying out the following checks as part of your daily routine will help to keep the forklift truck in good condition. These checks are supplemental and do not replace periodic maintenance work.

NOTE

If, when carrying out the daily checks, you discover a defect or you are unsure whether the truck will function properly, do not use the truck and contact the technical service department.

Daily inspection items

Drive mechanism and transmission system
Check the tyre and rim (for damage to the profile and outer section).
Check the drive axle/transmission gear oil level.
Check the tyre pressure (if fitted with optional pneumatic tyres).
Test the functionality of the service brake and parking brake.
Check the steering.
Check the brake fluid level.
Driver's cab
Check the condition and functionality of the driver's seat and seat belt.
Check the seat switch is working normally.
Check the steering column adjustment is secure.
Electrical system
Check the battery according to the manual provided by the battery manufacturer.
Check electrical systems (e.g. lighting, warning equipment and other special equipment).
Check the operating state of the key switch.
Hydraulic system
Check the oil level.
Visually inspect the truck for leaks.
Lifting system
Check the safety fittings on the fork arms and carriage.
Special equipment
Check wear and functionality of the sideshift and attachments (in accordance with the procedures stipulated by the manufacturer).
Check the condition of the antistatic belt and earth (only when using tyres that are not antistatic).
Subsequent tasks
Carry out a functional test and test drive

Periodic inspection items

⚠ CAUTION

Carrying out periodic inspections of the vehicle is supplemental to periodic servicing work and plays an important role in keeping the vehicle in good working order.

Please carry out periodic inspections according to the content of the **"Table of first service checks"** chapter (except for changing the gear oil).

It is recommended to perform an inspection every 1000 hours. This interval can be shortened accordingly based on the operating conditions.

NOTE

If, when carrying out checks, you discover a defect or you are unsure whether the truck will function properly, do not use the truck, and contact your authorised dealer.

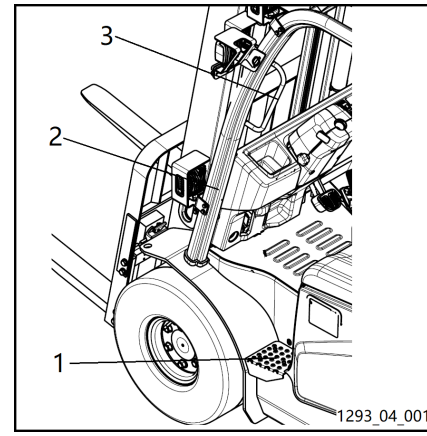
Troubleshooting guide

NOTE

The table below only lists some common faults and is not an exhaustive list. When a fault occurs on the truck, we recommend that you contact an authorised dealer to fix the fault as soon as possible.

Fault	Possible reason	Solution
Unable to drive the truck	1. The battery plug is not connected.	1. Check the battery plug and connect it if necessary.
	2. The emergency off switch is pressed.	2. Pull up the emergency off switch.
	3. The key switch is in position "0".	3. Put the key switch to position "1".
	4. The seat switch is not closed.	4. Check the seat switch and contact an authorised deal if necessary.
	5. The fuse is blown.	5. Check the fuse and replace if necessary.
	6. The fault indicator of the display unit lights up and an error code is shown.	6. Contact your authorised dealer.
Unable to lift a load	1. The truck is not ready for operation.	1. Perform all the fixes listed in the section "Unable to drive the truck".
	2. The hydraulic oil level is too low.	2. Check the hydraulic oil level and top up.
	3. The load weight is excessive.	3. Respect the rated load.
Truck driving at low speed	1. The parking brake is not released.	1. Check if the parking brake is fully released.
	2. The foot brake is not released.	2. Check if the foot brake is stuck and lubricate the foot brake connection points.
	3. The battery level is low	3. Check the battery level and charge the battery if necessary.
	4. The fault indicator of the display unit lights up and an error code is shown.	4. Contact your authorised dealer.

Mounting/dismounting



⚠ WARNING

Always face the vehicle when climbing off the forklift to prevent injury to legs and back.

NOTE

Do not grip the steering wheel or joysticks when climbing on/off the forklift.

After completing the daily checks on the forklift truck, carry out the following procedure to begin using it:

– First place your left foot on the non-slip tread (1). Grip the handhold (3) or overhead guard beam (2), and mount the truck from the left-hand side.

– Use the non-slip tread (1) and handhold (3) or overhead guard beam (2) to dismount from the left-hand side.

⚠ WARNING

Do not mount or dismount the truck from the right-hand side unless it is an emergency.

⚠ CAUTION

For safety reasons, it is not advisable to operate the forklift when the non-slip tread and floormat are removed or missing. Please ensure that the non-slip tread and floormat are clean.

Seat belt status and performance checks

Checking condition and performance

⚠ DANGER

For safety reasons, the condition and protective ability of the seat belt must be checked on a daily basis.

Do not operate the vehicle with the seat belt removed.

⚠ CAUTION

Carefully check that the retractor locking device, the seat belt locking device and the connections between the seat belt/seat and the seat/cover panel are all in good condition.

– Check the condition of the belt: pull the seat belt all the way out of the retractor and check the seat belt for damage.

⚠ CAUTION

The seat belt must be replaced if it is cracked, worn or has been damaged in an accident. When replacing a seat belt, the entire protection system must also be replaced, including the seat belt, latchplate, retractor and locking devices.

– Check the buckle locking device by inserting the latchplate of the seat belt into the buckle until you hear a click. Ensure that the latchplate, buckle and other locking devices are functioning properly.

– Carefully check the connection between the seat belt and the seat.

– Carefully check the connection between the seat and the panel cover below.

Adjusting the seat and seat belt ▷

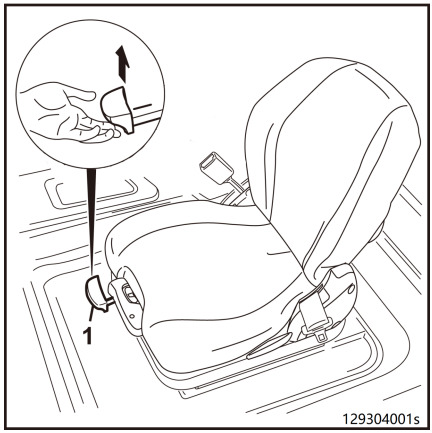
⚠ CAUTION

An incorrect seat setting may cause damage to the driver's back.

The adjustment controls for the driver's seat should not be used during operation.

Before starting the truck and whenever changing drivers, adjust the seat to correspond to the driver's weight and make sure that the settings have all engaged properly.

Do not place any objects in the driver's working area.



Adjusting the seat longitudinally

⚠ CAUTION

There is a risk of crushing the hand if the lever is grasped fully during adjustment.

Only grasp the handle by the guide provided for this purpose.

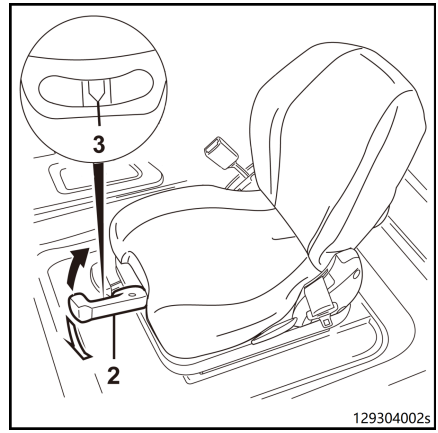
– Pull the adjustment handle (1) up.

– Move the seat forwards or backwards along the seat guide until the optimum position

between driver, steering wheel, accelerator pedal and operating levers is found.

– Retract the adjustment handle (1).

Setting the driver's weight ▷



NOTE

The individual driver's weight must be set with the driver sitting in the seat.

– Pull out the adjustment handle (2).

Move the adjustment handle and set the suspension spring in accordance with the driver's weight.

– The correct driver's weight has been selected when the arrow is in the centre of the inspection window (3).

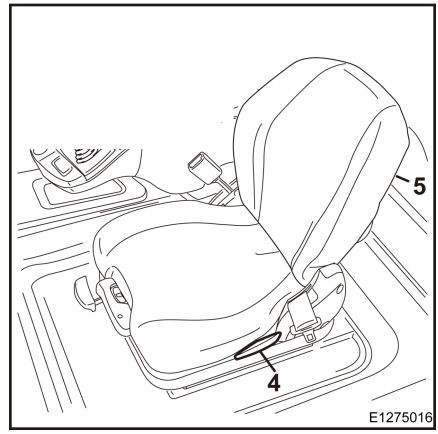
Move up the adjustment handle (2) to increase the set weight.

Move down the adjustment handle (2) to decrease the weight.

NOTE

Sitting for long periods of time puts a lot of pressure on the spine. Try to compensate for this by performing regular simple gymnastic movements.

Adjusting the seat backrest ▷



– Adjust the backrest using the seat backrest adjuster (4).

– Pull up the seat adjuster (4) and fix in place.

– Move the seat backrest (5) forwards or backwards until a comfortable position for the driver is found.

– Release the seat adjuster (4) to return the seat backrest (5) to its original position.

Fastening the seat belt

⚠ DANGER

There is a risk to life if the driver loses control of the vehicle.

The seat belt must be worn at all times that the truck is driven!

The seat belt must only be used by one person at any time.

⚠ CAUTION

The seat belt must be in working order.

Ensure that the seat belt is not twisted, stuck or knotted.

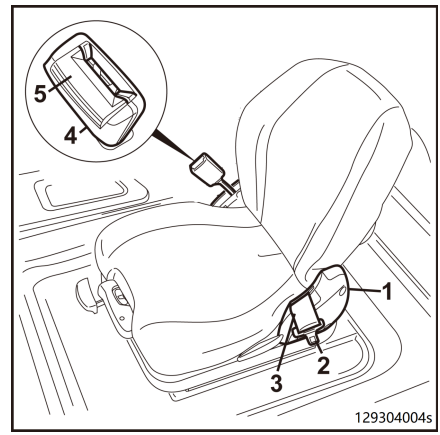
Protect the buckle and retractor to prevent foreign objects or dirt entering and to prevent damage.

NOTE

Even for the driver's cab to fully comply with driver safety systems, the driver should also wear the seat belt all the time.

- *When the truck is on a steep incline, the automatic latch on the seat belt will engage, which will prevent the wearer from unfastening the belt.*
- *The only way to disengage the automatic latch on the seat belt is to carefully level the truck.*
- *When the forklift truck is being operated (when driven or during lifting etc.), the driver should remain in the seat and lean back onto the backrest.*
- *The automatic latch in the retractor will ensure that the driver has sufficient freedom of movement when operating the truck.*

– Slowly pull the seat belt (3) out from the retractor (1).
– Place the seat belt around the waist, no higher than the abdomen.
– Press the seat belt latch plate (2) into the latch (4).
– Check the tightness of the seat belt; the belt should firmly hug the body.



⚠ DANGER

Do not fasten the seat belt over hard or fragile items in the driver's pockets as this may result in accidents.

Do not place objects between the body and the belt.

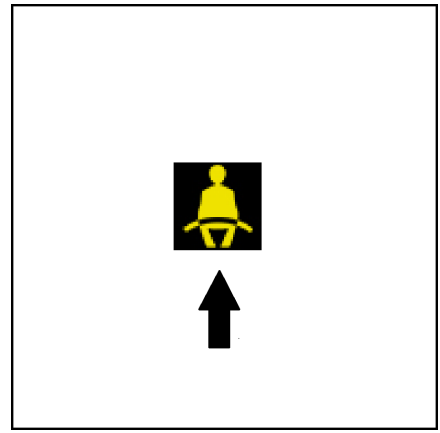
Unfastening the seat belt

– Press the red button (5) on the seat belt latch (4) to release the seat belt.
– Manually feed the seat belt latchplate (2) into the retractor (1).

NOTE

Moving the seat belt too quickly may cause the latchplate to catch on the automatic latch and housing, thus engaging the automatic lock. In this case, the seat belt cannot be pulled out using normal force.

Seat belt monitoring and alarm function



⚠ DANGER

The driver must sit in the driver's seat when operating the forklift truck.

The seat belt must be worn at all times that the truck is driven!

If the forklift truck is started without fastening the seat belt, the LED light shown by the arrow will flash on the display unit and the forklift truck can continue driving.

If the seat belt is unfastened while the forklift truck is travelling, the LED light shown by the

arrow in the display unit will flash. If the vehicle speed is above 4 km/h at this time, the beeper will also sound.

Different monitoring modes can be set using the diagnostic software so that the forklift truck gradually slows down to a standstill (0 km/h) or is restricted to creep speed (2 km/h).

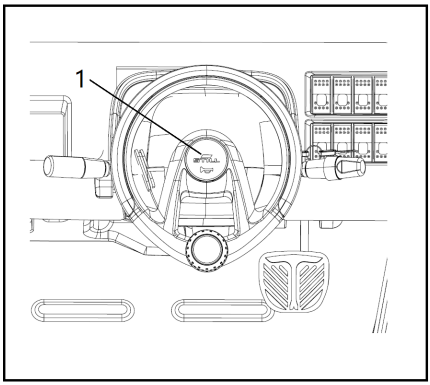
NOTE

The seat belt monitoring mode can be set using the diagnostic software. Please contact your authorised dealer.

⚠ CAUTION

This function is supported by trucks with conformity certification.

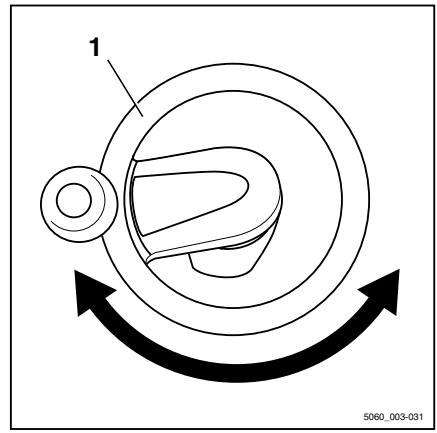
Operating the horn ▷



Sound the horn as a warning signal when working on roads or intersections with low visibility.

– Press the horn button (1) on the steering wheel to sound the horn.

Checking the steering system for correct function ▷



⚠ DANGER

If the hydraulics fail, there is a risk of accident as the steering characteristics have changed.

– Do not operate the truck if it has a defective steering system.

– Operate steering wheel (1). The steering play while stationary must not be more than two finger widths.

NOTE

If the truck is switched on with the steering wheel turned, the maximum driving speed is limited. Travel speed limitation is removed as soon as the steering wheel is moved out of a cornering position into the straight-ahead position. This requires a change in steering angle of about half a revolution.

Adjusting the steering column

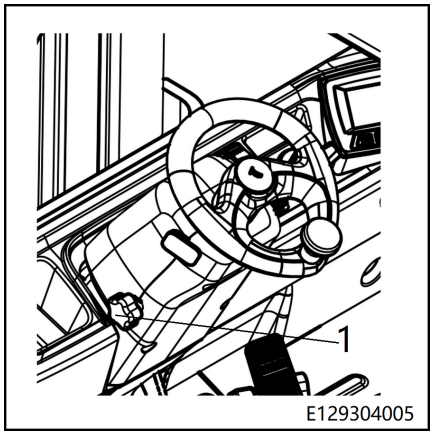
⚠ DANGER

Safe driving is not guaranteed with the clamping screw open.

Only adjust the steering column when the truck is stationary.

Adjusting the angle

– Loosen the clamping screw (1) anti-clockwise.
– Move the steering column into the required position.
– Tighten the clamping screw (1) clockwise.



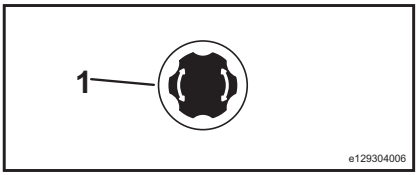
Emergency off switch

⚠ DANGER

This switch button is the primary power switch. Do not disconnect this switch when performing an emergency stop.

Pressing the emergency off switch

– Press the emergency off switch (1) and release. This will completely shut down the truck's electrical system.

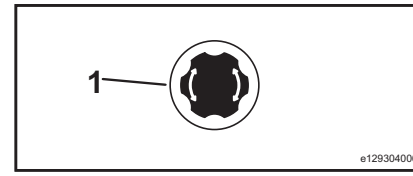


⚠ CAUTION

In order to completely cut power to the truck (e.g. for maintenance work), the battery male connector must be removed.

Pulling up the emergency off switch

– Pull up the emergency off switch (1). This will cause the truck's electrical system to start conducting. The truck is ready for use. ▷



NOTE

The truck is only operational after correctly pulling up the emergency off switch.

In the following situations, press the emergency off switch before operating:

First, disconnect the key switch, then press the emergency off switch.

- When preparing to recharge
- Before changing the battery
- Before lifting the battery cover
- Before routine maintenance checks

NOTE

When starting the forklift truck, first pull up the emergency off switch, if necessary, and then turn the key switch.

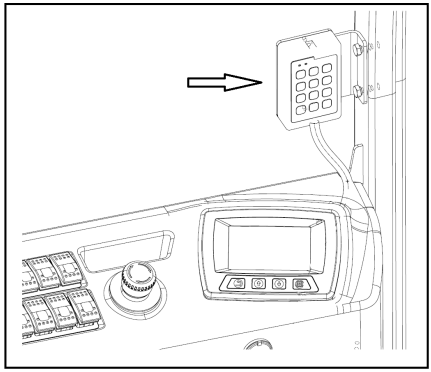
⚠ DANGER

Non-standard operation of the emergency off switch can easily cause accidents and damage to the power module.

Keypad (*Option)

RFID Keypad

– The truck is equipped with an RFID Keypad with driver identification system. The installation position is as shown on the right: ▷



⚠ CAUTION

For details, please refer to the chapter "RFID Keypad usage and settings".

RFID Keypad usage and settings.

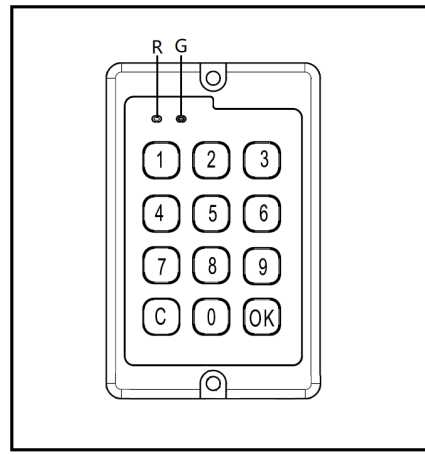
The RFID Keypad is a driver identification system on the truck. The driver must use a personal identification number or an RFID magnetic strip card to log in.

Trucks with an RFID Keypad can only be started after the driver logs in.

NOTE

The default driver password is 1 2 3 4 5, and the default administrator password is 9 8 7 6 5. We recommend that the administrator password be changed when the truck is delivered.

Unlocking with a password



– Turn on the key switch, and a red indicator (R) on the keypad will light up.
– Enter the correct driver password and press the [OK] button. The red indicator (R) will be off and the green indicator (G) will lights up.
– Press and hold the [C] button for 1 second to turn off the lock. The green indicator (G) will be off.

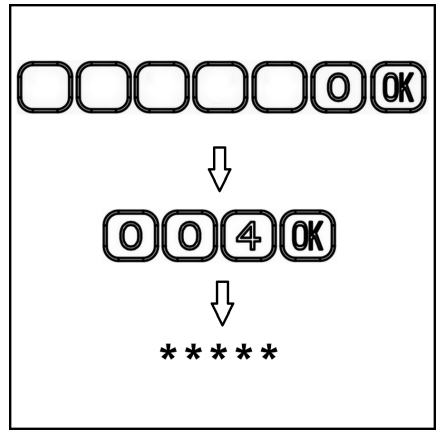
NOTE

If a wrong password is entered, the red indicator and the green indicator will both blink three times, indicating that the password is wrong.

Unlocking with a card

– Turn on the key switch, and a red indicator (R) on the keypad will light up.
– Put the ID card near the front of the Keypad for identification and unlocking. If unlocking is successful, the red indicator (R) will be off and the green indicator (G) will lights up.
– Swipe the card again or press and hold the [C] button for 1 second to turn off the lock. The green indicator (G) will be off.

Adding a driver password



– Enter the correct administrator password, then enter [0] and press the [OK] button to enter the administrator mode.
– Enter the 3-digit function code [0][0][4] and press the [OK] button.
– Enter a new 5-digit driver password.
– Press [1] to confirm the new password, or press [0] to cancel the entered password.

Press and hold the [C] button for 1 second to exit the administrator mode.

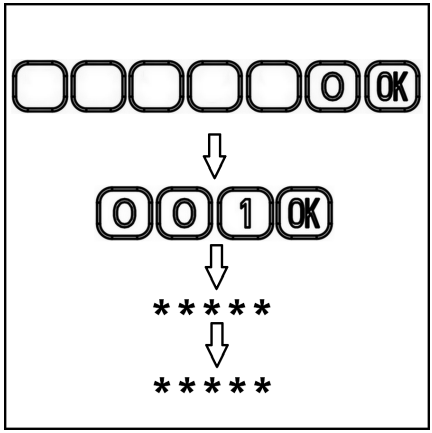
Deleting a driver password

– Enter the correct administrator password, then enter [0] and press the [OK] button to enter the administrator mode.

– Enter the 3-digit function code 0 0 4 and press the OK button.
– Enter an existing 5-digit driver password.
– Press 1 to delete the password, or press 0 to cancel the deletion.

Press and hold the C button for 1 second to exit the administrator mode.

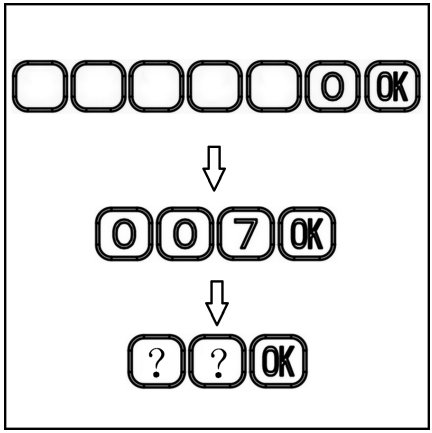
Resetting the administrator password ▷



– Enter the correct administrator password, then enter 0 and press the OK button to enter the administrator mode.
– Enter the 3-digit function code 0 0 1 and press the OK button.
– Enter a new 5-digit administrator password.
– Enter the new 5-digit administrator password again.

Press and hold the C button for 1 second to exit the administrator mode.

Binding an RFID card ▷



– Enter the correct administrator password, then enter 0 and press the OK button to enter the administrator mode.
– Enter the 3-digit function code 0 0 7 and press the OK button. The buzzer will give a long beep.
– Enter the 2-digit driver number (00–99) and press the OK button. The buzzer will give a long beep.
– Put the ID card near the front of the Keypad for identification and binding.

• If the binding is successful, the buzzer will beep briefly twice, and the green indicator will light up.
• If the ID has already been bound to another driver number (00–99), the binding will fail. The buzzer will beep briefly three times,

and both the red indicator and green indicator will blink.

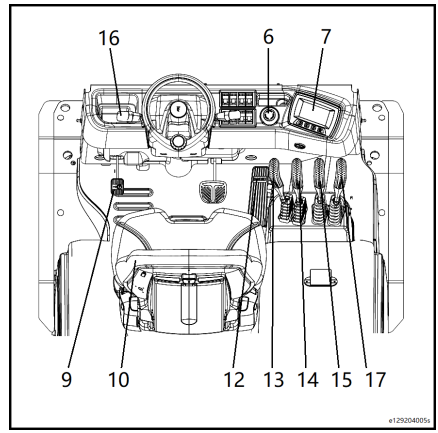
- If an unbound ID card is bound to a bound driver number (00–99), the ID card originally bound to the driver number will become invalid.

– After the binding is successful, you can repeat the steps to bind new ID cards.

Press and hold the C button for 1 second to exit the administrator mode.

Switching the truck on and off

Starting the truck



– Sit on the driver's seat (10).

– Fasten the seat belt.

NOTE

- *The single-pedal reversing control lever (16) must be in the neutral position. The joysticks (13), (14) and (15) must be in the neutral position.*
- *Joysticks (13), (14) and (15) must be in the neutral position.*

– Pull up the emergency off switch (6) if necessary.

NOTE

The forklift truck can only work when the emergency off switch is pulled up.

– Make sure that the parking brake pedal (9) is actuated.

NOTE

The truck can be started regardless of whether or not the parking brake pedal is actuated. For safety reasons, it is recommended to actuate the parking brake pedal before starting the truck.

– Insert the key in the key switch and turn clockwise from position zero to position "I".

The electrical system is switched on.

– Depress the parking brake pedal (9). The pedal will rebound and the parking brake will disengage.

– Observe the display unit (7).

NOTE

Ensure that the parking brake is fully disengaged. The truck cannot be driven until the parking symbol Ⓟ on the display unit has gone out.

The truck is now ready for use.

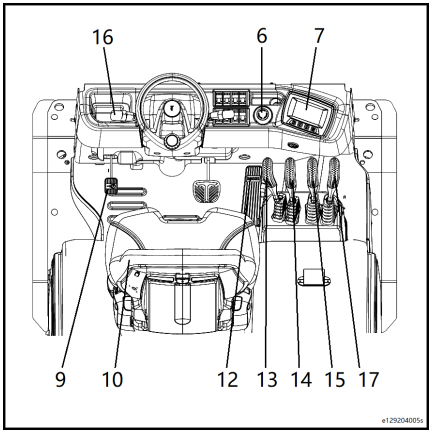
NOTE

Once the key switch has been switched on, a self-test of the display unit (7) is performed. The indicator lights at the bottom of the display light up for approx. 4 seconds before going out. The joysticks and/or accelerator pedals must not be used until all indicator lights have gone out. Otherwise, the truck will not function. To restart: switch the key switch off and on again.

Switching off the truck

– Lift both feet off the accelerator pedal (12).

– The single-pedal reversing control lever (16) must be in the neutral position. Joysticks (13), (14) and (15) must be in the neutral position.



– Depress the parking brake pedal (9) to actuate the parking brake. Observe whether the parking symbol Ⓟ remains lit on the display unit (7).



– Turn the switch key anticlockwise to the zero position.

– Remove the key when leaving the vehicle.

– Push down the emergency off switch (6) if necessary.

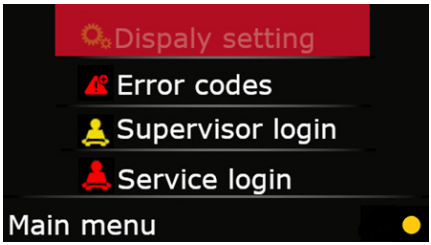
* = Optional

Setting the display unit

Setting the main interface

– Long press the Enter/Modify button on the display unit to access the settings page.

– The settings page contains the following four setting items: ▷



- Display settings
- Error codes
- Supervisor login
- Service login

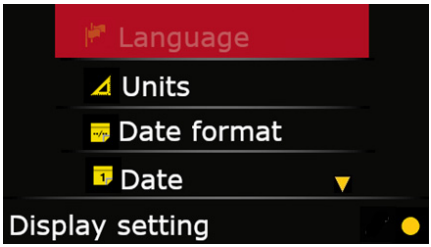
Press the up/down buttons on the display unit to select "Settings" on the toolbar.

Through the "Settings" interface, users and technicians can configure more settings.

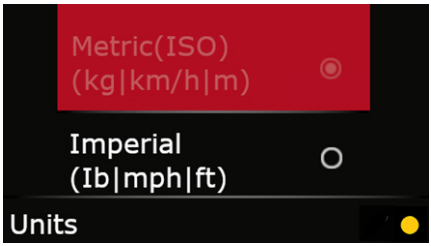
Display settings

Press the Enter button to open the "Settings" menu, press the up/down buttons to select "Display settings", then press OK to enter the next level submenu.

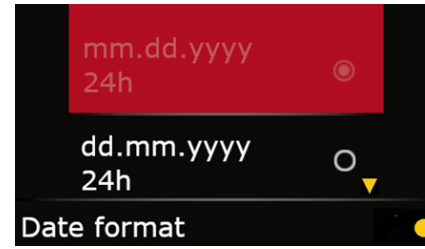
– Access the "Language" settings menu to change the language. (e.g. English, Chinese, Spanish etc.) ▷



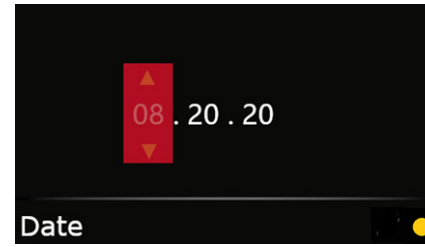
– Access the "Units" settings menu to change the measurement system. (Metric/Imperial) ▷



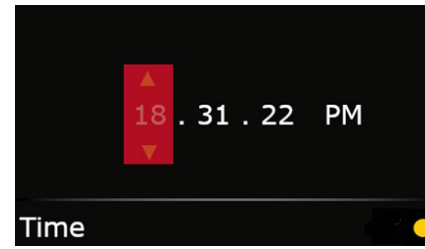
– Access the "Date format" settings menu to change the date format. (month.day.year 24-hour, day.month.year 24-hour, month/day/year 12-hour) ▷



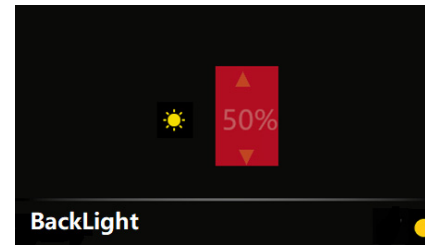
– Access the "Date" settings menu to change the date. ▷



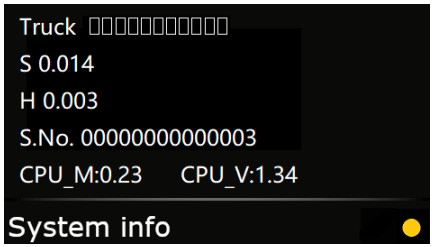
– Access the "Time" settings menu to change the time. ▷



– Access the "Backlight" settings menu to adjust the display brightness. ▷



– Access the "system information" to read the system information of the display unit, such as the vehicle model and the software version of the display unit. ▷



NOTE

The "Display settings" are settings for use by customers, whereas the other settings are for use by technicians.

Driving

Driving

⚠ CAUTION

For reasons of stability and minimum braking distance, do not use the forklift truck on a long slope with a gradient of more than 15%. If you need to use the forklift truck on slopes with higher gradients, please first consult your dealer. The gradeabilities given in the type sheet are calculated based on the truck's pulling force and are only applicable to situations in which the truck must surmount small obstacles or when driving on fairly even road surfaces.

The operating mode should suit road surface conditions (undulating, uneven, etc.), especially in dangerous working areas and when transporting loads.

⚠ CAUTION

Please note that the rear-view mirror must be used only to monitor rear traffic conditions.

Reversing is only permitted using direct rear view.

NOTE

Certain forklift trucks (e.g. those with a special container roof or a rotary seat) have a reduced clearance between the seat and overhead guard. For this reason, trucks should only be used by persons whose normal operating posture is such that there is a minimum of 30 mm clearance between their head and the overhead guard.

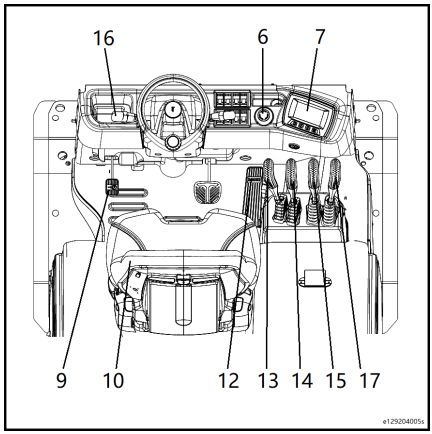
NOTE

The truck can only be driven with the driver's seat under load.

NOTE

Before starting the truck, joysticks (13), (14), (15)and (17) must be in the neutral position. The reversing lever (16) must be in the neutral position.

– Sit down on the driver's seat (10) (Only then is the seat switch under the driver's seat activated).
– Fasten the seat belt.
– Pull up the emergency off switch (6) if necessary.
– Make sure that the parking brake pedal (9) is actuated.



NOTE

The truck can be started regardless of whether or not the parking brake pedal is actuated. For safety reasons, it is recommended to engage the parking brake pedal first.

– Insert the key in the key switch and turn clockwise from position zero to position "I".

Observe the display screen (7).

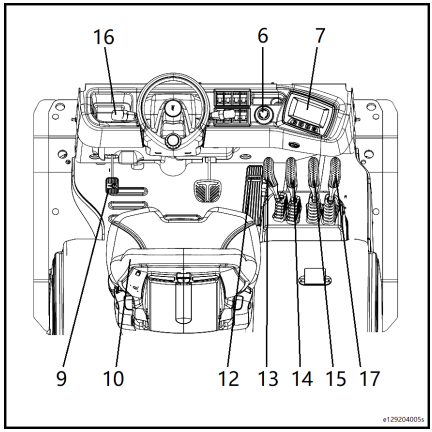
All indicator lights at the bottom of the display light up. (The indicator lights go out after approx. 4 seconds)

– Lift the forks slightly and tilt the lift mast backwards.
– Depress the parking brake pedal (9). The pedal will rebound and the parking brake will disengage.

Forward travel

Forward travel

– Set the reversing handle (16) to the forward position.
– Smoothly depress the right-hand accelerator pedal (12).



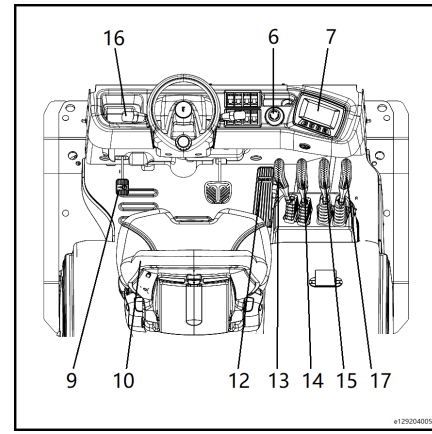
The display unit shows the symbol of the preceding line.

Driving speed accelerates in relation to the increase in pedal travel.

NOTE

Rapidly depressing the pedal will not change the acceleration, as the maximum acceleration is controlled automatically.

Reverse travel



– Set the reversing handle (16) to the reverse position.
– Smoothly depress the right-hand accelerator pedal (12).

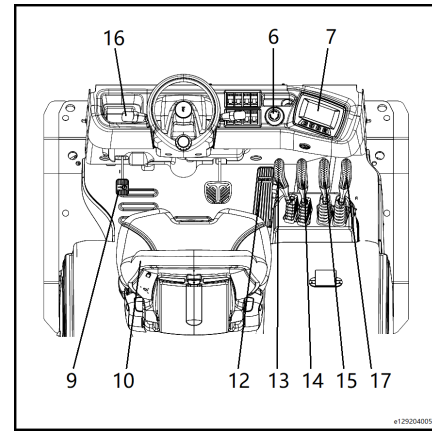
The display unit displays the reversing symbol.

Driving speed accelerates in relation to the increase in pedal travel.

NOTE

Rapidly depressing the pedal will not change the acceleration, as the maximum acceleration is controlled automatically.

Changing the drive direction



– Release the accelerator pedal (12).
– Pull the reversing handle (16) in the opposite direction.
– Depress the accelerator pedal (12) again to reverse acceleration.

The reversing handle can switch directly from forward to reverse without the accelerator pedal being released. The truck will slow to a halt using electrical braking and then accelerate in the selected direction.

NOTE

Rapidly depressing the pedal will not change the acceleration, as the maximum acceleration is controlled automatically.

Brake system

Brake system information

⚠ WARNING

Risk of accident or casualties if brake system is faulty.

Your truck should not be used under any circumstances if the brake system is faulty. Should you notice any defects in or wear to the brake system, please contact your authorised dealer immediately.

⚠ WARNING

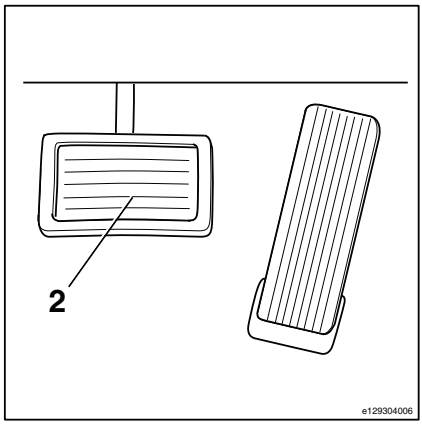
The braking characteristics of the truck are influenced by the viscosity of the oil, among other things. Using a different oil (with a different viscosity) to that prescribed by the manufacturer will affect braking characteristics and increase the risk of accidents and risk to life.

Therefore, only use the oil specified by the manufacturer (see Recommendations for consumables).

Please contact your authorised dealer.

Foot brake/emergency brake

– For emergency braking, depress the brake pedal (2) on the left side of the accelerator pedal. This will bring the forklift truck to a complete stop. ▷



NOTE

We recommend that drivers familiarise themselves with the efficacy of the brake system when the forklift truck is not carrying a load. Operate the forklift truck slowly on an uncrowded road surface to test travelling functions.

If the foot brake fails, use the parking pedal to perform emergency braking and bring the vehicle to a standstill.

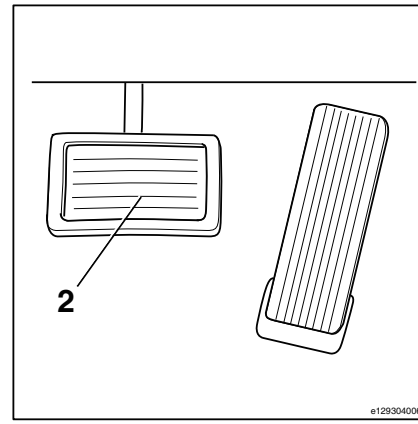
⚠ CAUTION

After performing an emergency stop using the parking brake, the parking braking system should be inspected for wear.

Electronic regenerative braking ▷

– Release the accelerator pedal (1) so that the pedal returns to the neutral position. Energy is recovered and a braking effect is produced.

This truck is equipped with the automatic brake control system. Slowly or quickly releasing the accelerator pedals to the neutral position allows the braking effect to be sensitively controlled, from gentle to hard braking.



NOTE

If required, this function can be adjusted via a diagnostic program so that the effect is greater or less. Contact your local authorised dealer.

NOTE

Regenerative braking increases the braking performance. For emergency braking, depress the foot brake pedal (1), which is located next to the accelerator pedal.

⚠ DANGER

Danger of accidents

The foot brake pedal (1) is generally used to perform an emergency stop.

⚠ CAUTION

Risk of accident

Depending on the battery charge state, the effect of electric regenerative braking may be diminished. In this case, to avoid excessive braking distance, the foot brake pedal should be used for braking, and the vehicle speed should be reasonably controlled according to the usage scenario.

For technical reasons, regenerative braking will not work if the battery is fully charged. In this situation, use the foot brake pedal to achieve braking.

Parking brake

⚠ WARNING

If there is a fault with the braking system or system parts are worn, contact your authorised authorized dealer.

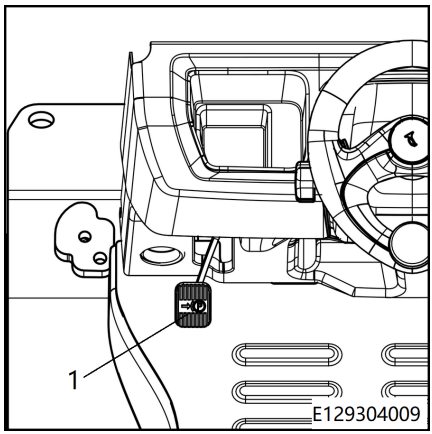
The forklift truck must not be operated if there are problems with the braking system.

Applying the parking brake

NOTE

The truck can be started regardless of whether or not the parking brake is applied. For safety reasons, it is recommended to start the truck with the parking brake applied.

– Depress the parking brake pedal (1) until it reaches the locked position. ▷



– The parking symbol Ⓟ on the display unit comes on and remains lit. The truck is braked. ▷



Releasing the parking brake

– Depress the parking brake pedal and then release. The parking brake will return to its original position.

– The parking symbol Ⓟ on the display unit goes out. The truck is ready for operation.

NOTE

Ensure the parking brake is fully disengaged. The truck cannot be driven until the parking symbol Ⓟ on the display unit has gone out.

Battery cover — Open - Closed

NOTE

This vehicle has been designed to avoid interference with the upper rear section of the overhead guard when the battery cover is opened in the following situations:

- *The steering column is at the limit position, close to the driver's cab.*
- *The driver's seat is adjusted forward to the limit position.*

⚠ CAUTION

In some special cases, the battery cover may interfere with the upper rear section of the overhead guard. Please adjust the seat or steering column to prevent this.

The battery cover must be opened during the following procedures:

- Changing the battery
- Servicing the battery

Opening the battery cover

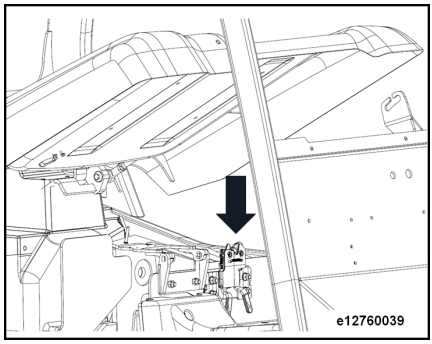
NOTE

Before doing this, be sure to remove any loose items from the battery cover or from under the driver's seat.

NOTE

If necessary, adjust the steering column and driver's seat when opening the battery cover.

– Pull the latch handle on the battery cover to the left to open the latch. The battery cover will automatically open. ▷



⚠ CAUTION

Do not lean too close to the battery cover, as it will spring open to a certain height.

– Push up the battery cover until it engages in the limit position.

NOTE

When replacing the battery, make sure that the battery cover is fully opened.

NOTE

*If a fully enclosed driver's compartment (*optional) is installed, the battery cover must be opened for battery replacement and similar operations, and the rear window of the driver's compartment must first be opened. This is to avoid the seat striking the rear window.*

⚠ CAUTION

After opening the battery cover, make sure that the gas spring is free from faults to prevent the battery cover from accidentally closing and causing personal injury in the event that the gas spring fails.

Closing the battery cover

⚠ CAUTION

Do not sit on the battery cover: risk of injury or damage.

To avoid injury, ensure that personnel are far enough away before closing the battery cover.

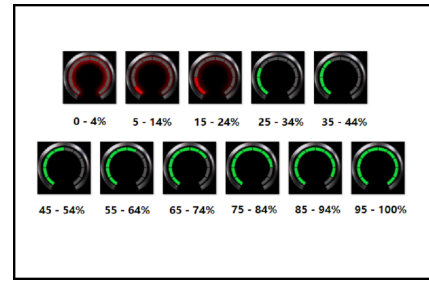
– Lock the latch by pressing the battery cover down until the latch makes a locking sound.

Checking battery level

General

The battery's discharge status is shown by an LED bar display on the display unit.

The green LEDs go out one after another as the battery discharges (each bar represents 10% of the battery capacity). ▷



⚠ CAUTION

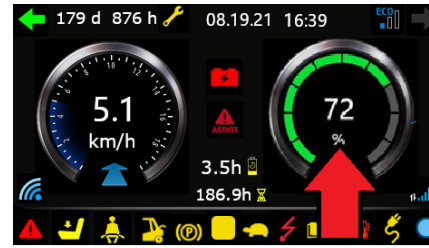
Repeated deep discharging of the battery can cause irreparable damage.

When the red LED flashes, the battery must be charged immediately.

– Pull up the emergency off switch if necessary.

– Insert the switch key into the switch lock and turn clockwise to the start position.

– Check the battery charge status on the discharge indicator (marked by the red arrow) on the display unit. ▷



Charging precautions (lead-acid battery)

⚠ CAUTION

To ensure operational safety and maintain the battery, please observe the following rules.

⚠ CAUTION

The electrolyte is a poisonous, corrosive diluted sulphuric acid liquid. Therefore, protective clothing and gloves must be worn when working near the battery. If the electrolyte accidentally comes into contact with your clothing, skin or eyes, please rinse with water immediately. If the electrolyte comes into contact with your eyes, please see a doctor immediately.

Neutralise any electrolyte that spills.

⚠ DANGER

When charging the battery in areas with insufficient ventilation, there is a risk of explosion due to release of combustible gases. Smoking and naked flames are strictly prohibited to avoid explosions.

The battery must only be charged at the charging stations and locations provided for this purpose and in accordance with regulations. They must fulfil certain criteria during the charging process. For example, battery charging and storage locations must be very well ventilated.

Do not smoke when using batteries, and extinguish all naked flames.

NOTE

Check the specific gravity of the electrolytes. Always charge and maintain the battery in accordance with instructions from the manufacturer. Optional battery chargers must also be operated according to their instructions.

⚠ CAUTION

No metal objects should be placed on the battery.

Be careful of short-circuiting the battery!

Do not fill up with electrolytes before charging.

⚠ CAUTION

Always charge and maintain the lithium-ion battery in accordance with instructions from the manufacturer.

Connecting the rechargeable battery to an external charger

⚠ CAUTION

The charging current for the battery must not exceed 250 A. If you are using a charger with a high charging current, please contact your authorized dealer.

Certain requirements must be strictly followed when charging the battery using an external charger:

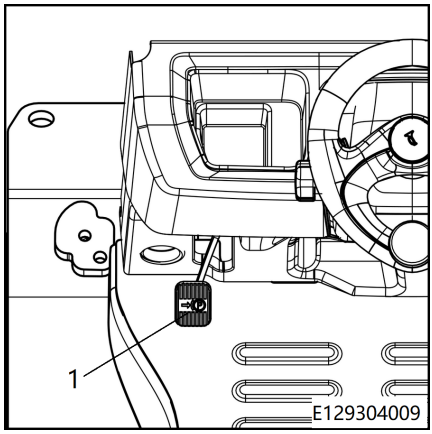
- Only use the battery charger and charging characteristic curve permitted in the battery specifications.

– Lower the fork carriage fully.

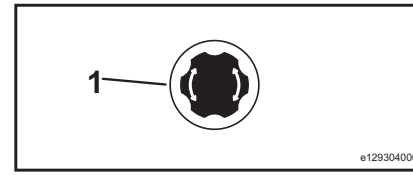
The fork arms must touch the ground.

– Apply the parking brake by depressing the parking brake pedal (1). ▷

– Turn the key switch off.



– Press the emergency off switch (1). ▷

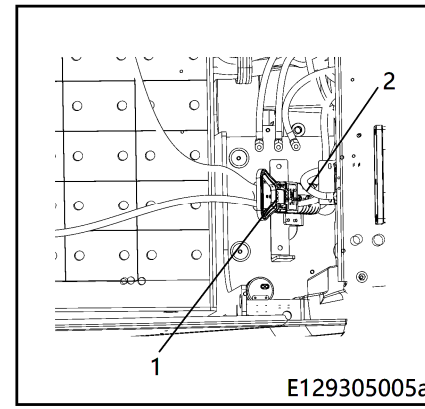


Lead acid batteries

– Open the battery cover. ▷
– Remove the battery male connector (1) from the forklift power connector(2).
– Connect the external charger plug to the battery connector (1).
– Switch on charger.

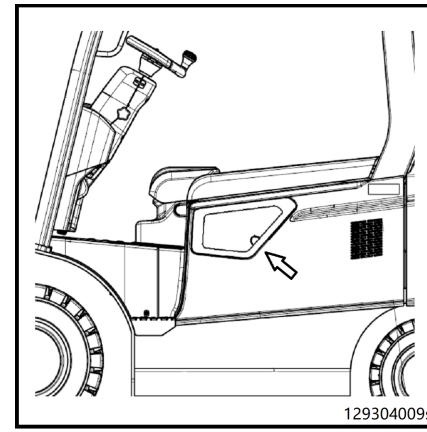
⚠ CAUTION

When inserting the battery plug, make sure that the plug is fully seated.



lithium battery

– Open the battery charging port baffle. ▷



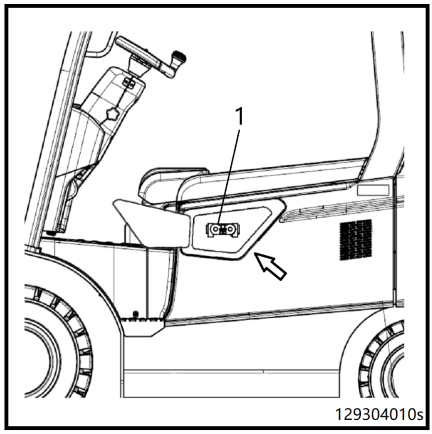
Check rechargeable battery condition, electrolyte level and specific gravity (lead-acid battery).

– Connect the external charger plug to the lithium battery connector (1). ▷

– Switch on charger.

⚠ CAUTION

When inserting the battery plug, make sure that the plug is fully seated.



Check rechargeable battery condition, electrolyte level and specific gravity (lead-acid battery).

– Inspect battery for cracks, raised plates and electrolyte leaks.

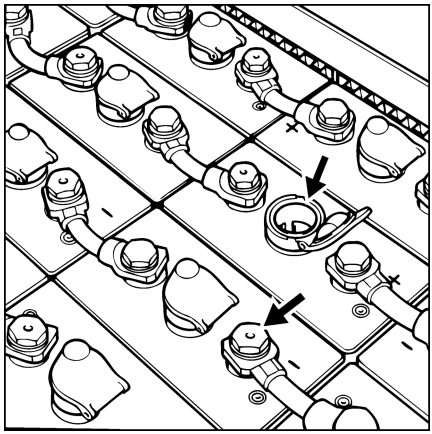
– Unscrew the battery cover and check the electrolyte level.

– If the battery has an inspection tube, then the electrolyte level should be at the base of the tube. If there is no inspection tube, then the electrolyte level should be 10–15 mm higher than the plates. ▷

– If the electrolyte level is excessively low, it can only be filled up with distilled water.

– Remove any sediment from the electrodes and lubricate with non-acidic lubricating grease.

– Retighten the electrode holder.



NOTE

If necessary, use a hydrometer to check the electrolyte.

Check rechargeable battery condition, electrolyte level and specific gravity (lead-acid battery).

⚠ CAUTION

Deep discharge (more than 20% of the battery rated capacity) will cause the battery life to shorten.

⚠ CAUTION

Always use and maintain the lithium-ion battery in accordance with instructions from the manufacturer.

Lifting devices and attachments

Operating the lifting device



⚠ WARNING

There is a risk of being trapped between parts due to the movement of the lift mast or attachments.

Never stand near or enter the lift mast, or the area between the lift mast and the truck.

Use the lift mast and attachments in an appropriate and correct manner.

The driver must be trained in the use of the lift mast and attachments.

Be aware of the maximum lift height of the mast.

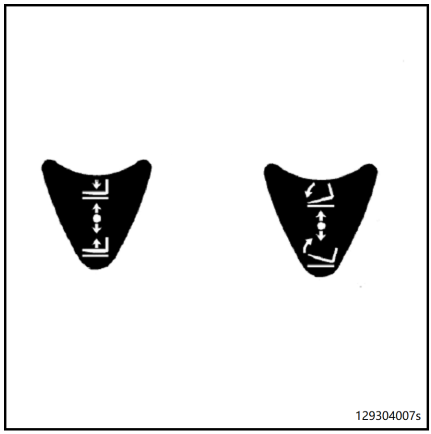
The control lever must be operated slowly and steadily.

Lifting, lowering and tilting speeds depend on the control lever's range of motion.The control lever will automatically return to neutral position once released.

NOTE

For trucks fitted with optional ISO functionality, the lifting system and attachments only function when the truck is switched on and the driver's seat is occupied (seat switch is actuated).

– Take note of the operating symbols marked with arrows. ▷



Lifting the fork carriage

– Push joystick (1)back.

Lowering the fork carriage

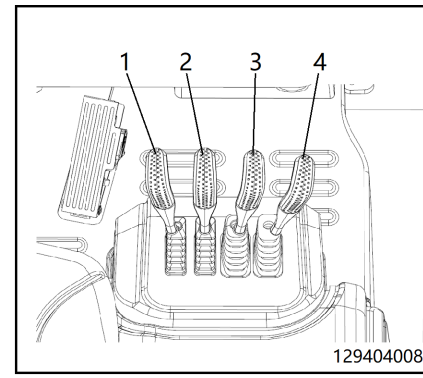
– Push joystick (1)forwards.

Tilting the lift mast forward

– Push the joystick (2)forwards.

Tilting the lift mast backwards

– Pull joystick (2)back.



⚠ DANGER

There is an increased risk of falling and tilting when the lift mast is lifted.For this reason, do not step onto the raised fork carriage.

⚠ CAUTION

Do not stand on the fork arms during lifting.

Danger of falling or being hit.

Operating attachments

Attachments are fitted to the truck as optional extras:(sideshift forks, rotators and tensioning devices etc.).Do not exceed the working pressure of the attachments during operation. Comply with operating instructions for the use of the attachments.One or two additional control levers can be fitted to operate the attachments.

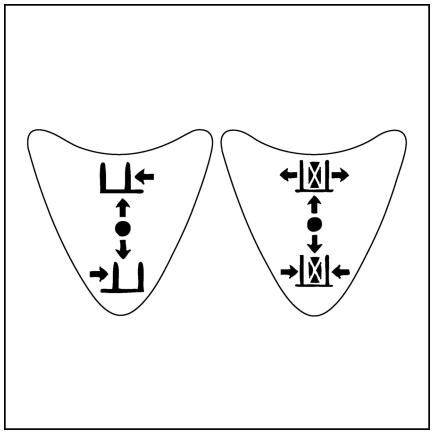
NOTE

Below is a description of attachment operations. The forklift truck can be configured with different joysticks.

NOTE

After installing each attachment, a label should be attached to the battery cover specifying the truck's load capacity after the installation.An attachment operating note should also be attached to the back of the attachment operating lever.

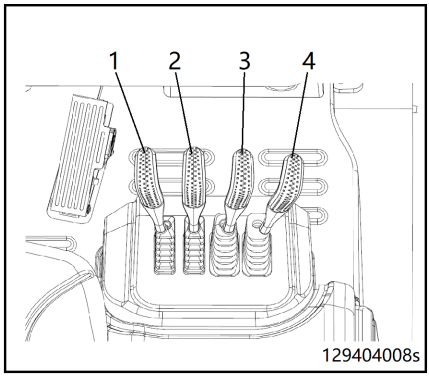
– Take note of the operating symbols with arrows. ▷



Sideshift operation

– Push the joystick (3)forwards to move the fork carriage to the left. ▷

– Pull the joystick (3)back to move the fork carriage to the right.



Operating the clamp

– Push the joystick (4)forwards to release the clamp.

– Pull the joystick (4)back to engage the clamp.

⚠ CAUTION

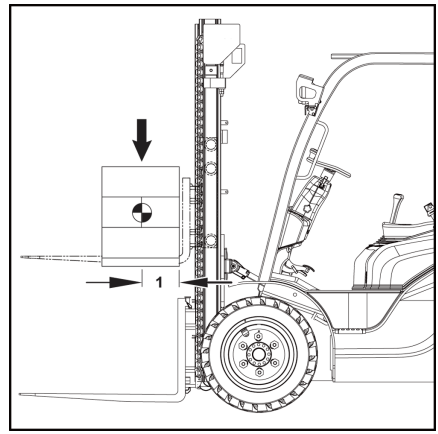
If the attachment was not supplied with the truck, it can be used only if verified by authorized dealer, and if safe operation, in terms of load capacity and stability after installation, is guaranteed.

Transporting loads

Load centre distance and load capacity

Before lifting goods, the relationship between the weight, load centre of gravity distance and maximum lift height of the goods must be understood.

– Load centre distance refers to the distance between the vertical plane of the fork arms and the centre of gravity of the loads (1). ▷



NOTE

The centre of gravity is not necessarily located at the centre of the load.Load capacity refers to the weight of loads that can be safely lifted to a required height within the given load centre distance.

Capacity rating plate

Before loading

Before lifting any load, please read the information on the truck's capacity rating plate.

⚠ DANGER

Risk of loss of stability.

The parameters on the capacity rating plate apply to compact, uniform loads. These load limits must not be exceeded. Exceeding the load limits will affect the stability of the forklift truck and the strength of the fork arms and lift mast.

If the truck is equipped with attachments, please read and follow the information on the additional capacity rating plate of each attachment (refer to the "Additional capacity rating plate" chapter for details).

Transporting loads

The load capacity of a truck depends on:

- Type of the lift mast (standard, duplex, triplex)
- Lifting height of the installed lift mast
- Tyres of the front axle
- Whether attachments or additional equipment are used
- Maximum permissible backward tilting angle of the lift mast
- Size and load capacity of the fork arms
- Size of load, offset in gravitational or geometric centre

If one of these parameters is changed, this can have a considerable effect on the load capacity.

If the truck has been modified, the load capacity rating must be determined again, and it may be necessary to replace the capacity rating plate.

– Please contact your authorised dealer.

NOTE

The truck's load capacity will also be restricted under the following circumstances:

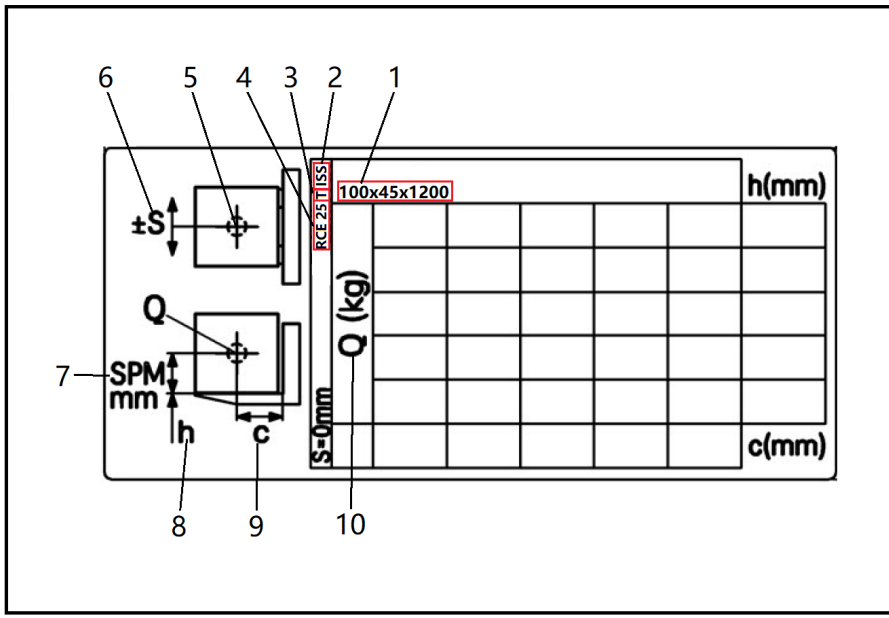
- *Transporting loads in level 6 or greater winds*

The maximum permissible load capacity is dependent on the load centre of gravity distance (the distance between the load's gravity centre and the vertical plane of the fork arms), the height of the gravity centre and the lift height.

NOTE

The capacity rating plate below is only an example.

Capacity rating plate



1	Fork arms dimensions: Maximum width, maximum thickness and maximum length, in mm Note: If larger fork arms are used, an additional capacity rating plate is required. Please contact your authorised dealer.
2	Identification of attachments: Integral sideshift (ISS), suspended sideshift (SS)
3	Lift mast types: Standard lift mast S, duplex lift mast D, triplex lift mast T
4	Truck model name
5	Symbol of load gravity centre
6	Maximum permissible side shift
7	Height from the load's gravity centre to the bottom edge of the load, in mm
8	Lift height (unit: mm)
9	Load centre of gravity distance refers to the distance between the vertical plane of the fork arms and the centre of gravity of the loads in millimetres.
10	Maximum load in kg

Load capacity example:

Load centre of gravity distance: 600 mm (9).

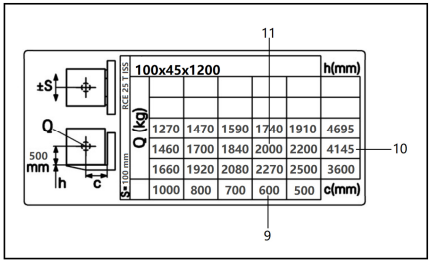
Load lift height: 4145 mm (10).

– Locate the intersection of the column of the 600 mm load centre of gravity distance and the row of the 4145 mm lift height.

In this example, the maximum permissible load capacity is 2000 kg (11).

Follow the same steps for other lift heights and load centre of gravity distances. The determined value is based on two fork arms and uniformly distributed central loads.

▷



NOTE

It is permitted to use a calculated (interpolated) value between two known adjacent values. It is not permitted to use H, Q and c values that are greater than the speficied value or c values that are smaller than the speficied value. If you need to use out-of-range values, please contact your authorised dealer.

Additional capacity rating plate

DANGER

Risk of loss of stability.

Using attachments will restrict the load capacity. Therefore, an additional capacity rating plate must be attached to a position that is visible to the driver.

If the plate is missing, or if any information about the truck, attachments and load capacity does not match the actual value, please contact your service partner.

Using attachments may affect the permitted maximum driving speed. When replacing attachments, be sure to always check the permitted maximum driving speed and make necessary adjustments. Alternatively, you can set the truck to permanently drive at the lowest allowable speed.

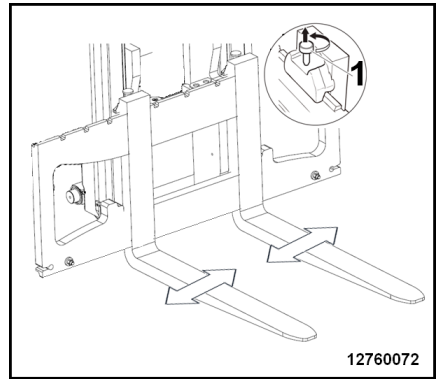
If preassembled fork carriage is used, then the relevant values on the additional capacity rating plate should be further reduced.

– Please contact an authorised dealer to determine the truck's new load capacity.

NOTE

The additional capacity rating plate has different data for different truck series, lift mast series, and attachments. Please refer to the "Capacity rating plate" chapter on how to read the additional capacity rating plate.

Adjusting the fork spacing



– Lift the fork arm lock bolts and turn them (1) 90° to unlock. The fork arm spacing can then be adjusted.
– Adjust the fork arm spacing based on the dimensions of the load.
– Note that the forks must be equidistant from the centreline of the fork carriage.
– After adjusting, return the fork arm lock bolts to their original positions and fit into the notches on the fork carriage, so that the fork arms are unable to move.

⚠ CAUTION

The fork arms are heavy! Exercise extreme caution when handling them.

When adjusting fork arm spacing, lean against the shelf. When you are standing securely, push the forks with your feet to adjust them.Do not adjust the forks using your hands.

NOTE

The load must be centred between the forks.

Picking up a load



⚠ DANGER

Fall and crush hazard

Standing on the forks is strictly prohibited.

It is strictly prohibited to use the forks, pallets or other devices for lifting people (as required by Chinese regulations).

National regulations for the location of use must be observed. The truck can be equipped with an approved working platform for lifting people, if permitted by national regulations in the location of use. Please contact your local authorised dealer.



⚠ DANGER

Danger due to falling load. Risk of fatal injury in the extension area of the lift mast.

When transporting loads, there must be no one in the danger area.

When stacking and unstacking, people must not stand or walk under a raised load.

Always keep the load lowered and the mast tilted backwards when driving forklift trucks. Look out for people.

⚠ DANGER

When a load is raised, it is not permitted for anyone to stand beneath the suspended load.

⚠ DANGER

Incorrectly positioned loads pose a risk of falling.

Loads should be arranged so that they do not project beyond the truck loading area and cannot slip, topple over or fall off. If there is a risk of small-sized loads falling between the crossmembers of the overhead guard, use an appropriate load backrest or install a guard grille on the overhead guard.

Make sure that there is sufficient room for extension above the lift mast.



⚠ DANGER

There is a risk of crushing as the lift mast or attachments may move.

For this reason, never reach into or enter the lift mast, or the area between the lift mast and the forklift.

The lifting system and attachments should only be used for their intended purpose.

Drivers must be instructed in the operation of the lifting system and attachments.

Take note of the maximum lift height.

⚠ DANGER

Overloading and tipping hazard

Strictly adhere to the permissible load indicated on the load rating plate.

⚠ DANGER

Tipping hazard!

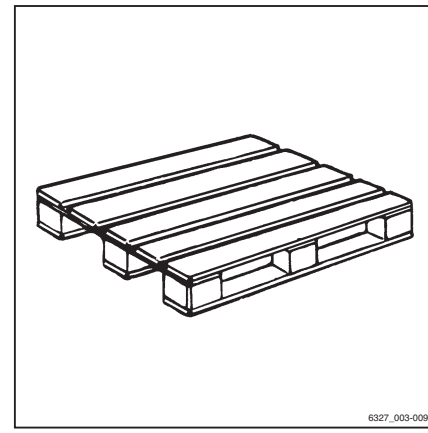
– Do not tilt the lift mast backwards with the load raised and when the lift height is high.

Transporting pallets

As a rule, loads (e.g. pallets) must be transported individually. Transporting multiple loads at the same time is only permitted:

- when instructed by the supervisor and
- when the technical requirements have been met.

The driver must ensure proper condition of the load. Only safely and carefully positioned loads may be transported.



Transporting suspended loads

Before transporting suspended loads, consult the national regulatory authorities (in Germany, the employer's liability insurance associations).

National regulations may place restrictions on these operations, e.g. in Italy. Contact the relevant authorities.

If there are no country-specific regulations for suspended loads in the country of use, the following instructions for safe handling must be observed.



⚠ DANGER

Suspended loads that begin to swing can result in the following risks:

- Impaired braking and steering movement
- Tipping over the load wheels or drive wheels
- Tipping the truck at right angles to the drive direction
- Risk of crushing of guide persons
- Reduced visibility

⚠ DANGER

Loss of stability!

Slipping or swinging suspended loads can lead to a loss of stability and cause the truck to tip over.

– When transporting suspended loads, observe the following instructions.

Instructions for transporting suspended loads:

- Swinging loads must be prevented by using the proper driving speed and driving style (careful steering, braking).
- Hanging loads must be hooked on to the truck in such a way that the harness cannot shift or release unintentionally and cannot be damaged.
- When transporting suspended loads, suitable aids (e.g. guy wires or supporting poles) must be available so that accompanying persons can guide suspended loads and prevent the loads from swinging.
- Take particular care to ensure that there is no one in the drive direction in the driving lane.
- If, despite this, the load begins to swing, ensure that no person is placed at risk.

⚠ DANGER

Risk of accident!

When transporting suspended loads, never perform or end driving and load movements abruptly.

Never drive on slopes with a suspended load.

Transporting containers holding fluids as hanging loads is not permitted.

Picking up a load

⚠ DANGER

There is a risk to life caused by a falling load or if parts of the truck are being lowered.

– Never walk or stand underneath suspended loads or raised fork arms.

– Never exceed the maximum load values specified on the capacity rating plate. Otherwise, stability cannot be guaranteed.

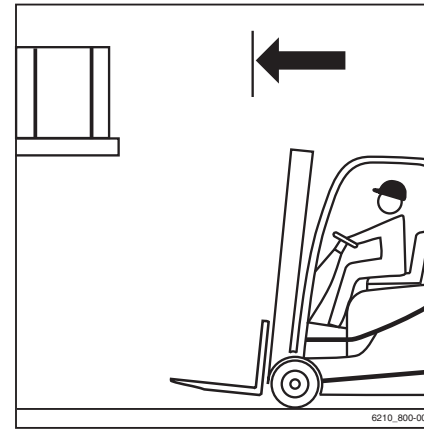
– Only store pallets that do not exceed the specified maximum size. Damaged loading

equipment and incorrectly formed loads must not be stored.

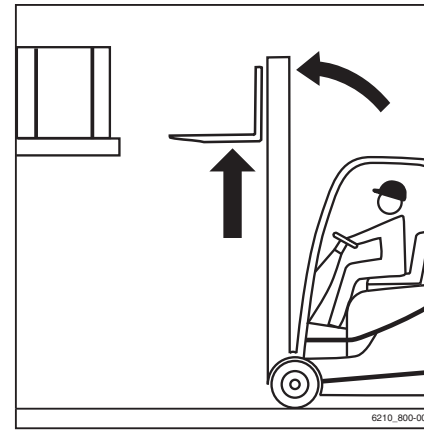
– Attach or secure the load to the lifting accessory so that the load cannot move or fall.

– Store the load so that the specified aisle width is not reduced by protruding parts.

– Approach the rack carefully, brake gently and stop just in front of the rack. ▷



– Position the forks. ▷



NOTE

The tilt speed of the lift mast in this truck is significantly higher than for previous products in this series. This is signalled by a warning message shown on the display and operating unit after the key switch has been switched on.

– Set the lift mast to vertical.

– Lift the fork carriage to the stacking height.

⚠ CAUTION

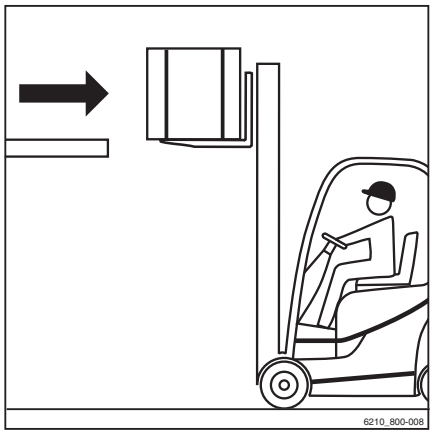
Risk of component damage!

When inserting the fork into the rack, ensure that the rack and load are not damaged.

– Insert the fork as far under the load as possible. Stop the truck as soon as the fork back is resting on the load. The load centre of gravity must be midway between the fork arms. ▷



– Lift the fork carriage until the load is resting entirely on the fork. ▷



⚠ DANGER

Risk of accident!

– Beware of any people in the danger area.

⚠ CAUTION

Risk of component damage!

– Ensure that the roadway behind you is clear.

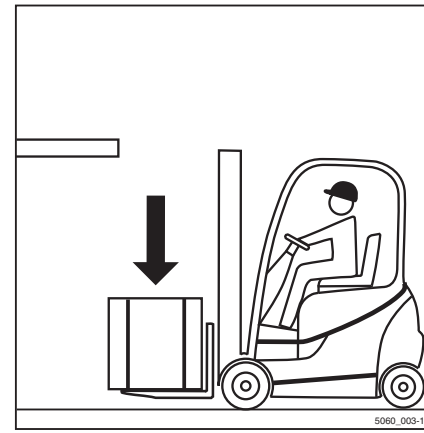
– Reverse carefully and slowly until the load is clear of the rack. Brake gently.

⚠ DANGER

Due to the risk of tipping, never tilt the lift mast with a raised load!

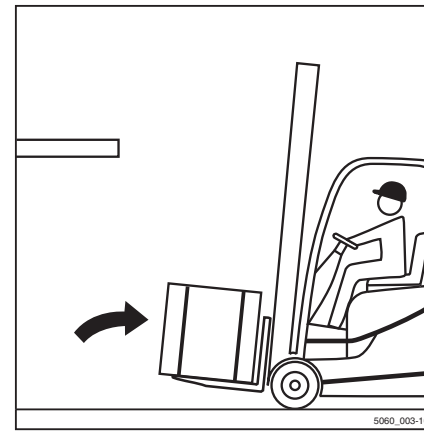
– Lower the load before tilting the lift mast.

– Lower the load while maintaining ground clearance. ▷



– Tilt the lift mast backwards. ▷

The load can be transported.



Transporting loads



NOTE

Observe the information in the chapter entitled "Safety regulations when driving".

DANGER

The higher a load is lifted, the less stable it becomes. The truck can tip over. The load can fall. There is an increased risk of accidents.

Driving with a raised load and the lift mast tilted forward is not permitted.

- Only drive with the load lowered.
- Lower the load until ground clearance is reached (not over 300 mm).
- Only drive with the lift mast tilted backwards.

- Drive slowly and carefully around corners.



NOTE

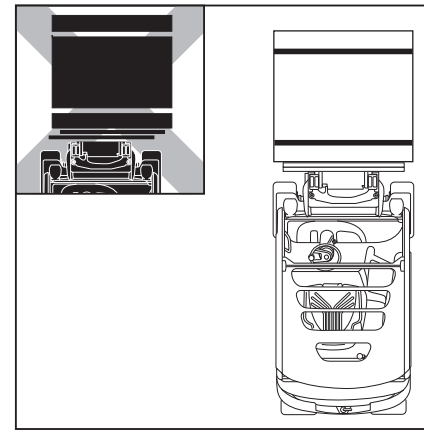
Observe the information in the chapter entitled "Steering".

- Always accelerate and brake gently.

NOTE

Observe the information in the chapter entitled "Operating the service brake".

– Never drive with a load protruding to the side (e.g. with the sideshift)! ▷



Setting down loads

⚠ DANGER

Risk of accident due to changed moment of tilt!

Please note that the lift mast can be tilted far enough forward with a raised load to cause the truck to tip over.

The load centre of gravity and the moment of tilt both change when the load slips. The truck may tip forwards.

– Only tilt the lift mast forwards with a raised lifting accessory when it is directly above the stack.
– When the lift mast is tilted forwards, take particular care to ensure that the truck does not tip forwards and that the load does not slip.

⚠ WARNING

Risk of accident from falling load!

If the fork or the load remains suspended during lowering, the load may fall.

– When removing from stock, move the truck far enough back so that the load and the fork can be lowered freely.

– Drive up to the stack with the load lowered in accordance with regulations. ▷
– Set the lift mast to vertical.
– Lift the load to the stacking height.
– Approach the rack at a moderate speed.



NOTE

The tilt speed of the lift mast in this truck is significantly higher than for previous products in this series. This is signalled by a warning message shown on the display and operating unit after the key switch has been switched on.

– Lower the load until it rests securely on the rack. ▷
– Look behind you!
– Move the truck back until the fork arms can be lowered without touching the stack.
– Lower the fork to the ground clearance position.
– Tilt the lift mast backwards and drive away.



Driving on ascending and descending gradients



⚠ DANGER

Danger to life!

Driving on ascending and descending gradients carries special dangers!

– Always follow the instructions below.

– On ascending and descending gradients, the load must be carried facing uphill.
– It is only permitted to drive on ascending and descending gradients that are marked as traffic routes and that can be used safely.
– Ensure that the ground to be traversed is clean and provides a good grip.
– Do not turn on ascending and descending gradients.
– Do not drive onto or along ascending and descending gradients at an angle.
– Do not park the truck on ascending or descending gradients.
– In case of emergency, secure the truck with wedges so that the truck does not roll away.
– Reduce the driving speed on descending gradients.

It is not permitted to drive on long ascending and descending gradients greater than 15% due to the specified minimum braking and stability values.

– Before driving on ascending and descending gradients greater than 15%, consult the authorised service centre.

The process of placing loads into stock and removing loads from stock while on an ascending or descending gradient is not permitted!

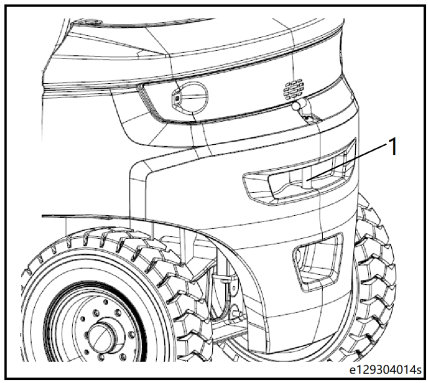
– Always place loads into stock and remove loads from stock on a horizontal plane.

Tow coupling

If the truck breaks down, it can be towed using the tow coupling.

The tow coupling can only be used for hauling light loads in factory areas. (Pay attention to accident prevention and comply with technical safety regulations)

– Lift out the towing pin (1). ▷
– Place the towing pin into the connector tube.
– Insert the towing pin into the lock aperture.



NOTE

When towing, the driver must be sitting in the seat to steer the truck, actuate the brakes and operate other controls.

NOTE

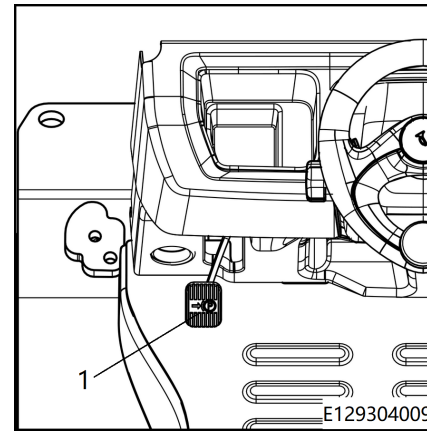
For IC counterbalanced forklift trucks, if there is no fault with the engine, we recommend starting the engine before towing the truck. This way, the hydraulic steering system can be used, which will facilitate steering.

Leaving the truck temporarily

If you want to leave the truck temporarily to perform simple tasks in the vicinity of the truck (for example, order picking, opening the door or hitching a trailer) while keeping the ignition switched on, you must observe the following precautions:

– Lower the fork carriage.

– Depress the parking brake pedal (1) until it reaches the locked position. ▷



– The parking symbol Ⓟ on the display unit comes on and remains lit. The truck is braked. ▷



⚠ WARNING

Make sure that the truck does not move.

NOTE

When leaving the truck temporarily, be sure to keep the truck under constant supervision.

Before exiting the truck

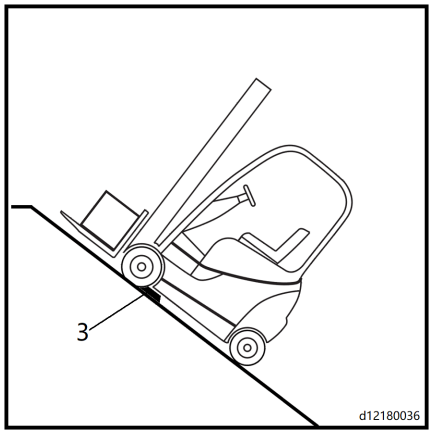
– Select a location that is secure and as clean as possible.
– Set down the load/lower the fork carriage completely.
– Tilt the mast forwards slightly.
– Lower the fork arms until they touch the ground.
– Apply the parking brake until it reaches the locked position.
– Switch off the truck by turning the key to the 0 position.
– Remove the key.

⚠ DANGER

Do not switch off the truck by turning the key when the truck is moving.

⚠ DANGER

The handbrake must be applied and the key removed before exiting the vehicle. Do not leave the truck on a ramp except in emergency situations. In such case, place chocks (3) under the front wheels to immobilise the vehicle.



Operation in special operating situations

Transport

⚠ CAUTION

Danger of material damage from overloading!

If the truck is driven onto a means of transport, the load capacity of the means of transport, the ramps and loading bridges must be greater than the actual total weight of the truck. Components may become permanently deformed or damaged due to overloading.

– Determine the actual total weight of the truck.

– Only load the truck if the load capacity of the means of transport, the ramps and loading bridges is greater than the actual total weight of the truck.

Determining the actual total weight

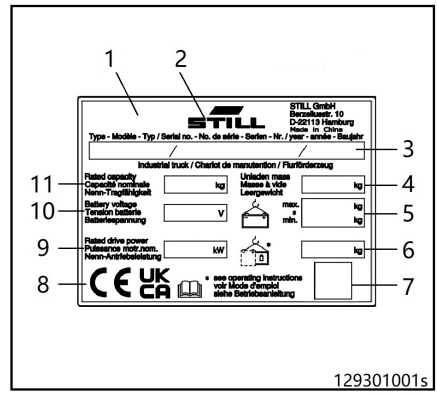
▷

– Park the truck securely.

– Determine the unit weights by reading the truck nameplate and, if necessary, the attachment (variant) nameplate.

– Add the determined unit weights to obtain the actual total weight of the truck:

Tare weight (4)
\+ Max. permissible battery weight (5)
\+ Ballast weight (variant) (6)
\+ Attachment net weight (variant)
\+ 100 kg allowance for driver
= Actual total weight



⚠ DANGER

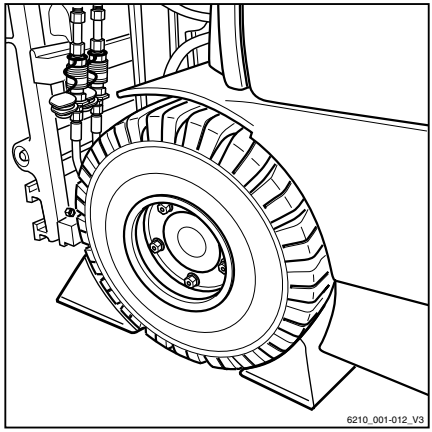
Risk of accident from the truck crashing!

Steering movements can cause the tail end to veer off the loading bridge towards the edge. This may cause the truck to crash.

- Before driving over a loading bridge, ensure that it is installed and secured properly.
- Ensure that the transport vehicle to be driven onto has been sufficiently secured against moving.
- Maintain a safety distance from edges, loading bridges, ramps, working platforms etc.
- Drive slowly and carefully onto the transport vehicle.

Setting chocks

- Secure the truck from rolling away by placing a wheel chock in front of each front wheel and behind each back wheel (1).
- Park the truck securely.



⚠ CAUTION

Risk of component damage!

If you remove the battery male connector when the key switch is switched on (under load), an arc will be produced. This can lead to erosion at the contacts, which considerably shortens their service life.

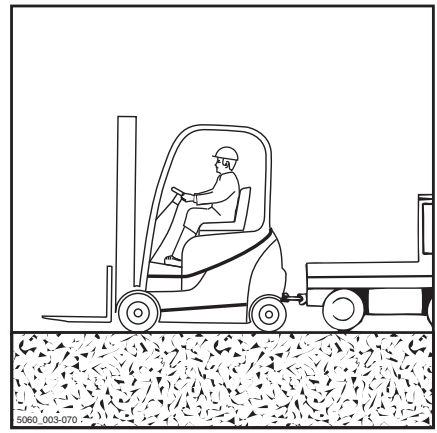
- Switch off the key switch before the battery male connector is disconnected.
- Only disconnect the battery male connector with the key switch switched on in an emergency.

- Ensure that the key switch is switched off.
- Disconnect the battery male connector.

NOTE

If the electric parking brake (variant) cannot be triggered electrically, it must be applied manually; see the chapter entitled "Emergency operation of the electric parking brake".

Towing



⚠ DANGER

The brake system on the towing vehicle may fail. There is a risk of accident!

If the brake system of the towing vehicle is not adequately sized, the vehicle may not brake safely or the brakes may fail. The towing vehicle must be able to absorb the pulling and braking forces from the unbraked towed load (total actual weight of the truck).

– Check the pulling and braking forces of the towing vehicle.

⚠ DANGER

The truck could drive into the towing vehicle when the towing vehicle brakes. There is a risk of accident!

If a rigid connection has not been used for power transmission in two directions during towing, the truck may drive into the towing vehicle when the towing vehicle brakes. For safety reasons, only a tested tow bar may be used.

– Use a tested tow bar.

⚠ CAUTION

If the drive of the truck between the drive motor and the drive axle is not interrupted, the drive may be damaged.

– Place the drive direction switch in the neutral position.

⚠ CAUTION

Risk of component damage!

If you remove the battery male connector with the key switch switched on (under load), an arc will be produced. This can lead to corrosion at the contacts, which considerably shortens their service life.

– Do not disconnect the battery male connector while the key switch is switched on.

⚠ DANGER

People can be crushed between the truck and towing vehicle during manoeuvring. There is danger of death!

The towing vehicle may only be manoeuvred and the tow bar may only be attached using a second person as a guide. This ensures that the driver of the towing vehicle and the mechanic attaching the tow bar are aware of possible risks.

– Only manoeuvre with a guide.

⚠ CAUTION

Steering is stiff! There is no power steering if the hydraulics fail!

– The selected towing speed must allow the truck and towing vehicle to be effectively braked and controlled at all times.

⚠ CAUTION

If the truck is not steered while it is being towed, it may veer out in an uncontrolled manner!

– The truck being towed must also be steered by a driver.
– The driver of the truck being towed must sit in the driver's seat and fasten the seat belt before towing.
– Where possible, activate the restraint systems provided.

– Set down load and lower fork arms close to the ground.
– Place the drive direction switch in the neutral position.
– Apply the parking brake.
– Switch off the key switch.
– Disconnect the battery male connector.
– Check the pulling and braking forces of the towing vehicle.
– With the help of a guide, attach the towing vehicle to the truck.
– Secure the tow bar to the tow coupling of the towing vehicle and the truck.
– Sit in the driver's seat in the truck to be towed, and fasten the safety belt.

– Where possible, activate the restraint systems provided.
– Release the parking brake.
– Select a towing speed that allows the truck and towing vehicle to be effectively braked and controlled at all times.
– Tow the truck.
– After towing, secure the truck from rolling away (e.g. by applying the parking brake or using chocks).
– Remove the tow bar.

Crane loading

Crane loading is only intended for transporting the complete truck, including the lift mast, for its initial commissioning. For application conditions that require frequent loading or that are not presented here, please contact the manufacturer with regard to special variants.

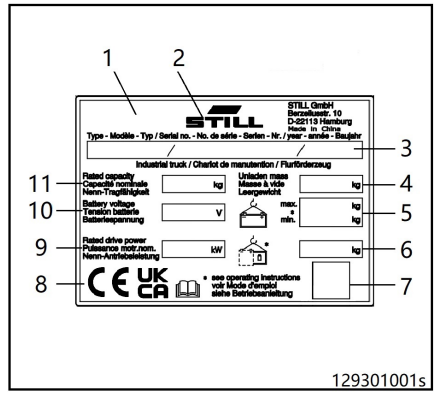
Only those persons with sufficient experience of suitable harnesses and hoists may load up forklift trucks.

Determining the actual total weight

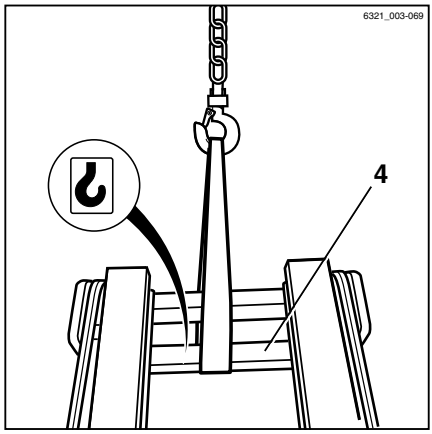
▷

– Park the forklift truck securely; see .
– Determine the unit weights by reading the truck nameplate and, if necessary, the attachment (variant) nameplate.
– Add the determined unit weights to obtain the actual total weight of the truck:

Tare weight (4)
\+ Max. permissible battery weight (5)
\+ Ballast weight (variant) (6)
\+ Attachment net weight (variant)
= Actual total weight



Hooking on the lifting straps



⚠ CAUTION

Harnesses may damage the truck's paintwork!

Harnesses may damage paintwork by chafing and pressing on the surface of the truck. Particularly hard or sharp-edged harnesses, such as wires or chains, can quickly damage the surface.

– Use textile harnesses, e.g. lifting straps, with edge protectors or similar protective devices if necessary.

⚠ DANGER

There is risk of being hit if the hoists and harnesses fail and cause the truck to fall, with potentially fatal consequences!

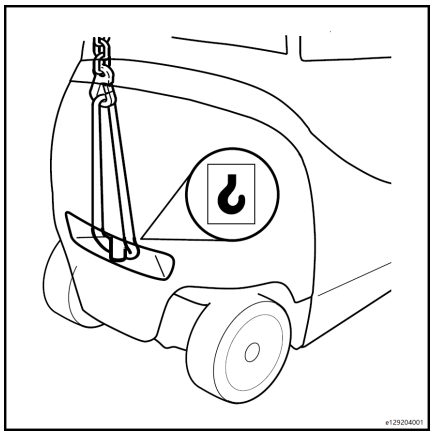
– Only use hoists and harness with sufficient load capacity for the actual total weight of the truck.
– Only use the truck's designated lifting points.
– Make sure that harnesses such as hooks, shackles, belts etc. are only used in the indicated load direction.
– The harnesses must not be damaged by truck parts.

– Loop the lifting straps around the main traverse (4) on the outer mast of the lift mast.

NOTE

The lifting points of the truck are marked with the hook symbol.

– loop the crane belts around towing pin.
– Determine the truck's centre of gravity.



– Set the length of the harnesses so that the lifting eye (6) is vertically above the truck's centre of gravity.

This ensures that the forklift truck hangs level when lifting it.

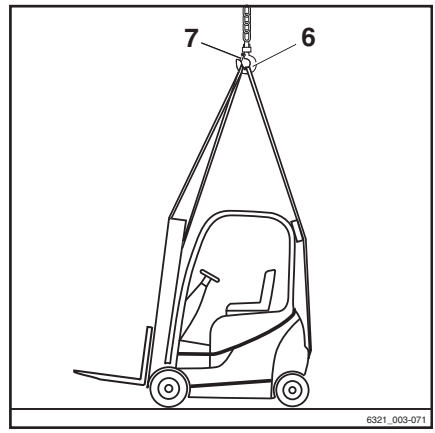
– Connect the lifting straps to the lifting eye and insert the safety device (7).

⚠ CAUTION

Incorrectly fitted harnesses may damage attachment parts!

Pressure from the harnesses can damage or destroy attachment parts when the truck is lifted. If attachment parts are in the way (e.g. lighting, rear window, trademark emblem etc.), these must be removed before loading. Ask your service centre about this.

– Secure harnesses in such a way that they do not touch any attachment parts.



Loading the truck



⚠ DANGER

If the raised truck swings in an uncontrolled fashion, it may crush people. There is a risk to life!

– Never walk or stand underneath suspended loads.
– Do not allow the truck to bump into anything whilst it is being lifted, or allow it to move in an uncontrolled way.
– If necessary, hold the truck using guide ropes.

– Carefully lift the truck and take care when setting it down at the intended location.

Storing the truck

Taking the truck out of operation

If the truck will not be used for over two months, place it in a very well ventilated, frost-free, clean and dry room. Additionally, the steps below should be followed:

Steps to be taken before putting the truck temporarily out of use

- Clean the truck thoroughly.
- Lift and lower the fork carriage to its full extent and tilt the lift mast forwards and backwards several times. Repeat the same operation several times on attachments, if fitted.
- Lower the fork carriage onto the support block to release the load on the chain.
- Check the hydraulic oil level and refill if necessary.
- Apply a thin coat of oil or grease to the surfaces of all exposed components.
- Lubricate the truck.
- Check the condition of the battery and the electrolyte level. Apply non-acidic grease to the terminal. (Should comply with manufacturer's instructions)
- Check the lithium-ion battery* (option) status. (Should comply with manufacturer's instructions)
- Spray all the electrical contacts with the appropriate contact spray.

⚠ CAUTION

Erect and fix the forklift truck to prevent permanent tyre deformation.

NOTE

Do not cover the truck with plastic film as it may accumulate water vapour.

NOTE

If the forklift truck is not in use for over 6 months, contact your authorised dealer in order to take further measures.

Bringing the truck back into use

- Clean the truck thoroughly.
- Lubricate the truck.
- Apply non-acidic grease to the battery terminal.
- Check the battery condition and electrolyte level. (Should comply with manufacturer's instructions)
- Check the lithium-ion battery* (option) status. (Should comply with manufacturer's instructions)
- Check if the hydraulic oil contains any water and change the oil if necessary.
- Check the brake fluid level and replace or top up if necessary.
- Conduct all maintenance as required for first use.
- Using the truck.

General Knowledge

Proper functioning of the forklift truck can only be maintained by carrying out periodic maintenance and checks according to the operating guidance and tips set out in the user guide. Checking and maintenance work may only be performed by technicians accredited by the manufacturer. This work can be performed by your dealer according to the Maintenance Contract.

If you wish to maintain and service the forklift truck yourself, we recommend that maintenance is carried out by the dealer's appointed technicians for at least the first three times. Your maintenance personnel should also be present in order to receive appropriate training.

During the maintenance process, please make sure that the forklift truck is stationary on flat ground and that it does not slide.

Lower the fork carriage and slowly tilt the lift mast forward until the truck is stationary. Apply the parking brake. Press the power isolation switch and remove the key. When working on a truck with a raised carriage or lift mast, the carriage or lift mast must be secured to prevent it falling.

Ensure that the carriage and lift mast will not fall suddenly when raised.

When carrying out maintenance on the back of the truck, the lift mast must be secured to prevent backwards tilting.

Modifying or installing additional equipment on the forklift truck is prohibited without the agreement of the manufacturer.

⚠ CAUTION

Lost or damaged dataplates and warning labels must be replaced. **Refer to user manuals for position and part numbers.**

A functional test and trial run should be performed after every maintenance check.

NOTE

If the forklift truck is used in an extreme environment (such as excessive heat, excessive cold or areas with high dust concentrations), the time intervals given in the maintenance tables should be reduced accordingly.

⚠ CAUTION

Follow the manufacturer's safety regulations and disposal methods regarding oil, lubricating grease and cleaning fluids.

Maintenance intervals

NOTE

If the forklift truck is used in a designated environment, the time intervals in the maintenance table can be changed. The inspection and maintenance intervals depend on the operating and service conditions of the forklift truck. ***We recommend shortening the maintenance intervals for forklift trucks operating in harsh environments. If you have any questions, please contact an authorised dealer.***

Disposal of old trucks

The disposal of old trucks is regulated in directive 2000/53/EC from the European Parliament and Council.

We therefore recommend having this work carried out in an approved recycling plant. If you would like to carry out this work yourself, you must obtain approval from the relevant authorities as per articles 9, 10 and 11 of directive 75/442/EEC.

In addition, the following minimum requirements must be observed:

- The locations in which old trucks are stored before treatment must be areas suited to this task with impervious surfaces. These areas are also to be equipped with collection devices and separators for leaking fluids and degreasing cleaning materials
- The locations for treatment must be areas suited to this task with impervious surfaces. These areas must also be equipped with collection devices and separators for leaking fluids and degreasing cleaning materials. Suitable storage areas must be available for disassembled and partially oil-smeared parts, as well as for tyres including fire protection measures. Suitable storage tanks for fluids such as fuel, AdBlue® (urea solution), engine oil, hydraulic oil, cooling fluid and fluids from air conditioning systems must also be provided
- In order to dispose of harmful substances from the old trucks, the batteries and LPG container must be removed. The following must also be removed, collected and stored separately: fuel, AdBlue® (urea solution), engine oil, cooling fluid, hydraulic oil and fluids from air conditioning systems
- The following parts are to be collected separately and recycled: catalytic converters, metal components containing copper and aluminium, tyres, large plastic components (consoles, fluid containers) and glass

NOTE

The operating company is responsible for adherence to the directives as well as additional country-specific regulations.

5

Maintenance

Safety information for inspection and maintenance work

The industrial truck will only remain ready for operation at all times if the maintenance and inspection tasks are performed at regular intervals and in accordance with the information in the operating instructions.

Maintenance work may be performed only by competent persons. You can agree to have this work performed on the basis of a maintenance contract concluded with your service partner.

Whenever performing maintenance work, the industrial truck should be parked on a level surface and secured so that it cannot roll away.

The industrial truck must be switched off completely, and the battery male connector and switch key must be removed.

When working with the fork carriage and/or lift mast raised, make sure they are secured against accidental dropping.

Whenever work is carried out around the front of the truck, the lift mast must be secured to prevent it tilting backwards.

No modifications, in particular attachments or conversions, should be made to your industrial truck without the manufacturer's approval.

All servicing work should be followed by a function check and a test run performed on the industrial truck.

⚠ WARNING

Any side doors fitted could fall shut during maintenance work and trap staff.

For this reason, both doors should be opened and secured in place during servicing.

⚠ CAUTION

The industrial truck must always be properly labelled.

Missing or damaged identification plates and/or adhesive labels must be replaced. For the warehouse and order number, please consult the spare parts catalogue.

ENVIRONMENT NOTE

Observe information about working with consumables.

Maintenance intervals

The inspection and maintenance intervals depend on the operating and application conditions of the industrial truck.

In the case of operation in extreme conditions (e.g. heat, cold or dust), the maintenance intervals must be reduced.

Contact your service partner.

Inspection and maintenance data

No.	Components	Consumable/equipment	Filling quantity/settings
1	Battery	Distilled water Acid-free grease	As required As required
2	Electric motors: Drive motor Hydraulic motor	Cleaning apparatus for electrical equipment	As required
3	Hydraulic system Standard, duplex and triple masts All lift heights	Hydraulic oil	Standard lift mast: 22 L Duplex mast 22 L Triplex mast 25.5 L
4	Wheels	Drive wheel Steering wheel	Torque value 558 Nm Torque value 210Nm
5	Pneumatic tyre inflation pressure	Drive wheel Steering wheel	1000–1050 kPa 1000–1050 kPa
6	Drive axle	Gear oil Brake fluid (for brake fluid reservoir)	Fill capacity: 8.5 L According to need (it is recommended to fill up to the chamfered level marked on the reservoir)
7	Steering axle, drive motor splined shaft, tilt cylinder	Lubricating grease	As required
8	Lift mast and chain guide	Chain spray	As required
9	Transmission gear installation	Hexagon head bolt M12x35-8.8-ZNS Hexagon head bolt M12x1, 25x40-8.8-ZNS Hexagon head bolt M16x80-8.8-ZNS	Tightening torque 80 N.m Tightening torque 88N.m Tightening torque 195 N.m

10	Installation of the drive axle	Hexagon head bolt M22x1, 5x55-8.8-ZLS	Tightening torque 570 N.m
11	Drive axle connection to lift mast	Socket head screw M16x1, 5x80-8.8-A2C	Tightening torque 200 N.m
12	Installation of the tilt cylinder	Hexagon head bolt M10x25-8.8-ZNS	Tightening torque 80 N.m

Recommended fuels and oils

ENVIRONMENT NOTE

Follow recommendations regarding the use of consumables.

Component name	Quantity		Original oil/fluid	International standard
	L	kg		
Drive axle	8.5		Gear oil	SAE80W-90 API-GL5
	0.25		For brake fluid reservoir	DOT4 brake fluid
Hydraulic system	22		Hydraulic oil (standard mast)	HLP 46 *Cold storage option: 32# hydraulic oil (light duty, average constant oil temperature below 50°C)
	22		Hydraulic oil (duplex mast)	
	25.5		Hydraulic oil (triplex mast)	
Hydraulic components such as tilt cylinder etc.	As required		Lubricating grease	KPF2N-20
Pedals, joints	As required		Lubricating grease	NLGI-2
Chains	As required		Chain spray	Standard chain spray For the spare part no., see spare parts catalogue

NOTE

Using oil of a lower grade than that specified in the table may damage the truck and will void the warranty.

Regular maintenance

The following maintenance will help in improving the truck condition and ensure its functionality.

The user need complete this work as regularly as possible, in accordance with the operating environment.

- Clean the truck (as required).
- Check and tighten the wheel fastener (Please refer to the section **"Tightening the wheel nuts"**).
- **Clean and lubricate the steering axle (every two weeks as recommended, or at least every month).**
- Clean the lift mast chain and apply chain spray.
- Clean and lubricate the sideshift and attachments and check functionality and state of wear (in accordance with the procedures stipulated by the manufacturer).

Table of first service checks

Maintenance precautions
Servicing work requires specialised knowledge and special tools. Please contact your authorised dealer immediately.

Preparations
Clean the truck (as required).
Check that all labels are complete and legible.
Read and delete error content.
Reset the maintenance interval.

Conduct the first maintenance after 1000 operating hours, or at least 12 months.
Drive mechanism and transmission system
Change the gear oil.
Check transmission gear and drive axle for leaks.
Check the installation of the transmission gear and tighten if necessary.
Check the installation of the drive axle and tighten if necessary.
Check wheel fittings and tighten, if necessary.
Check tyres for wear and foreign objects. (Visual inspection)
Clean and lubricate the steering axle.
Clean the drive motor.
Visually inspect the brake fluid level in the brake fluid reservoir. (It is recommended to replace the brake fluid in the reservoir every 2 years)
Check the joystick bellows and replace if damaged.
Chassis and bodywork
Check the mounting and tightness of the chassis, counterweight, overhead guard, drive axle, steering axle, tilt cylinder and tilt cylinder support.
Check whether there is damage to the structure of the top guard frame, whether there is deformation, cracks, welding, paint off, rust and other conditions.
Check the tightness of the bolts connecting the lift mast onto the drive axle, and tighten if necessary.
Check the side panel installation device and tension lock of the battery cover, and adjust if necessary.
Driver's cab
Check that the brake system (foot brake, parking brake, electric regenerative brake) is working properly and adjust if necessary.
Fill with dual-pedal grease (dual-pedal model only)
Check that the horn is working correctly
Check the pedal group for ease of movement, and lubricate.

Lubricate the driver's seat guide.
Check seat belt condition and correct operation.
Check handle bellows for damage and replace if necessary.
Electrical system
Check the working condition of the fan and clean the fan.
Check the power module for dirt and clean if necessary.
Check whether the main contactor cable is tightly installed and undamaged, and replace it if necessary.
Check the truck battery in accordance with manufacturer guidelines.
Check that the seat switch and seat belt monitoring function are working normally.
Check whether the module terminals are loose, and re-tighten if necessary.
Hydraulic system
Clean the hydraulic pump motor.
Check the hydraulic oil level.
Check the leak resistance of the hydraulics (visual inspection).
Check that the breather filter is working normally.
Check that the tilt cylinder is firmly connected and tighten if necessary.
Lubricate tilt cylinder bearings.
Lifting system
Check the working condition and installation of the lift mast, lifting chains and lifting cylinders, adjust the length of the lift mast chains if necessary, and clean and apply chain spray.
Clean and lubricate the lift mast.
Check the fork arms and the fork arm quick-release apparatus.
Check the fork carriage stops.
Special equipment
Clean and lubricate the sideshift and attachments and check functionality and state of wear (in accordance with the procedures stipulated by the manufacturer).
Check the preload of the double hoses for the attachments and adjust if necessary.
Check the condition of the antistatic belt and earth (only when using tyres that are not antistatic).

Subsequent tasks
Check and adjust the date and time of the display unit.
Carry out a functional test and test drive.
Attach a maintenance sticker.

Service plan table

Maintenance precautions
Servicing work requires specialised knowledge and special tools. Please contact your authorised dealer immediately.

Preparations
Clean the truck (as required).
Check that all labels are complete and legible.
Read and delete error content.
Reset the maintenance interval.

Additional maintenance to be performed every 1000 operating hours or at least once every 1 year (primarily checks) (unless otherwise stated in brackets)
Drive mechanism and transmission system
Check transmission gear and drive axle for leaks.
Check the installation of the transmission gear and tighten if necessary.
Check the installation of the drive axle and tighten if necessary.
Check wheel fittings and tighten, if necessary.
Check tyres for wear and foreign objects. (Visual inspection)
Clean and lubricate the steering axle.
Clean the drive motor.
Visually inspect the brake fluid level in the brake fluid reservoir. (It is recommended to replace the brake fluid in the reservoir every 2 years)
Check the joystick bellows and replace if damaged.
Chassis and bodywork
Check the mounting and tightness of the chassis, counterweight, overhead guard, drive axle, steering axle, tilt cylinder and tilt cylinder support.
Check the tightness of the bolts connecting the lift mast onto the drive axle, and tighten if necessary.
Check the side panel installation device and tension lock of the battery cover, and adjust if necessary.
Driver's cab
Check that the brake system (foot brake, parking brake, electric regenerative brake) is working properly and adjust if necessary.
Fill with dual-pedal grease (dual-pedal model only)
Check that the horn is working correctly
Check the pedal group for ease of movement, and lubricate.
Lubricate the driver's seat guide.
Check seat belt condition and correct operation.

Electrical system
Check the working condition of the fan and clean the fan.
Check the power module for dirt and clean if necessary.
Check whether the main contactor cable is tightly installed and undamaged, and replace it if necessary.
Check the truck battery in accordance with manufacturer guidelines.
Check that the seat switch and seat belt monitoring function are working normally.
Check whether the module terminals are loose, and re-tighten if necessary.
Check the condition and secure positioning of electric cables, plug connectors and cable connections.
Check the fuses.
Hydraulic system
Clean the hydraulic pump motor.
Check the tilt cylinder bearing for wear, and replace as required.
Lubricate tilt cylinder bearings.
Check that the tilt cylinder is firmly connected and tighten if necessary.
Check the leak resistance of the hydraulics (visual inspection).
Check the hydraulic oil level.
Lifting system
Check the working condition and installation of the lift mast, lifting chains and lifting cylinders, adjust the length of the lift mast chains if necessary, and clean and apply chain spray.
Clean and lubricate the lift mast.
Check the fork arms and the fork arm quick-release apparatus.
Adjust length of the lift chain, clean and apply chain spray.
Check the fork carriage stops (if installed).
Special equipment
Clean and lubricate the sideshift and attachments and check functionality and state of wear (in accordance with the procedures stipulated by the manufacturer).
Check the preload of the double hoses for the attachments and adjust if necessary.
Check the condition of the antistatic belt and earth (only when using tyres that are not antistatic).

Additional maintenance to be performed every 3000 operating hours or at least once every 3 years (unless otherwise stated in brackets)
Drive mechanism and transmission system
Change the gear oil.
Hydraulic system
Replace the breather filter.
Replace the suction filter insert.
Change the return oil filter.
Change the hydraulic oil.

Special equipment
Clean and lubricate the sideshift and attachments and check functionality and state of wear (in accordance with the procedures stipulated by the manufacturer).
Check the preload of the double hoses for the attachments and adjust if necessary.
Check the condition of the antistatic belt and earth (only when using tyres that are not antistatic).

Subsequent tasks
Check and adjust the date and time of the display unit.
Carry out a functional test and test drive.
Attach a maintenance sticker.

Cleaning the truck

The frequency with which cleaning is required depends on the application of the truck. If highly abrasive materials, e.g. salt water, fertiliser, chemicals or cement are used, the truck must be thoroughly cleaned after each assignment.

Deposits and accumulations of combustible materials on or in the vicinity of hot parts must be removed immediately.

Before performing service work, clean the oil filler openings and their surroundings, as well as the lubricating nipples.

When cleaning, note the following:

- Wear protective equipment
- Never wash the truck when it is switched on
- When using high-pressure cleaners, maintain a minimum distance of 300 mm between the spray pipe and the truck
- Cleaning materials that contain strong solvents can permanently damage painted and plastic surfaces
- Hot steam or cleaning materials with a powerful degreasing effect must be used with extreme caution, because these will affect the grease filling of bearings with lifetime lubrication, causing them to leak Relubrication is not possible The bearing will be destroyed

When cleaning with compressed air, remove stubborn contamination with a cold cleaning solvent.

⚠ CAUTION

Damage to or destruction of truck components!

Water must not be used for cleaning in the area of the central electrical system or switch console. Only use a dry cloth or clean compressed air for cleaning in this area.

The following areas must also **not** be subjected to a direct water jet when cleaning (e.g. using high-pressure cleaning equipment or steam cleaners):

- Electrical and electronic components
- Front axle
- Plug connectors
- Plastic pipes for the air duct
- Hydraulic hoses and coolant hoses
- Hose clips
- Insulating material

NOTE

If cleaning using a water jet cannot be avoided, the affected areas must be covered beforehand.

Drive mechanism and transmission system

Checking the transmission gear and drive axle for leaks

– Remove the rubber mat from the floorplate.

– Remove the floorplate.

– Check the appearance of the transmission gear and drive axle for evidence of leakage.

NOTE

If the transmission gear or drive axle is leaking, please contact your authorised dealer.

Checking the transmission gear and drive axle oil level

The transmission gear and drive axle gearbox are interconnected and their oil level observation hole is located on the drive axle.

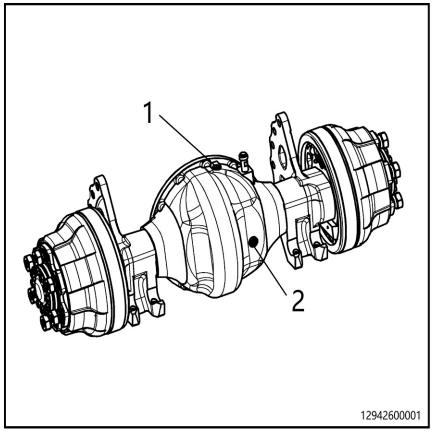
– Park the truck on level ground and switch off the truck

– Clean the area around the level checking screw (2). ▷

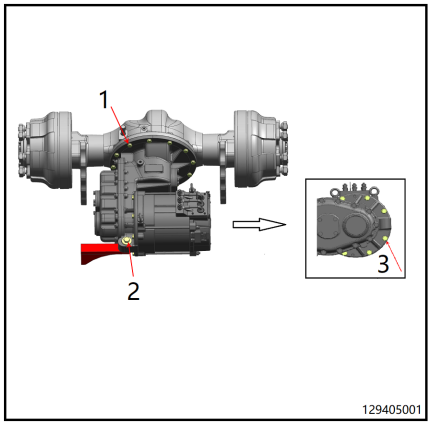
– Unscrew the level checking screw (2).

– Check the gear shaft oil level to ensure that it is near the observation aperture position.

– If necessary, fill with gear oil until oil flows out of the oil level aperture (1).



Checking the installation of the transmission gear

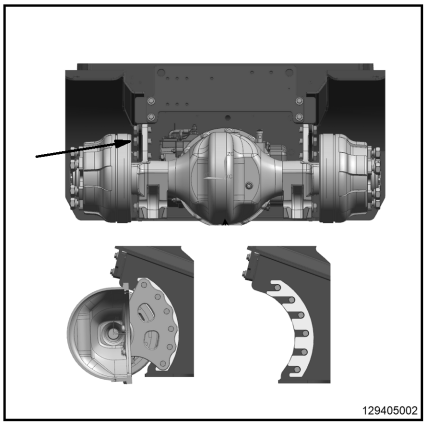


– Check the installation of bolts (1) connecting the gearbox and drive axle, bolts (2) connecting the gearbox and chassis, and bolts (3) connecting the gearbox and motor.
– If necessary, use a torque wrench to re-tighten the bolts.

NOTE

*Check the "**Inspection and maintenance data**" chapter for the specific torque of the connecting bolts.*

Checking the installation of the drive axle



– Check the installation of the bolts connecting the drive axle and chassis.
– If necessary, use a torque wrench to re-tighten the bolts.

NOTE

*Check the "**Inspection and maintenance data**" chapter for the specific torque of the connecting bolts.*

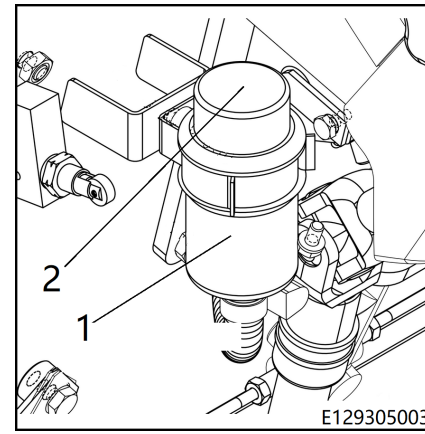
Checking the brake fluid level in the brake fluid reservoir

– Turn off the power to the forklift truck.

– Check the brake fluid level (1) in the brake fluid reservoir. If necessary, undo the lid of the brake fluid reservoir (2) and top up with brake fluid. Otherwise, the brakes may fail. Please refer to "Recommended fuels and oils" to select the correct brake fluid.

NOTE

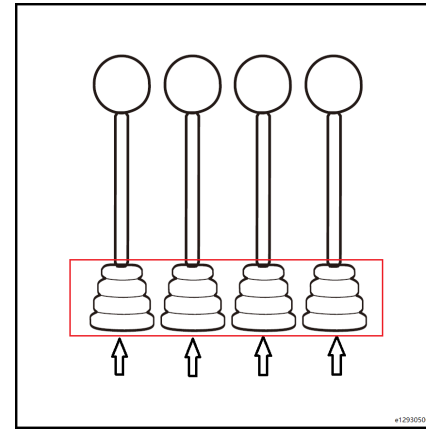
If there is a large loss of brake fluid, please contact your authorised dealer.



Checking the joystick bellows

– Check the bellows are positioned correctly and in good condition.

– Replace damaged bellows when necessary.



Adjust joysticks

This work should only be performed by authorised specialist staff.

Please contact your authorised dealer immediately.

Checking the wheels

Checking for tyre damage
Checking for foreign objects in the tyre

Secure the truck to prevent movement.

– Apply the parking brake.

– Put chocks behind the wheels that do not require lifting.

– Raise the truck using a jack until the wheels are off the ground.

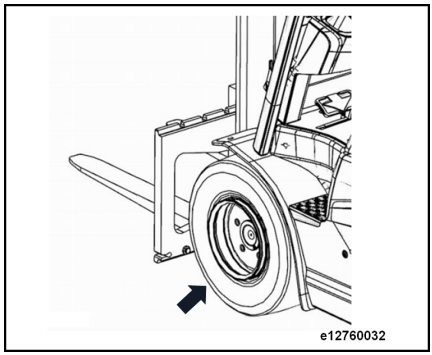
– Prop up using a square timber.

– Check that the wheels are able to turn freely and remove all obstructions. ▷

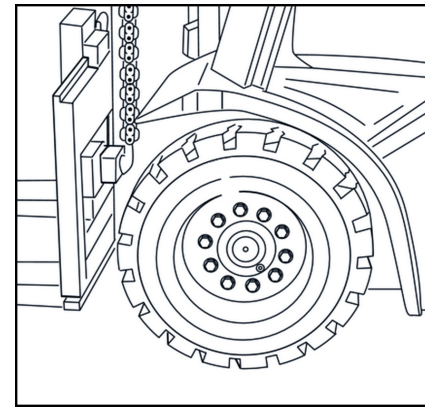
– Change abraded or damaged tyres.

A minimum tread depth is not required with solid rubber tyres.

The wear of tyres on the same wheel shaft must be the same.



Antistatic tyres



NOTE

Under certain circumstances, the truck may become electrostatically charged. The charge level depends on a number of factors, such as the type of tyre, air humidity, floor covering etc.

- *Excessive electrostatic charge is noticed when the electrostatic charge is discharged to the ground via the body of a person who touches the truck (electric shock) or when a spark passes from the truck to an earthed part (e.g. a metal shelf).*
- *With standard types of tyre (black pneumatic or solid rubber tyres), the high graphite content means that electrostatic charging is relatively rare. However, if non-mark tyres (light-coloured tyres) are used and the truck is driven into an area with a sealed floor, this electrostatic charge effect will frequently occur.*

⚠ DANGER

Risk of fire and explosion possible with electrostatic discharging.

Safety warning: Tyres are not electrically conductive.

The truck must always be earthed with an antistatic belt.

The antistatic belt must be in permanent contact with the ground.

Electrostatic charging is prevented by means of an antistatic belt, which is attached to the chassis under trucks with light-coloured tyres (non-marking tyres), while its free end trails along the ground.

Antistatic belts are made of a synthetic conductive material.

Check the tyre inflation pressure

NOTE

Low pneumatic pressure will reduce the service life of the tyres and the stability of the forklift.

– Check the specific inflation pressures of the tyres.
– When necessary, inflate and deflate using the inflation valve.

NOTE

*See the "**Inspection and maintenance data**" chapter for the specified tyre inflation pressures.*

Tightening the wheel nuts

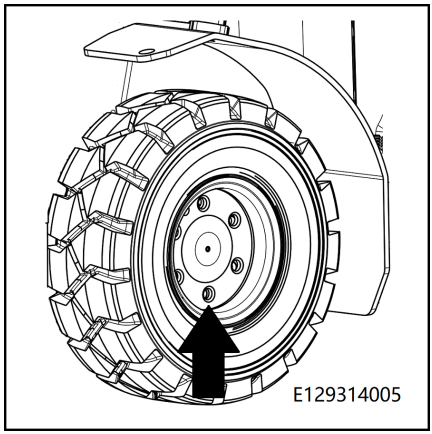
Tighten the wheel fastenings before initial commissioning and whenever wheels are dismantled and installed or repairs are performed to the wheel fastenings.

Then re-tighten the wheel fastenings at the latest after 100 operating hours.

– Check the specific torque of the tyre hook-up and tighten them in a crosswise sequence if necessary.

NOTE

*Refer to the "**Inspection and maintenance data**" chapter for the tightening torque.*



Changing wheels

DANGER

Risk of tipping.

Tyres must be the same type, from the same manufacturer and have identical dimensions and profiles.

CAUTION

Note the weight of the truck.

Only use hydraulic jacks with a load capacity at least equal to the weight of the forklift truck.

⚠ CAUTION

When using wheels that are not antistatic, pay attention to the antistatic belt.

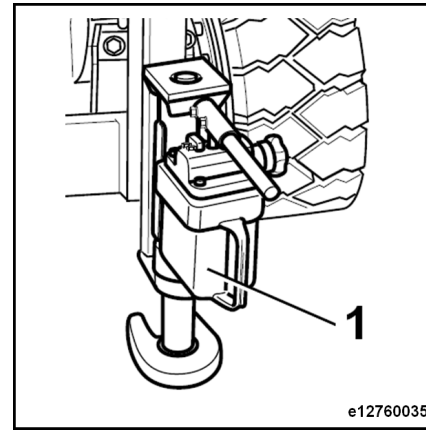
When changing wheels that are not antistatic, the truck must be equipped with an antistatic belt as these wheels are not electro conductive.

The antistatic belt must be in permanent contact with the ground.

Contact your local authorised dealer.

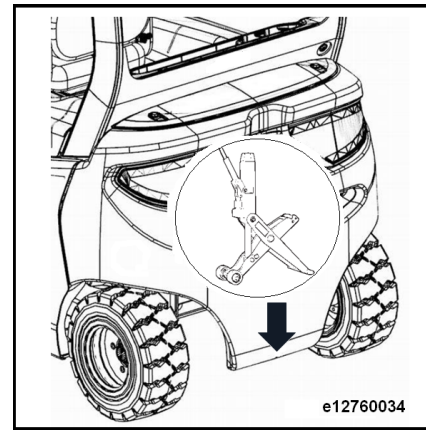
Changing wheels

– Place a jack (1) to the front left-hand or right-hand side of the lift mast fixing or below the undercarriage. ▷

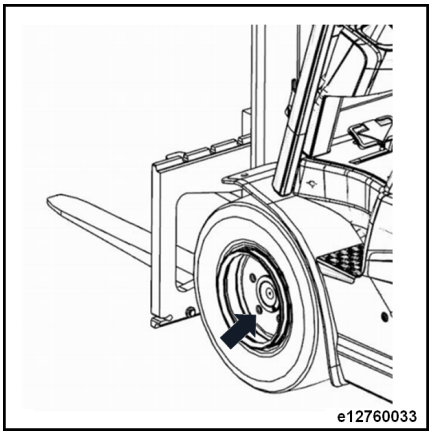


– Position a jack in the middle of the rear end of the counterweight. ▷

Only jack up the truck from these lifting points.



– Loosen all nuts on the wheel to be changed.
– Lift the truck with a hydraulic jack until the wheel is off the ground.



NOTE

If front wheels are to be changed, place a chock behind the rear wheels to prevent the truck sliding backwards.

– Use a hardwood strut to support the mast, undercarriage or counterweight, and then remove load from the jack.
– Unscrew the wheel nuts.
– Change the wheel.
– Fit the wheel nuts and tighten manually.
– Lift the truck, remove the supports and then lower the truck back down to the ground.
– Tighten front and rear wheel nuts.

NOTE

Refer to the "Inspection and maintenance data" chapter for the tightening torque.

Checking the condition of the antistatic belt

⚠ DANGER

Risk of fire and explosion possible in the event of electrostatic discharging.

Non-marking tyres are not electrically conductive and must always be earthed with an antistatic belt.

The antistatic belt must be in permanent contact with the ground.

Under certain circumstances, the truck may become electrostatically charged. To avoid electrostatic charging, an antistatic belt made from conductive plastic must be fitted to the base of the chassis.

Information on electrostatic charging:

- The charge level depends on a number of factors, such as the type of tyre, air humidity, floor covering etc.
- Excessive electrostatic charging is noticeable when the electrostatic charge is discharged to the ground via the body of a person who touches the truck (electric shock) or when a spark passes from the truck to an earthed part (e.g. a metal shelf)
- With standard types of tyre (black pneumatic or solid rubber tyres), the high graphite content means that electrostatic charging is relatively rare
- If non-marking tyres (light-coloured tyres) are used and the truck is driven in an area with a sealed floor, this electrostatic charging effect will frequently occur
- Non-marking tyres are identified by the safety information on the tyre wall.

– **Check that the antistatic belt is securely seated on the base of the chassis, check the condition and check for wear.**

– **If the antistatic belt is damaged, replace the antistatic belt.**

Clean and lubricate the steering axle

Cleaning the steering axle

– Lower the fork carriage fully.

– Press the emergency off switch.

– Thoroughly clean the steering axle with water or a cold-water detergent.

NOTE

After cleaning with a steam jet, lubrication is always recommended.

ENVIRONMENT NOTE

Follow recommendations regarding the use of consumables.

Lubricating the steering axle

NOTE

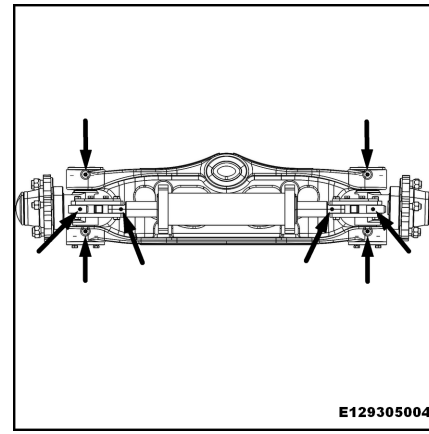
*Lubricate with lubricating grease. Please refer to the "**Recommended fuels and oils table**" chapter.*

– Lubricate the connecting rods and steering knuckles by adding grease via the grease nipples. ▷

– Fill grease gun with grease until fresh grease overflows.

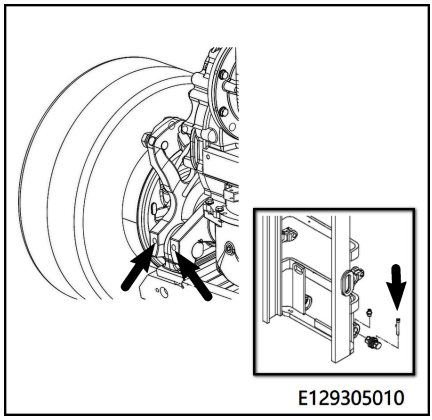
NOTE

Regularly greasing in small amounts is better than greasing in large amounts on an infrequent basis.



Chassis and bodywork

Checking the connecting bolts of the drive axle and lift mast ▷



– Check the installation of the bolts connecting the drive axle to the lift mast.

– Retighten if necessary.

NOTE

*Check the **"Inspection and maintenance data"** chapter for the specific torque of the connecting bolts.*

Check the overhead guard

– Check the installation of the bolts connecting the overhead guard and the frame. Retighten if necessary;

NOTE

*For the torque of the connection bolt, refer to the **"Inspection and maintenance data"** section.*

– Check whether the structure of the overhead guard is damaged, whether there are deformation, cracks, welding and other conditions;

– Check the surface of the top guard frame for paint loss, rust, etc ;

NOTE

For models with roof protection, please check whether there are loose bolts and cracks in the ceiling.

NOTE

If you have any questions, please contact your authorized dealer.

⚠ WARNING

It is strictly forbidden to modify the overhead guard without permission, such as drilling, welding, etc

Checking the battery cover locking devices

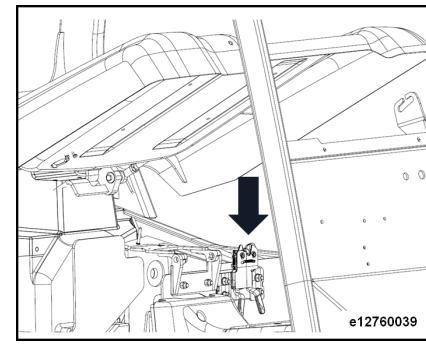
The truck must not be started under any circumstances until the battery cover is fully closed.

When closing the battery cover, the battery cover locking devices must audibly click into place.

⚠ CAUTION

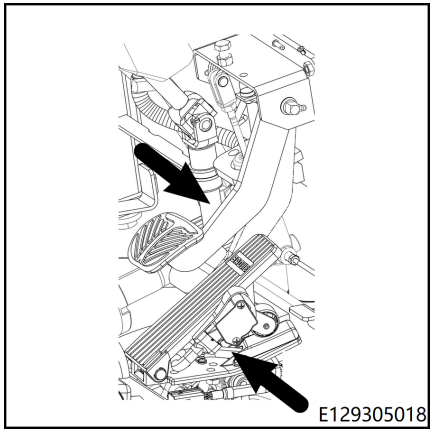
The truck must only be driven or operated after the battery cover is closed.

– Check and ensure that the locking devices (refer to the arrows) on the battery cover are working normally and close safely. ▷



Driver's cab

Checking the pedal group for ease of movement and lubricating as required



- Remove the rubber mat from the floorplate.
- Remove the floorplate.
- Check bolt and joint fastenings for secure positioning.
- Lightly oil the bearing, if necessary.
- Test functionality of the tension springs.
- Use lubricant to lubricate the contact face of the pedal.

NOTE

*Refer to the "**Recommended fuels and oils table**" for oil types.*

Checking other bearings and connections and lubricating

ENVIRONMENT NOTE

Follow recommendations regarding the use of consumables.

- Check and lubricate the following bearings and fasteners.
  - Driver's seat guide.
  - Windscreen wiper bearings (special equipment)

Other cleaning and lubricating

Performing maintenance every 1000 operating hours is generally sufficient when operating in a clean and dry internal environment. If used both indoors and outdoors, cleaning / lubricating is recommended between 500 and 1000 operating hours, or at least every 12 months.

Checking that the brake system is functioning properly

⚠ WARNING

There is a risk of accident or death if the braking system is faulty.

The forklift truck must not be driven if the brake system is defective.

If the braking system becomes faulty or worn, contact your authorised dealer.

Checking that the brake pedal is working normally

– When driving, take your foot off the accelerator pedal and depress the brake pedal.

When the brake pedal is depressed, the truck must immediately slow down to a complete stop.

⚠ WARNING

To prevent use of the brake pedal being impacted:

The rubber mat on the floorplate must stay in place and have no upturned edges.

The gap between the bottom edge of the brake pedal and the rubber mat must be at least 3 mm to ensure that maximum braking force can be applied.

There must be no obstacles in the footwell.

Checking whether the parking brake is working normally

– Drive the truck on a slope with a 15% gradient while transporting a load corresponding to the rated lifting capacity.

– Apply the parking brake as described in the **"Parking brake"** chapter.

– The parking symbol Ⓟ on the display unit comes on and remains lit. The truck is braked.

The vehicle must remain stationary.

– Release the parking brake as described in the **"Parking brake"** chapter.

– The parking brake symbol Ⓟ on the display unit goes out.

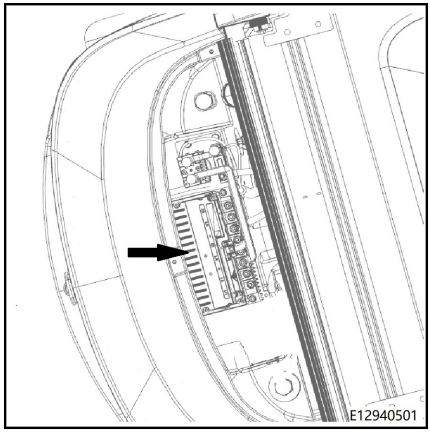
Electrics/electronics

Checking the module for dirt

ENVIRONMENT NOTE

Follow recommendations regarding the use of consumables.

The module is installed inside the truck counterweight. ▷



– Engage the parking brake.
– Switch off the truck.
– Press the emergency off switch.
– Remove the rear panelling on the counterweight.
– Check the radiator fins on the module for dirt.
– If necessary, clean the radiator fins with compressed air and/or cold cleaner solvent.

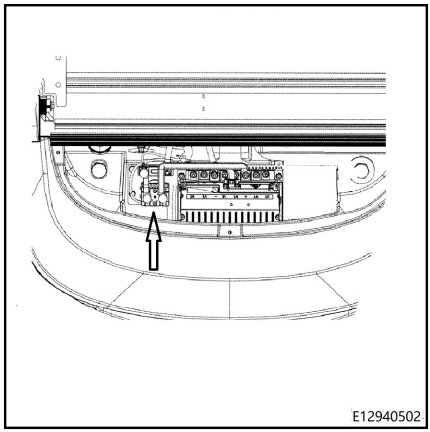
NOTE

If contamination is particularly severe, please contact an authorised dealer.

– Check whether the module terminals are loose and re-tighten if necessary.

Checking the main contactor ▷

The main contactor is installed on the left side of the control module, inside the counterweight.



– Switch off the truck.
– Open the rear panelling of the counterweight.
– Check whether the cable connected to the main contactor is installed firmly.
– Check cable for damage and replace if necessary.

Checking the condition of the batteries

⚠ WARNING

There is a risk of chemical burns from the battery electrolyte (sulphuric acid).

Therefore, when handling battery acid, be sure to wear personal protective equipment (protective apron, protective gloves) and eye protection. If clothing, skin or eyes come into contact with battery acid, the affected areas should be rinsed with water immediately. In the event of contact with the eyes, consult a doctor immediately! Any spilt battery acid should be neutralised straight away! Hazardous materials and accident prevention regulations must be observed.

The following instructions must be observed when handling the drive battery:

- Wear goggles and protective clothing
- Before touching the battery, first touch conductive parts of the chassis to discharge any static charge
- Avoid creating sparks

Checking the condition

– Fully open the battery cover and fasten it to prevent it closing accidentally.

– Disconnect the battery male connector and battery female connector.

– Check whether the battery unit connectors are damaged and whether they are firmly connected.

– Check that the water replenishment plug is undamaged and securely seated.

– Check whether the electrolyte circulation hose is firmly connected and undamaged.

– Remove any oxidation residues on the battery terminals and then apply acid-free grease.

– Check for damage to the battery bay and check for battery acid leaks.

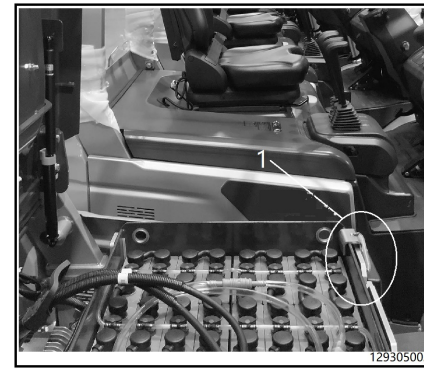
⚠ CAUTION

Lithium-ion batteries should be inspected in accordance with the "**Lithium-ion battery user guide**".

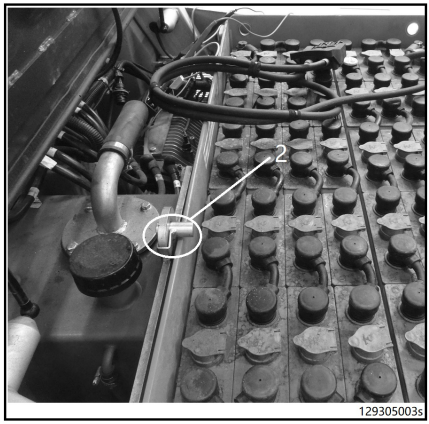
Removing battery safety decices

There are two safety devices which must removed, before the battery can be deinstalled.

– Safety bracket(1) on the side facing the steering wheel. ▷

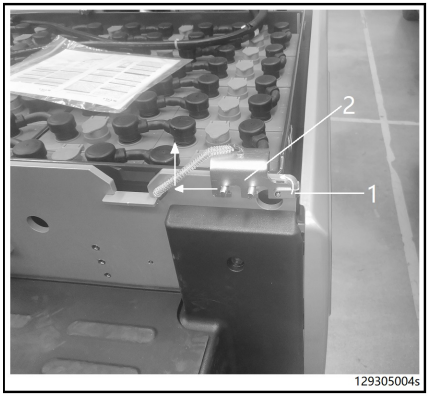


– Safety pin (2)facing counterweight. ▷



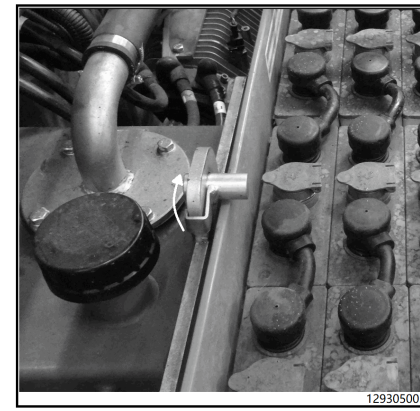
Opening the safety bracket

– Twist the bracket(1) upwards. ▷
– Slide the bracket(2) in the elongated holes and lift it away. The bracket is secured with a loss prevention cable.

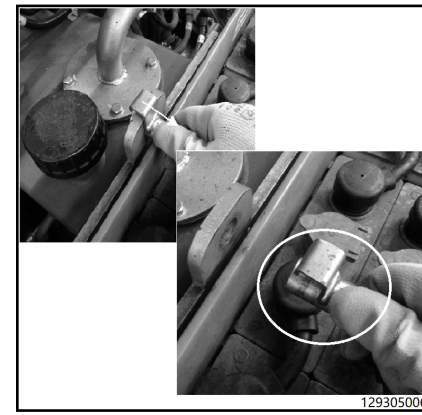


Removing the safety pin

– Twist the safety pin that the bracket faces upwards. ▷



– Pull the safety pin out. ▷



– After opening the safety bracket, removing the safety pin, and you can lift the battery out of the truck.

NOTE

When you reinstall the battery or install a new battery, make sure to reinstall the safety bracket and the safety pin, too.

Replacing the battery using a suspension arrangement

Replacing the battery using a suspension arrangement (hoist)

⚠ CAUTION

Risk of accident.

Only use a suspension arrangement with sufficient load capacity that has been approved by the manufacturer.

Use a hoist and lifting hook with sufficient lift capacity (refer to the technical datasheet for the battery weight).

⚠ WARNING

Ensure the surrounding area is clear when using a hoist to replace the rechargeable battery. Do not under any circumstances walk underneath heavy items that have been raised.

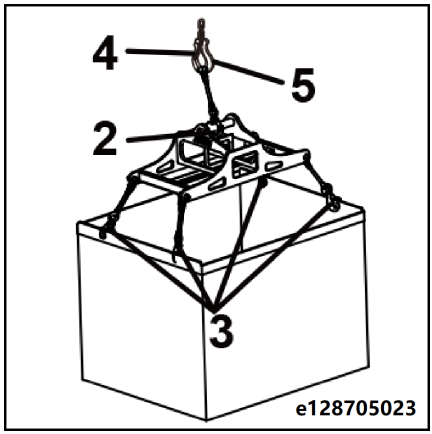
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NOTE

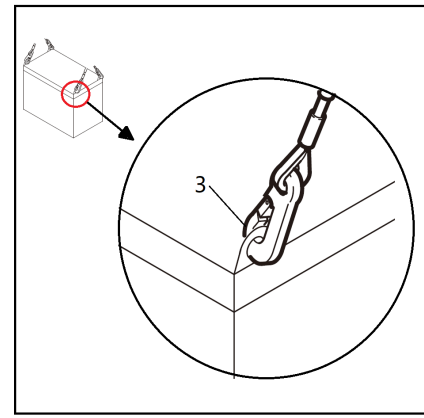
Before lifting the battery suspension arrangement (2), ensure that the fastener (4) on the hoist hook (5) is closed correctly.

– Open the battery cover until the mechanical locking devices click into the limit position.

– Operating the hoist carefully, position the battery suspension arrangement and lifting gear above the battery.



– Insert the four hooks on the suspension arrangement into the special lifting holes (3). ▷



⚠ WARNING

Risk of tipping if the entire suspension arrangement is not lifted.

– Carefully lift the battery cover.

NOTE

The battery can be withdrawn when it is lifted above the sides of the battery compartment.

– Slowly remove the battery from the truck body and set it down in a suitable position.

Replacing the battery using a suspension arrangement (fork arms)

⚠ CAUTION

Risk of accident.

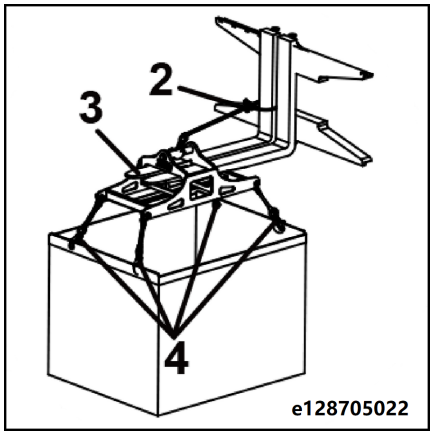
Only use a suspension arrangement with sufficient load capacity that has been approved by the manufacturer.

Use a forklift truck with sufficient lift height and load capacity.

⚠ WARNING

Ensure the surrounding area is clear when using a forklift truck to replace the battery. Do not under any circumstances walk underneath heavy items that have been raised.

– Open the battery cover until the mechanical locking devices click into the limit position.
– Lift the entire battery suspension arrangement using the fork arms (3) of the truck.
– Use pull cords (2) to secure the suspension arrangement on the fork arms.

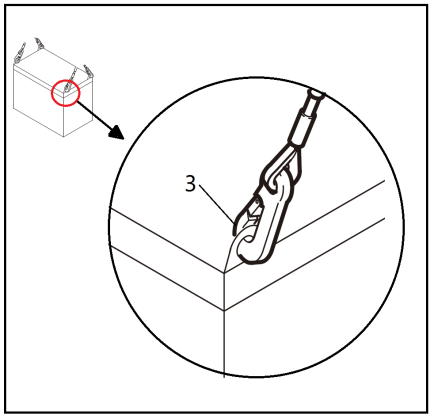


⚠ CAUTION

Risk of tipping if the entire suspension arrangement is not lifted.

Ensure that the fork arms protrude from the other end when lifting the battery suspension arrangement.

– Operating the truck and suspension arrangement slowly, carefully insert into position within the vehicle body, above the battery.
– Insert the four hooks on the suspension arrangement into the special lifting holes (4).
– Carefully lift the battery cover.



NOTE

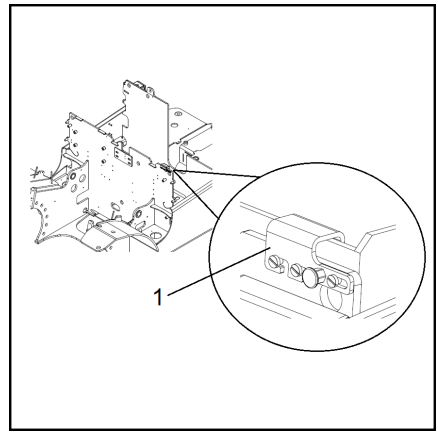
The battery can be withdrawn when it is lifted above the sides of the battery compartment.

– Slowly remove the battery from the truck body and set it down in a suitable position.

Battery installation

– Use a suspension arrangement to hoist the battery into the battery compartment. Be careful with the orientation: the cable connector side of the battery should be facing towards the operator. After the hoisting, visually check that the clearances between the battery and the compartment should be even on both sides.

– Install the battery limit support (*lead-acid battery) (1). ▷



NOTE

The battery limit support is used to secure the lead-acid battery. Remove the battery limit support before replacing the battery. The lithium-ion battery model doesn't have a battery limit support.

– Connect the cable connector to the battery connector.

– Organise the battery cables and make sure that the cables run smoothly and are not tangled. Make sure that the sharp corners of the battery do not interfere with the cables.

NOTE

Be careful when pressing down the battery cover and make sure it won't be pressed onto the cables.

Inspecting and maintaining the lithium-ion battery*

⚠ CAUTION

For inspecting and maintaining the lithium-ion battery, refer to the lithium-ion battery operating instructions supplied with the vehicle.

Strictly follow the operating instructions of the lithium-ion battery manufacturer.

* = Optional.

Hydraulics

Checking the hydraulic system for leaks

– Remove the rubber mat from the floorplate.

– Remove the floorplate.

NOTE

Remove the accelerator connection plug from the floorplate.

– Check the hydraulic pump of the working and steering hydraulics, valves, hoses and lines for leaks. Tighten pipe connections as necessary.

– Replace porous hoses.

– Check hydraulic lines for damage and replace if necessary.

⚠ DANGER

Note that the hydraulic pump needs to cool down before inspection or maintenance, otherwise there is a risk of burns.

Checking the hydraulic oil level

ENVIRONMENT NOTE

Follow recommendations regarding the use of consumables.

⚠ CAUTION

Comply with oil level and oil quantity regulations.

When checking the hydraulic oil level, ensure the lift mast is upright and the fork carriage is lowered.

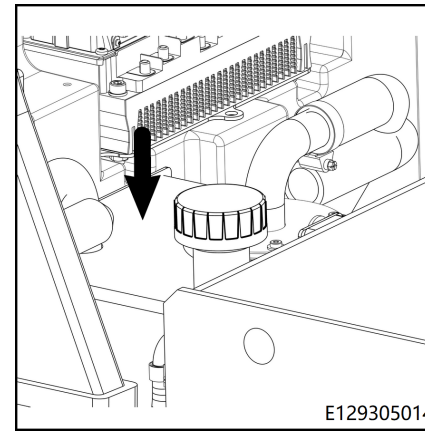
Record the amount of oil used.

– Lower the forks fully.

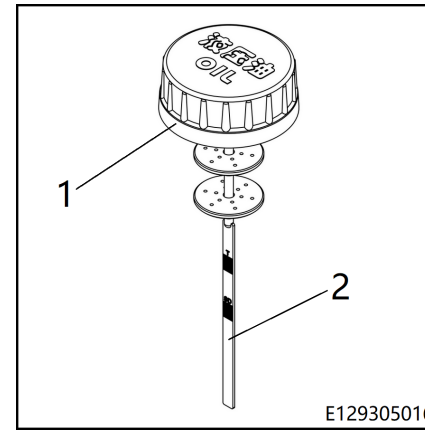
– Apply the parking brake.

– Turn the key switch off.

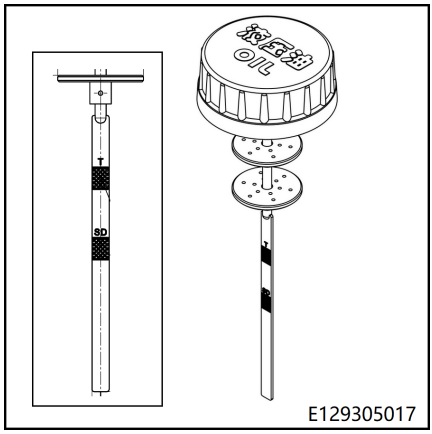
– Open the battery cover. The hydraulic oil tank is located on the rear right-hand side of the forklift truck. ▷



– Unscrew the breather filter (1) and dipstick (2) together. ▷
– Use a clean cloth to wipe the dipstick.
– Completely insert the breather filter and dipstick into the oil tank and then twist out again.



– Depending on the different types of mast, the oil level should reach the corresponding mark on the dipstick. ▷
  • S/D - Standard mast/Duplex mast
  • T - Triplex mast
– When required, fill the hydraulic oil up to the upper notch.
– Twist the breather filter and dipstick back in again.
– Close the battery cover.



NOTE

*Refer to the "**Opening/closing the battery cover**" cowling for instructions on opening and closing the battery cover.*

Checking the breather filter is working normally

NOTE

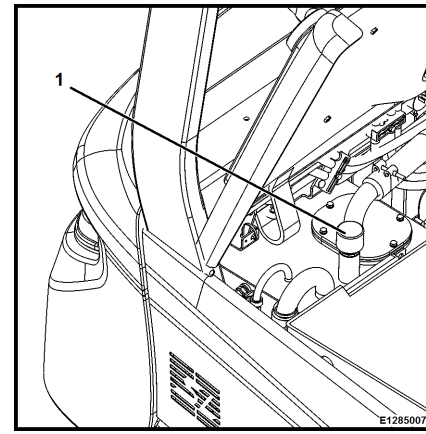
The breather filter in the hydraulic oil tank is fitted with an expansion valve which allows for a small amount of pressure within the tank.

ENVIRONMENT NOTE

Follow recommendations regarding the use of consumables.

– Switch on key switch.
– Lift the mast to its highest position and then lower it several times.
– Turn the key switch off.

– Open the breather filter (1) on the hydraulic oil tank. ▷



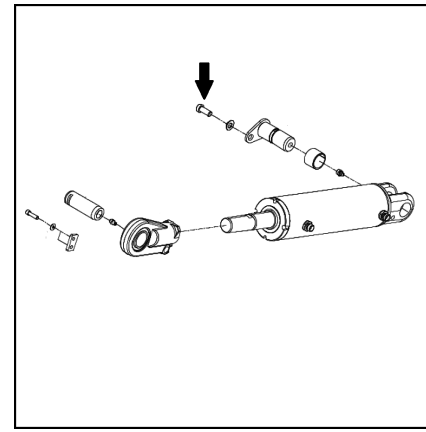
Ensure the sound of air escaping from the oil tank is heard.

– Replace the breather filter if you do not hear the sound of ventilation.

ENVIRONMENT NOTE

Dispose of the old breather filter in an environmentally friendly manner.

Checking installation of the tilt cylinder ▷



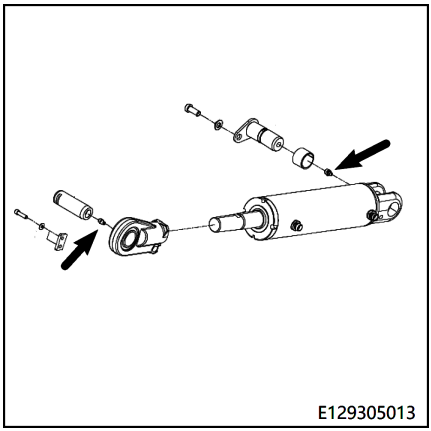
– Check installation of the tilt cylinder.

– Retighten if necessary.

NOTE

*Check the **"Inspection and maintenance data"** chapter for the specific torque of the connecting bolts.*

Lubricating tilt cylinder bearings ▷



ENVIRONMENT NOTE

Observe information regarding the use of consumables.

– Check and lubricate the tilt cylinder bearings.

NOTE

Refer to the "Recommended fuels and oils" table for oil types.

Lifting system

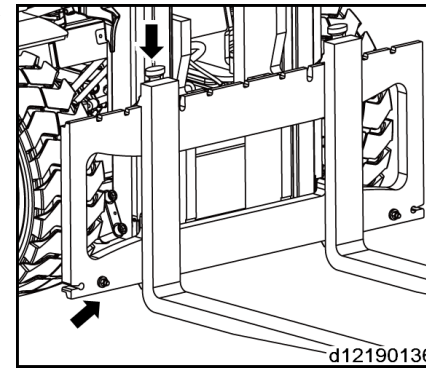
Checking the fork arms and the fork arm quick release apparatus

– Check the fork arms for serious deformation, abrasion and damage.

E.g.:The thickness of the horizontal and vertical sections of the fork arms has been reduced to 90% of the design thickness, or to the minimum thickness stipulated by the fork arm or forklift truck manufacturer.If the fork arms are defective as described above, use of the fork arms must be stopped.

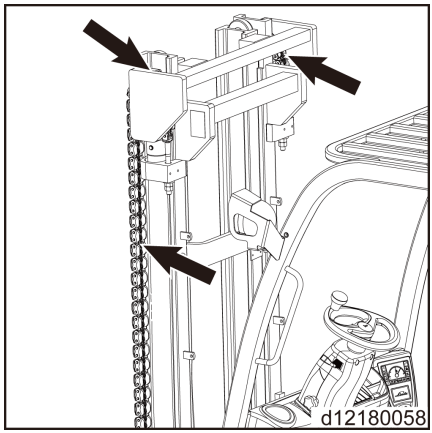
– Check that the fork arm quick release apparatus and fork arm limit block are positioned correctly and are not damaged. ▷

– Replace damaged parts.



Checking the working condition and installation of the lift mast, lifting chains and lift cylinder

– Clean the mast channel and lifting chains. ▷



– Check the working status of the lifting chains, along with any signs of abrasion, paying particular attention to the area around the chain wheels.

– Check that the chain fixed pins are secure.

– Replace damaged lifting chains.

NOTE

Damage to or loss of the plastic protective cases on individual chains will not affect the functioning and service life of the chains.

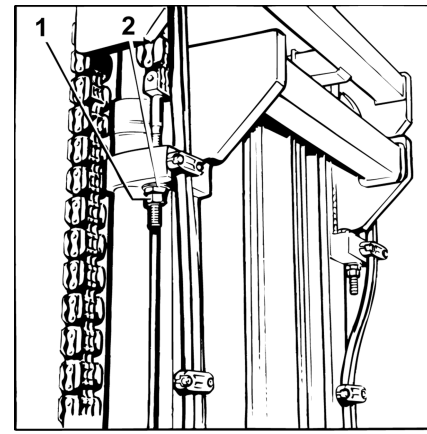
– Check the status and tightness of the lift mast column, mast channel surfaces and roller.

– Check the tightness of the elastic lock rings at the piston rod connections on top of the lift mast.

– Check the installation of the lift cylinder.

Adjusting the length of the lifting chains and lubricating using chain spray

Adjusting the length of the lifting chains* ▷



NOTE

Use over time will cause the lifting chains to stretch. Therefore, it is necessary to check and adjust the lengths of both the left and right chains.

– Fully lower the lift mast.
– Undo the lock nut (1).
– Adjust the adjustable nut (2) on the fixing bolt of the chain to modify the chain length. The guide roller under the fork carriage can extend out of the inner mast channel by a maximum of 25 mm.
– Tighten the lock nut (1).
– Adjust the second chain.

Lubricating the chains with chain spray

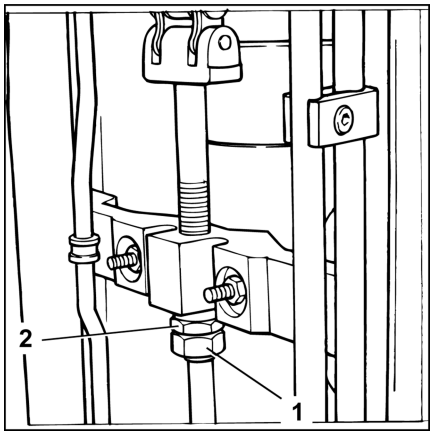
– Use the designated chain spray to coat the chains and guide slots.

NOTE

If the truck is used in the food industry, please use lubricating grease in place of spray.

* Only for standard masts

Adjusting the length of the lifting chains* ▷



NOTE

Use over time will cause the lift chains to stretch, therefore it is necessary to check and adjust their lengths.

– Fully lower the lift mast.
– Undo the lock nut (1).
– Adjust the adjustable nut (2) on the fixing bolt of the chain to modify the chain length. The guide roller under the fork carriage can extend out of the inner mast channel by a maximum of 25 mm.
– Tighten the lock nut (1).

Lubricating the chains with chain spray

– Use the designated chain spray to coat the chains and guide slots.

NOTE

If the truck is used in the food industry, please use lubricating grease in place of spray.

* Only for completely free lifting and triple masts

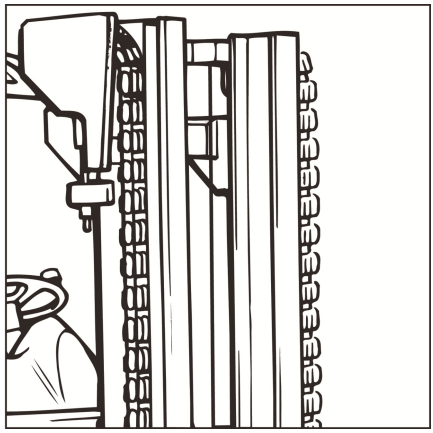
Lubricating the lift mast and chains with chain spray

NOTE

If there is excessive dust on the chain, affecting the ability of the lubricating oil to permeate the chain, the lifting chain must be cleaned.

– Place an oil collecting trough under the lift mast
– Carry out cleaning with an alkyl derivative such as an industrial diesel fuel cleaning agent (please comply with the manufacturer's safety instructions).
– Additives may not be used if using a steam nozzle.
– Immediately blow the chain dry after cleaning to remove water both on the chain surface and inside the hinge pins. Move the chain several times during the blow-drying process.
– Immediately apply the designated chain spray and keep the chain moving while doing so.

▷



NOTE

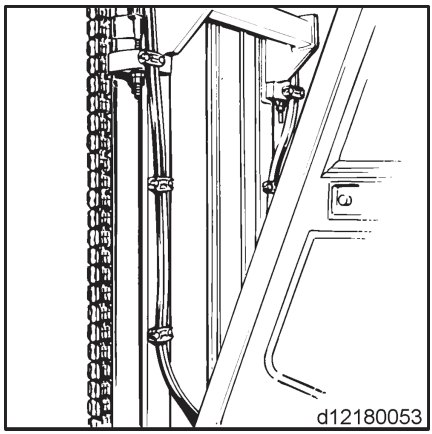
Lifting chains are safety components. The use of cold cleaning agents, chemical cleaning agents, corrosive liquids or liquids containing acid or chlorine will cause direct damage to the chains.

Special equipment

Checking the preload of the double hoses (if equipped with attachments)

– The double hoses should be preloaded by stretching them 5-10mm per meter based on their original length. ▷

– Move the hoses between the retaining clips so as to adjust the preload to the predetermined value.



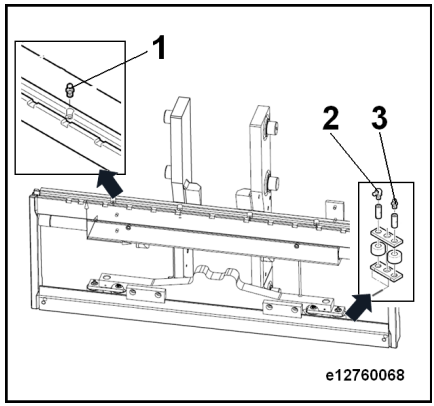
Cleaning and lubricating the sideshift forks* and checking connections

– Use a steam gun to clean the sideshift forks.

– Check hydraulic lines for damage and replace if necessary.

– Check the tightness and level of abrasion of the hydraulic lines and fasteners. Tighten or replace as necessary.

– Add lubricating grease to the oil filling ports (1), (2) and (3) on the fork carriage until fresh grease overflows from the filling port. ▷



NOTE

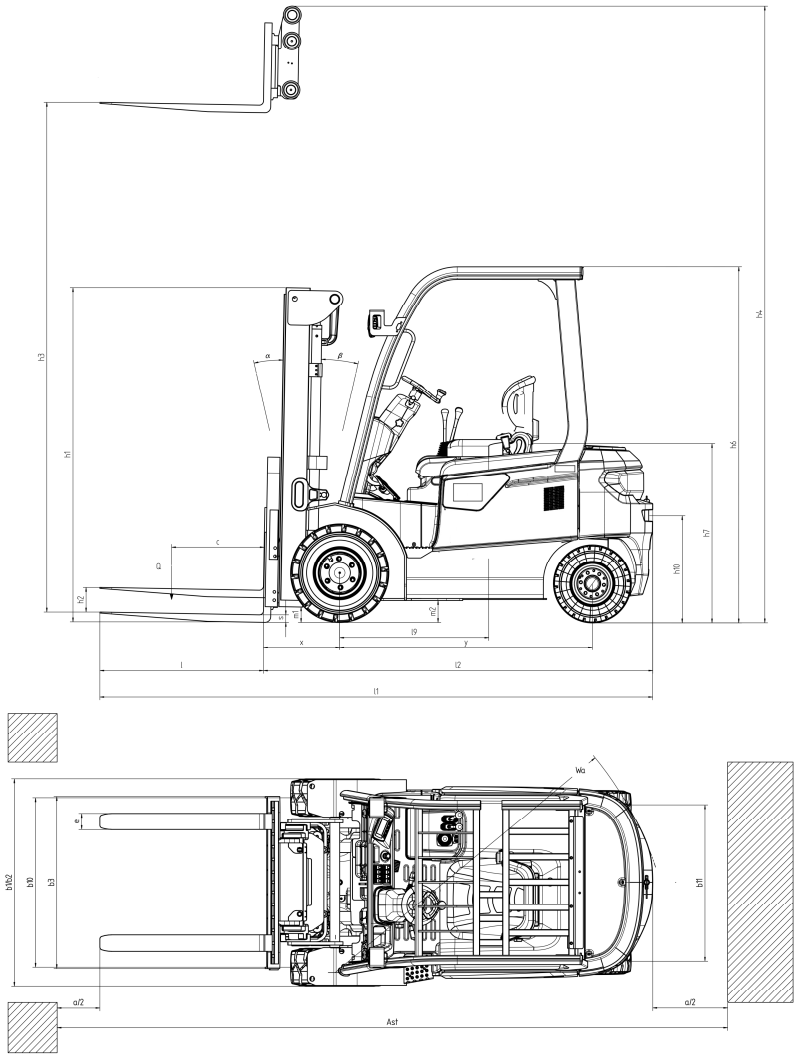
The sideshift forks must be lubricated each time the forklift truck is cleaned.

*Optional part

6

Technical datasheet

Dimensions overview



Datasheet

1.1	Manufacturer		KION JN	KION JN	KION JN	KION JN
1.2	Manufacturer's type designition		RCE 30	RCE 35	RCE 30 Li-Ion	RCE 35 Li-Ion
1.3	Drive: electric (battery type, mains, ...), diesel, petrol, fuel gas		Electric	Electric	Electric	Electric
1.4	Operator type: hand, pedestrian, standing, seated, order-picker		Seated	Seated	Seated	Seated
1.5	Rated capacity/rated load	Q(t)	3	3.5	3	3.5
1.6	Load centre distance	c(mm)	500	500	500	500
1.8	Load distance, centre of drive axle to fork	x(mm)	504	509	504	509
1.9	Wheelbase y[mm]		1785	1785	1785	1785
2.1	Service weight	kg	4970	5430	5050	5500
2.2	Axle loading, laden front/rear	kg	7085/885	7899/1031	7121/929	7930/1070
2.3	Axle loading, unladen front/rear	kg	2416/2564	2395/3035	2452/2598	2430/3068
3.1	Tyres: solid rubber, superelastic, pneumatic, polyurethane		solid rubber	solid rubber	solid rubber	solid rubber
3.2	Tyre size,front		28X9-15	28X9-15	28X9-15	28X9-15
3.3	Tyre size,rear		6.5-10	6.5-10	6.5-10	6.5-10
3.5	Wheels number,front/rear(x=drive wheel)		2x /2	2x /2	2x /2	2x /2
3.6	Tread, front b10	(mm)	1030	1030	1030	1030
3.7	Tread, rear b11	(mm)	953	953	953	953
4.1	Tilt of mast/fork carriage forward/backward	α/β (°)	6/10	6/10	6/10	6/10
4.2	Height of mast,lowered	h1(mm)	2137	2137	2137	2137
4.3	Free lift	h2(mm)	150	150	150	150
4.4	Lift	h3(mm)	3000	3000	3000	3000
4.5	Height of mast,extended	h4(mm)	4045	4045	4045	4045
4.7	Height of overhead guard(cabin)	h6(mm)	2230	2230	2230	2230
4.8	Height of seat/stand-on platform	h7(mm)	1238	1238	1238	1238
4.81	Distance front axle to SIP at middle seat position	l9(mm)	968	968	968	968
4.12	Coupling height h10(mm)		705	705	705	705

4.19	Overall length	l1(mm)	3667	3738	3667	3738
4.20	Length to face of forks	l2(mm)	2667	2738	2667	2738
4.21	Overall width	b1/ b2(mm)	1268	1268	1268	1268
4.22	Fork dimensions ISO 2331	sxexl(mm)	45x122x1 000	50x150x1 000	45x122x1 000	50x150x1 000
4.23	Fork carriage to ISO 2328,class/ type A, B		3A	3A	3A	3A
4.24	Fork-carriage width	b3(mm)	1100	1100	1100	1100
4.31	Ground clearance, laden, below mast	m1(mm)	141	137	141	137
4.32	Ground clearance, centre of wheelbase	m2(mm)	168	165	168	165
4.33	Aisle width,1000x1200mm across forks	Ast(m m)	4039	4109	4039	4109
4.34	Aisle width,800x1200mm along forks	Ast(m m)	4239	4309	4239	4309
4.35	Turning radius	Wa(m m)	2330	2400	2330	2400
4.36	Minimum pivoting point distance	b13(m m)	672	672	672	672
5.1	Travel speed, laden/unladen	km/h	15/15	15/15	15/15	15/15
5.2	Lift speed, laden/unladen	m/s	0.40/0.44	0.37/0.44	0.40/0.44	0.37/0.44
5.3	Lowering speed, lade/unladen	m/s	0.40/0.44	0.37/0.44	0.40/0.44	0.37/0.44
5.6	Max. drawbar pull, laden/unladen	N	14500/14 000	14380/13 900	14500/14 000	14380/13 900
5.8	Max. gradeability, laden/unladen	%	18/20	16/20	18/20	16/20
5.9	Acceleration time, laden/unladen	s	6.7/5.6	6.9/5.7	6.7/5.6	6.9/5.7
5.10	Service brake		Mechani- cal hy- draulic	Mechani- cal hy- draulic	Mechani- cal hy- draulic	Mechani- cal hy- draulic
6.1	Drive motor rating S2 60 min	Kw	13.6	13.6	13.6	13.6
6.2	Lift motor rating at S3 15%	Kw	21	21	21	21
6.3	Battery according to DIN 43531/35/36 A, B, C, no		DIN 43536 A	DIN 43536 A	-	-
6.4	Battery voltage, nominal capacity K5	(V)/ (Ah)	80/500	80/500	80/412	80/412
6.5	Battery weight	kg	1470	1470	340	340
6.6	Energy consumption according to DIN EN 16796	kWh/h	6	6.5	6	6.5
10.1	Operating pressure for attach- ments bar		185	200	185	200

10.2	Oil flow for attachments	l/min	30	30	30	30
10.7	Sound pressure level at the driver's seat	dB(A)	68	68	68	68

NOTE

The above datasheet is standard configuration forklift truck parameters. For non-standard configuration forklift truck, the parameters may be different.

Eco-design requirements for electric motors and variable speed drives

All motors in this industrial truck are exempt from Regulation (EU) 2019/1781 because these motors do not meet the description given in Article 2 "Scope", Item (1) (a) and because of the provisions in Article 2 (2) (h) "Motors in cordless or battery-operated equipment" and Article 2 (2) (o) "Motors designed specifically for the traction of electric vehicles".

All variable speed drives in this industrial truck are exempt from Regulation (EU) 2019/1781 because these variable speed drives do not meet the description given in Article 2 "Scope", Item (1) (b).

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5001 801 1627 EN - 10/2023 - 04