



Original instructions

Electric pallet truck

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Address of manufacturer and contact details ▷

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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

Your industrial truck

General

The truck described in these operating instructions corresponds to the applicable standards and safety regulations.

If the truck is to be operated on public roads, it must conform to the existing national regulations for the country in which it is being used. The driving permit must be obtained from the appropriate office.

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

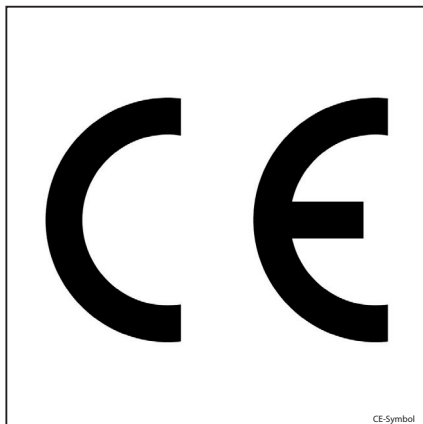
- Before commissioning the truck, read the operating instructions and follow the instructions.
- Always follow all of the safety information contained in the operating instructions and on the truck.

CE labelling

The manufacturer uses CE labelling to indicate that the truck complies with the standards and regulations valid at the time of marketing. This is confirmed by the issued EC declaration of conformity. The CE labelling is attached to the nameplate.

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

The EC declaration of conformity must be carefully stored and made available to the responsible authorities.



Information about documentation

EC declaration of conformity

Declaration	
STILL GmbH Berzeliusstraße 10 22113 Hamburg Germany	
We declare that the machine	
Industrial truck	according to these operating instructions
Model	according to these operating instructions
conforms to the latest version of the Machinery Directive 2006/42/EC	
Personnel authorised to compile the technical documents:	
See EC compliance declaration	
STILL GmbH	

EC declaration of conformity

The manufacturer declares that the truck complies with the requirements of the EC machinery directive and any other EC directives, if applicable, that are valid at the time of placing on the market. This is confirmed by the EC declaration of conformity and by the CE labelling on the nameplate.

The EC declaration of conformity document is delivered with the truck. The declaration

shown explains the conformity with the requirements of the EC machinery directive.

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

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

Information about documentation

Documentation scope

- Operating instructions
- Operating instructions for attachment parts (special equipment)
- Spare parts list
- VDMA rules for the proper use of industrial trucks (EU countries only)

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.

Copyright and property rights

This manual - and any excerpts thereof - may not be reproduced, translated or transmitted in any form to third parties without the express written permission of the manufacturer.

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

The operating instructions are included in the spare parts list and 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 ⇒ Chapter "Definition of terms used for responsible persons", P. 20) 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.

Information about documentation

Explanation of symbols used

DANGER

Compulsory procedure that must be followed to avoid danger to life or physical harm.

WARNING

Compulsory procedure that must followed to avoid injury.

CAUTION

Compulsory procedure that must be followed to avoid 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



NOTE

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
ABE	Display operating unit	
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 mark)
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 transmission
DIN	Deutsches Institut für Normung	German standardisation organisation
EG	European Community	

Information about documentation

Abbreviation	Meaning	Explanation
EN	European standard	
FEM	Fédération Européene de la Manutention	European Federation of Materials Handling and Storage Equipment
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.	ID number	
ISO	International Organization for Standardization	International standardisation organisation
LAN	Local Area Network	Local area network
K _{pA}	Uncertainty of measurement of sound pressure levels	
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
VDE	Verband der Elektrotechnik Elektronik Informationstechnik	German technical/scientific association

Abbreviation	Meaning	Explanation
VDI	Verein Deutscher Ingenieure	German technical/scientific association
VDMA	Verband Deutscher Maschinen- und Anlagenbau e.V.	German Mechanical Engineering Industry Association
WLAN	Wireless LAN	Wireless local area network

Environmental considerations

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.

Technical description

This series of electric pallet trucks is used for handling pallets and has a maximum load capacity of 1200 kg.

Design

The latest ergonomic and practical design, adaptable to all operators and working conditions.

The polyurethane cowling provides superior stability and shock resistance.

The chassis is made of thick steel plate and is suitable for the harshest working conditions.

Steering system

Extremely smooth steering makes the vehicle easier to manoeuvre in tight spaces.

A gas spring enables the tiller to quickly return to the vertical position after it is released.

Tiller

The composite construction tiller head provides excellent impact resistance.

Ergonomic, suitable for left and right-handed operators. The push-buttons for the horn, lifting and lowering can be operated using one hand without changing grip.

The walking, lifting and lowering devices, harnesses and components are IP55 dust- and water-resistant.

The anti-crush button integrated into the tiller head protects the operator if the vehicle recoils.

Drive

Precise, load-independent travel.

Jolt-free starting and smooth acceleration to maximum speed.

Simply release or turn the drive direction switch to brake.

Booster circuit prevents the truck rolling back when starting on a gradient.

Brake system

The electromagnetic brake with dust protection function can be used as a safety brake and parking brake. Braking is controlled by the drive controller: the brake's electromagnet acts on the motor shaft and simultaneously cuts off the power. Automatic braking is activated when the tiller is in the horizontal or vertical position (end stop brake).

Battery

24V/20Ah maintenance-free industrial battery.

The display instrument displays the battery's remaining charge.

Use of the truck

Intended use of the trucks

CAUTION

This machine was designed for the transport and storage on racks (pallet stackers only) of loads packed on pallets or in industrial containers designed for this purpose.

The dimensions and capacity of the pallet or container must be adapted to the load being transported and must ensure stability.

The table of characteristics and performance attached to this user manual gives you the information you need to check that the equipment is suitable for the work being carried out.

Any specific usage must be authorised by the site manager; an analysis of the potential risks associated with this usage will enable him to put in place any necessary additional safety measures.

Use of the truck

Unauthorised use

Any danger caused as a result of unauthorised use becomes the responsibility of the operator or driver and not that of the manufacturer.

Use for purposes other than those described in these operating instructions is prohibited.

Transporting people is prohibited.

The forklift truck should not be used in areas where there is a risk of fire, explosion or corrosion, or in areas that are particularly dusty.

Stacking or unstacking is not permissible on inclined surfaces or ramps.

Precautions

- Do not drive on steep slopes, to prevent the load from slipping off.
- The truck must be switched off when left unattended.
- 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

- Due to the characteristics of the lithium battery, use the vehicle at an ambient temperature of -10°C to $+45^{\circ}\text{C}$.
- The truck can climb gentle gradients below 4% at full load, or below 10% without a load.
- Only use the truck at altitudes not exceeding 2000 metres.
- Indoor use only.
- Use the truck properly, to avoid being crushed by the drive wheel.
- Do not use the truck to carry passengers.
- Do not drive on slippery surfaces such as grease, etc.

Residual risks

Residual risks

Despite careful operation and compliance with all applicable standards and regulations, the possibility of other dangers when using the truck cannot be entirely excluded.

The truck and additional equipment comply with applicable safety regulations. However, residual risks cannot be excluded even if the truck is used correctly and instructions are carefully followed.

Even beyond the danger areas of the truck itself, residual risks remain. Persons in the area around the truck must exercise particular caution. They must react immediately in the event of malfunction, incident, breakdown etc.

They must be informed of the risks associated with the use of the forklift.

These operating instructions also contain additional safety instructions.

Residual risks can include:

- Escape of consumables due to leakages or the rupture of lines, hoses or containers.
- Risk of accident when driving over difficult ground such as gradients, smooth or irregular surfaces, or with poor visibility etc.
- Risk of falling, tripping or slipping during movement of the truck, especially on wet or icy surfaces or in the event of consumable leaks.
- Risk of fire and explosion due to the battery and electrical voltages.
- Human error.
- Disregarding the safety regulations.
- Risk caused by unrepaired damage.
- Risk caused by insufficient maintenance and testing.
- Risk caused by using unsuitable consumables.

Special risks associated with using the truck and attachments

The manufacturer's approval is required as soon as:

- The truck is used differently from its normal use
- The driver is not sure if he can use the truck correctly and without risk of accident

Residual risks

Overview of hazards and counter-measures

 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	Measure	Check note √ Complete - Not applicable	Notes
Truck equipment does not comply with local regulations	Test	○	If in doubt, consult competent factory inspectorate or employers' liability insurance association
Lack of skills and qualification of driver	Driver training (sit-on and stand-on)	○	BGG 925 VDI 3313 driver permit
Usage by unauthorised persons	Access with key only for authorised persons	○	
Truck not in a safe condition	Recurrent testing and rectification of defects	○	German Ordinance on Industrial Safety and Health (BetrSichV)
Risk of falling when using working platforms	Compliance with national regulations (different national laws)	○	German Ordinance on Industrial Safety and Health (BetrSichV) and employer's liability insurance associations
Impaired visibility due to load	Resource planning	○	German Ordinance on Industrial Safety and Health (BetrSichV)
Contamination of respiratory air	Assessment of diesel exhaust gases	○	Technical Regulations for Hazardous Substances (TRGS) 554 and the German Ordinance on Industrial Safety and Health (BetrSichV)
	Assessment of LPG exhaust gases	○	German threshold limit values list (MAK-Liste) and the German Ordinance on Industrial Safety and Health (BetrSichV)

Hazard	Measure	Check note √ Complete - Not applicable	Notes
Impermissible usage (improper usage)	Issuing of operating instructions	○	German Ordinance on Industrial Safety and Health (BetrSichV) and German Health and labour protection law (ArbSchG)
	Written notice of instruction to driver	○	German Ordinance on Industrial Safety and Health (BetrSichV) and German Health and labour protection law (ArbSchG)
	Note the German Ordinance on Industrial Safety and Health (BetrSichV), the operating instructions and the German Engineering Federation (VDMA) rules	○	
When fuelling			
a) Diesel	Note the German Ordinance on Industrial Safety and Health (BetrSichV), the operating instructions and the German Engineering Federation (VDMA) rules	○	
b) LPG	Note German Social Accident Insurance (DGUV) regulation D34, the operating instructions and the German Engineering Federation (VDMA) rules	○	

Residual risks

Hazard	Measure	Check note ✓ Complete - Not applicable	Notes
When charging the traction battery	Note the German Ordinance on Industrial Safety and Health (BetrSichV), the operating instructions and the German Engineering Federation (VDMA) rules	○	Association for Electrical, Electronic and Information Technologies (VDE) regulation 0510: In particular - Ensure adequate ventilation - Insulation value within the permissible range
When using battery chargers	Note the German Ordinance on Industrial Safety and Health (BetrSichV), employers' liability insurance association regulation 104 and the operating instructions	○	German Ordinance on Industrial Safety and Health (BetrSichV) and employers' liability insurance association regulation 104
When parking LPG trucks	Note the German Ordinance on Industrial Safety and Health (BetrSichV), employers' liability insurance association regulation 104 and the operating instructions	○	German Ordinance on Industrial Safety and Health (BetrSichV) and employers' liability insurance association regulation 104
With driverless transport systems			
Roadway quality inadequate	Clean/clear driveways	○	German Ordinance on Industrial Safety and Health (BetrSichV)
Load carrier incorrect/slipped	Reattach load to pallet	○	German Ordinance on Industrial Safety and Health (BetrSichV)
Drive behaviour unpredictable	Employee training	○	German Ordinance on Industrial Safety and Health (BetrSichV)
Driveways blocked	Mark driveways Keep driveways clear	○	German Ordinance on Industrial Safety and Health (BetrSichV)
Driveways intersect	Announce right-of-way rule	○	German Ordinance on Industrial Safety and Health (BetrSichV)
No person detection during depositing and retrieval	Employee training	○	German Ordinance on Industrial Safety and Health (BetrSichV)

Danger to employees

The operating company must identify and evaluate the dangers involved in using the truck. It must also establish which occupational health and safety measures are required to protect employees. Appropriate operating instructions must be drafted and provided for the driver accordingly. A person responsible for health and safety must be appointed.

Construction and equipment of the truck correspond to the Machinery Directive 2006/42/EC and they are therefore identified with the CE symbol. As a result, these factors are not included in the hazard assessment; nor are the attachments, which have their own CE labelling. The operating company must, however, select the type and equipment of the truck so as to comply with the local provisions for deployment.

The results must be published. In the case of truck deployment involving similar hazard situations it is permitted to summarise the results. This overview (see chapter entitled "Overview of hazards and countermeasures") is intended to facilitate compliance with the conditions of these regulations. The overview indicates the main causes of accidents in the event of non-compliance. If other major operational hazards are involved, they must also be taken into consideration.

The working conditions for the trucks are largely similar for many sites. The dangers can therefore be summarised in a single overview. It is recommended that the information provided by the relevant employers' liability insurance association be observed in this respect.

2

Safety

Safety regulations

Safety regulations

These operating instructions, which come with the truck, must be communicated to all those concerned and in particular to personnel responsible for maintenance and driving. The employer must make sure that the forklift operator has properly understood all the safety information.

Please observe the directives and safety regulations attached, in particular:

- Information concerning the use of materials handling trucks
- Regulations concerning traffic lanes and working areas
- Appropriate behaviour, rights and responsibilities of the driver
- Use in particular areas
- Information about the weight and dimensions of pallets or any other container
- Information concerning starting, driving and braking
- Information concerning maintenance and repair

- Regular checks and technical inspections
- Recycling of lubricants, oils and batteries
- Residual risks.

Care is recommended both for the user and the person in charge (employer) with regard to adhering to all safety rules concerning the use of material-handling trucks.

When instructing forklift operators, we recommend the following points are emphasized:

- The features of the truck
- The special accessories
- The specific features of the working environment.

Train the user in how to drive the truck, until it is under proper control.

Then, and only then, proceed to transferring pallets.

Forklift truck stability is guaranteed when the unit is used correctly.

Definition of terms used for responsible persons

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 intended purpose and in compliance with the safety guidelines set out in these operating instructions.

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

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

It is recommended that these checks comply with national performance specifications.

Specialist

A specialist is deemed to be:

- A person whose experience and technical training has allowed him to develop relevant knowledge of industrial trucks
- A person who is also familiar with national health and safety regulations and gener-

ally recognised technical directives and conventions (standards, VDE regulations, technical regulations of other European Union member states or countries that are

signatories to the treaty that established the European Economic Area). This expertise allows him to assess the condition of industrial trucks in terms of health and safety

Drivers

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

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 refitting

If your truck is to be used in specific conditions (e.g. refrigerated warehouse or flameproof protection), it must be specially equipped and approved for this purpose, if applicable.

If your truck is used for work that is not specified in the guidelines or in these instructions, and it must be modified or refitted for this purpose, it is important to remember that any structural modification could affect truck handling while driving as well as the stability of the truck, and could lead to accidents. You should therefore contact the manufacturer before carrying out any modification. Permission from the manufacturer is required for any modification that may affect the truck's stability.

Any constructional modification or transformation of your truck is forbidden without prior written permission from the manufacturer. Authorisation from the relevant authority may also be required.

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,

SPECIAL CASE: if the manufacturer of the truck is no longer in business and its activity is unlikely to be taken over by a successor

In this specific case, you may plan a modification or alteration to your truck provided that:

- The modification or alteration is designed, tested and implemented by one or more engineers who are experts in the field of industrial trucks and their safety
- A record is kept of the design, the different tests and the implementation of the modification or alteration
- Appropriate changes are approved and made to the capacity plate, decals, labels and operating instructions
- a permanent and clearly visible label is attached to the truck indicating the nature of the modification or alteration as well as the date of the modification or alteration, and the name and address of the company that carried out the work.

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 accessories) 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.

Basic principles for safe operation

Vibrations

Vibrations to which the hands and arms are exposed

The following value is valid for all truck models:

- $\bar{a}_w < 2.5 \text{ m/s}^2$



NOTE

It is mandatory to specify the hand-arm vibrations, even where the values do not indicate any danger, as in this case.

CAUTION

The value expressed above can be used to compare forklift trucks of the same category. It cannot be used to determine the operator's daily exposure to vibrations during real operation of the truck; these vibrations depend on the conditions of use (floor conditions, method of use etc.) and therefore daily exposure must be calculated using data from the place of use.

Safety tests

Carrying out regular inspections on the truck

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, the technical condition of the truck must be completely tested with regard to accident safety. In addition, the truck must be thoroughly checked for damage that may have been caused by improper use. A test log must be created. The results of the inspection must be retained at least until a further two inspections have been carried out.

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

- Arrange for the authorised service centre to perform regular testing on the truck.
- Observe the guidelines for tests carried out on the truck in accordance with FEM 4.004.

The operating company is responsible for ensuring that any defects are remedied without delay.

- Notify your authorised service centre.



NOTE

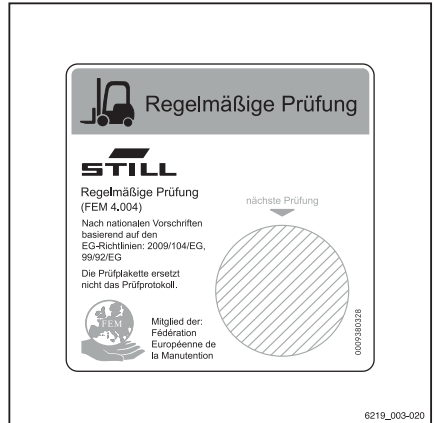
In addition, observe the national regulations for the country of use.

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.



Safety tests

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 k Ω	> 24 k Ω
48 volts	100 VDC	Min. 100 k Ω	> 48 k Ω
80 volts	100 VDC	Min. 200 k Ω	> 80 k Ω

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.

Oils



DANGER

Oils are flammable!

- Follow the statutory regulations
- Do not allow oils to come into contact with hot motor parts.
- No smoking, fires or flames!

WARNING

There is a risk of slipping on spilled oil, particularly when combined with water!

- Collect spilled oil immediately using an oil-binding agent and dispose of it in accordance with regulations.



DANGER

Oils are toxic!

- Avoid contact and consumption
- In case of inhalation of steam or fumes, breathe fresh air immediately.
- After contact with the eyes, rinse thoroughly with water (for at least 10 minutes) and then consult an eye specialist.
- If swallowed, do not induce vomiting. Seek immediate medical attention.



ENVIRONMENT NOTE

Oils are water pollutants!

Always store oil in containers that comply with the applicable regulations.

Avoid spilling oils.

Collect spilt oil immediately using an oil binding agent and dispose of it in accordance with regulations.

Dispose of old oils according to the applicable regulations.



WARNING

Prolonged intensive contact with the skin can result in loss of skin oils and cause irritation.

- Avoid contact and consumption.
- Wear protective gloves!
- After any contact, wash the skin with soap and water and then apply a skin care product.
- Immediately change soaked clothing and shoes.

Safety devices

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).

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.



ENVIRONMENT NOTE

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.

Safety devices

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

Battery connection cables

CAUTION

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

EMC – Electromagnetic compatibility

EMC – Electromagnetic compatibility

Electromagnetic compatibility (EMC) is a key quality feature of the truck.

EMC involves

- limiting the emission of electromagnetic interference to a level that ensures the troublefree operation of other equipment in the environment.
- ensuring sufficient resistance to external electromagnetic interference so as to guarantee proper operation at the planned usage location under the electromagnetic interference conditions to be expected there.

An EMC test thus firstly measures the electromagnetic interference emitted by the truck and secondly checks it for sufficient resistance to electromagnetic interference with reference to the planned usage location. A number of electrical measures are taken to ensure the electromagnetic compatibility of the truck.

CAUTION

The EMC regulations for the truck must be observed.

When replacing truck components the protective EMC components must be installed and connected again.

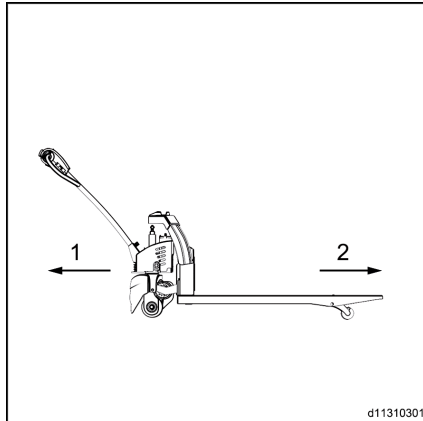
3

Views

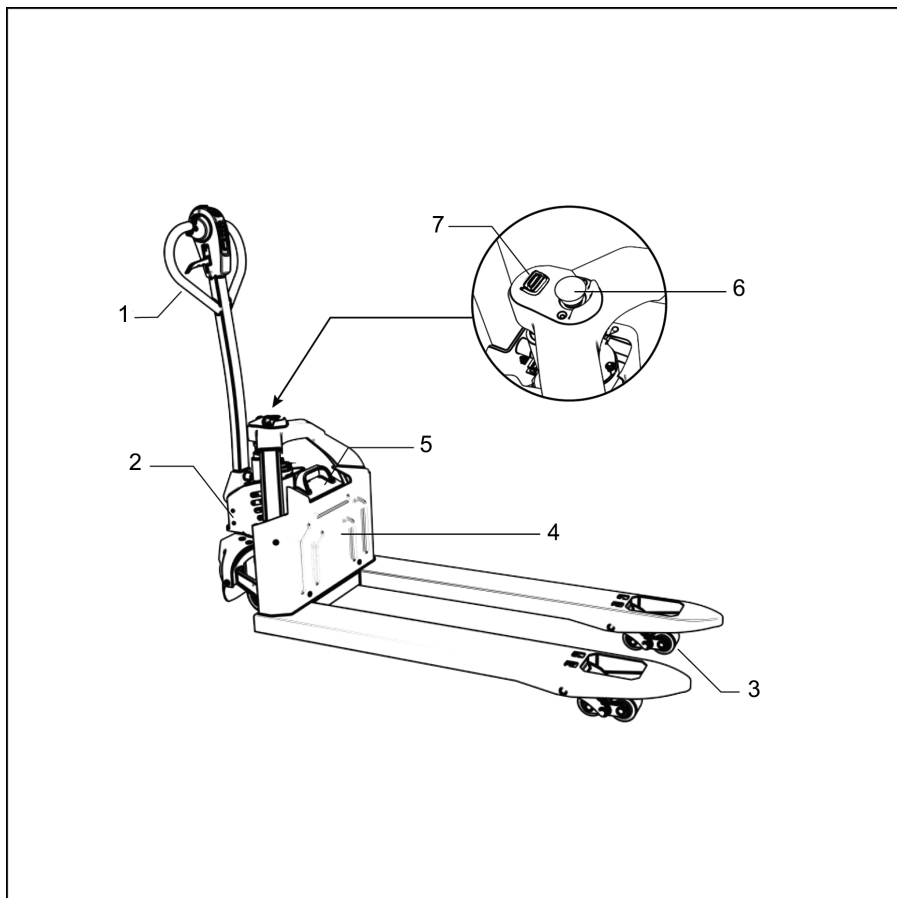
Drive directions

Drive directions

The drive directions of the truck are forward (1) and reverse (2).



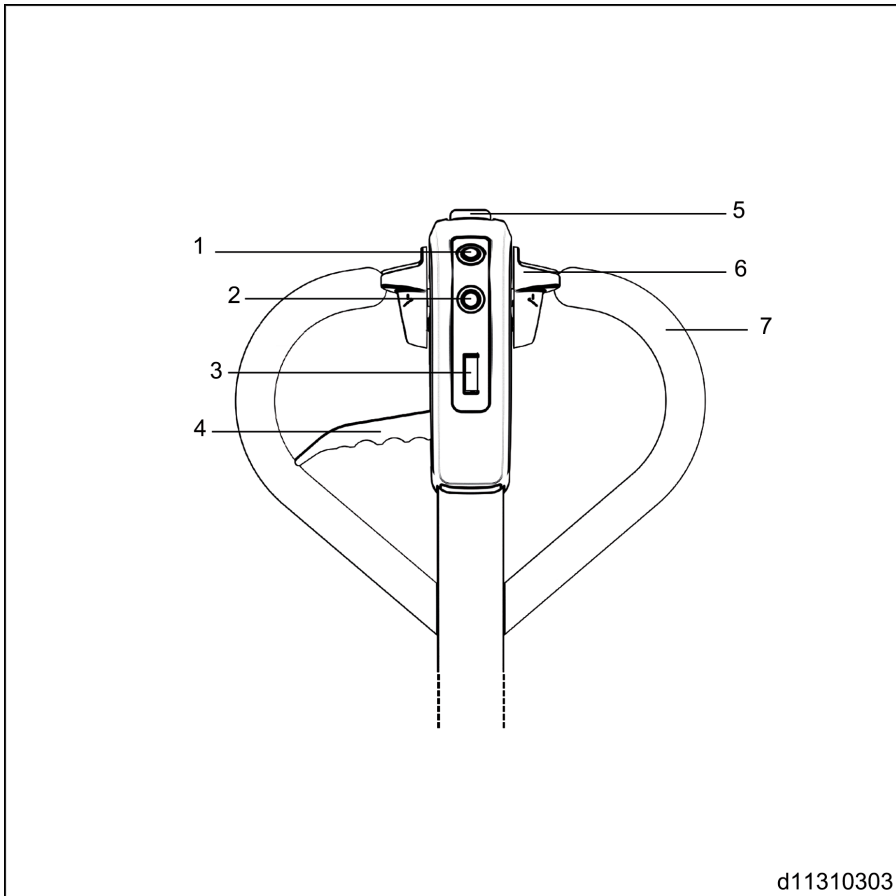
Overview of main components



- 1 Tiller
- 2 Hydraulics cowling
- 3 Rollers
- 4 Front protective panel
- 5 Battery
- 6 Emergency stop switch
- 7 Key

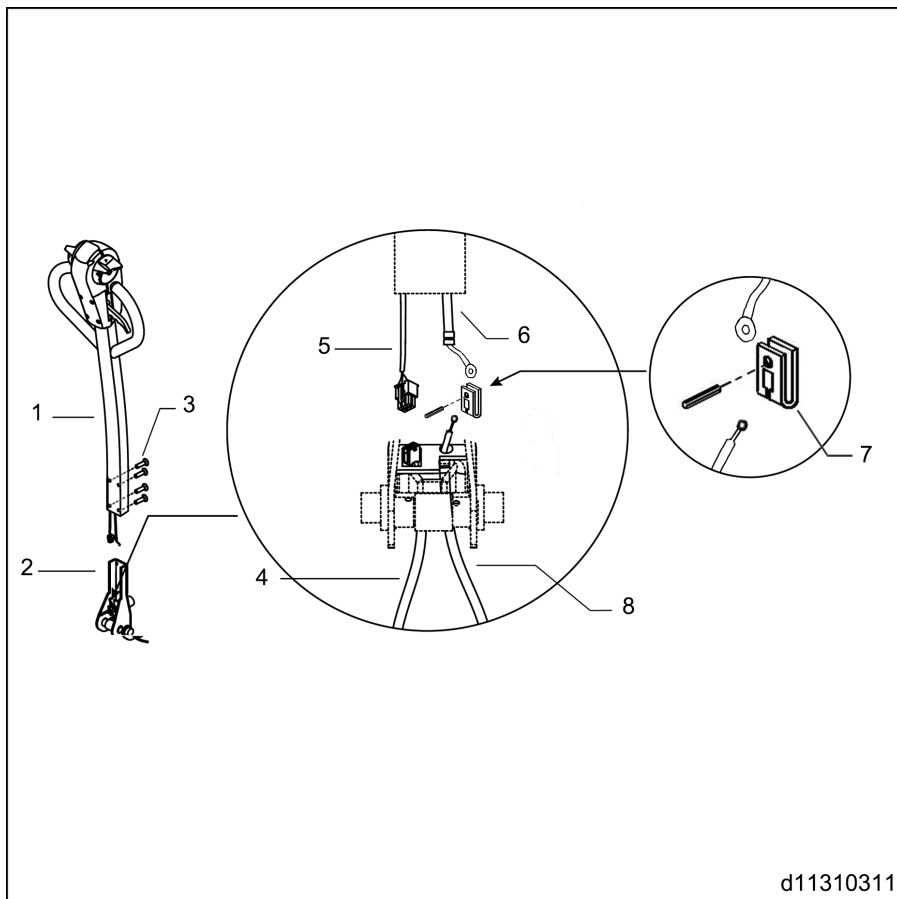
Control handle

Control handle



- 1 Horn switch
- 2 Lifting switch
- 3 Power display
- 4 Manual lowering handle
- 5 Emergency reverse switch
- 6 Drive switch
- 7 Handle

Installing the operating handle



d11310311

1	Square operating tube	5	Square tube harness
2	Mounting base	6	Wire
3	Screw (M6x10)	7	Bracket
4	Control harness	8	Ball head wire

- Connect the square tube harness connector to the control harness.
- Insert wire (6) and ball head wire (8) into bracket (7) (press the hydraulic pressure release switch from the right side cover auxiliary hole), release the pressed hydraulic

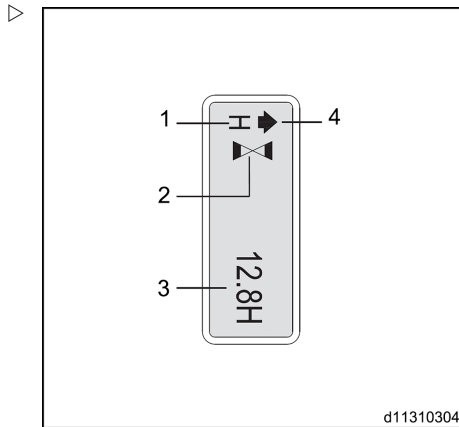
Instrument display

release switch, the ball head wire (8) will become taut and correctly installed.

- Use 4 screws to install the square control tube on the mounting base (standard torque).

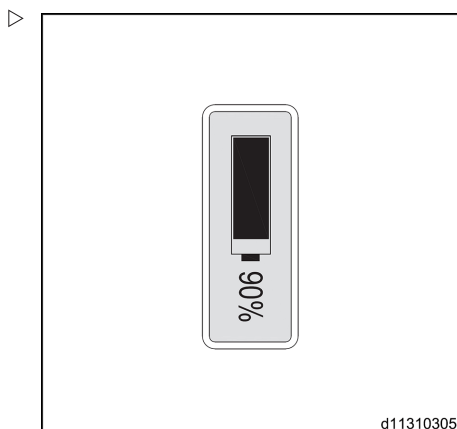
Instrument display

Normal display state

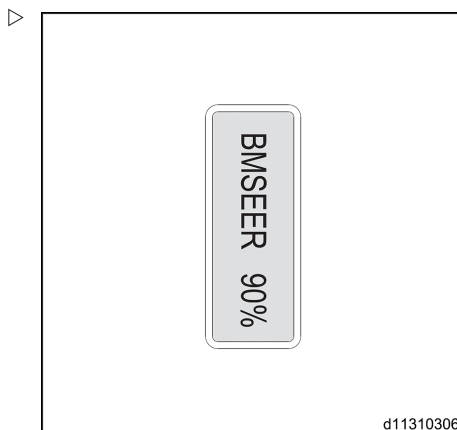


- 1 Horn in normal working state
- 2 Interlock switch status, acceleration status (flashing)
- 3 Total operating time
- 4 The display description includes forward, backward, fork lifting and fork lowering. The display changes occasionally from time to time depending on the operation

Charge percentage display

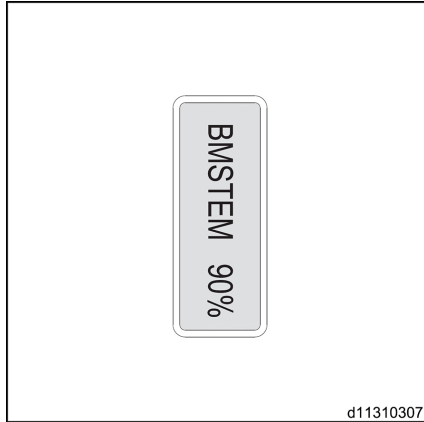


Motor temperature too high

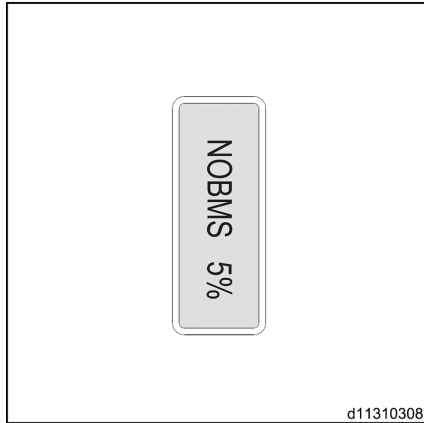


Instrument display

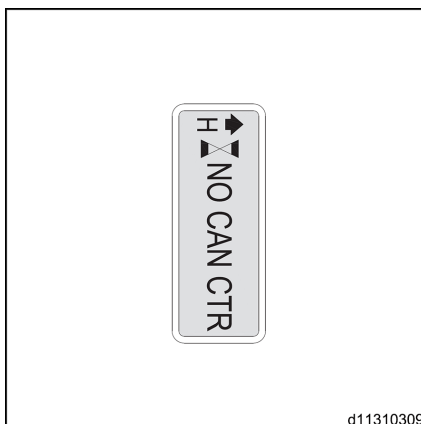
Other battery faults



Battery CAN signal not connected

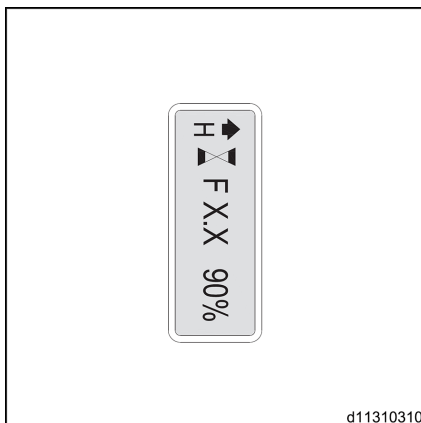


Controller CAN signal not switched on



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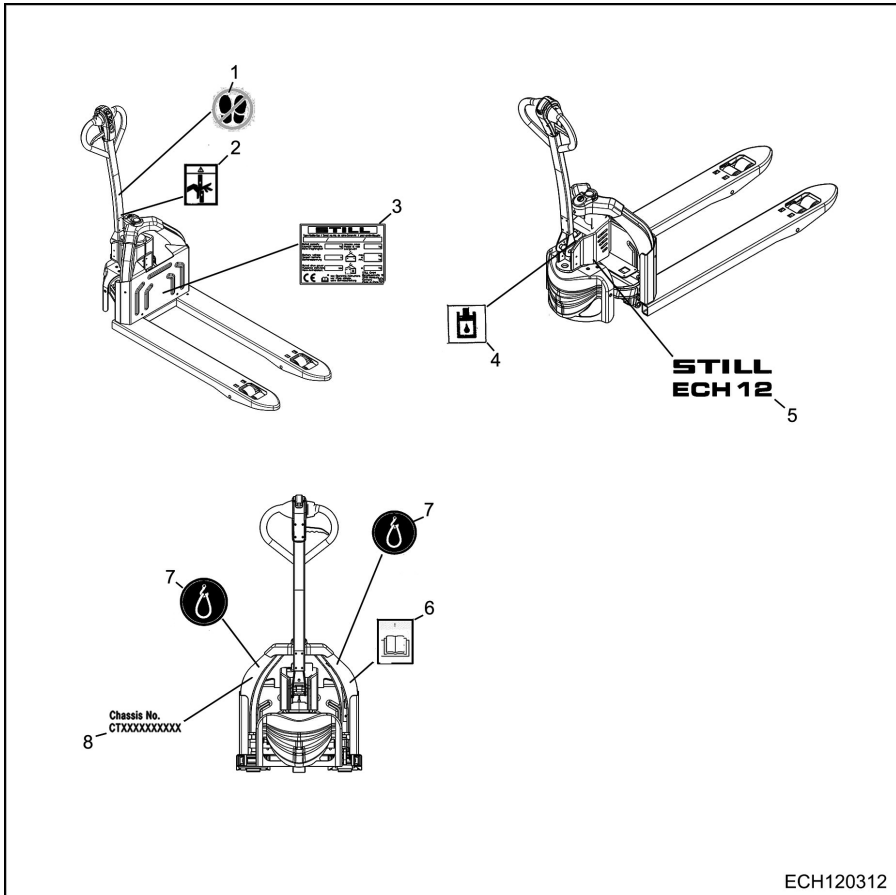
F.X.X:Error code (X refers to a number)



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Safety devices and warning labels

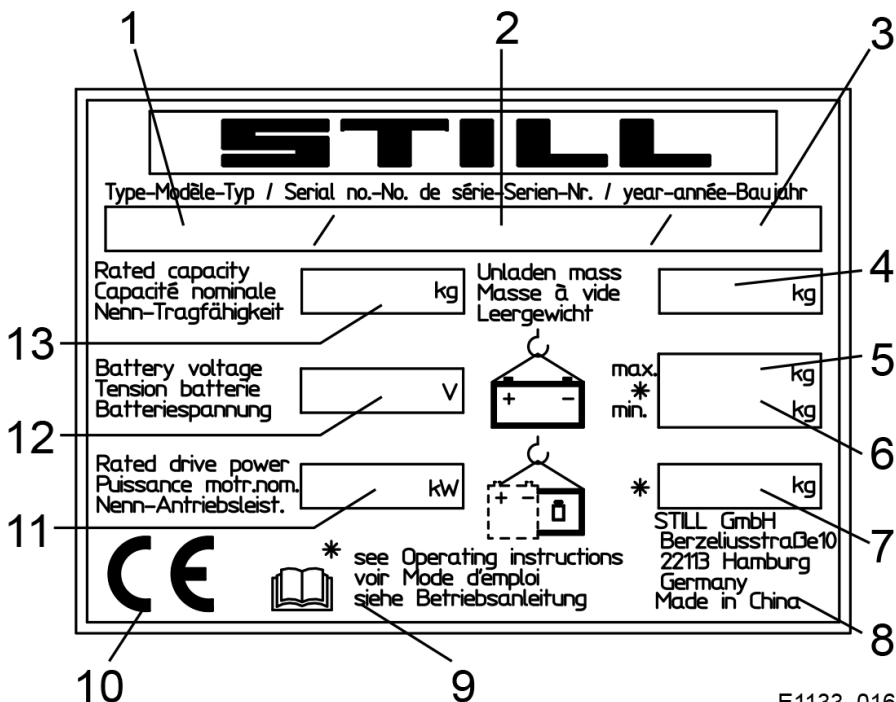
Safety devices and warning labels



- 1 "Forbid stampede" label
- 2 "Anti-pinch" label
- 3 "Identification plate" label
- 4 "Filler port" label

- 5 "Pallet truck model" label
- 6 "Instructions" label
- 7 Slinging label
- 8 Chassis NO.

Identification plate



- | | | | |
|---|--|----|---|
| 1 | Type | 7 | Own mass (self weight) in kg without battery |
| 2 | Serial number | 8 | Manufacturer |
| 3 | Year of manufacture | 9 | Refer to technical data listed in this operating instructions for more detailed information |
| 4 | Unladen mass in kg | 10 | CE label |
| 5 | Max. permissible battery weight in kg (for electric trucks only) | 11 | Rated drive power in kW |
| 6 | Min. permissible battery weight in kg (for electric trucks only) | 12 | Battery voltage in V |
| | | 13 | Rated capacity |

Identification plate

4

Operation

Handling of the Lithium-Ion battery

Handling of the Lithium-Ion battery

Information on the conformity of lithium-ion batteries

The manufacturer of the lithium-ion battery and Kion group provider declares that:

the lithium-ion battery

conforms with the provisions of the following EU directive **2004/108/EC**

in accordance with **EN 61000-6-2:2006 and EN 61000-6-3:2007**.

This declaration of conformity with EC directives applies only to battery use that conforms to the recommendations described in the operating instructions.

Special lithium-ion safety rules

⚠ DANGER

There is a risk of fire.

Have class D fire extinguishers or inert gas, carbon dioxide, powder or foam fire extinguishers near the zone in which the lithium-ion batteries are used.

⚠ DANGER

Electrical danger

Do not open the battery. Electrical risk.

Only the After-Sales Service Centre technicians can open the battery.

It is necessary to respect the following guidelines:

- Read the documents provided with the battery carefully.
- Only persons who have been trained to work with lithium-ion technology are permitted to work on the batteries (for example After-Sales Service Centre technicians).
- Do not place lithium-ion batteries on or near flames or hot heat sources (> 70°C). This may cause the batteries to overheat or burst into flames. This type of use also impairs the performance of the batteries and reduces their service life.
- Improper use may cause overheating or serious injury. Respect the following safety rules:
 - Never short circuit the battery terminals
 - Do not reverse the battery polarity
 - Do not open the battery

- Do not submit the battery to excessive mechanical constraints
- Do not expose the battery unit to humidity or water (> 95%)
- Install the batteries in a Level 2 pollution zone in accordance with standard EN 60664-1
 - Batteries must be installed in a room that can be easily ventilated in the event of incorrect use.
 - The forklift operator must drive the truck carefully to avoid any risk of piercing or damaging the lithium-ion batteries.

⚠ DANGER

Risk of injury

In the event of an accident (shock, fall, collision), the battery may be damaged, pierced or deformed. Establish a 5-metre safety perimeter around the battery. Contact the emergency services and tell them that there is a lithium-ion battery fire. Contact the after-sales service department.

- Store strapped batteries on pallets. Do not store them too high to reduce any risk of falling. Do not store on the ground to reduce the risk of humidity and impacts. We recommend that batteries are stored at a height between 60 and 120 cm.
- If an unusual smell, change of shape or any other anomaly is observed during operation, immediately disconnect the battery (using either the emergency stop or the charger socket). Contact the after-sales service department. If necessary, also contact the emergency services and tell them that there is a lithium-ion battery fire.

Handling of the Lithium-Ion battery

What to do in the event of incorrect use

Lithium-ion batteries present no chemical danger in the context of normal use. Batteries must not be opened or burned for example.

In the event of exposure to the internal components or of their being burned, follow these instructions.

In the event of contact with eyes

The content of an open battery can cause eye irritation.

Dust is likely to cause inflammation of the eyelids.

- Rinse immediately and thoroughly with water for at least 15 minutes
- See a doctor as quickly as possible

In the event of contact with skin

An open battery can lead to skin irritation and allergies.

- Remove contaminated clothes
- Rinse the parts of the skin affected thoroughly for at least 15 minutes
- Wash the skin using soap and water
- See a doctor if the irritation persists

In the event of inhalation

An open battery can cause irritation of the respiratory tracts and mucous membranes or an allergic reaction.

During disassembly of the battery, a gas may be released and irritate the throat.

- Carry the person into the open air
- See a doctor as quickly as possible

In the event of ingestion

- Rinse the mouth thoroughly with water
- Drink lots of water

- Do not make the person vomit
- See a doctor as quickly as possible

In the event of a fire

If a fire breaks out, follow these instructions:

For a small fire:

- Use class D fire extinguishers or inert gas, carbon dioxide, powder or foam fire extinguishers
- Establish a safety perimeter of five metres around the battery
- Call the emergency services and tell them that it is a lithium-ion battery fire
- After extinguishing the fire, do not reuse the battery. Contact the after-sales service department.

For a large fire:

- Establish a safety perimeter of five metres around the battery
- Call the emergency services and tell them that it is a lithium-ion battery fire

Special fire-fighting procedures (intervention of firefighters):

- Firefighters must wear self-contained breathing apparatus
- Use an approved mask to avoid inhalation of toxic fumes
- Wear protective clothing and equipment to avoid accidental bodily contact with the electrolyte solution
- All the types of extinguishing agents given above can be used on the batteries
- Use a large amount of water to cool the outside of the batteries if they are exposed to fire to prevent them rupturing
- After extinguishing the fire, do not reuse the battery. Contact the after-sales service department.

⚠ DANGER

Electrical risk

Do not use water on connected batteries in the charging room.

⚠ DANGER

Risk of explosion: release of gas that may create an explosive atmosphere

After extinguishing the fire, establish a safety perimeter of at least five metres around the battery.

⚠ DANGER

Risk of release of toxic products

Personal protective measures following an incident

⚠ WARNING

Handle an open battery only in a well-ventilated place.

Respiratory protection	If an element is opened or if it leaks, use a gas mask covering the entire face and fitted with ABEK filters or self-contained breathing apparatus (escape mask-type). Firefighters must wear self-contained breathing apparatus.
Hand protection	Use polypropylene, polyethylene, rubber or Viton gloves to handle leaking or broken elements.
Eye protection	Wear safety goggles with side shields or a mask covering the face to handle leaking or broken elements.
Other	Wear a rubber apron and a protection suit to handle leaking or broken elements.

What to do in the event of an accidental spillage

Take the following precautions in the event of leakage:

the skin or eyes, or if there is inhalation or ingestion

- Wear goggles and protective gloves

Precautions for individuals

- Evacuate staff from the contaminated area until the vapours have dispersed
- Avoid inhaling the gas in the event of electrolyte leakage from an element or a battery
- Follow the instructions on **What to do in the event of incorrect use** if there is contact with

Precautions for the environment

- Avoid pollution of wastewater, surface water and groundwater
- Avoid pollution of the soil and atmosphere
- Use absorbent materials (sand, earth) to absorb exudation
- Seal battery leakages

Handling of the Lithium-Ion battery

- Put the contaminated absorbent product in a plastic bag and dispose of it as special waste according to the local regulations in force

DANGER

Environmental danger

Do not reuse a lithium-ion battery that has leaked.
Call the After-Sales Service Centre.

Transporting a lithium-ion battery

Before transporting any lithium-ion battery, check the current regulations on the transport of dangerous goods. Comply with these when preparing the packaging and transport. Train authorised staff to dispatch lithium-ion batteries.

NOTE

It is recommended that the original packaging is kept for any subsequent dispatch.

A lithium-ion battery is a special product. Special precautions should be taken when:

- Transporting a truck equipped with a lithium-ion battery
- Transporting only the lithium battery

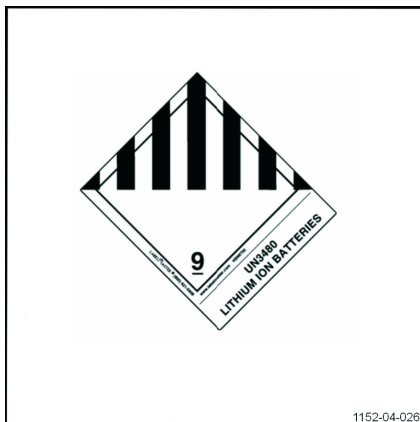
A class 9 danger label must be affixed to the packaging for transport.

It is different if the battery is transported on its own or in a truck. An example of a label appears in this supplement. Refer to the latest current regulations before dispatch as the information might have changed since this supplement was written.

Special documents must be sent with the battery. Refer to the applicable standards or regulations.

NOTE

Recharge the lithium-ion battery before transporting it taking account of the transport mode (plane, boat, road). Excessive discharge on arrival could damage the performance of the battery.



Handling of the Lithium-Ion battery

Scrapping lithium-ion batteries



ENVIRONMENT NOTE

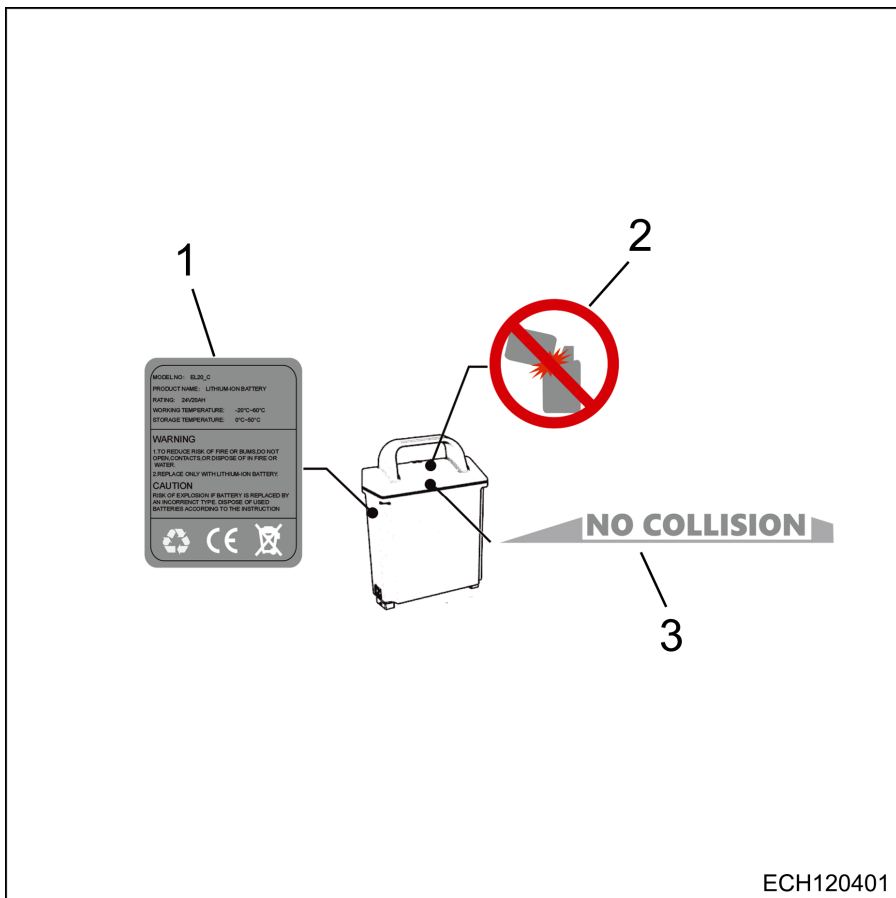
Comply with current regulations for scrapping batteries. Take care to minimise, as far as possible, any impact on the environment.

Lithium-ion batteries must be sent to the collection centre to be recycled. Contact the After-Sales Service Centre to agree how to send them.

Apply the following main rules for transport:

- Make sure that the battery is discharged
- Affix the **Class 9** transport label on the battery
- Use packaging that complies with international regulations
- Use the original packaging, if possible. Use sturdy packaging capable of bearing the weight of the batteries. Store it in a dry place.
- Wedge the battery well in the packaging to prevent it moving during transport
- Pack batteries individually in plastic bags. Package them to prevent any risk of short-circuit between terminals.
- Identify the type and number of batteries on the outside of the packaging
- Do not store near to a heat source

Labels on the lithium-ion batteries



- 1 Battery nameplate
- 2 No impact
- 3 No collision

Handling of the Lithium-Ion battery

Lithium-ion batteries: Long-term storage

⚠ DANGER

Electrical danger

We recommend that batteries are stored at a height between 60 and 120 cm.

Remain extremely vigilant when manoeuvring to avoid piercing the batteries.

Special precautions should be taken when storing lithium-ion batteries.

- Store the battery in a dry place at a temperature between 0 and 40° to preserve its service life. This area must not be hermetically sealed to allow air renewal.
- Indicate the storage area. Access should be strictly limited to personnel who are aware of the risks and safety instructions.
- It is strongly advisable to recharge the battery fully before storing it.
- Batteries can be stored for a maximum period of 12 months if they are fully charged (100%).
- Check the battery charge level regularly. Do this at least every three months to maintain the charge level above 30%. Recharge the battery if necessary.
- Completely recharge the battery every three months to avoid impairing the performance of the battery.
- Recharging could take up to 24 hours.

⚠ CAUTION

A battery that has reached an excessively low level cannot be recharged.

Contact your After-Sales Service immediately.

Precautions should be taken if the truck must not be used for a reasonably long period. The operations depend on the length of time it is unused.

Storage of trucks for a period of less than two months

If the truck is not used for a period of up to two months, it is necessary to perform certain operations:

- Clean the truck carefully.
- Check the hydraulic oil level and refill if necessary.
- Coat any unpainted metal parts with a thin layer of oil or grease.
- Grease all hinges and joints.
- Spray contacts with a suitable aerosol product.
- Place the truck on chocks to avoid the tyres becoming flat.
- Cover the truck with a cotton cover to protect it from dust. Avoid using a plastic sheet.

Long-term truck storage

The following work must be carried out on the truck to prevent corrosion if it needs to be stored for a long period of time. If the truck is to be stored for more than two months, it must be positioned in a clean and dry area. The area must be well-ventilated with no risk of freezing.

The following operations must be performed:

- Clean the truck carefully.
- Check the hydraulic oil level and refill if necessary.
- Coat any unpainted metal parts with a thin layer of oil or grease.
- Grease all hinges and joints.
- Recharge the lithium-ion battery every 3 months. Please observe the above instructions.
- Spray contacts with an aerosol product designed for contacts.

- Raise and chock the truck: the wheels must not touch the ground in order to prevent irreversible deformation of the tyres.
- Cover the truck with a cotton cover to protect it from dust.

⚠ CAUTION

We recommend that you do not use a plastic sheet as this encourages condensation to form.

Consult the After-Sales Service for further measures to take if the truck must be stored for a longer period of time.

Recommissioning after storage

If the truck has been stored for more than six months, it must be checked carefully before being recommissioned. This check is similar to the workplace accident prevention inspection. It is therefore necessary to check

all points and devices that are important for truck safety.

Carry out the following operations:

- Clean the truck carefully.
- Grease all hinges and joints.
- Check the battery charge status and recharge the battery if necessary.
- Check that there are no traces of condensation water in the hydraulic oil. Drain if necessary.
- Carry out the same maintenance work as for the first time it was commissioned.
- Commission the truck.
- In particular, check the following during start-up:
 - traction, control and steering
 - brakes (service brake and parking brake).

Operating instructions

The pallet truck is designed for use in safe environments: the ambient temperature must be between -10°C and +45°C and the altitude must not exceed 2000 metres.



NOTE

The floor surface must be dry, clean and level.

For braking and stability reasons, the maximum permissible gradient over short distances is limited to 10% unladen and 4% laden.

The pallet truck can only carry pallets up to a maximum weight of 1200 kg evenly distributed on the forks. For uses other than those specified above, contact an authorised dealer.

⚠ CAUTION

The pallets used must be in good condition.

⚠ WARNING

Risk of serious injury and/or major equipment damage.

Always drive in accordance with the floor conditions (uneven floor, etc.), especially in the case of hazardous work areas and hazardous loads.

⚠ CAUTION

Equipment wear or damage

To avoid scraping the bottom of the lifting system on the floor, keep the forks raised before starting.

⚠ CAUTION

Equipment wear or damage

The driver must turn off the ignition and remove the key before leaving the pallet truck.

Checks before use

⚠ CAUTION

Equipment wear or damage
Safety shoes must be worn to provide effective protection.

⚠ WARNING

Risk of serious injury and/or major equipment damage.
Place both hands on the tiller and turn off the power supply before touching moving parts and any equipment.

⚠ WARNING

Risk of serious injury and/or major equipment damage.
To prevent visibility being affected or completely obstructed during operation of the stacker, do not install or affix anything on the mast protection screen.

⚠ DANGER

Fatal crushing hazard!

The fork carriage must be at its lowest position when carrying out any work on the protection screen (cleaning, replacement, etc.).

⚠ CAUTION

Equipment wear or damage
The driver is not permitted to sit on the dashboard/battery cover.

Checks before use

⚠ WARNING

The truck can only be driven by battery power!

After the truck has arrived or been transported, you must perform the following checks before putting it into use:

- Check whether the equipment is intact and in good condition.
- Check whether the hydraulic system is in good condition.
- Check the vertical creep of the truck.
- Check the smooth movement of the wheels.
- Check the function of the emergency brake by activating the emergency button.
- Check, the tiller arm- switch braking function
- Check the lifting and lowering functions by operating the buttons.
- Check if all bolts and nuts are tightened firmly.

⚠ WARNING

Risk of serious injury and/or major equipment damage.

Before driving forwards or backwards, carefully check in the direction of travel to ensure that it is safe to proceed.

⚠ CAUTION

Equipment wear or damage
To ensure the safety of the driver, the pallet truck must not be used in the vicinity of forklift trucks.

⚠ CAUTION

Equipment wear or damage
To prevent feet from being crushed by the load or forks, keep a safe distance from other people when lowering the forks.

⚠ WARNING

The working area of the industrial truck must be adequately lit.

If it is insufficiently lit, working spotlights must be installed. To ensure that the driver can see properly.

- Visual check if there are any broken hoses or broken electric wires.
- If the truck does not yet have a battery installed, you must install a battery, making sure not to damage the battery cables.
- Recharge the battery.

Break-in period precautions

During the initial stage of putting the truck into use, it should be operated with low loads. Within the first 100 hours in particular, the following requirements should also be met:

- Excessive discharge of a new battery during initial use must be prevented. It should generally be charged promptly when at 20%.
- The specified preventive maintenance must be done thoroughly.
- Avoid sudden braking, driving quickly or sharp turns.

If the truck is parked for too long, the wheels may become slightly flattened where they touch the ground. The flat areas will automatically return to their former condition after the truck is driven for a short time.

- Change oil or lubricant promptly according to the instructions.
- Limit the load weight to 70-80% of the rated load.

⚠ CAUTION

When the truck is in the running-in stage (approx. 100 hours of operation), the equipment user should check the fastening of the wheel nuts and bolts and refasten them if necessary.

Drive system

Drive system

Instructions for driving

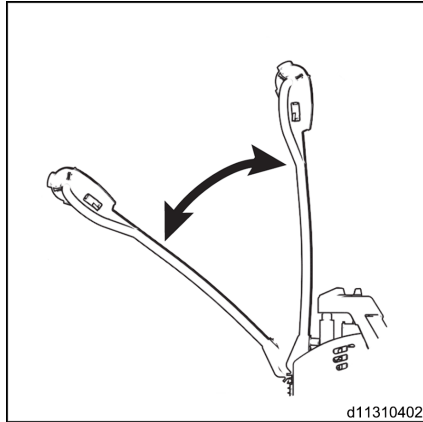
- Insert the magnetic key into the key hole and switch on the power supply.



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Drive system

- Tilt the control handle to the drive position. ▷



- Rotate the drive button to drive the vehicle forward or backward. ▷

⚠ CAUTION

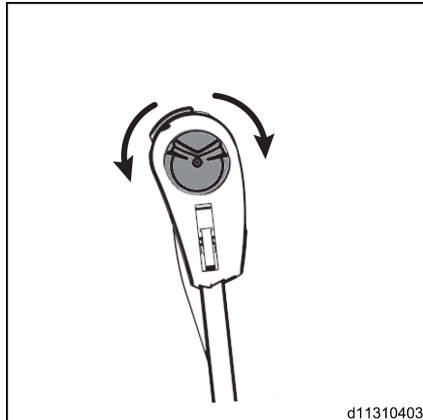
Carry out a routine inspection on the vehicle before using it.

i NOTE

The drive switch can be used to adjust the vehicle's speed.

i NOTE

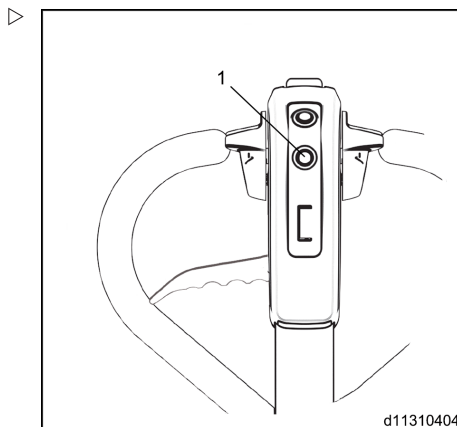
Releasing the drive switch causes the vehicle to brake.



Lifting, lowering, braking and using the horn

Lifting

- Press and hold down the lift button on the control handle (1). The forks will be lifted to the maximum height until they stop by themselves.



Manual lowering

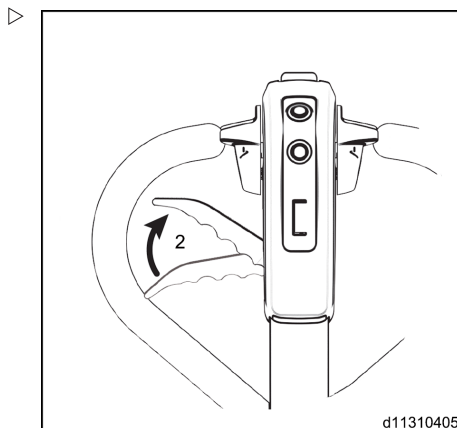
- Pull and hold the manual lower switch (2). The forks will lower to the minimum height until they stop by themselves.

⚠ CAUTION

Before lifting a load, make sure that it has been properly laid out on the pallet and that its weight does not exceed the rated load capacity of 1200 kg.

⚠ CAUTION

Make sure that the forks are completely under the load before the vehicle moves off.

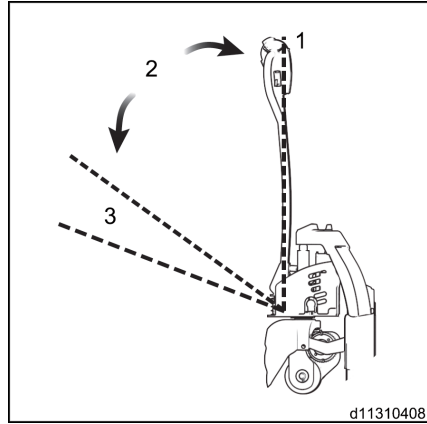


Drive system

Mechanical operating brake

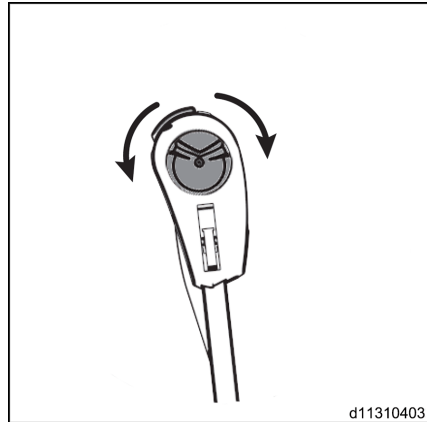
The truck is braked when the operating handle is released.

The mechanical brake engages when the tiller is positioned in areas (1) and (3).



Reverse braking

- Braking can be accomplished by changing the direction of travel.
- Press the reverse switch in the opposite direction until the truck comes to a stop, then release the drive switch.

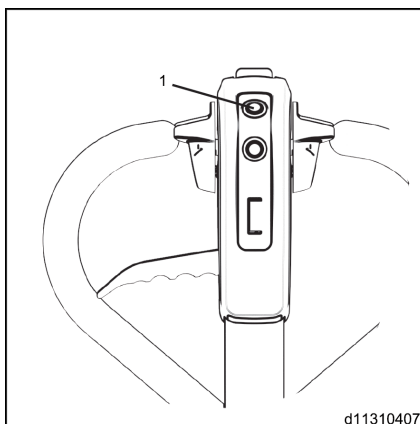


Horn

- Press the warning horn button (1).

**NOTE**

The horn must be used at junctions or places with poor visibility.

**Safety reverse and emergency stop****Safety reverse**

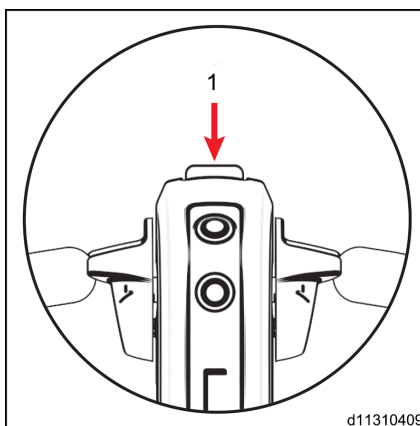
- Press the safety reverse button (1). The vehicle will begin to travel in the opposite direction.

CAUTION

If the safety reverse switch resets slowly, this indicates a fault. The cause of the fault must be identified and eliminated. The spring can be replaced if necessary.

**NOTE**

The safety reverse button (1) can be pressed in various ways, such as against the belly.



Drive system

Emergency stop

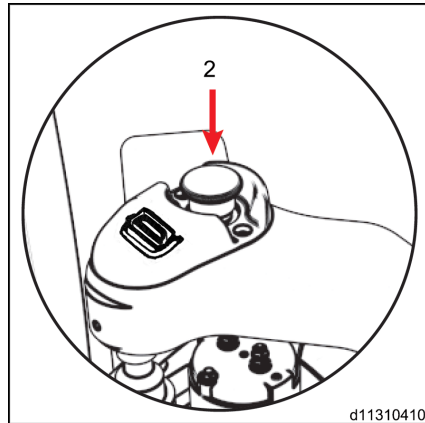
- Press the emergency switch (2). All power will be cut off and the vehicle will stop working.

⚠ CAUTION

When the emergency stop button (2) is pressed, it will lock in position. Rotate the button clockwise half a turn to release it. Do not pull hard, as it will reset on its own.

⚠ CAUTION

The condition of the floor surface affects the braking distance of the truck and should be taken into considered by the operator.



d11310410

Using the truck on a slope

NOTE

Incorrect use of the truck on slopes is not recommended. It places particular stress on the traction motor, brakes and battery.

Be particularly careful near slopes:

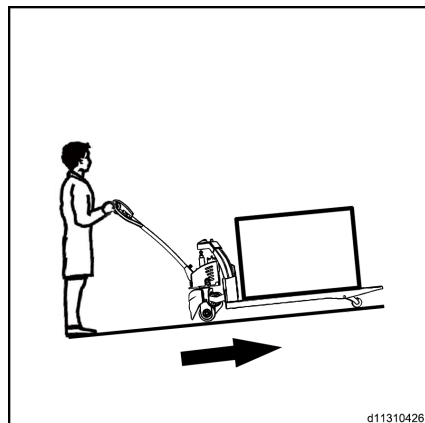
- Never attempt a slope with a gradient greater than that specified in the truck's datasheet.
- Make sure that the ground is dry with a non-slip surface and that the route is clear.

Ascending slopes



Always ascend slopes travelling in the reverse direction, with the load facing uphill.

Without a load, it is recommend to ascend slopes forwards.



d11310426

Descending slopes

Travel down slopes must always be forwards, with the load uphill.

Without a load, it is recommended to descend slopes forwards.

In all cases, travel at a very low speed and brake very gradually.

⚠ DANGER

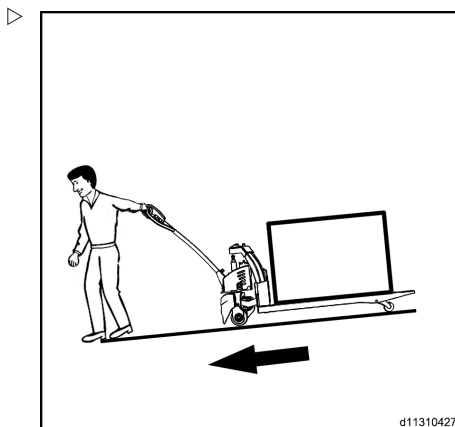
Risk to life and/or risk of major equipment damage.

Never park the truck on a slope. Never make a U-turn or take shortcuts on a slope. On a slope, the operator must drive very slowly.

⚠ WARNING

Risk of serious injury and/or serious damage to equipment

Due to limited braking capacity, the large drive version: must not be driven on a gradient of over 10% when unladen, or on a gradient of more than 4% under full load. Small drive version: must not be driven on a gradient of over 8% when unladen, or on a gradient of more than 2% under full load.



Starting on a slope

If you have to stop and then start on slope, proceed as follows:

- Stop on the slope by pressing the accelerator in the opposite direction until the machine comes to a standstill.
- Return the accelerator to the neutral position, then release the accelerator control button to apply the parking brake.
- To restart, press the accelerator button for the desired direction.
- The truck will move off.

Load handling

Load handling

Safety guidelines for handling loads

⚠ WARNING

Closely observe the following instructions before picking up loads. Never touch or stand on moving parts of the truck (e.g. lifting devices, equipment for picking up loads).

⚠ WARNING

Risk of crushing hands and feet when using the lift. When using the lift, keep hands and feet away from moving parts.

⚠ DANGER

It is not permitted to walk under the forks. It is not permitted to transport or lift people on the forks.

If there are people under or on top of the forks, do not move the truck. Do not move the forks and do not drive the truck.

⚠ DANGER

Risk of accident when forks are changed:

If the forks are changed and a different type of forks to the original forks is fitted, the residual load capacity changes.

When forks are changed, a new residual capacity plate must be affixed.

If a truck is supplied without forks, the residual capacity plate for standard forks is affixed. (See chapter "Technical Datasheet")

⚠ DANGER

Wear protective footwear. Always keep a suitable distance between your feet and the truck.

Risk of crushing feet when manoeuvring the truck.

⚠ CAUTION

The transport of persons or passengers is strictly prohibited.

⚠ CAUTION

Be especially careful not to collide with adjacent loads.

The load must be properly positioned to prevent collisions in narrow aisle spaces.

Loading

Loading

⚠ CAUTION

Before lifting a load, ensure that its weight does not exceed the truck's maximum load capacity.

- Refer to the rated load capacity specified on the truck's identification plate.
- Ensure that the load is stable and uniform to prevent any partial spillage.
- Check that the width of the load is compatible with the width of the forks.

⚠ DANGER

It is mandatory to wear safety footwear for pedestrian mode driving.

⚠ WARNING

Transporting people is strictly prohibited.

⚠ CAUTION

Take care not to disturb any adjacent loads, or those which may be to the side or in front of the load being handled.

Loads should be laid out as follows:

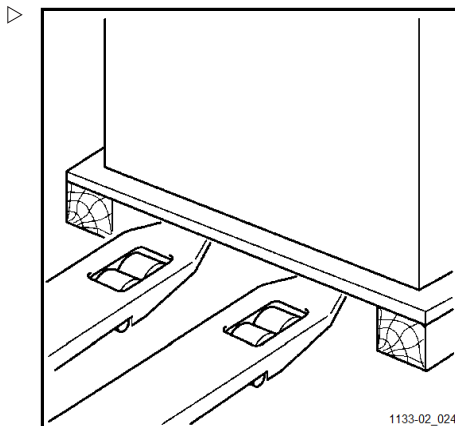
- Line up loads with a small space between each one and its neighbour to avoid any fouling.

⚠ CAUTION

Only transport loads that have been positioned and secured in accordance with regulations.

Take appropriate protective measures if the load is at risk of tipping over or falling during transport.

- Approach the load carefully.
- Adjust the height of the forks until they can be easily inserted into the pallet.
- Insert the forks under the load.
- If the load is shorter than the forks, position the forks so that the front of the load overhangs them by a few centimetres, to avoid interference with the load immediately ahead.

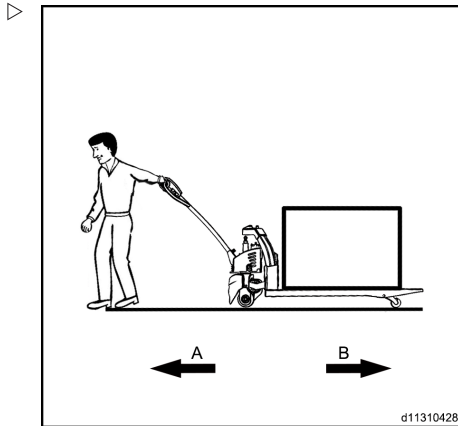


Load handling

- Raise the load a few centimetres above its support.
- Back the truck away from the stack or any neighbouring loads, gently and in a straight line.

Transporting loads

- Always carry loads in the forward direction of travel (A) in order to have the best visibility.
- When carrying a load on a slope, always ascend or descend with the load uphill. Never drive sideways across a slope or perform a U-turn.
- Reverse travel (B) is to be used solely for unloading. Since visibility is reduced when travelling in this direction, drive only at very slow speed.

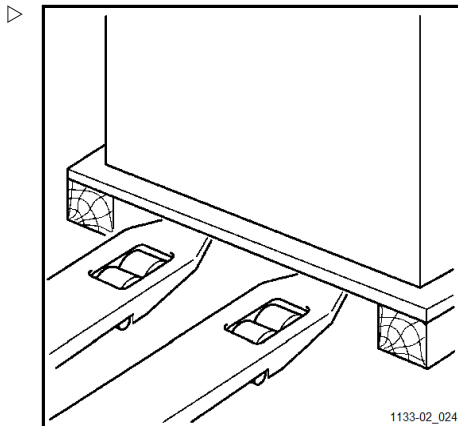


Unloading

- Carefully drive the truck to the desired location.
- Carefully drive the truck to the unloading area.
- Lower the load until the fork arms are free from the pallet.
- Back the truck away in a straight line.
- Raise the forks to mid-height.

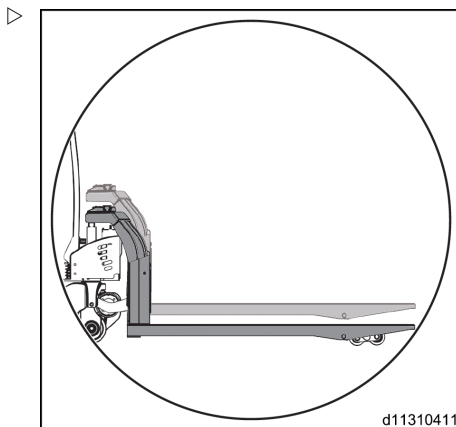
⚠ CAUTION

Take care not to disturb any adjacent loads, or those which may be to the side or in front of the load being handled.



Parking the vehicle safely

- Lower the forks to the lowest position.



- Remove the magnetic key.

⚠ WARNING

Do not park the truck on slopes. If unavoidable, secure the truck with chocks.

Never leave the truck with the load raised.

⚠ CAUTION

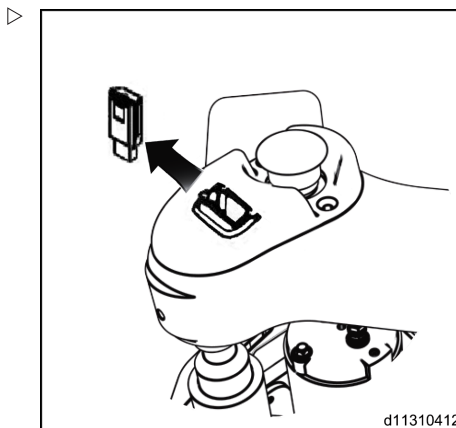
The forks must be fully lowered.

⚠ CAUTION

Always park the truck on a level surface that does not interfere with traffic.

⚠ CAUTION

If the vehicle is to be parked for an extended period, remove the battery and refer to the servicing and maintenance instructions.



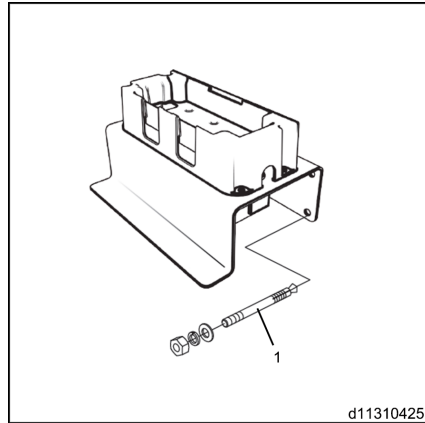
Battery use

Battery use

Mounting the battery charger

 NOTE

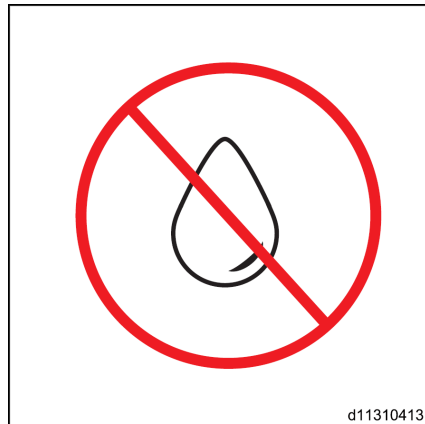
The charging stand can be secured to the wall using expansion screws (1).



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Battery precautions

- Avoid the battery becoming corroded by water or corrosive liquid.



d11310413

- Keep the battery away from all fire sources, heat sources and flammable or explosive materials. ▷



d11310414

- Do not place the battery on top of conductive objects. ▷

⚠ WARNING

If this happens, the battery may leak, emit heat or smoke, which may lead to a serious fire or explosion.



d11310415

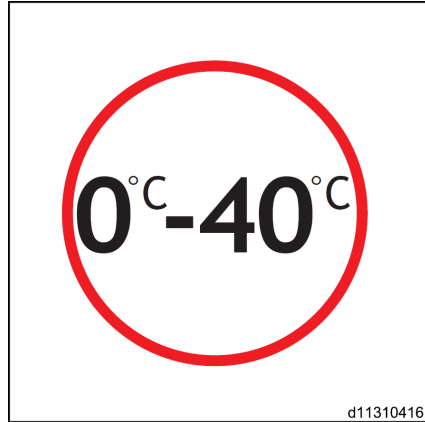
Battery use

- The charging environment temperature should be 0°C to 40°C.

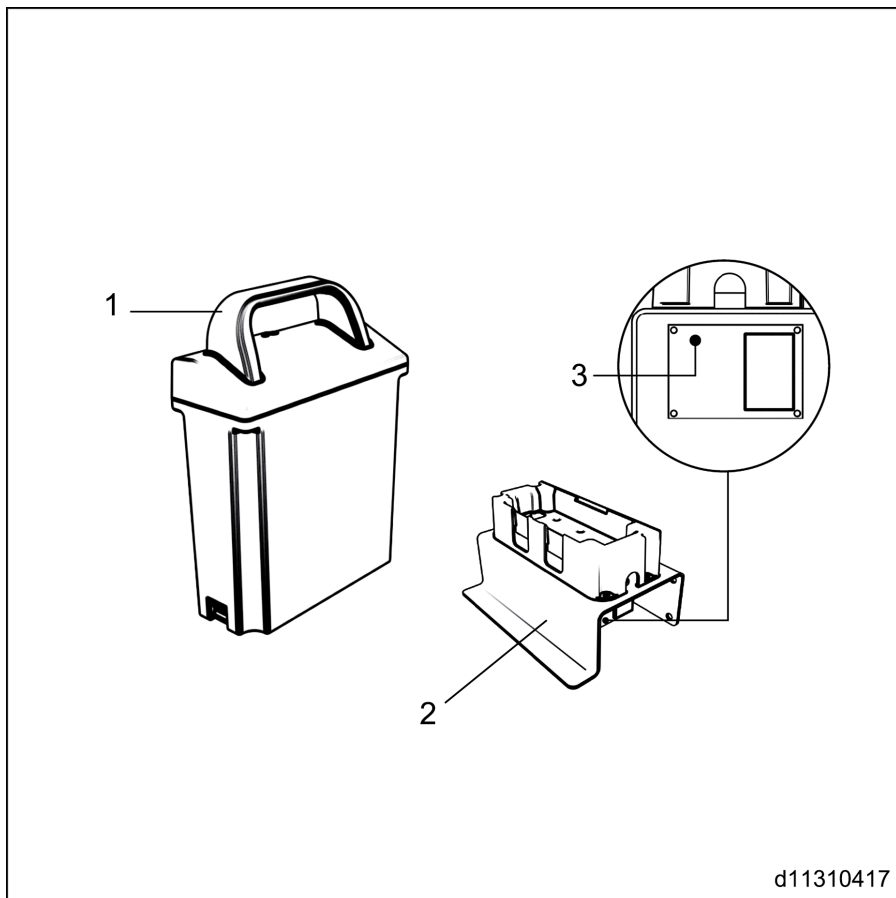
**⚠ WARNING**

If the battery fails, please contact an authorised dealer to have it repaired.

Do not disassemble the battery.



Battery charger

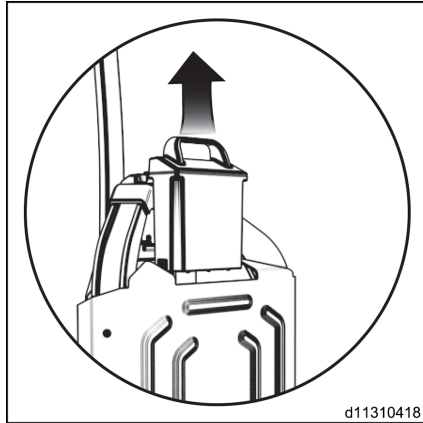


d11310417

- 1 Battery
- 2 Charging stand
- 3 LED light

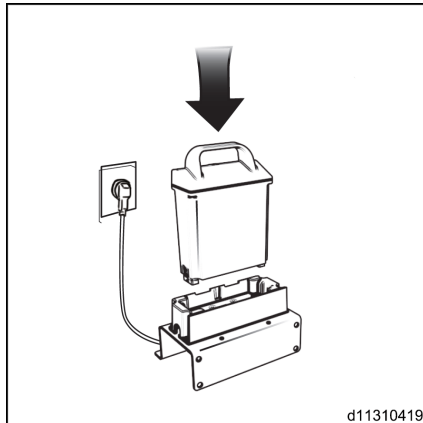
Battery use**Battery charger**

- Remove the battery.



d11310418

- Plug into charging stand and charge (110/220V 50/60HZ).



d11310419

- The LED light (1) comes on.

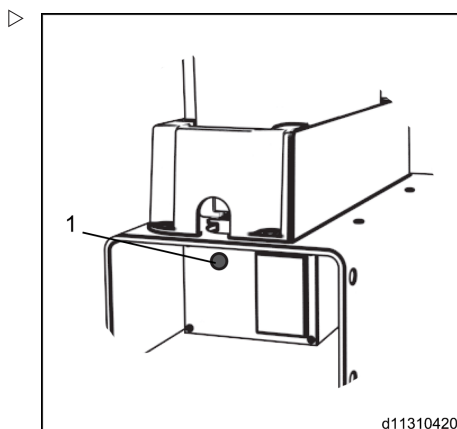
i NOTE

LED light mode

- *Charging:red LED light*
- *Fully charged:green LED light*
- *Charging fault:flashing yellow LED light*
- *Battery fault:steady yellow LED light*

⚠ WARNING

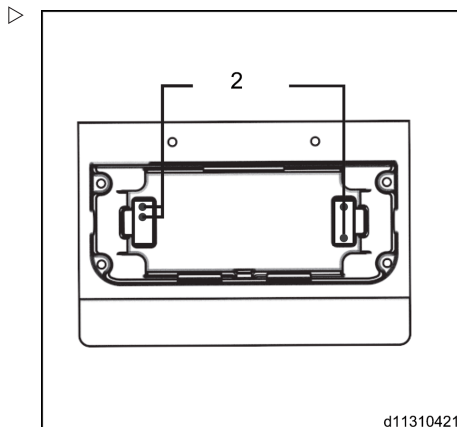
Before removing the battery, make sure the vehicle is completely powered off.



The figure on the right is a top view diagram of the charging contact pins (2). Correctly plug the battery into the charging stand.

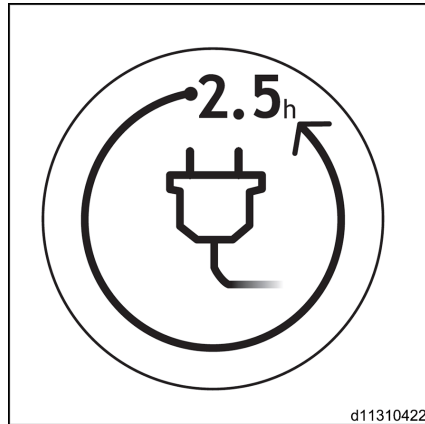
i NOTE

If the battery is still not fully charged after five hours, contact an authorised dealer.



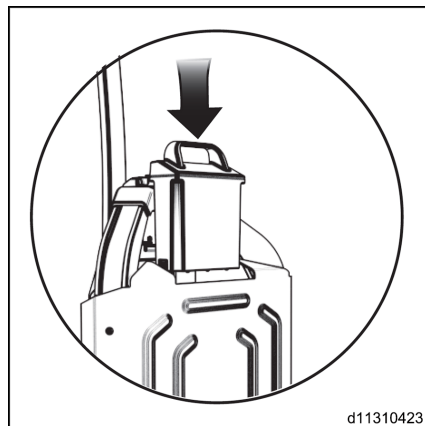
Battery use**Charging complete**

- The battery will take approximately 2.5 hours to fully charge at a voltage of 100–240 V AC.



d11310422

- Insert the battery into the vehicle's battery holder.



d11310423

- A fully charged battery can last for three hours of continuous use.

⚠ WARNING

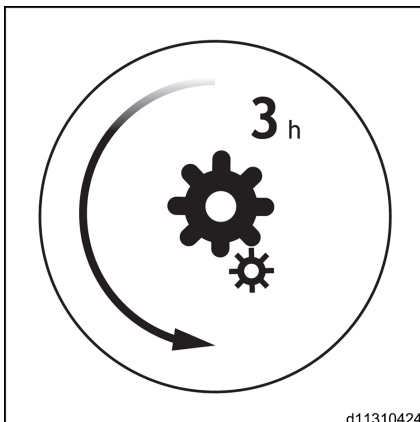
Before returning the battery to the vehicle, ensure that the vehicle is powered off.

⚠ CAUTION

Identify the positive and negative terminals according to the charging stand contact pins.

i NOTE

Due to the characteristics of lithium batteries, battery capacity is reduced in low-temperature environments.



Hoisting

⚠ DANGER**Danger to life!**

Personnel must not stand below or near the truck when the pallet truck is being lifted.

⚠ WARNING

Risk of serious injury and/or major equipment damage.

Use lifting hooks and a hoist with adequate lifting capacity. Protect all components that come into contact with the lifting device.

Truck weight (with battery): see technical specifications.

- Remove the load before hoisting the pallet truck.
- Disconnect the power supply.

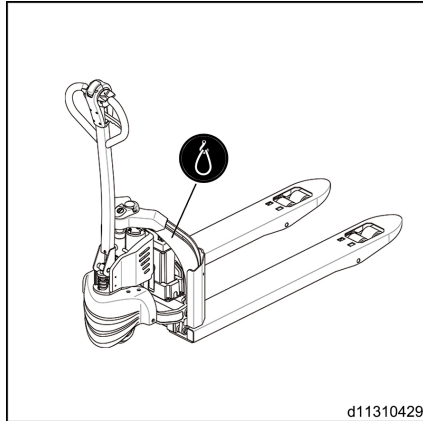
Truck transport

- Attach slings in the positions identified by the hook symbol.

⚠ CAUTION

Risk of major equipment damage.

It is strictly forbidden to attach the lifting slings to the operating handle or to other points not intended for this purpose.



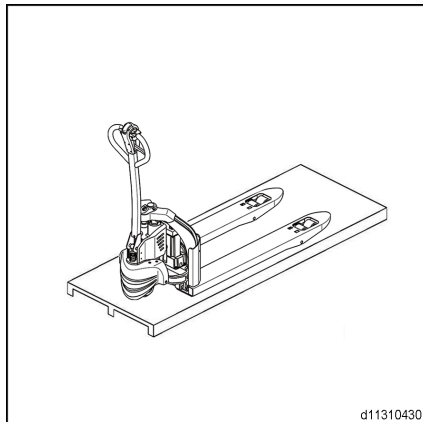
Truck transport

- Place the truck on a wooden pallet.

ⓘ NOTE

Only use haulage equipment with sufficient load capacity.

- *The load weight is greater than the net weight of the truck (including battery weight). The load weight does not just include the net weight of the truck, it also includes the wooden pallet.*
 - *The pallet or wooden box should be large and strong enough to withstand the weight of the truck.*
 - *Pay attention to the fork blades when lifting the truck onto the pallet, to prevent injuries caused by the fork blades trailing on the ground.*
- Follow the prescribed steps and park the vehicle correctly.

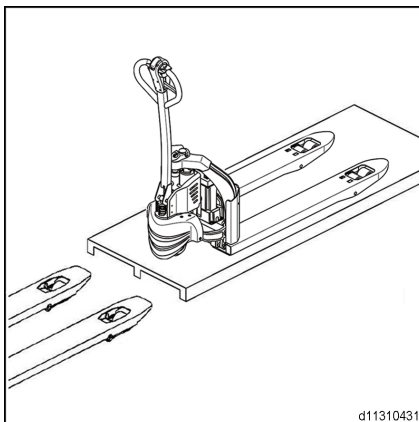


- Make sure the forks are aligned with the pallet, move slowly and stop after inserting the forks as far into the pallet as possible.

⚠ CAUTION

Operate on open, level ground and pay attention to ground conditions when lifting and lowering the pallet to prevent the truck from tipping.

When transporting the truck, make sure it is fully secured and take precautionary measures against bad weather.



Cleaning the Forklift

Cleaning the Forklift

Cleaning depends on the type of use and the workplace. Should the truck come into contact with highly aggressive elements such as salt water, fertilizers, chemical products, cement, etc., it should be cleaned as carefully as possible after every work cycle. It is preferable to use cold compressed air and detergents.

Use water-dampened rags to clean the parts of the body.

⚠ CAUTION

Do not clean the truck with direct jets of water; DO NOT use solvents and petrols that could damage parts of the truck.

Storing the truck for an extended period

If the truck is to be decommissioned for a long period, it must be parked in a frost-free and dry location. Before decommissioning:

- Clean the truck thoroughly.
- Lower the fork arms to the lowest position and unload the load.
- Check the brakes
- Check the hydraulic oil level and top up if required.
- Apply a thin layer of lubricating oil or grease to all non-painted mechanical components.
- Lubricate the truck in accordance with the lubrication schedule.
- Remove the battery and recharge it at least once per month.
- Clean the battery and apply specialised grease to the terminals.

- Spray all exposed electrical contacts with a suitable contact spray.

⚠ CAUTION

Jack up the truck so that all wheels are clear of the ground. This prevents permanent deformation of the tyres.

- Cover the truck with a cotton cover to protect against dust.

⚠ CAUTION

We do not recommend using a plastic sheet as this promotes the formation of condensation.

⚠ WARNING

Lithium-ion batteries must be stored in a cool, dry and ventilated place.

High temperatures (above 40°C) reduce the battery life.

5

Maintenance

General servicing information

General servicing information

General

The following instructions contain all the information required for servicing your truck. Carry out the various maintenance work in compliance with the maintenance plan. This will ensure that your truck is reliable and in good working order and that the warranty remains valid.

Maintenance should only be carried out by authorised technicians, or by authorised dealers in accordance with a signed maintenance contract.

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

NOTE

If the data plates or affixed labels are incomplete or damaged, they should be replaced with new ones. For locations and reference numbers, please see the spare parts catalogue.

CAUTION

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.

ENVIRONMENT NOTE

Please comply with regulations regarding the use, handling and disposal of fuel and lubricating oil.

Servicing and maintenance personnel training and qualification

Truck maintenance must only be carried out by qualified and authorised personnel.

The annual inspection for prevention of accidents at work must be carried out by a person qualified to do so. The person carrying out this inspection must provide their expertise and opinion without being influenced by

The forklift must undergo functional testing and a trial run after each inspection.

Service plan

Maintenance work must be carried out according to the maintenance checklist.

The service plan is followed by advice to facilitate work.

Maintenance intervals must be reduced if the truck is used under harsh conditions (extreme heat or extreme cold, large quantities of dust).

Grade and quantity of lubricants and other consumables

Only lubricants and other consumables specified in these operating instructions are authorised for use during maintenance work.

Lubricants and other consumables required for truck maintenance are listed in the maintenance specifications table.

Never mix different qualities of grease or oil. If it is absolutely necessary to change brands, make sure to flush thoroughly beforehand.

Before changing any filters or working on the hydraulic system, thoroughly clean the surface and the areas around the part.

All containers used to pour oil must be clean.

economic factors or company internal issues. Safety is the only critical deciding factor.

The person responsible for carrying out the inspection must have sufficient knowledge and experience to be able to assess the condition of the truck and the efficiency of the protective installations in accordance

with the technical regulations and principles established for checking industrial trucks.

Inspection and maintenance

Maintenance - 1000 hours / every 6 months

At operating hours								Carried out			
1000		3000		5000		7000				9000	
11000		13000		15000		17000		19000		✓	*
Functions and controls											
Check and fasten the controller and contactor.											
Check that cables are free from damage and that terminals are firmly attached.											
Power and drive system											
Check whether battery cables are damaged and replace if necessary.											
Check the battery charging connector.											
Check battery and battery holder for damage and liquid ingress.											
Check the wheel bearings and their mounting.											
Check whether weight-bearing bridge is damaged or broken.											
Check the gearbox for abnormal sound and leakage.											
Check and lubricate the bearings between the drive motor and gearbox.											
Check and lubricate the drive chain.											
Hydraulics											
Check hoses, pipes and interfaces for damage and ensure their tightness and sealing.											
Check cylinders for leaks.											
Check valves for leaks.											
Check the hydraulic oil level.											
Brake system											
Check the electromagnetic brake air gap.											
Lithium-ion battery											
Check the battery for damage.											
Perform insulation testing of the battery.											
Lifting system											

Inspection and maintenance

At operating hours								Carried out	
1000	3000	5000	7000	9000					
11000	13000	15000	17000	19000				✓	*
Check link mechanism for wear or damage.									
Check whether pin shaft is fixed securely.									
Check and lubricate moving parts on link mechanism.									
Other									
Check connections between nuts and bolts.									
Check that labels are clear and complete.									
Check covers for cracks.									

Maintenance - 2000 hours / every 12 months

At operating hours								Carried out	
2000	4000	6000	8000	10000					
12000	14000	16000	18000	20000				✓	*
Note									
Perform all 1000-hour maintenance work.									
Functions and controls									
Check error message record and operating time.									
Power and drive system									
Check bearing positions for noise.									
Clean or add gearbox grease.									
Check driving speeds.									
Hydraulics									
Check cylinders for damage and ensure that they are properly secured.									
Clean or change hydraulic oil.									
Check overflow pressure.									
Brake system									
Check that electromagnetic brakes are installed and connected.									
Check braking distance of electromagnetic brakes.									
Lifting system									

At operating hours								Carried out			
2000		4000		6000		8000		10000			
12000		14000		16000		18000		20000	✓	*	
Check lifting and lowering speeds.											
Other											
Check chassis for cracks or damage.											

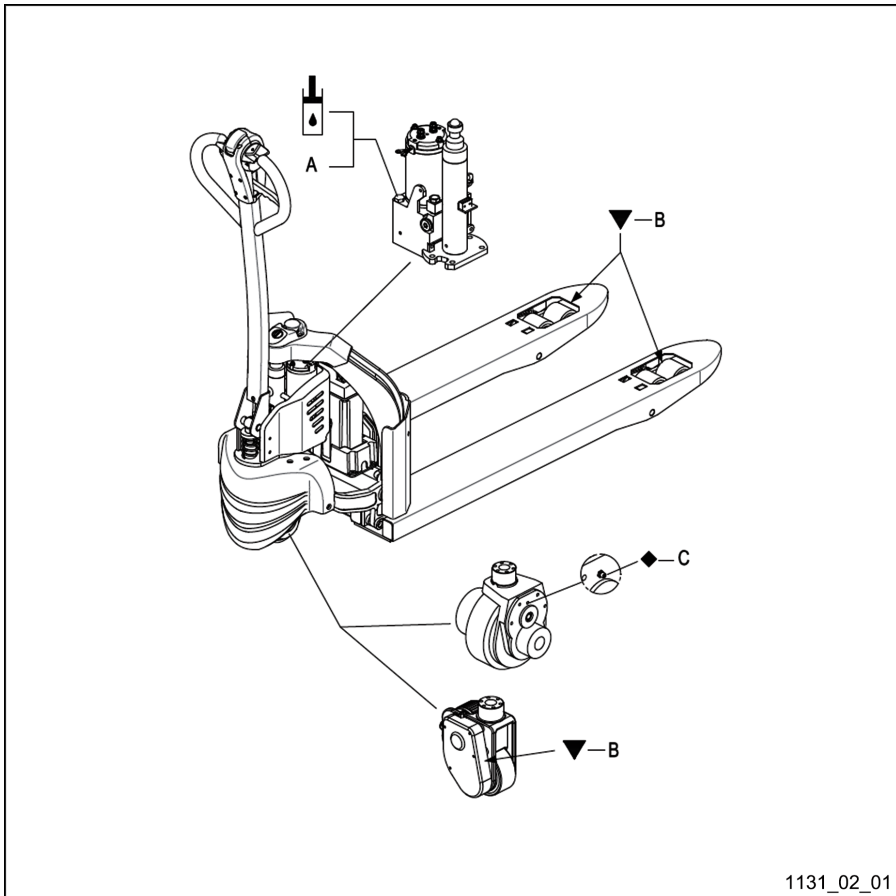
Technical inspection and maintenance data

Lubricants table

Designation	Model no.	Amount added	Position used
Antifriction hydraulic oil	L-HM46	0.16–0.18 L	Hydraulics
Antifriction hydraulic oil (cold stores)	L-HV32		
Multi-purpose lubricating grease	Polylub GA352P	As appropriate	Sliding surfaces
Moly lithium grease no. 3	–	100 g	Transmission

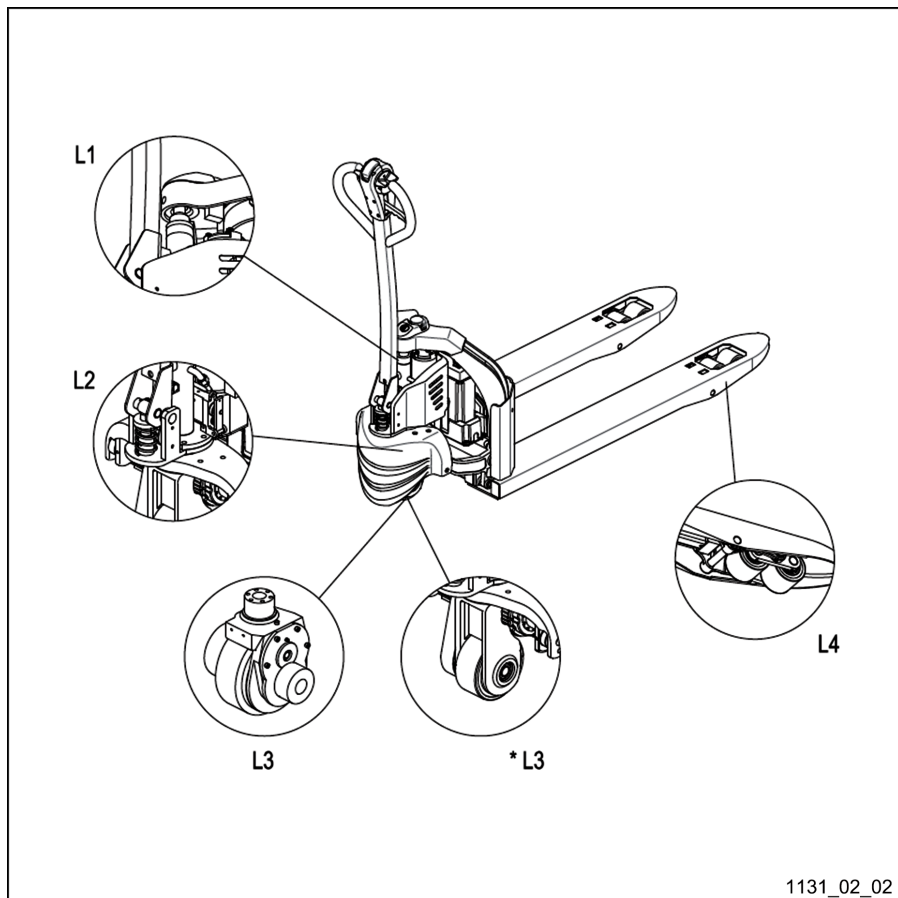
Inspection and maintenance

Diagram for lubrication and servicing



- A Hydraulic oil filler port
- B Lubrication surface
- C Gear oil filler port

Lubrication of sliding surfaces



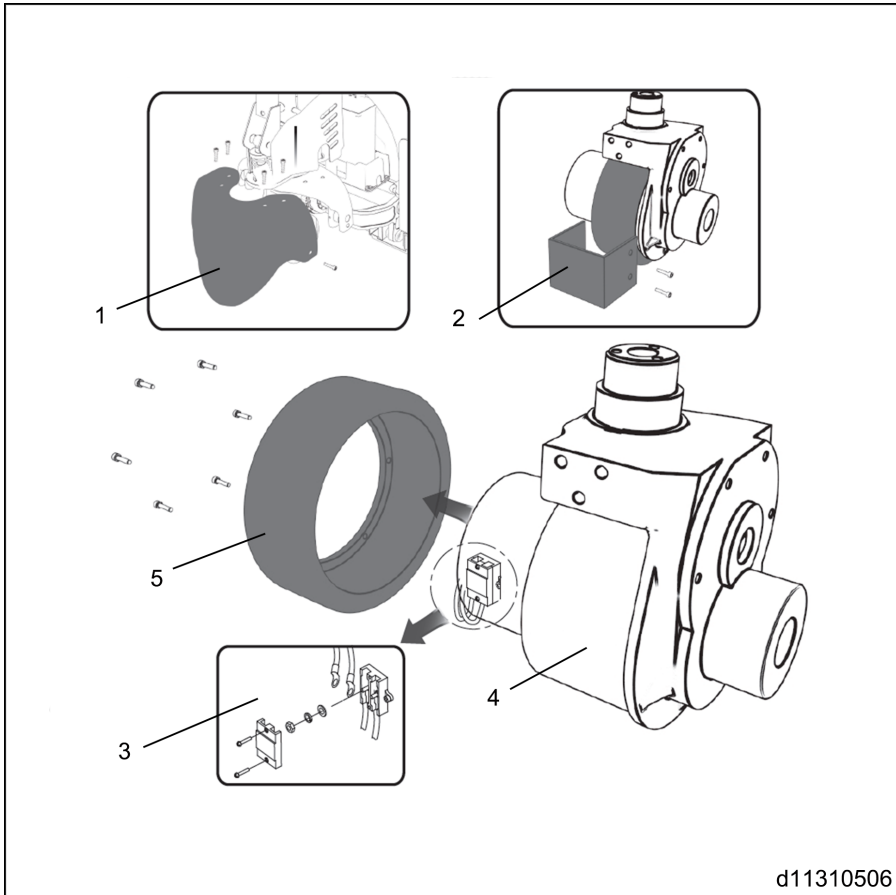
- L1 Steel stopper ball
- L2 Steering bearing
- L3 Drive wheel
- *L3 Drive wheel and drive chain
- L4 Rollers

Essential maintenance

Essential maintenance

Replacing the drive wheel

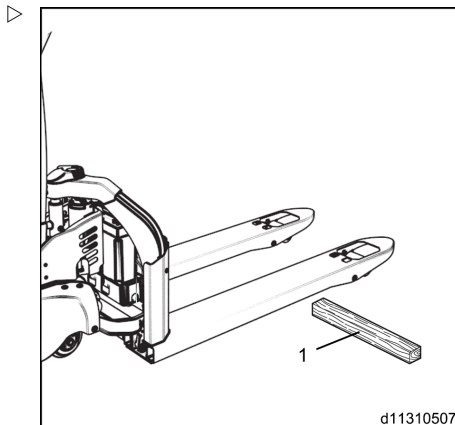
Replacing the drive wheel



- Remove the drive cowling (1).
- Remove the plate (2).
- Remove the motor and cable mounting base and remove the motor cables (3).
- Loosen the six screws using a spanner, then remove the drive wheel (5) from the drive assembly (4).
- Refit in reverse order to removal.

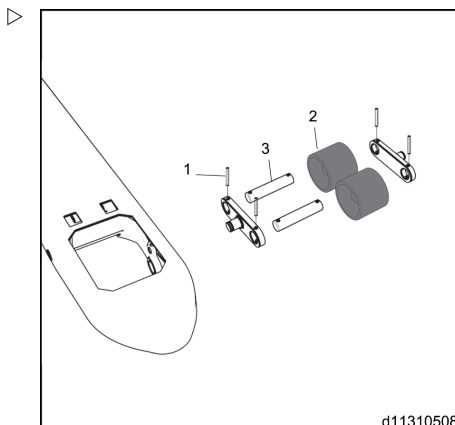
Replacing the load wheels

- Place a wooden block (1) under the load wheels to raise them off the floor.



Double load wheels

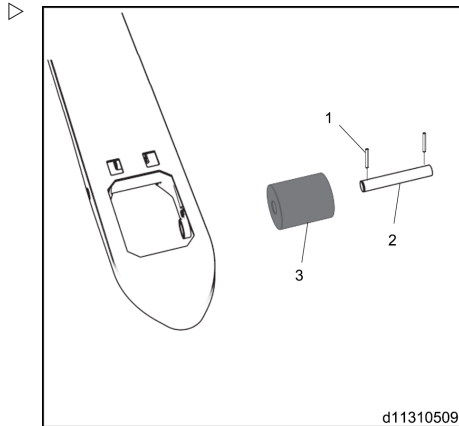
- Remove the spiral slotted spring pin on the wheel frame (1).
- Turn the wheel frame to the vertical direction.
- Tap out the wheel pin spindle from the side.
- Remove the load wheels (2) and bearing assembly (3).



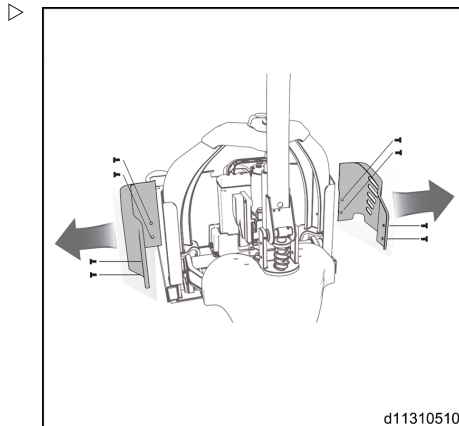
Essential maintenance

Single load wheels

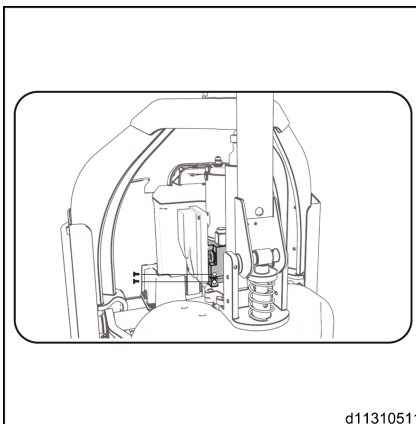
- Use a knockout pin to remove the spiral slotted spring pin (1).
- Tap out the wheel pin spindle from the side.
- Remove the wheel (2) and bearing assembly (3).

**Changing the hydraulic oil**

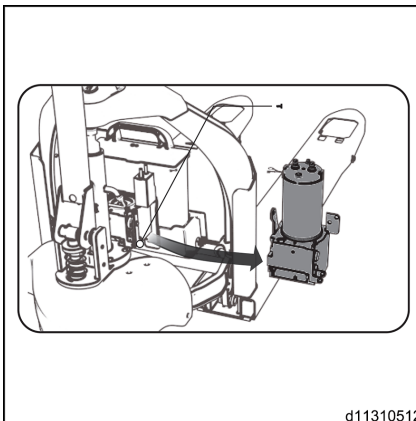
- Remove the hydraulic station protective covers on both sides.



- Remove the two screws on the left.

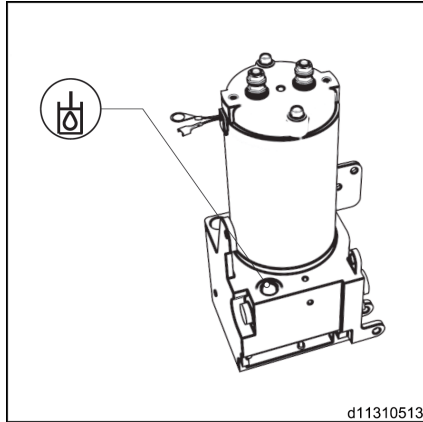


- Remove the screw on the right.
- Then remove the pump housing and motor.



Essential maintenance

- Remove the plug and drain the old hydraulic fluid from this hole. ▷
- Add new oil.

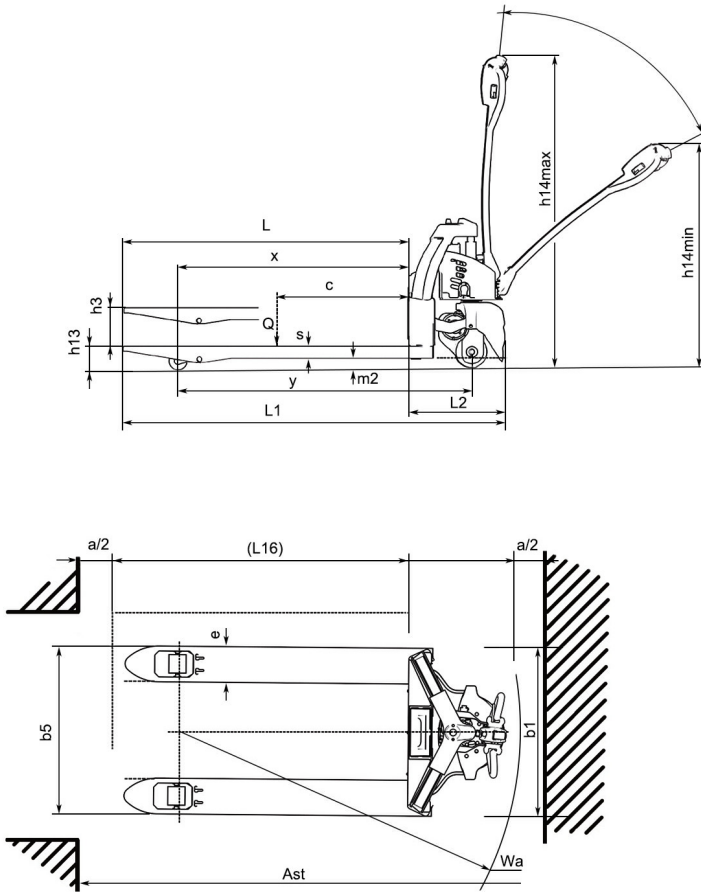


6

Technical data

Main technical data

Main technical data



d11310601

Technical datasheet

Description			
1.1	Manufacturer		Still
1.2	Model		ECH 12
1.3	Drive type: Battery, diesel, petrol, LP gas, mains power		Battery
1.4	Operation		Pedestrian
1.5	Nominal loading capacity	Q (kg)	1200
1.6	Load centre	c (mm)	600
1.8	Axle centre to fork face	x (mm)	950 (880)
1.9	Wheelbase	y (mm)	1190 (1120)

Weight			
2.1	Service weight	kg	130
2.2	Axle load with load, drive side/load side ($\pm 10\%$)	kg	420/910
2.3	Axle load without load, drive side/load side ($\pm 10\%$)	kg	110/20

Wheels			
3.1	Tyres: pneumatic, polyurethane, rubber		PU/PU
3.2	Drive wheel sizes	\varnothing x w (mm)	210x70
3.3	Load wheel specifications	\varnothing x w (mm)	80x60
3.5	Wheels, number drive side/load side (x=traction)		1x+4

Dimensions			
4.4	Lift height	h3 (mm)	110
4.9	Tiller height, travel position (min./max.)	h14 (mm)	800/1190
4.15	Fork height, lowered	h13 (mm)	80
4.19	Overall length	l1 (mm)	1540
4.20	Length to fork face	l2 (mm)	390
4.21	Total width	b1/b2 (mm)	560 (685)
4.22	Dimensions of forks	s/e/l (mm)	53x150x1150
4.25	Fork spread (outside of forks)	b5 (mm)	560 (685)

Technical datasheet

Dimensions			
4.32	Ground clearance at centre of wheelbase, with load	m2 (mm)	27
4.34	Aisle width with 800 x 1200 mm pallet along forks	Ast (mm)	2062
4.35	Turning radius	Wa (mm)	1390

Performance data			
5.1	Driving speed, full load/no load	km/h	4.0/4.5
5.2	Lifting speed, full load/no load	m/s	0.02/0.025
5.3	Lowering speed, full load/no load	m/s	0.06/0.03
5.8	Maximum climbing ability, with/without load	%	4/10
5.9	Acceleration time, with/without load	s	n/a
5.10	Brake type		Electromagnetic

Drive			
6.1	Traction motor rating S2 60 min	kW	0.65
6.2	Lifting motor rating at S3 15%	kW	0.5
6.3	Battery according to DIN 43531/35/36 A, B, C, no		Lithium battery
6.4	Battery voltage, nominal capacity K5	V/Ah	24/20
6.5	Battery weight ($\pm 10\%$)	kg	3.7
6.6	Energy consumption according to VDI cycle	kWh	n/a

Other			
8.1	Drive control method		DC
8.4	Noise level at operator's ear	dB(A)	<74

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STILL GmbH

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