Original instructions

Pallet truck

EXH-SF 20
EXH-SF 25

0185 0186 2362 2363

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first in intralogistics

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1

Introduction

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.

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.

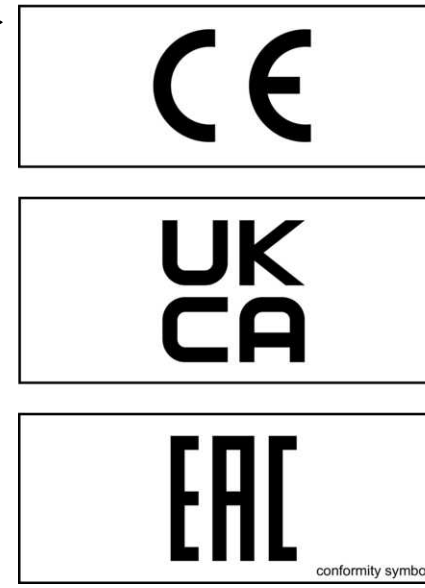
Conformity marking

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

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

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

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



conformity symbols

Declaration that reflects the content of the declaration of conformity

Declaration

STILL GmbH
Berzeliusstraße 10
22113 Hamburg Germany

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

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

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

Personnel authorised to compile the technical documents:

See declaration of conformity

STILL GmbH

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

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

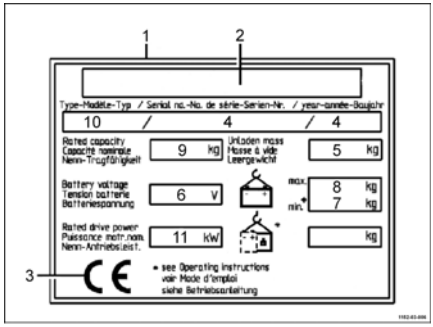
An unauthorised structural change or addition to the industrial truck can compromise safety, thus invalidating the declaration of conformity.

The declaration of conformity must be carefully stored and made available to the responsible authorities if necessary. It must also be

handed over to the new owner if the industrial truck is sold on.

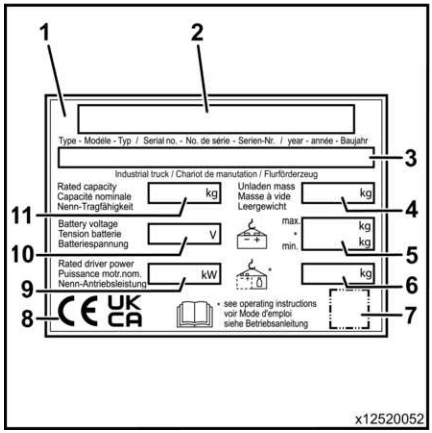
Identification label

Version 1



1 Identification label
2 Manufacturer
3 CE symbol (this symbol means that the machine complies with European regulations for industrial trucks)
4 Serial number/year
5 Unladen weight
6 Battery voltage
7 Minimum battery weight (for a lithium-ion battery, the weight of the ballast container is included)
8 Maximum battery weight
9 Nominal capacity of the truck
10 Model
11 Nominal motor power

Version 2



1 Identification label
2 Manufacturer
3 Model/Serial number/ Manufacturing year
4 Net weight
5 Battery maximum weight/ Battery minimum weight
6 Ballast weight
7 Placeholder for "data-matrix code"
8 Conformity marking:
CE marking for EU markets, EU candidate countries, EFTA states and Switzerland
UKCA marking for the UK market
EAC marking for the Eurasian Economic Union market
9 Nominal drive power
10 Battery voltage
11 Nominal load capacity

NOTE

- *Several conformity markings may appear on the nameplate.*
- *The EAC marking can also be located in the immediate vicinity of the nameplate.*

List of abbreviations

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

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

List of abbreviations

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

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.

Spare parts list

The spare parts list can be downloaded by entering the address **https://sparepartlist.still.eu** into a web browser or by scanning the QR code displayed to the side.

When the web page is open, please type in the following password: **Spareparts24!**.

On the next screen, please enter your email address and truck serial number to receive the link by email. Then download the spare parts list.

Permissible use

The truck described in these operating instructions is suitable for lifting and transporting loads.

The truck should only be used for the purposes for which it was designed, as described in these instructions.

If the truck needs to be used for purposes other than those specified in these instructions, you should first:

- Obtain permission from the manufacturer
- Obtain permission from the competent authorities, if applicable

The purpose of obtaining these permissions in advance is to limit danger as far as possible.

Description of use and climatic conditions

Normal use

– Indoor and outdoor use.

– Ambient temperature in tropical and Nordic regions ranging from -10°C to 45°C

– Start capability from -10°C to 45°C.

– Maximum start time of 20 seconds

– Use at up to 2000 metres above sea level.

Special use (partly with special measures) for trucks equipped with Gel or Lead batteries

– Use, for example, in the event of abrasive dust (such as AL203), lint, acid, leach, salt and incombustible substances.

– Ambient temperature in tropical regions up to 55 °C.

– Start capability at -25°C.

– Use at up to 3,500 metres above sea level.

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.

Explanation of symbols used

⚠ DANGER

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

⚠ WARNING

Compulsory procedure that must followed to avoid injury.

⚠ CAUTION

Compulsory procedure that must be followed to avoid damage to and/or destruction of equipment.

NOTE

For technical requirements that require special attention.

ENVIRONMENT NOTE

To prevent environmental damage.

Disposing of components and batteries

The truck is made up of different materials.

If components or batteries must be replaced and scrapped, 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 when disposing of components and batteries.

2

Safety

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.

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!

⚠ 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.

⚠ 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.

⚠ 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.

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.

Hydraulic fluid

⚠ WARNING

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

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

ENVIRONMENT NOTE

Hydraulic fluid is a water-polluting substance!

Always store hydraulic fluid in containers complying with the regulations.

Avoid spilling.

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

Dispose of old hydraulic fluid according to regulations.

Battery acid

⚠ WARNING

Battery acid contains dissolved sulphuric acid. This is toxic.

- Avoid contact and consumption.
- In case of injury, seek medical advice immediately.

⚠ WARNING

Battery acid contains dissolved sulphuric acid. This is corrosive.

- When working with battery acid, always wear protective clothing and eye protection.
- Do not allow any acid to get onto the clothing or skin or into the eyes; if this does happen, rinse immediately with plenty of clean water.
- In case of injury, seek medical advice immediately.
- Immediately rinse away spilt battery acid with plenty of water.
- Follow the statutory regulations

ENVIRONMENT NOTE

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

Disposal of consumables

ENVIRONMENT NOTE

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

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

Emissions

Noise emission values

Calculated during the test cycle performed in accordance with standard EN 12053.

Acoustic pressure level in the driver's compartment			
Truck	L_{PAZ}	=	64 dB (A)
Uncertainty	K_{PA}	±	2.5 dB (A)

NOTE

Lower or higher noise values may occur when using industrial trucks, e.g. due to the mode of operation, environmental factors and other sources of noise.

Vibration characteristics for vibrations to which the body is exposed

The values were determined according to EN 13059 using trucks with standard equipment according to the datasheet (driving over test course with humps).

Specified characteristics for upper limb vibrations	
Vibration characteristics	< 2.5 m/s^2

NOTE

The vibration characteristics for bodily vibrations cannot be used to determine the actual load level of vibrations during operation. This depends on the operating conditions (state of ground, mode of operation etc.) and should therefore be determined on site, where appropriate. It is mandatory to specify the hand-arm vibrations even where the values do not indicate any hazard, as in this case.

Residual dangers, residual risks

Despite all operational precautions and compliance with standards and rules, the possibility of additional risks when using the truck cannot be entirely excluded.

The truck and all its components comply with the regulations relating to current applicable safety rules.

Persons in the vicinity of the truck must be particularly cautious and react immediately in the event of any malfunction, incident, breakdown etc.

⚠ WARNING

Personnel in contact with the truck must be informed of the risks related to using the truck.

These operating instructions draw your attention to the safety rules.

The risks are:

- Escape of consumables due to leaks, ruptured lines and tanks etc.
- Risk of accident when driving over difficult ground such as slopes, soft or irregular surfaces or in poor visibility etc.
- Falling, tripping etc. when moving on the industrial truck, especially in the wet, with leaking consumables or icy surfaces.
- Loss of stability due to the load being unstable or the load slipping etc.
- Risk of fire and explosion due to batteries and electrical voltages.
- Human error - Disregarding safety regulations.

It is important to adjust the speed of the truck depending on the load and ground conditions.

The stability of the truck has been tested to the latest standards. These standards only take account of the static and dynamic tilting forces that can arise during operation that complies with the specifications and operating rules. Risks caused by misuse or incorrect operation that jeopardise the stability cannot be ruled out in extreme situations.

Stability

Stability is only guaranteed if the industrial truck is used according to the indicated recommendations.

It is not guaranteed in the event of:

– cornering at high speeds

– moving with a load that is protruding to the side (e.g. sideshift)

– turning and driving diagonally on descents or ascents

– driving on descents or ascents with the load on the downhill side

– loads that are too wide or too heavy

– driving with an unstable load

– ramp edges or steps.

Definition of 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 generally 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

This truck may only be driven by suitable persons who are at least 18 years of age, have been trained in driving, have demonstrated their skills in driving and handling loads, and have been specifically designated to drive the truck. Specific knowledge of the truck is also necessary.

Driver rights,duties and rules of behaviour

The driver must be duly informed of his rights and duties.

The driver must be granted the required rights.

The driver must wear protective equipment (protection suit, safety helmet, industrial goggles and protective gloves) that is appropriate for the conditions, the task and the load to be lifted. The driver must also wear safety footwear to be able to drive and brake in complete safety.

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 instructions
- 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 above-mentioned 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.

Safety tests

Regular safety inspection of the truck

Safety inspection based on time and extraordinary incidents ▷

The operating company (see chapter entitled "Definition of responsible persons") must ensure that the truck is checked by a specialist at least once a year or after noteworthy incidents.

As part of this inspection:

- A full check of the technical condition of the truck in terms of accident safety must be performed
- The truck must be thoroughly checked to detect any damage that may have been caused by improper use
- A test log must be created.

The results of the inspection must be retained until at least a further two inspections have been carried out.

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

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

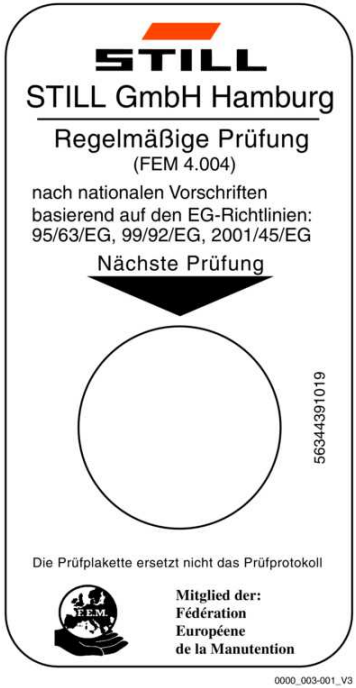
– Observe the guidelines for tests carried out on the truck in accordance with FEM 4.004.

The operator is responsible for ensuring that any defects are remedied immediately.

– Contact your service centre.

NOTE

Observe the regulations in force in your country.

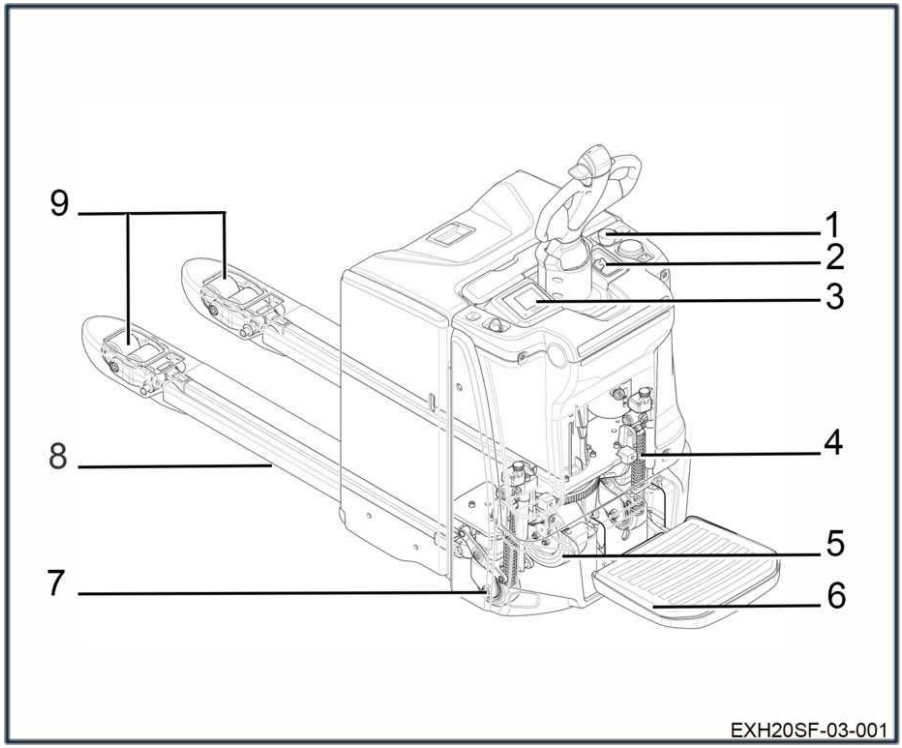


3

Overviews

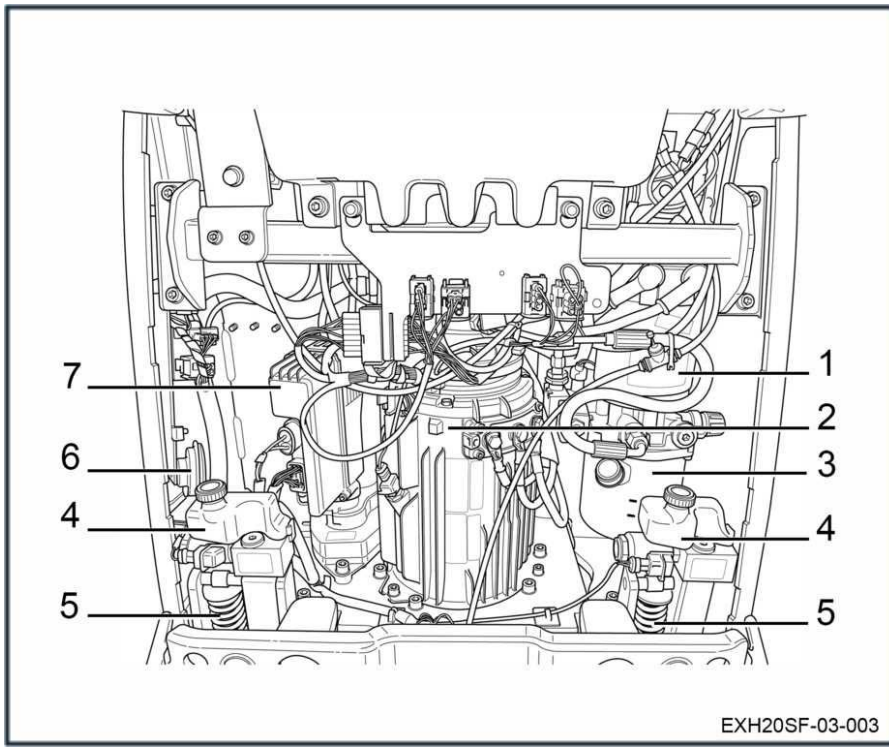
Overview

General view of the truck



1	Emergency off switch	6	Platform
2	Key switch or electronic key	7	Stabiliser wheel
3	Display	8	Load arms
4	Stabilisers	9	Load wheels or bogies
5	Drive wheel		

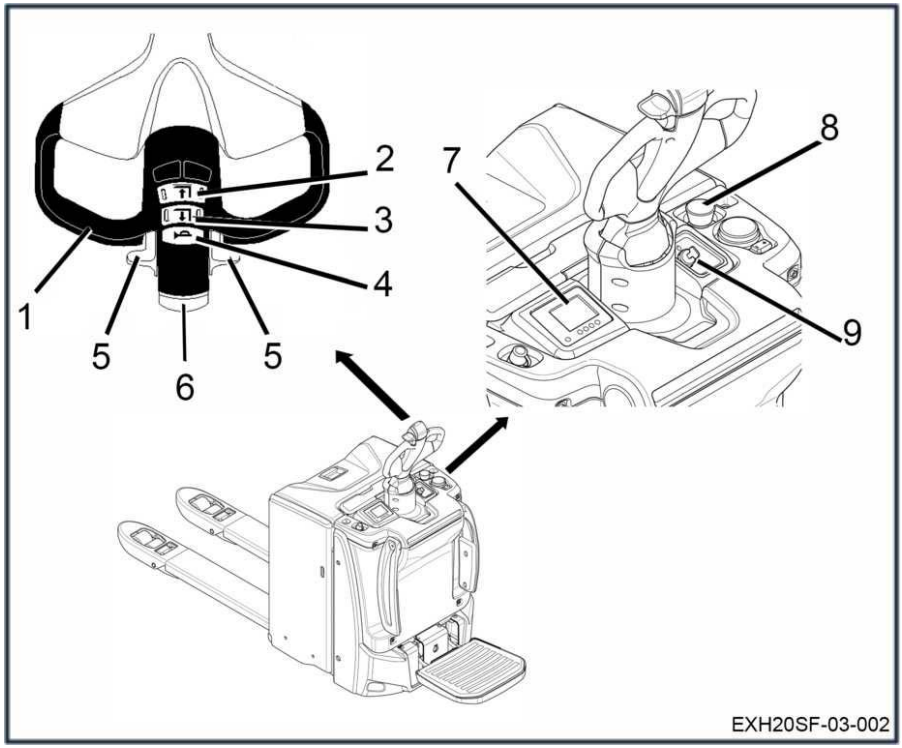
General view of the technical compartment



1	Pump unit	5	Stabilisers
2	Traction motor	6	Horn
3	Pump unit tank	7	ES30–24 steering unit
4	Servo stabilisers tank		

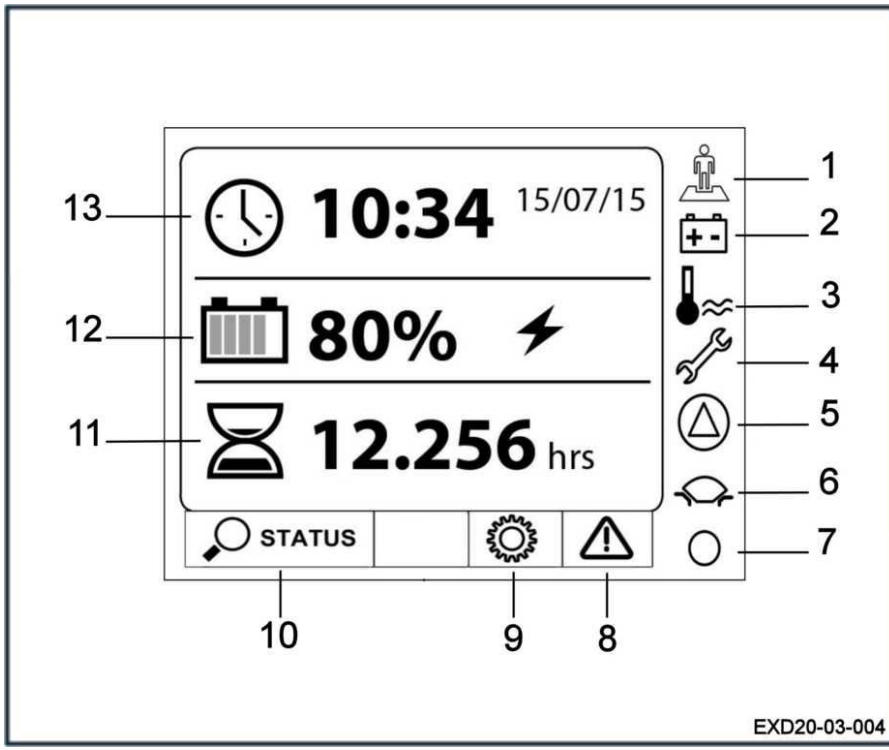
Operating and display devices

Driver's compartment



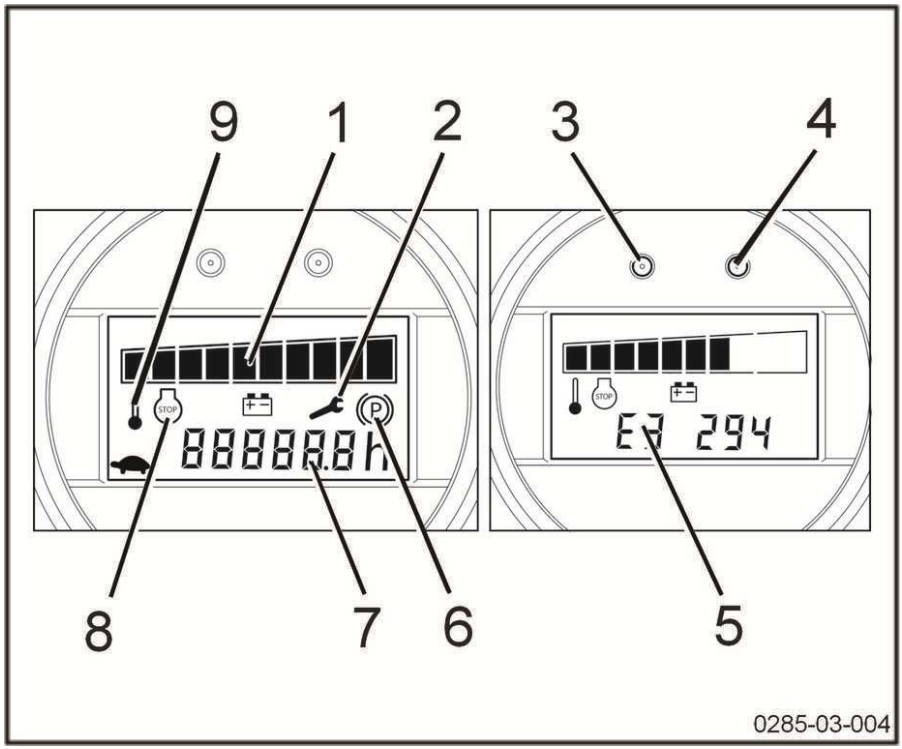
1	Handle	6	Anti-crush safety device
2	Lowering the load arms	7	Display
3	Lifting the load arms	8	Emergency off switch
4	Horn	9	Key switch or electronic key
5	Drive switch		

Display-operating unit



1	Operator present indicator light (depending on the model of the truck)	7	Activity indicator light
2	Battery indicator light	8	Error Code menu
3	Temperature indicator light	9	Settings menu
4	Settings indicator light	10	Truck status menu
5	Warning indicator light	11	Display of the operating time of the truck
6	Drive programme indicator light	12	Display of the battery charge
		13	Display of the date and time

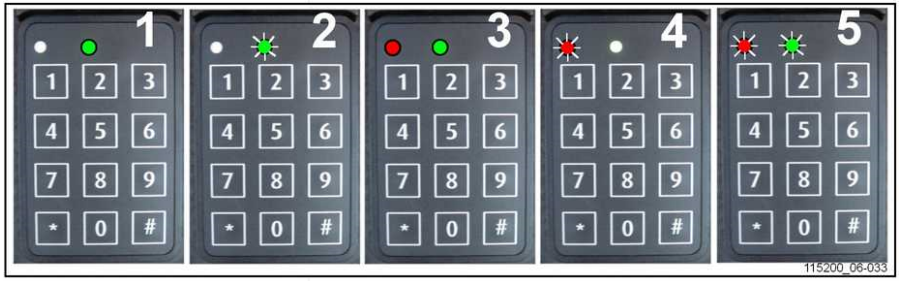
Battery charging indicator



	DESCRIPTION	EXPLANATION	COMMENTS/SCREEN MESSAGES
1	Battery charge level represented by 10 bars	Full charge: 100% Low charge: 10% Discharged: 0%	91% - 100%: 10 bars 1% - 10%: 1 bar 0%: 1 flashing bar (lift function not permitted). NB: To protect the battery, 0% corresponds to max. 80% discharge.
2	Service alarm (red)	**1)** Flashing: less than 50 hours' truck operation until the next service **2)** Constant: Service date overdue	

	DESCRIPTION	EXPLANATION	COMMENTS/SCREEN MESSAGES
3	Red indicator light	Switched on: default or alarm	
4	Green indicator light	Switched off: truck switched off Switched on: truck switched on	
5	Error code	E3 294	These codes will help the service department to decide on the appropriate response from the service engineer.
6	Fault or brake wear (air gap)		Do not operate the truck
7	Hour meter	Indicates the number of operating hours of the machine	- The meter starts running when the machine is switched on and a control is used. - When counting, the dot next to the tenths of an hour flashes. - The hour meter displays hours and tenths of an hour. - When the power supply is disconnected, the hours are stored in the memory.
8	STOP alarm (red)	Miscellaneous problems	Do not operate the truck.
9	T° alarm (red)	Constant: control module overheating	-> Truck is stopped In general, wait a few minutes and then continue.
10	Tortoise symbol	Indicates the slow speed	Concerns traction, lifting and lowering speeds.

Electronic key (option)



1 Switch ON (operating mode)
2 Switch OFF and awaiting code
3 Programming mode active
4 Key fault or incorrect code
5 Time delay of automatic switch-off

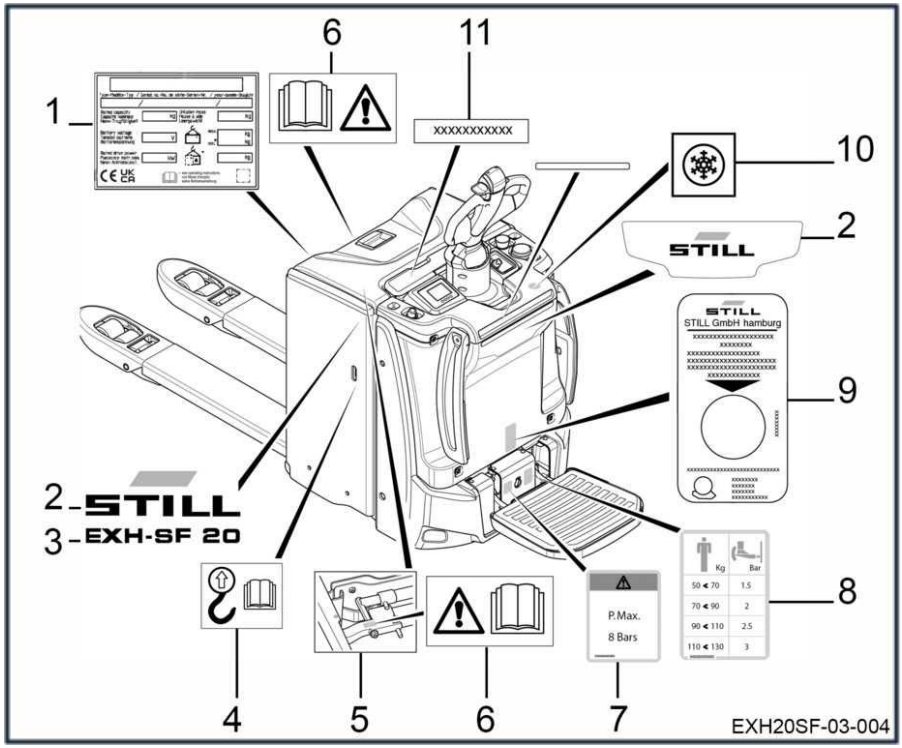
Operation	Enter	Status of LEDs	Comments
USE			
ON	[*][1][2][3][4][5][#] (by default)	○ red off ● continuous green (1) (correct PIN) ● red flashing ○ green off (4) (incorrect PIN)	[1][2][3][4][5] default PIN
OFF	[#] (3 seconds)	○ red off ● green flashing (2)	Truck power off

PROGRAMMING (truck switch OFF only (2))			
ADMINISTRATOR CODE ESSENTIAL FOR ALL ELECTRONIC KEY SETTINGS	[*][0][0][0][0][0][0][0][0] [#] (by default)	● continuous red ● continuous green (3)	Once the LEDs have gone out, the electronic key automatically reverts to "operating mode".
New operator code	[*][0][*][4][5][6][7][8][#]	○ red off ● green flashing (2) (code accepted)	Example of new operator code: 45678
Allocating operator codes	[*][2][*][5][4][3][2][1][#]	○ red off ● green flashing (2) (code accepted)	*2*: operator reference 10 options from 0 to 9
Deleting operator codes	[*][2][*][#]	○ red off ● green flashing (2) (deletion accepted)	*2*: operator reference (between 0 and 9)
Modifying administrator codes	[*][*][9][*][1][2][3][4][5] [6][7][8][#]	○ red off ● green flashing (2) (code accepted)	

PROGRAMMING (truck switch OFF only (2))			
Restoring the initial administrator code			To reactivate the default administrator code (00000000), please contact your agent or nearest dealer.
Activating the automatic switch-off	[*][*][2][*][1][#]	● red flashing ● green flashing (5) (5 seconds before switch-off)	Power switches off automatically after 10 minutes (600 seconds by default) if the truck is not in use.
Setting the time delay of the automatic switch-off	[*][*][3][*][6][0][#]	○ red off ● green flashing (2) (value accepted)	Example: automatically switches off after 1 minute (60 seconds) if not in use. Minimum setting = 10 seconds/maximum = 3000 seconds
Deactivating the automatic switch-off	[*][*][2][*][0][#]	○ red off ● green flashing (2) (command accepted)	

Markings

Labels



1 Identification label
2 Brand label
3 Model label
4 Slinging label. Consult the operating instructions
5 Danger instructions label for the battery lock
6 Danger instructions label. Consult the operating instructions
7 Label to indicate the pressure of the compressor (platform)
8 Label to indicate the recommended pressure of the compressor (platform)
9 Next inspection label
10 Cold store label
11 Serial number in the battery compartment

Serial number

NOTE

Indicate the serial number for all technical enquiries.

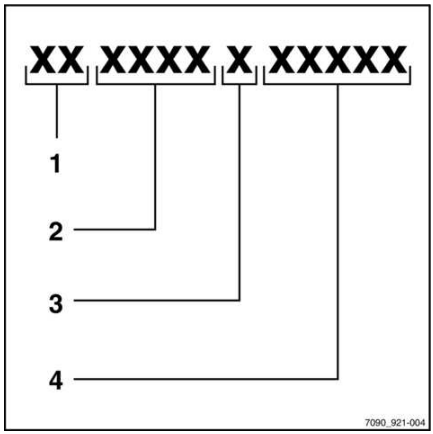
The serial number contains the following information:

1 Production location

2 Type

3 Year of production

4 Count number



4

Use

Technical description

Trucks EXH-SF 20 and EXH-SF 25 allow you to transfer loads from one place to another and to pick orders.

Available models:

- EXH-SF 20: 2000 kg
- EXH-SF 25: 2500 kg

AP model: Ride-on mode.

Features

EXH-SF 20 without side protection guardrails:

- **6 km/h** unladen and **6 km/h** laden.

EXH-SF 20 with side protection guardrails:

- **8 km/h** unladen and **7 km/h** laden.

- **10 km/h** unladen and **10 km/h** laden.

EXH-SF 25 with side protection guardrails:

- **12 km/h** unladen and **10 km/h** laden.

- **14 km/h** unladen and **10 km/h** laden.

Drive system

The truck drive system comprises:

- 2.3-kW traction motor (EXH-SF 20 model) and 3-kW traction motor (EXH-SF 25 model)
- LAC (Linde Asynchronous Controller) microprocessor controller for traction and lift control
- ES30–24 steering unit
- 1.2-kW pump unit (EXH-SF 20 models) and 1.5-kW pump unit (EXH-SF 25 models)

Batteries

Power is supplied by:

- A lead battery
- A gel battery
- Or a lithium-ion battery (the truck therefore has specific characteristics)

The types of battery removal that are available are as follows:

- Vertical access
- Side access

These different battery types are not available on all models.

Steering

The electric steering ES30–24 offers driving precision and easier manoeuvres.

The truck is equipped with a 0,185 kW asynchronous steering motor.

The steering is controlled by a tiller.

Braking

The truck is equipped with two brake systems:

- an electric counter-current brake:
  - When releasing the drive switch
  - By reversing the drive direction
  - Controlled by the rear safety button

- An electromagnetic brake:
  - Electromagnetic safety brake, controlled by the emergency off switch
  - Electromagnetic safety brake, controlled by the upper or lower position of the tiller
  - Electromagnetic parking brake, applied when the power supply is cut

Driver's compartment

The tiller groups together control functions such as: steering, proportional lift, forward and reverse traction, initial lift, horn and double throw safety switch.

The various models are equipped with:

- An emergency off switch
- A display
- A diagnostic connector
- A driver's platform

Equipment available as standard or as additional options:

That can be added to the truck:

- Load wheels: single wheels or bogies
- Lithium-ion battery
- Central refilling system

- Cold store (-35°C)
- Side protection guardrails

List of checks prior to start-up

⚠ WARNING

Damage or other defects on the truck or attachments (special equipment) can result in accidents.

If damage or other faults are noticed on the truck or attachments (special equipment) during the following inspections, do not use the truck until it has been properly repaired. Do not remove or disable the safety systems and switches. Do not change the pre-set values.

Before start-up, ensure that the truck operates correctly.

To do this, perform the following checks:

– The load arms must not show any signs of noticeable damage (for example: bending, cracks, significant wear).

– Check that there are no signs of leaking consumables under the truck.

– Do not restrict the field of vision. Ensure the visible area specified by the manufacturer is observed.

– Attachment parts (special equipment) must be properly secured and function according to their operating instructions.

– Damaged or missing stickers must be replaced in compliance with the marking position table.

– The roller channels must be coated in a visible layer of grease.

– The wheels must show no signs of defects or heavy wear. They must be mounted correctly.

– Check that there are no foreign objects that could hinder the operation of the wheels and rollers.

– The warning devices (horn etc.) must work.

– The battery hood must be closed.

– Check that the hoods are correctly positioned.

– The operator must be qualified to drive the truck. The operator must be able to reach the controls and operate them (especially the anti-crush device). Do not obstruct access to the controls.

Please inform your supervisor if you notice any defects.

Starting up

NOTE

- *Check that the battery hood is closed.*
- *Check that the battery is locked.*

– Check that the battery is connected.

– Check that the battery compartment hood is closed and locked correctly.

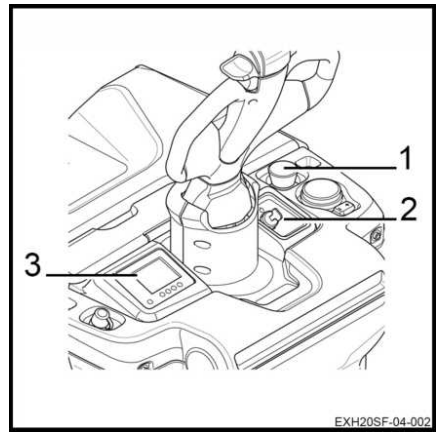
– Release the emergency off switch (1) if it has been pressed. ▷

– Turn the key (2). For models equipped with an electronic key or the FleetManager™ option, enter the PIN.

The display (3) switches on. The truck is ready for operation. The brake is automatically disengaged.

– Lower the tiller then reposition it in the rest position to unblock truck use.

– Raise the load arms a few centimetres.



NOTE

Always adjust your speed to suit the route, any dangers and the load. Use the truck on ground that has the correct surface and hardness.

⚠ DANGER

Risk of sparks

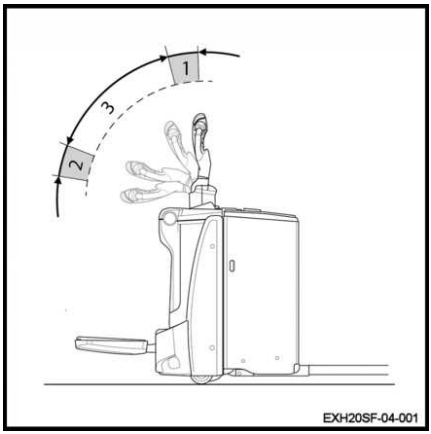
Using the truck with the battery hood open is prohibited.

⚠ WARNING

Risk of accident or loss of load

Driving on slopes steeper than 10% is prohibited due to braking capacity and stability. The load being transported could tip over.

– Tilt the tiller in the driving area (3). ▷

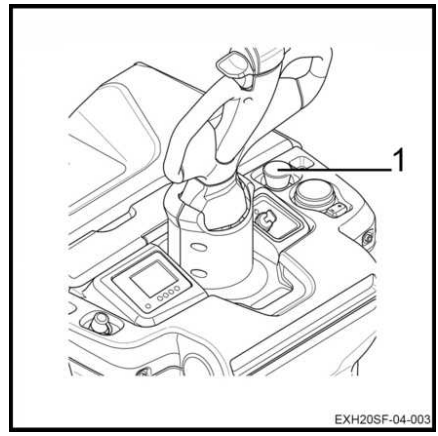


NOTE

In areas (1) and (2), the electromagnetic brake is applied and it is not possible to drive the truck.

Checks and actions prior to commissioning

Checking the emergency shut-down



To check the operation of the emergency off switch, proceed as follows:

– Start up the truck.

– Drive the truck.

– Press the emergency off switch (1).

- The truck stops immediately
- The truck power supply is cut
- The electrical controls and motors are no longer supplied with power

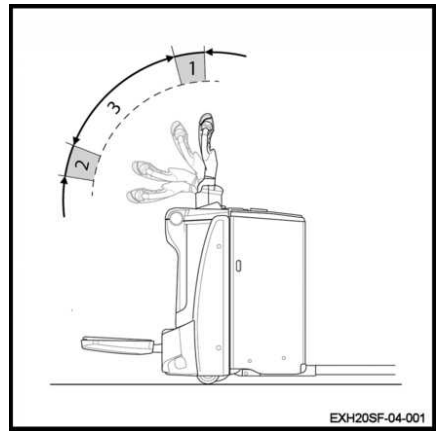
– Pull the emergency off switch (1).

The functions are available again.

NOTE

Ensure that the stabiliser wheels operate correctly. This adjustment influences braking effectiveness.

Checking the brake



NOTE

Perform this check on a flat surface.

– Drive the machine forward.

– Tilt the tiller in areas (1) and (2).

In these two areas, the machine is braked and the drive unit is no longer powered.

Releasing the tiller in the drive area (3) sends the tiller into area (1) and cuts traction.

Checking the anti-crush safety device

Anti-crush safety function

The machine moves in the opposite direction when the anti-crush button (2) is pressed.

If the truck is being operated in narrow areas (such as in a lift for example), the operator may get stuck against the wall if care is not taken. Without an anti-crush safety device, the tiller could injure the operator.

The truck immediately moves off in the opposite direction when the anti-crush device on the tiller head comes into contact with the driver's body. When the operator moves away from the anti-crush safety device, the machine stops even if a drive direction is selected again.

Normal operation may be resumed after releasing the drive switches.

Checking the anti-crush safety device ▷

⚠ WARNING

Ensure that the test zone is free of people and objects, both in front of and behind the truck.

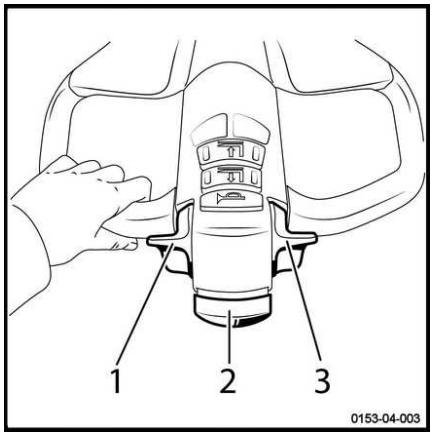
– Move the drive switch (1) or (3) to move the truck towards you.

– Operate the anti-crush safety device (2).

The truck stops and accelerates in the opposite drive direction.

– Release the anti-crush safety button.

The truck stops.

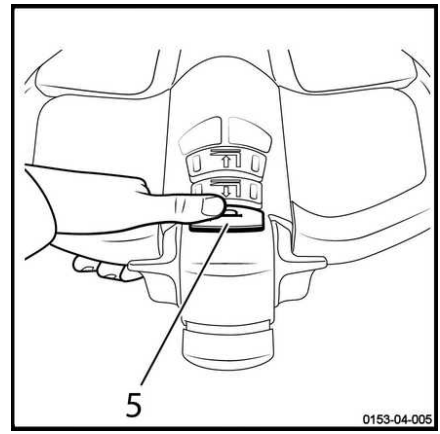


Checking the horn

– Press the horn button (5) located on the upper part of the tiller.

– The horn sounds.

▷



Truck operating instructions

The trucks are designed for indoor and outdoor use in non-hazardous atmospheres. The temperature should be between -10°C and +45°C and the relative humidity of the air less than 95%.

NOTE

A cold store option is available for lower temperatures.

The places where the truck is used must comply with the applicable regulations (condition of the ground, lighting etc.).

The trucks must be used on dry, clean and flat ground.

Before using the truck, it is essential to check the working environment. This check can take the form of visual inspection.

The work area must be clear. The truck's path must be free of obstacles and people.

The forklift operator must be alert to anything that might prevent manoeuvres being carried out safely. The following may create a potential danger:

- A person near the truck
- The forklift operator must not use an MP3 player or any other electrical equipment that could impair awareness of his/her surroundings
- There must be no signs of oil or grease on the floor

The forklift operator must take care when transporting a load. The load dimensions can interfere with manoeuvres and restrict the field of vision. The speed of the truck must also be reduced as the truck could tip over when breaking or cornering.

The loads must be consistent, with a maximum recommended height of 2 m.

For uses other than those shown above, please consult the After-Sales Service Centre.

It is important to use pallets that are in good condition.

Speed must be reduced when moving over obstacles to prevent the truck from becoming unbalanced and vibrations in the forklift operator's arms.

The trucks can drive across ramps and shallow inclines. With an initial lift, they can cross larger obstacles.

⚠ WARNING

Risk of loss of stability

– Always adapt your driving to the ground conditions (uneven surfaces etc.), particularly hazardous working areas and the load.

NOTE

- *To prevent the bottom of the load lift system from scraping the ground, always move the load arms to the raised position before setting off*
- *Always switch off the ignition before leaving the truck*

⚠ WARNING

Risk of injury

Always keep your hands on the controls. Never put your hands near moving parts and assemblies without first lowering the load arms to the ground and disconnecting the battery.

For effective protection, safety shoes must be worn.

⚠ WARNING

Driving safety guidelines:

– The driver must drive slowly around corners and when entering narrow passageways.

– The driver must always maintain a safe braking distance from vehicles or people in front of him.

– The driver must avoid stopping suddenly, making U-turns too quickly and overtaking in dangerous areas with poor visibility.

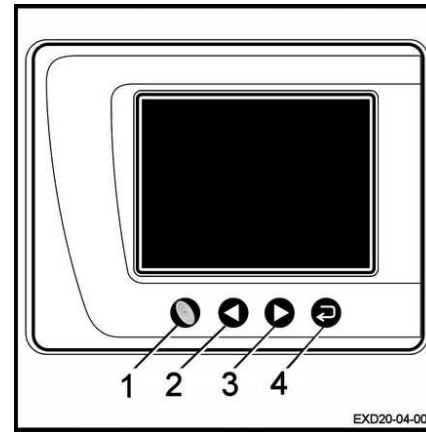
⚠ CAUTION

Risk of injury

Before using a side access truck, check that the battery is correctly locked.

Using the display-operating unit

Selection buttons

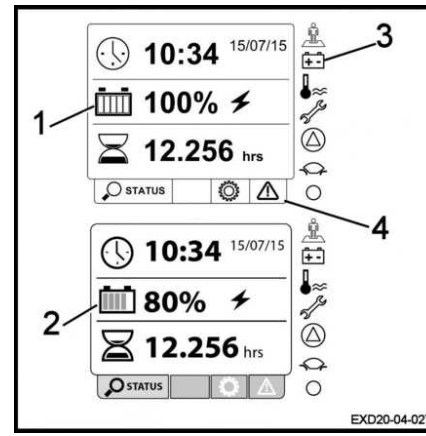


The operator selects the menus using the four selection buttons:

- The **Blue Q** button (1) to select Blue Q mode, hare mode or tortoise mode
- The **left arrow** button (2) to scroll left through the drop-down menu
- The **right arrow** button (3) to scroll right through the drop-down menu
- The **confirm** button (4) to confirm the highlighted choice on the screen

Operation of the display unit

Managing battery charging



The operating unit shows the battery charge level.

The operator can refer to the battery icon (1) or (2).

The number of bars shown indicates the battery charge level.

- From 0 to 20%: 1 bar
- From 21 to 40%: 2 bars
- From 41 to 60 %: 3 bars
- From 61 to 80 %: 4 bars
- From 81 to 100 %: 5 bars

The **battery** light (3) comes on in the event of a deep discharge of the battery or in the event of a fault.

Two distinct warnings may be displayed if the battery charge is insufficient:

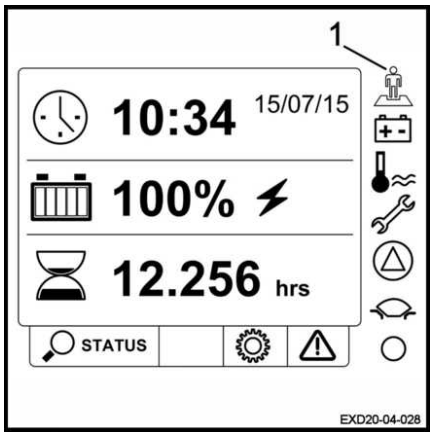
- 1) Less than 25% of charge remaining: the (3) and (4) icons flash and an audible beep sounds A warning message appears at the icon (4) and remains on until the battery is recharged
- 2) 20% of charge remaining: Three regular beeps sound, lifting is restricted, the (3)

icon flashes and the (4) icon remains on with a new warning message

Operator presence

The **Operator present**(1) indicator light comes on when the operator steps onto the detection platform.

It turns off immediately afterwards.



Temperature, settings and warning lights

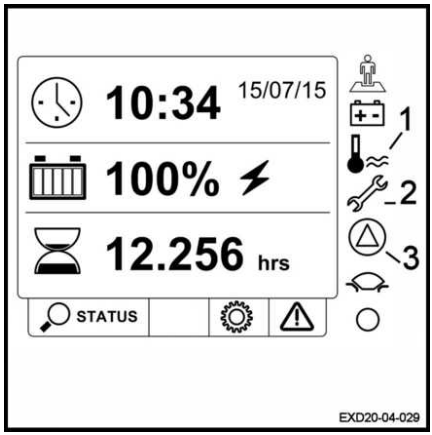
The **temperature** light (1) comes on in the event of overheating of the traction motor or the controller.

A warning is shown on the display.

The **settings** light (2) comes on to indicate the date of the next maintenance.

A warning is shown on the display.

The **warning** light (3) comes on in the event of a fault in a truck component.



Drive program

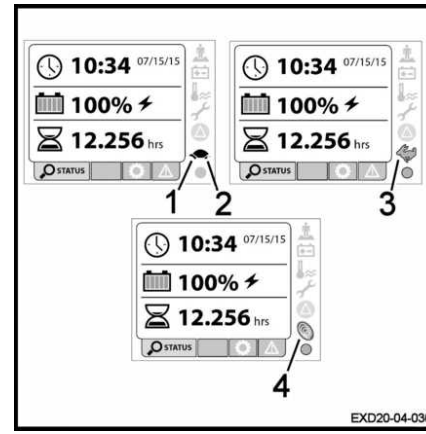
The **drive program** light (1) is permanently illuminated when a travel mode is selected.

There are three different drive modes:

- Tortoise mode (2)
- Hare mode (3)
- Blue Q mode (4)

The icon of the drive mode selected appears on the display.

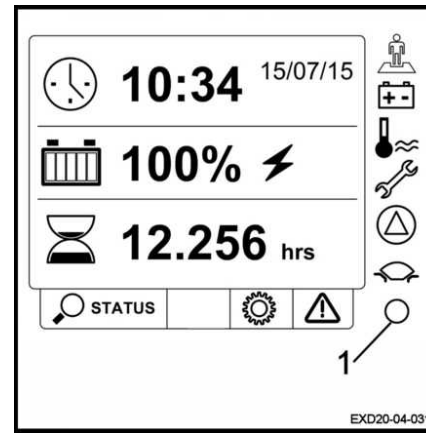
– Select the desired drive mode using the navigation keys.



Activity indicator

The **activity indicator** light (1) flashes continuously while the truck is in operation.

When the indicator is off, the display unit is locked or frozen. A warning is shown on the display.



Settings menu

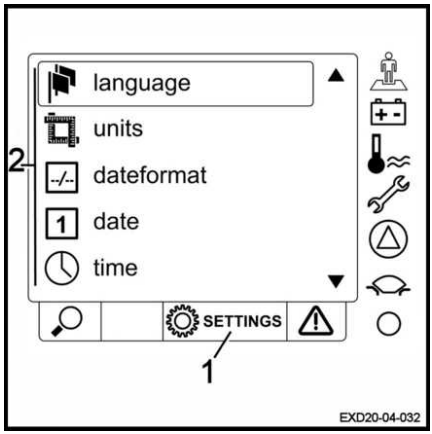
It is possible to access different settings through the Settings menu.

– Select the **Settings** menu (1)

This menu allows access to a drop-down menu (2) consisting of:

- Language
- Unit
- Date format
- Date
- Time
- Adjustment of the Load Management warning sounds
- Adjustment of the contrast
- Adjustment of the brightness

– Select the desired option



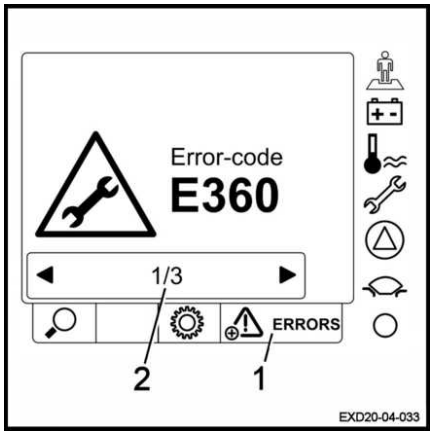
Error codes menu

It is possible to access error messages that are disrupting the operation of the truck.

– Select the **Error messages** menu (1)

The operator can access the error codes. If several codes are affecting the truck, the operator can scroll through several successive displays.

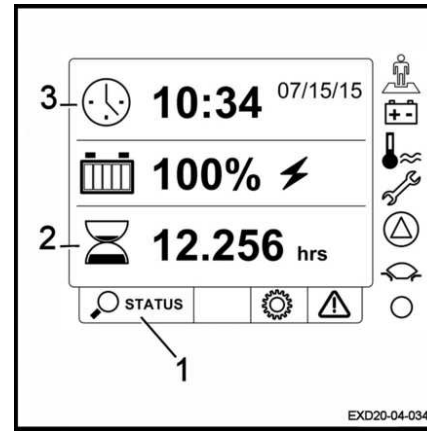
The number of error messages is indicated at the bottom of the display (2).



Start-up screen

In addition to the various menus and lights mentioned above, additional data is available:

- The **truck status** menu (1) displays the truck menu
- The **hourglass** icon (2) indicates the operating time of the truck
- The **clock** icon (3) indicates the time and date



Driving safety guidelines

Behaviour when driving

Operators must obey the same rules within the plant as on the road. They must drive at speeds appropriate for the driving conditions.

Therefore, they must drive slowly:

- When cornering
- Through narrow passageways
- Through swing doors
- In low-visibility areas
- When the roadway is uneven

Operators must always maintain a safe braking distance from vehicles or people in front of them. They must always maintain control of the truck. They must avoid sudden stops, making fast U-turns, overtaking other vehicles in potentially hazardous or low-visibility areas.

Driving the truck while sitting on the dashboard is prohibited. The operator must be resting against the seat.

These trucks are designed to be used as a pallet stacker, double pallet stacker and pallet truck. Therefore:

- Never sit on the dashboard to drive the truck
- The truck must not be used as a stepladder
- The truck is not designed to transport people
- Operators must always stay within the truck clearance
- Stay in the safety area (working area defined by the manufacturer)
- Ensure the stability of the truck and do not exceed its capacity

Use of a telephone or radio with the truck is permitted.

However, do not use these devices when driving as they may distract you.

Take a test drive on an open surface.

NOTE

Drivers must wear safety shoes that fit properly to be able to drive and brake in complete safety.

Driving

Defining directions

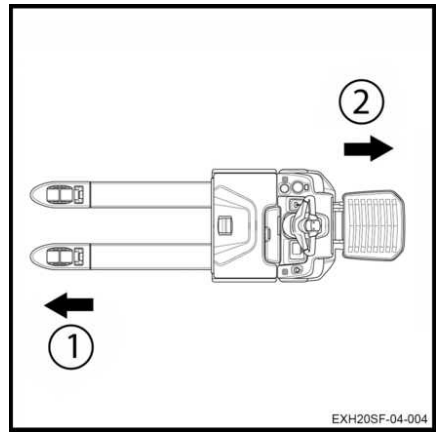
The drive directions on a ride-on pallet truck are as follows:

- Forward travel: Direction of load arms (1)
- Reverse travel: Opposite direction to load arms (2)

The load is positioned at the front.

NOTE

The drive directions are modified when the truck is used in pedestrian mode.



Driving

– Turn the switch key.

– Lower the tiller into zone (3).

NOTE

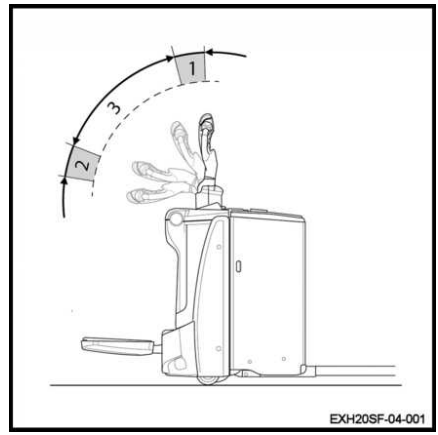
The truck is in the driving position in zone (3). In the lower zone (2) or the upper zone (1), the brake is applied and the traction motor is switched off.

DANGER

Risk of obstructing the use of the tiller

Do not adjust the A4-sized support to a height that is too low. This could hinder the forklift operator when driving the truck.

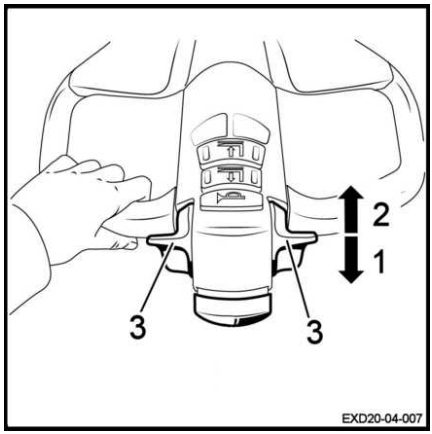
Forward travel



– Press the upper part (2) of the drive switch (3) with your thumb.
– The speed increases with the movement of the drive switch.
– When the drive switch is released, the truck brakes electrically.

Reverse travel

– Press the lower part (1) of the drive switch (3) with your thumb.
– The speed increases with the movement of the drive switch.
– When the drive switch is released, the truck brakes electrically.



⚠ WARNING

Restricted visibility

During reverse travel, visibility may be restricted. Be very careful. Make sure that the path behind is clear before travelling in reverse.

Reversing the drive direction

– Push the drive switch in direction (1) or (2).
– Release the drive switch.
– Operate it progressively in the opposite direction until the required speed is reached.

Horn

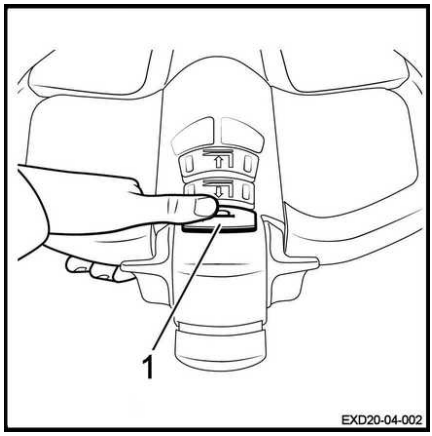
The horn is positioned on the inner side of the tiller.

It is used:

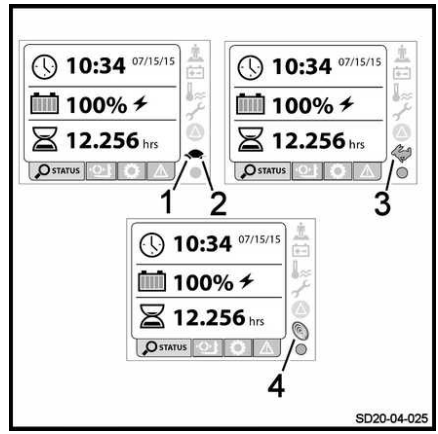
- On routes where there is poor visibility
- At junctions
- In the event of immediate danger

– Press the button (1) .

The horn sounds.



Drive program



The indicator light (1) is on during operation of the truck. The shape of the indicator light indicates the selected program.

The truck is equipped with three different drive programs:

- Hare mode (3)
- BlueQ mode (4)
- Tortoise mode (2)

NOTE

When the operator restarts the truck, the last mode selected is automatically activated.

NOTE

The drive program is instantly changed. If the operator changes mode while driving the truck, he must remain vigilant.

Hare mode

When Hare mode is selected on the screen, the truck operates at its maximum performance.

Blue Q mode

Selecting Blue Q mode allows you to slightly reduce the performance of the truck:

- The travel speed of the truck is reduced (70% of maximum speed)
- The speed of lifting and lowering the forks is reduced (90% of maximum speed)

This mode allows you to save battery.

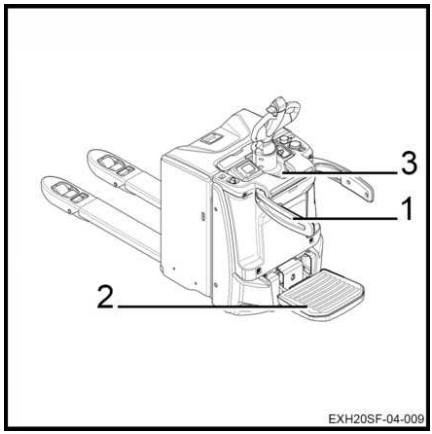
Tortoise mode

Selecting Tortoise mode allows you to reduce the performance of the truck:

- The travel speed of the truck is reduced to 6 km/h
- The speed of lifting and lowering the forks is considerably reduced

The different speeds can be adjusted. Contact the After-Sales Service Centre to change these.

Ride-on driving ▷



⚠ WARNING

Risk of the operator falling

The side protection guardrails (1) prevent the operator from falling while driving.

Do not climb or sit on the side protection guardrails (1).

– Lower the platform (2).
– Raise the side protection guardrails (1).
– Lock the side protection guardrails in the raised position.
– Step onto the platform.
– Tilt the tiller in the driving area.

⚠ DANGER

Risk of falling

Only one operator can stand on the platform at once. The truck is not designed to transport two people.

NOTE

When the side protection guardrails are folded and the platform is in the lower position, the speed of the truck is limited to 6 km/h.

⚠ WARNING

Driving safety guidelines

The operator must not use the guardrails to push loads sideways.

NOTE

To lower the side protection guardrails (1), the tab (3) must be pressed to unlock them.

Pedestrian driving

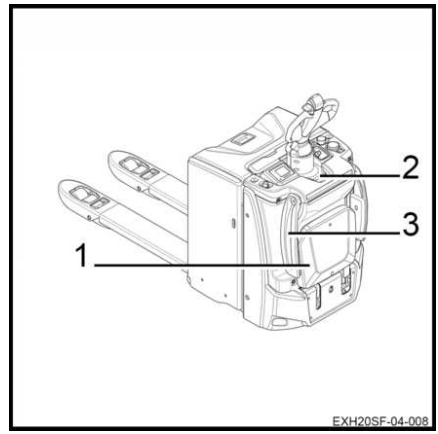
This pallet truck can be used in pedestrian mode to facilitate manoeuvring in narrow spaces.

– Raise the platform (1).

– Push on the tab (2) to unlock the side protection guardrails (3).

– Fold down the side protection guardrails (3).

– Tilt the tiller in the driving area.



NOTE

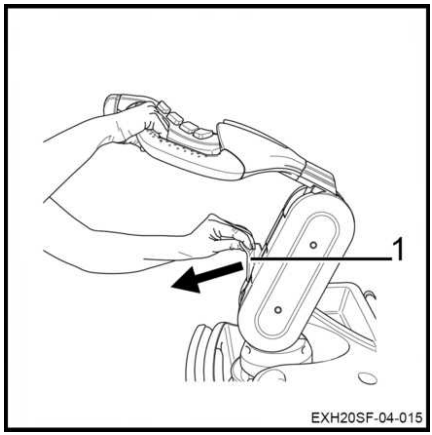
- *Driving in pedestrian mode is possible when the platform is raised and the side protection guardrails are folded down.*
- *The double throw safety switch is activated.*
- *Maximum speed in pedestrian mode is reduced to 4 km/h.*
- *The maximum speed in pedestrian mode is reduced to 6 km/h if the truck is fitted with a combi tiller.*

Combi tiller

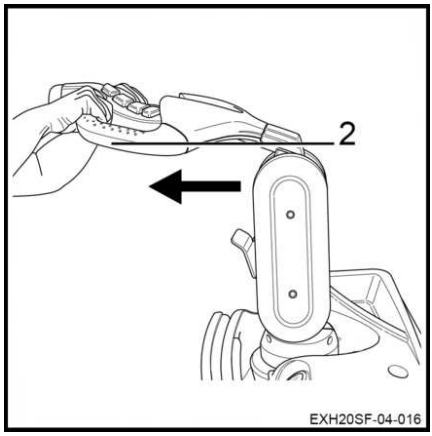
A combi tiller is available as an option. It increases the safety distance between the truck and the forklift operator for greater safety during use.

Unfolding the combi tiller

– Pull on the lock (1) to unlock the tiller. ▷

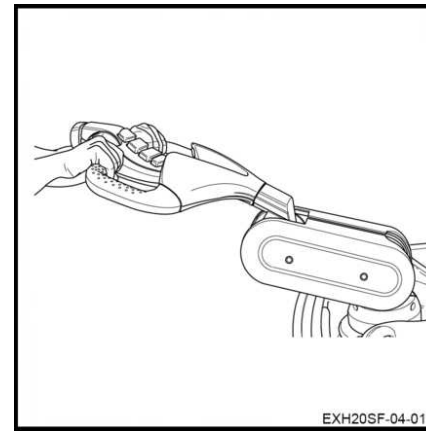


– Pull the handle of the tiller (2) towards you to unfold it. ▷



– Press one of the controls. ▷

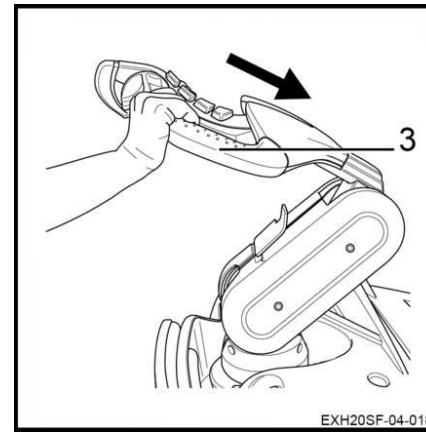
The forklift operator can use the truck with an increased safety distance. The combi tiller controls are operated in the same way as the standard tiller controls.



Folding the combi tiller

– Push on the tiller handles (3) to fold it. ▷

The forklift operator uses the truck in a more standard configuration.



Using the truck on a ramp

NOTE

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

Ramps must always be approached with caution:

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

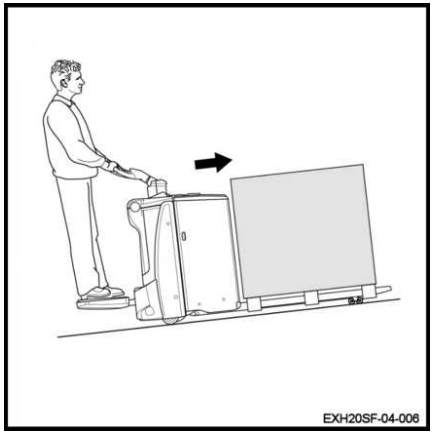
Travelling up slopes ▷

Always travel forwards when going up a slope.

When the truck is used in pedestrian mode, always travel in reverse when going up a slope.

The load faces uphill.

Without a load, we recommend that you go up a slope forwards.



Travelling down slopes ▷

Always travel in reverse when going down a slope.

When the truck is used in pedestrian mode, always travel forwards when going down a slope.

The load faces uphill.

Without a load, we recommend that you go down a slope forwards.

Avoid maximum speed when travelling downhill.

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

⚠ DANGER

Danger of death and/or risk of serious damage to equipment

Never park the truck on a slope. Never make a U-turn or take a short cut on a slope.

On a slope, the forklift operator must drive more slowly.

⚠ WARNING

Risk of serious injury and/or serious damage to equipment

Driving on slopes steeper than 10% is prohibited due to braking capacity and stability. The load being transported could tip over.

Starting on a ramp

Proceed as follows:

– Move the drive switch in the required direction.

– Release the drive switch to apply the parking brake.

Operating the FleetManager™ option

Description of the FleetManager option

The FleetManager option allows you to control access to the truck. The option is a fleet management system.

You can access the system:

- Either by using a keypad
- Or by using a reading device for a transponder or an RFID card

The fleet manager sets the access details via the web interface. This affects the transponder cards or PIN codes for the corresponding trucks. It is possible to change the amount of time for which the access authorisation is valid.

Software is also available.

Additional options:

- Shock sensor
- Tools for wireless data management:
  ▸ GSM[2]GPRS[1] module with antenna

The options available on the truck are:

- Access control
- Access control and shock sensor
- Access control and GPRS module
- Access control, shock sensor and GPRS module

[1] GPRS: General Packet Radio Service

[2] GSM: Global System for Mobile Communication

Shock sensor

This sensor allows you to record the shocks received by the truck.

If the truck receives a shock, it is possible to configure a speed reduction.

The fleet manager is the only person who is able to change certain parameters.

NOTE

Replace the sensor if it is faulty.

GSMGPRS module

The module consists of a GSM modem and an antenna.

The module allows you to:

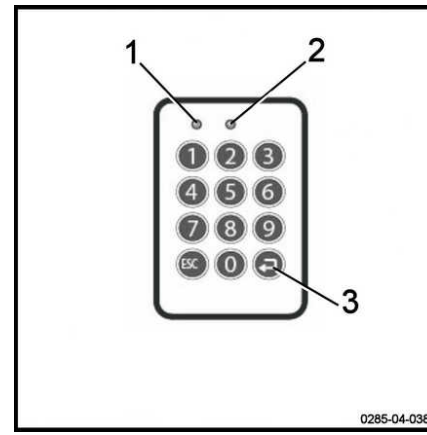
- Access truck information remotely
- Use geolocation

The data is stored on a server.

Data is transmitted by Bluetooth (default) or by GSM module (optional).

Commissioning a truck equipped with the FleetManager™ option

Commissioning a truck equipped with a keypad or an electronic key ▷



– Turn the switch key to start the truck.

– Enter the PIN code on the keypad. The PIN code consists of five to eight digits.

By default, no PIN code is given as a factory setting.

If the PIN code is correct, the LED (1) is not lit. The LED (2) flashes slowly at two-second intervals (green colour).

No acoustic signal sounds.

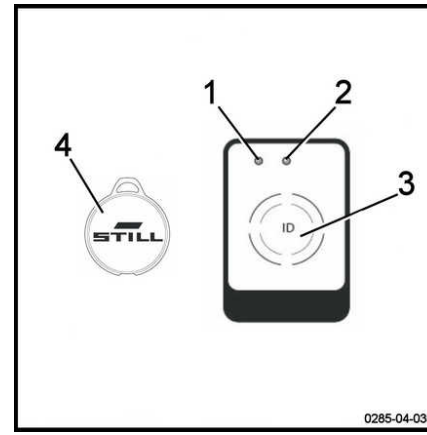
– Press the Enter key (3) to confirm.

The truck is now ready for use.

NOTE

In the configuration, the fleet manager can specify that the operator must enter a preliminary code when logging in. The operator can then assess the state of the truck.

Commissioning a truck equipped with an RFID reading device ▷



– Turn the switch key to start the truck.

– Place the RFID transponder card or the RFID transponder (4) in front of the reading device (3).

If the card is correct, the LED (1) is not lit. The LED (2) flashes slowly at two-second intervals (green colour).

Two acoustic signals sound.

The truck is now ready for use.

FleetManager™ option: Colour code for the LEDs

The LEDs can have different statuses and different colours. Below is the list of the most common messages and their meanings.

Malfunction			Cause	Solution
LED status		Signal transmitter		
LED 1	LED 2			
Lit continuously Red colour	Off	A long acoustic signal sounds	**Reading device variant:** no valid access authorisation	Generate a valid access authorisation using the interface
			Keypad variant: no valid access authorisation for the PIN code entered	
			Keypad variant: PIN code entered incorrect or not confirmed using the Enter key	Re-enter the PIN code
Lit continuously Red colour	Flashes once Green colour	A long acoustic signal sounds	The operator has been granted access authorisation. But the period of validity has expired.	Use the interface to enter a new period of validity
			The date of the truck is incorrect	Update the date of the truck
Flashes quickly Yellow colour	Lit continuously Green colour		Memory is 80% full	Clear the memory
Flashes quickly Red colour	Flashes quickly Red colour	A long acoustic signal sounds upon activation	There are several possible causes: - Reading device or keypad not accessible - GPRS module not accessible - Built-in rechargeable battery flat - Memory full	Contact the After-Sales Service Centre

Malfunction			Cause	Solution
LED status		Signal transmitter		
LED 1	LED 2			
Flashes quickly Red colour	Lit continuously Green colour		A shock has occurred	Reset the shock
Flashes quickly Blue colour	Off		The truck is connected via a Bluetooth link. The operating data is being read. The reading process can take up to five minutes.	The truck is switched on but is not moving. Wait for all of the relevant data to be read. As soon as the LEDs change to a different status, resume work.

Disconnecting a truck equipped with the FleetManager™ option

NOTE

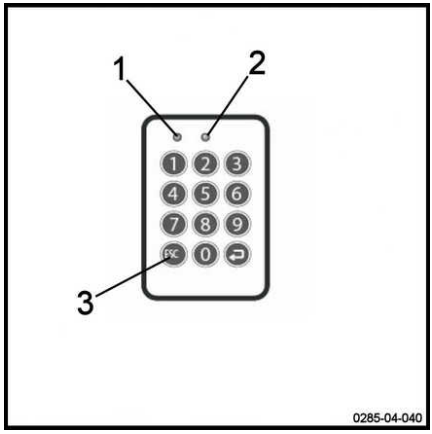
Operators must not log off intentionally while driving.

⚠ WARNING

Access to the truck must be disabled.

Unauthorised users are not allowed to use the truck.

Disconnecting a truck equipped with a keypad or electronic key ▷



– Park the truck in a safe place.

– Press the button (3) to log off. Keep the button pressed in.

No LEDs light up. A long acoustic signal sounds.

The LED (1) lights up for a second (red colour). The LED (2) is not lit. A long acoustic signal sounds.

The LED (1) is no longer lit. The LED (2) flashes slowly at two-second intervals (green colour). No acoustic signal sounds.

The truck is disabled.

– Turn the switch key to the off position to switch the truck off completely.

Disconnecting a truck equipped with an RFID reading device ▷

– Park the truck in a safe place.

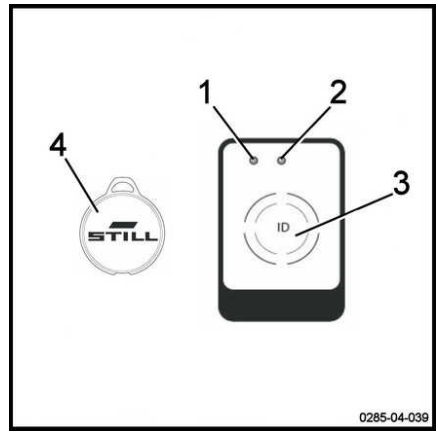
– Briefly place the RFID card or the RFID transponder (4) in front of the reading device (3).

The LED (1) lights up for a second (red colour). The LED (2) is not lit. A long acoustic signal sounds.

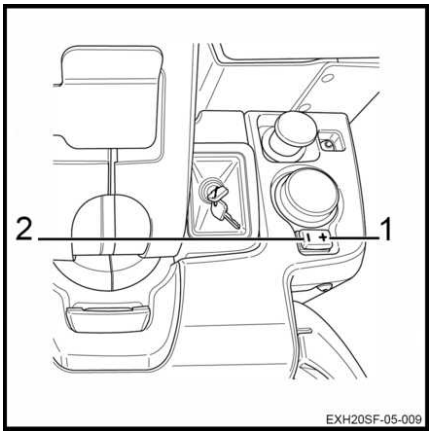
The LED (1) is no longer lit. The LED (2) flashes slowly at two-second intervals (green colour). No acoustic signal sounds.

The truck is disabled.

– Turn the switch key to the off position to switch the truck off completely.



Using the on-board compressor option ▷



The on-board compressor option allows you to automatically pressurise the shock-absorbing platform bellows.

This shock-absorbing platform reduces the vibrations felt within the truck while driving. It can be adjusted in accordance with the weight of the forklift operator.

To increase the shock absorbency:

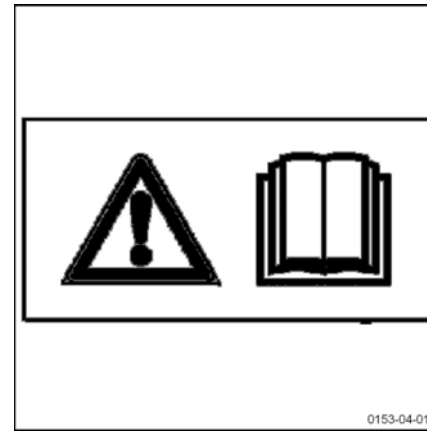
– Press the + button (1) located on the dashboard.

To decrease the shock absorbency:

– Press the - button (2) located on the dashboard.

Transporting loads

Load handling safety rules



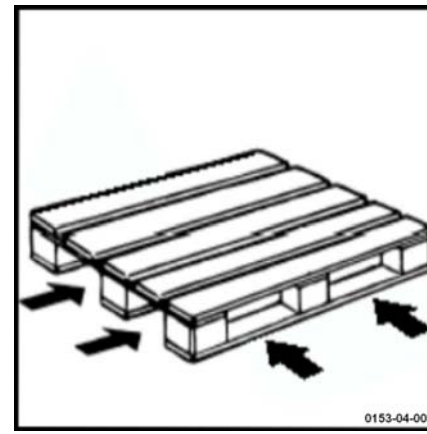
⚠ WARNING

Closely follow the following instructions before picking up loads. Never touch or stand on moving parts of the truck (e.g. lifting device, pushing devices, work installations or devices for picking up loads).

⚠ WARNING

Take care not to trap hands or feet when operating the truck.

Grabbing a loading unit



Watch out for the following elements:

- the load must be well-balanced and centred correctly between the fork arms
- the fork arms must be sufficiently slid underneath the load to guarantee stability.

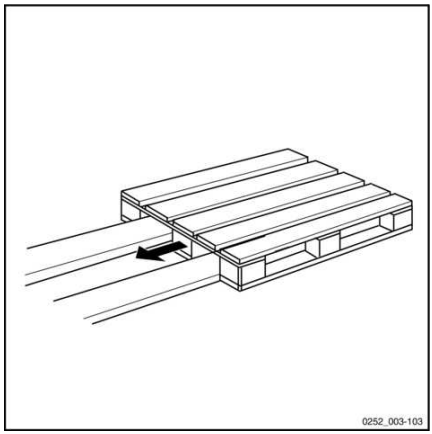
The load must not protrude too far over the fork arms, nor should the fork arms protrude too far out from the load.

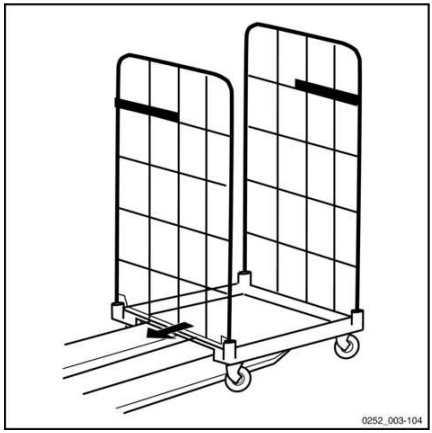
Transporting pallets or other containers ▷

As a general rule, loading units must be transported one by one (e.g. pallets). Transporting several loading units at a time is only authorised:

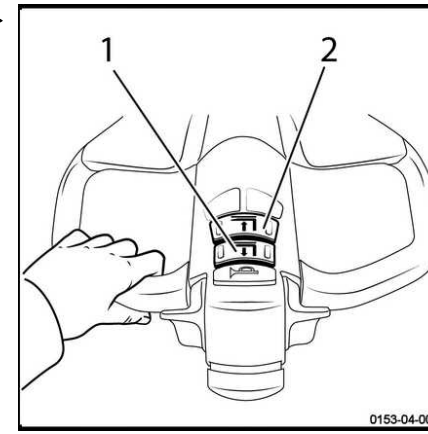
- when the safety preconditions are fulfilled.
- by order of the monitoring agent.

The forklift operator must ensure that the loading unit is properly packaged. He must only move loading units that have been carefully prepared and that meet the safety requirements.





Lifting and lowering the load arms



NOTE

Keep your hands on the tiller when lifting or lowering the load arms.

Lifting the load arms:

– Press the control button (1).

The load arms are raised.

Lowering the load arms:

– Press the control button (2).

The load arms are lowered.

Load handling

⚠ WARNING

Risk of crushing feet

Safety shoes must be worn.

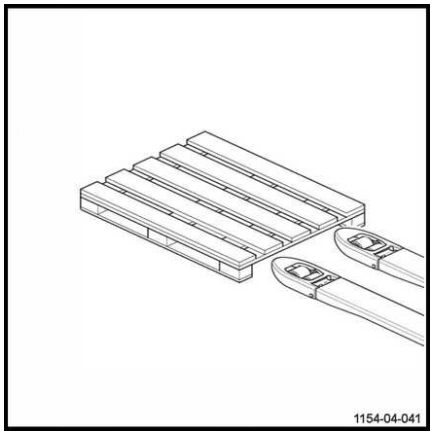
⚠ WARNING

Arrangement of loads

Do not touch nearby loads or loads positioned at the side or in front of the load being handled.

Arrange the loads with a small space between them to prevent them hooking onto one another.

Before picking up a load



- Ensure that the load weight does not exceed the capacity of the truck.
- Also ensure that the load is stable and balanced, to avoid dropping any part of the load.
- Check that the width of the load is compatible with the width of the load arms.
- Check that the load is not damaged.

⚠ DANGER

Risk of tipping

It is essential to slow down when approaching a corner or on wet ground.

Picking up a load from the ground

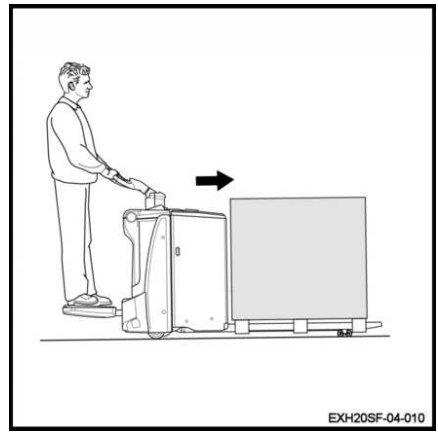
Proceed as follows:

- Approach the load carefully.
- Lower the load arms so that they can easily be inserted into the pallet.
- Insert the load arms under the load.
- For a load that is shorter than the load arms, position it so that the load overhangs the end of the load arms by a few centimetres. This will prevent the load hooking onto the one in front.
- Raise the load arms a few centimetres to lift the load.
- Slowly withdraw the load in a straight line.

Transporting a load

Observe the following recommendations:

- Drive forwards for optimum visibility
- Travel up or down slopes with the load uphill Do not travel across the slope or make a U-turn
- Reverse travel is used for setting down the load Adjust your speed, as the position of the forklift operator is now less comfortable
- Do not drive with an unstable load
- If visibility is poor, let someone guide you
- Raise the load arms slightly in order to pass obstacles



Setting a load down on the ground

Proceed as follows:

– Drive the truck to the required location.

– Carefully move the load into the unloading zone.

– Lower the load until the load arms are free.

– Withdraw the truck in a straight line.

– Raise the load arms again by a few centimetres.

⚠ CAUTION

Risk of accident

Before you set down the load, ensure that no one is around the truck or the load.

Before leaving the truck

NOTE

Always stop the truck on level ground away from traffic routes.

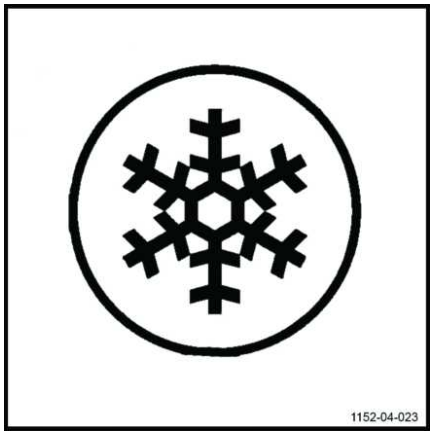
Proceed as follows:

– Lower the load arms to the lowered position.

– Switch off the ignition (key or electronic key).

– In the event of a prolonged shutdown, press the emergency off switch. Then disconnect the battery.

Cold store usage (optional) ▷



⚠ CAUTION

Standard trucks risk being subject to significant damage if used in extreme conditions.

Only trucks with the Cold Store option may be used inside cold storage. Specific oil designed for cold stores must be used.

These trucks are identified by their Cold Store label.

Area of Use

Trucks with the Cold Store option may be used in two different areas:

- **operating range 1**: the truck can operate at a temperature of -5 °C and, for short periods, at a temperature of -10 °C. It must be parked outside of the cold store.
- **operating range 2 (Entry / Exit applications)**: the truck must be used alternately inside and outside of the cold store. It can withstand temperatures between -30 °C and +45 °C. Specific rules should be followed so as not to damage the truck and to avoid the occurrence of streaming (see the following paragraph). The truck is parked outside of the cold store.

Precautions for Use

The difference in temperature between the cold store and the room temperature zone may result in the formation of condensation water.

This water can freeze when the truck goes back into the cold store and jam the moving parts of the truck.

Streaming occurs if the truck remains outside of the cold store for more than ten minutes. Therefore, it is essential to leave the truck outside of the cold store for 30 minutes so that the condensation disappears.

⚠ DANGER

If the condensation freezes in the cold store, it is prohibited to operate the jammed parts.

This could cause permanent damage to the truck.

Parking

The truck must be parked outside of the cold store.

Parking inside the cold store could cause serious damage to the electrical and mechanical equipment (seals, hoses, rubber and synthetic parts).

⚠ CAUTION

Do not leave discharged or unused batteries in the cold store.

They could be permanently damaged.

Before leaving the truck

– Choose a safe and level location.

– Set down the load and fully lower the load arms.

The load arms must touch the ground.

– Switch off the truck.

The automatic braking is activated.

– Remove the switch key.

⚠ DANGER

Risk of injury!

It is prohibited to park the truck with the load lift system in the raised position.

Handling the battery

Battery type

Trucks can be fitted with different types of battery. Comply with the information indicated on your battery's type plate, as well as with its features.

⚠ WARNING

The weight and size of the battery influence the stability of the truck.

The new battery must weigh the same as the old one. Do not remove extra weight or change its position.

⚠ CAUTION

Be careful not to damage any wiring when replacing the battery.

Order picking

Maintenance personnel

The battery must be replaced by specially trained personnel. Personnel must follow the manufacturer's instructions for the battery, the charger and the truck.

It is also necessary to follow the battery maintenance instructions.

Fire protection measures

⚠ WARNING

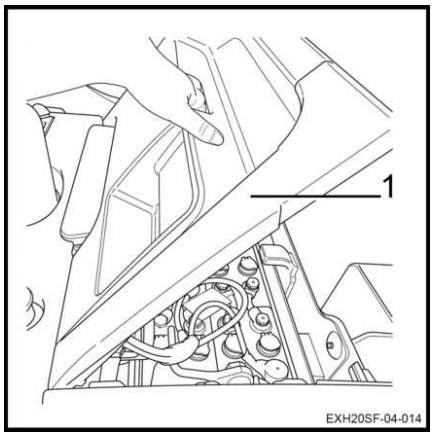
Do not smoke or create a flame when handling batteries. There must be no combustible material or tools that produce sparks within a minimum radius of 2 m around the truck and the battery charger.

The work area must be well ventilated. Fire extinguishers must be provided and located near the work area.

Parking the truck securely

When the battery is being worked on, the truck must be parked safely. The truck can only be restarted when the covers and connectors have been put back in the operating position.

Opening and closing the battery hood ▷



Opening the battery hood

To open the battery hood:

– Immobilise the truck.

– Lower the forks.

– Switch off the ignition (key or electronic key).

– Press the emergency off switch.

– Lift the hood (1) using the handle designed for this purpose.

Closing the battery hood

To close the battery hood:

⚠ WARNING

Risk of trapping fingers

When closing the battery hood, correctly position your fingers to avoid any risk of them being trapped.

– Close the hood (1).

– Ensure that the battery hood is closed securely.

⚠ CAUTION

Risk of sparks

Never drive with the hood open or incorrectly closed.

⚠ DANGER

Risk of falling

Do not climb on the battery compartment hood.

Charging the battery using an external charger

⚠ CAUTION

Deep discharging may damage the battery.

– Charge the battery immediately.

The fixed socket on the truck (1) is located above the battery and under the battery hood.

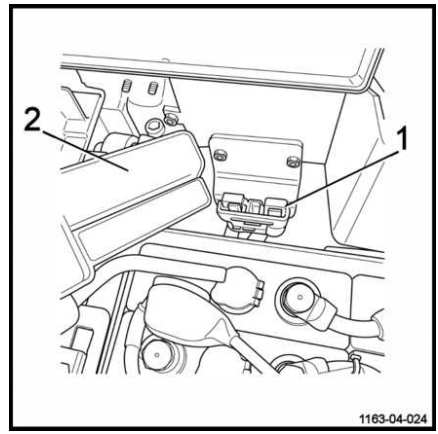
– Park the truck safely.

– Before charging, check the condition of the battery cable and the charger cable. Replace them if necessary.

– Open the hood and leave it open.

– Pull the handle of the battery connector (2) to disconnect it from the fixed socket on the truck (1). ▷

– Connect the battery connector to the wall-mounted connector.



⚠ WARNING

Electrical risk

Only unplug the battery connector from the battery charger when both the battery charger and the truck are switched off.

NOTE

Follow the instructions provided by the manufacturer of the battery and the battery charger (equalising charge).

⚠ WARNING

Risk of damage, short circuit or explosion.

Do not place any metal objects or tools on the battery.

Smoking is prohibited.

⚠ WARNING

The electrolyte (diluted sulphuric acid) is toxic and very caustic.

Follow the safety regulations when handling battery acid.

⚠ WARNING

Explosive gases are generated during battery charging.

– Make sure that the area is well-ventilated.
– Make sure that the battery hood remains open for the entire time the battery is charging.

On-board charger

Precautions for installation and use

The on-board charger means you no longer have to use a charging room. This charger can be connected to any 2P+T 230 V 16 A socket. However, before charging this way, the user must ensure that the location selected for charging satisfies all the required safety guarantees:

- The electrical system must comply with standard NF C 15 100.
- The electric wall socket must be a 2 pole + earth 16 A 230 V type that is correctly connected and protected.
- Before charging, check the condition of the connections and cables (retighten, as required).
- Charging must be carried out in an area where there is no condensation or pollution and there must be sufficient ventilation.
- The charger must not be exposed to oil, grease or other similar substances.
- Charging must be carried out with the truck stopped.
- The increase in the temperature of the unit in relation to the ambient temperature is 10°C maximum. The temperature of the expelled air is 25°C maximum. Wait 10 minutes after stopping the charger before touching the unit.
- As the charger is cooled by forced ventilation, do not block the air inlets and outlets. There must be sufficient air circulation to the outside.

The charger is designed:

- To be incorporated inside an industrial truck. The charger must never be used alone (out of the truck).
- To stay permanently connected to the battery.
- To operate in all positions.
- Remain connected to the mains during periods of truck downtime to ensure the availability of the machine.
- To tolerate "opportunity charging".

⚠ CAUTION

Risk of damage to the mains cable resulting in electric shock and/or burns.

Park the truck very close to the wall-mounted mains socket to avoid tensioning the charger's mains cable during charging.

Electrical specifications of the charger

Mains voltage	190 V < U < 260 V
Network frequency	50 / 60 Hz +/-1% (automatic adaptation) No inrush current to the mains connection
Maximum output power	1040 W +/-3%
Maximum output current	35 A +/-2%
Nominal battery voltage	24 V
Tolerance on the voltage of bearing U	1%

Electrical safety

- Protection against reversal of battery polarity: the charger is protected by an output relay. After the battery is reconnected in the right direction, the charger starts charging without requiring human intervention.
- Mains protection: by a 250 V 10 A 5x20 timed fuse. The mains fuse is fitted directly to the electronic card. The user is not authorised to change this fuse. If this fuse is faulty, the charger must be returned to the service centre.

Other charging characteristics

Maintenance charges

If the charger stays connected to the mains, it restarts a charging cycle every 48 hours after the end of the previous charge in order to compensate for self-discharge.

Partial recharging

The charger adapts automatically to the battery discharge situation and therefore allows

any type of partial charging to be carried out ("opportunity charging").

The overcharging calculation takes into account partial recharging. The mixture is always sufficient, without needless water consumption, which prevents premature wear of the batteries (often due to overlong charging periods) and reduces the need for maintenance.

Protection during charging

Mains micro-break protection

If the mains power is cut off, all the existing charging parameters are stored in the memory for 13 minutes. As soon as the mains power returns, charging resumes from the point (I, U) at which it was cut off, with the number of Ah already injected stored in the memory.

If the cut-off period is longer than 13 minutes (the truck could have been used), a complete charging cycle is initialised.

Time protection

If the duration of phases I1 + P + U is more than 16 hours, the charger automatically stops. This can happen when a battery has a short-circuited component. Simply reset the mains to clear the fault.

Temperature safety

As the charger is cooled by ventilation, the air inlets and outlets must never be blocked.

The fan runs when the mains power is connected. It stops when charging is complete or when the mains power is disconnected.

The charger supplies reduced power if the ambient temperature exceeds the usage temperature range in order to protect itself (the charging period will be extended in this case).

The charger stops if the micro-controller detects a temperature measurement fault.

Using the on-board charger ▷

NOTE

The charger is compatible with wet lead and gel batteries with a maximum capacity of 400 Ah.

⚠ CAUTION

Risk of damaging the battery

Do not disconnect the battery connector during charging (green indicator light flashes).

The truck cannot be operated during charging.

⚠ WARNING

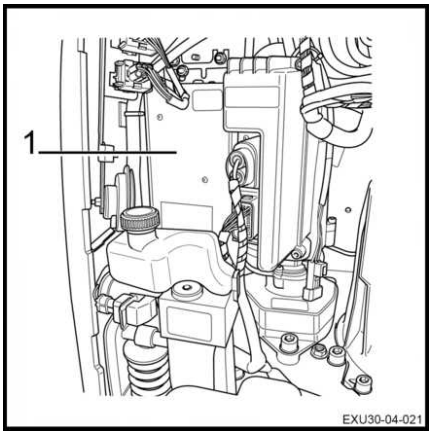
A battery produces explosive gases during charging.

– Make sure that the area is well-ventilated.

– Make sure that the battery hood remains open for the entire time the battery is charging.

The on-board charger is intended to recharge the battery.

– Switch off the truck.



Do not pull the emergency stop handle. This operation cuts off the circuits and stops the battery from charging.

– Connect the charger plug (1) to a mains socket.

Phase	Green LED	Red LED
Mains socket disconnected	Off	Off
Charging phases	Flashing	Off
Stopped/ Equalisation/ Maintenance phase	Continuously lit	Off
Charging process too long	Off	Continuously lit
Charger polarity reversed (+battery and -battery charger cables reversed, with the battery remaining normally connected to the truck assembly)	Continuously lit	Continuously lit
Battery polarity reversed	Off	Off
Selector in neutral position	Flashing	Flashing

⚠ CAUTION

Risk of damaging the battery

It is strictly prohibited to use an on-board charger other than the one recommended.

⚠ CAUTION

Risk of damage to the mains cable due to frequent operator handling. Risk of electric shock and/or burns!

The mains cable must be regularly checked as part of periodic statutory checks and maintenance operations.

NOTE

The on-board charger is not compatible with the Cold Store option.

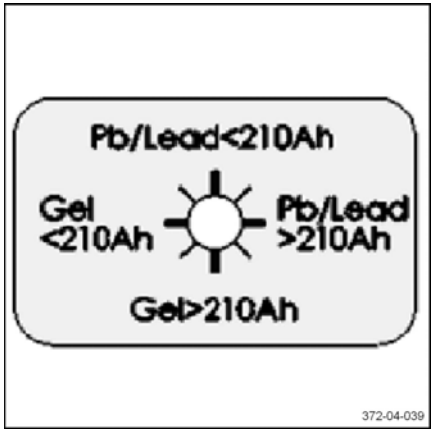
Adjusting the on-board charger

Charging curve selector

The curve is selected using the selector located on the front face of the charger.

The curve selector is protected by a cap.

The 4 fine lines indicate neutral positions. The charger does not flow and the two LEDs flash simultaneously to indicate that no curve has been selected.



⚠ CAUTION

Risk of premature damage to the battery.

Ensure that the charger setting corresponds to the type of battery.

If the battery is changed, ensure that the setting corresponds to the type of battery.

The four thick lines indicate the four charging curves:

- open lead-acid battery with a capacity less than or equal to 210 Ah
- open lead-acid battery with a capacity equal to or exceeding 210 Ah
- GEL battery with a capacity below 210 Ah
- GEL battery with a capacity greater than 210 Ah

⚠ CAUTION

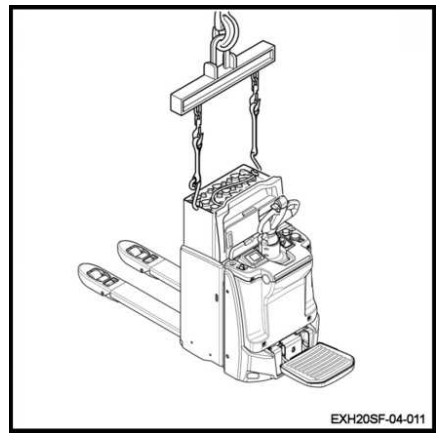
The charger is supplied in the **neutral** position.

Changing the vertical access battery

To change the battery, proceed as follows:

– Immobilise the truck.
– Lower the load arms.
– Switch off the ignition and remove the key.
– Press in the emergency off switch.
– Open the battery hood.
– Disconnect the battery connector.
– Attach the slinging hooks to the battery compartment.

▷



NOTE

Using secured hooks is recommended.

– Lift the battery.
– Replace the battery.
– Position the new battery in the chassis.
– Remove the slinging hooks.
– Reconnect the battery connector.
– Close the battery hood.
– Return the truck to service.

Changing the side access battery: system 1

There are two different systems for locking the side access battery. Check which system is fitted to your truck before changing the side access battery.

⚠ DANGER

Risk of trapping fingers

It is advisable to wear gloves when changing the battery.

⚠ WARNING

Risk of injury

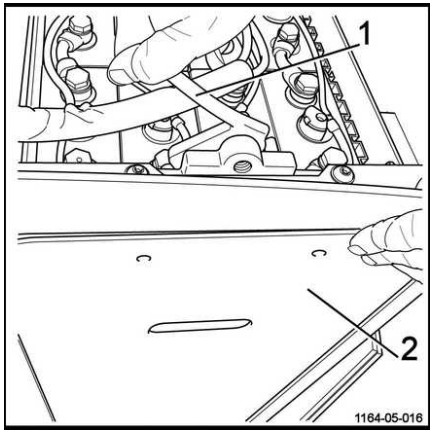
Safety shoes must be worn when changing the battery.

Before handling, ensure that there is nobody around the truck.

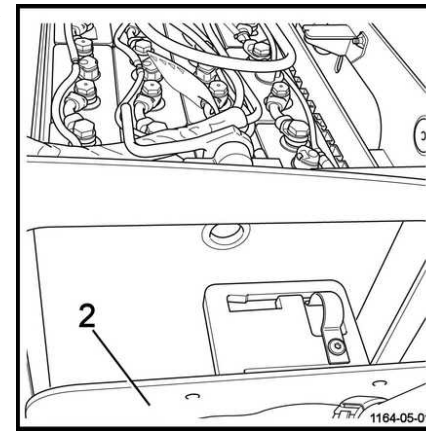
To remove the battery, we recommend that you use a fixed roller frame or a truck with extraction rollers (fitted with rollers) for easier handling of the battery.

To change the battery, proceed as follows:

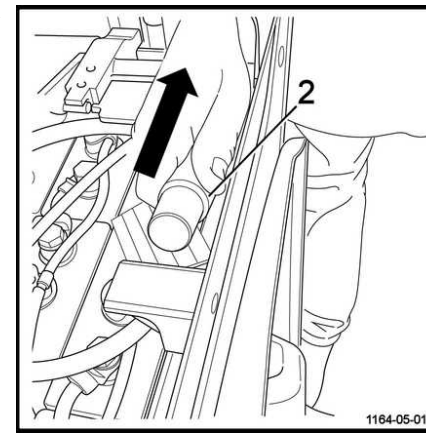
– Immobilise the truck.
– Lower the load arms.
– Switch off the ignition and remove the key.
– Press the emergency off switch.
– Open the battery hood.
– Disconnect the battery connector.
– Place the connector on the battery cells.
– Unlock the door that is not attached to the side of the battery by lifting the latch (1). Hold the door (2) to prevent it falling. ▷



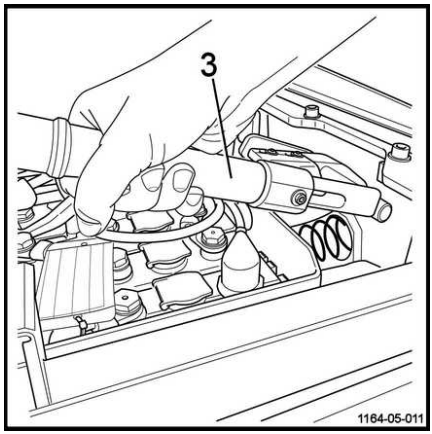
– Remove the door (2) (if this option is selected) and put it to one side.
– Position the truck with extraction rollers or the roller frame in the upright position next to the battery compartment on level ground.



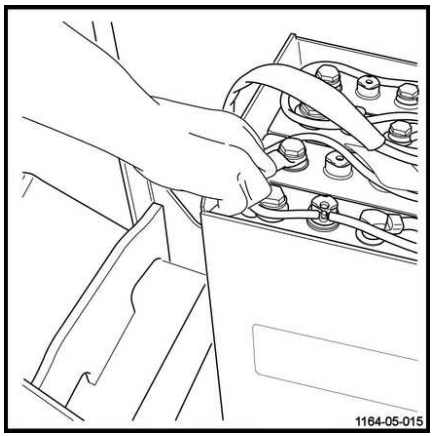
– Operate and pull the locking handle (2) in the direction indicated by the arrow.



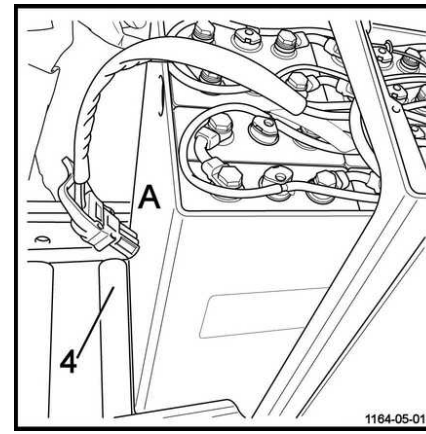
– Lift the locking bar (3) until the battery is freed. ▷



– Pull the battery onto the truck with extraction rollers or the roller frame. ▷
– Replace the battery. Remove the discharged battery and position a charged battery on the roller frame.
– Position the truck with extraction rollers or the roller frame (4) in the upright position next to the battery compartment.



– Push the battery into the compartment. ▷

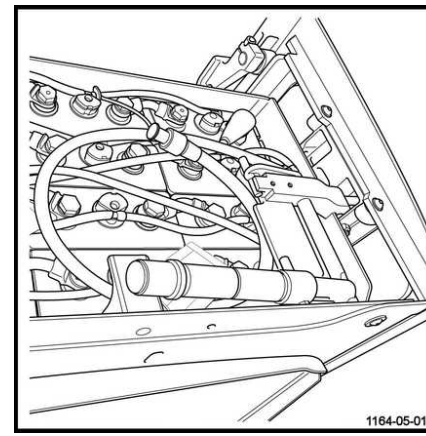


⚠ DANGER

Risk of trapping fingers

Push the battery from the rear side (A) of the battery. Take care not to trap your fingers by pushing from the top or the side of the battery.

– Push until a click is heard. The battery is correctly installed. ▷



⚠ WARNING

Risk of injury

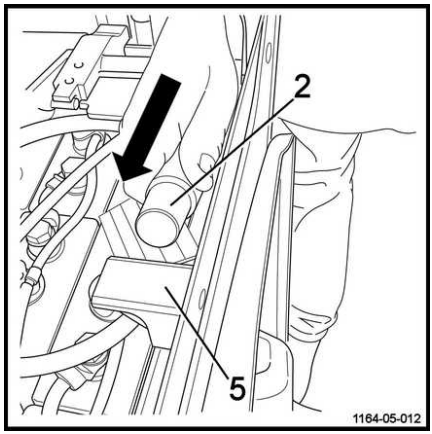
Ensure that the battery is in the end position and that the hook is correctly holding the battery.

⚠ DANGER

Risk of injury

The battery is correctly positioned but is not yet locked.

– Lower and lock the handle (2) of the locking bar (3) in the direction indicated by the arrow. The locking bar must be horizontal and must be right up against the stop (5). ▷



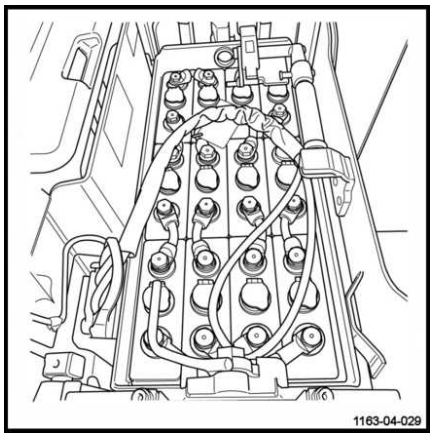
⚠ CAUTION

Risk of locking the battery incorrectly

The locking bar must not in any circumstances be positioned under or on top of the stop. It must be positioned against the stop.

– Reconnect the battery connector.

– Lower the latch of the battery compartment door (if this option is selected). The door that is not attached to the side of the battery must be correctly locked. ▷



– Refit the battery hood.

– Return the truck to service.

⚠ WARNING

Risk of injury

Before restarting the truck, ensure that the battery is correctly installed. Check that the battery is locked and that the battery hood is closed.

Changing the side access battery: system 2

There are two different systems for locking the side access battery. Check which system is fitted to your truck before changing the side access battery.

⚠ DANGER

Risk of trapping fingers

It is advisable to wear gloves when changing the battery.

⚠ WARNING

Risk of injury

Safety shoes must be worn when changing the battery.

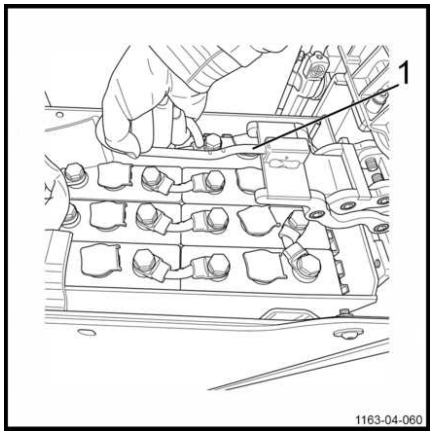
Before handling, ensure that there is nobody around the truck.

To remove the battery, we recommend that you use a fixed roller frame or a truck with extraction rollers (fitted with rollers) for easier handling of the battery.

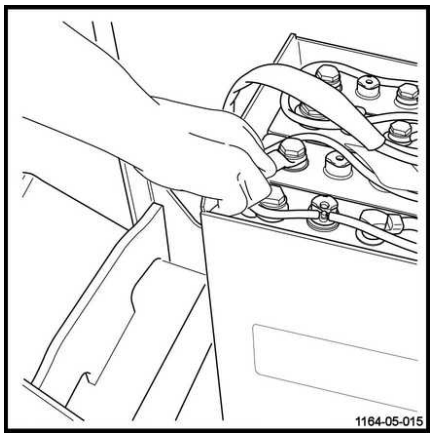
To change the battery, proceed as follows:

– Immobilise the truck.
– Lower the load arms.
– Switch off the ignition and remove the key.
– Press the emergency off switch.
– Open the battery hood.
– Disconnect the battery connector.
– Place the connector on the battery cells.
– Position the truck with extraction rollers or the roller frame in the upright position next to the battery compartment on level ground.

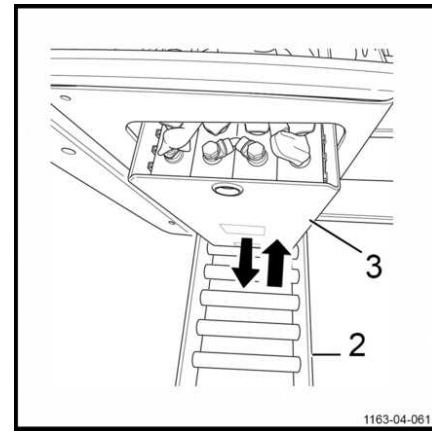
– Lift the locking handle (1) until the battery is freed. ▷



– Pull the battery onto the truck with extraction rollers or the roller frame. ▷
– Replace the battery. Remove the discharged battery and position a charged battery on the roller frame.
– Position the truck with extraction rollers or the roller frame (2) in the upright position next to the battery compartment.



– Push the battery into the compartment. ▷

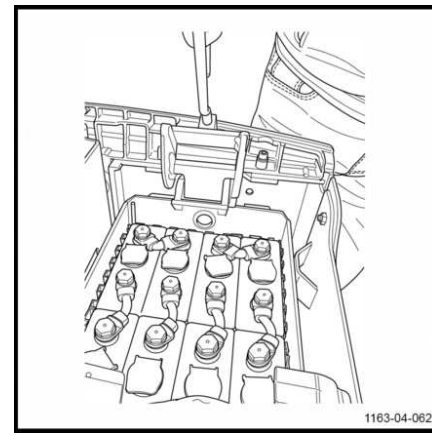


⚠ DANGER

Risk of trapping fingers

Push the battery from the rear side of the battery (3). Take care not to trap your fingers by pushing from the top or the side of the battery.

– Push until a click is heard. The battery is correctly installed. ▷

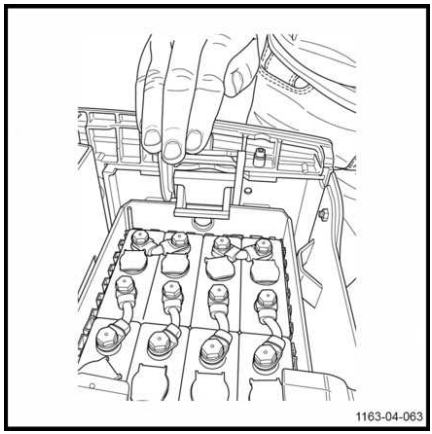


⚠ DANGER

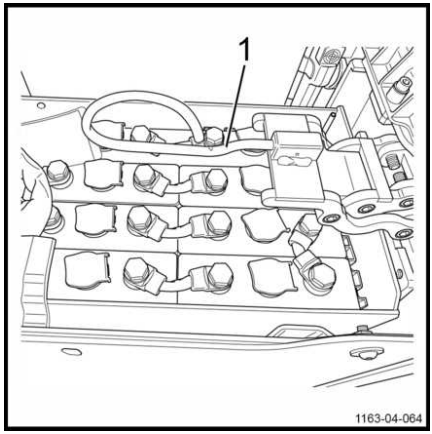
Risk of injury

The battery is correctly positioned but is not yet locked.

– Lower the handle (1) of the locking bar. ▷



– Reposition the locking bar (1) horizontally. . ▷
– Reconnect the battery connector.
– Refit the battery hood.
– Return the truck to service.



⚠ WARNING

Risk of injury

Before restarting the truck, ensure that the battery is correctly installed. Check that the battery is locked and that the battery hood is closed.

Handling the truck in an emergency

Truck towing procedure

It is not possible to tow the truck with no electrical function. The electromagnetic brake remains in the closed position.

Truck towing is authorised with a rigid connection (tow bar) if the truck to be towed can no longer be braked. Check that the towing vehicle is sufficiently powerful to pull and brake the truck being towed.

Moving with no battery

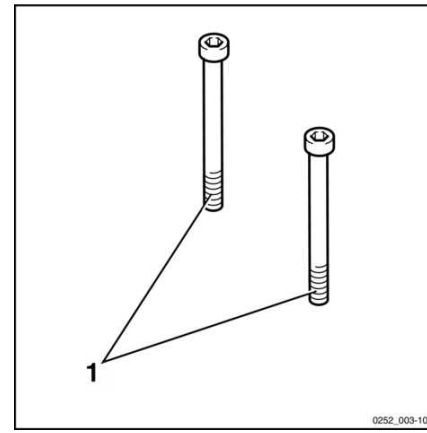
NOTE

In the event of an electrical fault or no battery, it is possible to unlock the brake manually.

⚠ CAUTION

This procedure must be carried out by authorised personnel.

– Unload the fork arms, then disconnect the battery.
– Remove the engine cover.
– Two M5 X 35 screws (1) are required.
– Screw the screws (1) to the brake (2) in the holes (3). The brake is then unlocked.



⚠ CAUTION

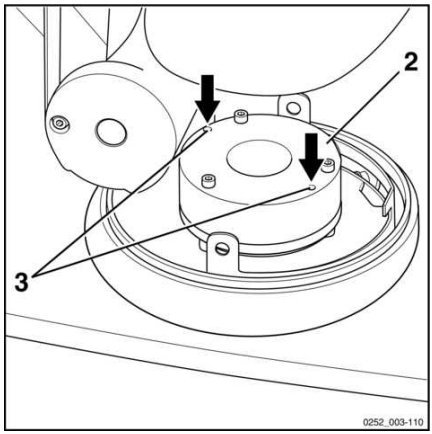
The truck must only be towed at low speeds.

– After towing, chock the truck to prevent it from moving.
– To re-establish brake operation, unscrew and remove the two screws (1).
– Refit the covers.

⚠ WARNING

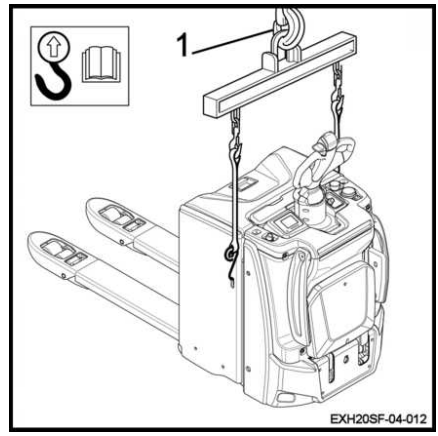
It is essential that the covers are correctly refitted before the machine is used.

▷



Handling the truck in specific situations

Slinging the truck ▷



⚠ DANGER

Danger of truck falling

Only use slings and a hoist of sufficient quality. Check the weight of the machine (including battery) in order to choose a suitable device. Refer to the technical features.

Observe the following instructions:

– Shut off the truck and disconnect the battery connector.

– Lower the load arms (the initial lift must be in the lowered position).

– Raise the platform and lower the safety side protection.

– Remove any items that could fall.

– Protect all parts that come into contact with the lifting device.

– Hook the lifting device (1) onto the appropriate locations as shown by the "slinging hooks" label.

NOTE

Do not sling the truck by the tiller. Do not sling the truck by the accessory support.

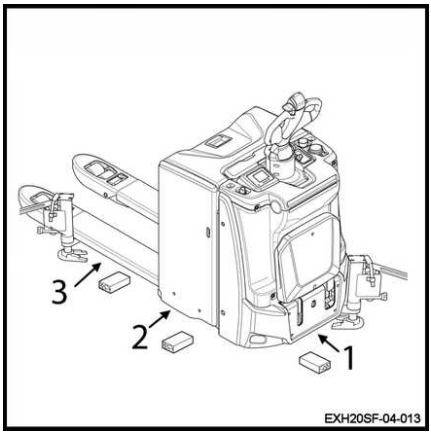
– Carefully lift the truck.

⚠ DANGER

Risk of falling

Make sure no one is under or near the truck when slinging the truck.

Lifting the truck



⚠ DANGER

Danger of swinging

Truck lifting must be performed carefully.

For some work, it is necessary to lift the truck.

– Lift the load arms.

– Switch off the ignition and disconnect the battery connector.

– Use a jack with adequate lifting capacity.

Front section of the truck:

– Place a jack under the chassis (1).

For work on the lifting device:

– Position the jack under the battery frame (2).

Maintenance of the load wheels:

– Place the jack under the forks in the indicated locations (3).

As a safety precaution, always insert a wooden wedge.

⚠ WARNING

Risk of truck falling

Immobilise and chock the truck after lifting it.

Transporting the truck

⚠ CAUTION

Always switch off the ignition and disconnect the battery.

Never tie down or sling the truck by the control unit or other points not designed for this.

⚠ CAUTION

Risk of damage to the truck.

Use a hoist and woven **NON METALLIC** slings with an adequate lifting capacity. Refer to the load weight shown on the truck's capacity plate.

The lifting operations must be performed by qualified personnel.

Trucks are generally transported by road or by rail.

The truck must be suitably protected from the effects of the weather during transport and storage.

To load or unload the truck, use an inclined plane or a mobile ramp.

If the truck is out of service or if the battery has been removed, sling the truck. See **Chapter 4 Slinging the truck**.

Transporting the machine

If the truck has to be transported, please ensure that it is properly chocked and protected against bad weather.

⚠ WARNING

Risk of truck losing stability

Exercise great care when moving a truck that has no battery and is equipped with reinforced stabilisers.

Transporting the truck in the lift

The truck must only be taken in lifts with an adequate loading capacity that are designed for this purpose, and for which authorisation has been received from the operator. Inside the lift, the truck must be immobilised so that no part is in contact with the wall of the lift cage.

⚠ DANGER

Danger of death.

Do not stand within the hoist's operating radius or below the lifted truck.

A minimum safety distance of 100 mm from the walls of the lift must always be observed.

Anyone transported with the truck must only enter the lift after the truck has been correctly immobilised and they must exit the lift first.

Driving on loading bridges

Before crossing a loading bridge, the operator must make sure it is properly attached and secured and its load capacity is sufficient. Cross the loading bridge slowly and carefully. The driver must be sure that the vehicle to be entered is secured sufficiently against movement and that it can support the load of the forklift truck.

The lorry driver and lift truck operator must coordinate the departure time of the lorry.

5

Maintenance

General maintenance information

General

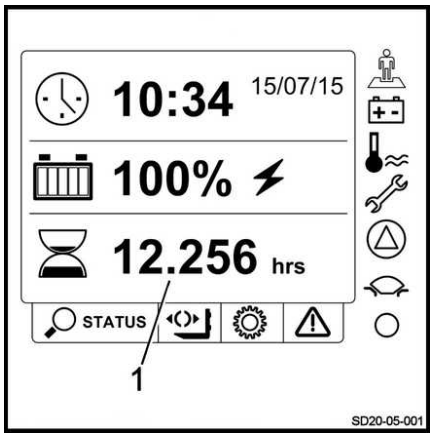
The following instructions contain all the information required for maintenance of your truck. Carry out the various maintenance work in compliance with the maintenance plan. This will ensure that your truck is reliable and in good working order and that the warranty remains valid.

Maintenance plan

One of the display functions indicates the truck's hours of use. Refer to it and consult the truck's maintenance plan.

The maintenance plan is followed by advice to facilitate work.

Maintenance intervals must be reduced if the truck is used under harsh conditions (extreme heat or 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 in maintenance work.

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

Never mix different grades 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.

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 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.

Battery maintenance staff

Batteries must only be recharged, maintained and changed by specially trained personnel. Personnel must follow the manufacturer's instructions of the battery, the battery charger and the truck.

It is essential to follow the battery maintenance instructions and the battery charger operating instructions.

Maintenance operations that do not require special training

Simple maintenance operations such as checking the hydraulic fluid level or checking the battery electrolyte level can be carried out by persons with no special training.

A specific qualification is not necessary.

Refer to the maintenance section of this manual for further information.

Ordering spare parts and consumables

Spare parts are provided by our spare parts service department. You will find the information required to place an order in the spare parts and fitting catalogue.

Only use spare parts recommended by the manufacturer.

Unauthorised spare parts may increase the risk of accidents due to faults relating to quality or incorrect choices. Anyone who uses non-compliant spare parts must assume full responsibility in the event of an accident.

Safety guidelines for maintenance

Servicing and maintenance measures

To avoid accidents during servicing and maintenance operations, take all necessary safety measures. For example:

– Ensure that there is no risk of the truck moving or starting up unexpectedly. For this reason, remove the battery connector.

Working on the electrical equipment

Operations on the truck's electrical system must only be carried out when there is no voltage supply.

Operating checks, testing and adjustment work on parts supplied with voltage must only be carried out by personnel:

- who have received detailed instructions
- who have been authorised to perform this work
- who have taken the necessary precautionary measures.

Rings, metal bracelets etc., must be removed before carrying out any operations on electric components.

Remove the electric equipment (which comprises electric components such as the traction controller) before carrying out any welding operations. This precaution prevents this electric equipment from being damaged.

Operations on the electric system require the consent of the manufacturer.

Safety devices

After any repair or maintenance work, it is necessary:

- to refit all safety devices
- to check these for correct operation.

Technical data for inspection and maintenance

Assembly	Consumables/lubricants	Capacities/adjustment values
Hydraulic system	Hydraulic oil	
Transmission gear	Transmission gear oil	1.1 l
Traction motor 2.3 kW for EXH-SF 20 3 kW for EXH-SF 25	1F1 fuse	Power: 300 A, quantity: 1
Steering unit ES30–24 (0.185 kW S1)	3F1 fuse	Power: 40 A, quantity: 1
Pump motor 1.2 kW for EXH-SF 20 1.5 kW for EXH-SF 25	1F1 fuse	Power: 300 A, quantity: 1
Control fuse	1F3 fuse	Control: 7.5 A, quantity: 1
Control fuse	1F4 fuse	Control: 5 A, quantity: 1
Battery	Distilled water	As required
Joints	Lithium soap grease	As required

Recommended lubricants

⚠ DANGER

Toxic products.

Oils and other consumables are toxic products. It is advisable to handle and use them with the utmost care.

Hydraulic oil

Recommended oil for standard use:

ISO-L-HM 46 as per ISO 6743-4 or ISO VG46-HLP as per DIN 51524-2

Recommended oil for heavy-duty use:

ISO-L-HM 68 as per ISO 6743-4 or ISO VG68-HLP as per DIN 51524-2

Recommended oil for the cold store version:

ISO-L-HM 32 as per ISO 6743-4 or ISO VG32-HLP as per DIN 51524-2

NOTE

If in doubt, please ask your local dealer for advice. You should also consult your local dealer if a representative of an oil company offers you an oil product that is not specified in these operating instructions. Only the oils listed above are approved by the manufacturer. Using oil mixtures or hydraulic fluids that are not recommended can cause damage that may be expensive to rectify.

Transmission gear oil

Recommended oil:

Depending on the transmission gear fitted in the truck, two types of oil can be used:

- CLP PG220 DIN 51 517–3
- RENOLYN XT 150 DIN 51 517–3

Please contact the After-Sales Service to find out which oil should be used with your transmission gear.

Aerosol can for chains

Standard chain spray A167.

Multi-purpose grease

Lithium soap grease, extreme pressure with anti-wear additive - Standard DIN 51825 - KPF 2K - 30, KPF 2K - 20, KPF 2N - 30.

ENVIRONMENT NOTE

Used oil must be stored safely until it is disposed of in compliance with environmental protection measures. No one should have access to the used oil. Do not dispose of used oil in drains or allow it to penetrate soil.

ENVIRONMENT NOTE

Do not allow the product to disperse into the environment. Packaging that has contained this product is treated as waste. Contaminated packaging must be completely emptied and may then be recovered following a thorough clean.

Accessing the technical compartment

⚠ WARNING

Risk of injury

Before removing anything, turn the ignition off and press the emergency off switch.

To access the technical compartment, it is necessary to lift the top hood (1) and remove the front hood (2).

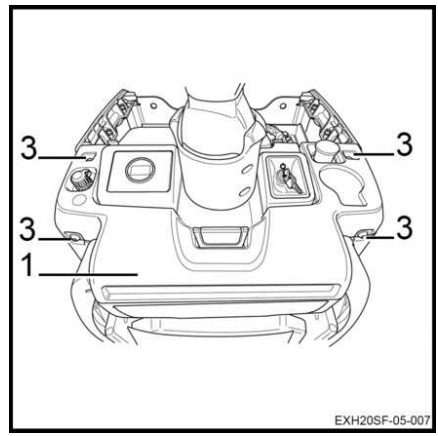
Proceed as follows:

– Lower the platform and raise the side protections.

– Unscrew the four screws (3) from the top hood (1). ▷

– Lift the top hood slightly.

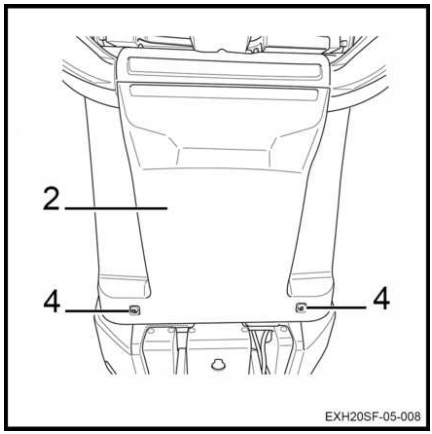
– Remove the two screws (4) from the front hood (2).



– Remove the front hood.

The technical compartment must be closed once the operation is finished.

– Reposition the front hood (2).
– Tighten the two screws (4) of the front hood.
– Reposition the top hood (1).
– Tighten the four screws (3) of the top hood.
– Return the truck to service.



1000-hour service plan

Depending on the application, environmental conditions and driving style, the following procedures should be carried out every 1000, 2000, 3000, 4000, 6000, 7000, 8000 and 9000 hours
Preparation
Clean the truck
Check the error codes using the diagnostic tool
Chassis and equipment
Check the condition of the load arms
Check the electromagnetic brake and ensure that it is working correctly
Check and grease the hinges
Check the pump motor brooms for wear
Check the transmission gear for noise and leaks
Grease the gears
Check the platform
Check the forklift operator side protection
Wheels
Check the condition and tightness of the wheels
Check the stabilisers
Electrical equipment
Clean the electric steering system and the lifting motors
Check the condition of the cables and the battery sockets and ensure that they are positioned correctly
Check the electrical insulation between the chassis and the electrical components
Check the electrical insulation between the chassis and the control unit components
Check the fuses
Check the battery acid level and the electrolyte level
Hydraulics
Check the hydraulic oil level
Check the condition of the pipe line
Check the oil level of the controlled stabilisers

5000-hour maintenance plan

Depending on the application, environmental conditions and driving style, the following procedures should be carried out every 5000 and 10,000 hours
Information
Carry out all 1000-hour maintenance work

Hydraulics
Drain the hydraulic oil

10,000-hour service plan

Depending on the application, environmental conditions and driving style, the following procedures should be carried out every 10,000 hours
Information
Carry out all 1000-hour maintenance work
Carry out all 5000-hour maintenance work
Motor
Drain the transmission gear oil

Chassis, bodywork and fittings

Cleaning the truck

Cleaning instructions

– Park the truck.

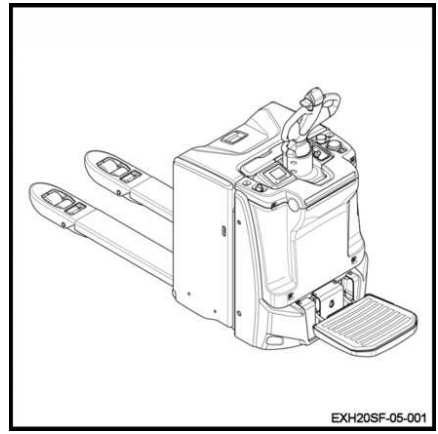
– Press the emergency off switch.

⚠ CAUTION

Electrical hazards

The battery must always be disconnected during cleaning procedures.

Washing the outside of the truck ▷



⚠ WARNING

Risk of damage to the truck

– Do not use flammable liquids to clean the truck.

– You must observe the safety rules set out above to prevent spark formation. Sparks could lead to a short circuit.

– All components that are sensitive to moisture (particularly electric components) must be protected when the truck is cleaned.

– Observe the manufacturer's instructions when using the cleaning product.

– Clean the truck with a non-flammable cleaning product mixed with water; a sponge and cloths.

– Specifically clean the oil filling openings and surrounding areas as well as the grease nipples (before lubrication).

NOTE

A truck that is cleaned frequently must be lubricated more regularly.

Cleaning the electrical installations

⚠ WARNING

Electrical hazards

Do not expose electrical systems (especially motors) to direct jets.

NOTE

- *Only use dry cleaning products.*
- *Do not remove the cowlings.*

– Clean the electrical installations with a non-metal brush and dry with lightly compressed air.

After washing

– Carefully dry the truck (e.g. with compressed air).

⚠ WARNING

Use of compressed air

It is advisable to wear protection goggles and a mask.

– Restart the truck in accordance with the instructions.

NOTE

If, despite taking precautions, traces of moisture remain in the motor, dry it using compressed air. After having eliminated any traces of moisture, the truck may be reactivated. Do not do so before then to prevent any corrosion.

General information on battery maintenance

⚠ DANGER

Risk of injury

Before carrying out any operations on the electric installation, turn the truck power supply off. Disconnect the battery connector.

Precautions to be taken during battery maintenance

The plugs on the battery cells must always be dry and clean.

Neutralise any spilt battery acid immediately.

The battery terminals and lugs must be clean, lightly covered with grease for terminals and securely tightened.

Charging the battery

During the charging process, the surface of the battery cells must be clear to ensure sufficient ventilation.

Do not place metal objects on the battery.

The battery cover must remain open during charging. See the chapter entitled **Battery charging using an external charger.**

Battery type

Lead or gel batteries are used. It is advisable to choose a compatible charger.

Before charging, ensure that the charger is suitable for the type of battery.

⚠ CAUTION

Gel batteries are subject to specific charging, maintenance and treatment instructions. A non-compatible charger may result in a battery failure.

Observe the manufacturer's recommendations.

NOTE

- *The discharge indicators used to check the battery must also be suitable for the type of battery*
- *Contact the relevant After-Sales Service Centre*

Charging the battery

– Park the truck in an area without condensation or pollution and with sufficient ventilation.

– Stop the truck.

– Press the emergency off switch.

– Open the battery hood.

– Follow the instructions.

⚠ CAUTION

Do not expose the charger to water, rain, oils, grease or any similar substances.

The charger becomes hot during the operation.

⚠ CAUTION

Risk of injury

Do not obstruct the ventilation. Allow the charger to cool down for 10 minutes after charging is complete before touching it. Do not use the charger out of the truck.

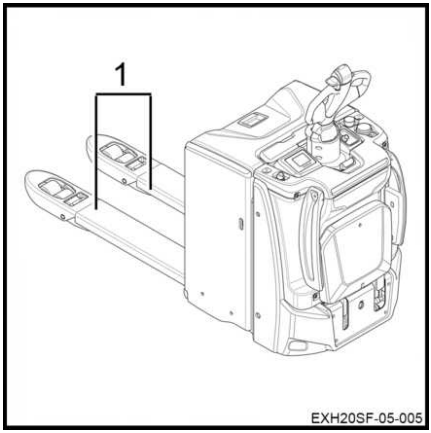
Checking the condition of the load arms ▷

– Check that the load arms (1) show no signs of deformation, splits, heavy wear or cracks.

⚠ CAUTION

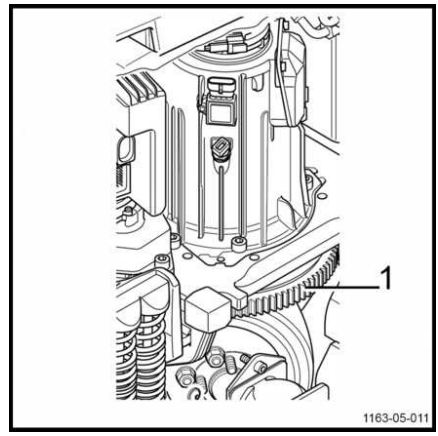
Truck damage

If the carriage is damaged, have it changed by the After-Sales Service Centre.



Steering and wheels

Cleaning the pinion gear of the steering geared motor ▷



- Immobilise the truck.
- Lower the load arms.
- Switch off the ignition and remove the key.
- Press in the emergency off switch.
- Open the battery hood.
- Disconnect the battery connector.
- Remove the hood of the technical compartment.
- Check that the pinion gear and the ring gear (1) are free from dirt.
- Clean with solvent if necessary, then dry with compressed air.

⚠ CAUTION

Use of compressed air

It is advisable to wear protection goggles and a mask.

- Then lubricate the pinion and ring gear with silicone aerosol spray.
- Reconnect the battery connector.
- Return the truck to service.

⚠ CAUTION

Risk of dust clogging

There is a risk of dust clogging if non-recommended products are used for greasing.

⚠ CAUTION

Risk of injury

It is advisable to wear gloves when carrying out maintenance on the pinion and the turntable.

Checking the condition of the wheels ▷

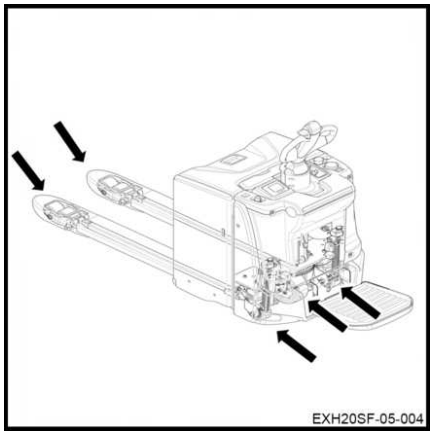
– Raise the truck until the wheels are off the ground.

– Check that the wheels rotate freely and remove any objects that may obstruct them or prevent them from turning.

⚠ CAUTION

Risk of damaging the wheels

In order to avoid any risk of damaging the wheel bearings and tyres, any wires or plastic strips that may wind around the wheel hubs and mountings must be removed.



Stabiliser maintenance

Trucks are equipped with two stabilisers. They ensure the dynamic stability of the truck. Different types of stabilisers are available as options.

Stabilisers do not require any specific maintenance or adjustment work. Wheel wear (drive wheel and stabiliser wheel) is automatically compensated.

However, it is necessary to check the condition of the stabilisers:

- No significant damage to the superstructure.
- The damper cylinder pins must not be twisted.
- No oil leakage must be present on the damper cylinder. This cylinder must be inside the spiral spring.
- No damage to the rollers. The wheels must rotate freely
- No locking at the level of the upper bearing.
- Ensure that the wheel nuts are correctly tightened.
- Ensure that there is no oil leakage under the truck when it is fitted with hydraulic stabilisers.

⚠ WARNING

Risk of loss of dynamic stability

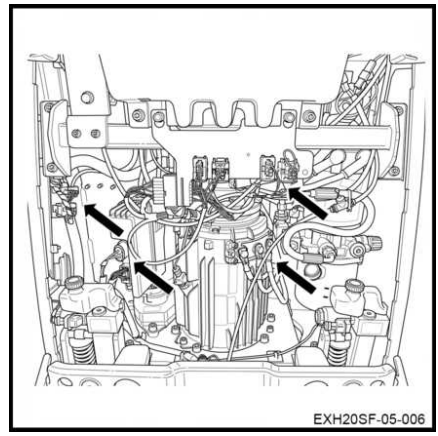
The dynamic behaviour of the device must be monitored, particularly when turning. The behaviour of the truck must be the same when cornering, whether turning to the left or right. If there is a difference in behaviour, please contact the After-Sales Service Centre. Only the technician can replace the two stabilisers if deemed necessary.

NOTE

It is necessary to monitor the wear of the wheels in order to preserve the traction of the truck.

Electrical equipment

Cleaning and blowing air through the electrical components



⚠ CAUTION

Electrical hazards

Always disconnect the battery connector before working on an electrical component.

– Press the emergency off switch.
– Disconnect the battery connector.
– Open the technical compartment.
– Blow the electrical components with compressed air.

⚠ WARNING

Use of compressed air

It is advisable to wear protection goggles and a mask.

– Check the condition of the harness connector pins.

Checking the battery acid level and electrolyte density ▷

⚠ WARNING

The electrolyte (diluted sulphuric acid) is poisonous and caustic!

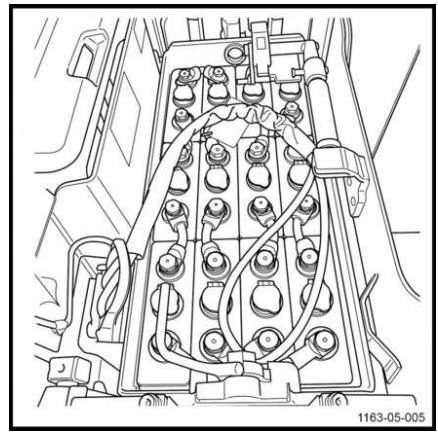
- Always wear suitable protective equipment (industrial goggles, safety gloves) when working on a battery.
- Never wear a watch or jewellery when handling battery acid.
- Do not allow any acid to get onto the clothing or skin or into the eyes. If this does happen, rinse immediately with plenty of clean water.
- Immediately rinse away any spilled battery acid with plenty of water.
- In case of injury, seek medical advice immediately.
- Always follow the safety information provided by the battery manufacturer.
- Comply with the regulations in force.

- Check the battery acid level and electrolyte density according to the battery manufacturer's recommendations.
- The cell covers of the battery must be kept dry and clean.
- Any spillage of battery acid must be neutralised immediately.

ENVIRONMENT NOTE

Dispose of any used battery acid in accordance with the regulations.

Checking the condition of the cables, terminals and battery connector ▷



- Check that the cable insulation is undamaged.
- Check that there are no signs of heat build-up in the connections.
- Check that the "+" and "-" output terminals are not sulphated (presence of white salt).
- Check the condition of the battery connector contacts and the presence of the keying pin.

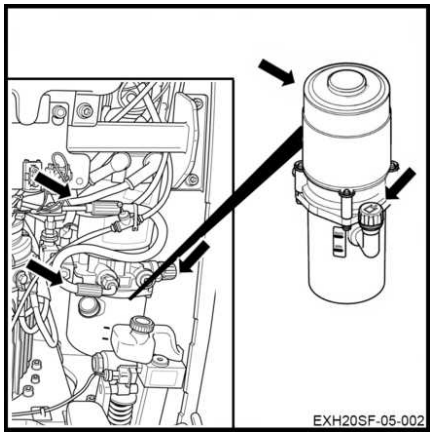
⚠ CAUTION

Risk of damaging the equipment

The points mentioned above can cause serious incidents. In the event of an incident, contact our After-Sales Service Centre as quickly as possible.

Hydraulic systems

Checking the hydraulic system for leaks ▷



– Switch off the truck and disconnect the battery connector.
– Remove the hood of the technical compartment.
– Inspect the hydraulic system: pipes, hoses and connections between the pump unit and the cylinders.
– Check the cylinders for leaks.
– Check that the hoses are attached correctly and show no signs of friction wear.
– Check the external pipes and hoses on the technical compartment.
– Refit the hood of the technical compartment.
– Return the truck to service.

⚠ CAUTION

Risk of damaging the truck

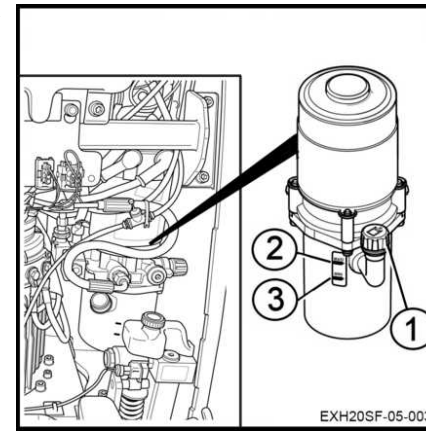
In the event of leakage, please contact the After-Sales Service Centre.

Checking the hydraulic oil level

To check the hydraulic oil level, proceed as follows:

– Immobilise the truck.
– Lower the load arms.
– Switch off the ignition and remove the key.
– Press the emergency off switch.
– Disconnect the battery connector.

– Remove the hood of the technical compartment. ▷



To ensure correct operation of the truck functions, the oil level must be between the minimum mark (3) and maximum mark (2) on the tank.

– Remove the plug (1). If necessary, top up via the opening.

– Refit the plug (1) afterwards.

⚠ CAUTION

Risk of damage to hydraulic components

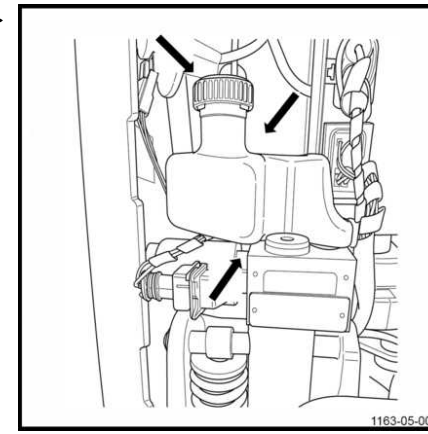
Only use hydraulic oil that complies with the manufacturer's specifications (see table of recommended lubricants).

– Refit the hood of the technical compartment.

– Reconnect the battery connector.

– Return the truck to service.

Checking the controlled stabiliser hydraulic system for leaks ▷



– Switch off the truck and disconnect the battery connector.

– Remove the hood of the technical compartment.

– Inspect the stabiliser hydraulic system:

- Tank
- Rigid pipes
- Connections from the stabiliser directional control valve block to the cylinders

– Check the tank for leaks.

– Tighten the swivel joints on the cylinders if necessary.

– Check the cylinders for leaks.

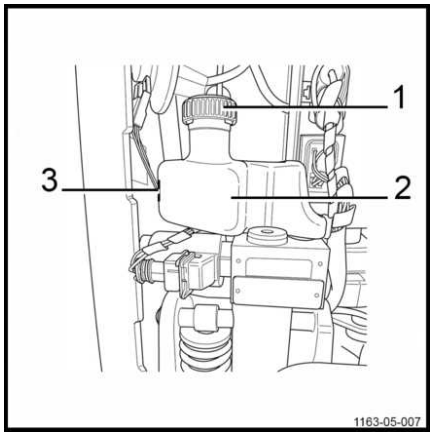
– Check that the rigid pipes are attached correctly and show no signs of friction wear.

– Refit the hood of the technical compartment.

– Return the truck to service.

In the event of leakage, please contact the After-Sales Service Centre.

Checking the oil level in the controlled stabiliser circuit ▷



– Switch off the truck and disconnect the battery connector.

– Remove the hood of the technical compartment.

It is essential that the oil level of the stabilisers is on the mark situated between the raised MIN and MAX (3) lettering on the tank (2)

– Top up the level if necessary, after unscrewing the plug (1).

– Screw the plug back in at the end of the operation.

⚠ CAUTION

Risk of damage to the truck

Only use hydraulic oil that complies with the specifications. See table of lubricants.

– Refit the hood of the technical compartment.

– Return the truck to service.

Storage and decommissioning

Storage of truck

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.

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 thoroughly.

– Check the hydraulic oil level and refill if necessary.

– Lower the forks onto a suitable support (e.g. a pallet) until the chains are slack.

– Coat any unpainted metal parts with a thin layer of oil or grease.

– Grease all hinges and joints.

– Check battery condition and electrolyte density. Maintain the battery in accordance with the manufacturer's requirements. (Follow the 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 service department 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 systems that are important for truck safety.

Carry out the following operations:

– Clean the truck thoroughly.

– Grease all hinges and joints.

– Check the condition and density of electrolyte, and, if necessary, recharge the battery.

– 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).
- lifting device.

Permanent Putting Out of Commission (Destruction)

When scrapping the truck, it is necessary to:

– Remove the various parts of the truck (covers, battery, chains, motors etc.)

– Sort out the components depending on their type: pipes, rubber components, lubricants, aluminium, iron etc.

– Before scrapping the truck, notify the competent authorities of your country in writing.

– After receiving the authorisation from the competent authorities, remove any components according to national standards.

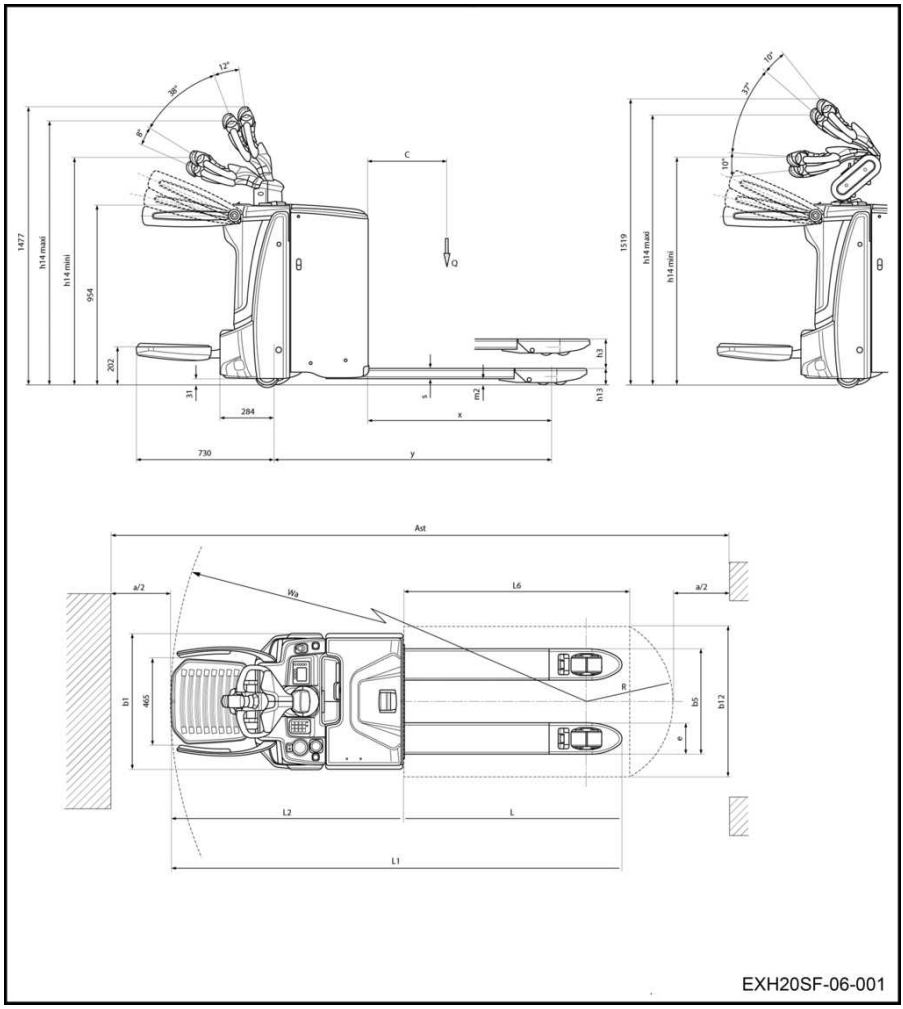
NOTE

The client is solely responsible for any irregularities he has committed during or after the scrapping of the truck's components and the removal of components.

6

Technical specifications

EXH-SF 20 and EXH-SF 25 datasheet



DESCRIPTION				
1.1	Manufacturer		STILL	
1.2	Model type		EXH-SF 20	EXH-SF 25
1.3	Drive type: battery, diesel, petrol, LPG, mains power		Battery	
1.4	Driving mode: manual, pedestrian, standing, seated, order picking		Standing	
1.5	Nominal capacity	Q (kg)	2000	2500
1.6	Centre of gravity	C (mm)	600	
1.8	Distance from load wheel axle to load support face (±5 mm)	X	965	
1.9	Wheelbase (±5 mm)	Y	1478	

WEIGHT			EXH-SF 20	EXH-SF 25
2.1	Kerb weight (±10%) with battery	kg	850 (2)	960 (2)
2.2	Load per laden axle, drive side/load side (±10%)	kg	1190/1660 (1)	1491/1969(1)
2.3	Load per unladen axle, drive side/load side (±10%)	kg	682/168 (1)	773/187 (1)

WHEELS			EXH-SF 20	EXH-SF 25
3.1	Tyre: polyurethane, rubber, drive side/ load side		R + P/P	
3.2	Drive wheel dimensions (width at the ground)	Ø x L (mm)	Ø230 x L90/Ø230 x L100	
3.3	Wheel dimensions, load side	Ø x L (mm)	Ø85 x L85 (bogies: Ø85 x L60)	
3.4	Additional wheels (dimensions)	Ø x L (mm)	2 x Ø125 x L60	
3.5	Number of wheels at drive side/load side (X = drive wheel)		1X + 2/2 (1X + 2/4)	
3.6	Track width, drive side (±5 mm)	mm	502	
3.7	Track width, load side (±5 mm)	mm	380	

DIMENSIONS			EXH-SF 20	EXH-SF 25
4.4	Lift (±5 mm)	h3 (mm)	125	
4.9.1	Height of tiller in driving position, min./ max. (±5 mm)	h14 (mm)	1208/1402	

4.9.2	Height of combi tiller in driving position, min./max. (±5 mm)	h14 (mm)	1213/1438
4.19	Total length (+5 mm)	L1 (mm)	86
4.20	Length to the load support face (±5 mm)	L2 (mm)	2338
4.21	Total width (±5 mm)	b1 (mm)	720
4.22	Load arm dimensions	s/e/L (mm)	55/165/1150
4.25	Outside load arm spread (± 5 mm)	b5 (mm)	520/540/560/680
4.32	Ground clearance at centre of wheel-base (±2 mm)	m2 (mm)	30
4.33	Load dimension b12 x L6	mm	800 x 1200
4.34	Aisle width with predetermined load	Ast (mm)	2870 (3)
4.34.2	Aisle width with an 800 x 1200 pallet crosswise	Ast (mm)	2699 (3)
4.35	Turning radius (minimum) (±20 mm), initial lift raised/lowered	Wa (mm)	2140/2210

PERFORMANCE DATA			EXH-SF 20	EXH-SF 25
5.1	Travel speed, laden/unladen (±5%)	km/h	6/6	12/10
5.2	Initial lifting speed when laden/unladen (±10%)	m/s	0.050/0.0061	
5.3	Initial lowering speed when laden/unladen (±10%)	m/s	0.102/0.082	
5.8	Maximum gradient, laden/unladen	%	20/15/12	
5.9	Acceleration time (10 m)	s	7.6/6.7	5.9/4.7
5.10	Service brake		electromagnetic	

DRIVE SYSTEM			EXH-SF 20	EXH-SF 25
6.1	Traction motor, S2: 60 minutes	kW	2.3	3
6.2	Lift motor at S3: 10% utilisation	kW	2.2	
6.3	Battery type in accordance with DIN 43 535		3 PzS SL	
6.4	Battery voltage and capacity (discharge in 5 hours)	V/Ah	24/375	
			3 PzS SL Li-ion 205 Ah: 23/205	
			3 PzS SL Li-ion 410 Ah: 23/410	
6.5	Battery weight (±10%)	(kg)	290	
	Battery weight with case (±10%)		3 PzS SL Li-ion 205 Ah: 190	

	Battery weight with case (±10%)		3 PzS SL Li-ion 410 Ah: 229	
6.6	Energy consumption according to standardised VDI cycle	kWh/h	0.42	0.51
6.7	Turnover output	T/h	118	177.5
6.8	Energy consumption at turnover output	kWh/h	0.91	1.68

MISCELLANEOUS			EXH-SF 20	EXH-SF 25
8.1	Speed monitor (AC controller)		LAC	
10.7	Noise level at forklift operator's ears (±2.5)	dB (A)	64	
	Vibrations transmitted to the operator (EN 13059)	m/s²		

1) Weight according to line 2.1

2) With battery line 6.5

3) Ast = Wa + R + a

Safety distance a = 200 mm

Eco-design requirements for electric motors and variable speed drives

All motors in this industrial truck are exempt from Regulation (EU) 2019/1781 because these motors do not meet the description given in Article 2 "Scope", Item (1) (a) and because of the provisions in Article 2 (2) (h) "Motors in cordless or battery-operated equipment" and Article 2 (2) (o) "Motors designed specifically for the traction of electric vehicles".

All variable speed drives in this industrial truck are exempt from Regulation (EU) 2019/1781 because these variable speed drives do not meet the description given in Article 2 "Scope", Item (1) (b).

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