Original instructions

STILL
ELECTRONIC
DOCUMENTATION
SYSTEM

Forklift towing tractor

KANVAN-05
KANVAN-10

CE

1067 1068

first in intralogistics

50108043033 EN - 00-10/2013

7 Technical data

1

Foreword

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 trucks have been fitted with state-of-the-art technology. All that remains is to handle the truck safely and maintain its functionality.

These operating instructions provide the necessary information to do this. Read and observe the information provided before commissioning the truck. This will prevent accidents and ensure that the warranty remains valid.

EC declaration of conformity in accordance with Machinery Directive

Declaration

STILL GmbH
Berzeliusstraße 10
D-22113 Hamburg Germany

We declare that the

Industrial truck	**according to these operating instructions**
Model	**according to these operating instructions**

conforms to the latest version of the Machinery Directive 2006/42/EC.

Personnel authorised to compile the technical documents:

See EC compliance declaration

STILL GmbH

Information about documentation

Documentation scope

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

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

Enter the production number and the year of production located on the nameplate ⇒ Chapter "Data plate", P. 4-51 in the field provided:

Production no. .....

Year of production
.....

Please quote these numbers for all technical enquiries.

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

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

The operating instructions are included in the spare parts list and can be reordered there as a spare part.

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

The operating company (see ⇒ Chapter "Definition of responsible persons", P. 26) must ensure that all operators have received, read and understood these instructions.

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

Date of edition and latest update of this manual

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

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

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

Copyright and trademark rights

Explanation of symbols used

⚠ DANGER

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

⚠ WARNING

Compulsory procedure that must followed to avoid injury.

⚠ CAUTION

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

NOTE

For technical requirements that require special attention.

ENVIRONMENT NOTE

To prevent environmental damage.

Explanation of the cross-references

Cross references are used to direct the reader to the appropriate section or chapter.

Examples:

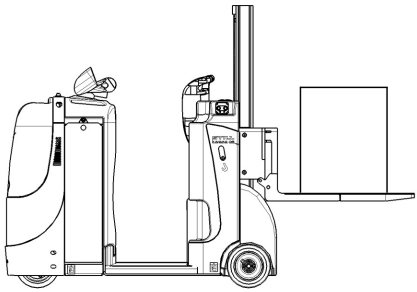
- Cross reference to a section: ⇒ Chapter "Explanation of the cross-references", P. 1-7
- Cross reference to a chapter: ⇒ Chapter "Definition of responsible persons", P. 26

Sample graphics

This documentation explains the cycle (usually sequential) of certain functions or operations. Schematic diagrams of a truck are used to illustrate these cycles.

NOTE

These schematic diagrams are not representative of the constructed state of the documented truck.



Environmental considerations

Packaging

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

ENVIRONMENT NOTE

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

Disposal of components and batteries

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

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

NOTE

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

ENVIRONMENT NOTE

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

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Introduction

Technical description

The KANVAN forklift tractor combines the driveability and compactness of a platform tractor with the option of handling loads of up to 500 kg (KANVAN 05) and 1000 kg (KANVAN 10) at a height of 1250 or even 1800 mm. Its 3 kW AC motor ensures a traction capacity of 4000 kg and a speed of 7.5 km/h with load and 13 km/h without load. Its compact construction with a length of 1595 mm guarantees maximum manoeuvrability even in the narrowest aisles.

Steering

- Electric steering with automatic return to neutral.
- On straight runs, an electrical compensation system for involuntary steering actions made by the driver ensures a perfectly straight trajectory without the trailer swaying.
- The drive wheel's central position guarantees optimal traction and stability when moving in a straight line and when slowing.
- Automatic speed reduction when cornering ensures a very high level of lateral stability by reducing the effects of centrifugal force.

Chassis

- The front part is reinforced by a large fender. A removable front hood ensures quick and easy access to all of the vehicle's subplates.

Multi-function control panel

The new-generation multi-function cockpit brings together all of the KANVAN's driving, manoeuvring and control functions. The ergonomic position of the different buttons allows all the functions to be used without having to move your hand. The cockpit brings together the following functions:

- Driving
- Steering
- Lifting and lowering
- Hour meter
- Battery charge indicator
- Adjustable driving programs
- PIN code access control included as standard
- Diagnostics by service codes

Furthermore, the multi-function joystick on the STILL cockpit control panel allows steady and tension-free steering during driving.

Handling functions

- The lifting device is very simply operated from the driver's platform via the cockpit. An additional control is also included as standard at the front of the vehicle for greater comfort and visibility of the fork ends when handling loads.
- A patented system allows the fork arms to be raised and lowered at the touch of a button. The driver is therefore able to control and check all handling functions on the vehicle without leaving the platform.

Driver's platform

- The suspended driver's platform offers optimal comfort when driving as well as when mounting and dismounting from the platform thanks to its low access height and its thick, anti-slip mat.
- This mat includes a detector switch safety mechanism: The driver must be on-board the vehicle while carrying out fork lifting and lowering operations.
- The support area at the front of the platform is covered by a high-strength moulded (RIM) plastic coating that is ergonomically designed to support a standing driver.
- Rear backrest with ergonomic side handles offers a high standard of comfort and safety when moving.
- Platform with several storage options, as well as fastenings for rolls of plastic film or document holders.

Drive

- Powerful and economical 3.0 kW AC asynchronous motor designed and configured for maximum efficiency.
- The drive wheel's central position guarantees good traction.
- High ground clearance of 70 mm and polyurethane tyres with a strong damping coefficient allow the truck to be used outdoors and/or on uneven ground.
- Direct locking of the motor brake by the control when the accelerator pedal is released prevents uncontrolled backwards movement - for example, in the event of stopping on a slope.
- In "ECO" mode (turtle icon), the motor operates according to its standard specifications - meaning it consumes a minimum amount of current with acceleration set to its nominal value. Advantage: maximum range between each battery charge.
- In "BOOST" mode (hare icon), the motor is configured according to a dynamic curve that gives high torque, powerful acceleration and a maximum speed with load. Advantage: maximum productivity from every battery charge.
- This choice of two drive settings ensures the driver always enjoys the most suitable parameters (speed, acceleration and braking), whatever the situation and use.
- A speed sensor integrated into the control ensures that the KANVAN accelerates smoothly and gradually up to the maximum speed, regardless of the load towed or carried on the forks.
- The truck uses two types of braking: by simply releasing the accelerator pedal in the cockpit or by activating the brake. The AC motor works as a generator, restoring battery energy lost through braking.

Mast

- The KANVAN Simplex mast offers a lift height of 1250 mm as standard or 1800 mm as an option.
- Depending on the type of loads to be lifted, the truck can be fitted with three different lengths of fork arms that can be folded upwards (790 mm, 990 mm and 1190 mm).
- A proportional hydraulic valve ensures precise and gradual lifting and lowering of loads, as well as good fluency when lowering and lifting the folding forks.

Braking system

- Gradual braking is very safe and recovers energy when activated by releasing or reversing the acceleration throttle valve.

Battery

- The battery is easily accessible and can, in case of continuous use on two or three shifts, be changed using a hoist or laterally using the rollers integrated into the floor of the compartment.
- Choice of two battery compartment sizes, giving a capacity of 450 or 600 Ah respectively.

Coupling

- 4000 kg traction capacity
- The coupling pin fitted as standard allows five coupling heights (300/355/410 mm).

Operating the truck

Intended use of the trucks

⚠ CAUTION

This machine is designed to tow industrial trailers and for the storage of loads packed on pallets or in industrial containers designed for this purpose.

The dimensions and capacity of the trailers, pallets or containers must be adapted to the load being transported and must ensure stability.

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

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

⚠ CAUTION

Never use the trailer mode and the pallet stacker mode at the same time!

This machine can be operated in trailer mode OR pallet stacker mode.

Therefore, it is prohibited to tow a trailer and stack another load at the same time.

Approved applications

The truck is suitable for carrying and transporting loads in a way described and shown in this manual.

If the truck is to be used in a way other than established in the operating instructions, the written approval of the manufacturer and, if necessary, of the responsible authorities must be obtained beforehand to prevent any potential dangers.

The maximum load that can be towed is specified on the drawbar pull plate. Do not exceed the maximum load capacity.

Unintended use

Any danger due to unauthorised use becomes the responsibility of the operator or driver and

not of the manufacturer (also see ⇒ Chapter "Definition of responsible persons", P. 26).

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

⚠ WARNING

There is a risk of accident!

Passengers are not allowed.

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

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

Place of use

The truck can be used in buildings and, occasionally, outside. The truck cannot be used outside during bad weather! Operation on public roads is only permitted if the special equipment specified in the Road Traffic Licensing Regulations is installed.

The various regulations applicable in different countries for driving the truck on public roads must be observed.

The sites on which the truck is used must comply with the current regulations (condition of the ground, lighting, etc.).

The ground must have sufficient load capacity (concrete, asphalt). The driveways, work areas and working widths must correspond with the specifications in the operating manual (see ⇒ Chapter "Before driving", P. 5-68).

The truck can be operated on a slope in compliance with the data and specifications indicated (see ⇒ Chapter "Before driving", P. 5-68).

The truck is suitable for mainly indoor use.

Your truck is not suitable for use in a refrigerated storage area.

The operator (see ⇒ Chapter "Definition of responsible persons", P. 26) must ensure adequate fire protection in the vicinity of the

truck for its use. If necessary, additional fire protection must be provided on the truck. If in doubt, contact the relevant authorities.

Residual risks

Residual dangers, residual risks

Despite careful working and compliance with standards and regulations, the occurrence of other risks when using the truck cannot be entirely excluded.

The truck and all other system components comply with current safety requirements. Nevertheless, even when the truck is used for its proper purpose and all instructions are followed, some residual risk cannot be excluded.

Even beyond the narrow danger areas of the truck itself, a residual risk cannot be excluded. Persons in this area around the truck must exercise a heightened degree of awareness, so that they can react immediately in the event of any malfunction, incident or breakdown etc.

⚠ WARNING

All persons that are in the vicinity of the truck must be instructed regarding these risks that arise through use of the truck.

In addition, we draw attention to the safety regulations in these operating instructions.

The risks can include:

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

The manufacturer is not held responsible for accidents involving the truck caused by the failure of the operating company to comply with these regulations either intentionally or carelessly.

Stability

The stability of the truck has been tested to the latest technological standards and is guaranteed if the truck is used properly and according to its intended purpose. These standards only take into account the static and dynamic tipping forces that can arise during specified use in accordance with the operating rules and intended purpose. The risk of exceeding the moment of tilt that arises from improper use or incorrect operation cannot be excluded in extreme cases, and will impact stability.

The risks can include:

- loss of stability due to unstable or sliding loads etc.
- cornering at excessive speeds,
- moving with the load raised,
- moving with a load that is protruding to the side (e.g. sideshift),
- turning and driving diagonally across slopes,
- driving on slopes with the load on the downhill side,
- loads that are too wide,
- swinging loads,
- ramp edges or steps.

Special risks arising from use of the truck and its accessories

Consult the manufacturer or the relevant work safety authority if you use your truck for works outside normal use or if the operator is uncertain of the correct use and compliance with the safety regulations. In particularly difficult cases, the person responsible for manoeuvring must be present at the site of the operation to direct and supervise the manoeuvres.

⚠ CAUTION

In lifting mode, allow sufficient space for the forks to be extended.

Overview of hazards and counter-measures

NOTE

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

NOTE

Observe the national regulations for your country!

Hazard	Measure	Check note √ actioned - not applicable	Notes
Truck equipment does not comply with local regulations	Test	O	If in doubt, consult competent factory inspectorate or employers' liability insurance association
Lack of skills and qualification of driver	Driver training (sit-on and stand-on)	O	BGG 925 VDI 3313 driver permit
Usage by unautho-rised persons	Access with key only for authorised persons	O	
Truck not in a safe condition	Recurrent testing and rectification of defects	O	BetrSichVO (Workplace Safety Ordinance)
Risk of falling when using working platforms	Compliance with national regulations (different national laws)	O	BetrSichVO (Workplace Safety Ordinance) and employer's liability insurance associations
Impaired visibility due to load	Resource planning	O	BetrSichVO (Workplace Safety Ordinance)
Contamination of respiratory air	Assessment of diesel exhaust gases	O	TRGS 554 and BetrSichVO (Workplace Safety Ordinance)
	Assessment of LPG exhaust gases	O	MAK (Maximum Workplace Concentrations) list and BetrSichVO (Workplace Safety Ordinance)

Hazard	Measure	Check note √ actioned - not applicable	Notes
Impermissible usage (improper usage)	Issuing of operating instructions	O	BetrSichVO (Workplace Safety Ordinance) and ArbSchG (Health and Safety at Work Act)
	Written notice of instruction to driver	O	BetrSichVO (Workplace Safety Ordinance) and ArbSchG (Health and Safety at Work Act)
	Observe BetrSichVO (Workplace Safety Ordinance), operating instructions and VDMA (German Engineering Federation) rules	O	
When fuelling			
a) Diesel	Observe BetrSichVO (Workplace Safety Ordinance), operating instructions and VDMA (German Engineering Federation) rules	O	
b) LPG	Observe BGV D34, operating instructions and VDMA rules	O	
When charging the traction battery	Observe BetrSichVO (Workplace Safety Ordinance), operating instructions and VDMA (German Engineering Federation) rules	O	VDE 0510: In particular - Ensure ventilation - Insulation value within permissible range
When using battery chargers	Observe BetrSichVO (Workplace Safety Ordinance), BGR 104 and operating instructions	O	BetrSichVO (Workplace Safety Ordinance) and BGR 104
When parking LPG trucks	Observe BetrSichVO (Workplace Safety Ordinance), BGR 104 and operating instructions	O	BetrSichVO (Workplace Safety Ordinance) and BGR 104

Hazard	Measure	Check note √ actioned - not applicable	Notes
With driverless transport systems			
Roadway quality inadequate	Clean/clear driveways	O	BetrSichVO (Workplace Safety Ordinance)
Load carrier incorrect/slipped	Reattach load to pallet	O	BetrSichVO (Workplace Safety Ordinance)
Drive behaviour unpredictable	Employee training	O	BetrSichVO (Workplace Safety Ordinance)
Driveways blocked	Mark driveways Keep driveways clear	O	BetrSichVO (Workplace Safety Ordinance)
Driveways intersect	Announce right-of-way rule	O	BetrSichVO (Workplace Safety Ordinance)
No person detection during depositing and retrieval	Employee training	O	BetrSichVO (Workplace Safety Ordinance)

Hazards to employees

In accordance with the operating safety ordinance (BetrSichVO) and the German law on health and safety at work (ArbSchG), the operator (see ⇒ Chapter "Definition of responsible persons", P. 26) must identify and assess hazards during operation and establish health and safety measures at the workplace necessary to protect employees (BetrSichVO). The operator must therefore draw up appropriate operating instructions (§ 6 ArbSchG) and make them available to the driver. A person responsible for health and safety must be appointed.

Truck construction and equipment is regulated by the Machines Directive 2006/42/CE and therefore bears the CE mark. On account of their own CE mark, the attachment parts are not included in the hazard assessment. The operator must, however, select the type and equipment of the trucks so as to comply with local regulations relating to deployment.

The results must be documented (§ 6 ArbSchG). In the case of truck deployment involving similar hazard situations it is permitted to summarise the results. This overview (see ⇒ Chapter "Overview of hazards and countermeasures", P. 2-20) is designed to assist in satisfying the conditions of this regulation. The overview specifies the main causes of accidents in the event of non-compliance. If other major operational hazards are involved, these must also be taken into consideration.

The conditions of use for trucks are broadly similar in many plants, so that the hazards can be summarised in one overview. Follow the information provided by the relevant employers' liability insurance company in this regard.

3

Safety

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 proper purpose and in compliance with the safety regulations set out in these operating instructions.

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

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

We recommend that the national performance specifications are adhered to.

Specialist

A qualified person is defined as a mechanic working for the manufacturer or a person who fulfils the following requirements:

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

truck to be tested and the risk being assessed.

Expert

An expert is considered to be someone whose technical training and experience have enabled them to develop appropriate knowledge of industrial trucks and who is sufficiently familiar with the applicable national health and safety regulations, directives and generally recognised technical conventions (standards, VDE regulations, technical regulations of other member states of the European Union or other countries that are signatories to the treaty establishing the European Economic Area) capable of assessing the condition of industrial trucks in terms of health and safety.

Driver

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

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

Driver rights, duties and rules of behaviour

The driver must be trained in his rights and duties.

The driver must be granted the required rights.

The operator must wear appropriate protective equipment (protective clothing, safety footwear, safety helmet, industrial goggles

and safety gloves) suited to the operating conditions, the job and the load to be lifted. The driver must wear safety footwear for driving and braking in complete safety.

The drive must be familiar with the operating instructions, which must remain accessible at all times.

The driver must:

- Have read and understood the operating instructions
- Know how to operate the truck in complete safety
- Be physically and mentally capable of driving the truck safely

⚠ DANGER

The use of drugs, alcohol or medications that have an effect on reactions impair a person's ability to drive the truck!

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

Prohibition on use by unauthorised persons

The operator is responsible for the truck during working hours. He must prohibit any operation of the machine by unauthorised persons.

When leaving the truck, the driver must secure it against any unauthorised use.

Basic principles for safe operation

Insurance cover on company premises

In many cases, company premises are restricted public traffic areas.

NOTE

The business liability insurance should be reviewed to ensure that, in the event of any damage caused in restricted public traffic areas, there is insurance cover for the truck in respect of third parties.

Warning regarding non-original parts

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

⚠ CAUTION

Installation and/or use of such products may therefore have a negative impact on the design features of the truck and thus impair active and/or passive driving safety.

We recommend that you obtain approval from the manufacturer and, if necessary, from the relevant regulatory authorities before installing such parts. The manufacturer accepts no liability for any damage caused by the use of non-original parts and accessories without approval.

Modifications and refitting

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

If your truck is used for work that is not specified in the guidelines or in this manual and it must be modified or refitted for this purpose, please remember that any structural modification may affect truck handling while driving and its stability, and may lead to accidents.

You should therefore contact the manufacturer before carrying out any modification. No modification that may affect stability is permitted without the manufacturer's authorisation.

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

You may only make a modification or alteration to your truck, **if the manufacturer is no longer in business and is unlikely to be taken over by another company,** and only on condition that:

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

Medical equipment

When a driver is wearing medical equipment, e.g. heart pacemaker or hearing aids, the operation of this equipment may be affected. A doctor or the manufacturer of the medical equipment should be asked whether the equipment is sufficiently protected against electromagnetic interference.

Safety tests

Regular safety inspection of the truck ▷

Safety inspection based on time and extraordinary incidents

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

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

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

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

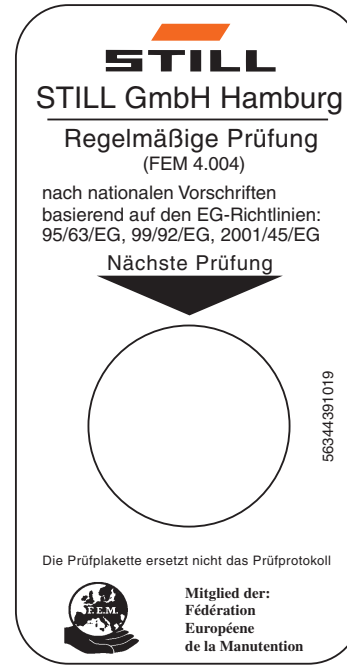
– Observe guidelines for checks carried out on the truck in accordance with FEM 4.004.

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

– Contact your service centre.

NOTE

Observe the national regulations for your country!



Electrical insulation test

The truck's electrical insulation must have sufficient insulation resistance. Insulation resistance must be tested in accordance with DIN 57117 and DIN 43539, VDE 0117 and VDE 0510 at least once a year.

NOTE

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

Measuring battery insulation resistance

NOTE

Nominal battery voltage < test voltage < 500V.

– Measure insulation resistance using a suitable meter.

The insulation resistance is sufficient when it has a nominal value of at least 1000 Ohms/V against the chassis.

Ask our service department.

Measuring the insulation resistance of the electrical system

NOTE

Nominal battery voltage < test voltage < 500V.

– Before testing the circuit, check that it is electrically dead.

– Measure insulation resistance using a suitable meter.

The insulation resistance is sufficient when it has a nominal value of at least 1000 Ohms/V against the chassis.

Ask our service department.

Safety regulations for handling consumables

Permissible consumables

⚠ DANGER

Failure to observe the safety regulations relating to consumables may result in a risk of injury, death or damage to the environment.

– Observe the safety regulations when handling such materials.

Refer to the maintenance data table for the permissible substances that are necessary for operation (see ⇒ Chapter "Table of maintenance characteristics", P. 6-119).

Oils

⚠ DANGER

Oils are flammable!

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

⚠ DANGER

Oils are toxic!

– Avoid contact and consumption.
– If vapour or fumes are inhaled, move to fresh air immediately.
– In the event of contact with the eyes, rinse thoroughly (for at least 10 minutes) with water 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 dryness and irritate the skin!

– 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!

– Spilt oil should be removed immediately with oil-binding agents and disposed of according to the regulations.

ENVIRONMENT NOTE

Oil is a water-polluting substance!

- *Always store oil in containers that comply with the applicable regulations.*
- *Avoid spilling oils.*
- *Spilt oil should be removed immediately with oil-binding agents and disposed of according to the regulations.*
- *Dispose of old oils according to the regulations.*

Hydraulic fluid

⚠ WARNING

These fluids are pressurised during operation of the truck and are hazardous to your health.

– Do not spill the fluids.
– Follow the statutory regulations.
– Do not allow the fluids to come into contact with hot engine parts.

⚠ WARNING

These fluids are pressurised during operation of the truck and are hazardous to your health.

– Do not allow the fluids to come into contact with the skin.
– Avoid inhaling 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, immediate medical assistance is required.
– 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 that comply with regulations*
- *Avoid spills*
- *Spilt hydraulic fluid should be removed immediately with oil-binding agents and disposed of according to the regulations*
- *Dispose of old hydraulic fluid according to the regulations*

Battery acid

⚠ WARNING

Battery acid contains dissolved sulphuric acid. This is toxic.

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

⚠ WARNING

Battery acid contains dissolved sulphuric acid. This is corrosive.

- When working with battery acid, always wear a protection suit and eye protection.
- When working with battery acid, never wear a watch or any jewellery.
- Do not allow any acid to get onto clothing or skin or into the eyes; if this does happen, rinse immediately with plenty of clean water.
- In case of injury, seek medical advice immediately.
- Immediately rinse away spilt battery acid with plenty of water.
- Follow the statutory regulations.

ENVIRONMENT NOTE

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

Disposal of consumables

ENVIRONMENT NOTE

Materials that accumulate during repair, maintenance and cleaning must be collected properly and disposed of in accordance with the national regulations for the country in which the truck is being used. Work must only be carried out in areas designated for the purpose. Care must be taken to minimise any environmental pollution.

- Soak up any spilt fluids such as hydraulic oil, brake fluid or gearbox oil using an oil-binding agent.
- Neutralise any spilt battery acid immediately.
- Always observe national regulations concerning the disposal of used oil.

Emissions

Noise emissions

The values are determined using the methods set out in the European Standard EN 12053 (measuring noise emissions from industrial trucks, based on Standards ISO 11201 and EN ISO 3744 and in compliance with standard EN ISO 4871). In accordance with this method, the machine transmits the following sound pressure level:

Continuous sound pressure level in driver's compartment	
LpAz	64 dB (A)
Uncertainty KpA	2.5 dB (A)

These values were recorded during a test cycle using an identical machine and calculated from the weighted values under driving, lifting and idling conditions.

Time proportions:

Lifting	0%
Idling	60%
Driving	40%

However, the noise measurements taken near the truck cannot be used to calculate the noise level at the work places in compliance with the **European Community Directive 86/188/EEC** (daily personal noise exposure). Noise levels must be measured directly at the work places and measurement must account for other factors (additional sources of noise, specifics of application and sound reflection).

Vibrations

Machine vibrations were measured using an identical machine, in accordance with Standard CEN EN 13059 "Test methods for measuring vibration by industrial trucks".

Weighted effective value of the stress on the body by acceleration (feet or seat):	1.71 m/s^2
Uncertainty K	±0.51 m/s^2

Trials have shown that the amount of hand-arm vibration when using the steering wheel and controls is less than 2.5 m/s^2 for industrial trucks. Consequently, no legal guidelines exist for this type of measurement.

The personal stress on the operator caused by vibrations during a day's work must be noted if necessary at the actual workplace so as to be able to consider all the other factors such as the state of the track, the intensity of use etc.

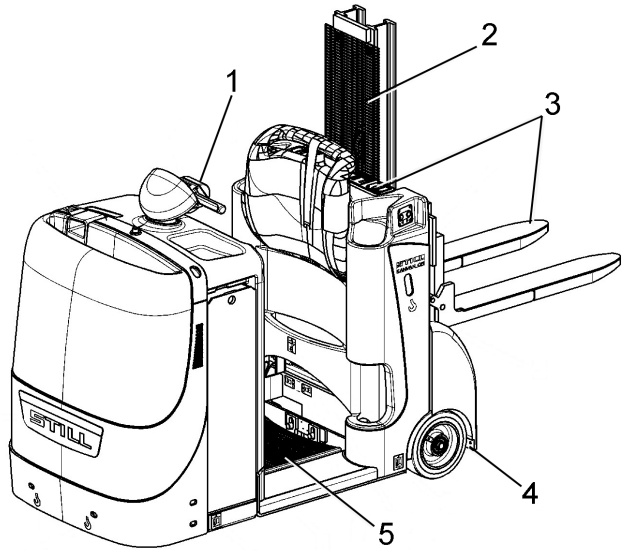
Traction battery emissions

Battery charging releases an explosive oxygen/hydrogen gas mixture (oxyhydrogen). This gas mixture is highly explosive and must not be ignited. Risk of explosion may be reduced by charging in an open area, away from all sources of open flames or sparks. Observe the safety regulations for handling batteries.

Safety devices

Location of safety devices

Main safety devices on the truck



1 Emergency stop button
2 Guard grille
3 Foldable forks with fork extension safety control on the backrest
4 Reinforced foot protection (with slow forward travel)
5 Platform with user detection
* Automatic reduction in speed when turning
** Ramp Stop® function

Ramp Stop® function

The Ramp Stop® function enables a gentle start-off when stopping on a slope, without the vehicle rolling backwards at all.

⚠ DANGER

Do not climb on the dashboard.

⚠ DANGER

Do not stand on the forks or the rear of the tractor.

⚠ CAUTION

Always exit the tractor on the side where there is no traffic.

⚠ CAUTION

Risk of crushing your feet in pedestrian mode.

Ensure that your feet are placed far enough away from the truck chassis.

Damage, defects and misuse of safety devices

The driver must report any damage or other defects to the truck or attachment immediately to the supervisory personnel.

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

Do not remove or deactivate safety devices and switches.

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

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

Battery connection cables

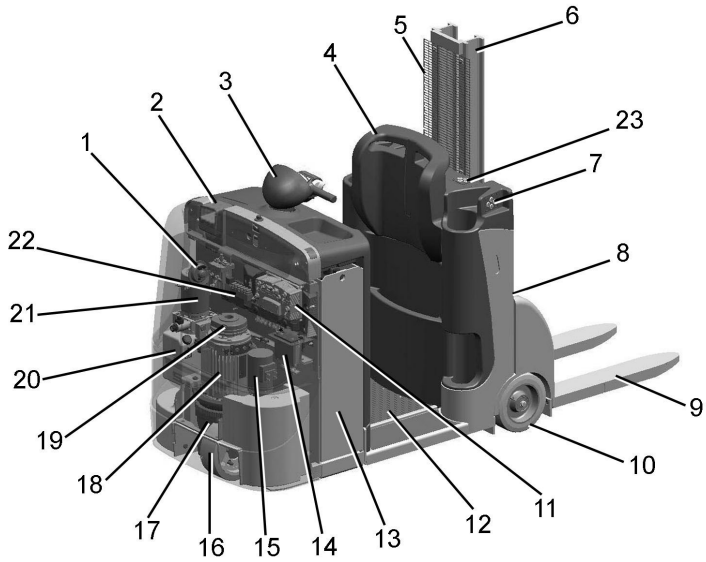
⚠ CAUTION

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

4

Overview

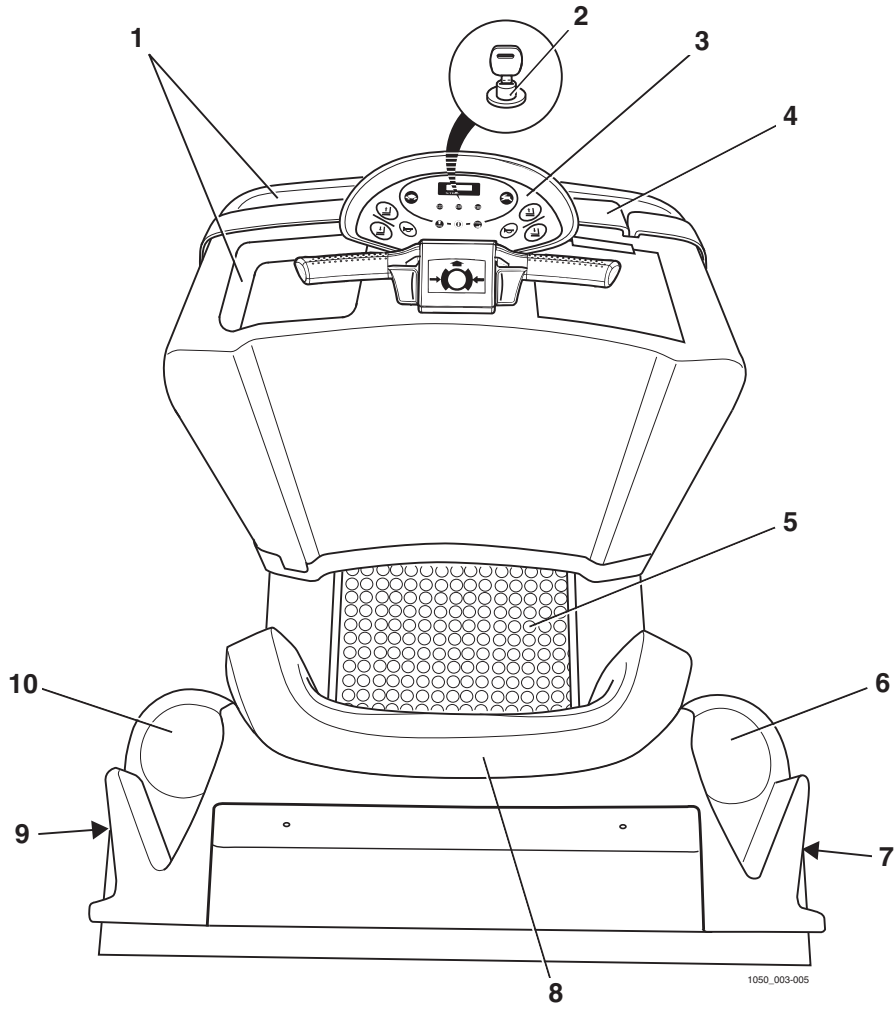
Total overview



1	Warning horn	12	Platform
2	Battery connector	13	Battery
3	Cockpit	14	Steering controller
4	Backrest	15	Power steering motor
5	Guard grille	16	Drive wheel
6	Mast	17	Reducer
7	Accompanied operation push-button (optional)	18	Traction motor
8	Tow coupling	19	Electromagnetic brake
9	Foldable forks	20	Hydraulic tank
10	Load wheels	21	Pump motor
11	Traction controller	22	Fuses
		23	Buttons for fork extension/folding

Control and display elements

Control devices



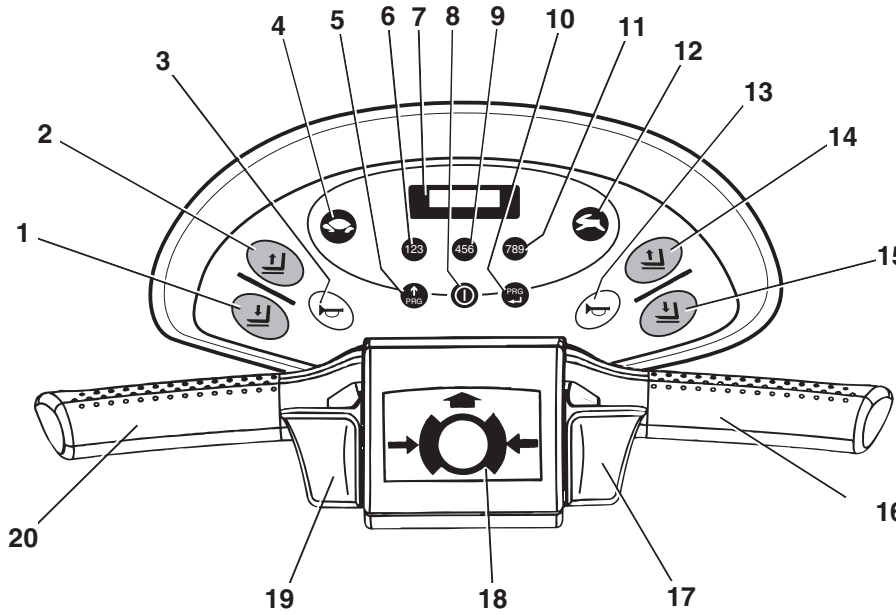
1	Storage compartment	7	Accompanied operation push-button (optional)
2	Battery compartment lock	8	Backrest
3	Cockpit	9	Accompanied operation push-button (optional)
4	Battery connector	10	Storage compartment
5	Presence zone		
6	Storage compartment		

Control and display elements

1 Foldingof forks

2 Extending of forks

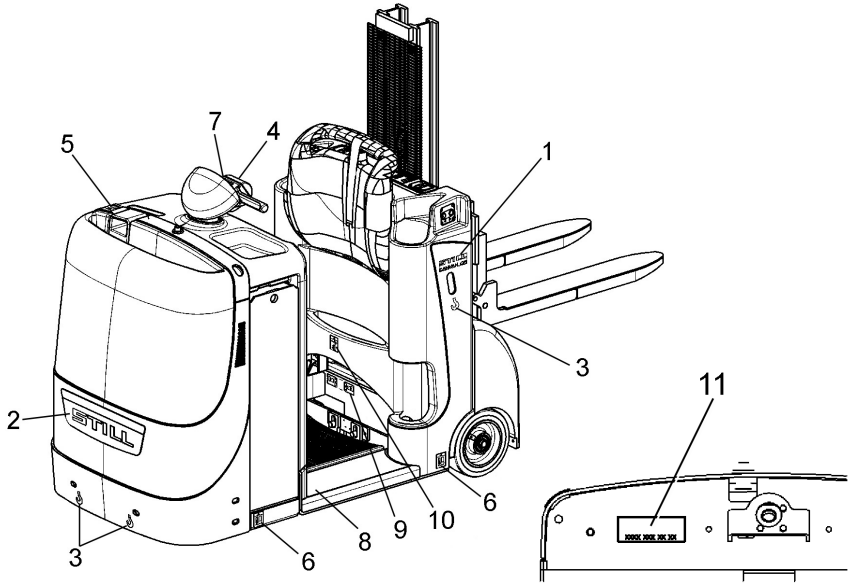
Cockpit



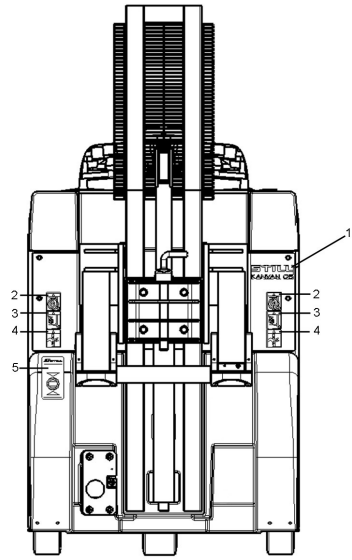
1	Lowering	11	Number button 789
2	Raising	12	Button, hare
3	Horn button	13	Horn button
4	Button, tortoise	14	Raising
5	PRG ↑ button (scroll)	15	Lowering
6	Number button 123	16	Handle
7	Display	17	Drive control throttle valve
8	Button I (start)	18	Emergency brake push button
9	Number button 456	19	Drive control throttle valve
10	PRG ↵ button (confirmation)	20	Handle

Markings

Marking positions

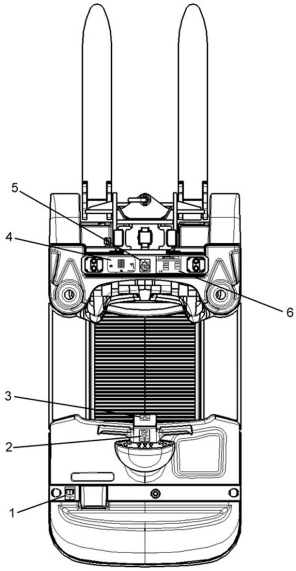


1	Manufacturer’s symbol and product identification	6	"Foot crushing" labels
2	Manufacturer’s symbol	7	"Non-slinging" label
3	"Slinging" symbol	8	Non-slip foot panels
4	"Stop" label	9	"Plug" label
5	"Decal information" label	10	"Not to be stood on" label
		11	Serial number label (barcode on the chassis)



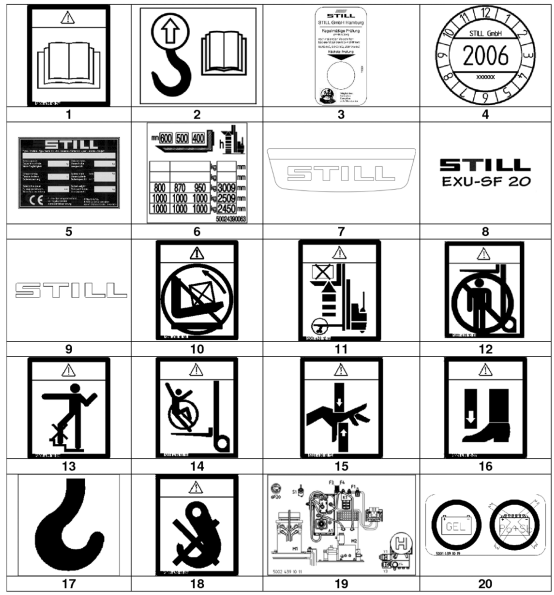
1	Manufacturer’s symbol and product identification	3	"Do not step onto the forks" label
2	"Danger/load" label	4	"Hand crushing" label
		5	UVV plate and mounting (Germany only)

Markings

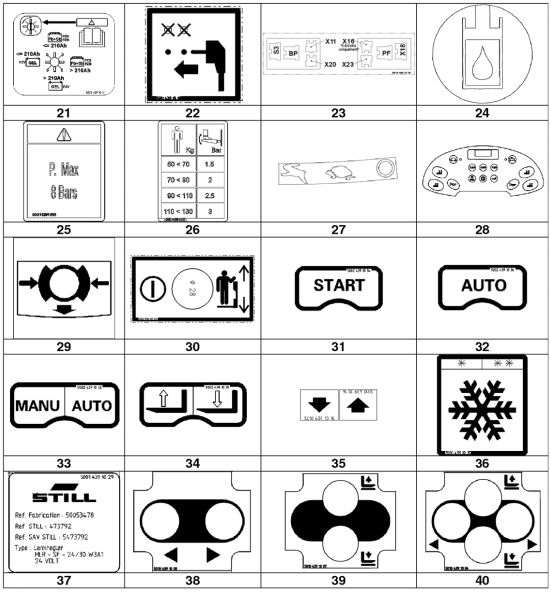


1	"Decal information" label	4	Loading diagram
2	"Non-slinging" label	5	"Forks" label
3	"Stop" label	6	Company plate

Labels



1	Operating instructions
2	Slinging - See the operating instructions
3	UVV support (Germany only)
4	UVV plate (Germany only)
5	Company plate
6	Load capacity plate (example)
7	Manufacturer's logo
8	Truck identification (example)
9	Company decal
10	Do not fold the forks when they are holding a load
11	Do not lift a load with the initial lift in the upper position
12	Do not step under a raised load
13	Do not climb
14	Do not stand on the forks
15	Risk of crushing hands
16	Risk of crushing feet
17	Slinging point
18	Do not sling here
19	Electrical plate (example)
20	Gel battery



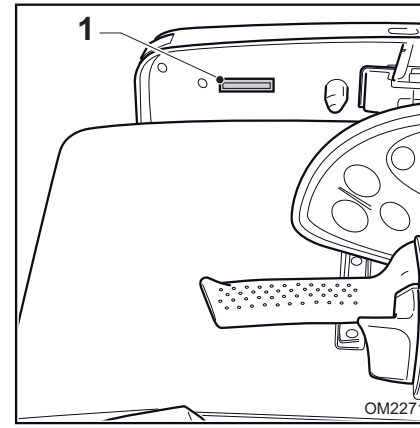
21 On-board charger label
22 Mains connector (on-board charger)
23 "Plugs" label
24 Hydraulic filler
25 Maximum pressure (example)
26 Platform pressure diagram (example)
27 Operating mode indication label
28 "Cockpit" label
29 Stop
30 Nacelle
31 Automatic mode confirmation (EXU-H autolift only)
32 Automatic mode selection indicator (EXU-H autolift only)
33 Manual or automatic mode selection (EXU-H autolift only)
34 Automatic lifting/lowering mode selection
35 Arrows
36 Cold store
37 Traction controller label
38 Slow forward travel (pedestrian mode)
39 Raising/lowering of forks
40 Slow forward travel (pedestrian mode) + raising/lowering of forks

NOTE

The labels listed below are not necessarily affixed to all trucks.

Chassis frame labelling

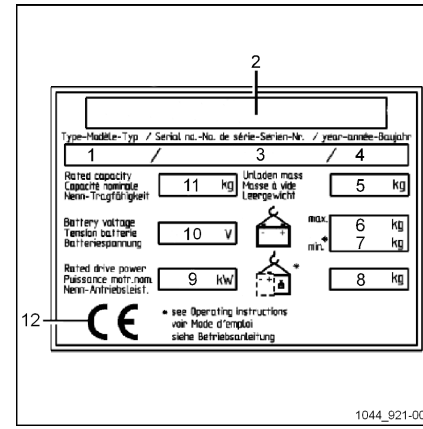
The truck's serial number is marked on the chassis frame (1).



Data plate

NOTE

Please indicate the serial no. for all technical enquiries.



1 Model
2 Manufacturer
3 Serial no.
4 Year of manufacture
5 Unladen weight (without battery) in kg
6 Maximum battery weight
7 Minimum battery weight
8 Additional weight (ballast) in kg
9 Nominal power rating in kW
10 Battery voltage V
11 Rated capacity in kg
12 EC conformity symbol

Options and variants

Standard equipment and options

Designation	Dimensions/Notes	KANVAN 05	KANVAN 10
Simplex mast (SX)	h1 = 1626 mm h = 1250 mm	Standard	Standard
Simplex mast (SX)	h1 = 2176 mm h = 1800 mm	Variant	Variant
Battery with roller platform	Boot 91 for 24 V / 520-620 Ah battery	-	Standard
Battery with roller platform	Boot 97 for 24 V / 345-465 Ah battery	Standard	-
Battery with roller platform	Boot 91 for 24 V / 520-620 Ah battery	Optional	-
Forks	Length = 790 mm Width = 120 mm	Optional	-
Forks	Length = 790 mm Width = 120 mm With non-slip coating	Optional	Optional
Forks	Length = 990 mm Width = 120 mm	Standard	-
Forks	Length = 990 mm Width = 120 mm With non-slip coating	Optional	Standard
Forks	Length = 1190 mm Width = 120 mm	Optional	-
Forks	Length = 1,190 mm Width = 120 mm With non-slip coating	Optional	Optional
Load wheels	250x80 mm Polyurethane 75 Shore A	Standard	Standard
Drive wheel	250x100 mm Polyurethane 92 Shore	Optional	Optional
Drive wheel	250x100 mm Notched polyurethane 92 Shore	Optional	Optional
Drive wheel	250x100 mm Soft polyurethane 75 Shore	Standard	Standard
Single-point tow coupling	-	Optional	Optional
Three-point tow coupling	-	Standard	Standard

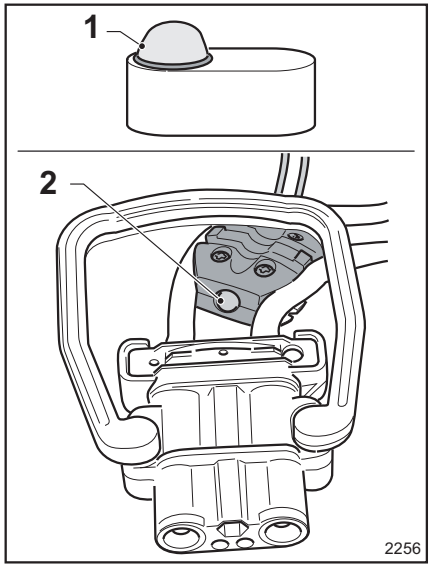
Designation	Dimensions/Notes	KANVAN 05	KANVAN 10
One-point coupling with automatic hook	-	Optional	Optional
Rockinger coupling	-	Optional	Optional
Steel bumper	Height 165 mm, drive area side With rubber insert	Optional	-
Steel bumper	Height 545 mm, drive area side	Optional	-
Steel bumper	Height 240 mm, drive area side With fixture for additional coupling	-	Standard
Steel bumper	Height 240 mm, drive area side With fixture for additional coupling and three-point tow coupling (max. traction load 1 t)	-	Optional
Metal battery cover	For boot 97	Optional	-
Padded backrest	-	Standard	Standard
Front accessory bar, lower drive area	-	Optional	Optional
Front accessory bar, upper drive area	-	Optional	Optional
Upper front accessory bar, with drive area cross piece	-	Optional	Optional
Pedestrian mode in forward/reverse gear with throttle release in the cockpit	-	Optional	Optional
Pedestrian mode in forward/reverse gear, throttles in cockpit + forward/reverse inching using buttons on either side of the backrest	-	Optional	Optional
Pedestrian mode in forward/reverse gear using buttons on either side of backrest	-	Optional	Optional
Upper accessory bar on coupling side	-	Optional	Optional

Options and variants

Designation	Dimensions/Notes	KANVAN 05	KANVAN 10
Programmable maintenance intervals	-	Optional	Optional
Flashing light, preferably under the accessories bar on the load side, with grill, LED system, 24 V, 65 flashes per minute, 6 sequences	-	Optional	Optional
Round work light with switch, 131 mm in diameter, 226 mm in height, 24 V, 70 Watts, front mounted on the accessories bar, protection grill, can be pointed in all directions	-	Optional	Optional
Standard hour meter connected to travel and lifting	-	Standard	Standard
Permanent reading standard hour meter connected to travel and lifting	-	Optional	Optional
Combination hour meter/counter for open lead-acid battery with speed limitation		Standard	Standard
Combi/hour meter for sealed battery with speed limitation		Optional	Optional
DIN A4-format adjustable clipboard mounted on the accessories bar	-	Optional	Optional
160 A SBE red cable and socket set with handle		Optional	Optional
160 A DIN Rema cable and socket set with handle		Optional	Optional
160 A cable and socket set with red air intake SBE with handle		Optional	Optional

Designation	Dimensions/Notes	KANVAN 05	KANVAN 10
160 A DIN cable and socket set with Rema air intake with handle		Optional	Optional
320A SBE red cable and socket set with handle		Optional	Optional
320A cable and socket set with red air intake SBE with handle		Optional	Optional
Fixed battery socket 160 A DIN 43589	-	Optional	Optional
Fixed battery socket SBE 160 A red	-	Optional	Optional
Fixed battery socket SBE 320 A red	-	Optional	Optional
Right-hand or left-hand rear-view mirror, mounted on the accessories bar, curved shape	200x140 mm	Optional	Optional
MMS preparation: front mechanical and electrical preparation for STILL 8.4" or 12.1" computer terminal with scanner, including: 24 V/5 A electrical power supply, interface cable with a 3-pole WAGO CAGE CLAMP socket (spring terminal), standard VESA75 bracket with holes and mounting equipment. Mounting point: side accessories bar		Optional	Optional
FleetManager	-	Optional	Optional

Battery electrolyte level indicator LED (optional)



There are two versions of the LED:

- 1) Located on the battery
- 2) Located next to the battery plug.

The LED indicates whether it is necessary to top up the distilled water in the battery.

Operation:

- If the LED (1) or (2) is green, there is a sufficient level of electrolyte in the battery. The battery must not be topped up with distilled water.
- If the LED (1) or (2) is red, there is an insufficient level of electrolyte in the battery. The battery must be topped up with distilled water.

5

Operation

Intended use of the trucks

⚠ CAUTION

This machine is designed to tow industrial trailers and for the storage of loads packed on pallets or in industrial containers designed for this purpose.

The dimensions and capacity of the trailers, pallets or containers must be adapted to the load being transported and must ensure stability.

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

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

⚠ CAUTION

Never use the trailer mode and the pallet stacker mode at the same time!

This machine can be operated in trailer mode OR pallet stacker mode.

Therefore, it is prohibited to tow a trailer and stack another load at the same time.

Checks and actions prior to use

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 defects 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.

Please inform your supervisor if you notice any defects.

⚠ WARNING

Risk of falling!

When working on high-level parts of the forklift truck (such as the mast), do not use truck components for access or to stand on.

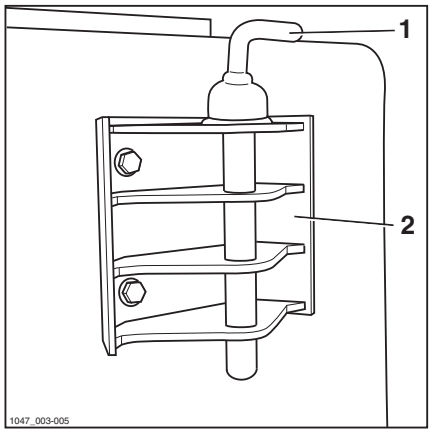
Always use suitable equipment for this.

Ensure that the truck is in good working condition prior to start-up:

- The wheels must not show signs of damage or significant evidence of wear, the mounting must be correct.
- The warning devices (horn etc.) must work.
- Check the area under the forklift truck for leaking consumables.
- Check that the uncovered sections of hydraulic pipes and hoses are in good condition and check them for leaks. Replace damaged hoses.
- Check that there is no binder twine or links hindering the operation of the wheels and rollers.
- The roller guide rails must be coated in a visible layer of grease.
- The fork arms or other load bearing equipment must not show any visible damage (crumpling, cracks, significant wear etc.)
- The chain must be in perfect condition and must be correctly extended.
- The battery cover must be closed.
- The key must be removed.
- Check that the battery cover is put back in place.
- Check that all warning and safety plates are present and legible.
- Damaged or missing stickers must be replaced in compliance with the marking position table.
- The guard grille must be intact and securely mounted.
- Accessories (optional) must be correctly attached and must operate as described in the user manual.
- Check for dirt and ice.
- The operator must be qualified to drive the truck. It must be possible for the operator to access the controls and activate them (especially the anti-collision device). Do not obstruct access to the controls.

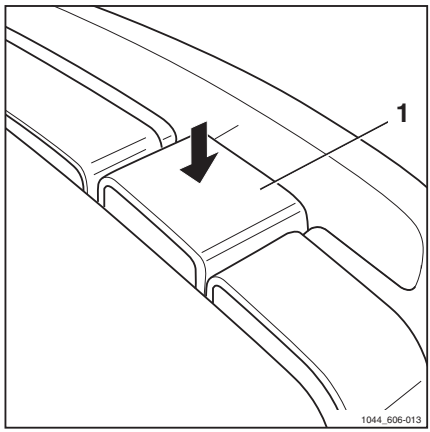
Check the operation and security of the trailer coupling

- Make sure that the tow pin (1) slides properly into the trailer coupling (2) and engages securely when locked.
- Make sure that the trailer coupling (2) is securely attached to the frame.
- The warning device (eg horn) must function properly.
- The wheels must not be damaged or worn and must be fastened correctly.



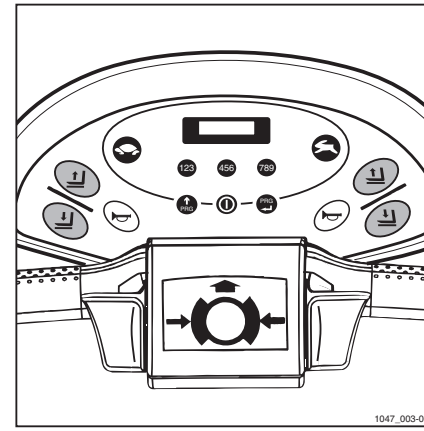
Connecting the battery plug (charging station)

- Disconnect the battery socket (1) from the charging station and insert into the plug on the truck.



Commissioning

Turning on the truck

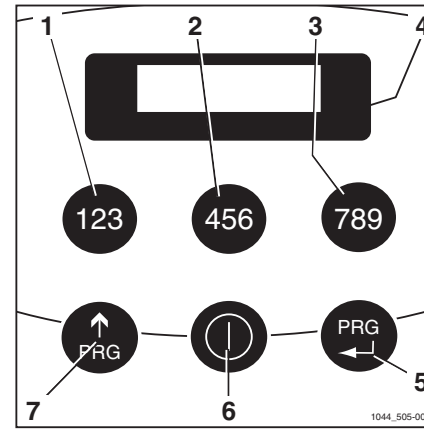


NOTE

The pallet truck is equipped with a digital control and is taken into operation by entering a driver code. The driver code consists of four figures and is assigned by the pool manager. It is used for normal use and operation of the truck by the driver and operator. The knowledge of the code is like a key and should not be misused. Do not tell third persons your driver code except if expressly ordered to do so.

– Other codes can be entered, ⇒ Chapter "Digicode control", P. 5-96.

Entering the user code



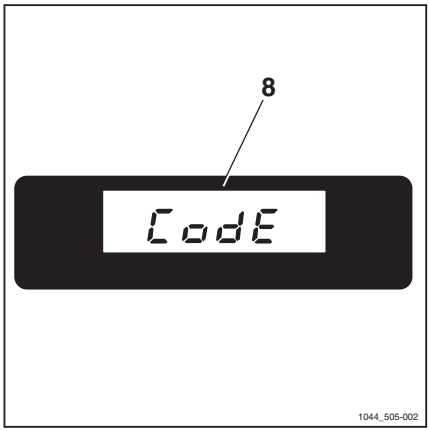
– Press the I key (on) (6). The display (4) shows the message Code (8). This message switches off after approximately one second. You can then enter the 4-digit user code. The digits are entered in the same way as on a mobile phone.

– Press keys (1), (2) or (3) several times until the desired digit is shown;

for digits:

- 1-2-3, press key 123 (1),
- 4-5-6, press key 456 (2),
- 7-8-9, press key 789 (3).

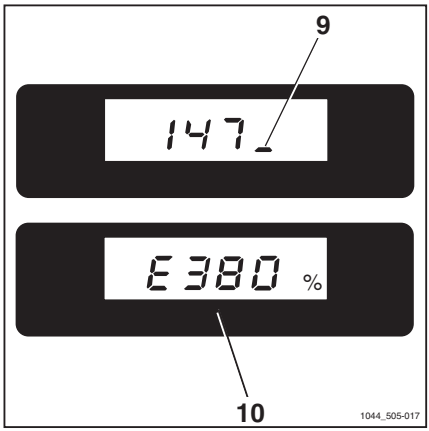
After entering a digit, the display moves to the next position. The display shows a flashing line (9) (the illustration shows an example).



NOTE

If the digit entered is wrong, it is possible to cancel it by depressing the PRG ↑ key (scroll) (7).

– The digit will be deleted and the flashing line (9) will reappear. It is now possible to enter digits again. ▷
– After the fourth digit has been entered, confirm this code by pressing PRG ↵ (5). The name of the truck manufacturer is displayed. It is now possible to activate the truck.



NOTE

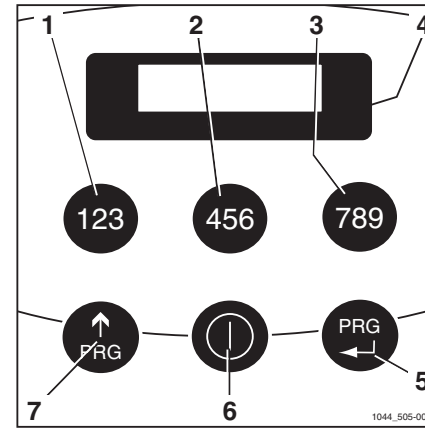
If an error code is displayed, e.g. E380 (10), stop the truck by pressing the key (6) and carry out the activation procedure again.

NOTE

It is possible to show the following displays by repeatedly depressing the PRG ↑ key (scroll) (7).

- Hour meter ⇒ Chapter "Hour meter", P. 5-64
- Battery charging ⇒ Chapter "Battery charge", P. 5-64
- Servicing interval management ⇒ Chapter "Maintenance interval management", P. 5-65

Starting with FleetManager (optional)

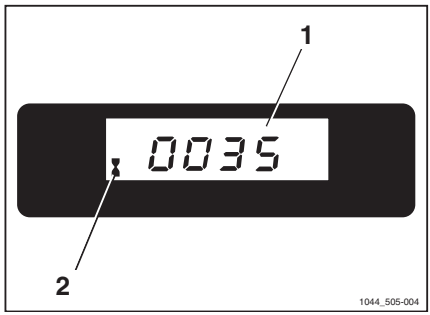


– Push the ⏻ key (START) (6). Do not pay attention to the `Code` alert that appears in the display

– Start the truck directly via the FleetManager keyboard or reading device, depending on the version.

Hour meter

The display changes approx. 4-5 s after power-up to show the operating hours (1) and the hour-glass symbol (2). These are the total number of hours since the commissioning of the pallet truck. The meter counts when driving. Have the maintenance carried out according to the service hours specified in the maintenance schedule.

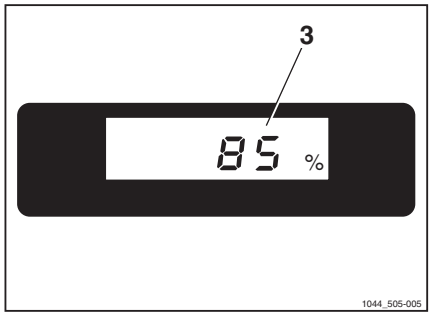


NOTE

The meter goes to 9999.

Battery charge

– Press the PRG ↑ (scrolling) button (4) to display the available battery charge (3).



NOTE

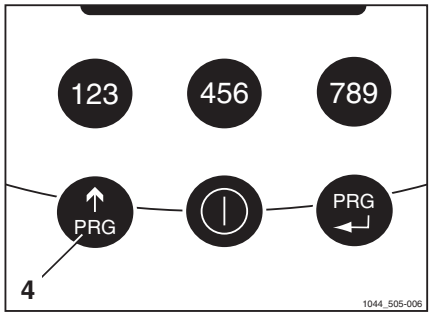
After the battery is connected, the correct state of charge appears only after about 1 minute.

The charge is shown in per cent and changes in steps of 5 %.

NOTE

The factory setting of the battery charge indicator is for a lead battery. The indicator can also be set to a gel battery. Please contact your Service.

- If a residual charge of 20% is reached, the battery must be charged soon.
- The driving speed is reduced.



⚠ CAUTION

Deep discharging damages the battery.

The battery must immediately be charged as deep discharging begins.

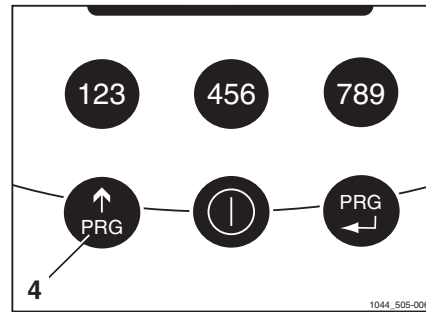
Maintenance interval management

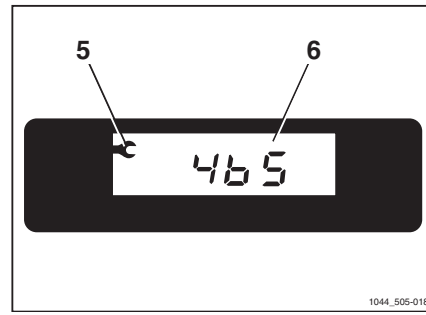
– Depress the PRG ↑ key (scroll) (4) to display the time remaining until the next maintenance deadline. The display shows the remaining hours (6) and a flat wrench symbol (5). Carry out the maintenance repair when the display is 0, in accordance with the maintenance schedule.

NOTE

Our service department can modify the maintenance interval management for you. Please contact the service centre in your area.

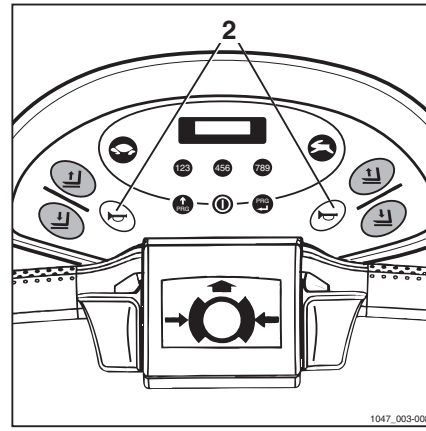
– The display can show subsequent information ⇒ Chapter "Error display", P. 5-103.





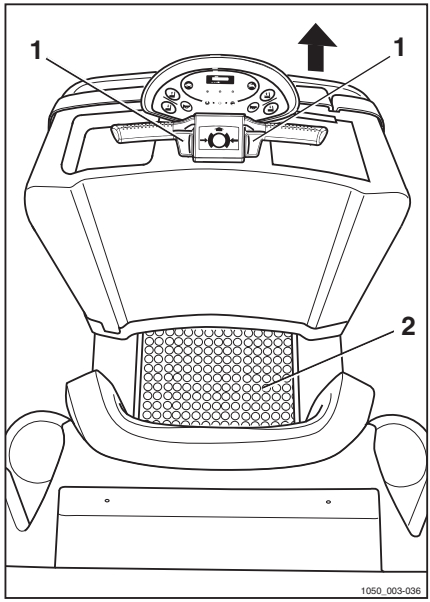
Operating the horn

– Press the horn button (2) on the tiller.



Check of brake and presence area

– Start the truck slowly with the throttle (1).
– Step off the presence area (2) while leaving the throttle actuated.



Checking the emergency brake

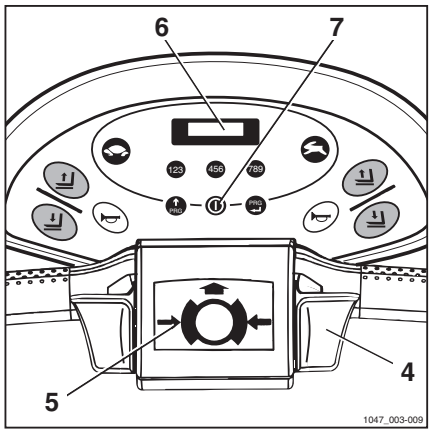
– Drive the truck slowly using the traction control (4).
– Press the belly button (5). The truck is braked to a stop.
– `StoP` appears in the display (6).

NOTE

After the disappearance of `StoP` *in the display, press the* ▯ *(ON) button (7) to restart work.*

⚠ CAUTION

This brake may only be used in an emergency.



Driving

Driving safety instructions

Behaviour when driving

The operator must obey the same rules within the plant as he would on the road. He must drive at a speed appropriate for the driving conditions. For example, an operator should drive slowly when manoeuvring around corners, through narrow passageways and swing doors, at blind spots, and on uneven surfaces. He must adapt the speed to the load and the ground. The operator must always maintain a safe braking distance from vehicles and persons in front of him and must always have the truck under control. He should avoid sudden stops, making fast U-turns, overtaking other vehicles in potentially dangerous areas or areas with poor visibility.

Driving the truck while sitting on top of it is prohibited. Climbing on the truck is prohibited except on the step plate and the user detection platform.

The KANVAN is designed to be used in ride-on standing mode or pedestrian mode; therefore:

- The truck must not be used as a stepladder.
- Do not drive on an incline. Always stay within the truck clearance.

Using a telephone or radio in the truck is permitted, but avoid using these devices when driving as they may distract you.

Take a test drive on an open surface.

Visibility when driving

The driver must look in the direction of travel and have a clear view of the route travelled on. In particular, the roadways must be sufficiently lighted. He must always ensure that the way is clear, particularly when reversing. When transporting goods that obstruct visibility, the truck must be driven with the load trailing. If this is not possible, a guide must walk ahead of the truck. In this case, the truck may only be driven at walking pace and with the utmost caution. The truck must be stopped

immediately when eye contact wit the guide is lost.

Before driving

Persons in the danger area

Before starting up, the driver must ensure that no person is standing in the danger area of the truck. If persons are at risk, a warning signal must be given in time. Stop work with the truck at once if persons do not leave the danger zone despite warning.

Danger zone

The danger zone is the area in which persons are endangered through the movement of the truck, its implements, load-lifting devices (eg attachments) or the carried load. This also includes the area within the range of falling loads or a descending implement.

Dimensions of roadways and working aisles

The dimensions specified in the description section apply under established conditions and should ensure safe manoeuvring. Check in each case whether a wider aisle is required when, for example, the load dimensions deviate.

Observe your local and national regulations.

The truck may only be used on roadways without too tight curves, too large gradients and too narrow and too low passages.

Condition of roadways

Roadways must be solid enough, free of debris and fallen objects. Drainage ducts, railway crossings and the like must be level and, if necessary, provided with ramps so that they can be crossed without jolts, if possible.

There must be sufficient clearance between the highest parts of the truck or load and fixed parts of the surroundings. The height depends on the lift height and the dimensions of the load. Check the data sheet for your truck.

Rules for roadways and working area

Only the roadways released for traffic by the operator or his representative may be driven on. The roadways must be free of obstacles. The load may only be stacked and stored at the appropriate places. The operator and his representative must ensure that unauthorized persons keep away from the working area.

Hazard areas

Hazard areas on roadways must be marked with the usual traffic signs or, if necessary, by additional warning signs.

Behaviour in emergency situations ▷

In an emergency, all the functions of the truck can be cut off.

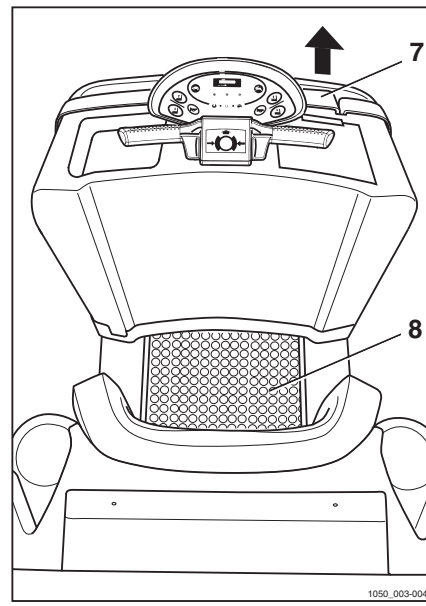
– To do so, disconnect the battery connector (7). The truck will come to a halt.

⚠ CAUTION

This safety feature may only be used in an emergency.

NOTE

To resume operation, first reconnect the battery connector and then re-enter the driver's code.



Different driving modes

The truck can be driven in the following modes:

- Driving, stand-on mode, see ⇒ Chapter "Driving, ride-on standing mode", P. 5-70
- Driving, pedestrian mode with cockpit, slow speed with throttle, see ⇒ Chapter "Driving

in accompanied mode with cockpit, slow forward travel using the throttles", P. 5-72

- Driving, pedestrian mode, traction button (option), see ⇒ Chapter "Driving in pedestrian mode with backrest push buttons", P. 5-75

Driving, ride-on standing mode

▷

– Stand upright, with feet placed in the presence zone (1) of the platform.

NOTE

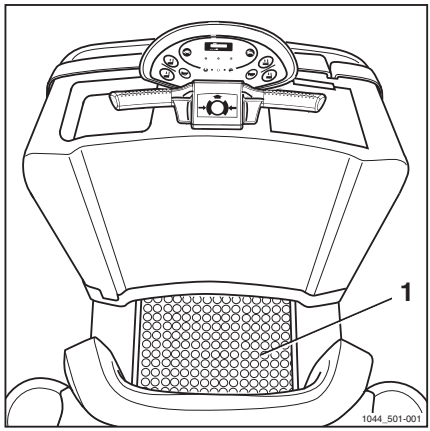
The truck must be activated.

⚠ WARNING

The platform floor must be kept free of any object that could activate the operator presence mat by its weight.

⚠ WARNING

Wait until the truck has completely stopped before dismounting it. Always dismount the truck on the non-travelling side.



Forwards

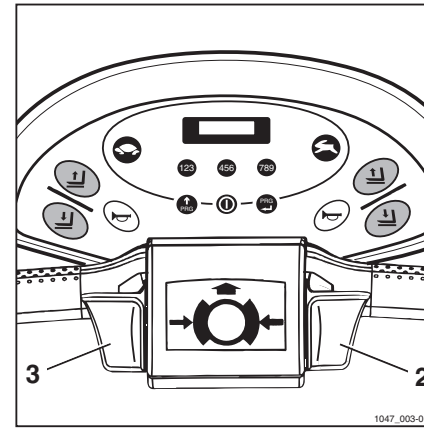
- Press the top section of the throttle (2) or (3) with your thumb.
- The speed increases with the movement of the throttle.
- When the travel throttle is released, the truck brakes electrically.

Backwards

- Press the lower section of the throttle (2) or (3) with your thumb.
- The speed increases with the movement of the throttle.
- When the travel throttle is released, the truck brakes electrically.

Reversing the direction of travel

- Release the throttle.
- Operate it in the opposite direction, progressively until the required speed is reached.



Selecting the driving mode

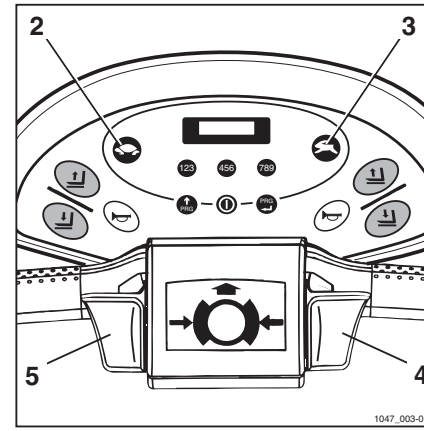
NOTE

The pallet truck has 2 selectable driving modes.

- For regular driving depress the hare button (3).
- For driving with gentle acceleration depress the tortoise button (2).

NOTE

The travel control (4) and (5) can be operated with both the left and the right hand. Always operate the travel control slowly to avoid jerky starting, braking or reversing.



Driving in accompanied mode with cockpit, slow forward travel using the throttles

– Hold by the side one of the handles (1) or (4) of the cockpit.

NOTE

The truck must be activated.

CAUTION

Take care when operating, especially if the user is not familiar with using this function.

DANGER

Risk of crushing feet.

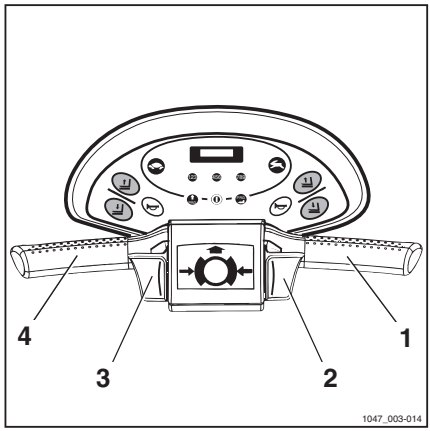
Do not use this function for turning.

This function is designed to maintain à straight line.

Proceed from the cockpit with very slight movements.

NOTE

One of the travel throttles (optional) (2) or (3) on the cockpit can be operated with the right or left hand. The driving speed is reduced; the cockpit can be used at any time to steer so that the truck continues to advance in a straight line. Always operate the travel throttle slowly, as the truck reacts immediately. Abrupt starts or braking or reversal of direction of travel must be avoided at all costs . If the travel throttle is held in position for a lengthy period, the truck stops for safety reasons. You then simply need to release the throttle and press it again.



Forwards

– Press with your thumb on the upper part of the throttle.

– The speed increases with the movement of the throttle; the speed is restricted to 2,5 km/h.

– When the control throttle is released, the truck brakes electrically.

Backwards

– Press with your thumb on the lower part of the throttle.

– The speed increases with the movement of the throttle; the speed is restricted to 2,5 km/h.

– When the control throttle is released, the truck brakes electrically.

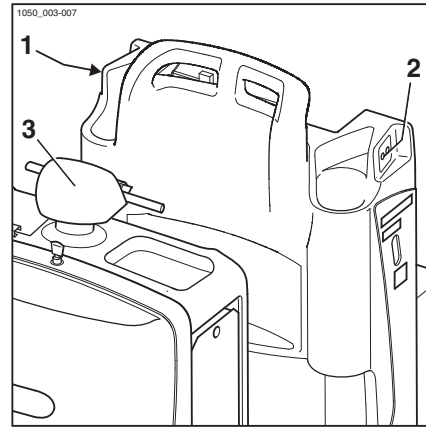
Reversing the direction of travel

– Release the throttle.

– Operate it in the opposite direction, progressively until the required speed is reached.

Driving in pedestrian mode with backrest push buttons

▷



NOTE

The truck is fitted with push buttons (1) and (2) on both sides of the backrest, enabling the truck travel to be controlled on both sides by a pedestrian operator. The speed is reduced, the cockpit (3) can be used at any time to direct the truck so that it continues to move forward in a straight line.

NOTE

The truck must be activated. If push button (4) or (5) is held in the operating position for a long

period, the truck stops for safety reasons. In this case, simply release the push button and press it again.

⚠ CAUTION

Take care when operating, especially if the user is not familiar with using this function.

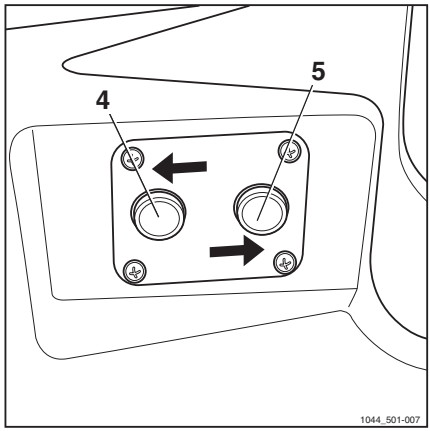
⚠ DANGER

Risk of crushing feet.

Do not use this function for turning.

This function is designed to maintain à straight line.

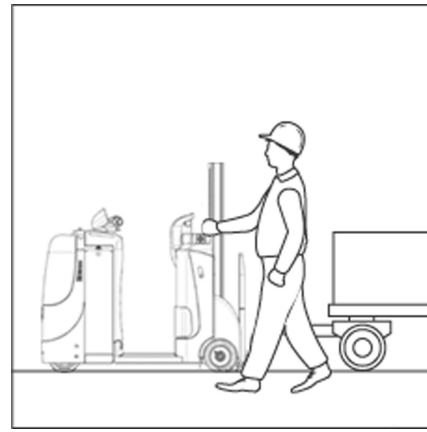
Proceed from the cockpit with very slight movements.



Forward travel with push button

– Depress the push button (5). The truck moves forwards, the speed is reduced to 2,5 km/h.

– To stop, release the push button (5). The truck will stop.



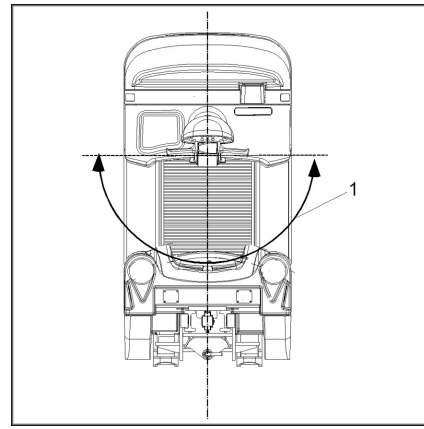
Reverse travel with push button

– Depress the push button (4). The truck travels in reverse, the speed is reduced to 2,5 km/h.

– To stop, release the push button (4). The truck will stop.

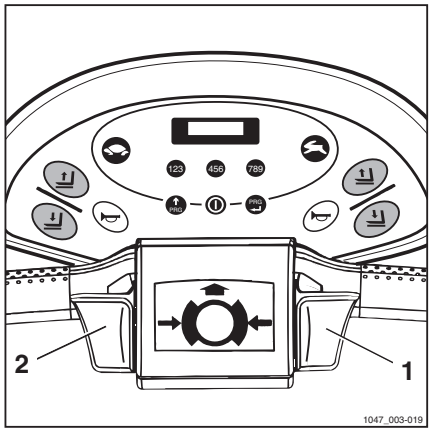
Steering ▷

The truck is turned by turning the cockpit to the angle indicated (1).



Braking

▷



⚠ WARNING

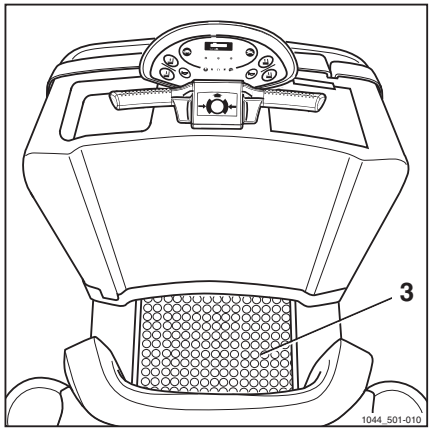
The stopping distance of the truck is affected by the condition of the floor surface.

Take this into consideration when driving.

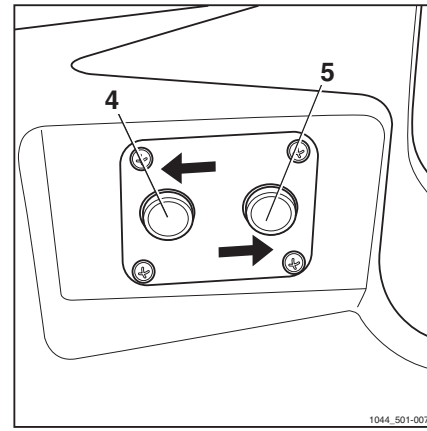
Light braking

– Release the throttle (1) or (2) when driving.

– Leave the presence area (3). ▷



– Release the traction button (4) or (5).



Moderate braking

– Press the throttle (1) or (2) in the opposite direction.

Emergency stop brake

⚠ CAUTION

This brake may only be used in an emergency.

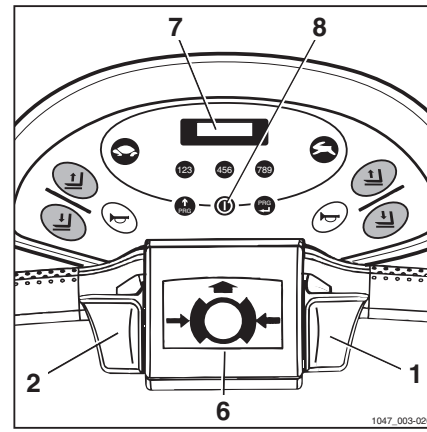
– Depress the emergency brake switch (6).

The truck is braked to a fast stop.

– `StoP` appears in the display (7).

NOTE

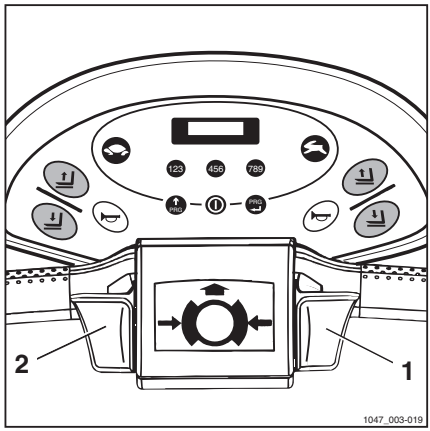
After the disappearance of `StoP` *in the display, press the* I *(ON) button (8) to restart work.*



Parking brake

– Release traction control (1) or (2).

The truck is braked by the electromagnetic brake.



Automatic shutdown

NOTE

If you leave the truck with the control turned on, it will be shut off automatically after approx. 15 minutes. The truck can only be operated again after the driver code is entered.

The delay time is adjustable. Please contact your Service Engineer in this regard.

Lifting

Lift controls

Extending and folding forks

⚠ CAUTION

It is expressly forbidden to pull a trailer when the elevation function is in use.

⚠ CAUTION

Make sure there is sufficient space to extend the forks.

– To extend the forks, the operator MUST use the presence pedal and simultaneously press the two buttons (2) until the forks are fully deployed.

⚠ CAUTION

Check that the forks are correctly extended before using traction.

NOTE

The fork extension phase is fully complete when the forks are in the horizontal position and the actuator piston is **fully** retracted.

The fork carriage may only be raised when the fork extension is fully complete.

⚠ CAUTION

It is not permitted to step onto the forks.

⚠ CAUTION

Check that no objects are placed on the forks before folding them.

– To fold the forks, the operator MUST use the presence pedal and simultaneously press the two buttons (1) until the forks are fully folded.

Lifting the forks

NOTE

The fork carriage may only be raised when the fork extension is fully complete.

– After extending the forks, press the cockpit button (2).

The forks are raised to the maximum height.

It is always possible to stop the movement of the forks by releasing the button.

Lowering the forks

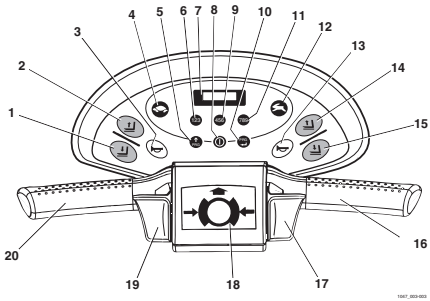
– Press the cockpit button (1).

The forks are lowered to the lowest position.

It is always possible to stop the movement of the forks by releasing the button.

⚠ CAUTION

Always fold the forks when you have finished.



1	Lowering
2	Raising
3	Horn button
4	Button, tortoise
5	PRG ↑ button (scroll)
6	Number button 123
7	Display
8	Button I (start)
9	Number button 456
10	PRG ↵ button (confirmation)
11	Number button 789
12	Button, hare
13	Horn button
14	Raising
15	Lowering
16	Handle
17	Drive control throttle valve
18	Emergency braking push button
19	Drive control throttle valve
20	Handle

Handling trailers

Proper use during towing

NOTE

This truck is designed to pull trailers and is fitted with a tow coupling for this purpose.

Trailer load

The load towed must not exceed the max. load indicated on the manufacturer's plate. The maximum wheel traction force is the maximum traction that the tractor can exert to overcome the resistance of the towed load on start-up (corresponding to the combined weight of the tractor, the trailers and the load).

⚠ CAUTION

When towing trailers under difficult conditions, such as on ramps or on icy or slippery surfaces, it is the braking capacity and NOT the maximum traction capacity of the tractor that will determine the maximum load for using the truck in complete safety.

⚠ CAUTION

The maximum permissible towing loads are only valid for towing (unbraked) on flat surfaces. It is necessary to reduce the maximum loads when towing on inclines or slopes.

Loading and discharge operations are prohibited on slopes. The trailer must be suitable for the load. The load must be uniformly distributed and correctly coupled.

Inform the manufacturer of your working conditions. The manufacturer will provide data that is valid for your requirements.

- The truck must not be coupled to rail vehicles.
- It is not permitted to use the truck to push wagons of any type.

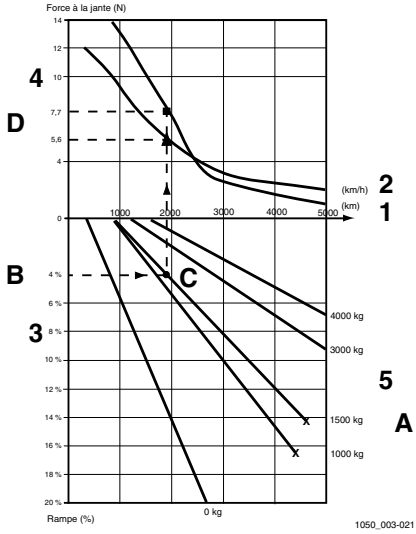
Example of towing capacity

The towing capacity diagram below contains the following information:

1	Distance (km)
2	Speed (km/h)
3	Gradient (%)
4	Wheel traction nominal force (N)
5	Load (kg)

Reading from the diagram

On a 4% slope with a towed weight of 1500 kg, the KANVAN can pull this load continuously at 5.6 km/h over 7.7 km of ramp and in addition brake it when descending.



NOTE

- The values and curves of the towing capacity diagram apply only to dry surfaces with a good grip.
- The permitted journey per hour is the total distance travelled, including the return journey and the descent of possible slopes.

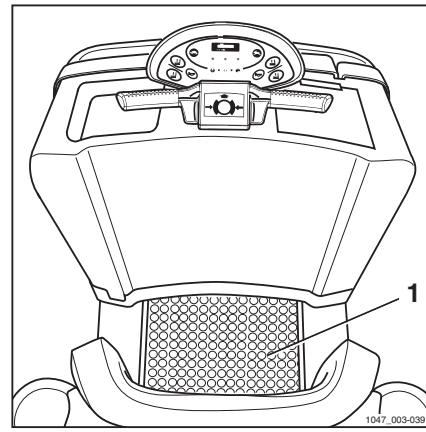
Coupling trailers

⚠ CAUTION

When coupling and uncoupling trailers, the tractor and trailer must always be on level ground. Make sure that all controls are in the neutral position and the parking brake is applied.

Before coupling a trailer, check if the draw bar of the trailer and the tow coupling of the tractor match. Make sure that the brakes of the trailer - if present - are applied or the wheels securely blocked to prevent any unintentional movement. Reverse the tractor to the trailer so that the tow pin and the trailer draw bar are aligned as seen from the driver's position.

– Step off the presence area (1). The tractor will be braked. ▷



Depending on the type of trailer coupling, proceed as follows:

- Single-position or multi-position trailer coupling, see ⇒ Chapter "Single-position or multi-position trailer coupling", P. 5-84
- Automatically closing trailer coupling, see ⇒ Chapter "Automatically closing trailer coupling", P. 5-86
- ROCKINGER trailer coupling, see ⇒ Chapter "ROCKINGER trailer coupling", P. 5-88

Single-position or multi-position trailer coupling

Trailer coupling

– Pull the tow pin (2) out.

– Reverse the tractor slowly.

⚠ DANGER

Do not allow anyone to stand between the tractor and trailer during the approach. Always drive the trailer to the tractor.

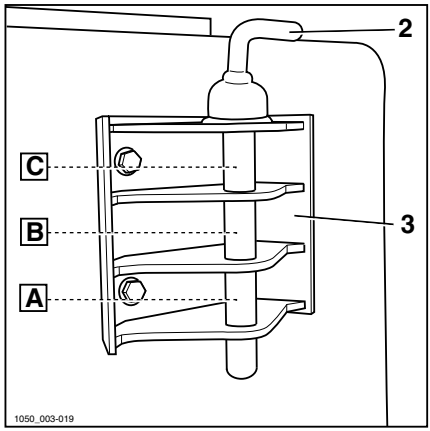
– Introduce the hitch of the drawbar into the coupling jaw (3) on the tractor.

NOTE

The multi-position coupling provides 3 hitch heights. It is recommended to choose the height at which the drawbar is horizontal:

Coupling height (distance from the ground)

Position	Height (mm)
A	300
B	355
C	410

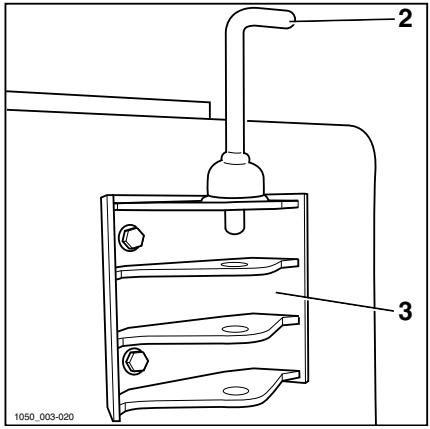


– Lower the tow pin (2) into the trailer coupling (3) and rotate it 90°. The tow pin is now secured.

⚠ CAUTION

Always make sure that the tow pin is secured after the coupling procedure.

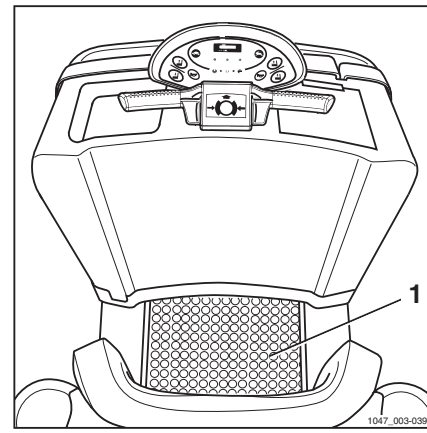
– Remove the chocks from the wheels of the trailer and release the trailer brakes.



Uncoupling

– Step off the presence area (1). The tractor will be braked. ▷

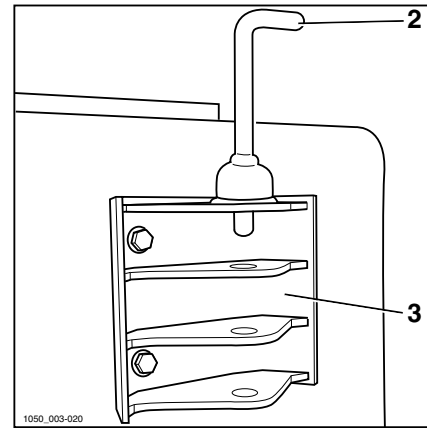
– Secure the trailer with chocks or engage the trailer brake.



– Turn the tow pin (2) 90° and pull it out of the trailer coupling (3). ▷

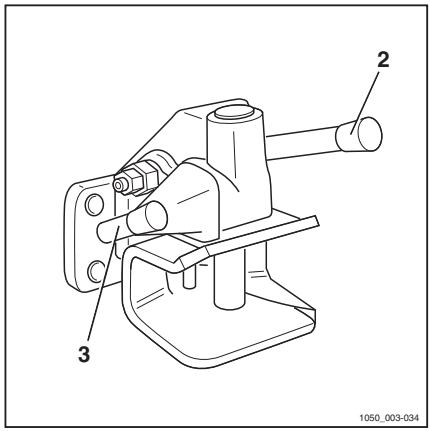
– Reverse the tractor slowly.

– Insert the tow pin (2) again into the trailer coupling (3) and secure it.



Automatically closing trailer coupling

Hitching up



– Pull the safety lever (3).

– Swivel the lever (2) up.

– Release the brake on the front axle of the articulated drawbar trailer.

⚠ CAUTION

If this is not done, the coupling jaw, drawbar eye and support can be damaged!

The drawbar eye must hit the centre of the coupling jaw when hitching up a rigid drawbar trailer.

– Reverse the tractor slowly.

⚠ DANGER

Do not allow anyone to stand between the tractor and trailer during the coupling procedure.

Only drive the tractor to the trailer.

⚠ DANGER

Risk of accident!

– Make sure that after each coupling procedure the safety (3) fully contacts the securing sleeve.

A projecting safety (3) indicates improper hitching.

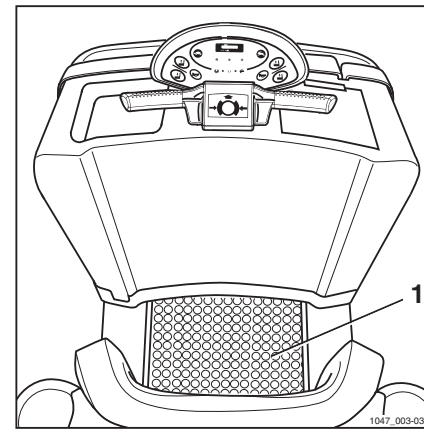
The trailer may not be driven in this state.

If the locking system is blocked, do not intervene. Risk of crushing your fingers! Please contact your after-sales service.

– Remove the chocks at the trailer.

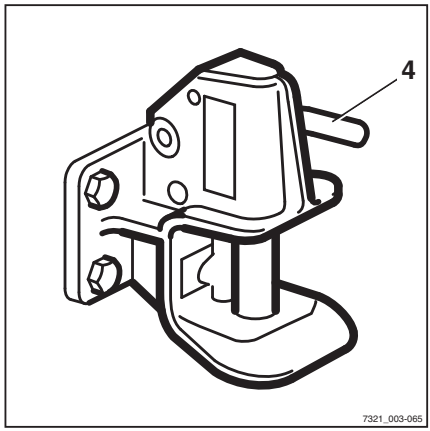
Uncoupling

- Step off the presence area (1). The tractors will be braked. ▷
- Secure the trailer with chocks or engage the trailer brake.
- Pull the safety lever (3).
- Swivel the lever (2) up.
- Drive the tractor slowly forward.



ROCKINGER trailer coupling

Hitching up



– Swivel the lever (2) up.

– Release the brake on the front axle of the articulated drawbar trailer.

⚠ CAUTION

If this is not done, the coupling jaw, drawbar eye and support can be damaged!

The drawbar eye must hit the centre of the coupling jaw when hitching up a rigid drawbar trailer.

– Reverse the tractor slowly.

⚠ DANGER

Do not allow anyone to stand between the tractor and trailer during the coupling procedure.

Only drive the tractor to the trailer.

⚠ DANGER

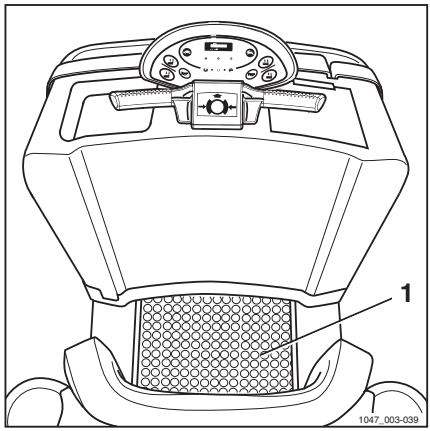
Risk of accident!

– Make sure that the tow pin is in the specified position.

If the locking system is blocked, do not intervene. Risk of crushing your fingers! Please contact your service centre.

– Remove the chocks at the trailer.

Unhitching



– Step off the presence area (1). The tractor will be braked.

– Secure the trailer with chocks or engage the trailer brake.

– Swivel the lever (2) up.

– Drive the tractor slowly forward.

Towing a trailer

NOTE

Ensure that you understand how to operate any braking systems that may be fitted to trailers being towed. Ensure trailer load is secure, stable, evenly distributed on the trailer, and within the rated drawbar pull of the tractor. Inspect trailer steering to determine the type fitted. This is particularly important on long trains because of the cutting in effect when cornering.

CAUTION

NEVER travel on public highways unless you comply with local highway regulations.

NOTE

If travelling on public highways ensure that regulation plates conform to local highway regulations.

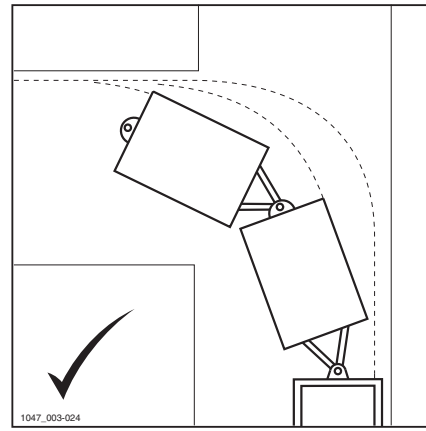
- Release trailer braking system and remove any chocks from the trailer wheels.
- Check width of the widest trailer or load to ensure free passage en-route.
- Check that the direction of travel is clear, slowly move the tractor forward taking up the slack in the trailer couplings before gently accelerating to the required speed.
- When approaching you destination reduce speed in advance to ensure bringing the tractor and trailers to rest. A sudden halt could cause load displacement and trailers could "jackknife".

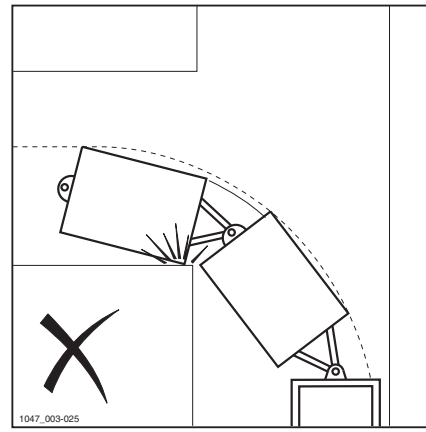
NOTE

A trailer train cannot be backed up into position, so learn to position trailers first time.

DANGER

Never carry passengers on a trailer unless it has been specifically designed for such purpose.





Working with loads

Safety regulations when handing loads

The safety regulations for handling loads are shown in the following sections.

⚠ DANGER

Risk to life

The working hydraulics must only be operated from the driver's compartment.

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

Never exceed the maximum loads specified on the load capacity label .Otherwise, stability cannot be ensured.

⚠ DANGER

Risk of accident

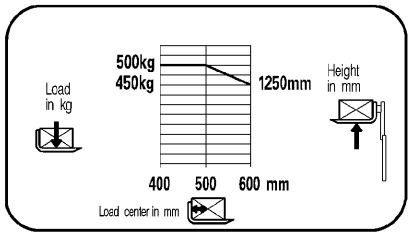
Do not step onto the forks.

Do not lift people.

Never grab or step onto moving parts of the truck.

Before picking up a load

Load capacity



Example 1	
Weight of load to be lifted	500 kg
Distance between load centre of gravity - fork back	500 mm
Permissible load height	1250 mm

Example 2	
Weight of load to be lifted	450 kg
Distance between load centre of gravity - fork back	600 mm
Permissible load height	1250 mm

The load capacity indicated for the truck must not be exceeded. It depends on the centre of gravity of the load and the lift height.

Take into account the load capacity label affixed to your truck.

⚠ WARNING

The figure above is only an example.

Only load capacity labels affixed to your truck are valid.

The placement of additional weights to increase load capacity is prohibited.

⚠ DANGER

Risk to life

Never exceed the maximum loads indicated! These ratings apply to compact and homogenous loads. Otherwise, the stability and strength of the fork arms and lift mast are not guaranteed.

Improper or incorrect use or the placement of persons to increase load capacity is prohibited.

Picking up a load

In order to guarantee load stability, ensure that the load is well balanced and centred on the fork arms and that the fork arms have been sufficiently slid underneath the load. The load should not excessively extend over the fork arms, nor should the fork arms excessively protrude out from the load.

Danger area

The danger area is the area in which people are at risk due to the movements of the truck, its working equipment, its load-carrying equipment (e.g. attachments) or the load. Also included are the areas where loads could fall or working equipment could fall or be lowered.

⚠ DANGER

Risk of injury!

– Do not step on the fork.

⚠ DANGER

Risk of injury!

– Do not step under the raised forks.

⚠ DANGER

People may be injured in the danger area of the truck!

The danger area of the truck must be completely clear of all personnel, except the driver in his normal operating position. If persons fail to leave the danger area despite warnings:

– Cease work with the truck immediately.
– Secure the truck against use by unauthorised parties.

⚠ DANGER

Danger of death from falling loads!

– Never walk or stand underneath suspended loads.

Transporting pallets or other containers

The load units (e.g. pallets) must generally be transported individually. Simultaneous transporting of several load units is only authorised when:

- the safety conditions are fulfilled
- the technical requirements have been met
- specifically instructed by the supervisor

The operator must ensure that the load is properly packaged. The operator must only move loads that have been carefully prepared and are safe.

Handling a load

Picking up a load

The truck can only handle pallets that do not exceed the maximum dimensions. Faulty loading accessories and loads that are poorly stacked must not be handled.

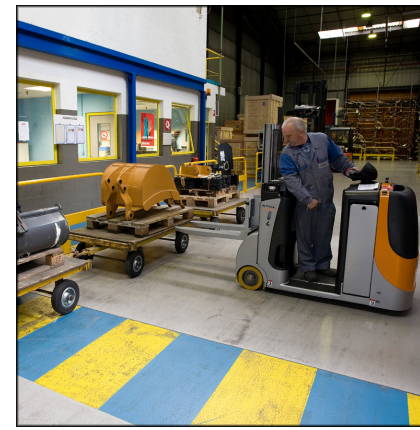
The load must be placed and attached to the lifting device so that it cannot slip or fall.

Loads must be stacked so that they do not reduce the width of the aisle.

– Extend the forks, see ⇒ Chapter "Lift controls", P. 5-79.

– Lift the forks.

– Approach the trailer at a moderate speed. Slow down progressively and immobilise the truck perpendicular to the trailer. ▷



– Gently insert the forks up to the heel, without coming up against either the trailer or the load. ▷

– Insert the forks as far under the load as possible. Stop the truck when the back of the fork touches the load. The centre of gravity of the load must be located in the middle of the fork arms.

– Raise the load until it rests on the fork. ▷

– Look in front of you to check that the way is clear. Manoeuvre the drive control throttle valve and move forward slowly and carefully perpendicular to the trailer to release the load. ▷

Transporting a load

– Lower the load to the transport position maintaining a sufficient ground clearance.

– Manoeuvre the drive control throttle and move forwards.

⚠ CAUTION

Avoid quick starts and forceful stops.

Approach bends slowly and carefully.

⚠ DANGER

Risk of injury when the load is on the forks in the upper position.

With the exception of the manoeuvre used to pick up (or put down) the load on the trailer, it is not permitted to drive or turn when the load is on the forks in the upper position.

⚠ DANGER

Never drive with a laterally protruding load.

Placing a load on a trailer (or racking)

– Approach the trailer at a moderate speed, with the load lowered.
– Slow down gradually and immobilise the truck perpendicular to the trailer.
– Lift the load to the trailer height.
– Carefully reverse the truck to position the load above the trailer.
– Lower the forks slowly so that the load rests on the trailer.
– Look in front of you to check that the way is clear. Manoeuvre the drive control throttle valve and move forward slowly and carefully perpendicular to the trailer to release the forks.

Driving on ramps

⚠ DANGER

When ascending and descending slopes, the load must be carried facing uphill.

Only those ascending and descending slopes that are marked as traffic routes may be can be used in complete safety in accordance with the technical data for this truck, see ⇒ Chapter "Datasheet (VDI)", P. 7-146.

The driver must check that the ground is clean with a good grip.

It is not permitted to perform turns on ascending slopes, to approach them diagonally or to park the truck on them.

Drive at a reduced speed on descending slopes.

It is not permitted to pick up or set down loads with the truck on an ascending or descending slope.

The truck should not be parked on a slope.

In case of emergency, secure the truck with chocks.

Transport in lifts

For this truck, the driver may only use lifts with a sufficient lifting capacity and which the operator is authorised to use.

– With the load at the back, drive the truck into the lift without touching the shaft walls.

– Secure the truck in the lift so that no part comes into contact with the shaft wall.

The distance from the shaft wall must be at least 100 mm.

⚠ DANGER

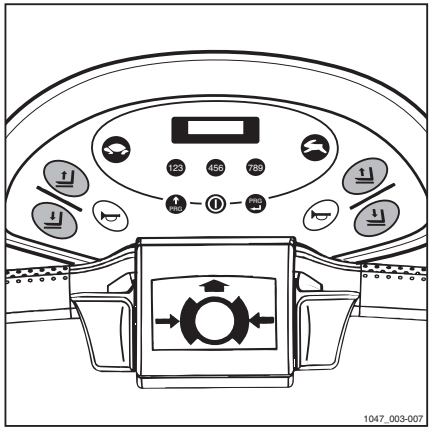
Risk of accident

Personnel accompanying the truck onto the lift are only allowed to occupy the lift once the truck is secure and must exit the lift first after the trip.

Maximum truck weight (tare weight with battery plus maximum load) : approximately 1755 kg

Digicode

Digicode control



Access to the electronic control is granted with three different codes:

- Driver's code
- master code
- service code

Driver's code

The driver's code consists of four digits and must be created by the Pool Manager.

It is used for the regular utilisation and operation of the truck by the driver and operator.

The knowledge of the code should be regarded as a key and must not be misused. The driver's code must not be given to other persons without express order.

The control can store a maximum of 200 driver's codes. A driver's code can be added ⇒ Chapter "Adding a driver's code", P. 5-100 or deleted ⇒ Chapter "Deleting a driver's code", P. 5-102 with the master code.

Master code

The master code consists of four digits and is reserved for the Pool Manager.

The factory setting of this code is "1234". The pool manager is advised to replace this code with a new master code ⇒ Chapter "Deleting a master code", P. 5-99 or ⇒ Chapter "Adding the master code", P. 5-97.

Like the driver's code, it is used for the regular operation and use of the truck, but it also allows the addition or deletion of a driver's code. This control can store a maximum of five master codes.

NOTE

If master codes or driver's codes are forgotten or get lost, please contact the Service Engineer, for he alone can make the stored codes visible.

Service code

The service code is only intended for the after-sales service. It allows the diagnosis of the truck for inspections and the access to the driver's and master code.

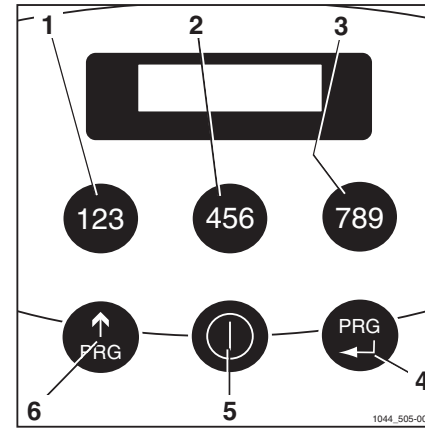
Adding the master code

NOTE

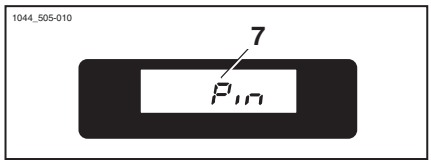
The truck is turned off, the battery is connected.

– Press the I (ON) button (5).

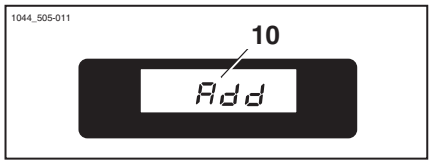
– Enter a valid 4-digit master code with the buttons 123 (1), 456 (2) and 789 (3).



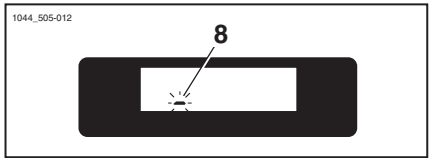
– Scroll with the PRG ↑ (scrolling) button (6) until `Pin` (7) appears in the display.



– Confirm with the PRG ↵ (enter) button (4) until `Add` (10) appears in the display.



– Confirm with the PRG ↵ (enter) button (4). A flashing line cursor (8) will appear in the display.

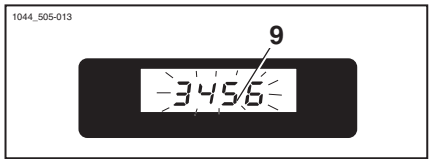


– Enter the desired new 4-digit master code with the buttons (1), (2) or (3) as described above.

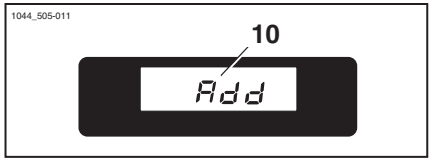
NOTE

The controller can store a maximum of five master codes. If one attempts to add a sixth master code, `Err` *will appear in the display.*

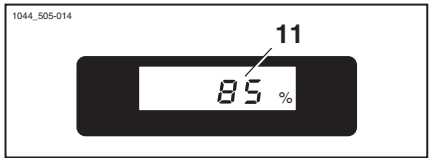
– Confirm with the PRG ↵ (enter) button (4) until the new master code (9) blinks (an example is shown).



– Then release the button. `Add` (10) will appear again in the display.



– Press the PRG ↑ (scrolling) button (6) until a normal readout (11) (eg battery charge) appears in the display. The new master code is entered.



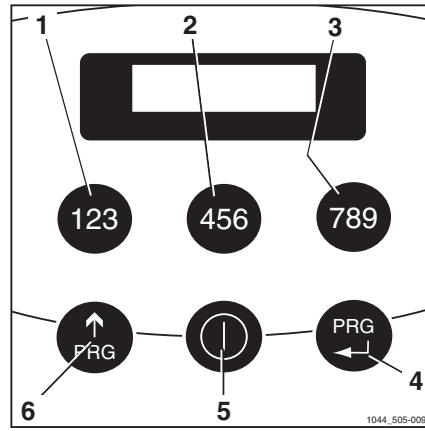
Deleting a master code

NOTE

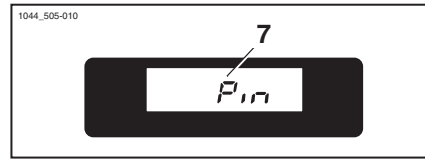
The truck is turned off, the battery is connected.

– Press the ⏻ (ON) button (5).

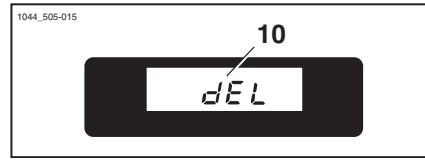
– Enter the valid 4-digit master code with the buttons 123 (1), 456 (2) and 789 (3).



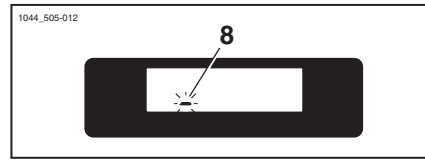
– Scroll with the PRG ↑ (scrolling) button (6) until `Pin` (7) appears in the display.



– Confirm with the PRG ↵ (enter) button (4) until `dEL` (10) appears in the display.



– Confirm with the PRG ↵ (enter) button (4). A flashing line cursor (8) will appear in the display.



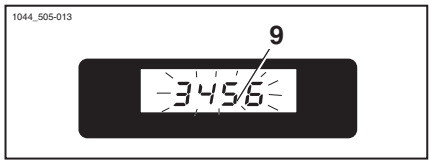
– Enter the 4-digit master code to be deleted with the buttons (1), (2) or (3) as described above.

NOTE

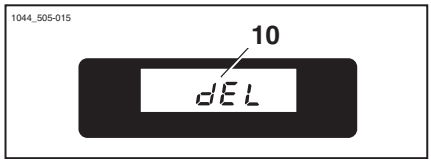
If one attempts to delete an erroneous master code, `Err` *will appear in the display. If only*

one master code remains, `None` *will appear in the display.*

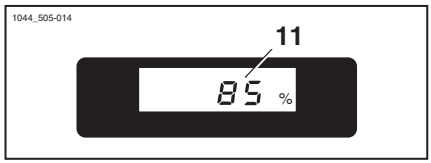
– Confirm with the PRG ↲ (enter) button (4) until the master code (9) to be deleted blinks (an example is shown).



– Then release the button. `dEL` (10) will appear again in the display.



– Press the PRG ↑ (scrolling) button (6) until a normal readout (11) (eg battery charge) appears in the display. The master code is deleted.



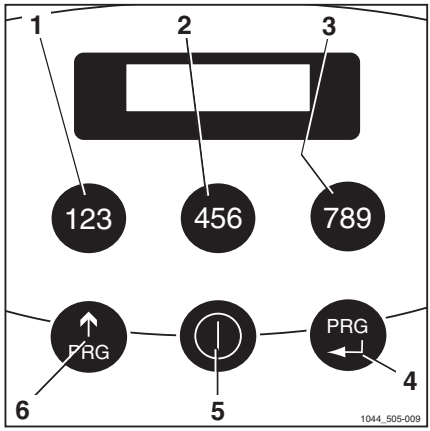
Adding a driver's code

NOTE

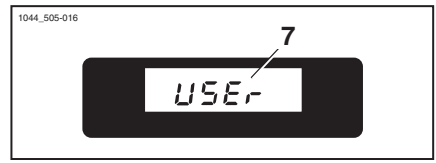
The truck is turned off, the battery is connected.

– Press the I (ON) button (5).

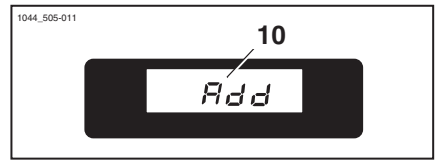
– Enter the valid 4-digit master code with the buttons 123 (1), 456 (2) and 789 (3).



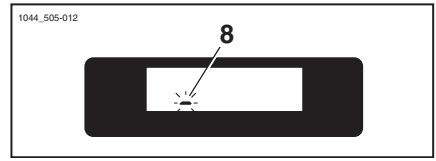
– Scroll with the PRG ↑ (scrolling) button (6) until USEr (7) appears in the display. ▷



– Confirm with the PRG ↵ (enter) button (4) until Add (10) appears in the display. ▷



– Confirm with the PRG ↵ (enter) button (4). A flashing line cursor (8) will appear in the display. ▷

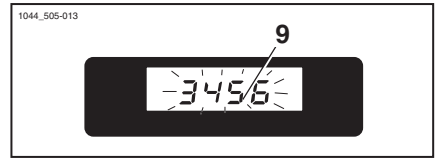


– Enter the new 4-digit driver's code with the buttons (1), (2) or (3) as described above.

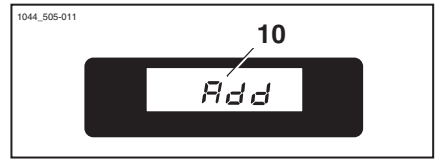
NOTE

The controller can store a maximum of 200 driver's codes. If one attempts to add a 201st driver's code, Err *will appear in the display.*

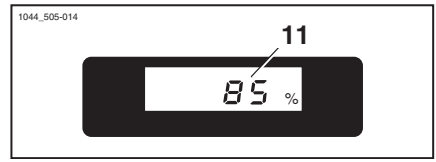
– Confirm with the PRG ↵ (enter) button (4) until the new driver's code (9) blinks (an example is shown). ▷



– Then release the button. Add (10) will appear again in the display. ▷



– Press the PRG ↑ (scrolling) button (6) until a normal readout (11) (eg battery charge) appears in the display. The new driver's code is entered. ▷



Deleting a driver's code

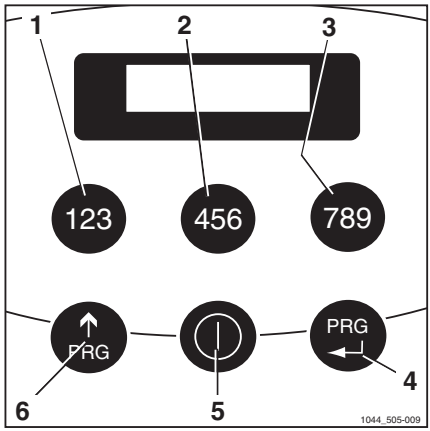
NOTE

The truck is turned off, the battery is connected.

– Press the [I] (ON) button (5).

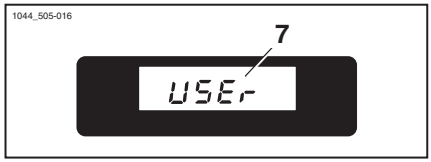
– Enter the valid 4-digit master code with the buttons [123] (1), [456] (2) and [789] (3).

▷



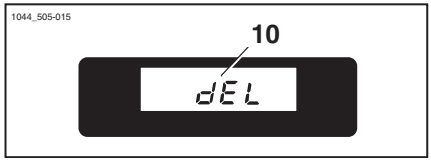
– Scroll with the [PRG ↑] (scrolling) button (6) until USEr (7) appears in the display.

▷



– Confirm with the [PRG ↵] (enter) button (4) until dEL (10) appears in the display.

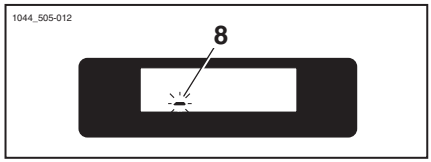
▷



– Confirm with the [PRG ↵] (enter) button (4). A flashing line cursor (8) will appear in the display.

– Enter the 4-digit driver's code to be deleted with the buttons (2), (3) or (3) as described above.

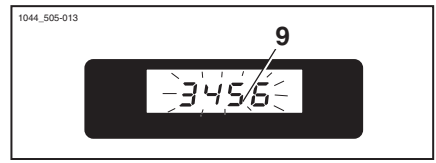
▷



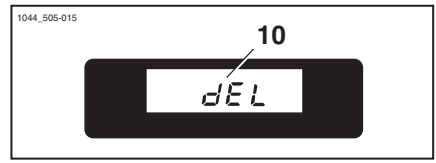
NOTE

If one attempts to delete an erroneous driver's code, Err *will appear in the display.*

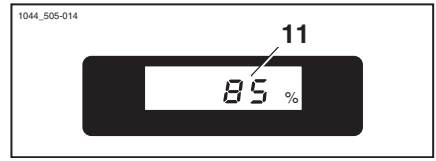
– Confirm with the PRG ↵ (enter) button (4) until the driver's code (9) to be deleted blinks (an example is shown).



– Then release the button. dEL (10) will appear again in the display.



– Press the PRG ↑ (scrolling) button (6) until a normal readout (11) (eg battery charge) appears in the display. The driver's code is deleted.

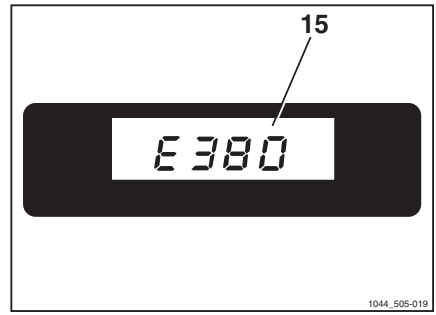


Error codes

Error display

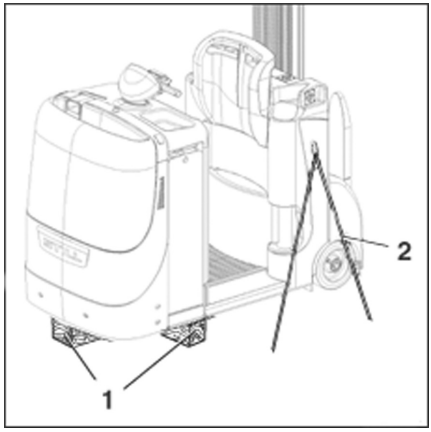
Error codes

The cockpit display (15) can show an error code (e.g. E380). If an error code is displayed, please call our service department.



Handling the truck in specific situations

Transport



– Disconnect the battery.

Wedging

– Fit chocks (1) as shown, to prevent any accidental movement.

Tie-down

– Tie down the truck using slings (2) attached to the frame.

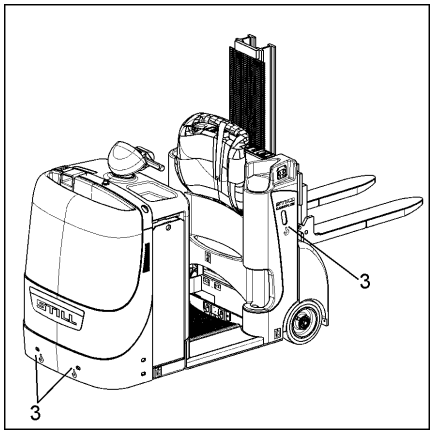
Towing procedure

As the electric brake is applied, the truck cannot be towed without functioning electrically.

NOTE

The brake can be released. Please contact your after-sales service.

Loading with a hoist



CAUTION

Use a hoist and hooks of sufficient capacity. See the truck data plate for the authorised load weight .

– Attach a sling to each location indicated by a hook symbol (3).

CAUTION

Slinging the truck via the cockpit or any other point not provided for this purpose is strictly prohibited.

CAUTION

Wedge battens between the chassis and slings to prevent damage.

⚠ DANGER

Danger to life!

No-one should be under a raised load.

Handling the battery

Preparation

Maintenance staff

Batteries may only be changed by specially trained personnel and in accordance with the instructions of the manufacturer of the battery, charger and truck. Follow the battery handling instructions.

Fire precautions

⚠ WARNING

Smoking and naked flames are not permitted when handling batteries. No inflammable or spark-producing materials may be located within at least 2 metres of the truck to be charged and the charger. The room must be well ventilated. Fire extinguishers must be kept ready.

Safe parking

When the battery is being worked on, the truck must be properly parked and it may only be started when the battery cover is closed and the battery plug connected.

Battery weight and dimensions

The weight and size of the battery influence the stability of the truck. When changing the battery, the weight conditions must not be changed. Additional weights may be neither removed nor their position changed.

Please note the description of installable batteries in the section "Battery type".

Notes on charging the battery are included in the workshop maintenance instructions in the section "Servicing the battery".

– Installation and connection of the charged battery is the reverse of removal. Make sure all covers are properly put in place.

Damage to cables

⚠ CAUTION

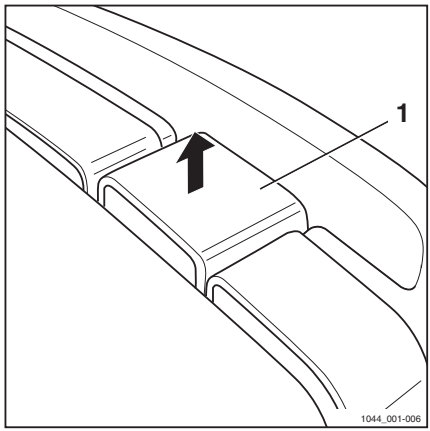
When removing and replacing the battery, take care not to damage the battery cables.

Opening/closing the battery compartment

Opening

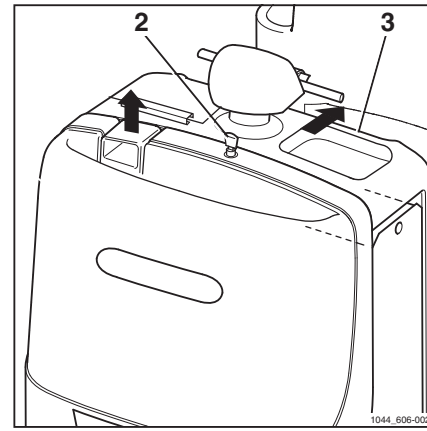
– Park the truck.

– Disconnect the female battery connector (1). ▷



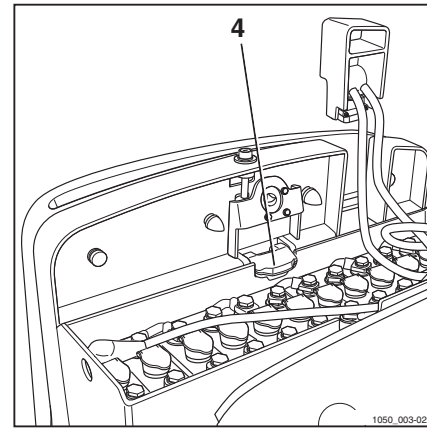
– Insert the key (2) into the battery lock and turn it 180°. Depress the battery lock. The battery cover (3) is unlocked and can be opened to rear.

▷



– Open the battery latch (4) 90°.

▷



Closing

⚠ WARNING

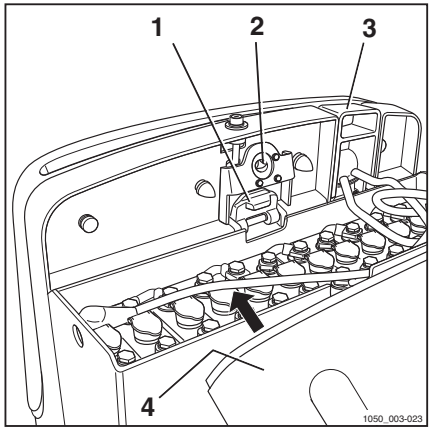
Danger of crushing.

When closing the battery door, there should be nothing between battery door and edge of the frame.

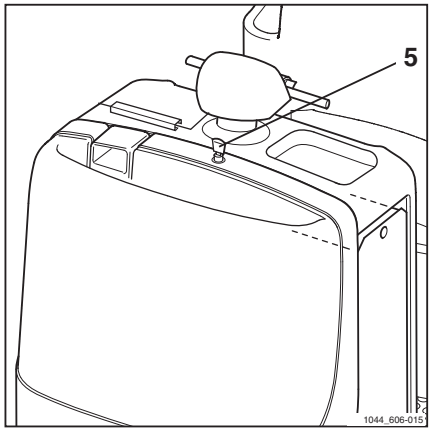
– Reconnect the female battery connector (3).

– Lower the battery latch (1).

– Push the battery cover (4) forward until it engages in the lock (2).



– Turn the key (5) for the battery compartment lock 180° and remove it.



Battery replacement

There are 2 ways of replacing the battery:

1. Vertically with a lifting tackle (all trucks)

2. With a lateral battery removal trolley (option)

To avoid short circuits, cover batteries with unprotected terminals or connectors with a rubber mat.

⚠ DANGER

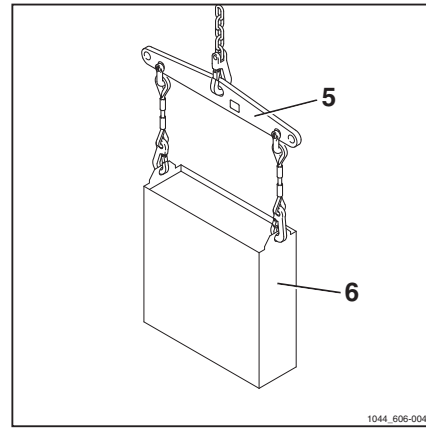
Danger!

Do not step or stand under a raised load.

– Carefully lift the battery out of the truck.

Battery replacement with crane ▷

– Disconnect the battery connector.
– Open the battery cover.
– Release the battery.
– Attach the battery (6) to a suitable lifting tackle (5).
– The lifting tackle should exercise a vertical pull so that the battery tray is not squeezed together. Hooks must be attached in such a way that they cannot fall onto the battery cells when the lifting tackle is slack.



Battery change with a roller battery holder ▷

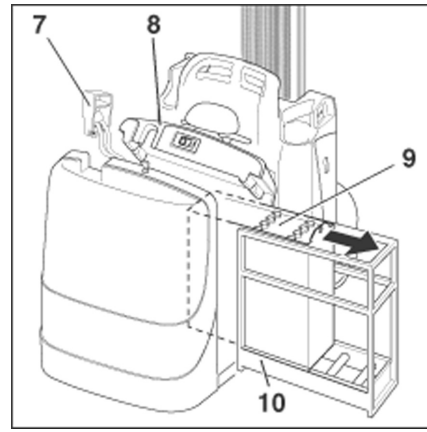
⚠ WARNING

Be careful not to trap your hand!

During dismantling or installation of the battery never put your hands between the chassis and the battery!

Dismantling

– Unplug the battery connector (7).
– Open the battery compartment (8).
– Unlock the battery.
– Position the roller holder (10) (optional) beside the battery.
– Stand on the opposite side of the cover and push the battery (9) to insert it on the trolley (10).



Installation

– Position the trolley (optional) (10) with the new battery beside the opening.
– Push the battery completely into the battery compartment.
– Close the battery compartment.

Servicing the battery

Observe the applicable national regulations for the installation and operation of battery charging units. Obey the operating instructions for the charging unit or charger and the battery. The following safety regulations must be observed when servicing, charging and replacing batteries:

Fire precautions

Smoking and naked flames are prohibited in the vicinity of batteries. No inflammable materials or spark-producing materials may be located within at least 2 metres of the truck to be charged and the charger. The room must be well ventilated. Keep fire extinguishers ready.

Safe parking

When the battery is being worked on, the truck must be properly parked and it may only be started when the battery cover is closed and the battery plug connected.

Battery servicing

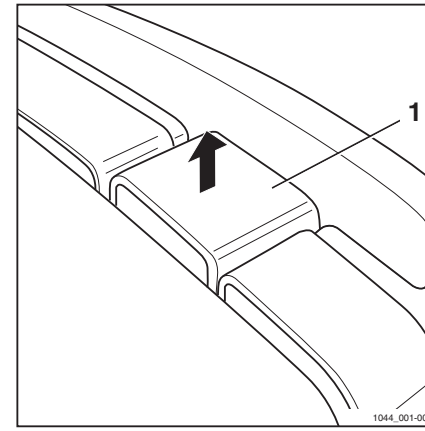
Keep the battery cell lid dry and clean. Neutralize spilled electrolyte immediately. Terminals and cable lugs should be clean, slightly greased and secure.

Battery charging

Switch off the truck and charger before removing the plug from the socket. During charging, keep the surface of the battery cells exposed in order to provide sufficient ventilation. Do not place any metallic objects on the batteries. While charging the battery keep battery cover open.

Decommissioning

Leaving the truck unattended



⚠ WARNING

Do not park the truck on gradients. In special cases secure the truck with chocks.

– Disconnect the battery connector (1).

NOTE

If you leave the pallet truck without disconnecting the battery connector, the control is shut off automatically after approx. 15 minutes.

The truck can only be operated again after reentering the driver code.

Storage

Measures when taking the truck out of service for a long period

If the truck is stored for a long period, carry out the following corrosion protection measures. When taking the truck out of service for over two months, park it in a clean and dry enclosed space which is also well ventilated and frost-free. Also perform the following measures:

Measures before taking out of service

– Thoroughly clean the truck.

– Cover all blank moving parts lightly with oil or grease.

– Check the condition and specific gravity of the battery. Service the battery according to the instructions of the manufacturer. (Follow the manufacturer's instructions.)

– Spray all open electric contacts with a suitable contact spray.

⚠ CAUTION

– Jack up the truck so that all wheels are clear of the ground. This measure will prevent a permanent deformation of the tyres.

– Cover the truck with a cotton cover and protect against dust.

⚠ CAUTION

We do not recommend using a plastic foil as this enhances the formation of condensate.

If the truck is to be taken out of service for a yet longer period, contact your Service.

Recommissioning after storage

If the truck has been stored for more than six months, it must be checked carefully before being recommissioned. This check must

be the same as the prevention of working accidents inspection, i.e. checking of all the significant safety points and devices on the truck is necessary.

– Clean the truck carefully.
– Check the condition and electrolyte level, and, if necessary, recharge the battery.
– Carry out the same maintenance work as for the first time it was used.
– Commission the truck.
– In particular, check the following on activation:

- the traction, control and steering,
- the brakes (service brake and parking brake),
- the coupling device,
- the fork lift/lowering device,
- the fork extension/folding device.

6

Maintenance

General maintenance information

General

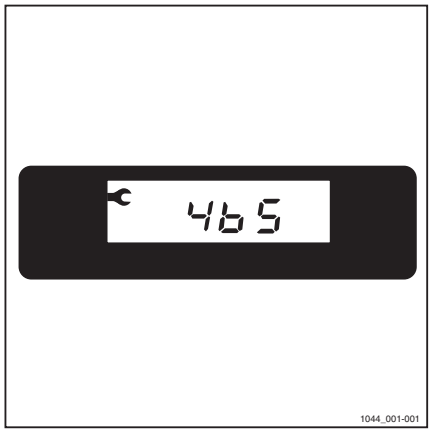
These instructions contain all the information required to perform the routine maintenance on your truck. Carry out the maintenance at the correct interval according to the maintenance chart to keep your truck ready for operation, maintain its efficiency and prolong its service life and to benefit from the warranty.

Maintenance chart

The maintenance on the truck must be performed according to the hour meter. Refer to the maintenance chart for the services required at a particular interval.

The instructions describing the maintenance procedures are located after the maintenance chart.

In a dusty environment and with fluctuating temperatures, reduce all lubrication and maintenance intervals as required.



Quality and quantity of required lubricants

Only use the lubricants specified in these operating instructions.

The fluids and lubricants and other materials required for the periodic maintenance of the truck are listed in the table of maintenance data.

Oils and greases of different grades may not be mixed, as this affects lubricity. If changing from one brand to another is unavoidable, drain the previous oil particularly thoroughly.

Carefully clean the area surrounding a component prior to filter renewal or working on the hydraulic system.

Use only clean containers when replenishing lubricants and other fluids!

Staff training and qualifications for maintenance and repairs

Only qualified and authorized staff may carry out the maintenance. The annual inspection must be performed by an expert. The expert must provide his opinion and safety assessment irrespective of operating and financial circumstances. He must have adequate knowledge and experience to assess the state of the vehicle and the effectiveness of the protective devices in accordance with the rules of technology and the basic principles of fork trucks.

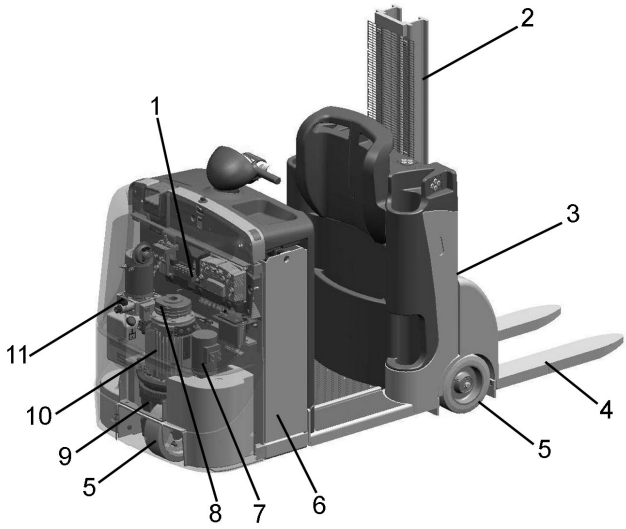
Maintenance personnel for batteries

Batteries may only be charged, serviced and replaced by specially trained personnel and in accordance with the instructions of the battery charger. Observe the battery handling and charger operating instructions.

Services not requiring special qualifications

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 qualification such as that outlined above is not necessary. Refer to the maintenance section of this manual for further information.

Servicing and inspection intervals



Carry out the work according to the intervals listed below.

h	Fig. n°	Maintenance work
as required	-	Cleaning the truck
	5	Servicing the wheels
	6	Servicing the battery
	8	Servicing the brake
	2	Servicing the lifting device
every 3 months/500 hours	11	Maintaining the hydraulic system
	7, 10	Servicing the electric motor
	1	Maintaining the electrical system
	8	Servicing the brake
	4	Check the forks
	2	Servicing the lifting device
	3	Coupling check

1000 hours	-	Checking the insulation
	-	Accident prevention technical inspection
annual/2000 hours	11	Maintaining the hydraulic system
	2	Servicing the lifting device
	1	Maintaining the electrical system
	-	Checking the insulation
	-	Accident prevention technical inspection
5000 hours	9	Servicing the reducer

Ordering spare parts and consumables

Spare parts are provided by our spare parts service department. You will find the necessary information for making 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 quality faults or incorrect choice. Anyone who uses non-compliant spare parts is entirely responsible in the event of an accident.

Table of maintenance characteristics

Sub-assembly	Lubricants and consumables	Abbre-viation	Specification	Dimensions	
Battery					
Fluid level	Distilled water			as required	
Insulation resistance				1000 ohm min. against the chassis	
Lubricants					
Joints and seals	Grease (lithium-saponified), TOTAL box oil	FL OG	NLGI Multi S2 MIL-L-2105, API:GL4	as required	
Reduction gear	Oil		TOTAL ELF: API GLA+ (80W90EP) STILL part number: 7326000010		approx. 1.5 l
Hydraulic system	Hydraulic oil (EQUIVIS)	XV 32	DIN 51524 P3 HVLP ISO 6743/4 HV	up to the mark on the gauge	approx. 6 l
Brushes					
2.2 kW pump motor				min. length	11 mm
Straddles					
Drive wheel				ø 250 x 100 mm	
Rear wheels				ø 250 x 80 mm	
Drive wheel nuts	Torque wrench			140 Nm	

Safety instructions for maintenance

Safety measures for maintenance and repair

To prevent accidents during maintenance and repair, perform all necessary safety measures such as:

– Ensure that the truck is secured against inadvertent movement or starting (disconnect the battery plug).

Work on the electrical equipment

Work on the electrical equipment of the truck is only allowed with the electrical system dead. Function checks, inspections and adjustments on live parts may only be carried out by trained and authorized staff under observance of suitable precautions. Rings, metal bracelets, etc. must be removed before working on electric components.

To prevent damage to electrical equipment with electronic components such as an electronic travel control or lift control, remove them from the vehicle before doing any electric welding.

Safety devices

Refit and check all safety devices for proper operation after maintenance and servicing.

Settings

Retain the vehicle-specific settings when repairing and replacing hydraulic and electric components. They are specified in the appropriate sections.

Preparatory procedures for maintenance

Slinging or jacking the truck

To lift the truck, its sub-assemblies or additional equipment, lifting devices must be hooked only to the appropriate lifting points. When jacking, take appropriate measures (using chocks or wooden blocks) to prevent the truck from slipping or tipping over.

Jacking

The truck must be jacked and chocked in order to perform certain maintenance operations. Always make sure:

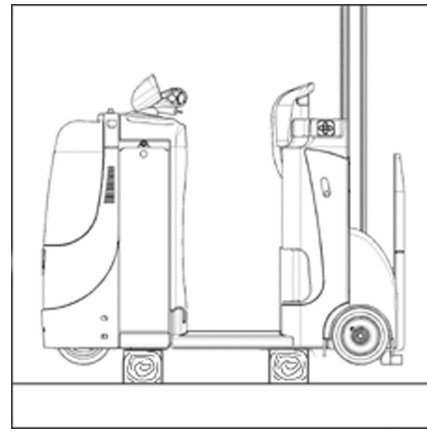
- To use a jack with an adequate lifting capacity.
- That the truck is parked on level ground and is secured against rolling and tipping.

⚠ WARNING

Disconnect the battery plug before lifting the truck!

Jacking the chassis

▷



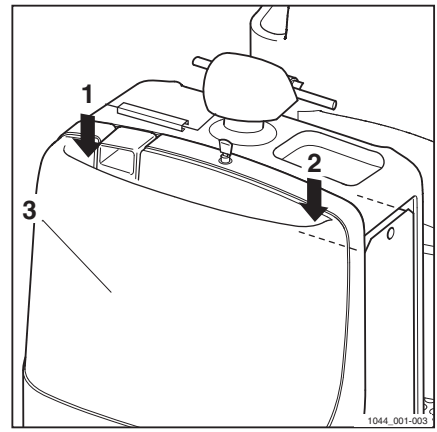
– Lift up the truck until the wheels are no longer in contact with the ground.
– Fit chocks under the truck.
– Lift the forks.
– Start to raise the truck from the rear.

Removing the cover

▷

Remove the cover before the maintenance work. For this reason, it is necessary:

– to undo the two screws (1) and (2) and
– remove the cover (3).



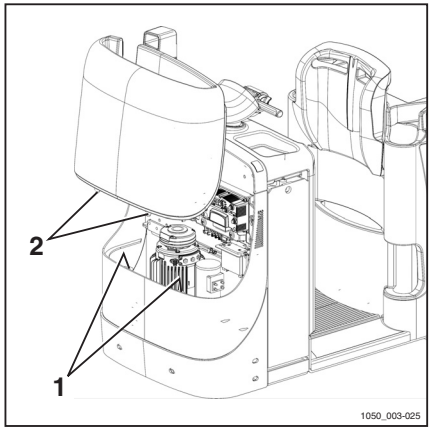
⚠ CAUTION

Do not damage the electric cables.

Refitting the cover

– Insert the cover (3) by the top. Place the guidance lugs (2) in the openings (1) of the chassis.

– Attach the cover using two screws.



Cleaning

Cleaning the truck

Cleaning instructions

– Always park the truck in compliance with the instructions.

– Disconnect the battery plug (1).

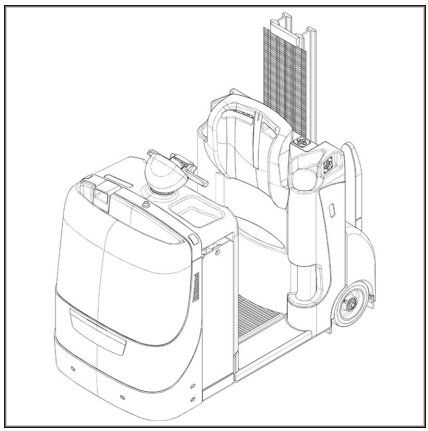
⚠ CAUTION

– The battery must be disconnected during cleaning procedures.

Washing the outside of the truck

⚠ WARNING

Do not use flammable liquid to wash the truck. The safety rules set out above must be followed to prevent the formation of sparks that could lead to a short circuit (remove the battery socket). All com-



ponents that are sensitive to moisture (particularly electrical components) must be protected if the truck is to be cleaned. Follow the manufacturer's instructions when using the cleaning product.

- Clean the truck with a cleaning product mixed with water (a sponge and cloths).
- Clean especially the oil filler holes and their surrounding area as well as the lubricating nipples, before lubrication.
- Lubricate the required locations (mast, hinges and seals).

Note: The more the truck is cleaned, the more it must be lubricated.

⚠ WARNING

Do not expose electric motors or other electrical equipment to direct jets.

Cleaning the chain

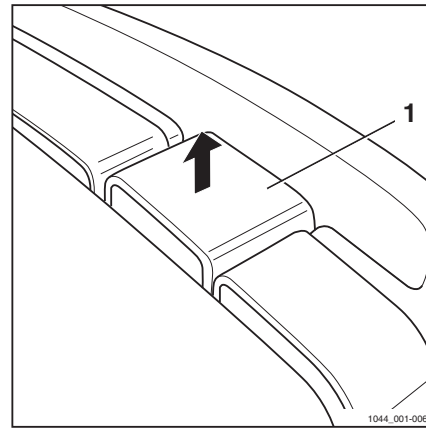
⚠ CAUTION

The use of cold or chemical detergents, as well as acidic and corrosive or chlorine-based liquids can damage the chain.

- Clean the chain with a paraffin derivative, e.g. petrol (follow the manufacturer's instructions).
- When cleaning with a steam jet, do not use additives.
- Dry the chain immediately after washing using compressed air. Move the chain so that the remaining water can leave the joints.
- Lubricate the chain immediately with the S aerosol for chains and move the chain again.

⚠ WARNING

Do not expose electric motors or other electrical equipment, brakes and bearings to direct jets.



Cleaning the electrical system

⚠ WARNING

Do not expose electric motors or other electrical equipment, brakes and bearings to a direct jet.

NOTE

Only use dry cleaning products. Do not remove the protective and other covers.

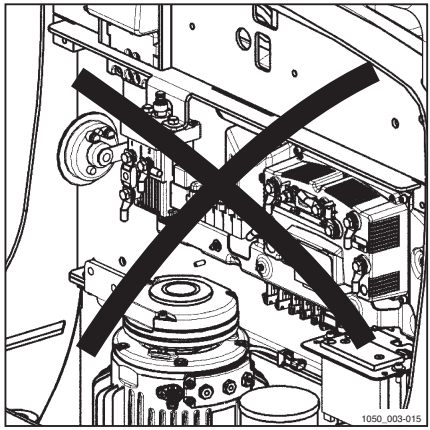
– Clean the electrical parts with a non-metal brush and dry with lightly compressed air.

After washing

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

– Start the truck, in accordance with the instructions.

If, despite taking precautions, traces of moisture persist in the motor, dry it using compressed air (clean and dry), otherwise there is a short-circuit risk. ONLY then may the truck be reactivated and restarted to prevent any corrosion.



Maintenance as required

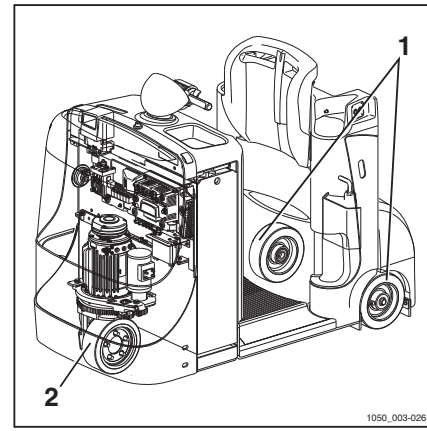
Service the wheels and rollers

Check the tyres for wear and damage

- The running surface of the traction wheel (2) and the rear wheels (1) should be undamaged.

Dimensions	
Traction wheel	250 x 100 mm
Rear wheels	250 x 80 mm

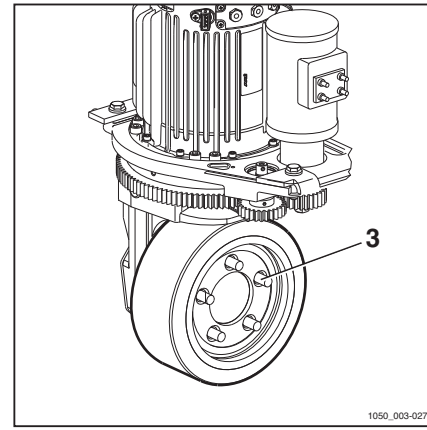
– Replace damaged or worn wheels with new ones.



Tighten wheel fasteners

– Check the wheel fasteners (3) for tightness and retighten them, if necessary.

Torque	140 Nm



Servicing the battery

⚠ CAUTION

Before performing any work on the electrical installation, remove any power from the system by disconnecting the battery connector.

Battery maintenance precautions

Keep the battery cell lid dry and clean. Neutralise spilled electrolyte immediately. Terminals and cable lugs should be clean, slightly greased with terminal grease and screwed on securely.

Battery charging

During charging, keep the surface of the battery cells exposed in order to provide sufficient ventilation. Do not place any metallic objects on the batteries. While charging the battery keep battery cover open.

Battery type

Lead or gel batteries are used as traction batteries. As the various types are structured differently, always use the correct type of charging device without fail. Before charging, check if the battery charger is suitable for your battery!

⚠ CAUTION

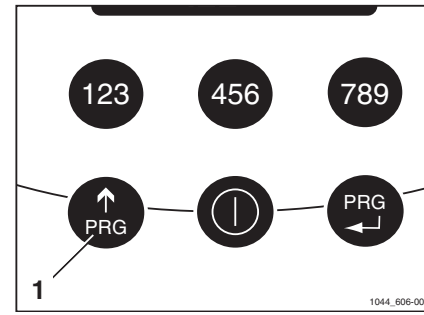
Gel batteries are subject to special charging/maintenance and handling regulations. Use of the wrong type of charging device can result in total battery failure.

Always obey the instructions issued by the relevant manufacturer.

NOTE

The factory setting of the battery charge indicator is for a lead battery. The indicator can also be set to a gel battery. Please contact your Service.

Charging the lead battery



⚠ WARNING

The battery could be damaged, shorted or an explosion could occur.

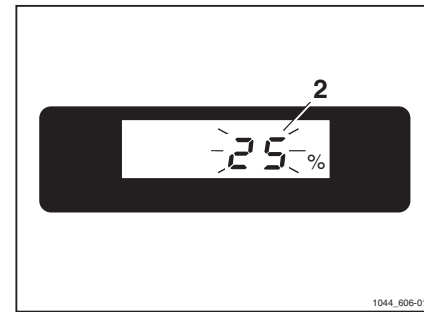
Do not place any metallic objects or tools on the battery. No naked lights, no smoking permitted!

⚠ WARNING

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

Follow the safety precautions for handling battery electrolyte.

– Press the PRG ↑ (scrolling) button (1) to display the existing battery charge (2).



NOTE

After the battery is connected, the correct state of charge appears only after approx. 1 minute.

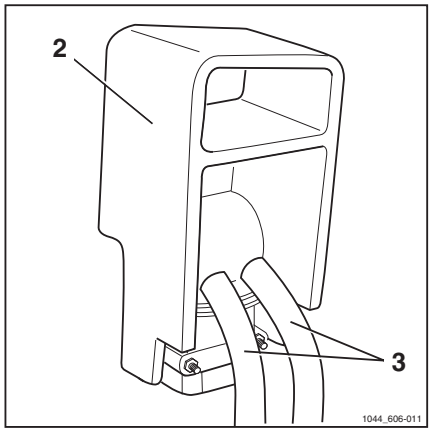
Charging the gel battery

– Refer to instructions for this battery.

⚠ WARNING

Disconnect the battery plug only when the truck and charger are switched off.

– Connect the battery plug (2) to the connector of the charger unit. ▷



NOTE

Please follow the information in the operating instructions for the battery and the charging station (equalising charge).

⚠ WARNING

The gases released during charging are explosive.

– Ensure that the room is well ventilated.

⚠ CAUTION

Never squeeze the battery cables (3).

Checking operation of the brake, checking the emergency brake

- Drive the truck.
- Leave presence area (5). The truck will brake to a stop.
- Drive the truck slowly with the traction control (2).
- Press the belly button (3). The truck is braked to a stop.
- `StoP` appears in the display (1).

NOTE

After the disappearance of `StoP` *in the display, press the* I *"ON" button (6) to restart work.*

WARNING

- Should the brakes show signs of wear or be defective, please contact your Service.

CAUTION

This brake may only be used in an emergency.

Emergency stop of the truck

- To make an emergency stop, disconnect the battery plug (4). The truck comes to a stop.

CAUTION

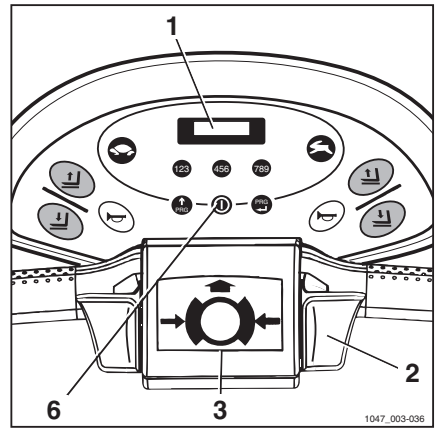
This safety feature may only be used in an emergency

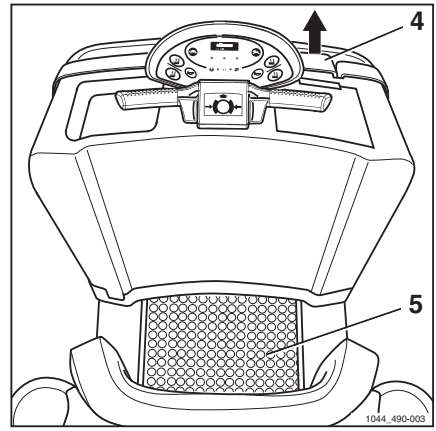
NOTE

To restart the truck, first reconnect the battery connector and then re-enter the driver code.

Lifting device

- Remove any dirt from the guide rails.
- Lubricate the guide rails using S pressure high resistance adhesive lubricant to slow down wear.





NOTE

Lubricate the guide rails uniformly using an aerosol spray at a distance of 15 to 20 cm. Wait approximately 15 mins before restarting the truck.

– Coat the chain with S spray for chains.

– Lubricate the various bearings and friction points with OM oil.

Fuses

CAUTION

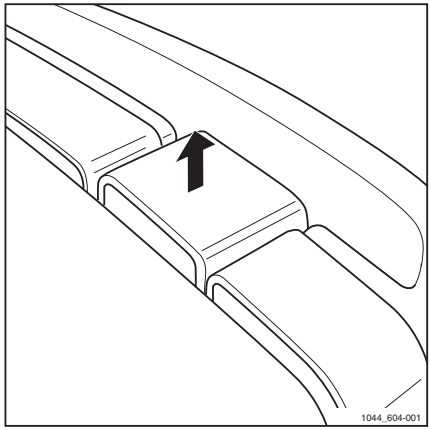
– Before working on the electrical system, the vehicle must be de-energised by disconnecting the battery connector.

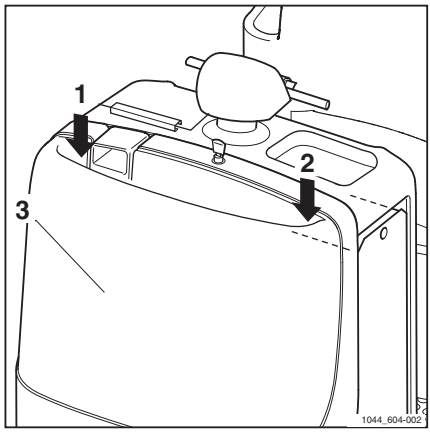
– Remove the two screws (1) and (2).

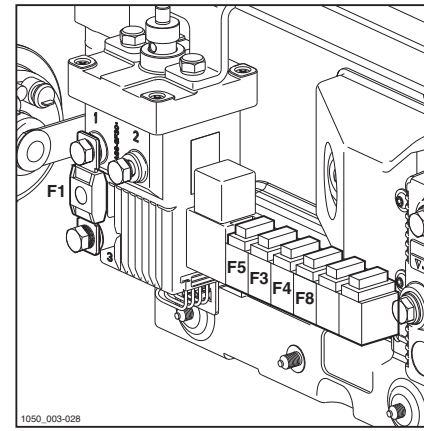
– Remove the cover (3).

The following fuses are located on the fuse holder:

F1	Main fuse	400 A
F3	Control fuse 24 V	7.5 A
F4	Other equipment fuse (horn...)	7.5 A
F5	Steering fuse	20 A
F8	Fuse for other power circuits	3 A






1
2
F1
3
F5
F3
F4
F8
1050_003-028

Maintenance every 500 hours

Other tasks

– Perform all maintenance work; see the "Maintenance" chapter.

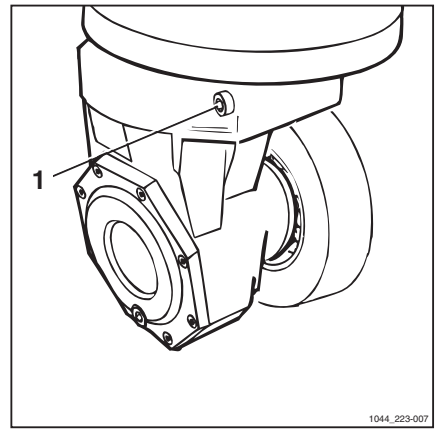
Checking the gearbox oil level

NOTE

The truck must stand on level ground.

– Turn the tiller until the level plug (1) is visible.

– Remove the level plug (1). The oil level must reach up to the edge the opening. If necessary, add oil OG according to the table of maintenance data.



Checking the gearbox for leaks

– Inspect the gearbox for leaks (traces of oil).

CAUTION

During lubrication services and oil changes, do not allow any oil or grease to get on the brake disc.

Servicing the pump motor

Checking the electrical connections

– Check the mounting, condition and insulation of the pump motor cables.

NOTE

Oxidised connections and faulty wiring lead to voltage drops causing disturbance.

– Remove any traces of oxidation and replace faulty wiring.

Replacing the pump motor brushes

– Stop the truck, disconnect the battery socket and remove the front cover.

To gain access to the brushes:

– Undo the two screws located above the pump motor and remove the cover.

– Lift the pressure springs and remove the brushes.

The brush length must not be less than the minimum length (i.e. 11 mm).

– Change all the brushes when a brush reaches this measurement.

NOTE

Change the set of brushes when they reach the minimum length. Before refitting, check that there is no trace of burning on the collector. The new brushes must be bedded before refitting. If old brushes are refitted, do not reverse them or turn them over. Consult your service department.

– Put back the pump motor cover.

– Put back the front cover.

Service the electrical system ▷

Check connections and fuses

DANGER

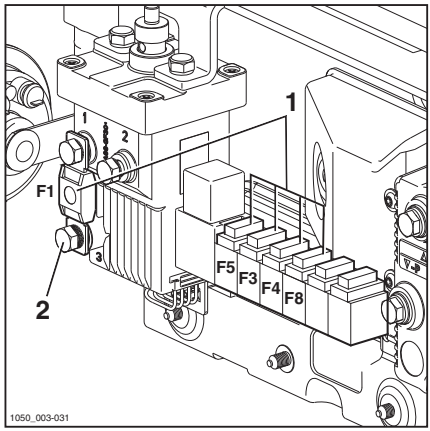
– Before beginning the following services, park the truck and disconnect the battery connector.

– Remove the front cover.

– Check the fuses (1) for proper condition.

– Check all connections (2) for security.

– Tighten all clamping screws.



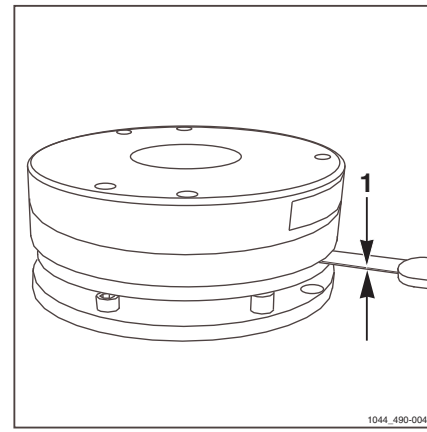
Check the contactor tips

– Check the contactor tips for pitting and have them replaced, if necessary.

– Refit and secure the cover.

Servicing the brake

Checking the air gap



– Release the brake.

– Measure the air gap (1) with an adjustment shim at three different points separated by 120°.

Min. air gap: 0.3 mm

Max. air gap: 0.8 mm

⚠ WARNING

– If the air gap cannot be satisfactorily adjusted, change the brake disc.

Checking the braking power

Braking must be carried out unladen (trailer mode) in accordance with standard ISO/DIS 6292. According to this standard, industrial tractors with 1 or 2 braked wheels travelling at 13 km/h must have a braking distance of less than 3.91 m.

⚠ WARNING

Keep the braking path clear and ensure there is sufficient safety distance.

– Drive the truck at 13 km/h.

– Activate the brake and measure the braking distance.

– If the distance measured is greater than 3.91 m, the brake must be changed by our service department.

⚠ WARNING

Never use the truck with a faulty brake.

Checking the condition of the forks

– Check that the forks show no signs of distortion, cracks, heavy wear or fissures.

⚠ CAUTION

Damaged forks must be replaced by our service department.

Servicing the mast

Checking the sealing of the lift cylinder and connections

– Visually check the hydraulic connections and cylinder for leaks.

– Tighten any unsealed connections and repair the faulty cylinder.

Checking the condition and wear of the chain, lubrication

– Lubricate the lift chain using S chain spray.

Checking the guard grille/screen

– Check the mounting and condition (no damage) of the guard grille (or screen).

– Replace the guard grille (or screen) if it is damaged.

– Adhere to the number of fastenings as defined by the manufacturer.

⚠ DANGER

The grille (or screen) MUST be installed and correctly attached; do not attach anything to the grille/screen that could affect the visibility on the forks. When cleaning on the fork side, clean the grille/screen only when the forks are in the low position.

Maintenance every 1000 hours

Work that must also be carried out

– Carry out maintenance work as necessary, see ⇒ Chapter "Maintenance as required", P. 125.

– Carry out 500-hour maintenance, see ⇒ Chapter "Maintenance every 500 hours", P. 133.

Insulation resistance check (earthing)

The insulation of industrial trucks should have sufficient insulation resistance. Test the truck and battery separately.

Testing the insulation resistance of the electrical system

Have the insulation resistance of all active electrical components checked in accordance with DIN 57117 and DIN 43539, VDE 0117 and VDE 0520.

Measurement voltage > nominal voltage < 500 V. Insulation is considered correct when it is measured in relation to the chassis and is higher than 1000 ohm/V of nominal voltage.

Please contact your Service for this test.

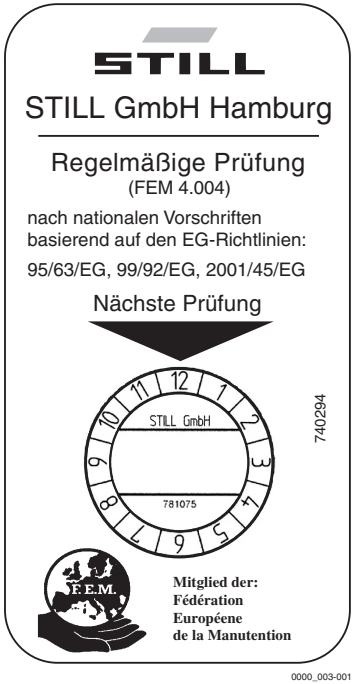
Performing the accident prevention check ▷

The vehicle must be tested (at least once a year) by an expert.

This annual test by an expert must cover the condition of the assemblies and equipment and the completeness and efficacy of the safety features.

The truck must also be examined thoroughly for damage which may have occurred through improper operation. An inspection report must be prepared. The results must be kept on file until the next inspection. The operator must ensure that any defects are remedied without delay.

Please contact your Service.



Maintenance every 2000 hours

Other tasks

- Carry out the services of the maintenance as required, see ⇒ Chapter "Maintenance as required", P. 125.
- Carry out the 500-hour maintenance, see ⇒ Chapter "Maintenance every 500 hours", P. 133.
- Carry out the 2000-hour maintenance, see ⇒ Chapter "Maintenance every 1000 hours", P. 137.

Maintaining the hydraulic system

Draining the hydraulic oil and replacing the oil filter

⚠ WARNING

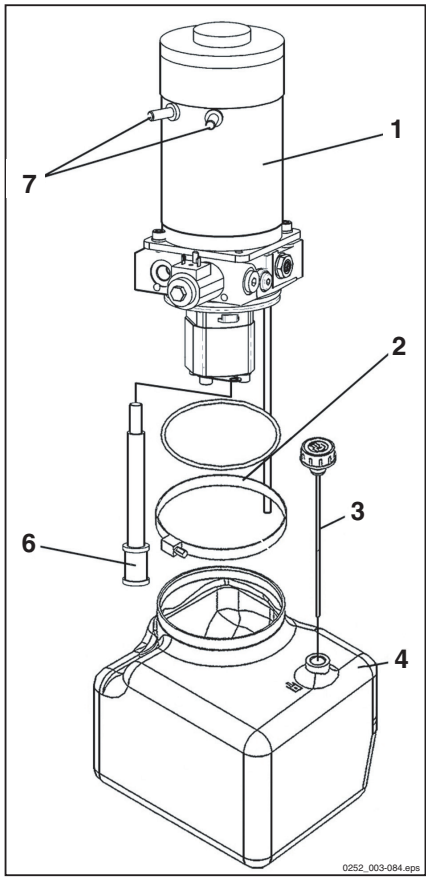
Hydraulic oil can damage your health.

Follow the safety instructions for using hydraulic oil.

⚠ CAUTION

Drain off the used oil in accordance with the instructions.

- Place the truck on a horizontal surface.
- Lower the forks.
- Remove the front cover.
- Disconnect the battery connector.
- Disconnect the electrical (7) and hydraulic connections of the pump motor (1).
- Unscrew the clip (2) and remove the pump motor from the hydraulic oil tank (4).
- Replace the filter (6).
- Remove the tank (4).
- Recover the hydraulic oil (approx. 6 l) and drain it.
- Refit the pump unit.
- Unscrew the gauge (3) and fill up with fresh hydraulic oil in compliance with the table of lubricants and ingredients until the max. mark on the gauge is reached (filling capacity approx. 6 l)
- Refit the parts.

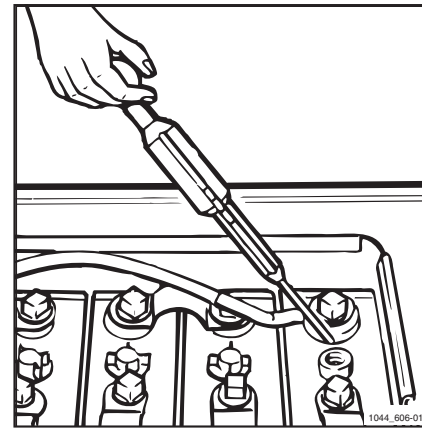


Servicing the mast

- Check the condition and clearance of the rollers.
- Check the condition and wear of the fork carriage.
- The rollers are greased for life and do not require any maintenance. Change them if clearance is too great or they are worn.

– Consult our service department to carry out this work.

Checking and cleaning the battery ▷



⚠ WARNING

Risk of short circuit and even explosion.

Do not smoke, keep away from naked flames and do not place metal objects on the battery.

Servicing the battery according to the manufacturer's instructions

⚠ WARNING

Risk of personal injury due to arcing!

– Do not reverse the battery poles or cause a short.

Insulation resistance check (earthing)

The insulation of industrial trucks should have sufficient insulation resistance. Test the truck and battery separately.

Testing the insulation resistance of the electrical system

Have the insulation resistance of all active electrical components checked in accordance with DIN 57117 and DIN 43539, VDE 0117 and VDE 0520.

Measurement voltage > nominal voltage < 500 V. Insulation is considered correct when

it is measured in relation to the chassis and is higher than 1000 ohm/V of nominal voltage.

Please contact your Service for this test.

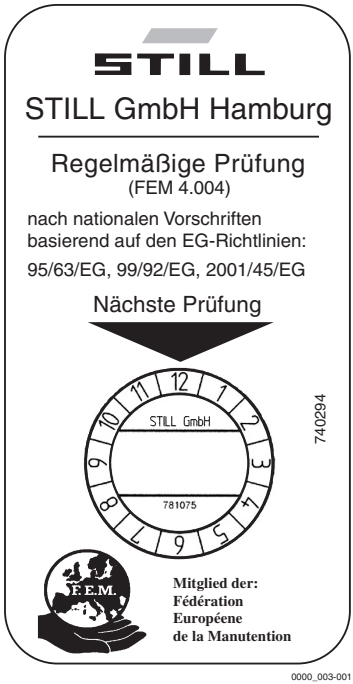
Performing the accident prevention check ▷

The vehicle must be tested (at least once a year) by an expert.

This annual test by an expert must cover the condition of the assemblies and equipment and the completeness and efficacy of the safety features.

The truck must also be examined thoroughly for damage which may have occurred through improper operation. An inspection report must be prepared. The results must be kept on file until the next inspection. The operator must ensure that any defects are remedied without delay.

Please contact your Service.



Maintenance every 5000 hours

Other activities

Work that must also be carried out

– Carry out maintenance work as necessary, see ⇒ Chapter "Maintenance as required", P. 125.

– Carry out 500-hour maintenance, see ⇒ Chapter "Maintenance every 500 hours", P. 133.

– Carry out 1000-hour maintenance, see ⇒ Chapter "Maintenance every 1000 hours", P. 137.
– Carry out 2000-hour maintenance, see ⇒ Chapter "Maintenance every 2000 hours", P. 139.

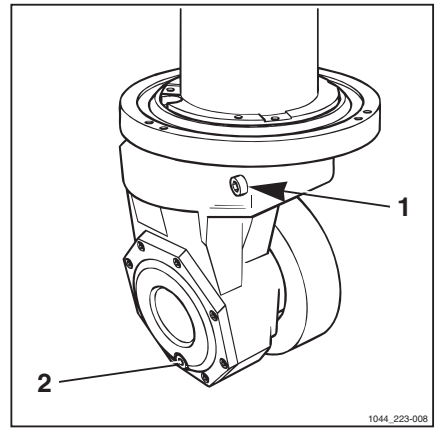
Servicing the gearbox

Changing gear oil

⚠ CAUTION

– Drain the oil at operating temperature.
– Follow the safety precautions for handling gear oil.

– Park and secure the truck and remove the cover.
– Turn the tiller until the filler plug (1) is accessible.
– Remove the drain plug (2) and filler plug (1) and allow the oil to drain completely.



ENVIRONMENT NOTE

Dispose of the used oil as specified.

– Tighten the oil drain plug with a new seal again.

Filling gear oil

– Fill fresh oil OG according to the table of maintenance data through the hole for the oil filler plug (1).

Capacity: approx. 1.5 l

7

Technical data

Datasheet (VDI)

DESIGNATION				
1.1	Manufacturer		STILL	STILL
1.2	Model		KANVAN 05	KANVAN 10
1.3	Energy source		Electric	Electric
1.4	Type of drive		Stand-on	Stand-on
1.5	Nominal capacity / load	Q (kg)	500	1000
1.5.1	Towed load	Q (kg)	4000	4000
1.6	Load centre of gravity	c (mm)	500	500
1.7	Nominal traction capacity	F (N)	1600	1600
1.8	Distance from front axle bolt to fork heel	x (mm)	165	165
1.9	Wheelbase	y (mm)	1216	1302

WEIGHT				
2.1	Unladen weight (with battery)	kg	1510	1645
2.2	Load per laden axle, drive side / load side	kg	530 / 1480	380 / 2265
2.3	Load per unladen axle, drive side / load side	kg	780 / 730	890 / 755

WHEELS				
3.1	Tyres		Polyurethane	Polyurethane
3.2	Drive wheel sizes	Øxl (mm)	Ø250x100	Ø250x100
3.3	Wheel sizes, load side	Øxl (mm)	Ø250x80	Ø250x80
3.5	Number of wheels, drive side/load side (x = drive wheel)		1x /2	1x /2
3.6	Track width, drive side	b_{10} (mm)	0	0
3.7	Track width, load side	b_{11} (mm)	679	679

DIMENSIONS				
4.2	Lowered mast height	h_1 (mm)	1650 / 2200	1650 / 2200
4.3	Height of initial lifting	h_2 (mm)	150	150
4.4	Lift height	h (mm)	1250	1250
4.5	Overall extended mast height	h_4 (mm)	1650	1650
4.8	Seat/platform height	h_7 (mm)	146	146

DIMENSIONS				
4.9	Height of tiller in driving position	h_{14} (mm)	1165	1165
4.12	Coupling height	h_{10} (mm)	300/355/410	300/355/410
4.15	Maximum lowering	h_{13} (mm)	45	45
4.17	Distance from coupling to rear axle	l_5 (mm)	135	135
4.19	Total length forks folded/extended	l_1 (mm)	1595 / 2756	1693 / 2854
4.20	Length to the load mating face	l_2 (mm)	1566	1664
4.21	Total width	b_1 (mm)	800	831
4.22	Dimensions of fork tips	s/e/l (mm)	45/120/990	45/120/990
4.24	Fork carriage width	b_3 (mm)	480	480
4.25	Outside fork spread	b_5 (mm)	520	520
4.31	Ground clearance, laden, under mast	m_1 (mm)	70	70
4.32	Ground clearance at centre of wheelbase	m_2 (mm)	70	70
4.33	Aisle width with a 1000 x 1200 pallet width wise	Ast (mm)	2940	3040
4.34	Aisle width with an 800 x 1200 pallet length wise (b_{12}xl_6)	Ast (mm)	3040	3140
4.35	Turning radius	W_a (mm)	1410	1500

PERFORMANCE DATA				
5.1	Travel speed, laden/unladen	km/h	7.5 / 13	7.5 / 13
5.2	Lifting speed, laden/unladen	m/s	0.16 / 0.20	-
5.3	Lowering speed, laden/unladen	m/s	0.28 / 0.23	-
5.5	Nominal traction force with load	N	400	400
5.6	Maximum nominal traction force	N	4000	4000
5.7	Slope S2=30, with/without load	%	see diagram	see diagram
5.10	Service brake		Electromag-netic	Electromag-netic

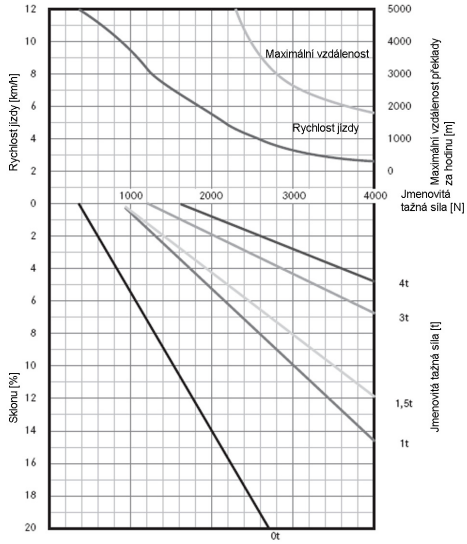
DRIVE				
6.1	Traction motor, power S2=60 mins	kW	3	3
6.2	Lift motor, power S3	kW	2.2 / 10%	2.2 / 10%
6.3	Battery type in accordance with DIN 46 531 / 35 /36 A, B, C, no		IEC 254 - 2; B	IEC 254 - 2; B
6.4	Battery voltage and capacity (dis-charge in 5 hours)	V/Ah	24 / 450	24 / 560
6.5	Battery weight (±5%)	kg	410	515

MISCELLANEOUS				
8.1	Speed control		AC controller	AC controller

Masts table - Simplex		
h_1	1650	2200
h_2	150	150
h_3	1250	1800
h_4	1650	2200

Maximum load				
KANVAN 05	CDG distance in mm	400	500	600
	h_3 1250 mm	500 kg	500 kg	450 kg
	h_3 1800 mm	500 kg	500 kg	450 kg
KANVAN 10	h_3 1250 mm	1000 kg	1000 kg	830 kg
	h_3 1800 mm	1000 kg	1000 kg	830 kg

Load diagram



Concrete example: on a 2 percent slope with a towed load of 4 t, the KANVAN can travel 3500 m at a speed of 4.0 km/h then slow to a stop. Then, with the same slope and towed load, a new start and a new run is possible. Maximum hourly travel is the total possible travel, taking reversing into account. Use of a trailer with brakes is recommended when the tractor load exceeds 2.5 tonnes - and whenever travelling on slopes.

Wheels and tyres

Approved types of tyres

Only the specified types of wheels may be installed.

A

B

C

D

E

F

G

H

I

L

M

O

P

Q

R

S

T

U

V

W

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