Original instructions

IC Truck
MTU Eu5

RCD 100
RCD 120
RCD 140
RCD 150
RCD 160
RCD 180
RCD 100 / 1200
RCD 120 / 1200
RCD 140 / 1200
RCD 150 / 1200
RCD 160 / 1200
RCD 180 / 900



5410 5411 5412 5413 5414 5415
5416 5417 5418 5419 5420 5421

first in intralogistics

5001 801 1625 EN - 07/2024 - 05

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Made in China

Rules for the operating company of industrial trucks

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

This guide provides information for handling industrial trucks:

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

Internet address and QR code

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

Abbreviations

Below is a list of abbreviations used in this manual

ACM	Aftertreatment Control Module
API	American Petroleum Institute
BITA	British Industrial Truck Association
CAN	Controller Area Network
CPC	Comon Powertrain Controler
ECM	Engine Control Module
FDE	Truck Data Acquisition Module
LED	Light Emitting Diode
LVDT	Linear Variable Displacement Transformer
MCM	Motor Control Module
PIN	Personal Identification Number
PPE	Personal Protective Equipment
RPM	Revolutions Per Minute
STVZO	Straßenverkehrs-Zulassungs-Ordnung (Road Traffic Licensing Regulations)
VDMA	Verband Deutscher Maschinen- und Anlagenbau (German Engineering Association)
LS	Load Sensing

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1

Introduction

Truck data

We recommend that you record all basic fork-lift truck data in the following table so that it is available if required by the sales network or authorised service centre.

Type	
Serial number	
Date of delivery	

Your industrial truck

Technical Description

General

The 1411-02 range of fork trucks with MTU engine offer the ability to lift capacities up to 16 or 18 tonnes, with lift capacities up to 16 tonnes available at 1200 mm load centre, with lift capacities up to 18 tonnes available at 600 mm. These products are based on 3 wheelbases and use modular components, ensuring the final configured product delivers the optimum balance between weight and manoeuvrability.

Engine

The engine system is equipped with an electronic engine management system which comprises the following control units:

- Engine management control module (MCM)

- Drive control system unit (CPC)

- Exhaust gas aftertreatment control unit (ACM)

The control units are connected in an electronic network. Data is exchanged via CAN (Controller Area Network).

In addition to the engine, the exhaust gas aftertreatment and the connection on the vehicle/ device, the electronic engine management system also monitors itself.

NOTE

It is not permitted to make changes to the engine which affect exhaust and noise emissions, contact your service partner if you are in any doubt.

Electronic engine management

The engine system is equipped with an electronic engine management system which comprises the following control units: - Engine control module (ECM). The control module is connected with IFM system via CAN bus and data is exchanged via CAN (Controller Area Network).

The engine and drive control system are monitored by the truck controller and status is displayed on the truck status display monitor.

In addition to the engine, the engine control module also monitors itself. Depending on the malfunctions/failures which occur, warning and information displays are displayed on the tuck status display monitor. The malfunction is stored in the fault memory and if necessary a safety and emergency mode is automatically selected. If the electronic engine management control detects a fault, the fault code is stored in the control units. It can then be read by a service partner.

Steering

The steering is a hydrostatic power system, which operates the rear wheels with the steering wheel via the steering cylinder

Brake System

The truck park brake system is a spring applied, pressure release fail-safe system, controlled by the operator via a switch located on the arm rest. The park brake will not release unless the operator has their foot on the service brake pedal to ensure safe operation.

The service brake is a pressure applied, spring release system, operated by connected pedals located either side of the steering column.

Both park and service brake circuits are powered by a fixed displacement gear pump mounted on the front of the main work hydraulic pump. This gear pump is fed by the hydraulic oil reservoir located on the right-hand side of the truck, The oil passes through a pressure filter before feeding the controlling valves. The excess and return oil flow from the brake circuits flushes and cools the oil immersed wet disk brakes in the front drive

axle before returning to the oil reservoir via the return filter.

Using sensors, audible and visual warnings will occur in the event of low brake pressure, or if a fault is present in the brake system.

Hydraulic system

A single or tandem (depending on truck variant) variable displacement, load sensing work hydraulic pump is mounted directly to the transmission. The back pump feeds both steering and work hydraulic functions while the front pump (if fitted) feeds the work hydraulic system. These pumps are fitted with pressure compensators which act as safety valves so that in the event of higher than expected pressure flow is reduced to zero and the maximum pressure is maintained at 310 bar.

An externally mounted in-line priority valve ensures the steering function has priority over work hydraulic functions.

The main hydraulic valve is a group of advanced CANbus controlled, load-independent proportional valves and include primary and secondary relief valves that prevent overload of the hydraulic circuits.

To improve and enhance the safe design of the hydraulic system the control valves are fitted with LVDT spool position feedback sensors which enable the valves to monitor their own condition and broadcast any errors over the CANbus.

The mast lift/lower section incorporate “leak free” valves to eliminate the possibility of mast creep when carrying heavy loads.

A combination cooler ensures that the temperatures are kept optimum for the transmission, engine water and charge air. The cooling direction and cooler location have been carefully developed with the aim of minimising the size of the cooling pack and maintaining best in class cooling performance. The cooled air direction pulls ambient clean air from above the rear of the truck and drives warm air down through the engine bay over the engine and finally out at the front.

Lift mast

The standard mast is a double open centre non-free lift type with twin lift and tilt cylinders, lift chains mounted on each side and are attached to the carriage.

Lift movement is achieved when the lift cylinders extend and the lift chains pull on the carriage, during this extension the inner mast section slides inside channels of the outer section.

The whole mast and carriage assembly is mounted and pivots on two pins that are fixed and located within the fabrications of the drive axle and chassis, Hydraulic operated side shifting is available with a choice of fork section, style and attachment type.

Electrical system

The main truck`s electrical system is 24 volts, this potential is delivered by two 12 v 95 AH batteries connected in series, Charge is provided by the engine mounted alternator and the charge current is controlled by a solid state rectifier.

Electronic/electrical installation

Parker control system allow:

- sensitive, smooth driving and reversing,

- automatic engine speed control to match the hydraulic power requirements,

- fast service due to self-diagnostics,

- greatest possible operational reliability.

Driving cab

The steel frame of the driver`s cab has been constructed to function as the load guard and has been tested to exceed the International safety standards. Driver entry is provided via the steps located to the left side of the truck. Steps are also fitted to the right side of the truck for access. The right cab door can to be used as an emergency exit and is provided for the use of a passenger where the optional passenger seat is fitted and located to the rear left of the cab floor.

The cab and doors have large glazed areas and allow the driver maximum all round visibility during driving and lifting operations.

Screen wiper and washers are fitted to the front, top and rear screens with demist functions as part of the cab heater or the optional climate control system.

An optional passenger seat can be fitted in the right rear corner of the cab.

An optional fire extinguisher can be fitted in the cab if required.

General

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

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

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

Therefore:

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

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

The guard rails is the standard configuration if the truck equipped with the ordinary glass.

Battery access

A compartment for battery access is located on the left side of the truck, which allows you to:

- check the truck batteries
- fill the windscreen washer reservoirs

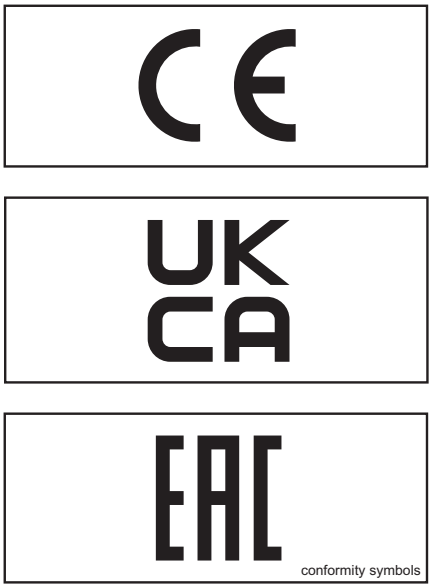
Conformity marking

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

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

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

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



conformity symbols

Declaration that reflects the content of the declaration of conformity

Declaration

STILL GmbH
Berzeliusstraße 10
22113 Hamburg Germany

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

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

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

Personnel authorised to compile the technical documents:

See declaration of conformity

STILL GmbH

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

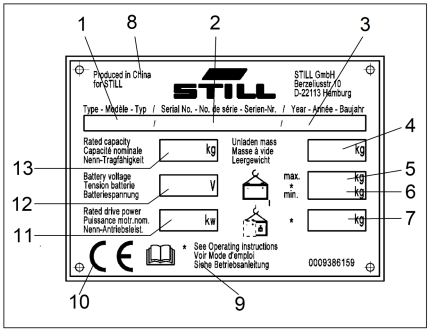
The declaration of conformity document is supplied with the industrial truck. The declaration shown explains the conformity with the provisions of the EC Machinery Directive and the Supply of Machinery Safety Regulation 2008, 2008 No. 1597.

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

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

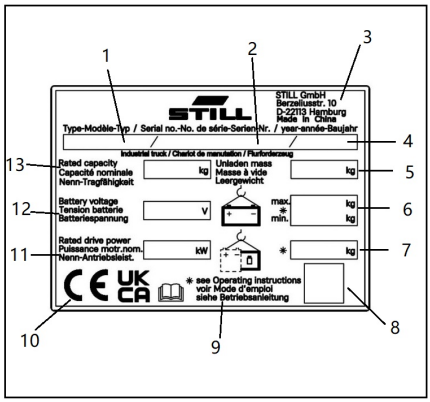
Nameplate

Nameplate, variant 1



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

Nameplate, variant 2



1 Type
2 Serial number
3 Manufacturer
4 Year of manufacture
5 Unladen mass in kg
6 permissible battery weight in kg (for electric trucks only) Max./Min.
7 Own mass (self weight) in kg without battery
8 Data matrix code
9 Refer to technical data listed in this operating instructions for more detailed information
10 Conformity marking: CE mark for the markets of the EU, the EU candidate countries, the EFTA States and Switzerland UKCA mark for the United Kingdom market EAC mark for the Eurasian Economic Union market
11 Rated drive power in kW

12 Battery voltage in V
13 Rated capacity

NOTE

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

NOTE

Nameplate provided according to collocation requirements.

Use of the truck

Commissioning

Commissioning is the initial intended use of the truck.

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

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

Improper use

The operating company or driver, and not the manufacturer, is liable for any hazards caused by improper use.

NOTE

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

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



⚠ DANGER

There is a risk of fatal injury from falling off the truck while it is moving!

– It is prohibited to carry passengers on the truck.

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

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

Precautions

– Do not drive on steep slopes, to prevent the load from slipping off.
– The truck must be switched off when left unattended. Key (or key code) must be

removed when the truck is unattended to prevent unauthorised use.

– When using this truck, pay attention to the surroundings and do not become distracted.
– Please pay attention to the moving parts of the truck to prevent your hands from being crushed.

Description of use and climatic conditions

Normal use

- Indoor and outdoor use
- Ambient temperature of -20°C to +40°C
- Altitude of no higher than 2000 m.

Information about documentation

Documentation scope

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

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

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

Production no. .....

Year of production .....

Please quote these numbers for all technical enquiries.

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

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

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

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

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

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

Supplementary documentation

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

This CO may consist of:

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

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

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

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

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

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

Issue date and topicality of the operating instructions

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

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

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

Copyright and trademark rights

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

Explanation of signal terms used

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTE

For technical requirements that require special attention.

ENVIRONMENT NOTE

To prevent environmental damage.

Date of edition and latest update of this manual

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

The manufacturer makes continuous efforts to improve its industrial trucks with modifications. The manufacturer reserves the right to make such additions to the contents of the truck's operating instructions in a timely manner.

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

List of abbreviations

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

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

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

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

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.

EMC – Electromagnetic compatibility

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

EMC involves

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

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

⚠ CAUTION

The EMC regulations for the truck must be observed.

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

Servicing and spare parts

For questions relating to scheduled maintenance and repairs to forklift trucks, please contact the authorised service network.

The authorised service network has personnel trained by the manufacturer, original spare parts and the tools necessary to carry out maintenance and repairs.

Servicing by the authorised service network and the use of original spare parts retain the technical properties of the forklift truck in the long term.

Only original spare parts provided by the manufacturer may be used for maintenance and repairs performed on forklift trucks. The use of non-original spare parts invalidates the warranty and renders the customer responsible for any accidents due to the incompatibility of the non-original parts.

Modifications and retrofitting

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

Modifications and retrofitting

Any modifications that adversely affect the stability, the load capacity or the circumferential view of the truck require written approval from the manufacturer.

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

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

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

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

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

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

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

The operating company must also fulfil the following prerequisites:

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

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

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

Using attachments

The truck can be equipped with attachments.

Please ask your authorised service centre about using these attachments. The following points must be addressed during the consultation:

- Is the attachment suitable for the truck?
- How will the attachment affect the load capacity of the truck? A residual load capacity rating plate must be created

⚠ CAUTION

Attaching a crane arm changes the original intended use of the forklift truck, which may not be designed for transporting free-swinging suspended loads. The use of this kind of equipment requires specific approval; the CE Declaration of Conformity is also required for any forklift trucks fitted with this kind of equipment. If this kind of equipment is to be used, you must contact your authorised service centre.

Using working platforms

⚠ WARNING

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

– Observe national legislation.

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

2

Safety

Definition of terms used for responsible persons

Operating company

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

The operating company must ensure that the truck is only used for its 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 service engineer or a person who fulfils the following requirements:

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

Drivers

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

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

Driver rights, duties and rules of behaviour

The driver must be trained in his rights and duties.

The driver must be granted the required rights.

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

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

The driver must:

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

⚠ DANGER

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

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

Prohibition of use by unauthorised persons

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

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

Basic principles for safe operation

Insurance cover on company premises

The company premises are very often restricted public traffic areas.

NOTE

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

Modifications and retrofitting

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

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

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

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

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

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

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

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

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



⚠ DANGER

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

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

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

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

The operating company must also fulfil the following prerequisites:

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

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

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

Warning regarding non-original parts

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

⚠ CAUTION

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

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

Damage, faults

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

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

Work on the electric installation (e.g. connecting a radio, additional lights or other accessories) is permitted only with the approval of the manufacturer.

Medical devices

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

Emissions

Noise emission values

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

Acoustic pressure level on the driver's compartment		
ECH 15	L_{PAZ}	<70

NOTE

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

Vibrations

Vibrations to which the hands and arms are exposed

The following value is valid for all truck models:

- Vibration characteristics < 2.5 m/s^2

NOTE

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

⚠ CAUTION

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

Wheels and tyres

⚠ DANGER

Risk to stability!

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

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

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

The following rules must be observed to ensure stability:

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

When changing wheels, always ensure that this does not cause the truck to tilt to one side (e.g. always replace right and left wheels at the same time). Changes must only be made following consultation with the manufacturer.

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

– Contact your authorised service centre regarding this matter.

Residual risks

Residual dangers, residual risks

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

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

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

⚠ WARNING

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

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

Risks can include:

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

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

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

Stability

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

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

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

Special risks associated with using the truck and attachments

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

use the truck correctly and without the risk of accidents.

Overview of hazards and countermeasures

NOTE

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

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

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

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

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

Danger to employees

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

NOTE

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

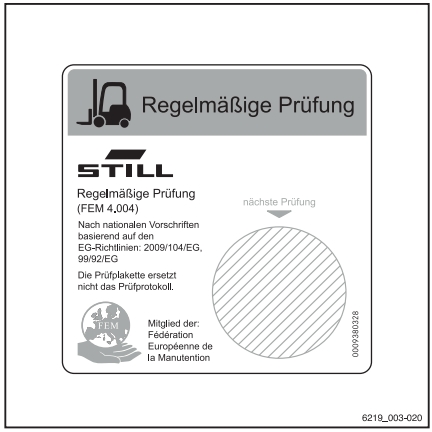
The design and equipment of the truck comply with the standards and directives required for CE conformity. The design and equipment also comply with the standards and directives necessary for the UKCA compliance that is required in the United Kingdom. The design and equipment are therefore not part of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

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

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

Safety tests

Carrying out regular inspections on the truck ▷



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

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

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

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

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

– Notify your authorised service centre.

NOTE

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

Insulation testing

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

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

– For insulation testing, contact the authorised service centre.

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

NOTE

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

Test values for the drive battery

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

Test values for the entire truck

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

Safety regulations for handling consumables

Exhaust gases

⚠ CAUTION

Risk to health from exhaust gases! Exhaust gases from internal combustion engines are harmful to your health. In particular, the soot particles contained in the diesel exhaust gas can cause cancer. Letting the combustion engine idle runs a risk of poisoning from the CO, CH and NO_x components contained in the exhaust gas

Modern exhaust gas treatment systems (e.g. catalytic converters, particle filters or comparable systems) can clean exhaust gases in a way that reduces the health hazard and risk of poisoning when operating the truck.

– Observe the national laws and regulations when using trucks with an internal combustion engine in entirely or partially enclosed working areas.

– Always ensure sufficient ventilation.

Safety guidelines for using the truck

- The operator must be trained and qualified according to national regulations. The operator must have knowledge of the operation and performance of the truck. The operator must use the truck with due care in accordance with their driving ability and experience.
- Any defect (squeaking, leaks etc.) must be promptly reported because, if neglected, it could cause more serious malfunctions.
- Carry out the checks indicated in the "Daily checks" chapter.

ENVIRONMENT NOTE

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

⚠ CAUTION

If you notice a burning smell, stop the truck and press the emergency stop button.

Safety regulations in case of accidental lateral tipping

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

a) Do not leave the forklift truck.

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

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

Safety regulations when driving

Driving conduct

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

The speed must be appropriate to the local conditions.

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

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

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

The following are forbidden during driving:

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

⚠ WARNING

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

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

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

⚠ WARNING

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

– Switch off the devices.

Visibility when driving

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

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

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

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

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

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

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

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

Permissible consumables

⚠ WARNING

Consumables can be dangerous.

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

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

Oils



⚠ DANGER

Oils are flammable!

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



⚠ DANGER

Oils are toxic!

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



⚠ WARNING

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

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

⚠ WARNING

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

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

ENVIRONMENT NOTE

Oils are water pollutants!

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

Avoid spilling oils.

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

Dispose of old oils according to the applicable regulations.

Hydraulic fluid



⚠ WARNING

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

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



ENVIRONMENT NOTE

Hydraulic fluid is a water-polluting substance!

Always store hydraulic fluid in containers complying with the regulations.

Avoid spilling.

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

Dispose of old hydraulic fluid according to regulations.

Battery acid



⚠ WARNING

Battery acid contains dissolved sulphuric acid. This is toxic.

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



⚠ WARNING

Battery acid contains dissolved sulphuric acid. This is corrosive.

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

ENVIRONMENT NOTE

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

Non-ionising radiation

If the forklift truck is fitted at the factory or at a later date with equipment that emits non-ionising radiation (such as radio transmitters, RFID transmitters, data terminals, scanners etc.), the compatibility of this equipment with medical devices (such as pacemakers and hearing aids) must be tested and verified.

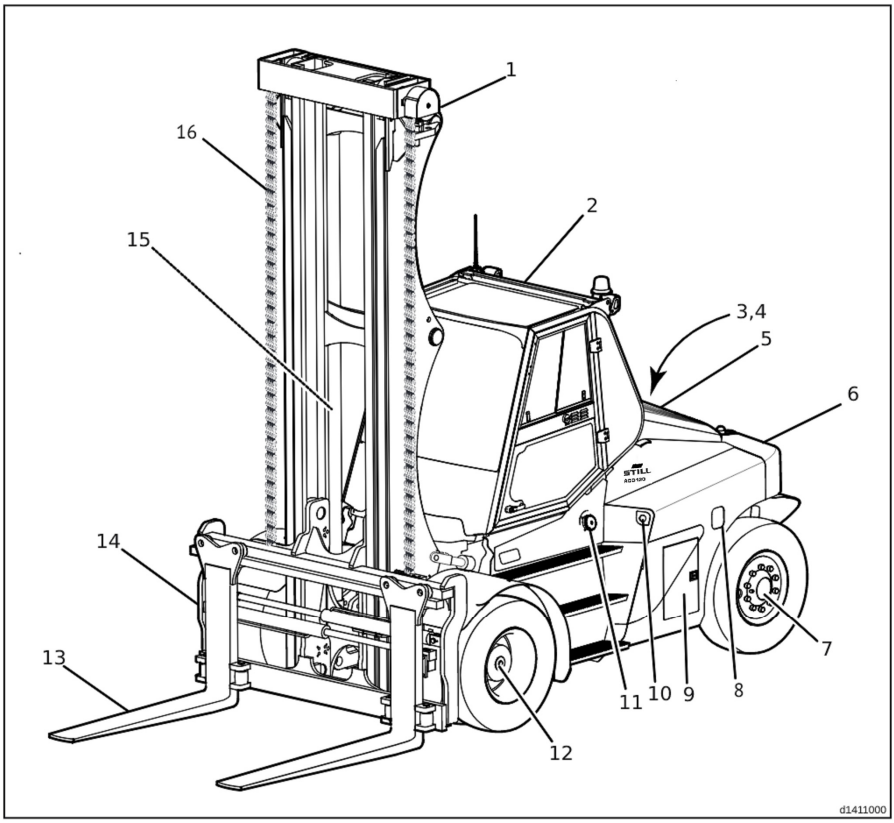
Medical equipment

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.

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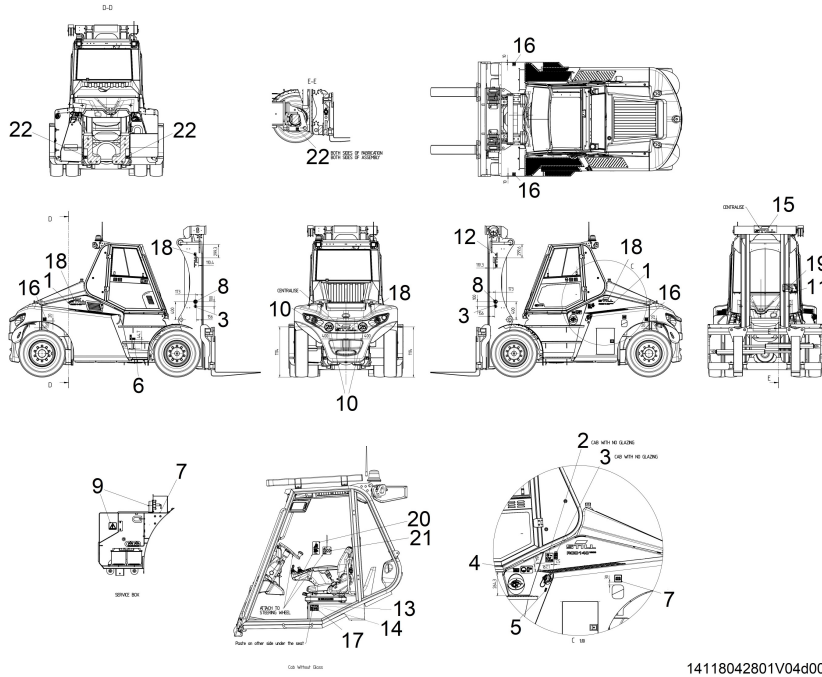
Overview

General view of Truck



1	Lift Mast
2	Cab
3, 4	Hydraulic cooler, Radiator
5	Radiator Grille
6	Counterweight
7	Steer axle
8	Battery isolator
9	Battery compartment
10	Adblue® filler
11	Fuel filler
12	Drive axle
13	Forks
14	Fork carriage
15	Lift cylinder
16	Lift chains

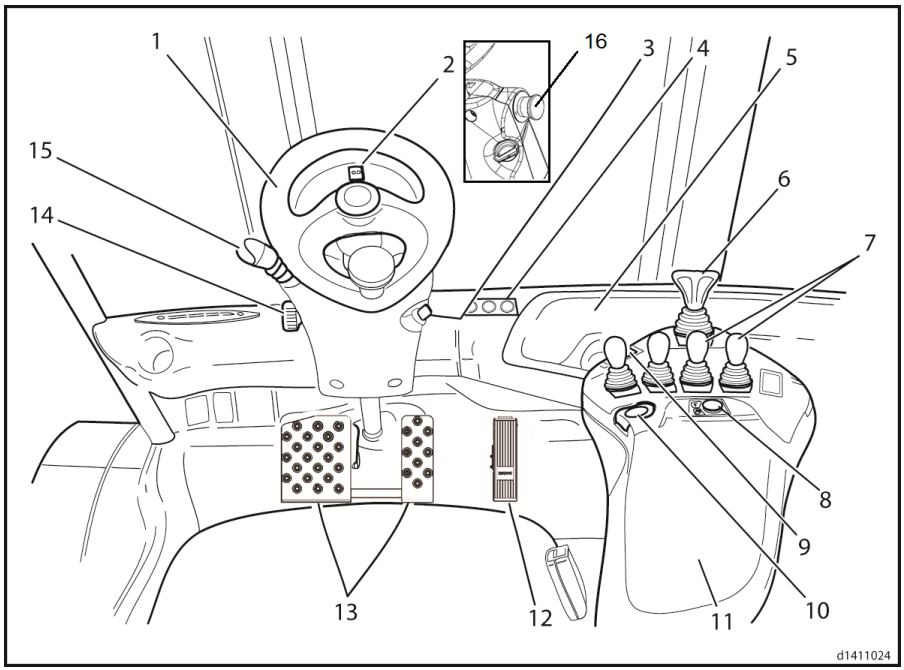
Safety devices and warning labels



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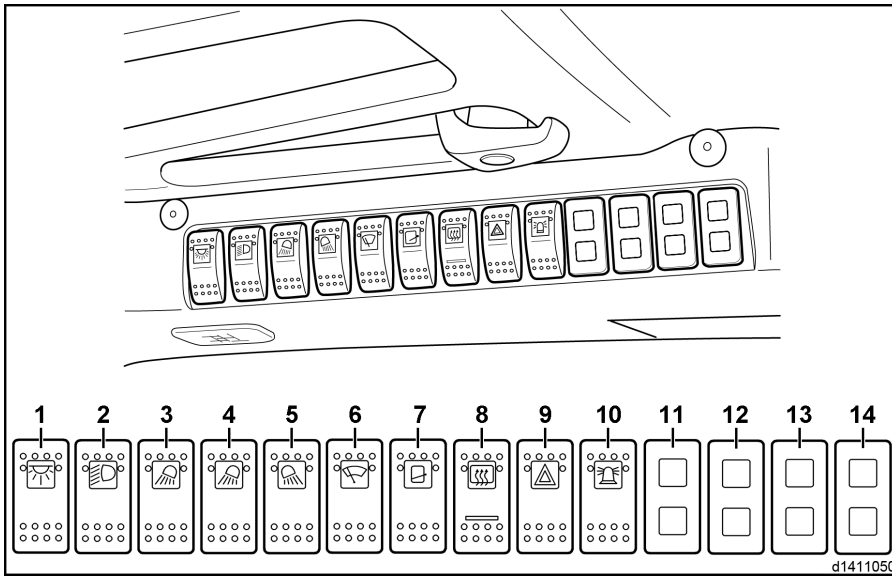
1	Type label	13	Made in China label (for export with CE/UK-CA)
2	label 'lwa 105dB cab with no glazing	14	Importer (for UK)
3	Label,read the operating manual	15	Still logo
4	Diesel oil indicator sticke	16	Tyre pressure label
5	label 'adblue	17	Nameplate
6	label 'SAE 10W-30	18	Still logo
7	label 'BATTERY ISOLATOR	19	Label,read the operating manual
8	“Do not stand under forks” label	20	Wheel torque card
9	label - electrical danger	21	Label,read the operating manual
10	label '25 km/h	22	symbol insert 'ISO 3287-16x12
11	Label,read the operating manual		
12	Still logo		

Control components



1	Steering wheel	10	Horn
2	Turn indicator	11	Handhold
3	Key switch/start switch	12	Accelerator pedal
4	Heater control (climate control)	13	Brake pedal
5	Storage area	14	Clamping screw for steering column adjustment
6	Direction lever	15	Multiple function electrical control lever
7	Central control levers (joysticks)	16	Emergency off switch
8	Driver control unit (optional)		
9	Parking brake switch		

Switch panel



The switch panel is mounted at the top right of the overhead guard.

1 Terminal board light and interior lighting
2 Standard or higher lighting
3 Working spotlight position 1/2
4 Working spotlight position 3/4 or working spotlight position 5/6
5 Working spotlight position 7/8
6 Front windscreen wiper and rear window wiper — continuous operation on/off (interval depends on the drive direction and the washer system is always activated)
7 Roof panel wiper - intermittent mode or continuous operation on/off (washer system is activated)
8 Rear window heating
9 Strobe beacon
10 Rotating beacon, flashing beacon or BlueSpot
11 Blank
12 Blank
13 Blank
14 Blank

NOTE

The configuration of the switch panel and arrangement of individual switches may vary, depending on the version. Observe the switch symbols.

4

Operation

Service plan before initial commissioning

Engine
Fill up with fuel
Fill up with Adblue and check for leaks
Check the engine oil level
Check the engine coolant level
Gearbox
Check the oil level in the gearbox
Check the oil level in the drive axle
Chassis undercarriage
Tighten the wheel fastenings
Check the tyre pressure
Controls
Check the brake system
Check the steering system
Electrics
Check the condition of the batteries
Hydraulics
Check the oil level in the hydraulic system
Load lift system
Check the lifting system and attachments

Instructions for running-in

The truck can be operated immediately.

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

Pre-shift checks

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

NOTE

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

Pre-shift check item

Engine
Check fuel level
Check AdBlue® fluid level
Check engine oil level
Check engine coolant level
Check the forklift for leaks (visual inspection)
Visually inspect whether the engine emits black smoke. If there is black smoke, contact an authorised service partner immediately.
Drive mechanism and transmission system
Check that the adjusting mechanism on the steering column is secure
Check the service brake system
Check the parking brake system
Check the tyres and rims (profile, external damage, air pressure and tightness of wheel fasteners)
Check the condition of the antistatic belt (only when using tyres that are not antistatic)
Chassis and bodywork
Washer system: Check the fill level in the container, and check the wipers
Driver's cab
Check the condition of the driver's seat and seat belt (visual inspection)
Check the controls settings
Electrics — Electronics
Check the electrical system (such as lighting, alarm system)
Check the functionality of the emergency off switch
Hydraulic system
Check the oil level in the hydraulic system
Check the forklift for leaks (visual inspection)
Lifting system
Check the pallet fork and door frame for damage (such as bending, cracks, wear etc.)

Standard equipment

Entering and exiting the truck

Entering the cab

– Open the cab door.

Both left and right cab doors are equipped with gas springs to limit movement when the cab door is fully open.

– Use handrails where fitted to climb the steps and enter the cab.

– Enter the cab in a forward direction.

– Close the cab door.

Exiting the cab

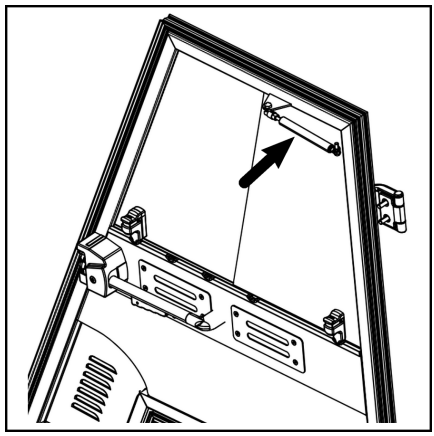
– Open the cab door.

– Exit the cab in a backwards direction.

– Use handrails where fitted to climb down the steps and exit the cab.

– Close the cab door.

▷



⚠ WARNING

Risk of injury from entering and exiting the truck incorrectly.

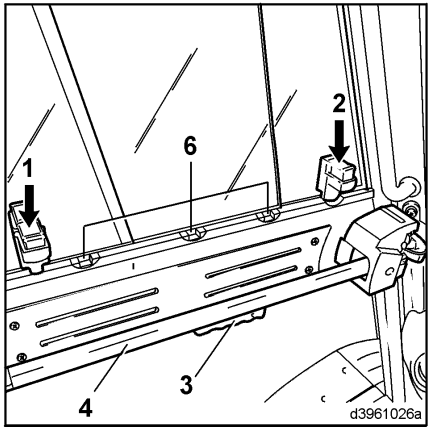
Face the truck when entering and exiting.

Driver's cab

Opening the cab door

– Push handle (3) upwards.

– Open driver's door outwards.

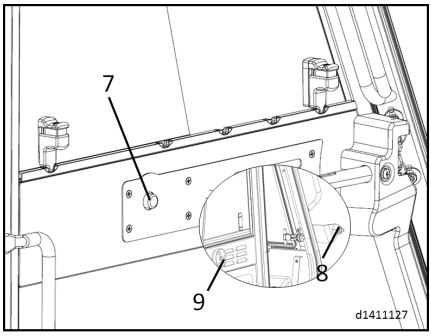


Secure the cab's door

– Open the door.

– Open the door fully rearward until spring loaded plunger(8) locks into retainer(9).

– Press the button(7) inside the cab to release the door. Pull the door outwards.



Closing the cab door

NOTE

To make it easier to close the door, open the side window slightly.

– Lift lever (1) inside the cab, or pull down the lever on the door retainer (3) to release (2). Pull the door outwards.

– Grip the rod (4) and pull the door towards you until the interlock engages.

Opening/closing the side window

– Press button (1) or (2).

– Keep the knob pressed, slide the side window into the desired position until it engages in one of the grooves (6).

Follow a similar procedure to close the side window.

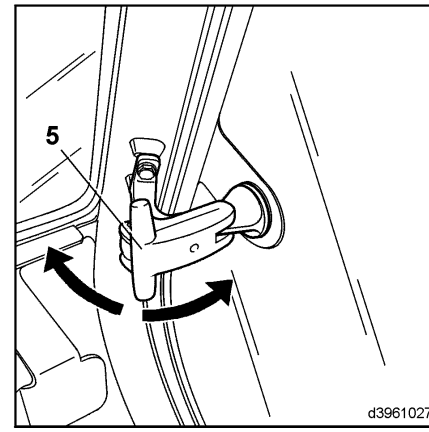
Opening the quarter window

– Pull the lever (5) forwards.

The window will open.

– Push the lever (5) backwards.

The window will close.



Tilt Cab_Face Lift

The cab can be tilted forward to allow access to the engine compartment.

To tilt the cab forward

⚠ CAUTION

When tilting, if the cab strikes the lift mast, the cab will be damaged.

Before tilting the cab, ensure that the lift mast is tilted fully forward.

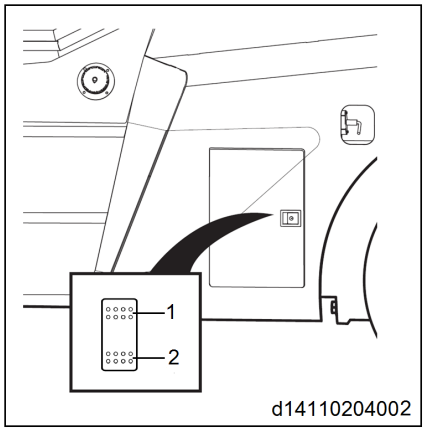
NOTE

If the truck is equipped with a lift mast tilt angle potentiometer, there is a safety option to prevent the lift mast from tilting fully forward.

- *Starting from the -10° position, the lift mast tilts forward by 5° and then stops.*
- *To tilt the lift mast forward to the maximum tilt angle of 15°, the driver must first return the operating lever to the neutral position and then tilt the operating lever forward.*

– Raise the forks approximately 3 feet (1 m) and tilt the lift mast fully forward.

– Switch off the engine and exit the cab.
– Remove any loose components from the cab.
– Open the battery case, the switch is inside the battery case.
– Push electrical switch (1) to tilt the cab fully forward. Push and hold the switch, until the cab is fully tilted. ▷

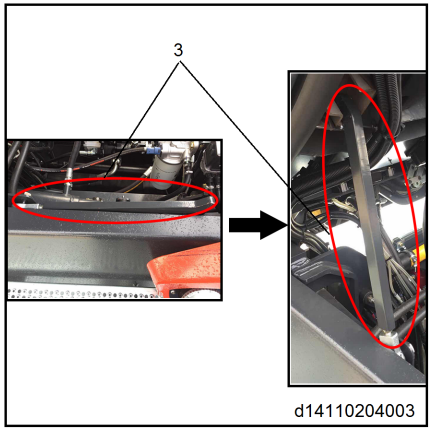


– Once the cab is raised, pull strut rod (3) up and secure it in the trough to prevent the cab from falling. ▷

⚠ WARNING

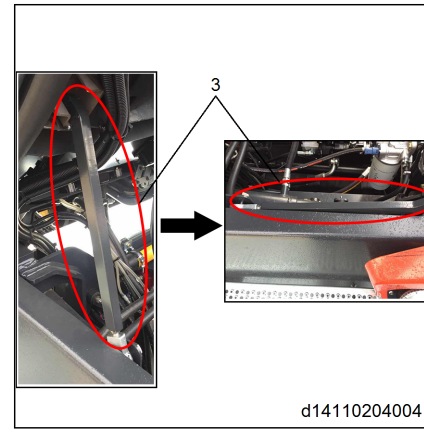
The cab is heavy and can cause injury if someone is below the cab during lowering.

Stand clear of the cab and do not approach when it is partially tilted, or being raised or lowered. The cab must be locked in the fully tilted position, and the tilt handle must be properly inserted into the safety ring before maintenance can begin.

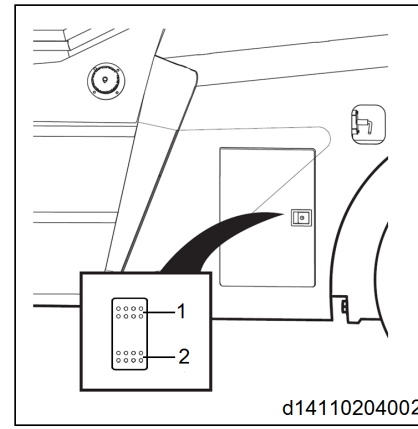


To lower the cab

– Remove strut rod (3) from the trough and return it to its original position. ▷



– Push lowering button (2) of the electrical switch to lower the cab into working position. Push and hold the switch, until the cab is fully lowered. ▷



Standard driver's seat and comfort driver's seat

⚠ WARNING

Risk of accident when adjusting the seat during travel. Back injury possible due to incorrect seat adjustment.

Do not adjust the driver's seat while driving.

– Before starting up the truck and whenever changing drivers, adjust the seat for the individual weight of the driver.

– Check that all of the settings have property engaged.

NOTE

Sitting for long periods of time puts a lot of pressure on the spine. This pressure can be relieved by performing simple therapeutic exercises at regular intervals.

NOTE

Do not place any objects in the adjustment range of the driver's seat.

Longitudinal adjustment

– Pull the lever (1) upwards.

– Move the driver's seat backwards or forwards on the rails to find the most comfortable position for the driver in relation to the steering wheel and the accelerator pedals.

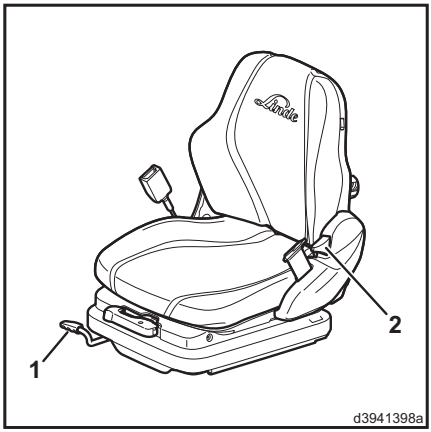
– Allow the lever (1) to engage.

Adjusting the seat backrest

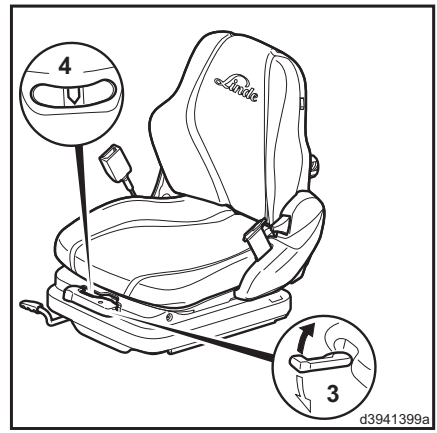
– Push the lever (2) upwards and hold it in place.

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

– Release the lever (2).



Setting the driver's weight



NOTE

The relevant driver's weight must be set when the driver's seat is occupied.

– Check the weight setting in the inspection window (4).

The correct driver's weight has been set when the arrow is in the centre position in the inspection window (4).

Set the driver's weight as necessary.

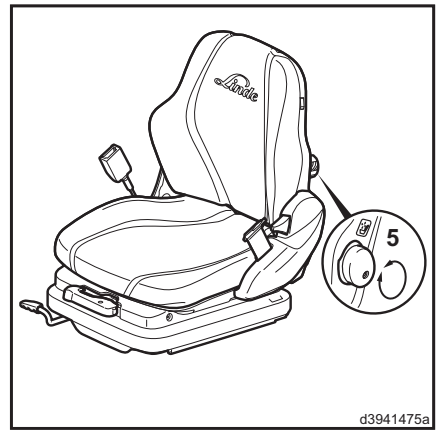
– Pull out the lever (3).

Move the lever to set the driver's weight for the suspension.

– Move the lever (3) upwards for a heavier weight.

– Move the lever (3) downwards for a lighter weight.

Adjusting the lumbar support (only with a comfort driver's seat)



NOTE

The lumbar support enables the seat backrest contour to be optimally adapted to the driver's body.

– Turn the knob (5) to the left or right.

The extent to which the lower and upper areas of the backrest are curved is adjusted individually.

Activating the seat heater (only with a comfort driver's seat)



Variant 1

– Push the switch (6) downwards to activate the seat heater.

– Push the switch (6) upwards to deactivate the seat heater.

NOTE

The maximum temperature is predefined.

Variant 2

– Push the switch (6a) upwards to activate the seat heater.

– Push the switch (6a) downwards to deactivate the seat heater.

NOTE

The maximum temperature is predefined.

Luxury driver's seat with automatic weight setting

⚠ WARNING

Risk of accident when adjusting the seat during travel. Back injury possible due to incorrect seat adjustment.

Do not adjust the driver's seat while driving.

– Before starting up the truck and whenever changing drivers, adjust the seat for the individual weight of the driver.

– Check that all of the settings have property engaged.

NOTE

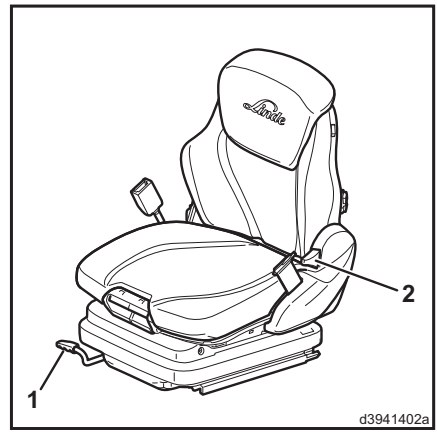
Sitting for long periods of time puts a lot of pressure on the spine. This pressure can be relieved by performing simple therapeutic exercises at regular intervals.

NOTE

Do not place any objects in the adjustment range of the driver's seat.

Longitudinal adjustment

– Pull the lever (1) upwards.
– Move the driver's seat backwards or forwards on the rails to find the most comfortable position for the driver in relation to the steering wheel and the accelerator pedals.
– Allow the lever (1) to engage.



Adjusting the seat backrest

– Push the lever (2) upwards and hold it in place.
– Move the seat backrest forwards or backwards until a comfortable seat position for the driver is found.
– Release the lever (2).

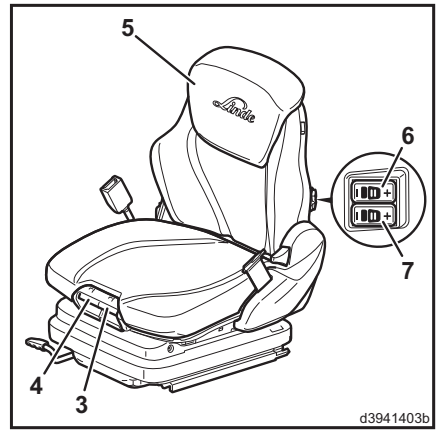
Setting the driver's weight

The correct driver's weight will be set automatically if the ignition is switched on and the driver's seat is occupied.

Adjusting the seat angle

– Pull the lever (3) upwards.

The seat base is moved to the desired position by applying pressure to the seat base or removing pressure from it.



Adjusting the seat depth

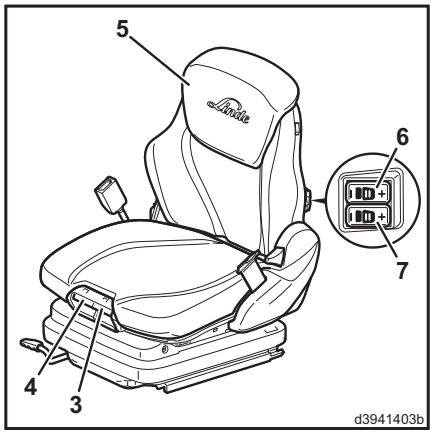
– Pull the lever (4) upwards.

The seat base can be moved to the desired position by sliding the seat base forwards or backwards.

Adjusting the backrest extension

– Push the backrest extension (5) in or pull it out for individual adjustment.

Adjusting the lumbar support



NOTE

The lumbar support enables the seat backrest contour to be optimally adapted to the driver's body.

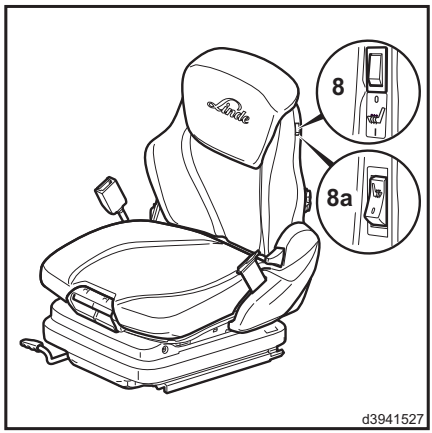
– Press button (6).

The extent to which the upper area of the backrest is curved is adjusted individually.

– Press button (7).

The extent to which the lower area of the backrest is curved is adjusted individually.

Activating the seat heater (luxury driver's seat)



Variant 1

– Push the switch (8) downwards to activate the seat heater.

– Push the switch (8) upwards to deactivate the seat heater.

NOTE

The maximum temperature is predefined.

Variant 2

– Push the switch (8a) upwards to activate the seat heater.

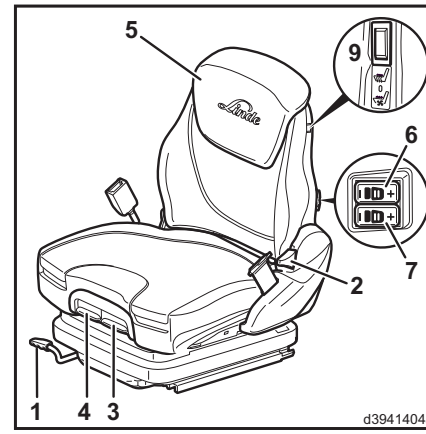
– Push the switch (8a) downwards to deactivate the seat heater.

NOTE

The maximum temperature is predefined.

Luxury active driver's seat with automatic weight setting

The luxury active driver's seat is operated in the same way as the luxury driver's seat. The only difference is the way in which the seat heater is activated.



Activating the seat heater (luxury active driver's seat)

– Push the switch (9) upwards to activate the seat heater.

– Push the switch (9) to the centre position to deactivate the seat heater.

Activating the seat air conditioning (luxury active seat)

– Push the switch (9) downwards to activate the seat air conditioning.

– Push the switch (9) to the centre position to deactivate the seat air conditioning.

NOTE

The maximum temperature is predefined.

Seat belt

DANGER

There is a risk to life if the driver leaves the vehicle in an uncontrolled manner.

For this reason, the seat belt must always be worn when operating the truck! The seat belt should only be worn by one person.

WARNING

The seat belt must function perfectly.

For this reason, the belt should not become twisted, trapped or tangled. The belt buckle and belt retractor should be protected from foreign bodies, damage and dirt.

NOTE

Driver's cabs with fixed closed doors or bracket doors meet the safety requirements for driver restraint systems. The seat belt may also be used. It must, however, be fastened when driving with doors that are open or have been removed. PVC doors do not constitute a driver restraint system. For trucks with the "speed reduction" special function, the seat belt must be worn even at the reduced speed.

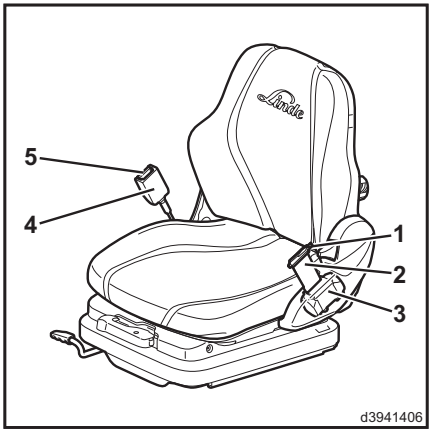
The automatic blocking mechanism prevents the belt from being extended whenever the industrial truck is on a steep slope. It is then not possible to pull the belt any further out of the retractor. To release the automatic blocking mechanism, carefully move the industrial truck so that it is no longer positioned on a slope.

While using the truck (e.g. driving, operating the lift mast etc.), the driver should adopt a sitting position as far back as possible so that his/her back rests against the seat backrest. The automatic blocking mechanism for the belt retractor offers sufficient freedom of movement on the seat for normal use of the truck.

Fastening the seat belt

– Pull the seat belt (2) smoothly out of the retractor to the left. ▷
– Position belt over the lap, not over the stomach.
– Snap the buckle guide (1) into place in the buckle (4).
– Check seat belt tension.

The belt must fit close to the body.



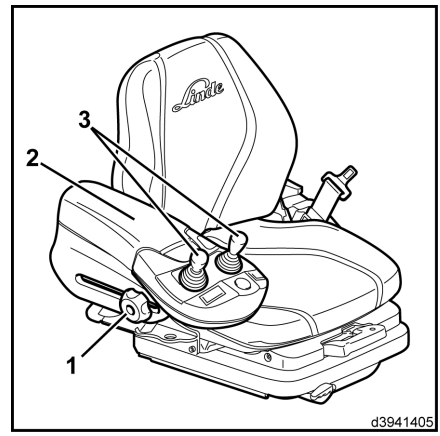
Unfastening the seat belt

– Push the red button (5) on the buckle (4).
– Manually feed the buckle guide (1) back into the retractor (3).

NOTE

The automatic blocking mechanism may be triggered if the web belt runs in too quickly and the buckle guide strikes the housing. The web belt cannot be pulled out with the usual force.

Adjusting the armrest



DANGER

Risk of accident: It is not possible to operate the truck safely when the armrest (2) is loosened.

Only adjust the armrest when the truck is stationary.

Before attempting to drive the truck, ensure that the armrest is screwed firmly in place with the clamping screw (1).

NOTE

Adjust the armrest so that all operating devices can be actuated safely.

– Sit on the driver's seat and release the clamping screw (1).
– Move the armrest (2) upwards/downwards and forwards/backwards until the arm is comfortably supported and the joysticks (3) can be easily reached.
– Tighten the clamping screw (1).

Adjusting the steering column

DANGER

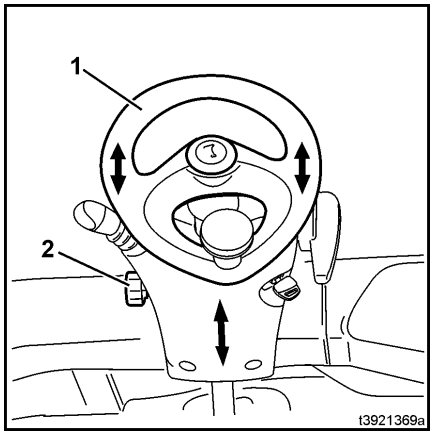
Safe driving is not guaranteed with the clamping screw open.

Only adjust the steering column when the vehicle is stationary.

Before attempting to drive the truck, ensure that the steering column is screwed firmly in place with the clamping screw (2).

Angle adjustment

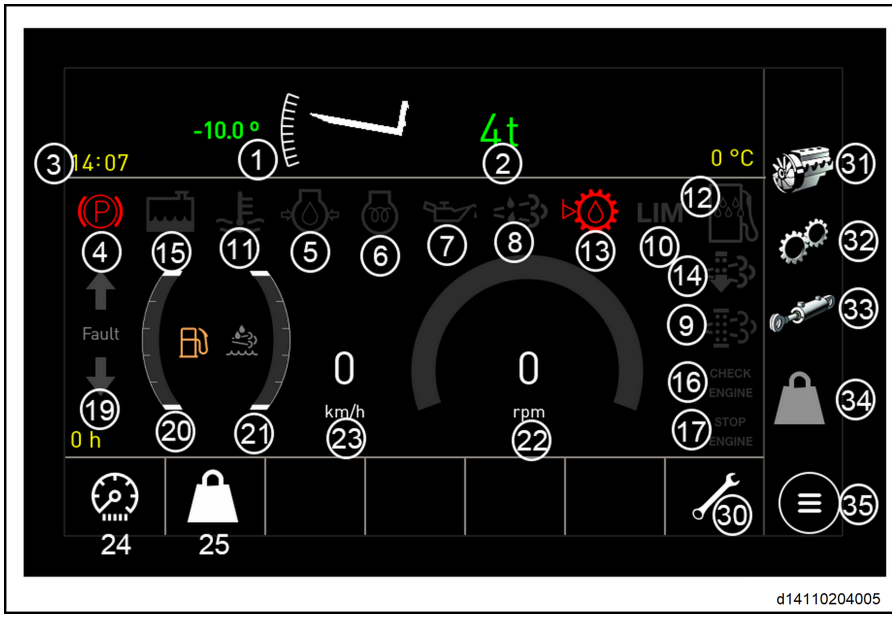
- Undo the clamping screw (2) anticlockwise. ▷
- Move the steering wheel (1) into the required position.
- Tighten the clamping screw (2) clockwise.



Height adjustment

- Undo the clamping screw (2) anticlockwise.
- Move the steering wheel (1) into the required position by pulling it upwards or pushing it downwards.
- Tighten the clamping screw (2) clockwise.

Display unit-Parker



1	Mast angle	16	Engine error indicator light (low)
2	Load weight display	17	Engine error indicator light (high)
3	Time display	19	Speed gear
4	Parking brake	20	Fuel gauge
5	Engine oil pressure warning light	21	Urea gauge
6	Preheat light	22	Engine RPM gauge
7	Engine oil level	23	Driving speeds
8	DEF alarm light	24	Easy interface switching
9	DPF alarm light	25	One touch weighing
10	DEF limit torque indicator	30	Service interface
11	Engine water temperature warning light	31	Engine interface
12	DEF alarm light	32	Transmission interface
13	Transmission oil level light	33	Hydraulic interface
14	DPF regeneration indicator light	34	Weighing interface
15	Coolant level	35	System parameter interface

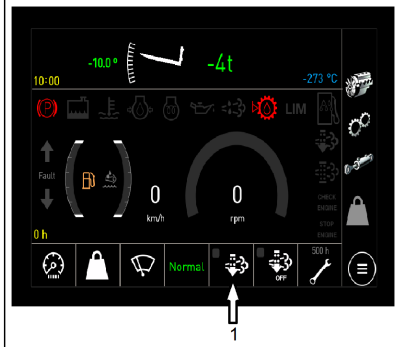
The touchscreen display unit is mounted to the top right-hand side of the cabin. It is positioned within the driver's field of vision and provides centralised information about all functions of the truck. Once the key switch has been switched on, a self-test of the display unit is then performed. During the self-test, all indicator lights and the displays are activated.

NOTE

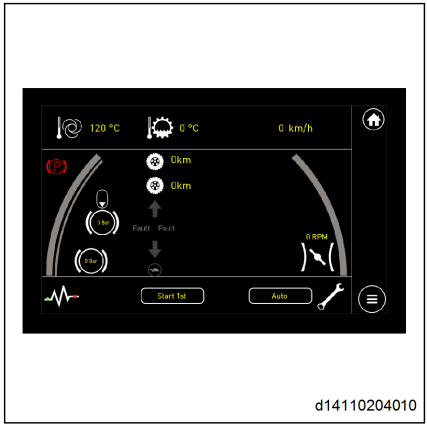
Versions of the display unit icon arrangement layout may vary due to continuous updates and improvements to the product. Display unit for reference purposes only, actual specifications apply.

Engine interface

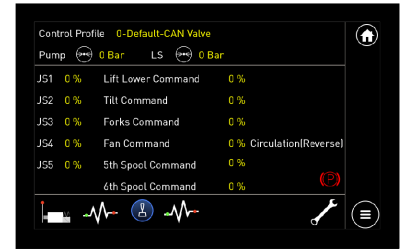
When DPF requires regeneration, start regeneration by pushing the (1) button on the display unit.



Transmission interface



Hydraulic interface ▷



Starting and stopping the engine

Starting the engine



⚠ DANGER

Danger of poisoning!

Do not leave the engine running in unventilated areas.

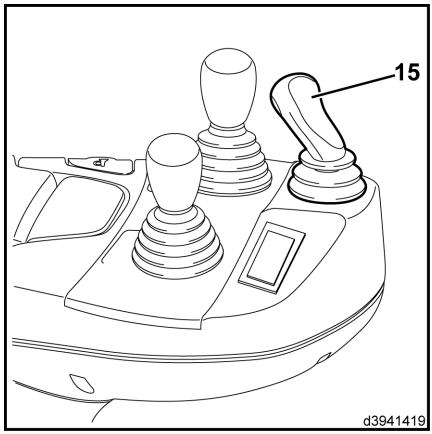
NOTE

Where possible, avoid frequently starting and stopping the engine over short periods of time, since this prevents the internal combustion engine from reaching its operating temperature. Frequent cold starts increase wear.

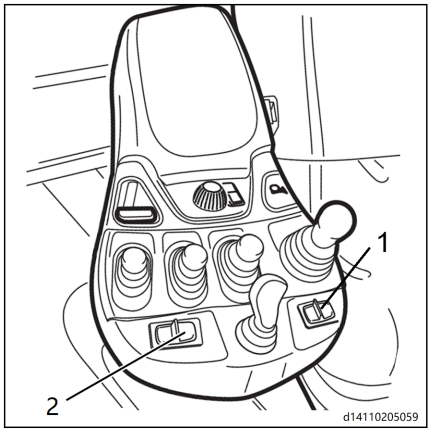
– Sit on the driver's seat.

– Fasten the seat belt (if seat belt is fitted).

– Move the actuating lever (joystick and drive direction (15)) into the neutral position. ▷



– Apply park brake (if not already applied) by pressing park brake switch (1) ▷
– Insert ignition key into the ignition and starting switch and turn it from the zero position to position "I".



The electrical system is switched on.

NOTE

After the ignition has been switched on, the display unit will perform a self-test. All displays light up for approx. 2 seconds and the operating hours until the next service are displayed for 5 seconds on the display unit. If any symbol flashes or lights up, the preset service interval has been exceeded. The maintenance work that is due must be performed. Contact your service partner.

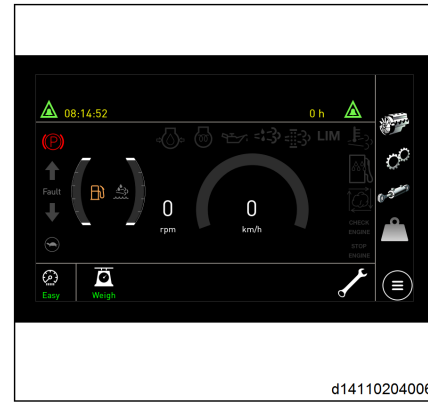
– Turn the key to position "II".

You have to wait for the display to boot up to start the truck

As soon as the engine starts:

– Release the key. Do not engage the starter continuously for more than 30 seconds.

– The display unit will then show the tachometer screen displaying: engine rpm, fuel level, Adblue® level (only for MTU engine), engine temperature, neutral and park brake status. ▷

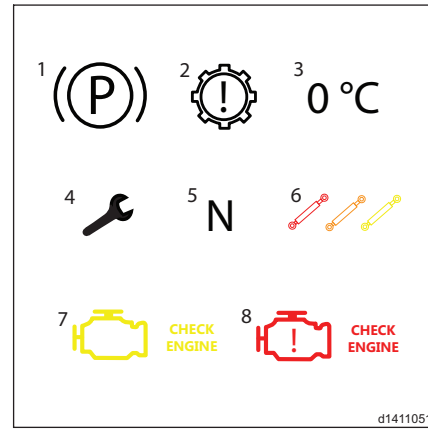


⚠ CAUTION

Danger of poisoning!

Do not leave the engine running in unventilated areas.

– During operation observe the following symbols: ▷



- 1 Parking brake indicator
- 2 Transmission error indicator
- 3 Ambient temperature
- 4 Service required indicator
- 5 Gear position indicator
- 6 Hydraulic system error indicator
- 7 Engine error indicator (low level)
- 8 Engine error indicator (high level)

If the engine fails to start:

– Ensure that the preheating process is complete. Depending on the truck version, temperature and altitude, preheating may require up to one minute or more. Once the preheating process is complete, engage the starter until the engine runs at idle speed. Do not engage the starter continuously for more than 30 seconds.

NOTE

A block against repeat starting is active and the engine cannot be started.

– Always leave the ignition switched on until the symbol goes out.

– Then try to restart.

To protect the battery, wait at least one minute between each starting procedure. If the engine still does not start after a third attempt to start

it, refer to the section entitled "Troubleshooting - diesel engine".

The engine speed is controlled automatically, depending on the load on the engine.

NOTE

Do not allow the engine to warm up at idling speed. When under load, drive the truck at a brisk speed. The engine will quickly reach its operating temperature.

Switching off the engine

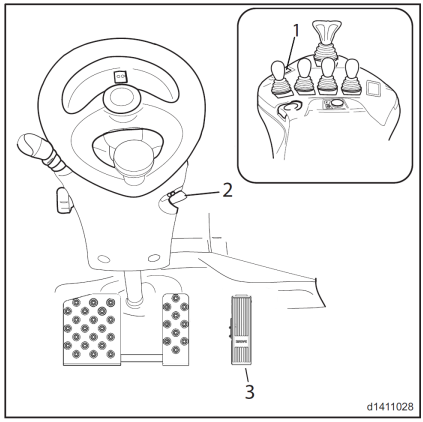
⚠ CAUTION

For engines with a turbocharger, there is a risk that the high speed of the turbocharger shaft (≥ 100,000 rpm at full load) could cause the shaft bearing to run dry through lack of lubrication, thus damaging it.

Do not switch off engine under full load, but rather allow it to run on for a few minutes at low speed.

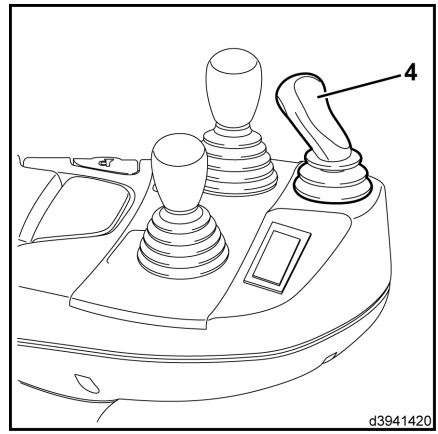
– Remove your foot from the accelerator pedal (3).

– Apply park brake by pressing park brake switch (1) ▷



– Move the direction selection lever to the neutral position.

– Turn the ignition key to the zero position.



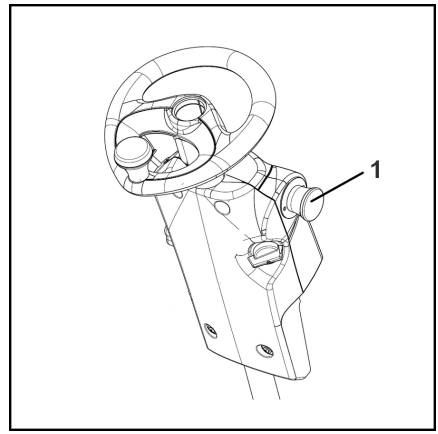
NOTE

The brake is applied automatically when the engine is switched off.

– Remove the ignition key when leaving the truck.

Emergency off switch

The emergency off switch can only be used in emergency situations and must not be disconnected during emergency stops.



⚠ WARNING

Risk of accident.

When the emergency off switch(1) is pressed, the parking brake is automatically applied, causing the vehicle to come to an emergency stop.

When the vehicle comes to a quick stop, the stability of the load is greatly reduced.

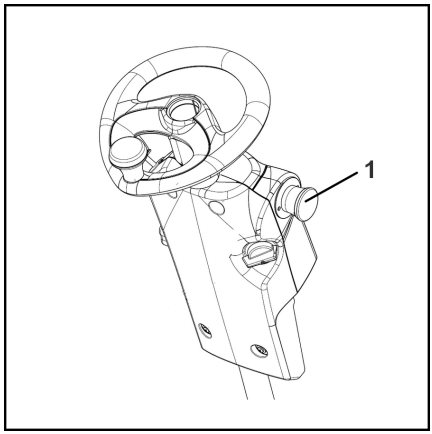
– Make sure that people around you are in a safe position before pressing the emergency off switch(1).

– If the emergency off switch(1) is pressed, be careful with the load.

NOTE

The engine will not be off when operating the emergency off switch.

– Press the emergency off switch(1) to stop the vehicle or hydraulic functions.
– Pull up the emergency off switch(1) to resume driving or hydraulic functions.



Function testing

NOTE

Check the functionality of the emergency off switch daily as part of the daily checks.

– Press the emergency off switch(1) to confirm that the vehicle is not moving or the hydraulic functions are not working.
– Turn off the engine key switch and reset the emergency off switch(1) to return the vehicle to service.

Driving

⚠ CAUTION

Risk of truck tip over.

Before driving on steeper slopes, consult your service partner.

Travel on long slopes over 15 % is not allowed as a rule due to the prescribed minimum brake applications and truck stability characteristics.

The climbing ability rates given in the data sheet were derived from the tractive force of the truck and they apply only for crossing obstacles and for short differences in level.

Always accommodate your driving style to suit the conditions of the roadway (rough surfaces, etc), especially hazardous work areas and the load.

⚠ CAUTION

Danger of damage to the cab door.

Ensure the cab door is secured in the closed position.

⚠ CAUTION

Danger of accident while reversing.

Take extra care.

Clean the rear-view mirror and adjust it to the proper position before starting to operate the truck. Please note that the rear-view mirror is only used to check the area near the truck before driving off and to check the condition of the rear of the vehicle. Reversing is only allowed with a direct view in the reverse direction of travel.

– Always look in the direction of travel and have an adequate overview of the road ahead, including to the sides when steering. When driving, ensure that the road ahead is clear.

If goods obstructing vision are being transported, drive the truck with the load trailing. If this is not possible, a second person shall walk in front of the truck as a guide.

The truck should then only be driven at walking speed with particular caution being exercised. If visibility aids are required (e.g. mirrors, camera/monitor), to ensure adequate sight, then training should be given for driving with these aids.

– Start the engine using ignition key.
– Elevate the forks slightly and tilt the mast back.
– Release the parking brake by stepping on the brake pedal and then pressing the parking brake switch.

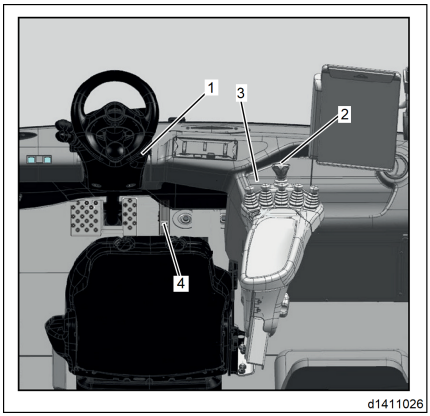
NOTE

Applying the foot brake while releasing the park brake prevents accidental truck movement.

Single pedal

Forward travel

– Ensure that the pedal area inside the cabin is clear of obstruction and debris before attempting to drive the truck.
– Push direction lever (2) forward.
– Depress the accelerator pedal (4) gently. Truck speed depends on how far the pedal is depressed.



NOTE

Quick flooring of the accelerator pedal is not recommended as the maximum acceleration rate is controlled automatically.

Reverse travel

– Pull direction lever (2) back.
– Depress accelerator pedal (4). The truck will reverse at a speed depending on the position of the accelerator pedal.

NOTE

Stop the truck before driving in reverse.

Stopping

– Release accelerator pedal (4) and press the brake pedal.
– When dismounting from the truck with the engine running, for example, in order to briefly perform some action in close vicinity to the truck (opening a gate, unhitching a trailer etc.), always apply the parking brake using switch (3) and release the seat belt. Shut down the engine if making a longer stop. When leaving the truck unattended, remove the ignition key (1).

Joystick with single lever operation



⚠ WARNING

There is a risk of becoming trapped between parts due to the moving lift mast or attachment.

Never reach into or enter the lift mast or the area between the lift mast and the truck.

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

Drivers must be trained in how to operate the lifting system and attachments.

Take note of the maximum lift height.

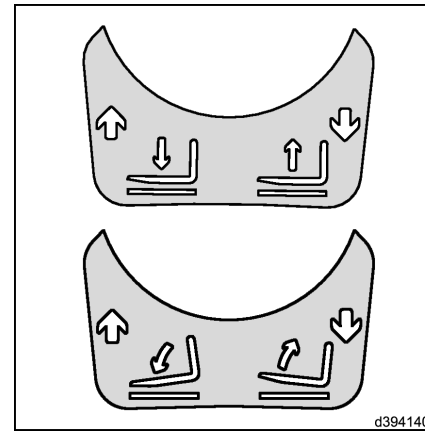
Operating the lifting and tilting equipment

– Observe the symbols with directional arrows.

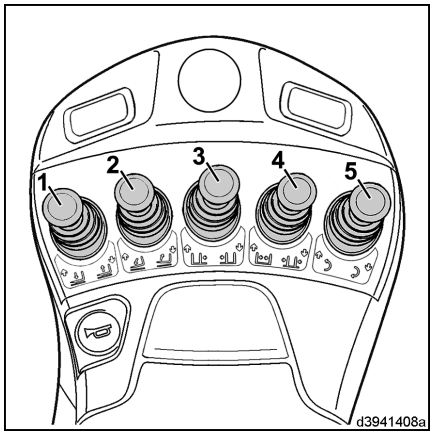
The joystick must always be operated gently, and never in a jerking motion. The deflection of the joystick is used to determine the lifting/lowering and tilting speed. Once the joystick is released, it automatically returns to its initial position.

NOTE

Joysticks only function when the engine is running and the driver is sitting in the driver's seat.



Lifting the fork carriage



⚠ DANGER

When lifting and lowering the fork arms, there is an increased risk of falling and crushing.

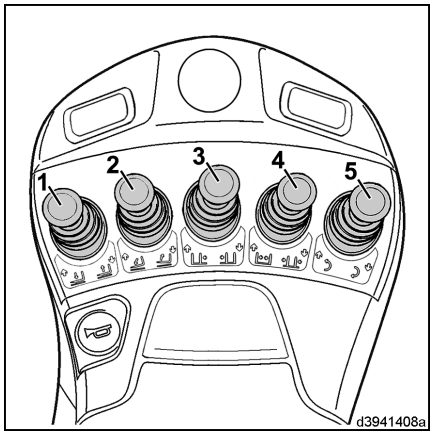
Do not step onto the raised fork arms.

– Pull the joystick (1) backwards.

Lowering the fork carriage

– Push the joystick (1) forwards.

Tilting the lift mast forwards



– Push the joystick (2) forwards.

NOTE

If the truck equipped with a mast angle potentiometer, there is a safety option to prevent mast tilting forward fully.

- *Tilting the mast forward starting at -10°, the mast will move forward 5°, then stops.*
- *Only when the driver returns the joystick to the neutral position and tilt forward again, the mast will continue to move to the maximum forward degree of 15°.*

Tilting the lift mast backwards

– Pull the joystick (2) backwards.

Operating attachments

Attachments can be fitted to the truck as special equipment (e.g. sideshift, fork prong positioner, rotator, clamp etc.). Observe the working pressure and operating instructions for the attachment. Additional joysticks are fitted for operating these attachments.

⚠ CAUTION

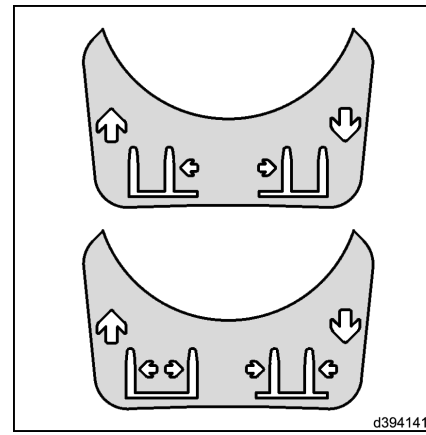
Danger of instability of the truck.

Attachments that are not supplied with the truck may only be used if the service partner has confirmed that the arrangement in terms of load capacity and stability ensures safe operation. Attachments alter the load capacity and stability of the truck.

NOTE

The methods of operating the attachments described here are examples. The configuration of the joystick may vary depending on your truck's equipment.

– Observe the symbols with directional arrows. ▷



Operating the sideshift ▷

NOTE

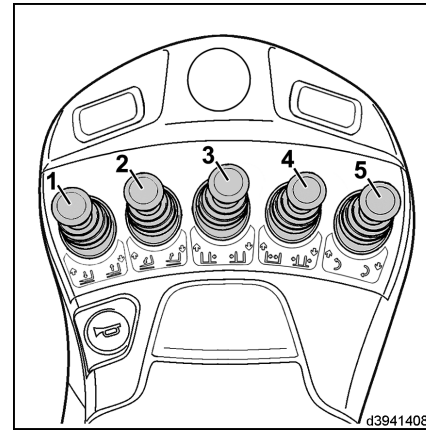
Do not operate the sideshift when the fork arms are on the ground.

– Push the joystick (3) forwards.

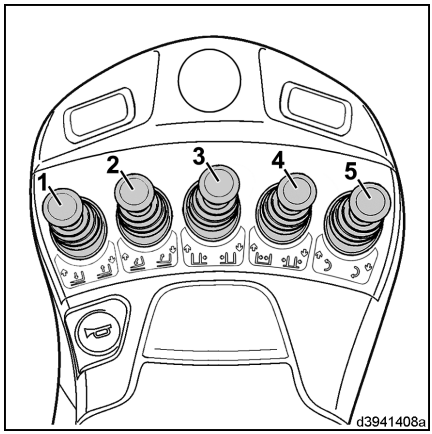
The sideshift moves to the left.

– Pull the joystick (3) backwards.

The sideshift moves to the right.



Operating the fork positioner



NOTE

To prevent damage, do not operate the fork positioner with a load or when the fork arms are on the ground. Do not use the fork positioner as a clamp.

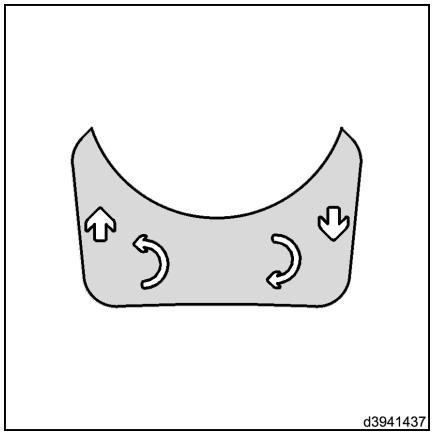
– Push the joystick (4) forwards.

The fork arms move outwards.

– Pull the joystick (4) backwards.

The fork arms move inwards.

Operating the rotator (optional equipment)



⚠ DANGER

Danger of instability of the truck.

Only pick up loads such that they can be turned in the load centre of gravity.

If loads are picked up off-centre, the residual load capacity may be exceeded when making a turning movement.

When turning, the actual centre of gravity of the load must therefore not be more than 100 mm (truck rated capacity below 6300 kg) or 150 mm (truck rated capacity between 6300 kg and 10,000 kg) outside the pivot point!

NOTE

Ensure that there is sufficient distance when turning to prevent damage.

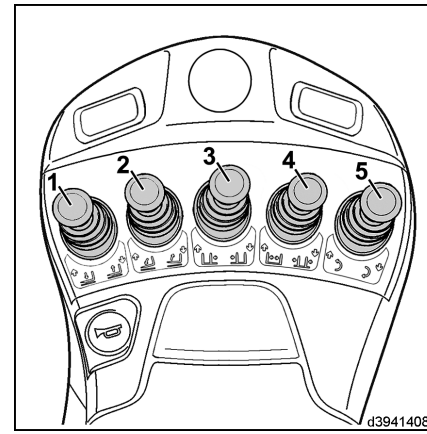
– Observe the symbols with directional arrows.

– Push the joystick (5) forwards.

The truck moves anti-clockwise.

– Pull the joystick (5) backwards.

The truck moves clockwise.



Operating the clamp (optional equipment)

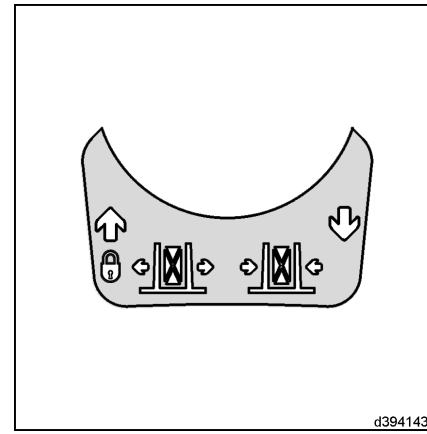
⚠ DANGER

Increased risk of accident from a falling load.

For attachments that perform a clamping function (e.g. a bale clamp), a lockable joystick must be used.

If your truck is not fitted with this equipment, please contact your service partner.

– Take note of the switching symbols with directional arrows.



Steering

Hydrostatic steering means that very little effort is required to turn the steer wheels of the truck. This is particularly advantageous when driving in narrow aisles.

– Start the truck.

– Turn the steering wheel to the left and right through the full cycle.

NOTE

The truck is fitted with steering acceleration which automatically adjusts the turning speed according to the speed that the steering wheel is turned.

⚠ CAUTION

Risk of accident.

Do not rely on the steering wheel position.

If the steering wheel is turned to the left three times quickly, and then three times to the right slowly, the truck will not return to its original direction.

– Always look at the direction of the truck. Do not rely on the steering wheel position.

NOTE

To avoid unnecessary tyre wear, turn the steering only when the truck is moving.

Contact your service partner if steering requires too much effort or if there is too much play in the steering.

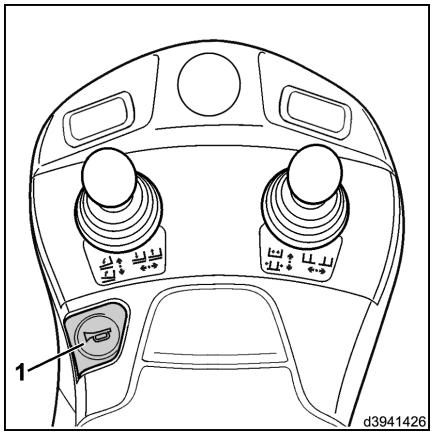
– Do not continue to operate the truck with faulty steering.

Horn ▷

Operating the horn

When operating at blind corners and junctions, a horn serves as warning signal.

– Press the horn button(1) on the armrest.



Service brake ▷

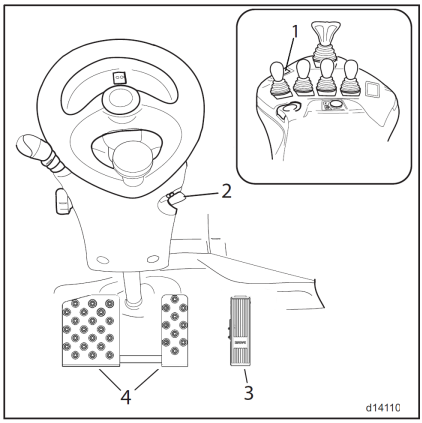
To operate the service brake:

– Release accelerator pedal (3) and allow it to return to its rest position.

– Depress either brake pedal (4).

⚠ CAUTION

In case of an emergency, switching off the ignition key (2) will apply the handbrake, bringing the truck to a complete stop and disabling all hydraulic functions.

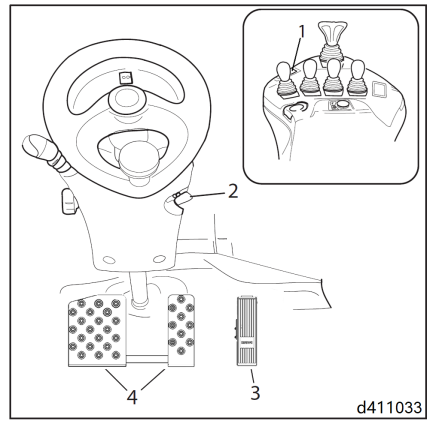


⚠ WARNING

This action should only be attempted in an emergency and could result in the truck becoming unstable and / or the loss of load from the fork arms.

Parking brake

The parking brake is operational at speeds below 3 km/h, the switch (1) is mounted in the front of the armrest.



To apply the parking brake manually:

– To apply the parking brake, press brake pedal(4) and hold parking brake switch (1) until the parking brake warning symbol on the truck display monitor illuminates.

– To release the parking brake, depress service brake pedal (4) and then press parking brake switch (1). This is a safety system to prevent unintended release of the parking brake.

⚠ WARNING

Risk of accident.

If the braking system is becoming faulty or worn, contact your authorised dealer. Do not drive your truck with faulty brakes.

Automatic parking brake operation

– Set up the automatic parking brake function.

NOTE

Specialist knowledge is required for setting up the automatic parking brake function. Contact your service partner.

If set up the automatic parking brake function:

When forward or reverse gear is selected, and the throttle pedal is pressed, the parking brake indicator will extinguish.

When stationary, with the service brake applied and in gear, following a period of 5 or more than 5 seconds, the parking brake will automatically engage and the indicator will flash.

NOTE

The interval time can be adjusted. Contact your service partner to do the adjustment.

⚠ CAUTION

Danger of personal injury and damage to the truck.

Always check that the park brake (manual or automatic) is applied before leaving the truck.

⚠ CAUTION

Danger of personal injury and damage to the truck.

Don't parking the truck on an unattended incline.

Diesel particulate filter

Important safety precautions:

NOTE

Fabric or flammable materials that remain in the engine compartment may ignite if they come into contact with the exhaust system or heat-generating engine components. If there is a fire risk, after completing maintenance work, please make sure that no external flammable material remains inside the engine compartment or on the exhaust system.

NOTE

If flammable materials generated by environmental factors or flammable materials carried by animals come into contact with the exhaust system or heat-generating engine components, these materials may ignite. There is a risk of fire.

NOTE

Flammable materials such as leaves, grass, twigs may ignite if they come into contact with heat-generating components of the exhaust system or exhaust flow. There is a risk of fire.

NOTE

Keep flammable materials away from heat-generating components during parking. Take special care not to park the vehicle on hayfield or harvested cropland.

– Ensure that the exhaust gas aftertreatment unit is cleaned and maintained.

⚠ WARNING

Do not stand in the air intake and exhaust areas.

⚠ WARNING

During automatic and manual regeneration, extremely hot exhaust gases will escape from the exhaust pipe. Maintain a distance of at least one metre from other objects, such as parked vehicles, in order to avoid making damages to property.

⚠ WARNING

If you operate the vehicle/equipment primarily under low load, the regeneration time may be significantly extended. Fuel consumption may increase and exhaust system functions may be affected.

Failure to follow these instructions will result in the following risks:

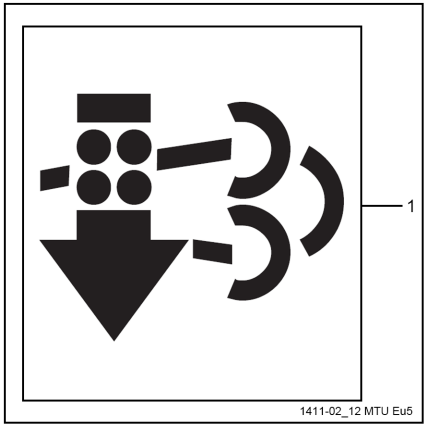
- Engine torque reduction
- Engine torque speed reduction
- Aftertreatment diesel particulate filter replacement required

Automatic regeneration

– When indicator light (1) on the instrument panel is illuminated, the automatic regeneration of the diesel particulate filter is in progress.

– Automatic regeneration will only start if all operating conditions are met (e.g. engine oil temperature and exhaust gas temperature are high enough). If a certain operating condition is no longer met while regeneration is in progress, indicator light (1) will go out and the regeneration process will be interrupted. Whenever indicator light (1) is illuminated, avoid interrupting the operation. Once all operating conditions are met again, the regeneration will automatically restart. If the regeneration is interrupted repeatedly, temporarily stop regeneration, and then start manual regeneration.

▷



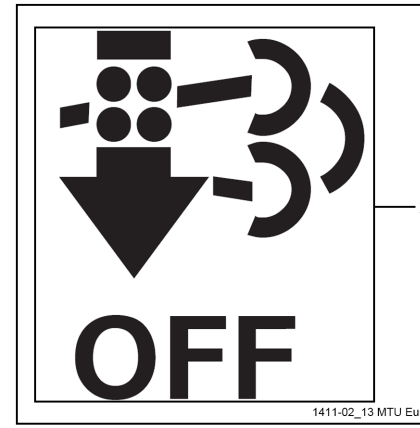
NOTE

Engine noise and idle speed may change during regeneration.

Regeneration interrupt

If you need to prevent the increase in exhaust gas temperature during regeneration (e.g. when the vehicle is driving into a danger area), the regeneration process can be interrupted. After which neither automatic regeneration nor manual regeneration may be started, and any current regeneration will be interrupted. Regeneration interrupt can only be enabled in emergency situations. If regeneration interrupt has been enabled, regeneration will remain inactive even after the engine is restarted. This may cause a large amounts of particles to accumulate quickly in the diesel particulate filter.

– **ON/OFF:** Press the button or switch (2). Regeneration is deactivated when indicator light (2) is illuminated. ▷



Start manual regeneration

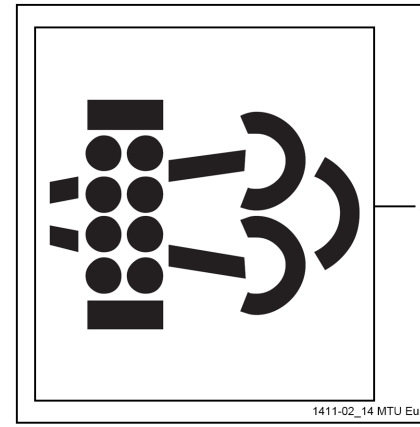
NOTE

Flammable materials such as leaves, grass, twigs may ignite if they come into contact with heat-generating components of the exhaust system or exhaust flow. There is a risk of fire.

NOTE

Keep flammable materials away from heat-generating components during parking. Take special care not to park the vehicle on hayfield or harvested cropland.

– If excess particles have accumulated on the diesel particulate filter, indicator light (3) on the instrument panel will illuminate. The exhaust gas aftertreatment system prompts you to start manual regeneration. ▷



NOTE

During regeneration, engine speed may increase and engine noise may change. Pay attention to the increased engine speed and the drive assembly.

NOTE

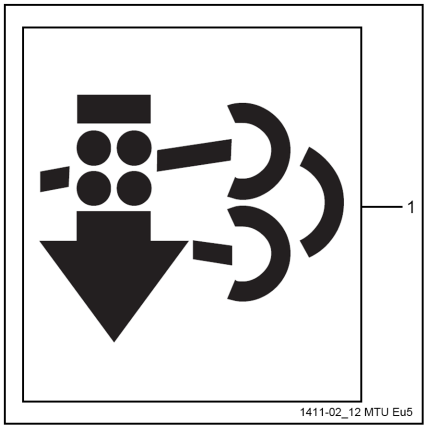
If the engine's electronic management system prompts you to conduct a manual regeneration when the external temperature is low, start the regeneration before turning off the engine.

If the engine is switched off without having conducted the regeneration, manual regeneration may only be conducted after the engine warms up.

If Adblue® solution/diesel exhaust fluid (DEF) freeze, please start the manual regeneration after a defrosting time of no more than 120 minutes.

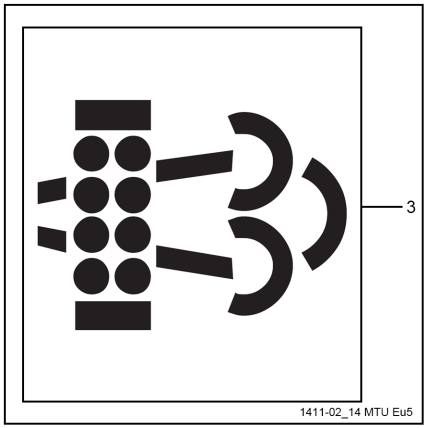
Manual regeneration has an approximate duration of 15 minutes and a maximum duration of 90 minutes.

– Start manual regeneration by button (1). ▷

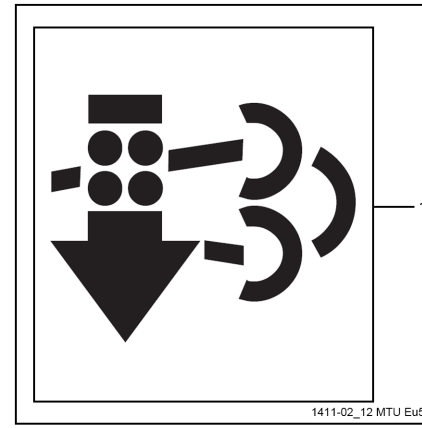


– Manual regeneration can only be started under the following conditions: The indicator light and warning light (3) have prompted you to perform a manual regeneration, or regeneration interrupt has not been enabled. ▷

– Pay attention to road and traffic conditions when stopping the vehicle/equipment, and keep the engine running. This operation should be executed at least one metre away from other vehicles, other objects and all flammable materials. Do not stand in the air intake and exhaust areas.



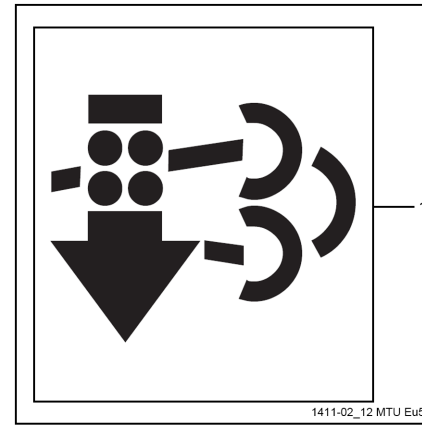
– Hold button (1) for about three seconds. ▷



Enable manual regeneration when the following conditions are met:

- Engine oil temperature and exhaust gas temperature are high enough
- Adblue® solution/diesel exhaust fluid (DEF) is not frozen
- The system is operating without errors

– Indicator light (1) on the instrument panel flashes and the engine speed increases. ▷



– After the regeneration is completed:

- Indicator light (1) on the instrument penal goes out
- The engine speed drops to idle speed

– After regeneration is interrupted, the engine speed drops to idle speed.

Override switch

The forklift management system will detect a fault in the system, force the forklift into "fault protection" mode or stop whatever caused the fault Using the control button, the operator can manoeuvre the forklift quickly to return the machine to safety.



NOTE

Override switch (1) can only be used by authorised personnel, these personnel can be evaluatied and are responsible for reducing load times

⚠ CAUTION

Beware of risk of injury to personnel and damage to the truck.

Use with extreme caution. Some safety devices are deactivated when the override switch is activated.

Mirrors

⚠ CAUTION

Risk of collision.

Do not operate the truck if visibility is impaired.

Rear view mirrors should be cleaned and adjusted to suit the operator before commencement of operation, and it should be noted that they are only provided for checking the vicinity of the truck before moving off, and to monitor the rear traffic area.

Reversing is only allowed with a direct view in the reverse direction of travel.

Window heater

Switching on the rear window heating

– Press push button (1).

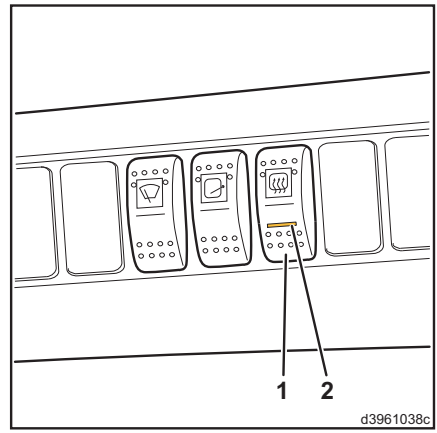
Dummy (2) test.

– Dummy (1) test.

The rear window heating is switched off.

– Dummy (1) test.

The rear window heating is in operation for a further 15 minutes.



Heating system, air conditioning

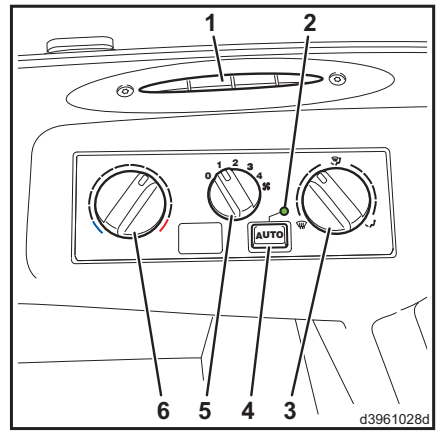
Heating operation

Operating options:

- Manual heating operation
- Automatic heating operation

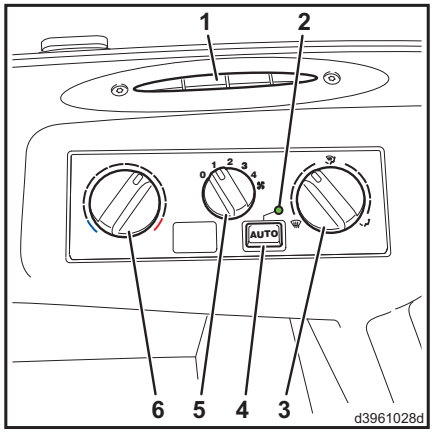
Operating devices for the heating system

- Cab air nozzle (1)
- Function display (2)
- Turning knob (3) for setting the vent positions: window defrosting – footwell ventilation
- Push button (4) for switching the automatic function on and off
- Turning knob (5) for adjusting the blower levels: levels 0 to 4
- Turning knob (6) for temperature control: left-hand end position ≙ cold / right-hand end position ≙ hot
- Left-hand and right-hand cab air nozzles (not shown)



Manual heating operation

Push button (4) for automatic operation must be switched off.



Switching on the heating system

– Turn the turning knob (5).

The blower is switched on and the air flow is set to the selected level.

Normal heating operation:

– Use the turning knob (6) to adjust the temperature.

– Use the turning knob (5), the turning knob (3) and the left-hand and right-hand cab air nozzles (not shown) to adjust the air flow and air distribution.

Settings for demisting the windows

– Turn the turning knob (6) to hot (right-hand end position).

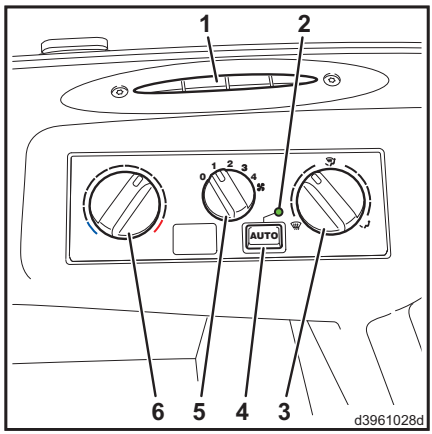
– Turn the turning knob (3) to window defrosting (left-hand end position).

– Turn the turning knob (5) to level 4.

– Open the left-hand and right-hand cab air nozzles (not shown) and direct the fins so that they are pointing towards the door windows.

Automatic heating operation

– Use the turning knob (6) to adjust the temperature.



– Presh the push button (4).

The automatic heating is switched on and the function display (2) lights up in green. The set temperature and the blower level are controlled automatically.

– Use the turning knob (3) and the left-hand and right-hand cab air nozzles (not shown) to adjust the air distribution.

NOTE

If the position of the turning knob (5) for the blower levels is changed, the heating system automatically switches to "manual heating operation".

⚠ CAUTION

If the function display (2) flashes five times after switching on and then goes out, there is a malfunction affecting the automatic heating.

Contact your service partner.

Switching off heating operation

– Turn the turning knob (5) to level 0.

The heating operation is switched off.

NOTE

When the automatic heating is switched on and the position of turning knob (5) is set to level 0, the position of turning knob (5) for the blower level must first be changed and then turned to level 0 to switch off heating operation.

Heating/air conditioning operation

Operating options:

- Manual air conditioning operation
- Automatic air conditioning operation
- Manual heating operation
- Automatic heating operation

⚠ CAUTION

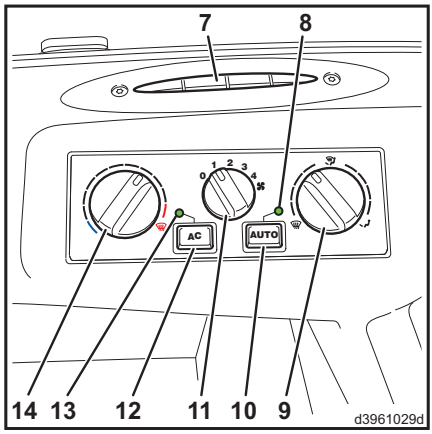
Damage to the compressor!

Switch on the air conditioning every four weeks for at least ten minutes. Doing so will prevent seizing of the bearings in the compressor.

The air conditioning must be serviced once a year by the service partner.

It is normal for condensation water to build up in the hoses and under the truck when the air conditioning is in operation.

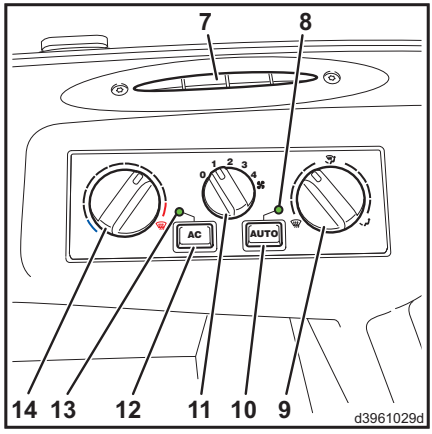
Operating devices for heating/air conditioning operation ▷



- Cab air nozzle (7)
- Function display (8)
- Turning knob (9) for setting the vent positions: window defrosting – footwell ventilation
- Push button (10) for switching the automatic function on and off
- Turning knob (11) for adjusting the blower levels: levels 0 to 4
- Push button (12) for switching the air conditioning on and off
- Function display (13)
- Turning knob (14) for temperature control and automatic window defrosting: left-hand end position ≙ cold / right-hand position ≙ hot / right-hand end position ≙ automatic window defrosting
- Left-hand and right-hand cab air nozzles (not shown)

Manual air conditioning operation

Push button (10) for automatic operation must be switched off. ▷



Switching on the air conditioning

– Turn the turning knob (11).

The blower is switched on and the air flow is set to the selected level.

– Presh the push button (12).

The air conditioning is switched on and the function display (13) lights up in green.

The air conditioning works only when the engine is running and the turning knob (11) is switched on (level 1 to 4). The fans on the condenser in the roof are switched on as necessary. It is possible for these fans to come to a standstill from time to time.

⚠ CAUTION

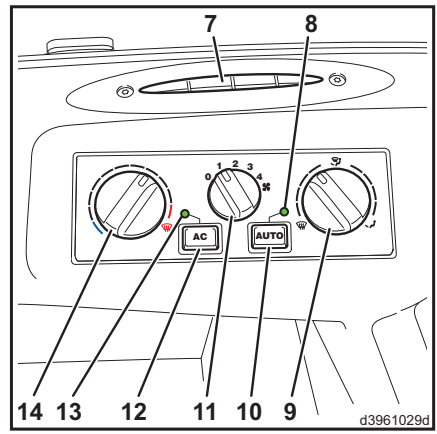
If the function display (13) flashes five times after switching on and then goes out, there is an malfunction affecting the air conditioning.

Contact your service partner.

NOTE

Condensation water in the evaporator can create a musty smell. Switching off the air conditioning ten minutes before completing the journey and keeping the blower running will dry out the condensation water, thus preventing the musty smell.

Normal heating and air conditioning operation:



- Use the turning knob (14) to adjust the temperature.
- Use the turning knob (11), the turning knob (9) and the left-hand and right-hand cab air nozzles (not shown) to adjust the air flow and air distribution.

NOTE

On cool, humid days, the heater and air conditioning can be used to dehumidify the air in the cab. By operating the heater and the air conditioning simultaneously, the heater can counteract the cooling effect. This produces a more pleasant temperature inside the cab and prevents misting of the windows.

Settings for maximum cooling in the cab

- Switch on the air conditioning.
- Turn the turning knob (14) to cold (left-hand end position).
- Turn the turning knob (9) to window defrosting (left-hand end position).
- Turn the turning knob (11) to level 4.
- Open the left-hand and right-hand cab air nozzles (not shown).
- Close the windows and doors.

NOTE

A significant difference between the internal temperature and the outside temperature increases the physical stress put on the driver. To reduce the risk of illness, the difference between the internal temperature and the outside temperature must not exceed six degrees.

Automatic air conditioning operation

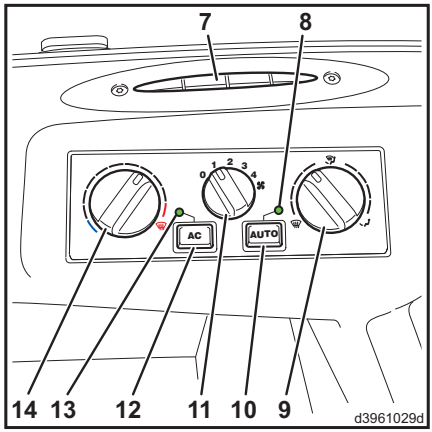
– Use the turning knob (14) to adjust the temperature. ▷

– Presh the push button (10).

The automatic air conditioning is switched on and the function displays (8) and (13) illuminate in green. The set temperature and the blower level are controlled automatically.

– Use the turning knob (9) and the left-hand and right-hand cab air nozzles (not shown) to adjust the air distribution.

The air conditioning operates only if the engine is running. The fans on the condenser in the roof are switched on as necessary. It is possible for these fans to come to a standstill from time to time.



NOTE

If the position of the turning knob (11) for the blower levels is changed, the turning knob (14) is turned to the automatic window defrosting position (right-hand end position) or push button (10) is used to switch off the automatic function, the air conditioning automatically switches to "manual air conditioning operation". If the push button (12) is used to switch off the air conditioning, the heating system automatically switches to "automatic heating operation".

⚠ CAUTION

If the function displays (8) or (13) flash five times after switching on and then go out, there is a malfunction affecting the automatic heating/air conditioning or the air conditioning.

Contact your service partner.

NOTE

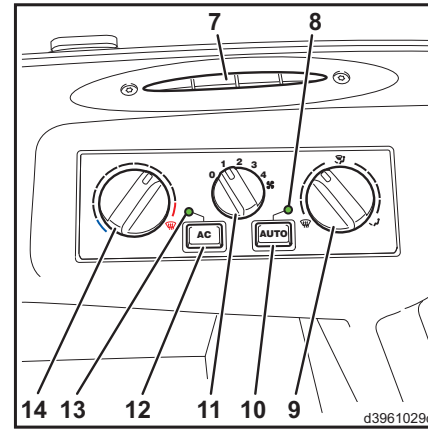
Condensation water in the evaporator can create a musty smell. Switching off the air conditioning ten minutes before completing the journey and keeping the blower running will dry out the condensation water, thus preventing the musty smell.

NOTE

A significant difference between the internal temperature and the outside temperature increases the physical stress put on the driver. To reduce the risk of illness, the difference between the internal temperature and the outside temperature must not exceed six degrees.

Manual heating operation

The push button (12) for the air conditioning and the push button (10) for the automatic mode must be switched off.



Switching on the heating system

– Turn the turning knob (11).

The blower is switched on and the air flow is set to the selected level.

Normal heating operation:

– Use the turning knob (14) to adjust the temperature.

– Use the turning knob (11), the turning knob (9) and the left-hand and right-hand cab air nozzles (not shown) to adjust the air flow and air distribution.

Settings for window defrosting/demisting the windows

– Turn the turning knob (14) to the automatic window defrosting position (right-hand end position).

The blower speed is automatically set to level 4 and the function display (13) lights up in green.

– Turn the turning knob (9) to window defrosting (left-hand end position).

– Open the left-hand and right-hand cab air nozzles (not shown) and direct the fins so that they are pointing towards the door windows.

Automatic heating operation

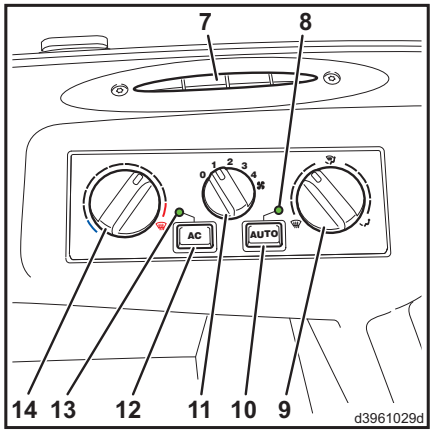
The push button (12) for the air conditioning must be switched off.

– Use the turning knob (14) to adjust the temperature.

– Press the push button (10) and then press the push button (12).

The automatic heating is switched on and the automatic air conditioning is switched off. The function display (8) lights up in green. The set temperature and the blower level are controlled automatically.

– Use the turning knob (9) and the left-hand and right-hand cab air nozzles (not shown) to adjust the air distribution.



NOTE

If the position of the turning knob (11) for the blower levels is changed or the turning knob (14) is turned to the automatic window defrosting position (right-hand end position), the heating system automatically switches to "manual heating operation". Windscreen defrosting can be performed only in manual mode.

⚠ CAUTION

If the function display (8) flashes five times after switching on and then goes out, there is a malfunction affecting the automatic heating.

Contact your service partner.

Switching off heating/air conditioning operation

– Turn the turning knob (11) to level 0.

The heating and air conditioning operation is switched off.

NOTE

When the automatic air conditioning or the automatic heating is switched on and the position of turning knob (11) is set to level 0, the position of turning knob (11) for the blower level must first be changed and then turned to level 0 to switch off heating/air conditioning operation.

NOTE

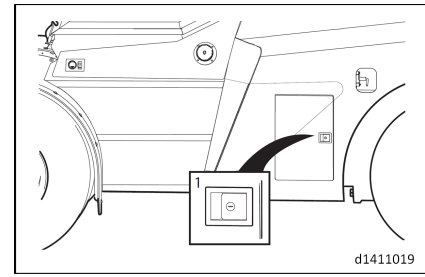
If the rotary knob (14) is set to the automatic window defrosting position (right-hand end position), the position of the turning knob (14) must first be changed and then the rotary knob (11) must be turned to level 0 to switch off heating/air conditioning operation.

Battery access - opening

– Batteries are located in a compartment on the rear left side of the truck.

– Check that door swing area is free from obstruction.

– Open door.



Battery access - closing

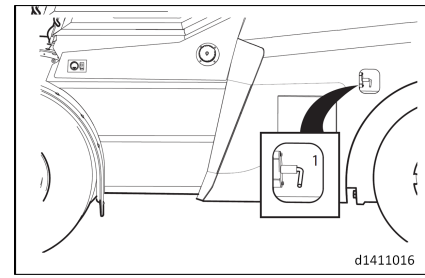
– Close door.

Batteries - isolate

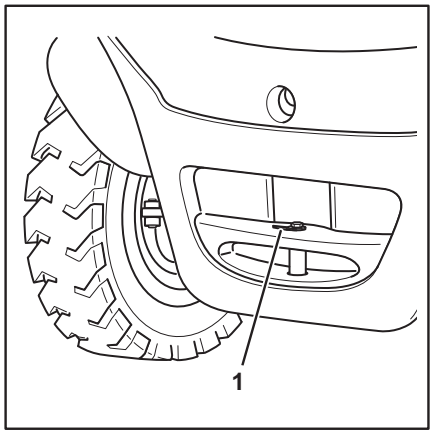
The battery isolator is located to the rear of the battery access compartment.

– To isolate the batteries, rotate handle (1) 90° anti clockwise. The batteries are now isolated.

– To restore battery power, return handle (1) to original position.



Trailer coupling ▷



NOTE

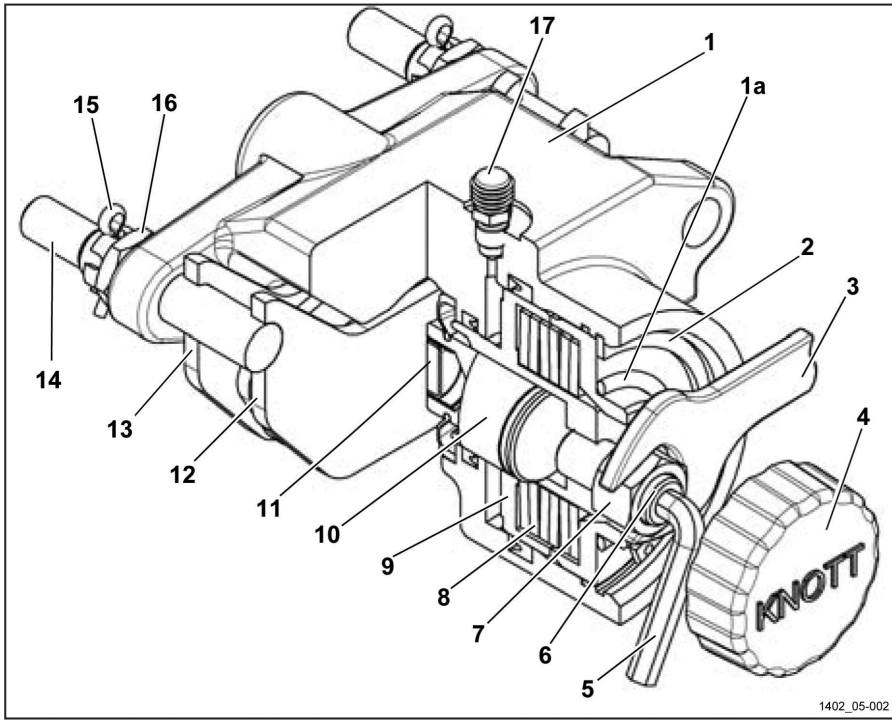
The trailer coupling should only be used to tow light trailers inside the plant working area.

– Lift tow pin (1).

– Place towbar in coupling recess.

– Push tow pin (1) down to engage the drawbar and the lower retaining hole.

To tow the truck



1	Caliper body	9	Piston
1a	O-ring seal	10	Thrust bolt
2	Circlip	11	Magnet
3	Wrench (24/30 mm)	12	Friction pad
4	Screw-cap	13	Friction pad
5	Allen key wrench (8/10 mm)	14	Guide bolt
6	Adjusting screw	15	Split-pin
7	Lock-nut	16	Castellated nut
8	Spring stack	17	Bleed nipple

NOTE

Read and understand this maintenance procedure before starting any work. If you are unsure of any aspect of this procedure, contact your service partner.

Safety conditions

The maintenance procedures that follow may involve the assembly and or movement of heavy hydraulic equipment, excitation of

hydraulic systems and movement of heavy vehicles. It is the responsibility of all personnel concerned with these procedures to maintain safe working practices.

NOTE

Unless otherwise stated all component parts must be inspected at disassembly for re-use if serviceable.

Emergency release of parking brake

⚠ DANGER

Risk of crush injuries and or death

Do not work on or under a truck unless it is prevented from any movement.

– Park truck on suitable level ground.
– Before any maintenance is started, make sure the truck is completely immobilised, (not able to move).
– Place chocks under wheels.
– Remove ignition key from cab of truck.
– Do not allow unauthorized personnel to enter the cab.

⚠ WARNING

Risk of personal injury.

Brake disc rotors and friction pads can become **very hot**.

– make sure all component parts are cool before starting any maintenance.
– Release screw-cap (4).
– Release lock-nut (7).

NOTE

40 to 70 Nm is required to release the brake using adjustment screw (6).

– Turn adjustment screw (6) anticlockwise until brake disc rotor is free.
– If the truck is to remain in this condition for any length of time, refit screw-cap (4)

hand tight to protect the mechanism from contaminants.

NOTE

Before the truck can be used, the parking brake must be re-adjusted - refer to the training manual.

Emergency exit

The right side cab door can be used as the emergency exit.

– Open the cab door.

– Exit the cab in a backwards direction.

– Use handrails where fitted to climb down the steps and exit the cab.

– Close the cab door.

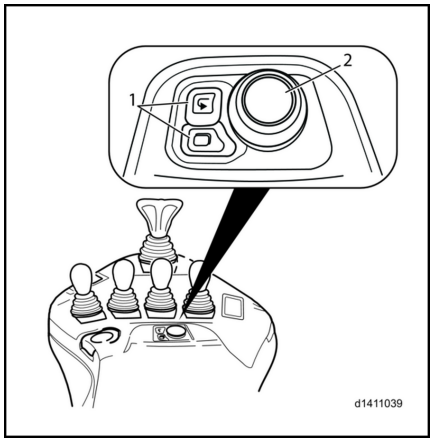
⚠ WARNING

Risk of injury from entering and exiting the truck incorrectly.

Face the truck when entering and exiting.

Optional equipment

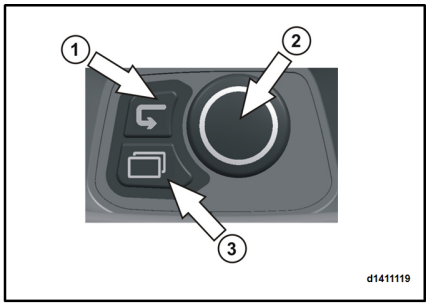
Drive controller



NOTE

The truck status display unit can be navigated in two ways, described below is using the buttons on the armrest.

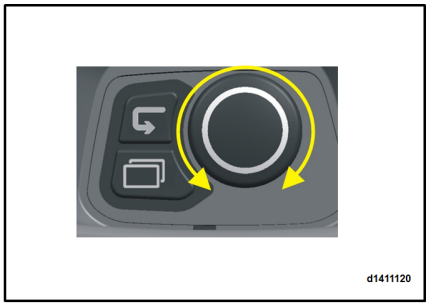
The drive controller is operated using the rotary/push button (2), the "Back" button (1) and the "Switch" button (3).



Turning the rotary/push button

Turning the rotary/push button to the left or right allows the following actions to be carried out:

- Scroll between menu items
- Change values continuously or in increments (brightness, digit value or numerical value)



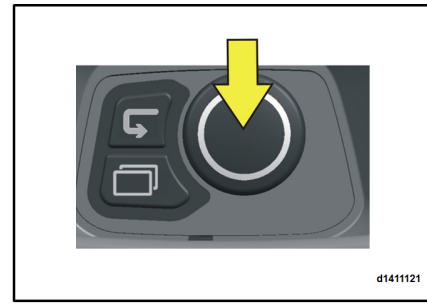
Pressing the rotary/push button

Briefly pressing the rotary/push button allows the following actions to be carried out:

- Select menu item
- Activate or deactivate a function
- Acknowledge a message

Pressing the rotary/push button for longer than two seconds activates the following functions:

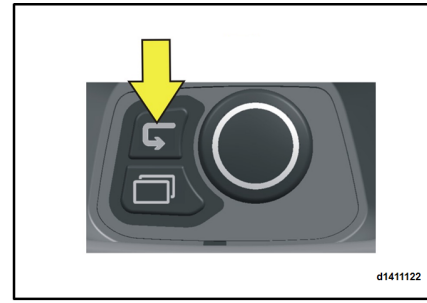
- Program position (tilt angle, lift height, lift limits)
- Assign or overwrite favourite position
- Select function or display after entering the PIN code
- Delete programmed values
- Delete favourite
- Set new time/date or PIN code
- Reset consumption



"Back" button

Briefly pressing the "Back" button allows the following actions to be carried out:

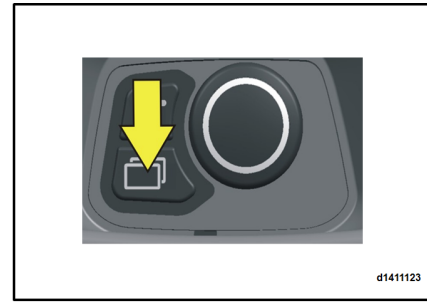
- Go back one menu level
- Acknowledge a message



"Switch" button

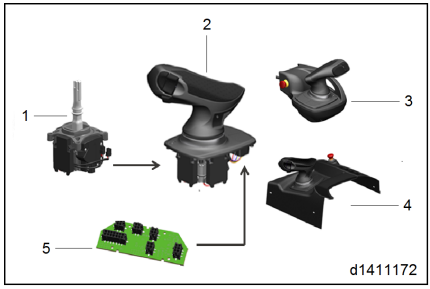
Briefly pressing the "Switch" button allows the following actions to be carried out:

- Switch between favourites
- Jump from the menu item to the favourites last used



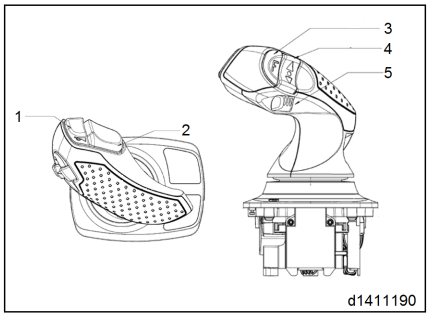
5100 040 Multifunction Joystick

Joystick 4Plus modular concept (Elobau)



1 KION Basis Module
2 Multifunction Lever
3 Multifunction Lever with housing for Counterbalance trucks
4 Multifunction Lever with housing for Reach trucks
5 Electronic Module with CAN

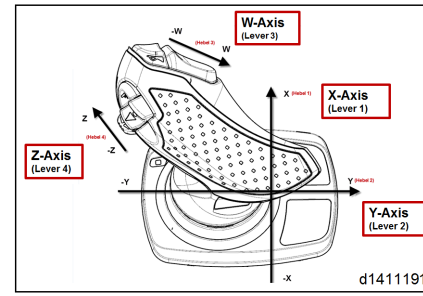
Actuation buttons



1 Signal-horn
2 Tilting
3 Function button
4 Drive direction
5 Side shift

Controlled axes

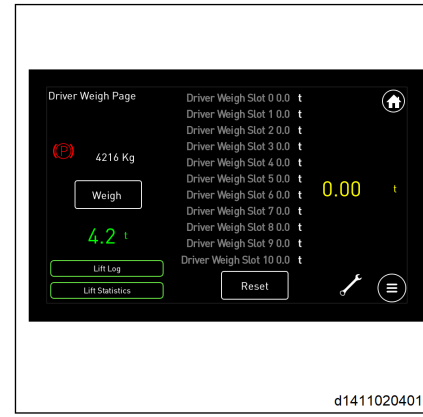
Power Supply	
Operating voltage (min.)	9V
Nominal Voltage	12V / 24V
Operating voltage (max.)	38V
Power consumption (max.)	1,8W



Multifunction Lever Environmental specification

Environmental Conditions	
Protection class	IP65 (mounted)
Storage Temperature	-35°C to +85°C
Environmental temperature	-35°C to +75°C
Suitable for cold store application	ΔT up to 60K
EMC immunity according to EN12895	36V/m
ESD: Contact discharge to the sensor housing (CD) Air discharge (AD)	 15kV from 150pF 25kV from 150pF
Magnetic field immunity: Tested according to EN61000-4-8 Level 5:	1000 A/m 3s (0Hz) 30 A/m 3s (50Hz)

6240 005 load weight display (weight error (+/-100 kg))



Determining and displaying the load weight

To improve the accuracy of the displayed load weight, the following conditions must be met:

- The forklift must be on a smooth, level surface and must be stationary
- The lift mast must be placed in the vertical position
- The hydraulic oil in the forklift must be at operating temperature
- The fork must not be raised more than 1.70 metres above the ground. When the fork is above 1.70 m, the load weight display does not show reliable values
- The raised load must remain stationary

NOTE

When the load weight is less than 100 kg, the reliability of the displayed load weight cannot be guaranteed.

NOTE

The load weight cannot be determined if the load pressure sensor fails. In such case, the display will show "-----".

NOTE

The load weight display will show the weight on the fork to the nearest 100 kg, and the 7" screen must be selected.

Forklift information management

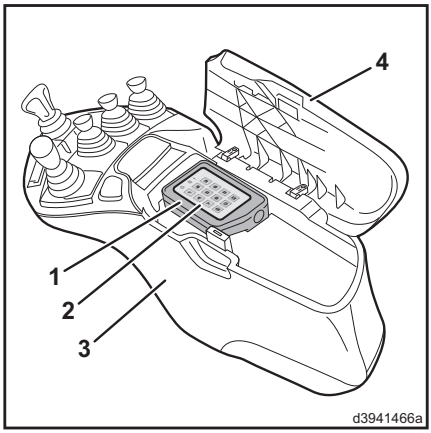
Access control PIN

The forklift data acquisition (FDE) input device (1) is located in the armrest console (3).

The input device has a 12-digit keypad (2).

With the standard setting, a 5-digit PIN is allocated to the respective driver to ensure that the forklift can only be operated by authorised personnel.

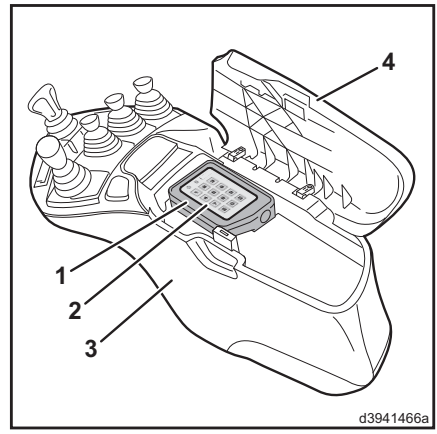
The forklift can only be started after entering this PIN and possibly a status code (depending on the setting).



NOTE

The PIN can be 5 to 8 digits long. Before entering the PIN, contact your fleet manager to check the number of digits in the PIN and to find out about the forklift settings.

Forklift data acquisition - standard setting (PIN) ▷

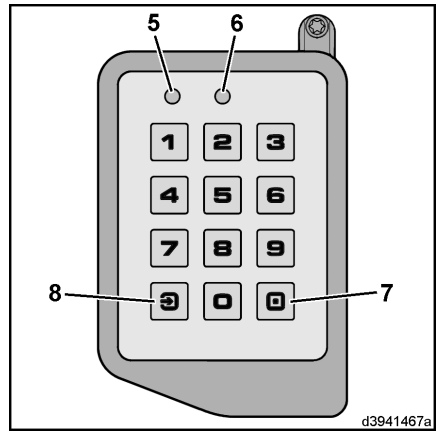


Log in and start the engine:

– Apply the parking brake.

– Open the armrest support (4) sideways to the right

– Press the Reset button (8) (or any other button) to activate the input unit from stand-by mode ▷



NOTE

If a number button is pressed to activate the device, this number is registered as the first digit of the PIN.

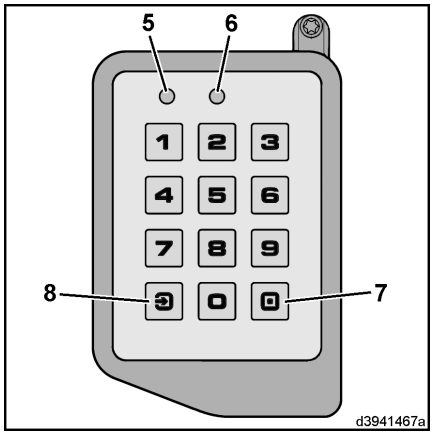
LED (5) and LED (6) flash green alternately.

NOTE

If no PIN is entered, the input device reverts to standby mode after 60 seconds (factory setting). This delay time can be changed. Contact your fleet manager.

– Enter personal PIN (factory setting = 0 0 0 0 0).

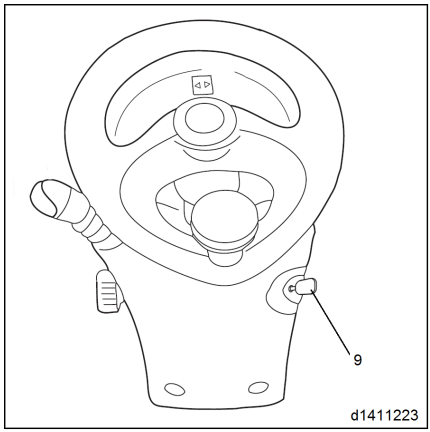
LED (5) and LED (6) both light up green. ▷



NOTE

If an incorrect PIN is entered, LED (5) and LED (6) flash red. After a delay time, the input unit reverts to login mode and the two LEDs flash green alternately. If an incorrect PIN is entered, the delay time increases after each incorrect attempt. If an error occurred while entering the PIN code, press the Reset *button (8) to clear the PIN code entered.*

– Turn rotating knob (9)to switch setting "II" and start the engine ▷



NOTE

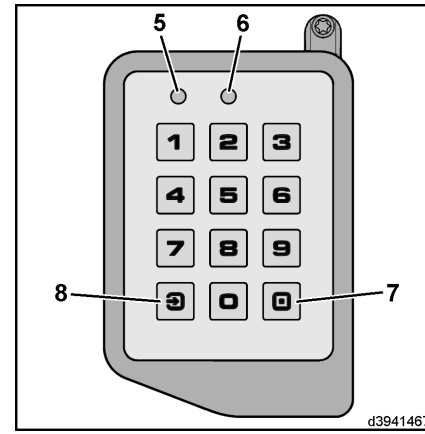
If the forklift does not start correctly the first time, you can start it again before rotating knob (9) returns to zero. The PIN code will not be kept once the delay time has elapsed.

NOTE

If LED (5) lights up red and LED (6) lights up green, the data must be read out. Inform your fleet manager immediately.

– Close armrest support (4)

Switch off the engine and log out:



⚠ CAUTION

Unwarranted use by unauthorised personnel.

When parking and leaving the forklift, the driver must log out.

– Apply the parking brake.

– Open the armrest support (4) sideways to the right

– Press the Log in/ESC button (7)

The engine is switched off, and LED (5) and (6) turn off.

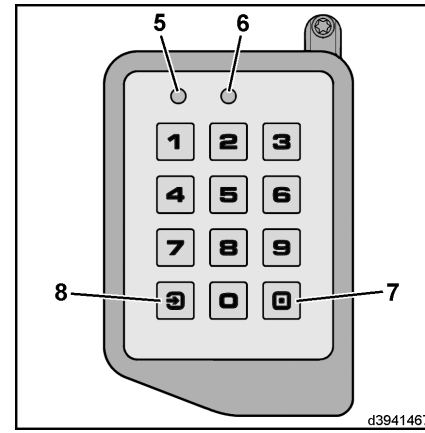
– Close armrest support (4)

– Turn rotating knob (9) to switch setting "0"

NOTE

If the driver leaves the driver's seat, the engine and power supply are switched off after the delay time elapses. If the driver switches off the engine using rotating knob (9), the forklift can be restarted within the delay time without having to re-enter the PIN. This delay time can be changed. Contact your fleet manager.

Activate the power supply:



– Press and hold the Log in/ESC button (7) for more than 2 seconds.

LED (5) lights up yellow, and LED (6) flashes green.

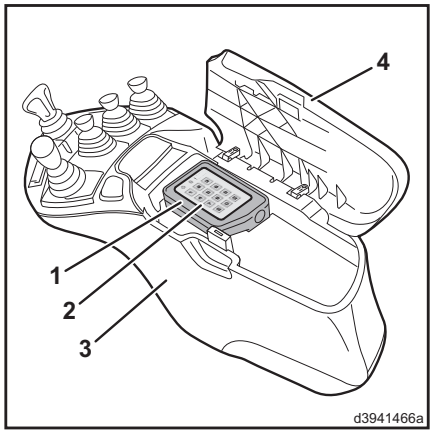
– Turn rotating knob (9) to switch setting "0"

The engine is switched off.

– Turn rotating knob (9) to switch setting "I"

The power supply remains switched on for approx. 60 seconds (e.g. for lighting).

Forklift data acquisition - special setting (PIN and status code) ▷

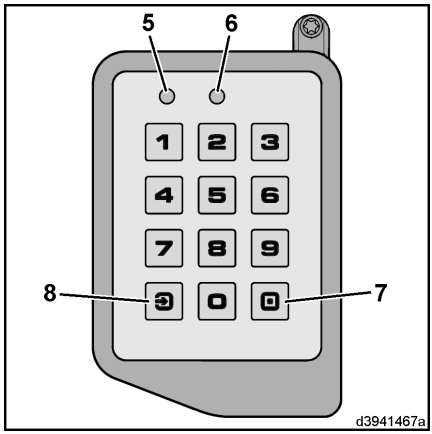


Log in and start the engine:

– Apply the parking brake.

– Open the armrest support (4) sideways to the right

– Press the Reset button (8) (or any other button) to activate the input unit from stand-by mode ▷



NOTE

If a number button is pressed to activate the device, this number is registered as the first digit of the PIN.

LED (5) and LED (6) flash green alternately.

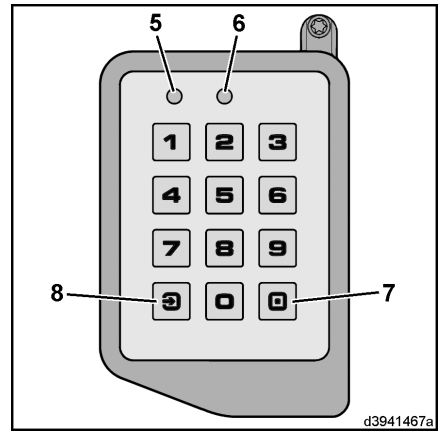
NOTE

If no PIN is entered, the input device reverts to standby mode after 60 seconds (factory setting). This delay time can be changed. Contact your fleet manager.

– Enter personal PIN (factory setting = 0 0 0 0 0) and status code.

To set up a forklift correctly, the PIN should be as follows: 0 0 0 0 0 0.

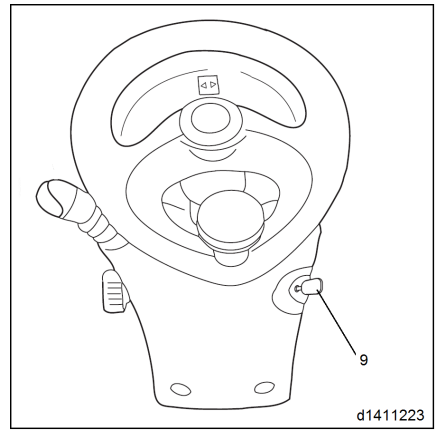
LED (5) and LED (6) both light up green. ▷



NOTE

If an incorrect PIN is entered, LED (5) and LED (6) flash red. After a delay time, the input unit reverts to login mode and the two LEDs flash green alternately. If an incorrect PIN is entered, the delay time increases after each incorrect attempt. If an error occurred while entering the PIN code, press the Reset button (8) to clear the PIN code entered.

– Turn rotating knob (9)to switch setting "II" and start the engine ▷



NOTE

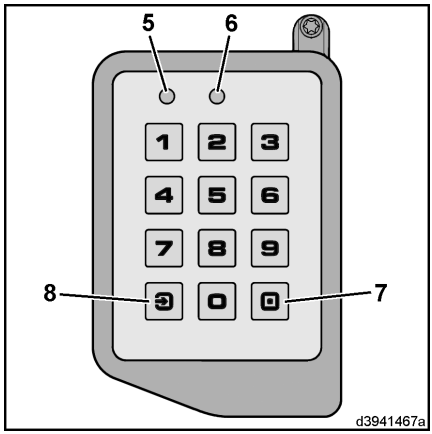
If the forklift does not start correctly the first time, you can start it again before rotating knob (9) returns to zero. The PIN code will not be kept once the delay time has elapsed.

NOTE

If LED (5) lights up red and LED (6) lights up green, the data must be read out. Inform your fleet manager immediately.

– Close armrest support (4)

Switch off the engine and log out:



⚠ CAUTION

Unwarranted use by unauthorised personnel.

When parking and leaving the forklift, the driver must log out.

– Apply the parking brake.

– Open the armrest support (4) sideways to the right

– Press the Log in/ESC button (7)

The engine is switched off, and LED (5) and (6) turn off.

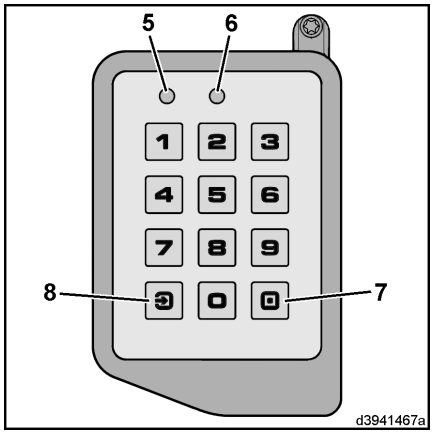
– Close armrest support (4)

– Turn rotating knob (9) to switch setting "0"

NOTE

If the driver leaves the driver's seat, the engine and power supply are switched off after the delay time elapses. If the driver switches off the engine using rotating knob (9), the forklift can be restarted within the delay time without having to re-enter the PIN. This delay time can be changed. Contact your fleet manager.

Activate the power supply:



– Press and hold the Log in/ESC button (7) for more than 2 seconds.

LED (5) lights up yellow, and LED (6) flashes green.

– Turn rotating knob (9) to switch setting "0"

The engine is switched off.

– Turn rotating knob (9) to switch setting "I"

The power supply remains switched on for approx. 60 seconds (e.g. for lighting).

Status code

NOTE

The status code indicates the status of the forklift.

The following codes are available:

- [0] = forklift OK
- [1] = request service (forklift cannot be started)
- [2] = request maintenance (forklift can be started)
- [3] = Problem with driving
- [4] = Problem with lifting
- [5] = Problem with steering
- [6] = Accident damage
- [7] = User-defined
- [8] = User-defined
- [9] = User-defined

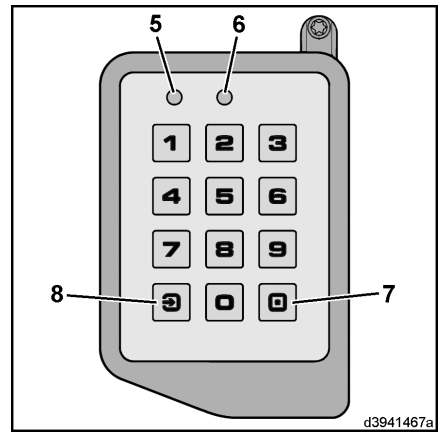
Status messages [7], [8] and [9] can be defined individually by the user. Contact your fleet manager to find out the definition of these status messages.

NOTE

If you only notice one of these statuses (e.g. a problem with driving) after having entered status code [0] (forklift OK), you must log out.

– Press [Reset] button (8).

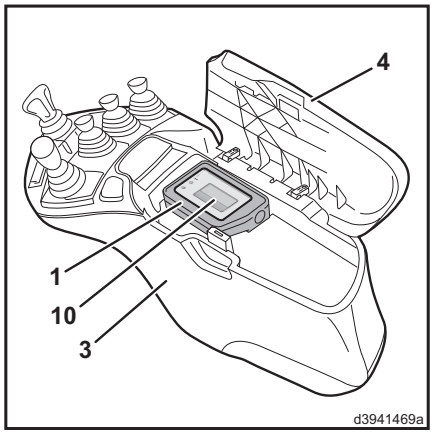
– Log in again with status message [3] (problem with driving)



Access Control RFID Dual

The forklift data acquisition (FDE) input device (1) is located in the armrest console (3).

The input device features a reading area (10) onto which the corresponding transponder (chip or magnetic stripe card) must be placed. The forklift can only be started once the transponder has been placed onto the reading area.



Log in and start the engine:

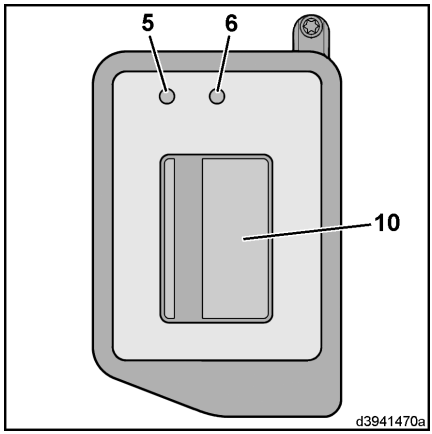
– Apply the parking brake.

– Open the armrest support (4) sideways to the right

– Place the valid transponder onto the reading area (10).

Data is read in, and LED (5) and LED (6) both light up green.

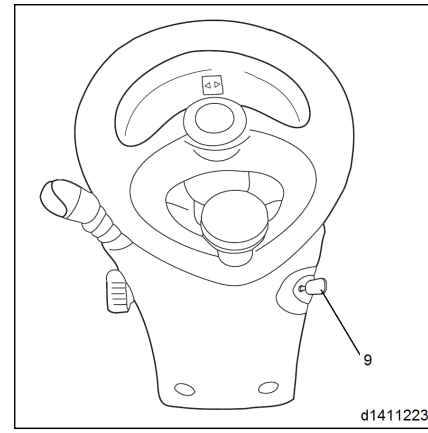
– Remove transponder.



NOTE

If LED (5) and LED (6) flash red, the transponder is invalid or there is a reading error. After a delay time, the input unit reverts to login mode and the two LEDs flash green alternately. If the transponder used is invalid, the delay time increases after each use. The input device is reactivated automatically when a valid transponder is placed on the reading area and read in. LED (5) and LED (6) both light up green.

– Turn rotating knob (9)to switch setting "II" and start the engine



NOTE

If the forklift does not start correctly the first time, it can be restarted before rotating knob (9) returns to zero. The engine can no longer be started once the delay time has elapsed.

NOTE

If LED (5) lights up red and LED (6) lights up green, the data must be read out. Inform your fleet manager immediately.

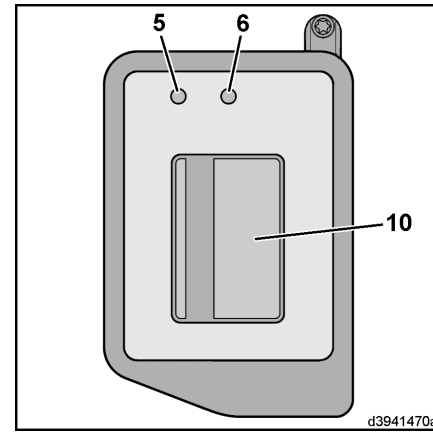
– Close armrest support (4)

Switch off the engine and log out:

CAUTION

Unwarranted use by unauthorised personnel.

When parking and leaving the forklift, the driver must log out.



– Apply the parking brake.
– Open the armrest support (4) sideways to the right
– Place the valid transponder onto the reading area (10).

The engine is switched off, and LED (5) and (6) turn off.

– Remove transponder.
– Close armrest support (4)
– Turn rotating knob (9) to switch setting "0"

NOTE

If the driver leaves the driver's seat, the engine and power supply are switched off after the delay time elapses. If the driver switches off the engine using rotating knob (9), the forklift can be started during the delay time without placing a valid transponder on the reading area again. This delay time can be changed. Contact your fleet manager.

Activate the power supply:

– Place a valid transponder on the reading area (10) and hold it there for longer than 2 seconds

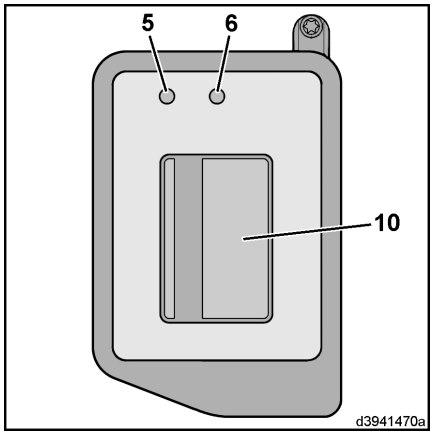
LED (5) lights up yellow, and LED (6) flashes green.

– Turn rotating knob (9) to switch setting "0"

The engine is switched off.

– Turn rotating knob (9) to switch setting "I"

The power supply remains switched on for approx. 60 seconds (e.g. for lighting).



NOTE

If another valid transponder is placed on the reading area within 60 seconds, the engine can be started again.

LED status display

Function:	LED (5)	LED (6)
Standby mode	Off	Off
Input prompt: PIN/transponder	LED (6) flashes green alternately	LED (5) flashes green alternately
No error when reading in PIN/transponder; engine can be started	Lights up green	Lights up green
Error when reading in PIN/transponder: engine cannot be started	Flashes red	Flashes red
Enter standby mode	Lights up red once	Lights up green once
Power supply active for 60 seconds	Lights up yellow	Flashes green
Need to read data — memory is 90% full	Flashes red	Lights up green
Need to read data — memory is 100% full	Lights up red	Lights up green
Speed reduction via shock sensor	Flashes red slowly	Flashes green slowly

Lighting

NOTE

The arrangement of the individual switches on the console on the upper right-hand side of the overhead guard may vary, depending on the version. Observe the switch symbols.

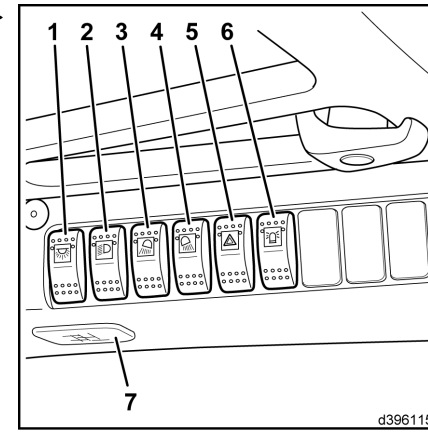
Switching on the terminal board and interior lighting

– Move the toggle switch (1) to the centre position.

The terminal board lighting is switched on.

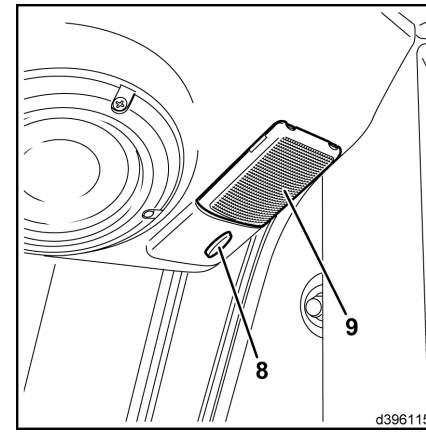
– Switch the toggle switch (1) as far as it will go.

The interior lighting (7) is switched on.



– Press the push button(8).

– The interior lighting (9) is switched on.



NOTE

If the pressure switch (8) has previously been actuated, the two interior lights (7) and (9) may be switched on and off via toggle switch (1).

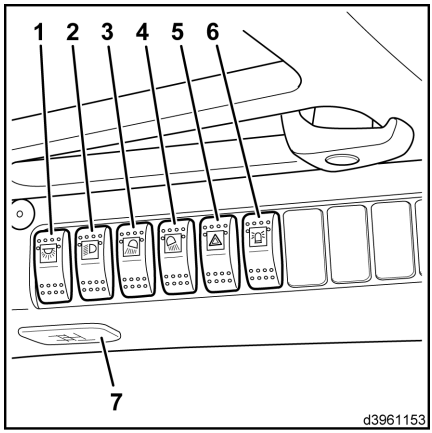
Switching on the lighting

– Move the toggle switch (2) to the centre position.

The sidelights and licence plate lamp are switched on.

– Switch the toggle switch (2) as far as it will go.

The dipped beams, sidelights and licence plate lamps are switched on.



Switching on the working spotlight

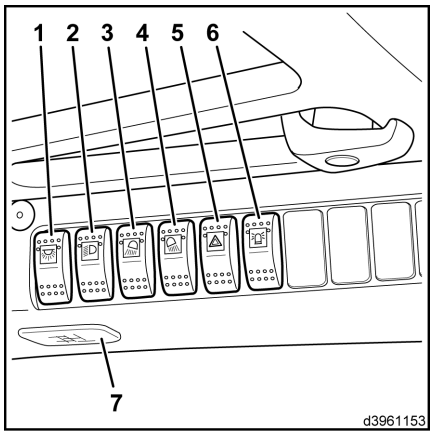
– Press toggle switch (3) or (4) (depending on the version).

Switching on the hazard warning system

– Press the toggle switch (5).

Switching on the rotating beacon/flashing beacon

Depending on the equipment, there are three different versions.



Version 1

– Press the toggle switch (6).

Set the toggle switch (6):

- Level 0: light "OFF"
- Level 1: light "ON" for reverse travel
- Level 2: light in continuous operation

Version 2

– Switch on the key switch.

The light is always in operation.

Version 3

– Switch on the key switch and press the reverse pedal.

The light is in operation for reverse travel only.

NOTE

If the truck is to be operated on public roads, the rotating beacon/flashing beacon must be switched off.

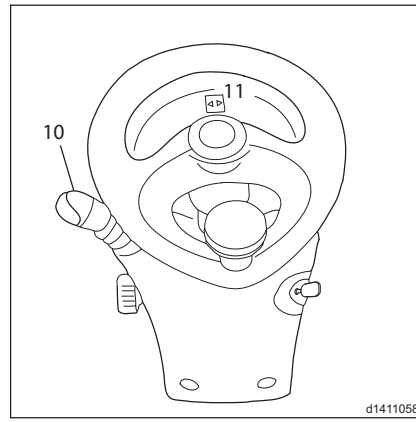
Switching on the direction indicators

– Push lever (10) up.

The direction indicators flash on the right of the truck. Indicator (11) flashes.

– Push lever (10) down.

The direction indicators flash on the left of the truck. Indicator (11) flashes.



Lighting options

NOTE

The arrangement of the individual switches on the console on the upper right-hand side of the overhead guard may vary, depending on the version. Observe the switch symbols.

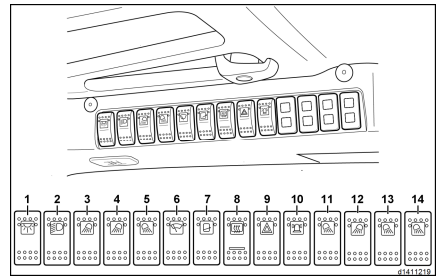
Switching on the full road lighting

– Press the toggle switch(2)

- 6100 005 Full road lighting
- 6100 010 Full road lighting (with stone guards)

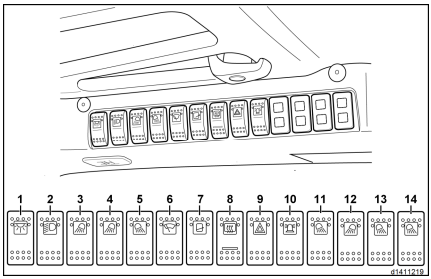
Set the toggle switch(2) :

- Level 0 : Light "OFF"
- Level 1 : open the low beam
- Level 2 : open the high beam



Open the rear lights only

– Press the toggle switch(4) ▷



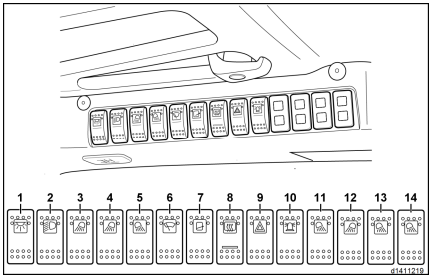
- 6100 015 Rear lights only
- 6100 020 Rear lights only (with stone guards)

Open the mast mounted front facing lamps

NOTE

According to the height of the frame, the mast lamp has different positions for the customers to choose.

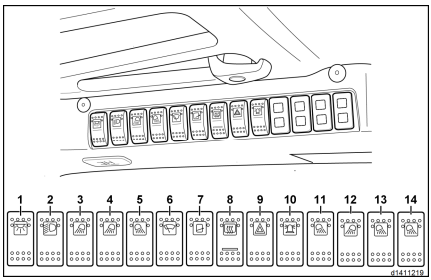
– Press the toggle switch (3) ▷



- 6103 005 Mast mounted front facing lamps
- 6103 010 Mast mounted front facing LED lamps
- 6105 005 Mast mounted front facing lamps >5m mast
- 6105 010 Mast mounted front facing LED lamps >5m mast

Open the cab mounted rear facing lamps

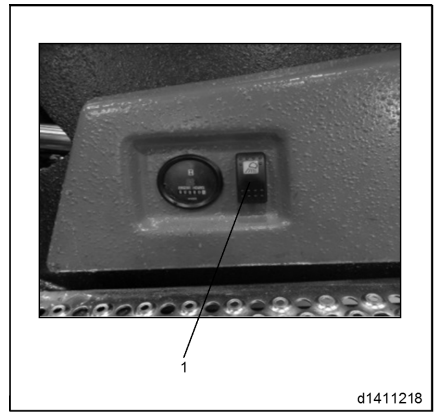
– Press the toggle switch(13) ▷



- 6104 005 Cab mounted rear facing lamps
- 6104 010 Cab mounted rear facing LED lamps

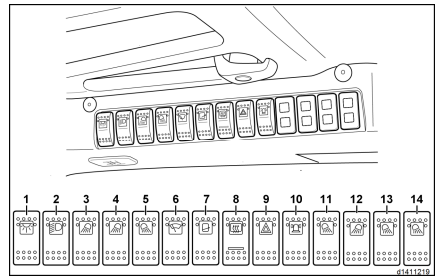
Open the step lights

– Version 1: press the toggle switch next to the pedal (1) ;



– Version 2: Press the toggle switch(12)。

- 6106 005 Step lights
- 6106 010 Step lights (LED)



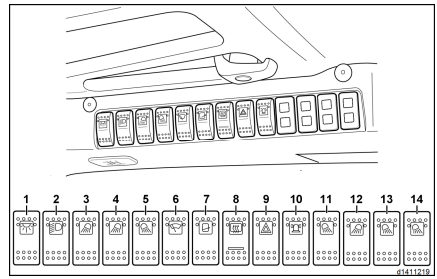
NOTE

There are two ways to open the step lights, the toggle switch next to the pedal and toggle switch on the panel. The two are parallel connections.

Open the reverse warning light

When the forklift is reversed, the reverse warning lights will automatically light up. But LED Reverse warning light need switch.

– Press the toggle switch(10)



The optional model is as follows :

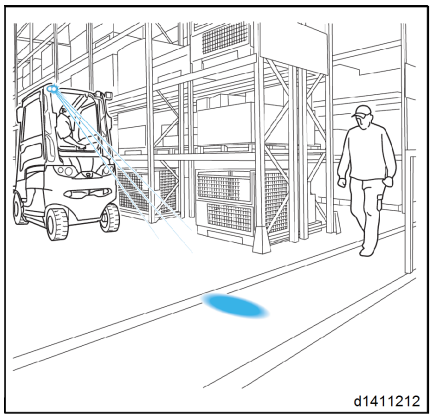
- 6104 015 Reverse warning light x 2
- 6104 020 LED Reverse warning light x 2

BlueSpot™

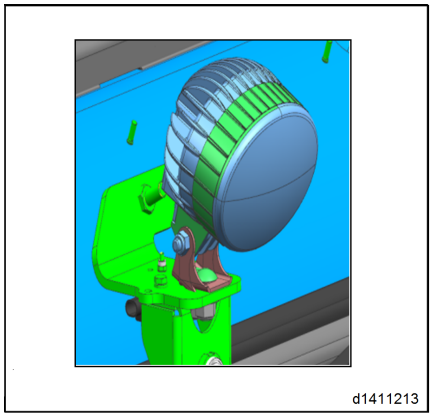
NOTE

Customers can choose Bluespot Front & Rear or Bluespot Rear according to the needs .

The BlueSpot™ comprises a visual warning unit that enables the early detection of trucks in driving areas with low visibility (such as drive lanes and high racks), as well as at blind junctions.



The BlueSpot™ is mounted above on the right-hand or left-hand support on a support mounting. It projects a high-power dot of light or arrow (LED technology) onto the ground. It is not affected by jolts and vibrations. The system allows pedestrians to notice an approaching truck at an early stage.



NOTE

The BlueSpot™ can be installed for forwards and reverse travel.

⚠ CAUTION

Do not look directly into the BlueSpot™.

Switching on the BlueSpot™

Depending on the equipment fitted, there are two different ways to activate the BlueSpot™:

Version 1 (When choosing 7118 005 Bluespot Rear)

– Switch on the key switch.

BlueSpot™ is always in operation.

Version 2 (When choosing 7118 015 Blue-spot Front & Rear)

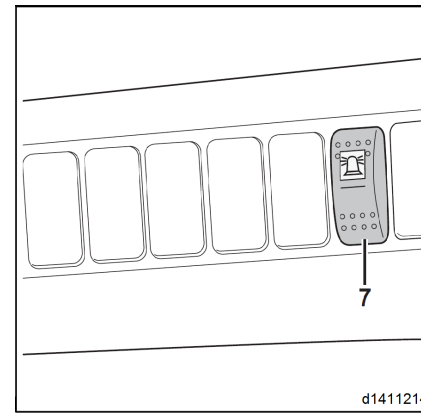
– Move the toggle switch (7)

Switch settings for the toggle switch :

- Level 0: BlueSpot™ OFF ;
- Level 1: BlueSpot™ ON .

NOTE

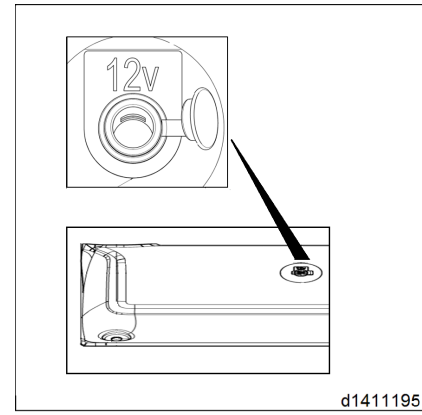
If the truck is to be operated on public roads, the BlueSpot™ must be switched off.



12v Power

The optional types are as follows :

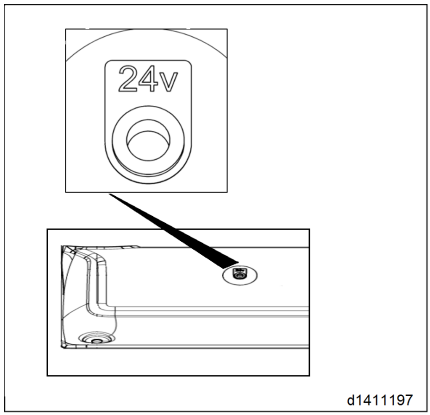
- 4412 020 1x12V - 20mm



24v Power

The optional types are as follows :

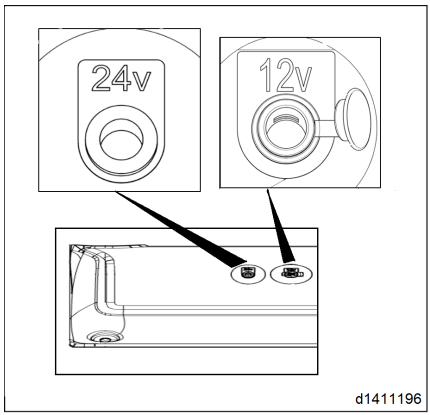
- 4412 015 1x24V - 20mm



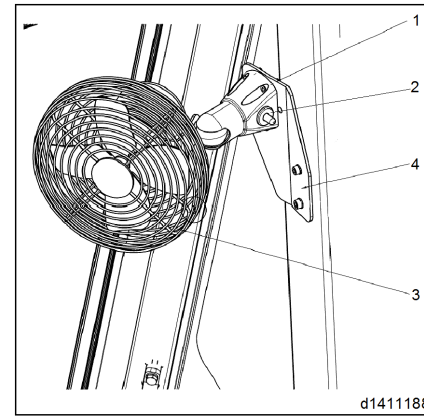
12/24v Power

The optional types are as follows :

- 4412 030 2x12/24V - 20mm



4470 005 Cab vent fan 24v ▷



1 Support fan
2 Switch
3 Fan
4 Socket head screw

Position

The fan is mounted on the left column of the cab

Switch

Set the fan switch(2)

- Level 0: "OFF" ;
- Level 1: low speed ;
- Level 2: high speed。

Mechless 1DIN truck radio with USB/AUX/Bluetooth ▷



- 4401 005 FM Radio/USB/Bluetooth
- 4401 010 FM Radio/CD/USB/Bluetooth
- 4401 015 DAB Radio/USB/Bluetooth

Robust mechless 1DIN 24 Volt truck radio with USB(2x)/Bluetooth/AUX Fixed panel with well legible LCD display Ideal for trucks due to 24 V direct connection Clear, lucid and easy to use.

Description

– Robust mechless 1DIN 24 Volt car radio with USB(2x)/Bluetooth/AUX
– Fixed panel with well legible LCD display
– Ideal for trucks due to 24 V direct connection
– Clear, lucid and easy to use
– Integrated Bluetooth hands-free system with external microphone
– A2DP Bluetooth audio playback
– MP3 playback via USB port

Optional equipment

- Front AUX input
- 2 channel amplifier with 2 x 40 W (max.)
- Rotary control for volume
- RDS
- Steering wheel control input (interfaces for many vehicles optional)
- ISO terminal
- i-Mode: Select the tracks on your i-Phone directly via the control buttons of the radio

Specifications

Fixed panel with LCD display

Front USB/AUX, rear USB

Bluetooth firmware updatable via USB

A2DP Bluetooth audio playback

MP3 playback via USB

MP3 ID3 display: track, artist, album

MP3 folder and file display

MP3 song/file/character search

4 channels x 40 W (max.)

Rotary control for volume

System EQ

PLL tuner with 18 FM and 6 AM presets

2 channels x 2 V line-out

ISO terminal, 24 Volt direct connection

RDS

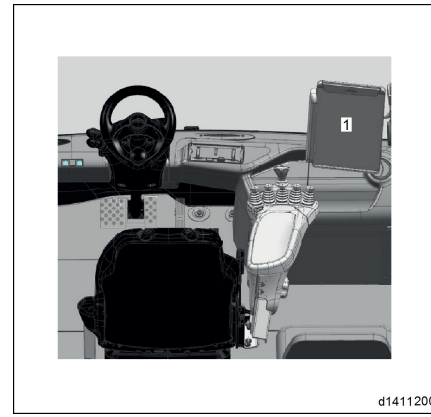
Phone mute

Last memory

Last position

Dimensions (W x H x D): 186 x 56 x 95 mm

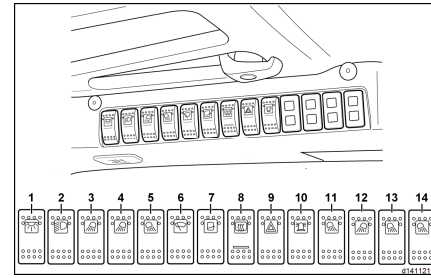
4460 005 Illuminated A4 clip-board ▷



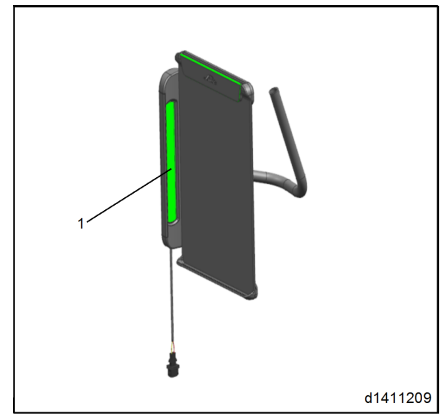
1 Illuminated A4 clipboard

Open the illuminated A4 clipboard

– Press the toggle switch(1) ; ▷

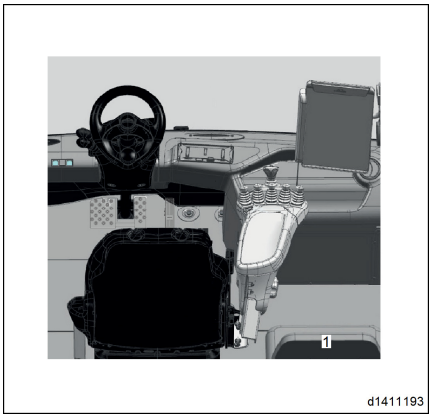


– The light on the side of illuminated A4 clip-board (1) is bright. ▷



4210 010 Buddy seat

The buddy seat(1)is located in the right rear of the cab.

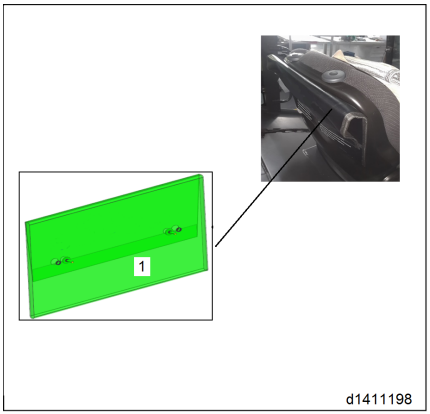


4480 005 Storage unit

Includes document holder(1), additional storage(3) and cup holder(2).

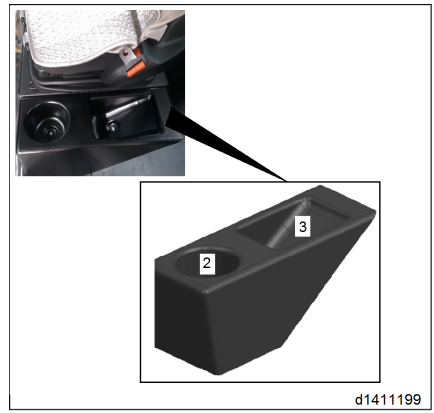
Document holder

This document holder has a lighting function.



1 Document holder

Additional storage and cup holder ▷



2 Cup holder
3 Storage

4450 005 With cup holder ▷

NOTE

When the cup holder and the fire extinguisher is all needed , The cup holder is placed on the door frame on the left of the cab.



1 With cup holder

Joystick with central lever operation



⚠ WARNING

There is a risk of becoming trapped between parts due to the moving lift mast or attachment.

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

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

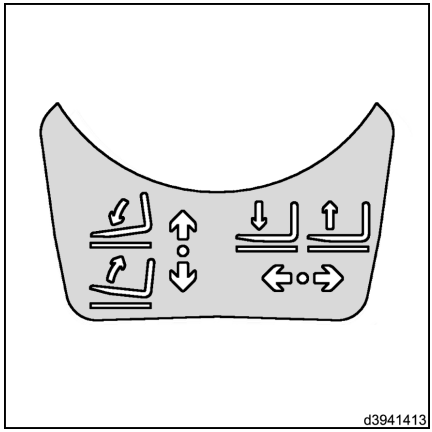
Drivers must be trained in how to operate the lifting system and attachments.

Take note of the maximum lift height.

NOTE

Extreme loading of the internal combustion engine leads to a slight delay in executing the working hydraulics due to the associated decrease in the number of revolutions. Where the engine is loaded for an extended period, the joystick must be switched to the neutral position in order to release the working hydraulics again.

Operating the lifting and tilting equipment ▷



NOTE

On the version with central lever operation, moving the joystick to an intermediate position (approx. 45°) will activate both functions at the same time (e.g. lifting and tilting).

– Take note of the switching symbols with directional arrows.

The joystick must always be operated gently, and never in a jerking motion. The deflection of the joystick is used to determine the lifting/lowering and tilting speed. Once the joystick is released, it automatically returns to its initial position.

NOTE

Joysticks only function when the engine is running and the driver is sitting in the driver's seat.

Lifting the fork carriage ▷

⚠ DANGER

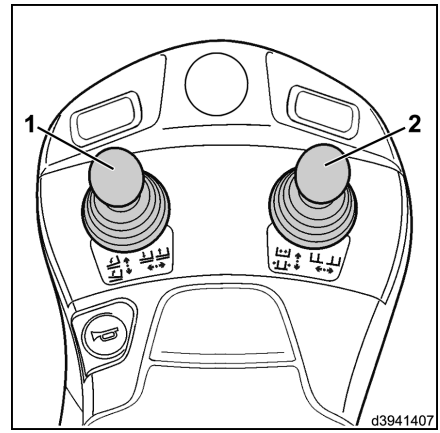
When lifting and lowering the fork arms, there is an increased risk of falling and crushing.

For this reason, do not step onto the raised fork arms.

– Push the joystick (1) to the right.

Lowering the fork carriage

– Push the joystick (1) to the left.

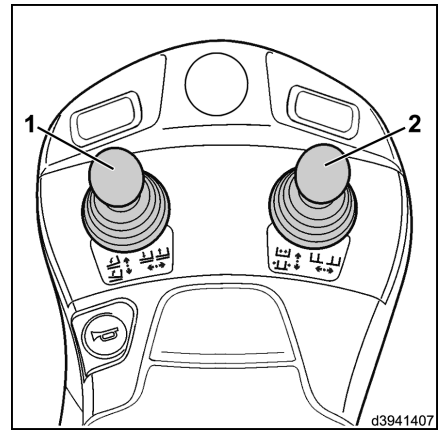


Tilting the lift mast forwards ▷

– Push the joystick (1) forwards.

Tilting the lift mast backwards

– Pull the joystick (1) backwards.



Operating attachments

Attachments can be fitted to the truck as special equipment (e.g. sideshift, fork prong positioner, clamp etc.). Observe the working pressure and operating instructions for the attachment. An additional joystick (cross lever) is fitted for operating these attachments.

⚠ CAUTION

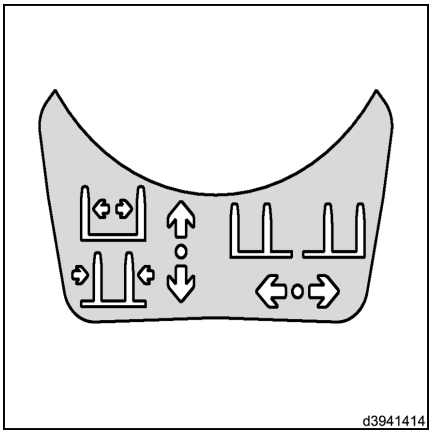
Attachments alter the load capacity and stability of the truck.

Attachments that are not supplied with the truck may only be used if the service partner has confirmed that the arrangement in terms of load capacity and stability ensures safe operation.

NOTE

The methods of operating the attachments described here are examples. The configuration of the joystick may vary depending on your truck's equipment.

– Take note of the switching symbols with directional arrows. ▷



Operating the sideshift ▷

NOTE

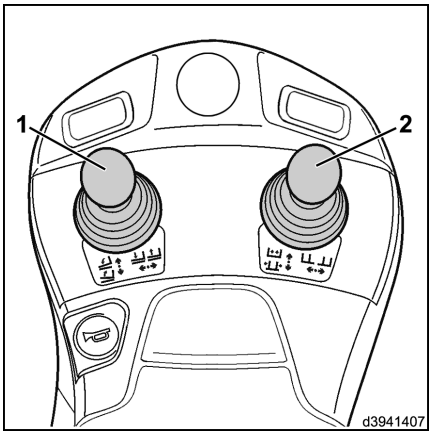
To prevent damage, do not operate the sideshift when the fork arms are on the ground.

– Push the joystick (2) to the left.

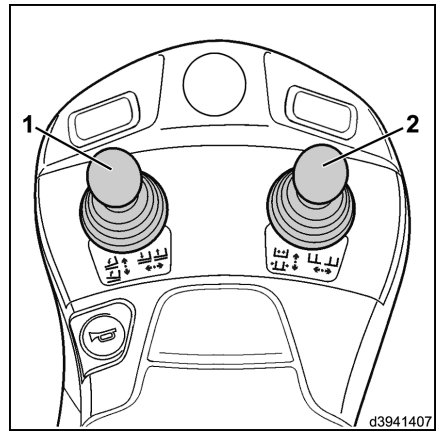
The sideshift moves to the left.

– Push the joystick (2) to the right.

The sideshift moves to the right.



Operating the fork prong positioner



NOTE

To prevent damage, do not operate the fork prong positioner with a load or when the fork arms are on the ground. Do not use the fork prong positioner as a clamp.

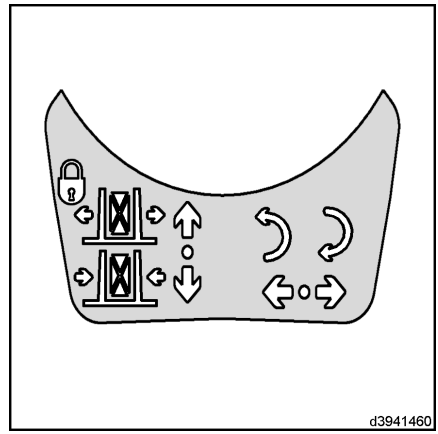
– Push the joystick (2) forwards.

The fork arms move outwards.

– Pull the joystick (2) backwards.

The fork arms move inwards.

Operating the rotator (optional equipment)



DANGER

Stability jeopardised.

Only pick up loads such that they can be turned in the load centre of gravity.

If loads are picked up off-centre, the residual load capacity may be exceeded when making a turning movement.

When turning, the actual centre of gravity of the load must therefore not be more than 100 mm (truck rated capacity below 6300 kg) or 150 mm (truck rated capacity between 6300 kg and 10,000 kg) outside the pivot point!

NOTE

Ensure that there is sufficient distance when turning to prevent damage.

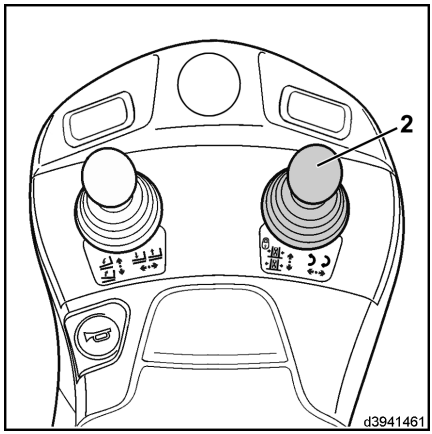
– Take note of the switching symbols with directional arrows.

– Push the joystick (2) to the left. ▷

The truck moves anti-clockwise.

– Push the joystick (2) to the right.

The truck moves clockwise.



Operating the clamp (optional equipment) ▷

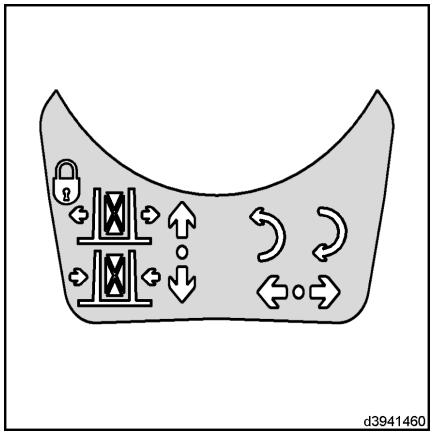
⚠ DANGER

Increased risk of accident from a falling load.

For attachments that hold a load by exerting pressure on it (e.g. a bale clamp), a lockable joystick must be used.

If your truck is not fitted with this equipment, please contact your service partner.

– Take note of the switching symbols with directional arrows.



Adjusting the driver's seat with rotating device

- 4202 005 Rotating Seat Plate – 10 deg to right
- 4202 010 Rotating Seat Plate – 17 deg to right

⚠ CAUTION

The driver's seat must not swivel while the industrial truck is in use.

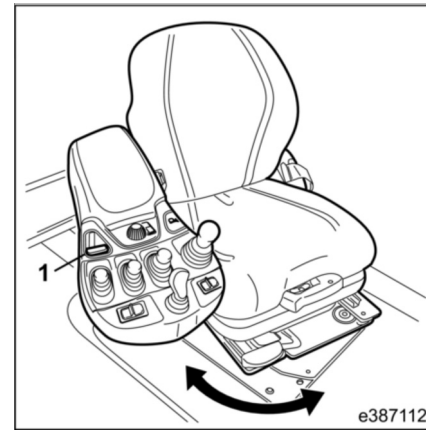
It should therefore be ensured that the rotating device is locked.

The driver's seat with rotating device offers better rear visibility during reverse travel over long distances. This allows the driver to maintain an ergonomic seating position.

When driving forwards for long distances, it is recommended that you return the seat to the straight-ahead position.

The rotating device is maintenance free.

– Pull locking lever (1) backwards. ▷



The rotating device is enabled and allows the seat to be swivelled, either by:

- 10° to the right, lockable at 0° and 10°

  or
- 17° to the right, lockable at 0° and 17°

– Turn the driver's seat to the right and allow the locking bolt to engage audibly in the interlock.

Safety equipment

7105 005 Absent Driver Isolator

Absent driver isolator will automatically brake when the forklift is stopped for 5 seconds.

NOTE

In the process of forklift upslope or downhill, this function can prevent the occurrence of slope sliding.

7105 010 Absent Driver Shutdown

Before the factory, the system is set to the driver no longer seat for 3 minutes, the engine automatically stops turning. and forklift flame-out.

7105 015 Seatbelt Sequence Interlock

– Open the key switch to the 1 Level when the driver sits on the seat.
– After hearing a buzzer behind the cab, Tie up the seat belt.
– Then open the key switch to the 2 Level and the forklift can start normally.

Fire extinguisher in the cabin ▷

NOTE

If the truck is equipped with a fire-fighting system, be sure that you are familiar with how to use it in an emergency.

NOTE

Fire extinguishers do expire. Please check the instruction manual for expiry information. Please contact an authorised service partner if there is any problem with the device.

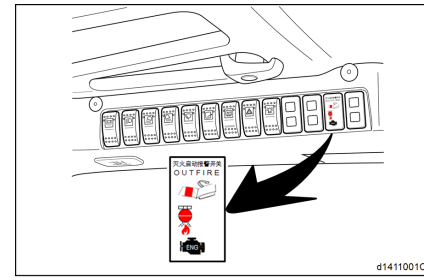


Note: In this example, the fire extinguisher weighs 2 kg.

Fire suppression system

7110 005 Automatic fire suppression system with additional manual activation switch in the cabin

Location of the switch ▷



The main function of the switch:

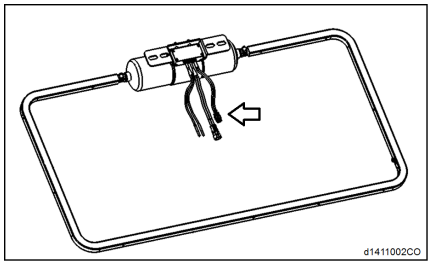
- **Power status indicator:** the green power indicator lights after normal power supply on.
- **Fire suppression system line detection function:** When the Fire suppression system line is not connected or shorted circuit to ground, the yellow indicator lights and the buzzer sounds and flash once about 5s. After the circuit back to normal, it will be recovered automatically.
- **Manual fire fighting capabilities:** Crash the button cover and hold the switch for 1-2 seconds to start the fire suppression system.
- **Fire suppression feedback function:** The red indicator lights and the buzzer sounds after spraying fire suppression device is activated.
- **Failure protection function:** Function modules isolated from each other, even if the switch occurs functional failure, the system still ensure the effectiveness of the manually start function.

7110 010 Automatic fire suppression system ▷



Maintenance

The blasting fuse of the fire suppression system should be checked whether ageing when doing the regular maintenance.



6310 005 Tire pressure monitoring system

The monitor is fixed on the right side in the cabin.



Programming of Monitor

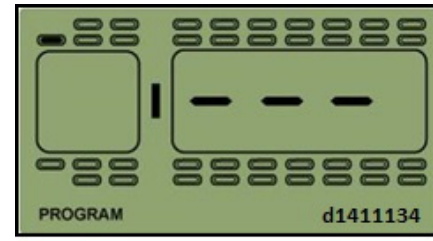
Programming of Transmitter ID

NOTE

If the user wants to program a new transmitter into the monitor, the operation should be finished in programming mode. At this time, make sure the transmitter to be programmed has not been screwed onto the valve yet. Screw on transmitters until the programming has been finished and the monitor returns to normal mode.

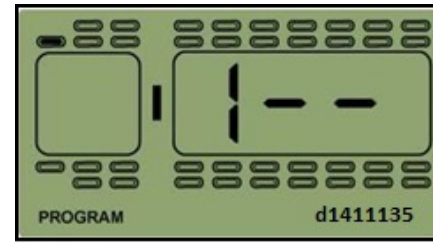
Each transmitter has 4 groups of ID, for example when program the transmitter with ID of 001 001 001 158 to front right tire position, the user only needs to input the last 3 digits “158”. Monitor will record the rest 3 groups of ID automatically. Operation steps are as following:

– After monitor is powered, the screen will display “NSP”, press P for 3 seconds to access the system programming mode, the first interface is for ID programming as shown below:



– Press any of the four arrow keys to choose the tire position which needs to be programmed with a transmitter.

– Then press S for 3 seconds to start programming and the digit flashes, then press up or down arrow key to adjust the number.



– Once finish programming of the first digit, press → to start programming the second digit which flashes. Press up or down arrow key to adjust the number. ▷

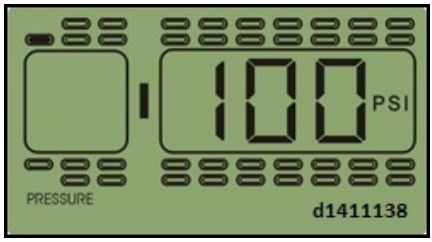


– Press → again to program the third digit which flashes. Press up or down arrow key to adjust the value. ▷
– When finish programming these 3 digits, press S for 3 seconds to save with the screen flashes twice, beep buzzes twice. Then it will automatically switch to next tire position.
– Repeat the above operations to program ID of other transmitters.

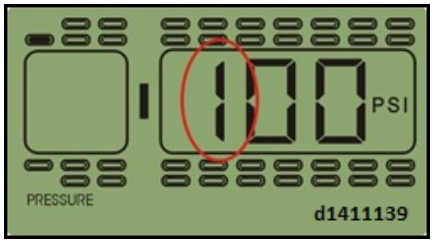


Standard Pressure Programming

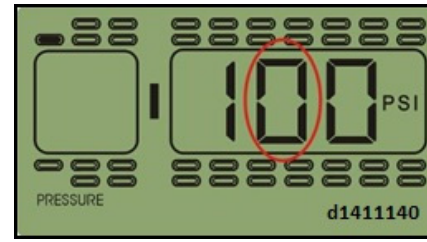
– When finish programming ID, press P to access the standard pressure programming mode.
– Then press any of the four arrow keys to choose the desired tire position. ▷



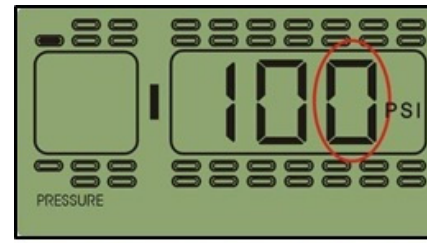
– Then press S for 3 seconds to set the first digit which flashes. Press up or down arrow key to adjust the value to 1. ▷



– Once finished programming the first number, press → to program the second digit which flashes and then press up or down arrow key to adjust the value to 0. ▷

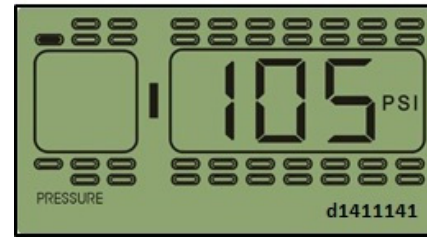


– Once finished programming the second number, press → to program the third digit which flashes and then press up or down arrow key to adjust the value to 5. Then press S for 3 seconds to save the setting. ▷



NOTE

The default standard pressure is set to 100 psi in factory.



System Time Programming

NOTE

The system clock was preset in the factory. It is the base of the alarm record, user can check the current date and time as follows:

– 1. When finish programming the standard pressure, press P to access interface for inquiry and programming of time/date, the first interface displays the year, 1 07 stands for the year 2007: ▷



– Press ↓ key to access the second interface, 211 stands for November. ▷



– Press the ↓ key to access the third interface, 312 stands for 12th day. ▷



– Press the ↓ key to access the fourth interface, 416 stands for 16 O'clock. ▷



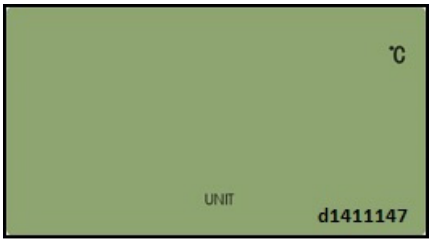
– Press the ↓ key to access the fifth interface, 533 stands for 33 mins. ▷



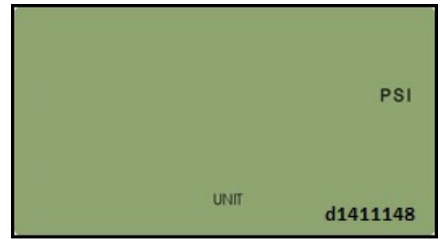
Under any interface of system time inquiry, press S for 3 seconds to start programming. For example change the year to "09", under the year interface, press S for 3 seconds, the second digit flashes, press up or down arrow key to adjust the value. Then press → key, the third number flashes, then press the up or down arrow key to adjust the value to"9". At last press S for 3 seconds to save the change with screen flashes twice and beep buzzes twice. Then it automatically switches to next interface for programming.

Programming of Temperature and Pressure Unit

– After program the system time, press P to access interface for programming temperature and pressure unit. The first interface displays the temperature unit. ▷

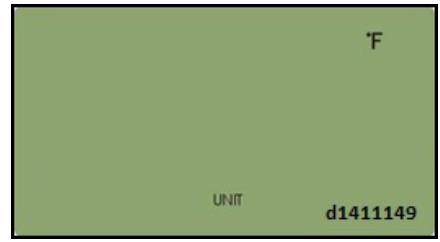


At this time, press up or down arrow key to switch to the pressure unit interface. ▷



– Under any interface displaying temperature or pressure, press S key for 3 seconds to start programming. Take change the temperature unit as an example: under the temperature unit interface, press S key for 3 seconds, the temperature unit “°C” starts flashing. Press up or down arrow key to select the needed temperature unit.

After select the desired unit, press S key for 3 seconds to save with the beep buzzes twice. Temperature unit will stop flashing. ▷



Deletion of transmitter ID

– When finish programming temperature and pressure unit, press P to access the transmitter deletion interface. Only the programmed and received transmitter will be shown and only the last 3 ID digits will be shown: ▷



– Press any of the four arrow keys to locate the tire position to be deleted.

– Press S key for 3 seconds to delete with the screen flashes twice and beep buzzes twice to confirm the deletion. Then it automatically switches to next transmitter location.

NOTE

After programming, press P key for 3 seconds to return to normal mode.

System Function

– Full-time Monitoring

TPMS ST@HD can monitor the tire pressure and temperature whether the vehicle is running or parked. Therefore to keep the driver informed of the tire state and realize full-time monitoring.

– High Pressure Alarm ▷



Function :

the system will issue the high pressure alarm when the tire pressure is 25% higher than the standard.

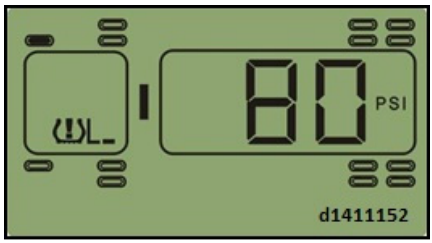
Alarm mode:

the alarm lamp flashes, high pressure warning icon, tire position icon and the audible alarm turn on together.

Treatment:

press any key to stop the audible alarm. The red alarm lamp remains on and the display reverts to the normal mode. At this time user should properly adjust the tire pressure to the normal level. The red alarm lamp goes off only when the tire pressure returns to the normal level.

– Low pressure level 1 alarm ▷



Function:

the system will issue low pressure level 1 alarm when the tire pressure is 12.5% lower than the standard.

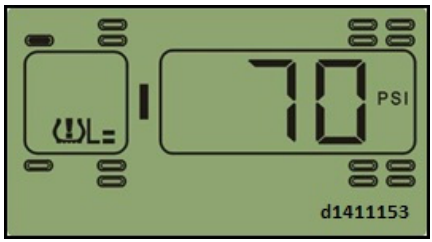
Alarm mode:

the alarm lamp flashes, low pressure level 1 alarm icon, tire position icon and the audible alarm turn on together.

Treatment:

press any key to stop the audible alarm. The red alarm lamp remains on and the display reverts to the normal mode. At this time the user should adjust the tire pressure to normal level as soon as possible. The red alarm lamp goes off only when the tire pressure returns to normal level.

– Low pressure level 2 alarm ▷



Function:

the system will issue low pressure level 2 alarm when the tire pressure is 25% lower than the standard.

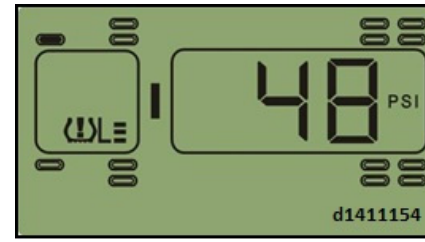
Alarm mode:

the alarm lamp flashes, low pressure level 2 alarm icon, tire position icon and the audible alarm turn on together.

Treatment:

press any key to stop the audible alarm. The red alarm lamp remains on and the display reverts to the normal mode. The user should slow down the vehicle and drive to a service shop to inflate the tire. The red alarm lamp goes off only when the tire pressure returns to normal level.

– Low pressure level 3 alarm ▷



Function:

the system will issue low pressure level 3 alarm when the tire pressure is 50% lower than the standard.

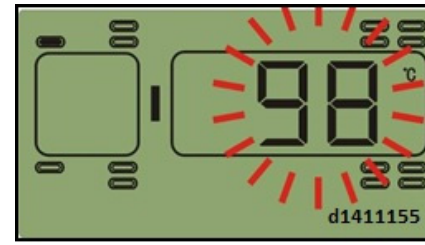
Alarm mode:

the alarm lamp flashes, low pressure level 3 alarm icon, tire position icon and the audible alarm turn on together.

Treatment:

press any key to stop the audible alarm. The red alarm lamp remains on and the display reverts to the normal mode. The user should slow down the vehicle and replace the tire with a spare tire. The red alarm lamp goes off only when the tire pressure returns to normal level.

– High Temperature Alarm ▷



Function:

When the temperature around the transmitter equals or exceeds 90℃, the system will issue the high temperature alarm.

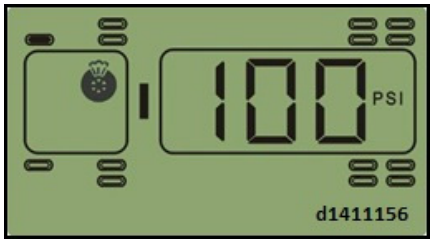
Alarm mode:

the alarm lamp and temperature value flashes, tire position icon and the audible alarm turn on together.

Treatment:

press any key to stop the audible alarm. The red alarm lamp remains on and the display reverts to the normal mode. The driver should slow down and properly cool down the tire. The red alarm lamp goes off automatically when the temperature returns to normal level.

– Quick Leak Alarm ▷



Function:

the system will issue a quick leak alarm when the pressure drops more than 2.8 psi within 12 seconds.

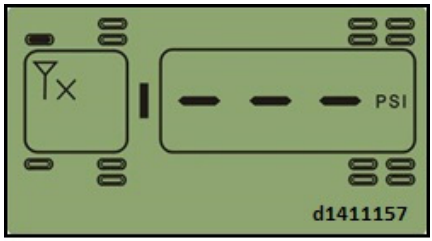
Alarm mode:

the alarm lamp flashes and the audible alarm turns on, the tire position icon flashes.

Treatment:

press any key to stop the audible alarm and the system reverts to normal mode. Then slow down and check the correspondent tire.

– Transmitter Trouble Alarm ▷



Function:

If one transmitter fails to work, or the monitor cannot receive the data because of the RF interference for 20 minutes, the system will issue a transmitter trouble alarm.

Alarm mode:

the audible alarm turns on, the red alarm lamp flashes, and transmitter trouble alarm icon appears.

Treatment:

press any key to stop the audible alarm. Then the system reverts to the normal mode.

NOTE

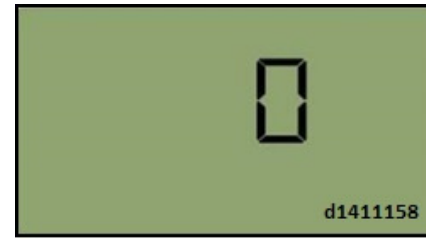
The red alarm lamp goes off automatically when the communication between the transmitter and monitor returns to normal state.

Auxiliary Functions in Normal Mode

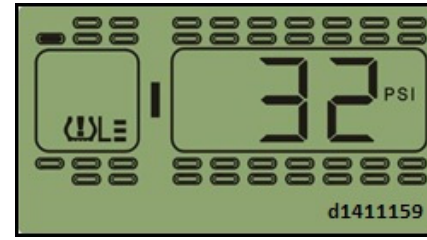
Alarm Record Inquiry

– Under normal mode or pressure inquiry interface, press P and S at the same time for 3 seconds to access the alarm record inquiry interface. The screen with “0” is the most recent alarm record.
– Under alarm record inquiry interface, Press → key to check through the record. If there is no operation within 3 seconds, it will automatically display the record data (pressure, temperature and time) in turn, each data displays 3 seconds.

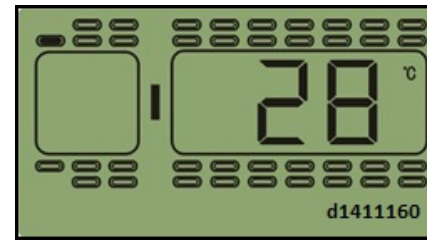
▷



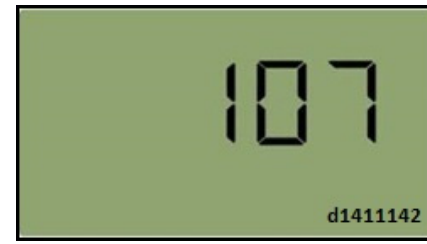
Pressure ▷



Temperature ▷



Time (year) ▷



Optional equipment

Time (month) ▷



Time (date) ▷



Time (hour) ▷



Time (minute) ▷



Then it will display the next alarm record in the same way as above.

– Press P and S at the same time to exit.

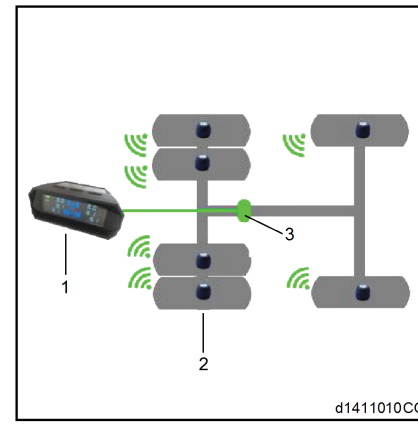
Tyre pressure detection system (new) ▷



1 External sensor
2 Host
3 Hub
4 Repeater

Product installation status ▷

- The sensor is external and can be locked onto the valve, resolving the issue of being unable to install a built-in sensor on the tyre valve.
- The sensor uses a separate display, making installation easy. The relay module can be placed directly inside the vehicle.
- The entire package in easy to install and maintain.
- The system can warn when the tyre pressure is too low or too high, when the temperature of the tyres is too high and when there is a slow air leak.



1 Display
2 Sensor
3 Relay module

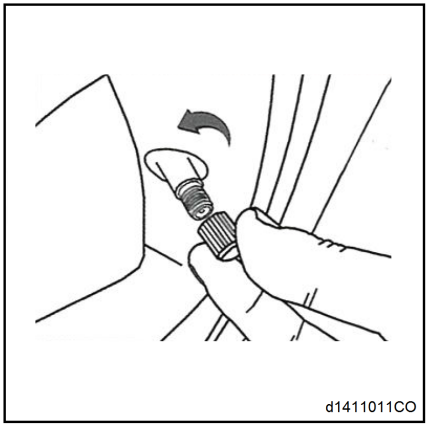
Technical data

Display	Frequency	433.9 MHz
	Operating voltage	5 V
	Operating temperature	-20–70°C
Sensor	Frequency	433.9 MHz
	Operating voltage	2.2–3.3 V
	Operating temperature	-40-125 °C

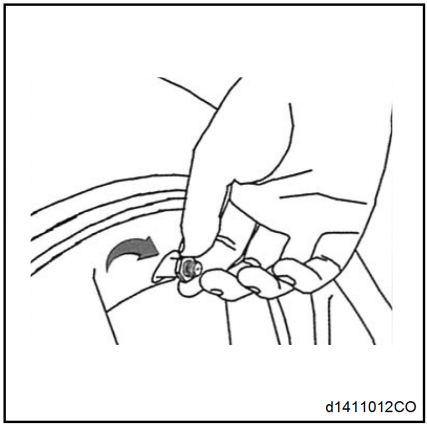
	Pressure range	0–12 bar
	Pressure accuracy	±0.1 bar
	Temperature accuracy	± 1°C

Sensor installation

– Unscrew the valve dust cap. ▷



– Screw on the anti-tamper hexagon nut. ▷



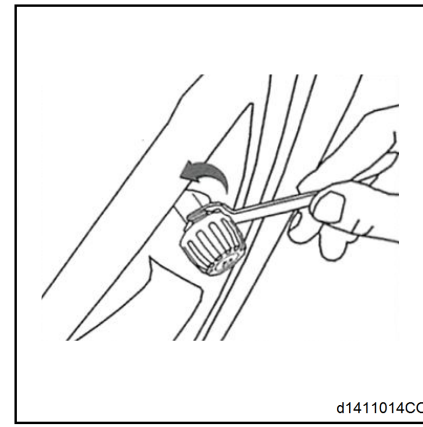
– Screw on the sensor. ▷



– Close the hexagon nut by turning in the opposite direction. ▷

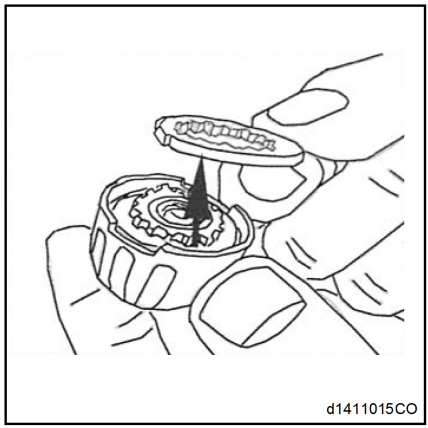
NOTE

After installing, spray with soapy water to check for leaks.

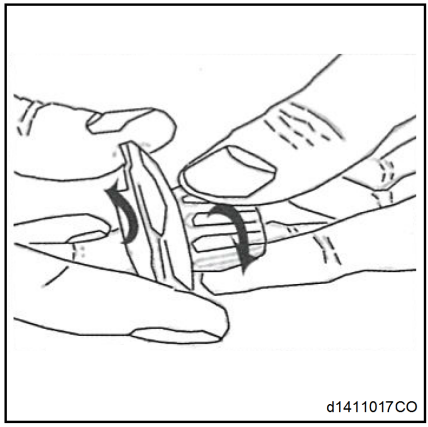


Replacing the battery

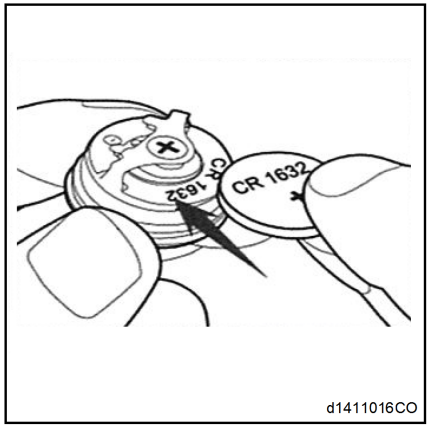
– Remove the anti-tamper shim. ▷



– Use a cover-opening wrench to open the external cover. ▷

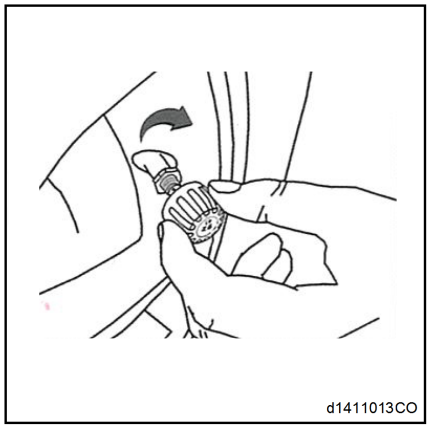


– Replace with a new button cell battery. ▷



d1411016CO

– Re-install the sensor. ▷


d1411013CO

Product introduction

– The host is connected to the on-board ACC power supply.
– Press and hold “◂”+“▸” to turn on and off.
– When turned on, the system displays data from the previous use. The data updates as soon as the tyres start to turn.
– Tyre pressure increases as the temperature of the tyre rises when moving.
– The system matches automatically and can be used direct from the factory.
– Press “◂” or “▸” to display tyre pressure or temperature.

Factory settings

Pressure unit	Bar
Tyre pressure upper limit	11.0 bar
Tyre pressure lower limit	9.0 bar
High temperature warning value	75℃

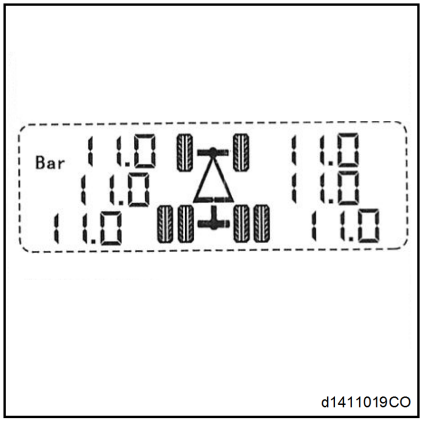
Entering and exiting setup

– In standby mode, press and hold “SET” for 3 seconds. The system will beep twice and then enter setup mode.
– In setup mode, press and hold “SET” for 3 seconds. The system will beep four times and then exit setup mode.
– If the system is not operated for 60 seconds in setup or matching mode, the system will beep four times and then exit setup mode.

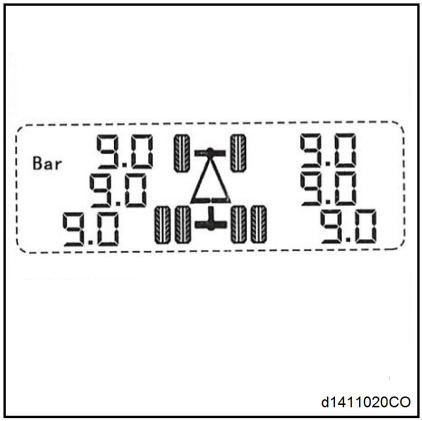
Setup options

Press and hold “SET” for 3 seconds to enter setup mode, then press “SET” again to select from the following four options:

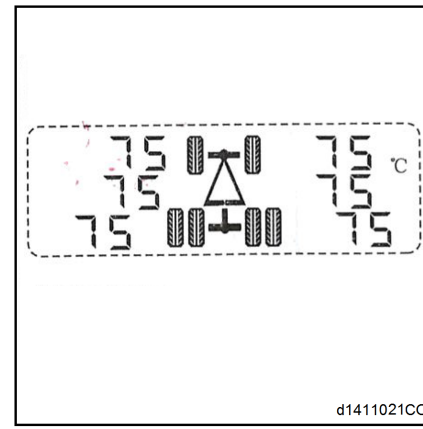
– Upper pressure limit: press and hold “SET” to enter setup mode as shown in the figure: when “11.0” flashes, press “◂” or “▸” to select the pressure value. ▷



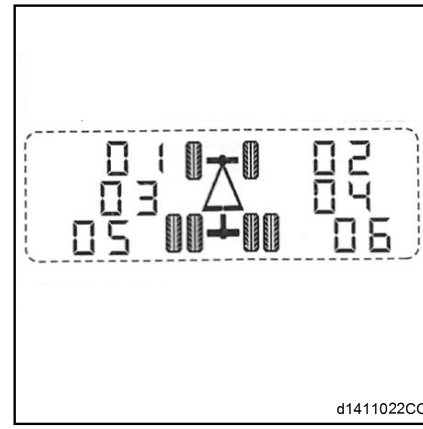
– Lower pressure limit: after entering setup mode, press “SET” again as shown in the figure: when “9.0” flashes, press “◂” or “▸” to select the pressure value. ▷



– Upper temperature limit: after entering set-up mode, press “SET” again twice, as shown in the figure: when the temperature “75” flashes, press “◂” or “▸” to select the temperature value. ▷



– Switching tyres (use with caution): in stand-by mode, press “SET” 5 times in succession. After hearing three beeps or the production date, as shown in the figure: the tyre flashes but the number does not flash, showing selection options for tyres 1-6. Press “◂” or “▸” to select the tyre number, then press “SET” once. The tyre and number will flash together and ID number setup will be shown. Press “◂” or “▸” to select the ID number, then press “SET” once. ▷



⚠ WARNING

Do not use this product while driving.

Exit the vehicle and check the tyres as soon as possible when the system issues a warning.

Tyre pressure and temperature will increase when driving.

Do not rely solely on this product for tyre safety. You should carry out regular tyre checks.

7330 015 Reversing warning system

The reversing warning system is consist of buzzer, controller, sensors.

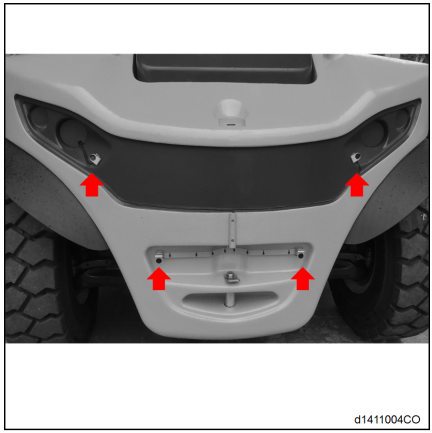
Segmented regions are close to the obstacle distance:

- 150CM security zone
- 120CM security zone
- 100CM warning area
- 80CM warning area
- 60CM warning area
- 30CM danger zone



d1411003CO

7160 990 The sensors are installed on the counterweight of the truck.

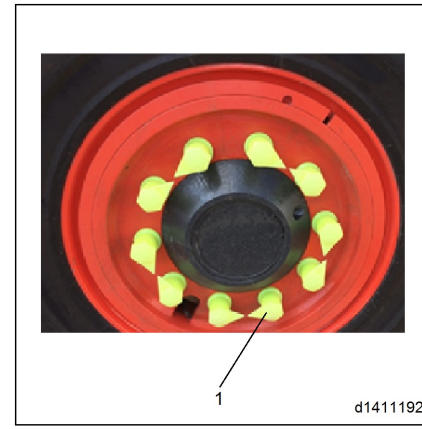

d1411004CO

6433 010 The buzzer is installed at the rear of the driver cabin. ▷



1390 010 Plastic wheel stud covers with movement indicator ▷

Plastic wheel stud covers with movement indicator(1) can prevent bolts from rusting



Operating optional attachments

Attachments can be installed as optional equipment. Observe the working pressure and operating instructions for the attachments.

NOTE

Affix a label indicating the truck load capacity with attachment, and a symbol label of the respective attachment on the windscreen to the right of the driver for every attachment. Symbols on the label can vary, depending on the controlled function.

⚠ CAUTION

Danger of damage to equipment.

Attachments not supplied with the truck may only be employed if an authorised dealer ascertains that safe operation is assured in respect of load capacity and stability.

NOTE

If the installation of an attachment changes the normal sequence of operation as described in this manual, follow the instructions supplied by truckmaker or the manufacturer of the attachment. If the customer desires the attachment operation with the central control levers, a label showing the movements possible with the control levers must be affixed on the screen to the right of the driver.

Coil boom

Integrally mast mounted

- 3670 005 Coil Boom – 1000mm long (177)
- 3670 010 Coil Boom – 1000mm long (178)
- 3670 015 Coil Boom – 1000mm long (179)

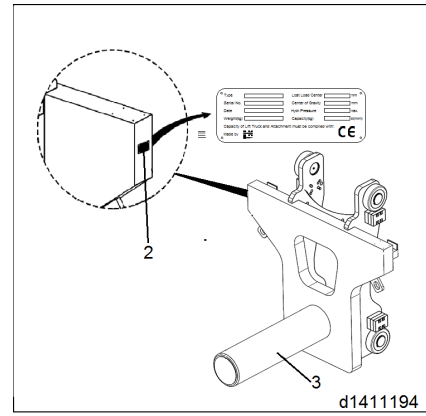
NOTE

These operating instructions or excerpts thereof may only be copied, translated or transmitted to third parties after prior written approval by the manufacturer.

NOTE

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

– Observe labels (2) on coil boom (3) for load centre and load lift height information. ▷



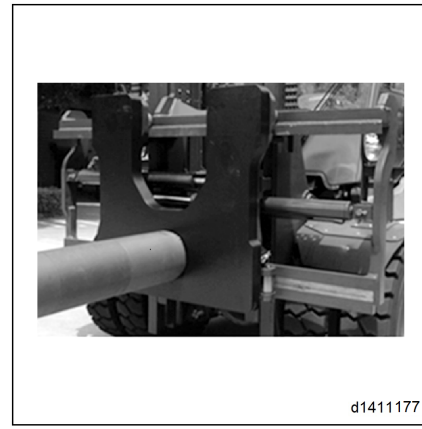
– This is another flat face carrier mounted kind of coil boom. ▷

- 3670 105 FF Coil boom - 1000 mm long(177)
- 3670 110 FF Coil boom - 1000 mm long(178)
- 3670 115 FF Coil boom - 1000 mm long(179)

⚠ CAUTION

Adjust all operating functions accordingly when maximum weight is being handled.

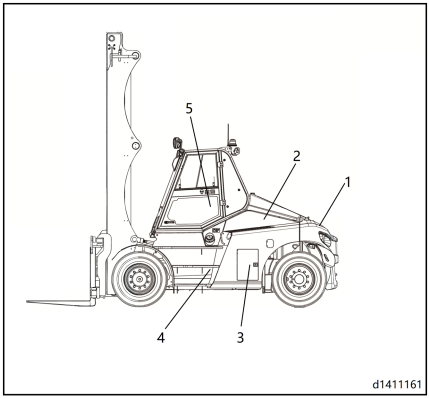
Danger of damage to equipment and personnel.



Cold Climate Options

NOTE

All mains powered heating devices are 220v rated, and the truck will come supplied with a suitable 110/220v converter when required.

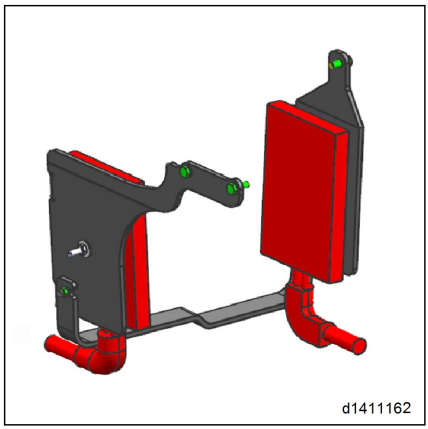


1 Engine Pre-heater
2 Hydraulic Oil Pre-heater
3 Battery Heaters
4 Diesel Fuel Heater
5 Cabin Pre-heater

Engine Pre-heater

220v, 150w (x2) Heater Pad.

Mounted on brackets and contacting the oil pan.



Hydraulic Oil Pre-heater

- 6407 010 Hydraulic oil heater - 500 W
- 6407 020 Hydraulic oil heater - 1000 W

220v

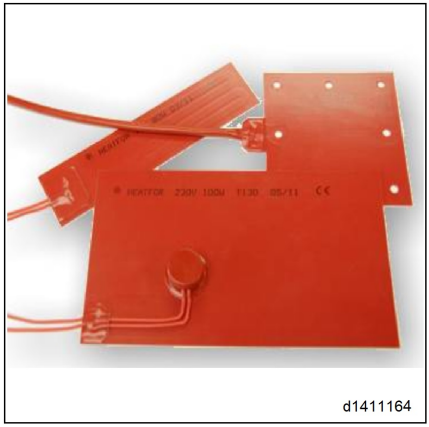
Depending on tank size


d1411163

6403 010 Battery Heaters

220v, 190w (x4)

Self-adhesive Silicone Mats Size - 300x100x1.5mm.


d1411164

6404 010 Diesel Fuel Pre-filter

24v, 350w.

Heater cartridge with internal temperature controlled switch.



Cabin Pre-heater

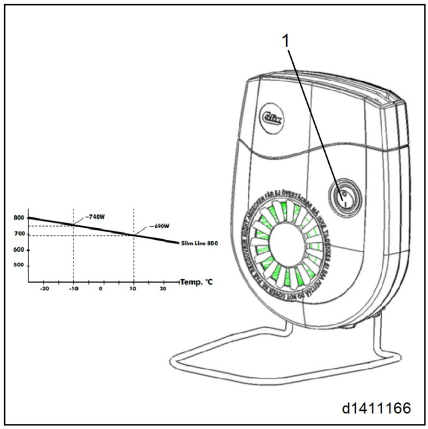
NOTE

There are two options to preheat the cab.

The first selection: Cab Pre-heater.

- 4409 010 Cab Pre-heater 220 V
- 4409 015 Cab Pre-heater 110 V

– Press the switch (1)



The second selection: 4409 005 Webasto Water Heater .

– Use Oval timer to set heating time, please see below for Oval timer operation. ▷



Operation:

– Operation of the timer is designed so that the symbols flash rapidly in the setting mode. If no button is pressed within 5 seconds, the displayed time will be saved. The display changes at high speed when the (1) and(2) buttons are pressed for more than 2 seconds.

– Whenever the power supply to the timer is disconnected, all previously programmed settings will be lost.

Switching On:

– Manually: by pressing the "Manual Operation" (3)button (continuous heating mode). The heating time and the symbol for heating operation are displayed. The heating time display disappears after 10 seconds.

– Automatically: upon reaching the preset starting time for heating. The program number and the symbol for heating are displayed.

Switching Off:

– Manually: by pressing the "Manual Operation" (3)button.

– Automatically: via the programmed end time. The display field goes out when the heating time expires.

Setting the Time

– This function is not available when heating mode is active! Press and hold the (4)button. Press the "Forward" (2)or "Reverse"(1) button as well. The time of the day is displayed and the clock symbol flashes.

– Set the time via the "Forward"(2) or "Reverse"(1) buttons. The set time is saved when the display goes out or by pressing the button.

Viewing the Time:

– Press the "Forward"(2) or "Reverse"(1) button.

Program Start of Heating

– Press the (4)button. Press the "Forward"(2) or "Reverse"(1) buttons within 10 seconds until the required time for starting heating operation is displayed.

– If a different program number is required, the(4) button must be pressed within 10 seconds.

Default start settings:

Time 1: 06:00 hours or 6:00 am;

Time 2: 16:00 hours or 4:00 pm;

Time 3: 22:00 hours or 10:00 pm

⚠ CAUTION

The default settings are overwritten when new values are entered. The preset times are saved until changed. The default settings are restored when the timer is disconnected from the on-board power supply.

Deactivate Preset Time:

– Briefly press the (4)button.

Select Preset Time:

– Press the button (4)within 10 seconds until the program number with the required preset time is displayed. The active mode (heating) and the program number flash.

Set Heating Duration Time:

– Press and hold the (4)button. Press the "Forward"(2) or "Reverse"(1) button as well. Release both buttons. The time and clock symbol are displayed.

– Press and hold the (4)button again. Press the "Forward"(2) or "Reverse"(1) button as well. Release both buttons. The preset time is displayed and the heating symbol and ventilation symbol flash.

– Set the heating time via the "Forward"(2) or "Reverse"(1) buttons. The set heating time is saved when the display goes out or by pressing the (4)button.

⚠ CAUTION

The default settings are restored when the timer is disconnected from the on-board power supply. In this case, the timer will revert to the default heating duration time setting of 30 minutes.

Set Remaining Time:

– The active remaining time can be changed between 10 minutes and 60 minutes via the "Forward"(2) or "Reverse"(1) buttons when heating mode is active.

Changing the Operating Mode

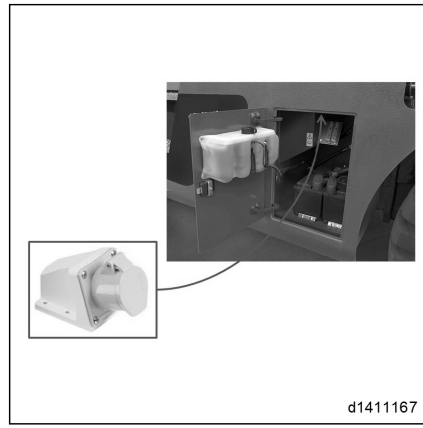
⚠ CAUTION

Ventilation mode is not available on the BlueHeat heater. The ventilation mode is only available with certain heater versions. This information is provided in the event mode of operation is inadvertently changed. Press the (4)button. Press the(4) button again and hold it. The last mode (heating or ventilation) is displayed. Press the "Forward"(2) or "Reverse"(1) button as well to change back and forth between heating or ventilation mode.

Mains Power Connection ▷

The optional model is as follows :

- 6400 010 Ext. Power supply - 110V
- 6400 020 Ext. Power supply - 240V



⚠ CAUTION

110/230v 3 pin female socket mounted in the battery box for easy connection to mains power.

⚠ CAUTION

If required, a 110/230v converter secured and hidden above battery box, and remains with truck.

⚠ CAUTION

All trucks are fitted with “Safety Cut-out Relay” to stop the engine being started when pre-heaters are still connected to the mains electricity.

Cold climate package instruction

– This should be set before installed. ▷

Electrify the temperature control switch, press "set" button for 3-5 seconds to enter setting page, adjust the number to 35°C by triangular button, then press "set" button to finish setting.

Position : In battery box.



d1411168

Electrify preheater socket. ▷

Position : In battery box.



d1411169

Circuit breaker should be switched on in the first time. ▷

Position : Under radiator

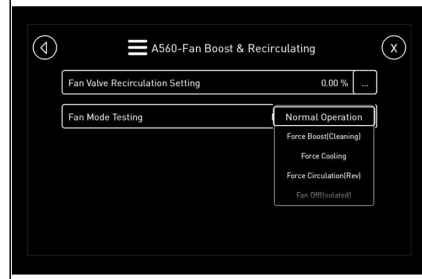
The circuit breaker can cut off and connect the load circuit, and cut off the fault circuit, ensure the safe operation. In case of overloading or abnormal operation of electrical appliances, if a fault occurs, the circuit breaker will automatically turn off the switch to play the role of protecting electrical appliances and wires.



d1411170

Fan functions in cleaning mode ▷

- The fan is set to `Forcing Cooling` by default.
- If the fan is set to `Normal Operation` mode and the forklift truck is cold started, the cooling fan will be rotating in the reverse direction, achieving heat dissipation by blowing air. This can be used to clean the radiator.
- When the temperature reaches the value required by the forced heat dissipation, the cooling fan will then rotate in the normal direction, achieving heat dissipation by suctioning air. This can be used for the normal heat dissipation.



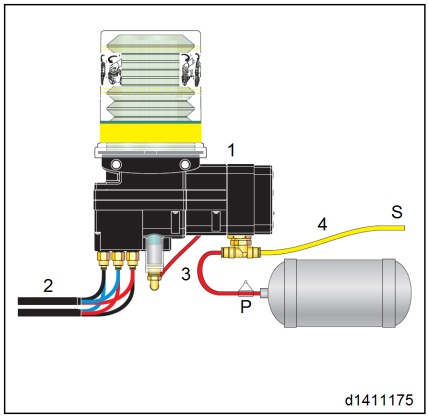
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7306 005 Central lubrication system – steer/mast/tilt

Main components

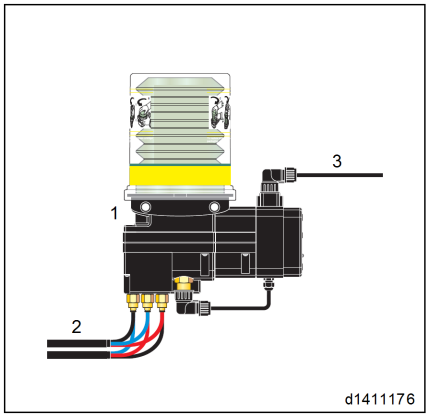
The central lubrication system has two versions: a pneumatic plunger pump and an electrical gear pump.

A pneumatic plunger pump system has the following components. ▷



1 Pump unit.
2 Grease lines from the metering units to the individual grease points.
3 Air lines to the pump.
4 Brake-counter, if installed.
5 Installation bracket for the pump (not shown).

An electrical gear pump system has the following components ▷



1 Pump unit.
2 Grease lines from the metering units to the individual grease points.
3 Electrical cable to the pump.
4 Installation bracket for the pump (not shown).

The CompAlube pump unit

The pump unit is the heart of the CompAlube greasing system. It is a very compact unit in which the most important components are integrated. The pump unit requires virtually no maintenance and is easy to install and put into service.

Maintenance

Introduction

The maintenance of the Groeneveld CompAlube greasing system can be combined with the normal maintenance on the vehicle or the machine.

⚠ CAUTION

The automatic greasing system significantly reduces the time and effort spent on manual greasing. However, do not forget that universal joints, for instance, must still be greased by hand.

Periodic check

- Check the grease-pressure indicator (must be green) or the control lamp (must not be lit).
- Check the grease level in the grease cartridge (replace the cartridge time or refill the cartridge through the filling connection).
- Check the pump unit for damage and leakage.
- Check the grease lines for damage and leakage.
- Check the condition of the grease points on the vehicle. There must be sufficient fresh grease present.
- Perform a test cycle to check the system operation. Note that every time you perform a test cycle a small amount of grease is supplied to the grease points (do not perform a test cycle too often).

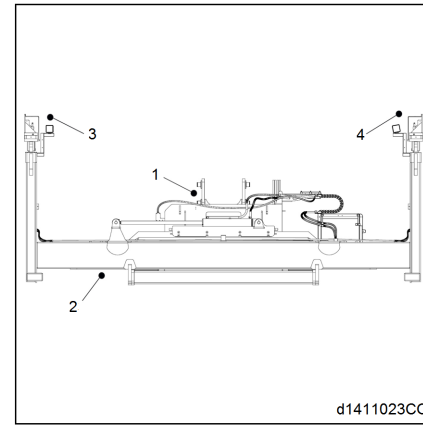
⚠ WARNING

If you use a high-pressure air or water gun to clean the vehicle, do not spray directly onto the greasing system pump unit. Water oo dirt might enter the pump unit through the vent openings.

User instruction

The following is a description of the spreader and how it's intended to be operated. This instruction should help the driver to quickly obtain maximum productivity from the truck and spreader.

- The models 178SP1000 empty container handlers are designed for the safe handling of empty containers by vertical twist locks, which are entered into the top pockets of the containers corner castings.
- The spreader engages the container from the top by inserting the twist locks into the top pockets of the corner castings.
- The spreaders have a capacity of 8 tons and can handle empty 20' ISO containers.
- Various heights of container (8ft,8ft6",9ft, 9ft6") can be handled by these spreaders.
- The floating heads can slide up and down giving the spreader mechanical pile slope, which enables the angle of the spreader to be moved up and down 1.5°in the 20ft position. The pile slope feature gives the driver

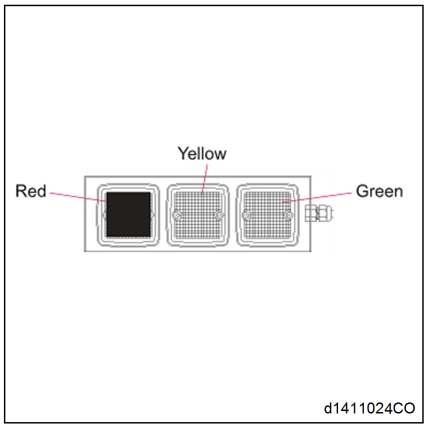


1 Transmission frame
2 main beam
3 The swing arm lock button
4 The swing arm lock button

the possibility of entering the highest twist lock first and then lowering the spreader until the twist lock at the other end of the spreader enters the corner casting at the opposite end of the container.

Indicator lights

There are three indicator lights on the spreader. ▷



Green - ”LOCKED” (Both twist locks are completly engaged and locked into the corner castings of the container.) It is safe to lift the container.

Yellow - ”SEATED” (The twist locks are both located correctly in the corner castings of the container and the spreader has been lowered so that it rests, unsupported on the container) when the yellow light has switched on it is then possible to activate the twist locks to the Locked position. As long as the yellow light is NOT switched on the twist lock activation circuit is inactive.

Red - ”NOT LOCKED” (Both twist locks have turned to the Not Locked position and the spreader can be safely lifted and removed from the container.)

Starting work with the spreader

Each work shift should be started by making a visual check of the unit (this must be part of the daily routine.) Possible damage will in this way be discovered at an early stage and enable repairs to be carried out at much lower cost.

⚠ WARNING

Never use the unit unless all safety devices function correctly.

– Check the operation of the twist locks and of the ”LOCKED” and ”NOT LOCKED”.

– Activate the twist locks to the ”NOT LOCKED” position.

Lifting a container

– With the twist locks in the Not Locked position drive the machine up to a stack of containers and raise the spreader until it is possible to enter one of the twist locks into the top aperture of one of the containers upper corner castings. Raise or lower the other end of the spreader until the opposite twistlock is lined up with the corner.

– Casting at the opposite end of the container. The spreader should now be lowered un- til the spreader rests unsupported on the container with the twist locks in the corner castings. In this position the yellow indicator light on the rear of the spreader should switch on. This situation is termed as the spreader being Seated and the yellow light tells the driver that the spreader is now ready to have the twist locks activated so that they lock onto the container.

– Press the lock button. The twist locks will turn and the indicator light will show that they are in the Locked mode. The white light will switch on indicating that it is safe to lift the container.

- If neither the Green (Locked light) nor the Red (Not locked) light switches on, then the lift interrupt function will be activated which will stop the truck from lifting.
- The spreader PCB (printed circuit board) is equipped with a unit that will cause the indicator lights to flash in cases where a sensor is not correctly adjusted or if a sensor is faulty.
- If a seated sensor is either incorrectly adjusted or if one of the seated sensors if faulty, the seated light only will flash and warn the driver that something is wrong.
- If either the Locked or the Not Locked sensors are badly adjusted or faulty then both the Locked and Not Locked lights will flash simultaneously.

NOTE

In cases where the indicator lights flash the systems should be investigated and corrected immediately. Never use a spreader with faulty safety systems.

Detach a container

When detaching a container, find a suitable level site on which to unload the contai- ner. (The trucks mast should be as near to vertical as possible during the depositing of a container) Lower the spreader slowly until it rests unsupported on the container and the Seated light illuminates and then activate the twist locks to the Not Locked position. The twist locks will turn and the red indicator light for Not Locked will illuminate. It is now possible to lift the twist locks free of the corner castings and reverse the machine away from the container.

The spreader is in the Not Locked mode and is ready for picking up the next container.

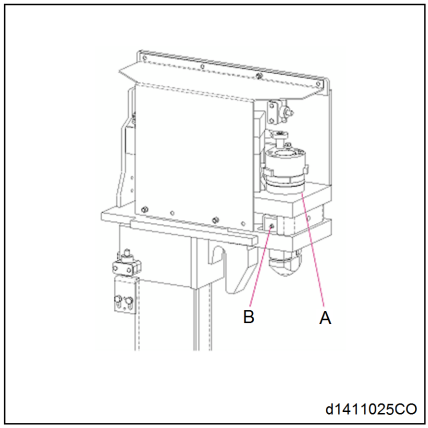
Maintenance instructions

Multipurpose grease (EP2)

Position 1

Twistlock assemblies

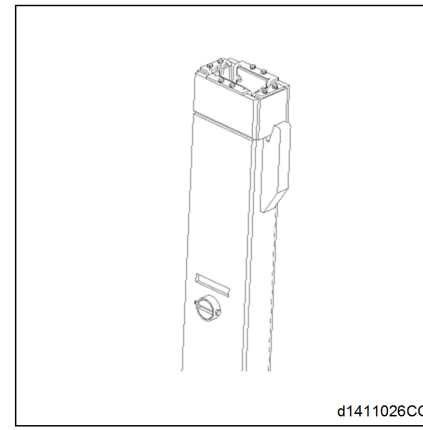
- No of grease points 4 per spreader.
- Interval-every 500 hours.
- 1 grease nipple per sleeve (see arrow “A”).
- 1 grease nipple per twistlock (see arrow “B”).
- Check for wear and possible damage of the twistlook and twistlook sleeve replace if in doubt.



Position 2

End beam slider pads

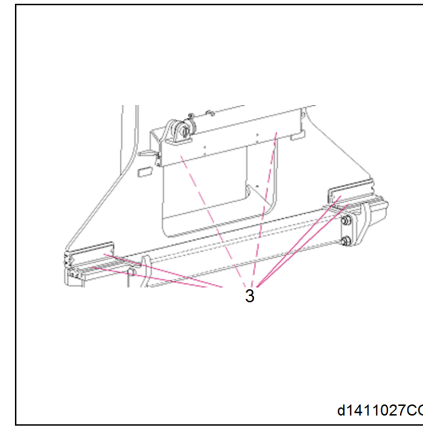
- Check for wear and possible damage of the twistlook and twistlook sleeve replace if in doubt.
- Interval-every 500 HOURS
- No greasing necessary



Position 3

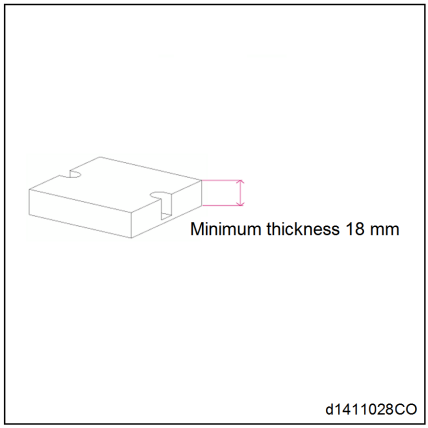
Upper side shift slider pads and lower side shift slider pads

- Every 500 hours or check for wear of the nylon wear pads and replace before metal to metal contact between the carriage and the spreader frame occurs.
- No greasing necessary.

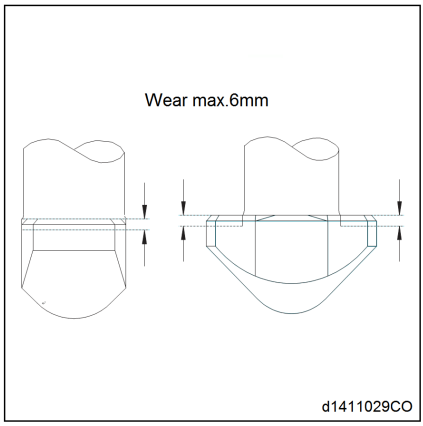


General maintenance instructions

– The nylon wear pads should be inspected for wear at the same time as their tracks are lubricated. The pads should be replaced when their thickness is reduced to minimum 18 mm. ▷



– Twist locks are wearing parts and need inspecting on a regular basis. Lubrication of the twist locks is recommended at monthly intervals and it is also recommended that they are inspected for wear and damage at the same time. ▷



– Should be replaced if this dim. is less than 25mm, The drawing shows where the heads of the twist locks wear. When the worn part exceeds the area indicated by cross- hatching the twist locks should be replaced.

Generally it is recommended that twist locks be replaced after a max. use of 5000 working hours or 80 000 TWL-cycles.

– The extension cylinder support has wear pads under it. These should also be inspected on a regular basis and replaced when their thickness is reduced to minimum 18 mm.

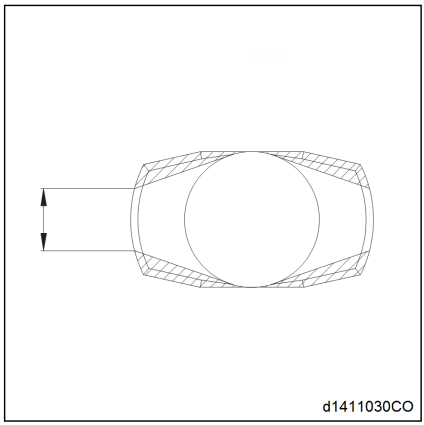
– Maintenance of the stop cylinders if fitted, consists of checking all mounting bolts for tightness and inspection for leakage from the cylinder.

– The side shift wear pads should be inspected for wear at the same time as lubrication is carried out. The wear pads should be replaced when their thickness is reduced to minimum 18 mm.

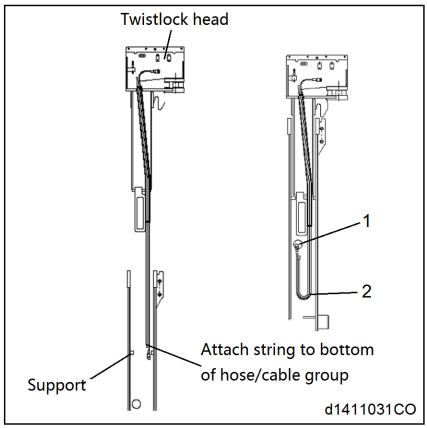
– Other recommended spreader maintenance is:

- Inspect the main spreader components for damage, cracks and distortion.
- Check the signal and safety systems for correct operation.
- Check the hydraulic pressures periodically.
- Check all hydraulic cylinders for leakage and reseal if necessary.
- Inspect all hydraulic hoses for damage and leakage. Replace if faulty.

▷



Mounting instructions for lowering the lifting heads into the end beams of 178 series spreaders.



- To start with it is better to tie a 2 meter long piece of string round the hoses and cable that stick out of the bottom of the head and attach a nut to the other end of the string.
- Lift the head high enough to allow the hoses and cable to be lowered into the vertical end beam so that the string drops through the support half way down the inside of the end beam.
- Lower the head into the end beam and at the same time draw the hoses and cable through the support by pulling them through with the string.
- it should be noted that ,when removing the heads from the end beams ,care should taken that the electric plug and the hose ends do not get caught on the support and subsequently become damaged.
- Feed the string through the short tube bend(1) in the side of the end beam and draw the hoses anf cable up through the tube and out through the side of the beam ,where they can be connected to the hoses and cable that run in the energy chain.
- Make sure that the hoses and cable(2) make an even bend that can move up and down with the movement of the heads.
- Removal of the heads is the revers of the above procedure but care must be taken to ensure that the hoses have been disconnected from the energy chain and that they have been pushed back into the end beam so that they hang straight down before the heads lifted out.

Storage of spreaders where it is necessary to have the spreader standing outside for periods longer than 3 months

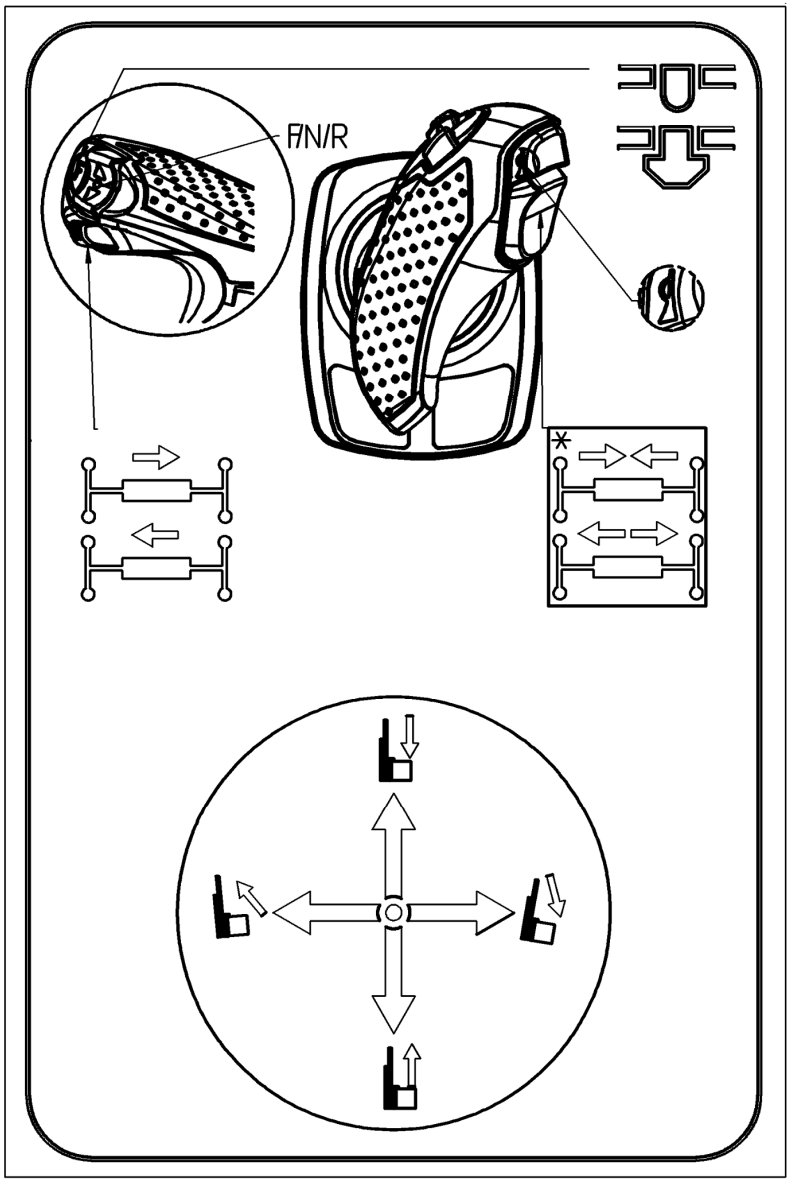
When storing an 178 spreader for longer periods of time, the following precautions should be taken:

- All chromed piston rods must be activated to the closed position so that the rods are stored inside the cylinder where this is possible. If it is not possible to retract the rod into the cylinder (for example the twist-lock cylinders) then the exposed part of the chromed rod should be sprayed with a rust inhibitor similar to.
- All grease points must be pumped full of molybdenum saturated grease.
- Grease all sliding surfaces by brushing on a suitable layer of grease.
- Grease all sliding surfaces by brushing on a suitable layer of grease.
- Where possible it would be advisable to equip the electric box with a heater (this could be a small electric bulb for ex. 40 watt which is allowed to burn constantly).
- Spray all electric connections both inside and outside of the box with a self- drying lubricant. This will efficiently protect electric connections against corrosion.

⚠ CAUTION

Efficient rust inhibitors often dry with time and should therefore be removed by a solvent before using the spreader again. Failure to do this can cause damage to the seals of the cylinders with subsequent leakage to follow.

Multifunctional handle _ 178 spreader



d1411032CO

Working with a load

Mast, lifting device and attachment controls

⚠ CAUTION

Danger of damage to the truck.

Use the lifting device and attachments only for authorised applications. The operator must be trained in the handling of the lifting device and attachments

Always move the central control lever (joystick) smoothly and slowly. How far the control lever is moved determines the lifting, lowering and tilting speed. The control lever returns to the neutral position automatically when released.

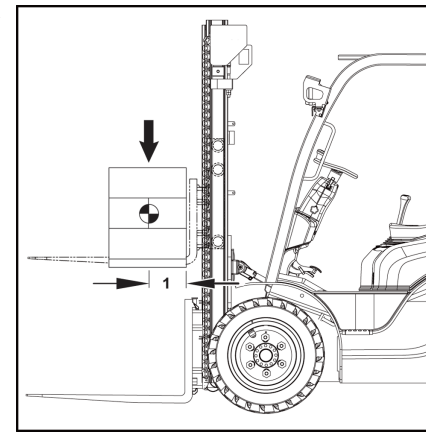
NOTE

Observe the symbols with direction arrows.

Load centre distance and load capacity

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

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



NOTE

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

Capacity rating plate

Before loading

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

⚠ DANGER

Risk of loss of stability.

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

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

NOTE

Refer to the "Summary diagram of labels" chapter for the location of the capacity rating plate.

The load capacity of a forklift depends on:

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

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

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

– Please contact your authorised dealer.

NOTE

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

- *Transporting loads in level 6 or greater winds*

The maximum permissible load capacity is dependent on the load centre of gravity distance (the distance between the load's gravity centre

and the vertical plane of the fork arms), the height of the gravity centre and the lift height.

NOTE

The capacity rating plate below is only an example.

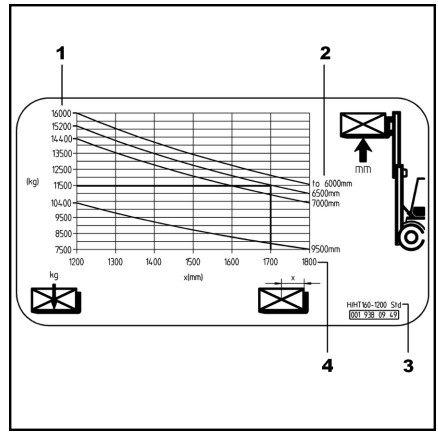
Label example:

Load centre of gravity distance 1700mm

Lift height: 6500mm

- Draw a vertical line from the 1700mm load centre of gravity distance coordinate to where it crosses the diagonal line representing the 6500mm lift height.
- The reading at the point where the coordinate intersects with the horizontal line that passes through this point of intersection is the maximum permitted load.
- In this case, the reading for the maximum permitted load is 11500kg

Corresponding loads relative to other lift heights and load centre of gravity distances can also be obtained in this way. This value relates to an evenly distributed load on two fork arms.



1 Maximum lift load (unit: kg)
2 Lift height (unit: mm)
3 Forklift model (based on forklift model and lift mast series)
4 Load centre of gravity distance from fork surface (unit: mm)

Additional capacity rating plate

⚠ DANGER

Risk of loss of stability.

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

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

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

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

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

NOTE

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

Picking up a load



⚠ DANGER

Fall and crush hazard

Standing on the fork arms is strictly prohibited.

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

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



⚠ DANGER

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

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

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

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

⚠ DANGER

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

⚠ DANGER

Incorrectly positioned loads pose a risk of falling.

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

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



⚠ DANGER

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

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

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

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

Take note of the maximum lift height.

⚠ DANGER

Overloading and tipping hazard

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

⚠ DANGER

Risk of tipping!

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

Lifting a load ▷

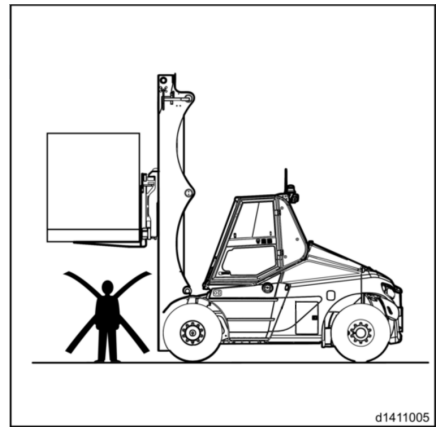


⚠ DANGER

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

There must be no-one in the working area when moving loads.

Always drive the truck with the load lowered and tilted to the rear. Look out for people.

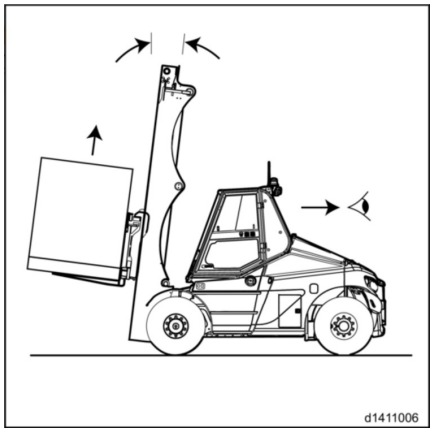


– Approach the load to be lifted as carefully and accurately as possible.
– Put the mast in the vertical position.
– Lift or lower the fork carriage to the correct height.
– If necessary, adjust the fork spread.
– Carefully insert the forks under the load so that load is centred and contacts the fork

face, if possible. **Do not touch adjacent loads.**

– Apply the parking brake.
– Elevate the mast until the load rests on the forks.
– Tilt the mast back slightly.
– Release the parking brake.
– Operate the lift truck in reverse until the load is clear.
– Tilt the mast fully back.
– Lower the mast to the travelling position.

▷



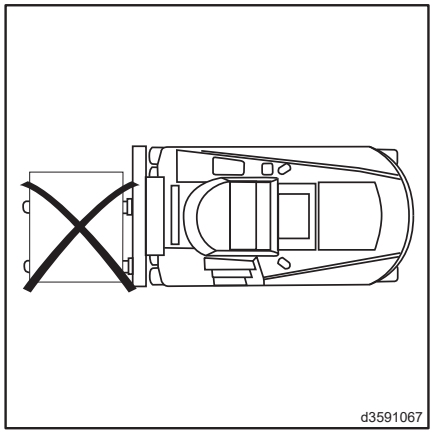
NOTE

If the truck is equipped with duplex mast or triplex mast, the line break safety valve will be locked when the attachment is under the impact load and the mast lower function is disabled, to resume the lower function, just lift the mast a little.

Travelling with load

– Do not travel with the load laterally displaced (e.g. with a sideshift).
– Transport the load near the ground.

▷

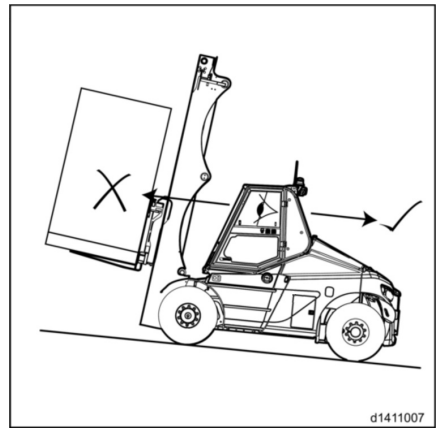


– Always travel with the load uphill on upgrades and down grades, never travel or turn across a slope.

– If visibility is reduced work with a guide.

– Operate the truck in reverse if the load being transported is stacked so high as to obstruct forward vision.

▷



NOTE

When the forks are fully lowered the truck speed is restricted and braking performance is adjusted accordingly. Normal speeds and functions are restored when the forks are raised.

– Always travel with the load uphill on upgrades and down grades, never travel or turn across a slope.

Transporting suspended loads

The transport of suspended loads is only permitted with the approval of the truck manufacturer.

National regulations may restrict the transport of suspended loads; in Italy, for example. In this case, contact the relevant authorities.

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

⚠ DANGER

Risk of accident!

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

- Poor braking conditions and steering conditions
- Tipping forward over the drive wheels
- Tipping over crosswise to the drive direction
- Risk of crushing of accompanying persons
- Poor visibility

⚠ DANGER

Loss of stability!

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

– When transporting suspended loads, observe the following instructions.

Instructions for transporting suspended loads:

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

⚠ DANGER

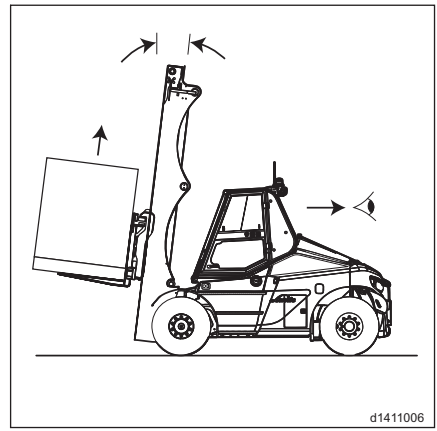
Risk of accident!

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

Never drive on ascents or descents with a suspended load.

Transporting containers holding fluids as hanging loads is not permitted.

Deposit the load



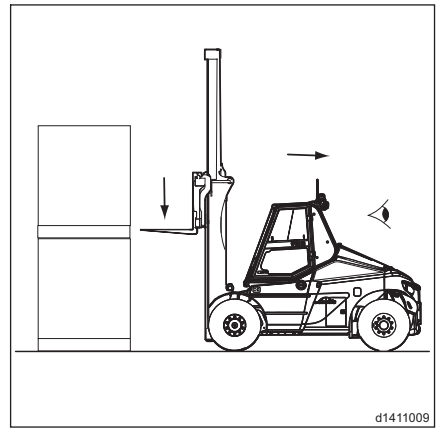
⚠ DANGER

There is a risk of accident when the lift mast is tilted forwards.

The load's centre of gravity and the tilting moment may change when the lift mast tilts forwards or the load slides. The forklift may tip forwards.

– Only tilt the lift mast forwards with the load raised when it is directly above the storage position.
– When tilting the lift mast forwards, take special care to ensure that the forklift does not tip forwards and that the load does not slide.

– Approach the stack or device receiving the load as carefully and as accurately as possible.
– Elevate the fork carriage to the correct height.
– Put the mast in the vertical position.
– Carefully move into the stack.
– Lower the load on to the stack, until the forks are clear of the load.
– Reverse the forklift away from the stack until clear.
– Lower the mast to the travel position.

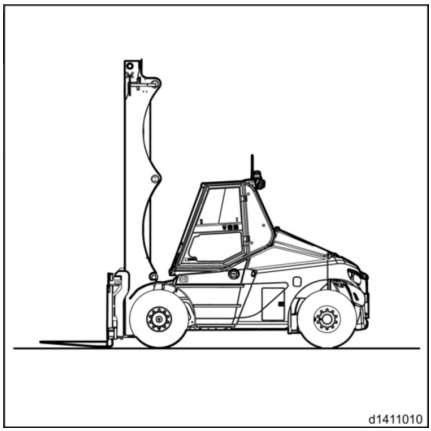


⚠ WARNING

Risk of personal injury and damage to property.

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

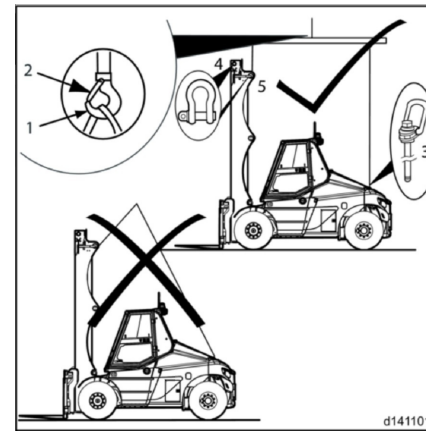
Before leaving the truck unattended ▷



– Deposit the load and lower the fork carriage.
– Tilt the mast to the vertical position, the forks must touch the ground.
– Apply the parking brake.
– Stop the engine and remove the ignition key.
– Lock the cab doors.

Loading/transporting

Hoisting the truck ▷



NOTE

When loading the truck by crane make sure nobody are within the working range of the crane! Only use hoisting equipment and loading crane with sufficient lifting capacity. For the truck weight see the manufacturer's name plate.

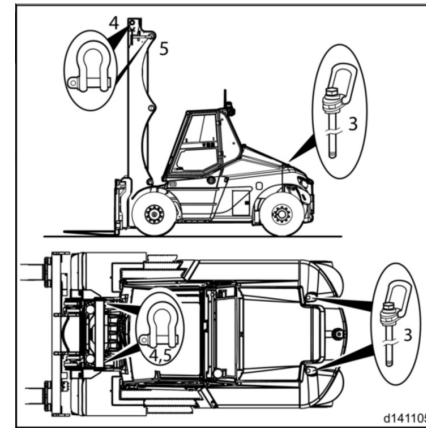
⚠ WARNING

Danger of personal injury and damage.

Do not step under the elevated load!

Attach lifting slings at the four points shown.

– Attach appropriate load rings to lifting points (3 & 4). ▷



NOTE

If the truck is fitted with a 5 m mast or lower, use upper lifting point (5). If the truck is fitted with 5 m mast or higher use lifting point (4).

– Attach two appropriate lifting shackles to the front lifting points (4 or 5) (see note above).

– Attach the slings to crane hook (1).

⚠ CAUTION

After attaching slings to the lifting hook, safety lock (2) must close to prevent 'lash slip'.

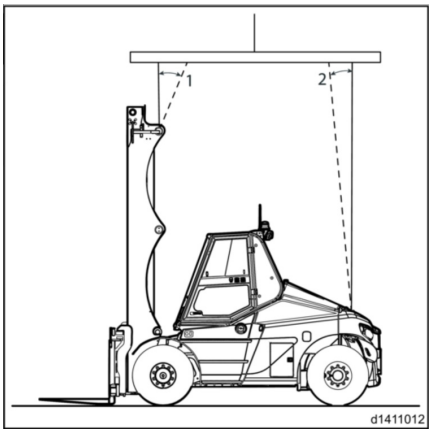
When the truck is hoisted the slings must not foul the cabin or any attachments fitted.

⚠ WARNING

Danger of truck tipping over and damage to truck lifting points.

The maximum angle for sling (1) is 40°. The maximum angle for sling (2) is 16°. Do not exceed these angles.

– Observe maximum sling angles when hoisting the truck. ▷



Transporting the truck

⚠ WARNING

Danger of damage and personal injury.

Do not step under the elevated load.

– When loading the truck make sure a safe distance is observed.

⚠ CAUTION

Danger of damage.

Only use transportation equipment with sufficient load capacity. For the truck weight, see the manufacturer's dataplate.

⚠ CAUTION

The minimum required strength of ropes/chains is 5 tonnes.

⚠ CAUTION

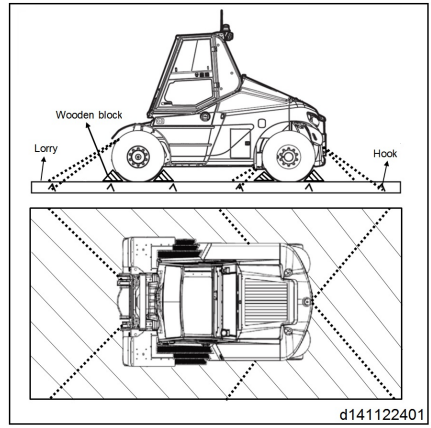
When transporting the truck, check that the truck is properly supported on blocks and securely fastened with load chains.

Transportation by loader truck

When the height of the mast is high, it must usually be removed.

When transporting in a loader truck, heavy chains or ropes are required. In this case, six chains are usually sufficient to secure the fork-lift truck.

– Six load chains are required to secure the forklift truck. ▷

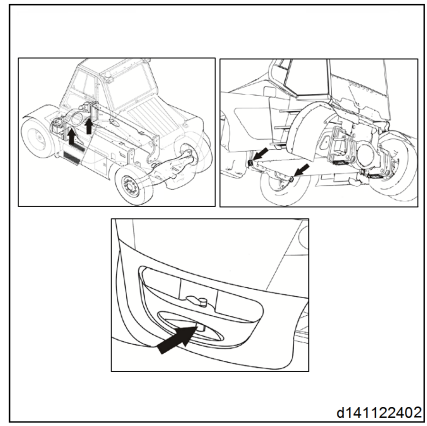


– Attach appropriate load chains to the tie down points as shown, and to appropriate tie down points on the transport equipment. ▷

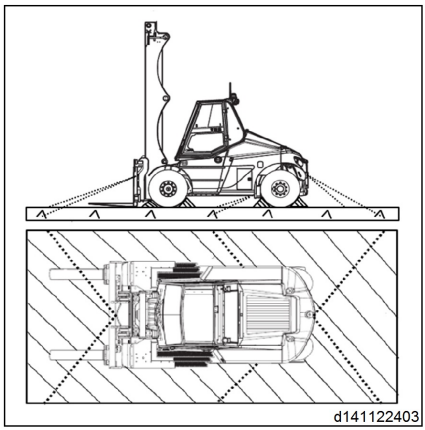
When the height of the mast is low, it does not need to be removed.

NOTE

The inner mast, outer mast, fork and fork carriage must be secured using suitable ropes to prevent them from shaking during transportation.



– Six load chains are required to secure the forklift truck. ▷

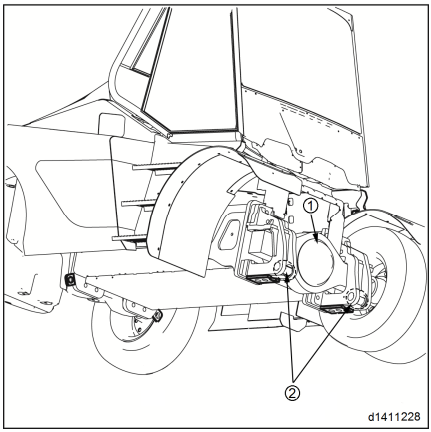


Transportation by freight container

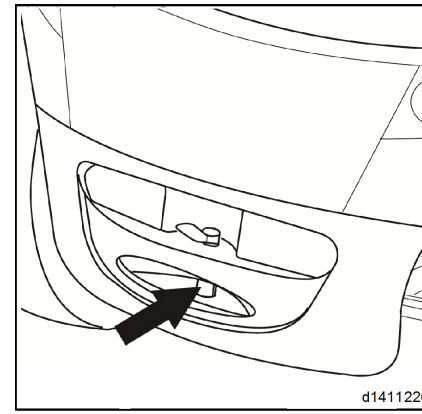
When transporting the truck in a freight container, the mast must be removed.

Secure the truck using ropes

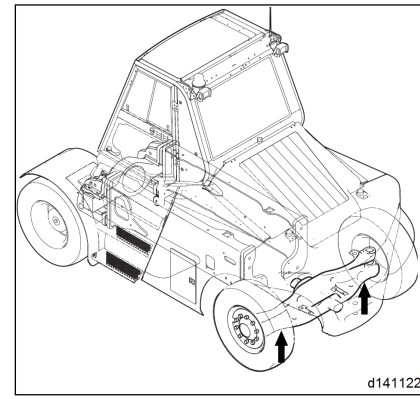
– Secure the front of the vehicle using 8 ropes. As shown in the figure, attach 2 ropes to the tie down points at positions (1) and (2) on both sides, cross over the ropes and attach them to the appropriate tie down points on the transport equipment. ▷



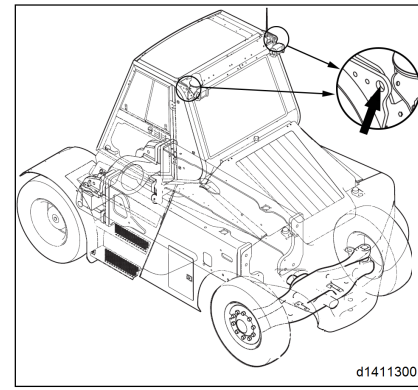
– As shown in the figure, attach 2 ropes to the tie down points at the rear of the vehicle, cross over the ropes and attach them to the appropriate tie down points on the transport equipment. ▷



– As shown in the figure, attach 2 ropes to the tie down points at the rear of the vehicle, cross over the ropes and attach them to the appropriate tie down points on the transport equipment. ▷

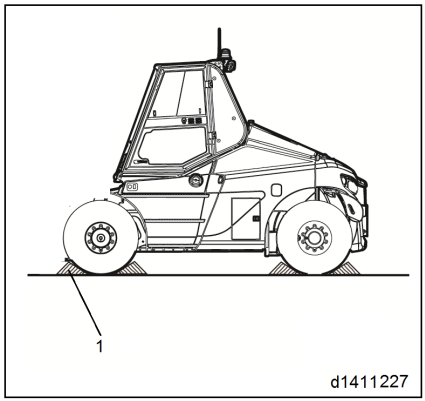


– As shown in the figure, attach ropes to the driver's cab tie down points and secure them to the appropriate tie down points on the transport equipment. ▷



Using wooden wedges to immobilise the truck

– Use wooden wedges (1) to immobilise the front and rear of the vehicle. ▷



Decommissioning the truck

Measures before taking the truck out of operation

If the truck is taken out of operation for over 2 months, it must be parked in a well ventilated, frost-free, clean and dry room and the following measures must be carried out.

- Thoroughly clean the truck.
- Fully elevate the fork carriage several times, tilt the mast forward and back and if fitted, operate the attachment several times.
- Lower the forks on a support until the chains are slack.
- Check the hydraulic oil level and add oil, if needed.
- Add diesel fuel.
- Apply a thin film of oil or grease on all unpainted mechanical parts.
- Lubricate the truck as described in the maintenance section of this manual.
- Check the condition and electrolyte level of the battery. Coat the battery terminals with non-acidic grease. (Follow the instructions of the battery manufacturer).
- Spray all open electrical contacts with a suitable contact spray.

⚠ CAUTION

Danger of tyre deformation.

Block up the truck so that all wheels are clear of the ground.

NOTE

Do not use plastic foil as this enhances the formation and collection of condensation water.

NOTE

If the vehicle is to be taken out of operation for a week or more, isolate the battery.

NOTE

If the vehicle is to be taken out of operation for over 6 months, contact your service partner for further measures.

Mast and load lifting device removal

⚠ DANGER

Danger of damage or injury.

This work must only be carried out by the trained personnel of your authorised dealer. Do not attempt to remove the mast or lifting device.

Taking the truck out of service (note)

If the vehicle is to be taken out of operation for three months or more, The engine should be started once a month and fully elevate the fork carriage several times, Tilt the mast forward and back several times, if the mast with attachment, operate the attachment several times .

Putting the truck back into service

– Thoroughly clean the truck as described in the maintenance section of this manual.
– Lubricate the truck.
– Coat the battery terminals with non-acidic grease.
– Check the condition of the battery / batteries.
– Check the engine oil for condensation water and change the oil, if necessary.
– Check the hydraulic oil for condensation water and change the oil, if necessary.
– Reconnect the battery.

NOTE

The digital clock display must be reset whenever the battery isolator has been used.

– Perform the same services as for commissioning.
– Return the truck to service.

NOTE

If the truck has to be jump started, refer to section entitled "Jump start procedure".

Disposal of old trucks

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

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

In addition, the following minimum requirements must be observed:

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

NOTE

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

5

Maintenance

General maintenance

Safety information regarding servicing work

The truck will remain ready for operation at all times only if the small amount of servicing work is performed at regular intervals and in accordance with the information in the operating instructions.

Only qualified persons authorised by the manufacturer may carry out servicing work.

You can agree to have this work performed on the basis of an agreement with your service partner.

Whenever performing work, the truck must be parked on a flat surface and secured so that it cannot roll away. The engine must be switched off and the key removed.

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

Once all work on the truck is complete, function checking and a test run must be performed.

⚠ DANGER

Risk of accident when working on the lift mast.

– Secure the raised fork carriage or lift mast to prevent accidental lowering.
– Whenever work is carried out at the front of the truck, secure the lift mast to prevent it tilting backwards.

⚠ WARNING

Risk of injury due to the doors falling shut.

Open doors and prevent them from closing.

⚠ CAUTION

The truck must always be properly labelled.

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

ENVIRONMENT NOTE

Observe the information regarding the use of consumables.

Service intervals

The specified service intervals depend on the operating conditions and application conditions, and on the consumables used. In certain circumstances, the service intervals can be changed.

In all cases, the "Regular Service tasks" must be performed once per year.

When operating in extreme conditions (e.g. heat, cold or dust), the service intervals must be reduced.

– Contact your service partner.

Inspection and maintenance data

No	Assembly	Aids / Fluids and lubricants	Filling capacity / Settings
1	Engine	Engine oil	Approx. 20 l
2	Fuel tank	Diesel	Approx. 250 l
3	Adblue tank	Adblue	Approx. 40 l
4	Cooling system	Antifreeze / water	Approx. 12 l
5	Working hydraulic system oil tank	Hydraulic oil	approx.180 l
6	Transmission	Transmission oil	approx. 20 l
7	Drive axle	Gear oil	Approx. 25 l
8	Battery	Maintenance free	Maintenance free
9	Tyres	Air	10 bar
10	Wheel nuts		680 Nm
11	Lift chains / mast channels	Chain spray	As required

Recommended consumables

NOTE

The use of consumables not recommended may invalidate your warranty. If in doubt, contact your authorized dealer.

Diesel fuel

Only use commercially available sulphur-free diesel fuel which complies with the following standards:

- EN 590 as of 2010 - maximum 0.001% sulphur by weight (10 ppm)
- ASTM D975 (maximum 0.0015% sulphur by weight (15 ppm)

The following fuel types **are not** permitted:

- Sulphurous fuels with a sulphur content greater than 0.001% by weight (10 ppm).
- Marine diesel fuel
- Aviation turbine fuel

- Heating oils
- Fatty acid methyl ester FAME (bio-diesel fuel) > 7% by volume

These fuel types cause irreversible damage to the engine and the exhaust after treatment system, as well as also significantly reducing the expected service life.

Only use fuel additives, that are approved by your authorized dealer if in doubt, contact your authorized dealer.

Adblue® (DEF)

⚠ CAUTION

Risk of skin, eye and nose and throat irritation.

Use PPE

AdBlue® must not come into contact with skin, eyes or clothing.

If AdBlue® comes into contact with your eyes or skin, rinse affected areas with clean water immediately. If AdBlue® is swallowed, rinse your mouth out with clean water and seek medical help.

Change clothing that is soiled with AdBlue® immediately.

If allergic reactions occur, seek medical help immediately.

Keep AdBlue® out of the reach of children.

Only use AdBlue® in accordance with DIN 70070/ISO 22241. Do not use any additives. If AdBlue® comes into contact with painted or aluminium surfaces when filling the tank, rinse the affected area immediately with plenty of water.

The terms "Urea" and "DEF" (Diesel Exhaust Fluid) are also used for "AdBlue®". If the AdBlue® tank is full of AdBlue®/ DEF, pressure compensation may occur when the tank lid is unscrewed. AdBlue® may spill out. Therefore, open the AdBlue® tank lid carefully. If AdBlue® spills out, immediately wash the affected area with plenty of water.

When opening the AdBlue® tank, small amounts of ammonia vapours could escape. Care must be taken as ammonia vapours

have a pungent smell and are particularly irritating to:

- skin
- mucous membranes
- eyes

The vapours may cause a burning sensation in the eyes, nose and throat as well as irritation of the throat and watering eyes. Avoid inhaling ammonia vapours.

Only fill the AdBlue® tank in well-ventilated areas.

Do not mix additives to AdBlue®. Do not dilute AdBlue® with tap water. This could destroy the exhaust gas after treatment system.

Containers made of the following materials are not suitable for the storage of AdBlue®:

- aluminium
- copper
- copper alloys
- unalloyed steel
- galvanised steel

If AdBlue® is stored in these types of container, constituents of these metals may dissolve and damage the exhaust gas after treatment beyond repair.

Only use containers made of the following materials to store AdBlue®:

- CrNi steel in accordance with DIN EN 10 088-1/2/3
- Mo-CrNi steel in accordance with DIN EN 10 088-1/2/3
- Polypropylene
- Polyethylene

Dispose of AdBlue® in an environmentally responsible manner.

Engine oil grades for MTU engine

Only use engine oils in accordance with:

Caterpillar: ECF-1-A

MTU: Category 3.1

MB-Approval: 228.51 (Mercedes-Benz)

Recommended oil is Shell Rimula R6 LM, SAE 10W-40.

Engine oils of API classification CD are not recommended for the first 50 hours of operation and for extra light duty. During engine operation, part of the oil serving as piston lubricant is burned (consumed). The products of combustion combined with the high temperatures lead to oil 'wear', especially of the chemical additives.

Since this oil wear depends on operating conditions and the quality of oil (productivity of oil) and fuel used, oil change intervals of different lengths result.

The longest possible oil change interval for lubricating oil in engines is one year, i.e. change oil at least once every year of operation independent of the oil change intervals.

⚠ CAUTION

Risk of poisoning and environmental issues.

Used oil must be kept out of the reach of children until disposed of in accordance with local authority guidelines. Do not allow oil to get into the sewage system or seep into the ground.

Due to the disposal problem, the required special tools and knowledge, the engine oil and filter change should be performed by your authorised dealer.

*option

Viscosity of oil

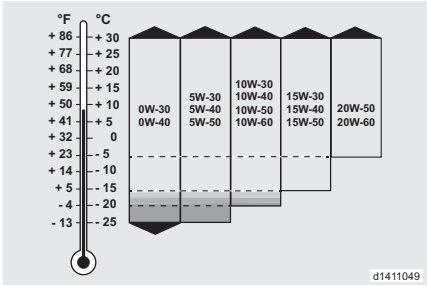
NOTE

Variations in these characteristics may occur with future improvements.

Oil operating temperatures

Since the viscosity of lubricants varies with temperature, the ambient temperature at the locality of the truck's use is the determining factor in selection of the viscosity range (SAE class) of the engine oil (see diagram).

If the ambient temperature occasionally falls below the temperature limit (e.g. using SAE 15 W/40 down to -15 °C), the cold start capability of the engine is reduced, but no damage to the engine will result.



NOTE

Oil additives of any kind must not be added to any of the above mentioned engine oils. Their use jeopardizes the warranty.

Mixing of different oil brands should be avoided.

Hydraulic oil

Recommended oil is Shell Spirax S4 TXM, SAE 10W-30 UTTO.

If it is difficult to obtain hydraulic oils that must be imported, use a similar high quality UTTO oil of a different brand.

If in doubt, contact your authorized dealer. Recommendations of representatives of the oil industry should also be checked with your authorized dealer.

Only the above-mentioned oils are approved by the manufacturer. If other hydraulic oils are used or mixed, costly damage can result.

Driveline oils

Gearbox

Recommended oil is Shell Spirax S4 TXM, SAE 10W-30 UTTO. Only use oils according to ZF-List of lubricants TE-ML 03,(go to www.zf.com), for Powershift transmissions 3 WG-116/131/161/171. Only the above-mentioned oils are approved by the manufacturer. If other hydraulic oils are used or mixed, costly damage can result.

Drive axle

Lubricant minimum requirement L .

hypoid gear oil according to API GL-5 and API MT-1 or hypoid gear oil according to SAE J2360 and API MT-1 .

From -10°C to +30°C	Single-grade oils SAE 90 or Multigrade oils SAE 75W-90 / SAE 80W-90 / SAE 85W-90
Permanently less than -10°C	Multigrade oils SAE 75W-85 / SAE 75W-90
Permanently over +30°C	Single-grade oils SAE 140 or Multigrade oils SAE 75W-140 / SAE 80W-140 / SAE 85W-140

NOTE

Important – On axles with self locking differentials a noise is produced if normal oils are used. In case of abnormal noises and in case of a jerky roll off of the tyres, use gear oil EP with additives of the "Limited Slip" type conforming to specification M 2C - 104 A

Lubricating grease

Heavy duty grease with additives EP and MOS2. Designation acc. to DIN 51825-KPF 2K-20 (see the Parts Catalogue for the order number). Any mixing with grease types other than lithium-based greases is not allowed.

Coolant

Use only approved corrosion inhibitor/antifreeze additives according to Sheet No.325.5 and 326.5. Mixtures with other corrosion inhibitors/antifreeze agents are not permitted. This prevents damage to the engine cooling system and engine.

When renewing the coolant, ensure that it contains 50% corrosion inhibitor/antifreeze by volume. This corresponds to antifreeze protection down to -37°.

Do not exceed 55% by volume (antifreeze down to approximately -45°).

The heat dissipation and antifreeze may otherwise be negatively affected. If there is a loss of coolant, do not top it up by using only water, but also add an approved corrosion inhibitor/antifreeze agent.

Good quality water is important for cooling system performance. Excessive levels of calcium and magnesium contribute to scaling problems, and excessive levels of chlorides and sulphates cause cooling system corrosion

Battery grease

Non-acidic grease (pole grease).

Chain spray

Chain spray specified by authorized dealer.

Electrical contact grease

For use on all electrical connections.

Service plan

Regular maintenance

The following maintenance will help improve the forklift's condition and ensure it works properly.

Operators shall carry out this maintenance work as often as possible, in accordance with the operating environment.

- Clean the forklift (as required).
- Drain water from the fuel pre-filter.
- Clean and lubricate all pivots, bearings and hinges.
- Clean and lubricate the steering axle (please see the **Service schedule for service times**).
- Check and tighten the wheel fasteners (see the section "Tightening Wheel Fasteners").
- Clean the lift mast chain and apply chain spray.

Service plan

Note on servicing work
Servicing work requires specialised knowledge and special tools. Please contact an authorised service partner

Preparations
Clean the forklift as required.
Check that all labels are complete and legible.
Read out and delete error memory.
Reset the maintenance interval

Conduct additional maintenance after 100 hours of operation
Engine
Change the fuel filter (fitted on the engine)
Replace the water trap (fitted on the chassis)
Check charge-air cooler (CAC) and piping system.
Check the dust discharge valve
Check the intake and exhaust pipes for leaks

Conduct additional maintenance after 100 hours of operation
Drive mechanism and transmission system
Change the transmission filter
Check the transmission, pumps, valves and lines for leaks
Check the axle mounting
Check the steering axle hub
Hydraulic system
Change the brake pressure filter
Replace the brake return oil filter
Replace the bypass hydraulic oil filter
Replace the cooler oil return filter
Check the oil level in the hydraulic system
Check the hydraulic system, pumps, valves and lines for leaks
Check the pre-load of the double hoses

Conduct additional maintenance every 500 hours of operation
Engine
Check the water trap
Check the coolant and lines
Check indicator and warning functions
Check the engine for leaks
Clean the air filter
Check the charge air cooler and the engine intake pipe
Check the engine harness for damage
Check the exhaust system for leaks
Drive mechanism and transmission system
Clean the steering axle and grease it
Chassis and bodywork
Clean and lubricate all bearings, pivots and joints
Clean and lubricate door hinges
Lifting system
Clean and lubricate the mast and tilt cylinder pivots and bearings

Conduct additional maintenance every 500 hours of operation
Clean, lubricate and check the side shift function is working properly.
Lubricate the lift mast bearing

Conduct additional maintenance every 1000 hours of operation
Engine
Change the engine oil and filter
Check the belt for wear or damage, and replace as required
Change the fuel filter
Check the engine and bracket installation
Replace the water trap
Change the air filter
Drive mechanism and transmission system
Replace the transmission oil
Replace the transmission oil filter
Check the transmission and pipe lines for leaks
Check the installation of the drive axle
Check the steering axle hub
Check and adjust the steer stops if necessary
Check mounting of the steer axle and steering kingpin
Check the functionality of the braking system (park brake and driving brake)
Chassis and bodywork
Check the condition of the chassis mount
Check the cab mountings
Check the driver’s cab tilt function
Check the security of the cab tilt pump handle and safety lock pin.
Check the condition of welded structures/components
Clean and lubricate door hinges
Driver's cab
Check pedals for smooth operation and ensure there is no excessive play
Check the condition and function of the seat belt (if fitted).
Check the functionality of the driver seat switch

Conduct additional maintenance every 1000 hours of operation
Electrical system
Check the condition of the electric cables, cable connectors and connections, and check that they are securely fitted
Check the condition of the batteries
Hydraulic system
Change the brake pressure filter
Replace the brake return oil filter
Replace the bypass hydraulic filter
Replace the cooler oil return filter
Check the hydraulic system, pumps, valves and lines for leaks
Check the oil level in the hydraulic system
Check the pre-load of the double hoses
Lifting system
Check the condition of the lift mast, lift mast chain, lift cylinders and end stops, and check that they are correctly mounted and working correctly.
Check the fork arms and arm safety devices

Conduct additional maintenance every 2000 hours of operation
Engine
Change the air safety filter
Drive mechanism and transmission system
Change the gearbox oil
Change the safety filter

Conduct additional maintenance every 3000 hours of operation
Engine
Change the coolant
Check and adjust the valve clearance
Replace the DEF filter
Replace the DEF suction strainer
Hydraulic system
Change the hydraulic breather filter
Replace the brake suction filter
Change the hydraulic oil (or as indicated on the display)

Conduct additional maintenance every 3000 hours of operation
Check the hydraulic pump mounting bolts
Lifting system
Check the forks
Check the mounting of the mast
Check the tension of lift mast hoses

Conduct additional maintenance every 4000 hours of operation
Engine
Replace the aftertreatment diesel particulate filter

Conduct additional maintenance every 6000 hours of operation
Lifting system
Replace the lift chain (to be carried out every 6000 hours of operation or once the chain stretch reaches 2%)

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

Preparatory tasks

Clean the truck

NOTE

How often the truck needs cleaning depends on its use. If used with very aggressive media like salt water, fertilizer, chemicals, cement, etc., the truck should be cleaned carefully and more often.

⚠ WARNING

Danger of damage to the bearings

Hot steam or intensive degreasing solutions should be used with utmost care. The grease in sealed for life bearings may dissolve and leak out. Since re-greasing is not possible, this will result in damage to the bearing..

⚠ CAUTION

Protect all electrical components and the air filter intake from the ingress of steam, water etc., when cleaning.

Protective clothing and eye protection must be worn.

Clean the cabin floor and ensure that no debris is allowed to obstruct the operation of the pedals.

Clean especially the oil filler areas and the lubrication points prior to servicing.

When cleaning with compressed air, remove sticking dirt with a cold cleaner.

When cleaning the truck with de-greasing solutions, allow sufficient time for the cleaner to soak in, then flush off with a strong water jet.

After cleaning the engine, allow it to run warm to dry off and to ensure there are no malfunctions due to water ingress.

Clean and spray the lifting chains

NOTE

The lifting chains must be cleaned if the dust covering the chain prevents penetration of the lubricant.

– Place a container under the mast.

– Clean the chain using paraffin derivatives such as washing petrol, wear protective clothing and observe the manufacturer's safety notes.
– When using a steam jet, use without using additives.
– After cleaning, blow dry the chain at once to remove any water in the chain links and on the surface. During this procedure the chain should be moved several times.
– Spray Linde chain spray immediately, move the chain while spraying by raising and lowering the fork carriage.

NOTE

Lifting chains are safety components. The use of cold cleaners, chemical cleaning agents and caustic or acidic and chlorinated fluids can be a direct cause of damage to the chain.

NOTE

Trucks in service in the food industry must be lubricated with an oil approved for the food industry instead of chain spray.

Engine

Filling fuel and Adblue®

⚠ CAUTION

Danger of costly damage to the engine and after treatment system.

Only Adblue® to be put in the Adblue® tank. Do not put Adblue® into the fuel tank.

Components that are damaged due to incorrect fuel/Adblue® filling are not covered by warranty.

NOTE

It is recommended that the Adblue® tank is filled at the same time as the fuel tank.

Filling fuel

⚠ CAUTION

Risk of fire.

Follow local regulations for handling diesel fuel.

Stop the engine before filling fuel. No smoking or naked flames when filling fuel. Do not spill or allow fuel to contact hot parts.

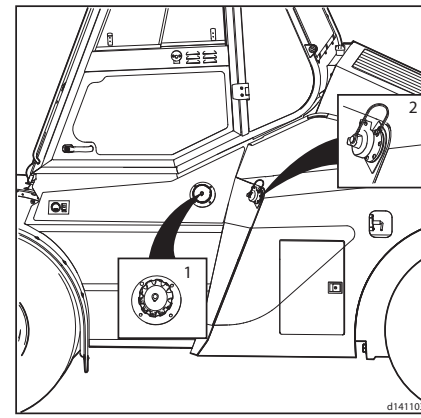
– Turn the ignition off.

– The fuel tank filler cap is located on the left side of the truck (1). ▷

– Remove fuel cap

– Fill the tank with clean diesel fuel (see recommended fuels).

– Refit the filler cap.



NOTE

Maximum fuel capacity - 250 l (approx).

Filling Adblue®

NOTE

Stop the engine before filling Adblue®.

⚠ CAUTION

Risk of skin irritation.

Wear personal protective equipment when filling Adblue®.

Ensure adequate ventilation. Avoid contact with skin or eyes. Keep containers closed until ready for use. Only use authorised equipment for transfer to tank. Contain spillages, absorb with spill kit, treat waste as hazardous.

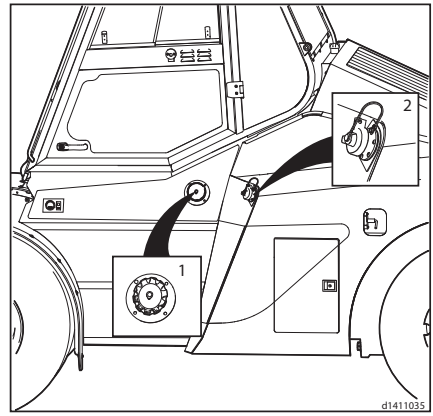
Do not spill or allow Adblue® to contact hot parts. Follow local regulations for handling Adblue®.

– Turn the ignition off.

– The Adblue® tank filler cap is located on the left side of the truck (2).

– Remove Adblue® filler cap (2).

– Fill the tank with clean Adblue®.



NOTE

Fill the tank slowly to prevent 'blow back' and to ensure correct fill capacity is achieved.

– Refit the filler cap (2).

NOTE

Maximum Adblue® capacity - 19 l (approx).

NOTE

The display will show the warning information when the Adblue quality is not correct.

- *After detection of incorrect quality / detection of system, the Adblue lamp lights up after 60 min. for 60 min, the engine power is normal.*
- *60 min. after detection, the Adblue lamp flashing and the LIM lamp lights up, the torque reduction to 75% of peak torque.*
- *180 min. after detection, the Adblue lamp flashing and the LIM lamp lights up, the torque reduction to 50% of peak torque, and the maximum speed is reduced to 60%.*
- *230 min. after detection, the Adblue lamp flashing and the LIM lamp lights up and the STOP ENGINE lamp solid. Reduction to 20% of peak torque. Reduction to idle speed.*
- *240 min. after detection, the Adblue lamp flashing and the LIM lamp flashing and the STOP ENGINE lamp flashing, the engine in idle speed.*

NOTE

With all system errors with the SCR system (Interruption signal, missing sensor, etc.), the System effects are the same than with bad Adblue quality, even the "CHECK ENGINE" lamp lights up from the beginning with the error.

NOTE

The display will use lamp symbols to show the information.

- *Adblue≤10%, The Adblue lamp lights up. The power is normal.*
- *5%≤Adblue≤7.5%, The Adblue lamp flashing and the LIM lamp lights up. The power is low inducement.*
- *2.5%≤Adblue≤5%, The Adblue lamp flashing and the LIM lamp flashing. The power is severe inducement.*
- *0%≤Adblue≤2.5%, The Adblue lamp flashing and the LIM lamp flashing and the STOP ENGINE lamp shining. The power begins the final inducement.*
- *Adblue=0%, The Adblue lamp flashing and the LIM lamp flashing and the STOP ENGINE lamp shining. The power is final inducement.*

NOTE

The display also use the error codes to indicate the warning information.

NOTE

This power reduction is self healing, this means, when the fill level is topped up again, the power is set back to 100%.

Air filter - check

⚠ WARNING

Risk of choking.

Do not start the engine with the filter element removed.

Wear a protective mask for all service work carried out on the air intake system.

⚠ CAUTION

Risk of damage to the air filter.

Do not clean the filter element.

– Clean the filter casing with a damp cloth.

If a warning message is displayed on the truck status display unit stating the air filter is blocked, stop the engine at once and renew the air filter.

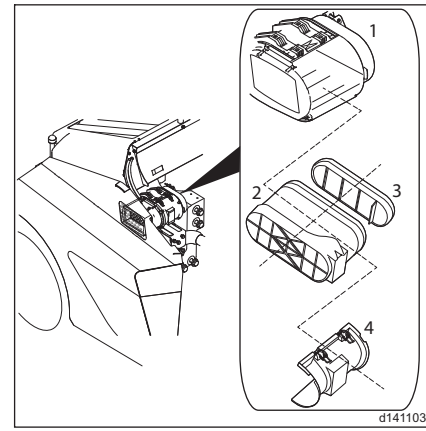
⚠ CAUTION

Risk of engine damage.

Do not continue to work with a blocked filter.

A dirty filter element decreases engine performance. Regular filter servicing is essential for the engine.

– Tilt the cab and open the engine access cover.
– Release clamps on filter casing (1) and remove filter end cover (4).
– Pull out the air filter element (2) and safety element (3).
– Inspect and re-use if serviceable. Replace if necessary.



Coolant level - check

Checking the coolant level

⚠ CAUTION

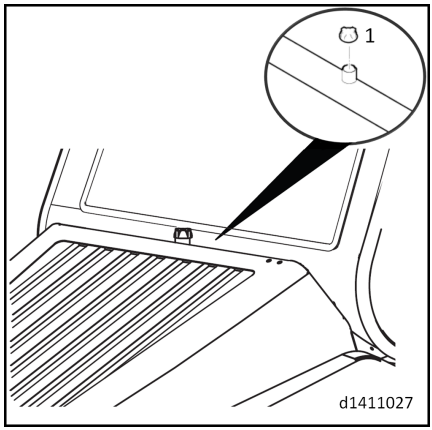
Risk of scalding!

Do not remove the filler cap if the reservoir is hot or when the engine is running. Follow the instructions for handling fluids and lubricants.

NOTE

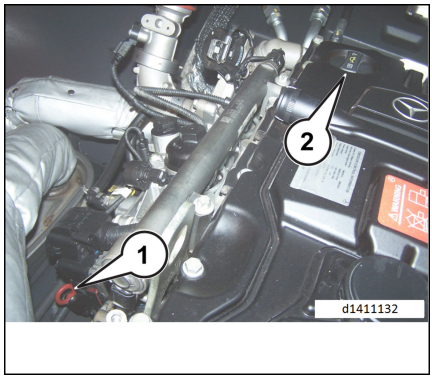
When the coolant level is too low or the coolant is too hot, the truck status display monitor will display a warning, coolant level must be checked.

– Open cooler cap(1) and inspect the coolant's level and quality. ▷



Check engine oil level ▷

– Park the truck on level ground.
– Tilt the cabin.
– Withdraw the oil dipstick (1) from the engine.
– Wipe the dipstick with a clean cloth.
– Re-insert the dipstick fully and remove it again. The oil level should be between the marks on the dipstick.
– If necessary to add oil, remove filler cap (2) from the filler opening. Pour oil into the opening until the level reaches the upper mark on the dipstick.



⚠ WARNING

Engine oil is flammable.

Do not allow engine oil to contact hot engine components. Use care when adding oil to avoid spilling.

⚠ CAUTION

Incorrect oil can damage the engine.

Use only oil that meets the specifications given in the Fluid and Lubricant Specifications section.

⚠ CAUTION

Overfilling the engine with oil can cause engine damage.

Do not overfill the engine with oil. Drain excess engine oil if necessary.

– After adding oil, replace the filler cap and turn to tighten it.

Bleeding and draining the fuel system

Bleeding, after refuelling a fuel system which has been run dry, is performed the next time the engine is started. Automatic continuous bleeding takes place in the filter.

When the engine is started, the battery must have sufficient charge to bleed the fuel system

Bleed the fuel prefilter with water separator on the vehicle before bleeding the fuel circuit on the engine. Use the manual fuel pump integrated in the fuel prefilter to do so.

Bleeding the fuel system with a fuel prefilter on the chassis frame

NOTE

Dispose of the water-fuel mixture in an environmentally responsible manner.

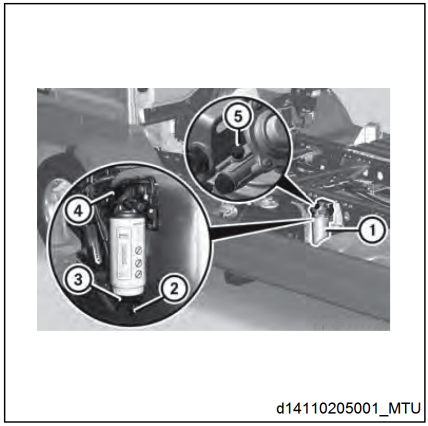
If water has collected in inspection window(3), drain fuel prefilter on chassis frame(1)before bleeding. Drain fuel prefilter on chassis frame (1)regularly.

Draining the prefilter on the chassis frame:

– Place a collector under drain plug(2).
– Turn drain plug(2)open.
– Press manual fuel pump(4)and collect the fuel/water mixture.
– Turn drain plug(2)closed.

Bleeding using the manual fuel pump of the fuel prefilter on the chassis frame:

– Unscrew the fuel tank filler cap.
– Place the collector underneath fuel prefilter(1)
– Unscrew bleed screw(5)。
– Press manual fuel pump(4)repeatedly until the fuel escaping at bleed screw(5)is free of bubbles.
– Tighten bleed screw(5)。



NOTE

If there was no fuel in the fuel tank, press manual fuel pump(4)again until there is noticeable resistance.

– Tighten the fuel tank filler cap.
– Then bleed the fuel circuit on the engine as described under "Bleeding the fuel system on the engine".

Bleeding the fuel system on the engine

Fuel filter on the engine without fuel hand pump

– Turn the key to the start position in the ignition lock and hold it. Do not depress the accelerator pedal whilst doing so.

NOTE

The starting procedure is automatically cancelled after approximately 60 seconds.

– Repeat the starting procedure after a waiting period of approximately 1 minute.
– After three starting attempts, wait approximately three minutes before trying again.
– If the engine starts normally, depress the accelerator pedal several times.

The fuel system is completely bled.

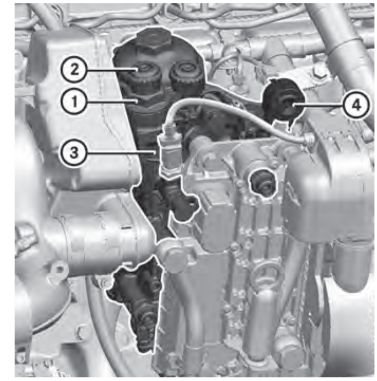
Fuel filter on the engine with fuel hand pump

Bleed the fuel system with the manual fuel pump on the engine.

NOTE

Do not bleed the fuel system with several starting procedures. You could otherwise damage the starter motor.

– Switch the ignition lock to the drive position.
– Shift into neutral.
– Unscrew the fuel tank filler cap.
– Unscrew handle(2)from fuel hand pump(1) on fuel filter module(3).
– Using approximately 100 pumping motions within approximately 1 minute, operate fuel hand pump(1)by handle(2)until there is noticeable pressure in fuel hand pump(1).
– Screw handle(2)into fuel hand pump(1)until hand-tight.
– Start the engine within 5 seconds using engine start/engine stop button(4) Press and hold the button until the engine is running at an increased engine speed.
– If the engine does not start or does not run at an increased engine speed, repeat step 5 (pumping with the fuel hand pump). Switch off the engine.



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NOTE

The starting procedure is automatically cancelled after approximately 60 seconds.

– Repeat the starting procedure after a waiting period of approximately 1 minute. After three starting attempts, wait approximately three minutes before trying again.
– Tighten the fuel tank filler cap.
– Briefly operate the engine at increased engine speeds. The fuel system is completely bled.

Draining the fuel filter with water separator on the engine

⚠ WARNING

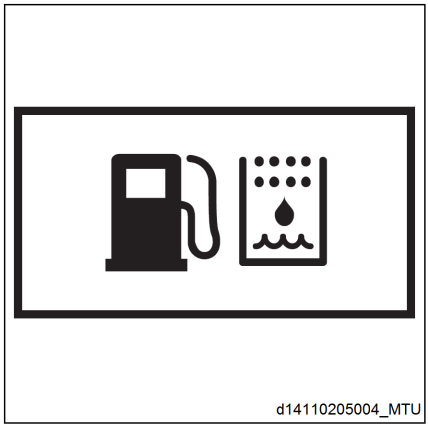
Fuel is highly flammable. Improper handing of fuel creates a risk of fire and explosion.

Avoid fire, naked flames, smoking and creating sparks under all circumstances. Switch off the ignition and auxiliary heating before carrying out work to the fuel system. Always wear protective gloves.

ENVIRONMENT NOTE

Dispose of the water-fuel mixture in an environmentally responsible manner.

If the indicator lamp lights up, drain the fuel filter with water separator immediately. Otherwise, the engine may be damaged. ▷

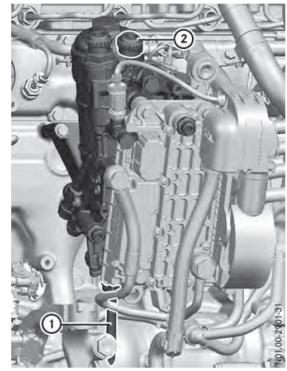


⚠ CAUTION

Call autherised service engineer carry out this maintenance work.

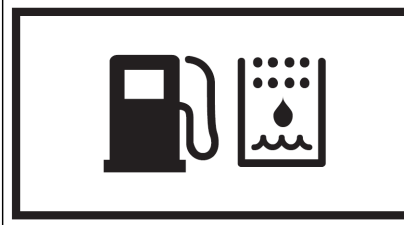
– Park the vehicle safely and secure it from rolling away.
– Switch off the auxiliary heating.
– Switch off the engine.

– Place a suitable collection tray beneath drain hose(1).
– Open drain plug(2)until the water/fuel mixture flows out of drain hose(1)
– Turn drain plug(2)closed.
– Dispose of the collected water/fuel mixture in an environmentally responsible manner, e.g. at a qualified specialist workshop.
– Check that drain plug(2)is closed. When the engine is running and drain plug(2)is open, fuel is lost through drain hose(1).



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– If the indicator lamp does not go out after draining: drain the fuel filter again.
– If the indicator lamp does not go out after draining for the second time: consult authorised service engineer and have the cause checked immediately.


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Running gear and drive train

Transmission oil level check

⚠ CAUTION

Follow the precautions for handling fluids and lubricants.

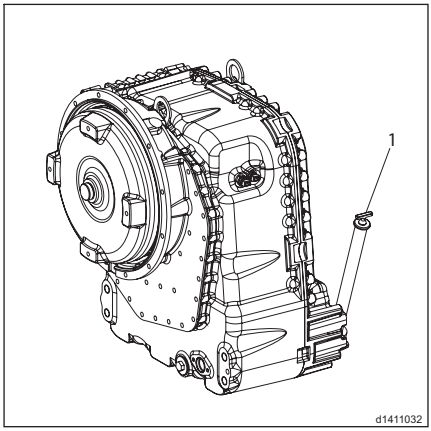
Wear protective equipment.

NOTE

Check the oil at operating temperature >40°C and with engine running. Do not check when the engine is cold.

Make sure truck is on level ground. Park brake on and wheels chocked. Engine must be running

- Tilt the cab and open the engine access covers.
- Remove dipstick (1) and wipe with a clean cloth. ▷
- Fully re-insert dipstick (1) and remove it again.
- The oil level should be between the Min. and Max. markings.
- Add oil if required.
- Replace engine covers and lower the cab.



NOTE

When transmission oil level is low a warning is displayed on the truck status display unit, the engine management system restricts the truck to low speed operation.

Check the tyres for damage and foreign objects

⚠ CAUTION

Low tyre inflation pressure reduces tyre service life and the stability of the truck.

Do not operate the truck with low tyre pressure.

⚠ CAUTION

Risk of death due to explosive force.

Refer to Wheel and Tyre removal and fitting procedures.

– Check the tyres for signs of damage or wear - visual check.

– Renew worn or damaged tyres.

Tighten the wheel fasteners

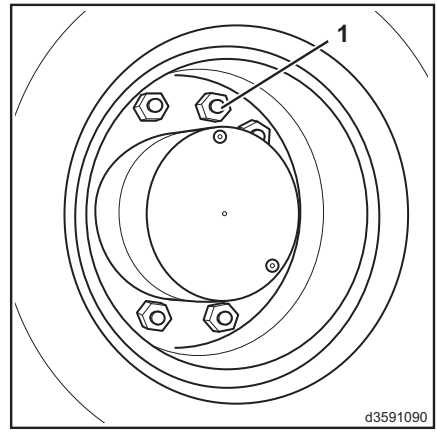
⚠ CAUTION

Risk of accident.

The wheel fasteners must be tightened before initial use and after removing and installing wheels, or repairing the wheel fasteners.

The wheel fasteners must then be retightened at least every 100 hours of operation.

– Check the specific torque for the tyre connection and, if necessary, alternately tighten the wheel fasteners.



NOTE

- *Refer to the "Inspection and maintenance data" section to tighten the torque*
- *A box-end wrench with an extension rod is needed to tighten the front wheel nuts*

Locations for jacks when changing wheels

⚠ CAUTION

Risk of accident.

Only use a jack with sufficient lifting capacity. The capacity of the jack should be 25,000 kg minimum.

⚠ CAUTION

Risk of accident.

Refer to the procedure for removing and installing wheels.

⚠ CAUTION

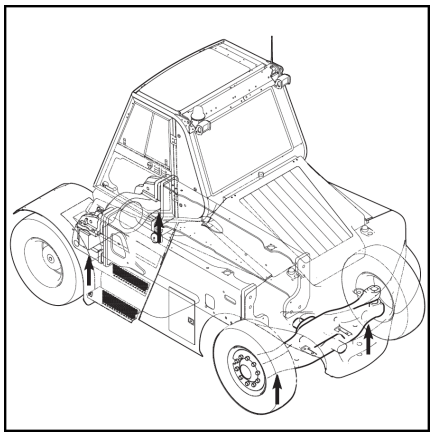
Risk of accident.

When working under the truck, secure the chassis with wooden blocks. Do not rely solely on the jack.

NOTE

The truck should only be jacked up at jacking points indicated (↑). When jacking up the front of the truck, chock the rear wheels with plastic blocks.

– To jack up the front of the truck, place the jack under the drive axle. ▷
– To jack up the rear of the truck, place the jack under the steer axle.



Wheel removal — drive axle

Refer to your local/national authority guidelines.

For example: OSHA (Occupational Safety and Health Administration)/EUWA (Association of European Wheel Manufacturers)/HSE (Health and Safety Executive).

⚠ CAUTION

Wear personal protective equipment (PPE).

Do not carry out these procedures without PPE.

⚠ DANGER

Risk of death due to explosive force.

Always ensure that the multi-piece rim wheel has been raised off the ground by methods of hydraulically raising the vehicle before deflating/inflating the multi-piece rim wheel. Secure the raised truck with an axle support device.

⚠ DANGER

Risk of death due to explosive force.

Before demounting a multi-piece rim wheel from a vehicle the operator must completely deflate the tyre by removing the valve core. Always check that the tyre is fully deflated using a tyre pressure gauge. NOTE: the valve may become blocked with ice. Check that the valve stem has not frozen.

⚠ DANGER

Risk of death due to explosive force.

Always use a restraining device during tyre deflation/inflation on multi-piece rim wheels. If a restraining device is not being used then tyres must be deflated/inflated using remote control inflation equipment. Employees must not remain in the wheel rim separation trajectory zone.

⚠ DANGER

Risk of death due to explosive force.

Fully deflate the tyre before carrying out a thorough examination of suspected damage to any wheel or tyre.

Removing an outer drive wheel

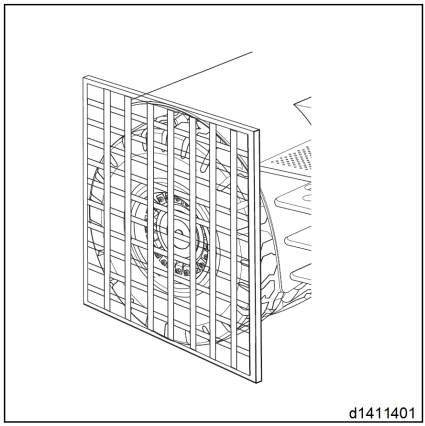
– Park the truck on level ground in a safe working area.

– Chock the wheels.

– Isolate the ignition/batteries.

– Jack up the truck at the jack points and secure with an axle support device. DO NOT RELY ON JUST THE JACK.

– Place a protection device around the wheel assembly being removed. ▷



– Remove the valve cores and fully deflate the tyres (see warnings). ▷

⚠ DANGER

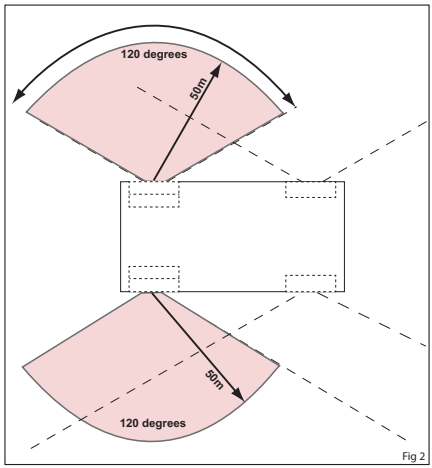
Risk of death due to explosive force.

Do not allow anyone to enter the area shown in Fig. 2 during deflation of the tyre.

⚠ CAUTION

Ensure the valve stem has not frozen during deflation.

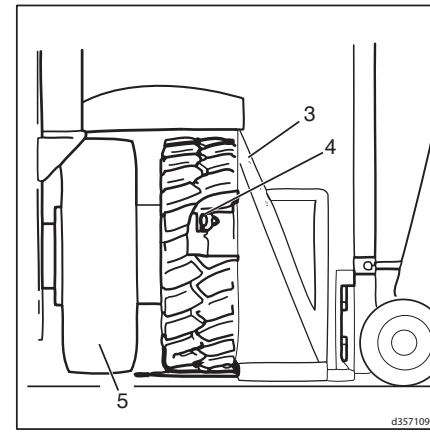
If necessary use antifreeze to prevent the valve stem freezing.



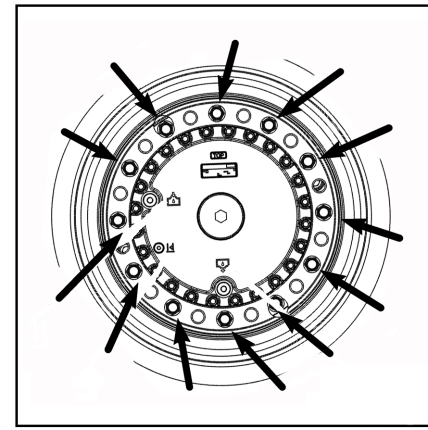
– Use a tyre pressure gauge to ensure the tyres are fully deflated.

– Remove the protection device.

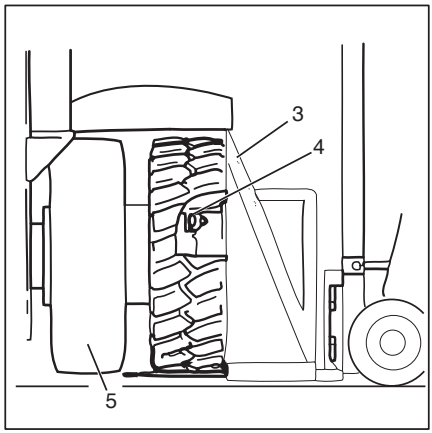
– Carefully drive the forks of a second truck with holder (3) under the outer drive wheel.
– Slowly lift the forks until the wheel rests on them. (Do not touch the inner drive wheel(5).)



– Remove all wheel fasteners(1).



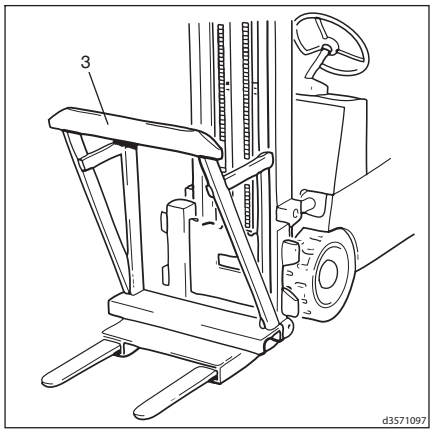
– Tilt outer wheel (4) against holder (3) and secure it. ▷
– Carefully reverse the truck with the tyre and deposit it.



Removing an inner drive wheel

– Remove the outer drive wheel.

– Carefully drive the forks of a second truck with a holder (3) under the inner drive wheel (5). ▷
– Slowly lift the forks until the wheel rests on them.
– Tilt the inner wheel against the holder and secure it.
– Carefully reverse the truck with the tyre clear of the truck.



Wheel refitting — drive axle

Refer to your local/national authority guidelines.

For example: OSHA (Occupational Safety and Health Administration)/EUWA (Association of European Wheel Manufacturers)/HSE (Health and Safety Executive).

⚠ CAUTION

Wear personal protective equipment (PPE).

Do not carry out these procedures without PPE.

⚠ DANGER

Risk of death due to explosive force.

Always ensure that the multi-piece rim wheel has been raised off the ground by methods of hydraulically raising the vehicle before deflating/inflating the multi-piece rim wheel. Secure the raised truck with an axle support device.

⚠ DANGER

Risk of death due to explosive force.

Always use a restraining device during tyre deflation/inflation on multi-piece rim wheels. If a restraining device is not being used then tyres must be deflated/inflated using remote control inflation equipment. Employees must not remain in the wheel rim separation trajectory zone.

Mounting an inner drive wheel

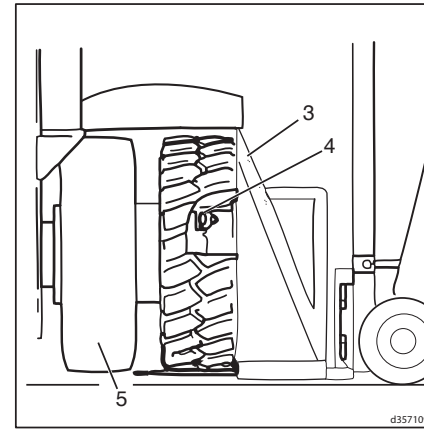
NOTE

Only use tyres approved by the manufacturer.

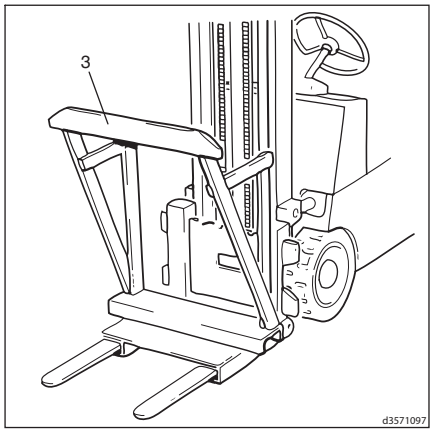
– Put the inner wheel (5) on the forks of a second truck and secure it on the holder (3).

– Clean the mating surface on the hub and rim.

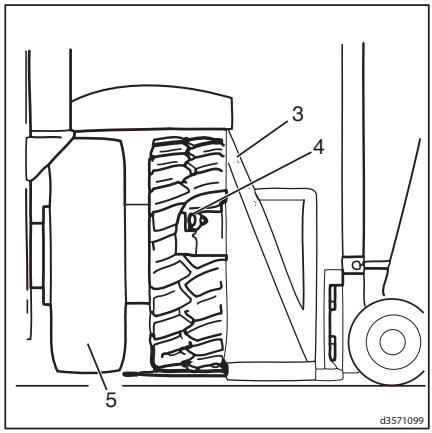
▷



– Carefully drive the truck with the wheel (5) to the wheel hub and align it. ▷



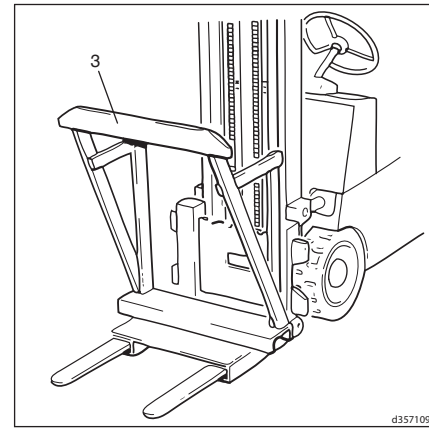
– Align the wheel (5) on the hub. ▷
– Slowly lower the forks until the drive wheel sits on the hub.
– Carefully reverse the second truck.
– Install the spacer ring.



Mounting an outer drive wheel

– Put the outer wheel on the forks of a second truck and secure it in place.

– Clean the mating surface on the hub and rim.

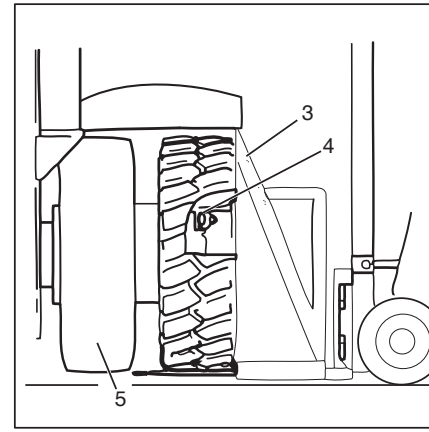


– Carefully drive the truck with the wheel (4) to the wheel hub and align it.

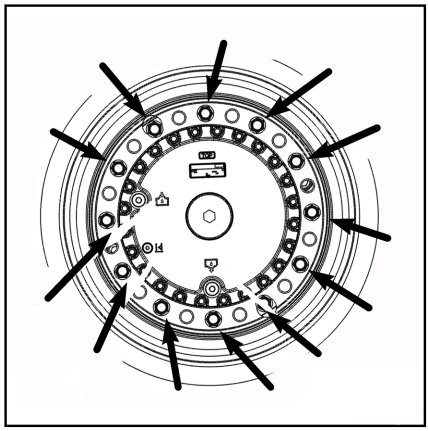
– Slide the wheel (4) over the wheel hub.

– Remove the wheel retainer on the holder (3).

– Align the wheel (4) on the hub.



– Tighten the wheel fastenings in a cross pattern to the required torque and place the wheel assembly on the hub. ▷

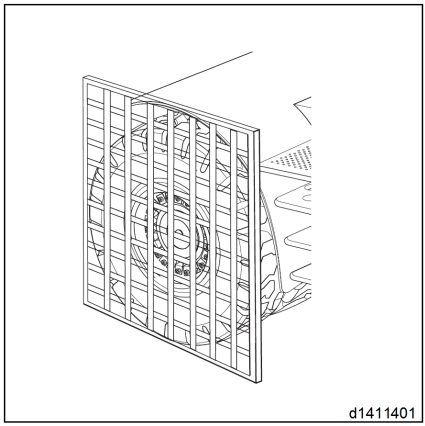


NOTE

Please refer to the Inspection and Maintenance Data table for the front wheel nut torque.

– Tighten the remaining wheel fastenings.
– Tighten all wheel fastenings diagonally across.
– Slowly lower the forks.
– Carefully reverse the second truck.

– Place the protection device around the wheel assembly. ▷



– Make sure the track area is clear.
– Inflate the tyres to 10 bar at the inflation valve.
– Inspect the wheel assembly to ensure the lock ring is correctly seated.

⚠ DANGER

Risk of death due to explosive force.

Do not hammer any part of the rim wheel while the tyre is pressurised.

– Remove the protection device.
– Remove the axle support and jack.
– After refitting the wheel, tighten the wheel fasteners, which must be retightened at least every 100 hours of operation.
– Check tyres for defects every day.
– Check tyre pressures every week.

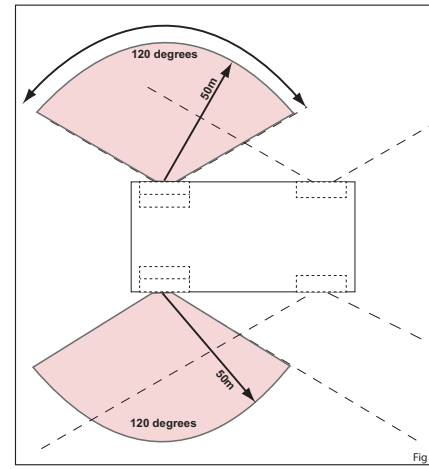


Fig 2

Check the parking brake for proper operation

– Drive the lift truck with the maximum load onto a 15 % slope.
– Apply the parking brake. The truck should not move.
– Release the parking brake.
– Stop the engine. The lift truck should not move.

NOTE

If the parking brake is not operating correctly, contact your service partner.

Brake control mechanism

NOTE

These checks must take place every service interval, PLUS after any component replacement, PLUS after any adjustment.

– Check the operation and adjustment of brake pedals.

NOTE

Ensure brake pedal movement is not obstructed.

– Adjust the brake pedal stops, to allow correct operation.
– Start the engine and test the handbrake, switch off the engine.
– Start the engine, test the foot brake, switch off the engine

NOTE

Specialist knowledge is required to carry out these procedures, please contact your service partner.

Clean and lubricate the steering axle

Cleaning the steering axle

– Lower the fork carriage fully. Park the truck properly.
– Press the emergency off switch.
– Thoroughly clean the steering axle with water or a cold-water detergent.

NOTE

After cleaning with a steam jet, lubrication is always recommended.

ENVIRONMENT NOTE

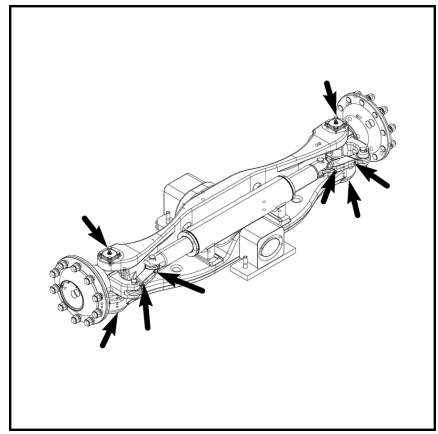
Follow recommendations regarding the use of consumables.

Lubricating the steering axle

NOTE

Lubricate with lubricating grease. Please refer to the "Recommended fuels and oils table" chapter.

– Lubricate the connecting rods and steering knuckles by adding grease via the grease nipples.
– Fill grease gun with grease until fresh grease overflows.

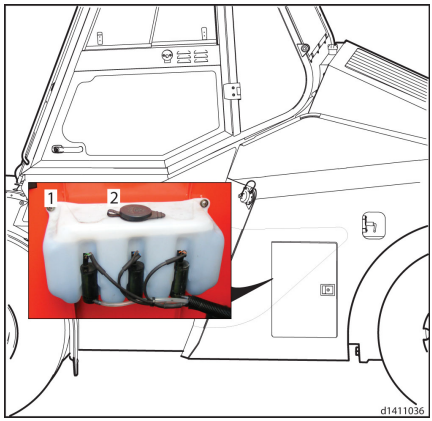


NOTE

Regularly filling lubricating grease in small amounts is better than filling lubricating grease in large amounts on an infrequent basis.

Chassis and bodywork

Filling the windscreen washer bottle



- Open battery access door to access the washer bottle (1).
- Open filler cap (2) top up if necessary.
- Replace filler cap (2).
- Close battery access door.

Check the condition of structured components

⚠ CAUTION

Danger of injury or accident.

Work on the truck on level ground. Lower the carriage, stop the engine and put the parking brake on when working.

⚠ CAUTION

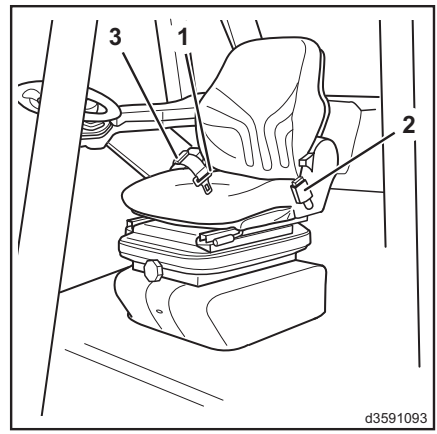
Danger of fall injuries.

This maintenance procedure requires to be carried out at heights of more than 2 metres. Use suitable access equipment.

- Examine the structural components of the truck to assure their integrity. Inspection should cover all areas of the main structures and their connections. Attention should be given to welds and material adjoining welds, particularly at changes of section, bolted interfaces and sliding pad pressure points.
- Examine the mast, lift and tilt cylinders, anchor and bearing points for damage, wear, missing lock bolts, metal fatigue, etc.
- Examine the bearings for damage, missing retaining rings and abnormal wear.

Driver's compartment

Check seat belt for condition and correct operation (option) ▷



NOTE

For safety reasons the condition and proper operation of the retention system should be inspected regularly (monthly).

Under extreme operating conditions this check is required daily before taking the truck into operation.

– Pull belt (1) out fully and inspect for fraying.
– Check lock (2) for correct operation and the retractor for proper return of the belt.
– Check covers for damage.
– Check the automatic lock.
– Park the truck on level ground.
– Pull out the belt with a jerk. The automatic lock should prevent the belt from unrolling from retractor (3).
– Slide the seat fully forward.
– Tilt the backrest fully forward.

⚠ CAUTION

Danger of injury.

Do not operate the truck with a faulty seat belt. Have a defective seat belt replaced immediately by your authorised dealer.

To prevent accidents, check that all adjustments are properly engaged before operating the truck.

Do not operate the seat adjusting devices while operating the truck.

Seat belts must be applied before operation of the truck.

After an accident, the seat belt must be renewed. In the case of seat belts attached to the operator seat, the seat and mounting of the seat must also be inspected by qualified personnel.

Nuts and bolts should be checked regularly for tightness.

An unstable seat can indicate loose bolts or other faults.

If malfunctions in the operation of the seat are detected (e.g. seat cushioning), contact your service partner immediately to eliminate the cause.

If the seat belt is not checked, you put your health in danger and there is a higher risk of accidents.

Driver's seat switch

NOTE

This switch will not prevent the startup of the truck whether the driver is seated or not.

This is activated when the driver leaves the seat while driving. When this happens the transmission will disengage and the truck will come to rest quickly.

To reset the switch

– Sit back on the driver's seat.

– Put the gear lever into neutral.

– Select forward or reverse gear.

Normal operation is restored.

Electrical system

Check the battery / batteries

⚠ CAUTION

Battery electrolyte is very caustic.

Avoid any contact with battery electrolyte. If electrolyte comes into contact with clothing, skin or eyes, flush the areas in question immediately with water. In case of eye contact see a doctor at once! Neutralize any spilled battery acid immediately!

– Check the battery / batteries for cracks in the casings, and leaked electrolyte.
– Remove any corrosion on battery terminals and check the connections for tight seating.
– Tighten the terminals and coat with non-acidic grease.

Check electric cables, connectors and connections for condition and tightness

– Examine cable connections for looseness and corrosion.
– Inspect the earth lead for loose connection.
– Examine the electrical wiring for chaffing and loose connections.

NOTE

Corroded connections and cracked cables lead to a drop in voltages, which may cause starting difficulties.

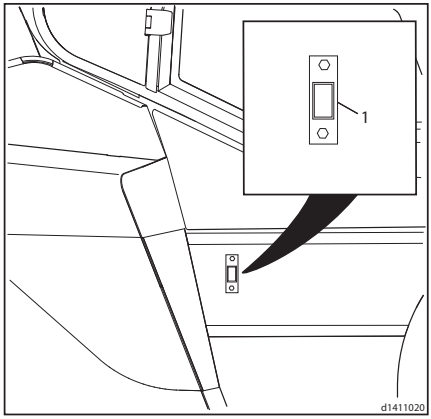
– Remove corrosion and replace cracked cables.

Hydraulic system

Hydraulic system: oil level check ▷

– Park the truck on level ground and lower the forks to the ground.

– Check sight glass (1) on the right side of the chassis. Add oil if necessary.

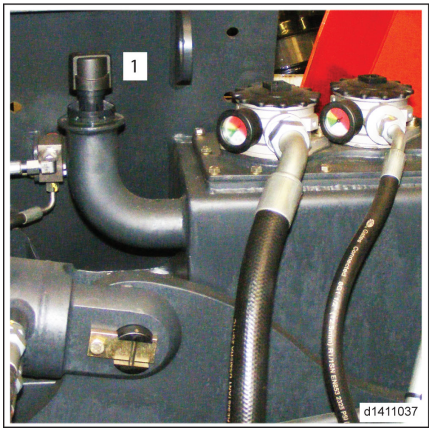


NOTE

Mast should be vertical when checking oil level.

Adding Hydraulic oil

– Remove hydraulic tank breather/filler (1) to add oil. ▷



NOTE

Observe the sight glass and fill to maximum.

Hydraulic tank capacity - 180 l approx.

Hydraulic system: check for leaks

⚠ WARNING

Risk of burns and scolds.

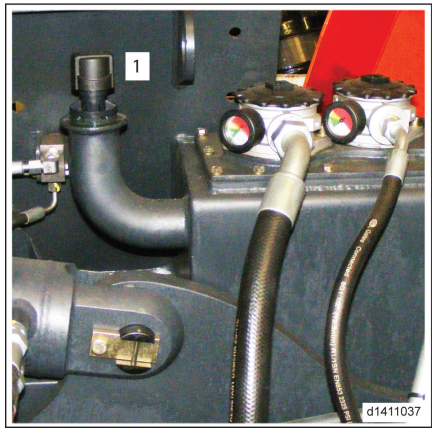
Beware of hot engine and exhaust components. Wear protective equipment.

NOTE

It is necessary to ensure that all relevant pipes are disconnected and take preventive measures to disconnect pipes before opening the radiator. It is suggested that this operation be performed by Authorized Service Provider.

– Park the truck.
– Tilt the cab.
– Open the radiator cover.
– Check all connections between the oil tank, pumps and control valves for leaks.
– Re-tighten the connections if necessary.
– Check the lift, tilt and steering cylinders for leaks.
– Replace porous hoses.
– Check lines for scuffing and replace if necessary.

Hydraulic tank breather filter - check ▷



NOTE

The truck should be at normal operating temperature, and the oil level should be correct. Raise and lower the mast twice in quick succession before performing this check.

– Slowly unscrew breather filter (1) located on the top of the hydraulic oil tank, allowing the air to escape before removing fully.

NOTE

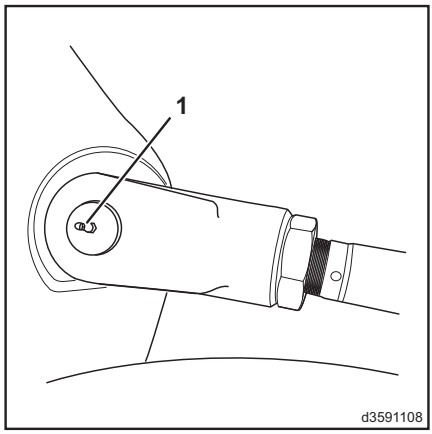
In a dusty atmosphere it may be necessary to renew the filter earlier.

– If air is not heard to escape, replace breather filter (1).
– Discard used filter according to local authority guidelines

Lifting system

Lubricate the mast and tilt cylinder pivots

Lubricate the mast pivot pins ▷



⚠ CAUTION

Danger of damage to the truck.

Take the weight off each pivot pin in turn using a suitable jack to ensure the optimum ingress of grease.

NOTE

Lubricate with grease according to the lubricant recommendations.

– Lubricate mast pivot pin (1) through the front of the mast.

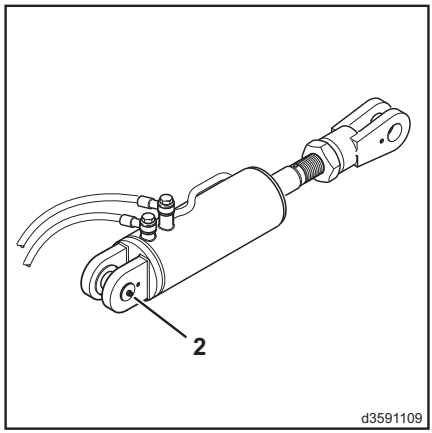
– Lubricate with grease gun until new grease is visible at the bearing.

⚠ CAUTION

Danger of accident.

Refer to safety notes on securing the mast when working on the front of the machine.

Lubricate the tilt cylinder pivots ▷



NOTE

Lubricate with grease according to the lubricant recommendations.

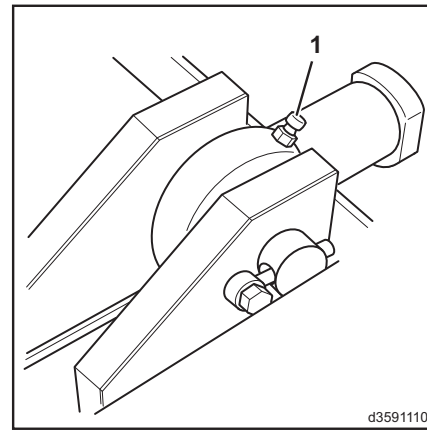
– Lubricate tilt cylinder pivots (2), two points.

– Access to the bottom two points is from the side of the tilt cylinder recess under the cab.

– Access to the top two points is on either side of the mast.

– Lubricate with grease gun until new grease is visible at the bearing.

Lubricate fork carriage cylinder bearings



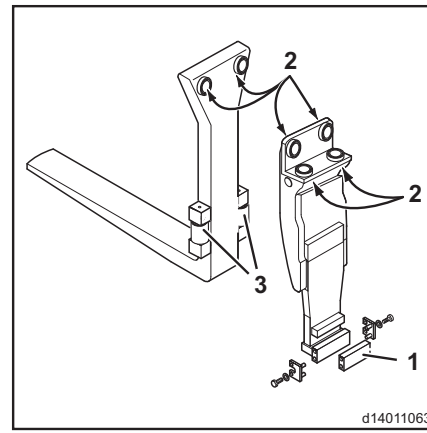
NOTE

Ensure that the forkspread is retracted sufficiently to allow access to the greasing points.

– Lubricate the universal carriage cylinders bearing (1). Two points each cylinder.

– Lubricate with grease gun until new grease is visible at the bearing.

Check the fork carrier slider pads



– Check the clearance at slider pads (1), fitted to the base of the fork carriers.

– Slider pads (1) should be changed when clearance exceeds 2 mm.

Lubricate the fork roller bearings

– Lubricate the fork roller bearings (2). Four points each fork carrier

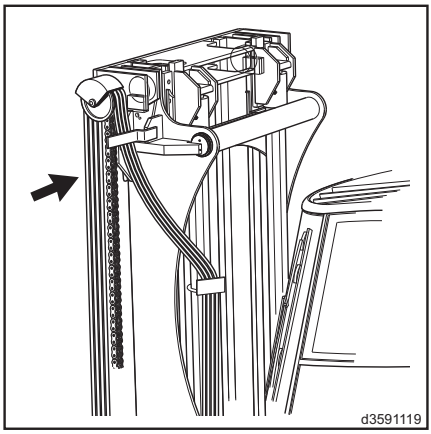
– Lubricate with grease gun until new grease is visible at the bearing.

Lubricate the fork lower rollers

– Lubricate the fork lower rollers (3).

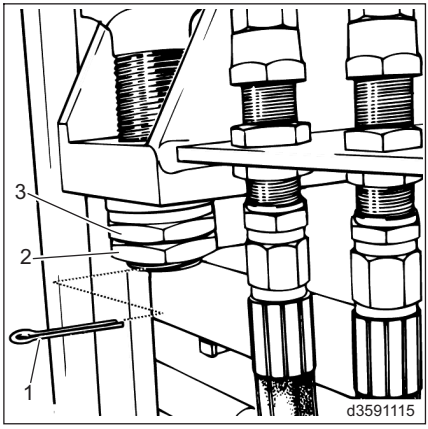
– Lubricate with grease gun until new grease is visible at the bearing.

Check the tension of double hoses ▷



– The tension of the double hoses should be 5-10 mm per meter, referred to initial length.
– Adjust the tension of the hoses to the specified dimension by sliding them in the clamps.

Check and adjust mast chains, lubricate with chain spray ▷



NOTE

After some time in service the lifting chains stretch and therefore must be checked and adjusted as necessary on the left and right sides of the mast.

– Clean the mast chains.
– Put the mast vertical.
– Remove split pin (1).
– Release locknuts (2).
– Using nuts (3), adjust the chains to allow a clearance of 12 mm (1/2 inch) between the fork heels and the floor.
– Tighten locknuts (2).
– Fit new split pin (1).

NOTE

Ensure both chains are adjusted equally.

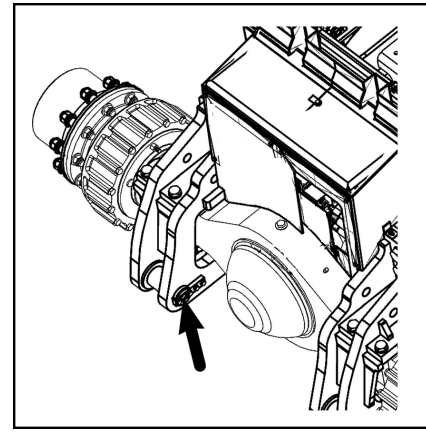
– Spray channel surfaces, pulleys and chains with chain spray.

NOTE

Trucks in service in the food industry must be lubricated with an oil approved for the food industry instead of chain spray.

Lubricate the lift mast bearings

– Use a grease gun to fill the lift mast bearings with grease until fresh grease overflows. ▷



NOTE

Refer to the "Recommended fuels and oils" table for oil types.

NOTE

Regularly filling lubricating grease in small amounts is better than filling lubricating grease in large amounts on an infrequent basis.

Troubleshooting

Troubleshooting of Engine

Problem	Possible causes	consequences and M Solutions
The drive pinion does not turn or turns too slowly.	The battery is not sufficiently charged.	Charge the battery.
	The connecting cable to the starter motor is loose.	Tighten the cable on the terminal.
	The earth connection to the battery is loose.	Tighten the cable on the terminal.
	The starter motor solenoid switch is faulty or the starter motor is faulty.	Call authorized service engineer to check.
The engine does not start or stalls again immediately.	The fuel tank is empty.	Refill the fuel tank
	The fuel filter is blocked.	Replace the fuel filter element.
	The fuel prefilter contains water.	Drain the fuel prefilter.
	The fuel prefilter is blocked.	Replace the fuel filter element.
	There are leaks or there is insufficient pressure in the low-pressure fuel circuit.	Check for leaks (visual check), replace the seals if necessary. Call authorized service engineer to test. the fuel pressure.
Engine fails to start when the ambient temperature is low.	The fuel is not resistant to cold. The flow properties of the diesel fuel are inadequate due to paraffin separation.	Malfunctions resulting from paraffin separation can be corrected by warming the entire fuel system, e.g. by parking the vehicle in a heated area; Refuel with winter fuel
	The engine oil viscosity is incorrect.	Alter the engine oil viscosity to the conditions of use; If the engine does not start after another attempt, have the cause traced and rectified at a qualified specialist workshop.
The engine stops inadvertently.	The power supply to the engine management (MCM) or the exhaust gas aftertreatment (ACM) control modules is interrupted, or there is a short circuit in the wiring.	Check the electrical fuses. Call authorized service engineer to check the power supply.
	There are leaks or there is insufficient pressure in the low-pressure fuel circuit.	Carry out a check for leaks (visual check). Call authorized service engineer to test the fuel pressure.

The engine is in emergency running mode.	There is an interruption in the engine management (MCM) control cluster data flow.	Check the battery terminals on the battery and the connectors on the control units for secure seating and corrosion. Read out the control unit's fault memory. Call authorized service engineer to check.
The engine surges, vibrates or runs irregularly.	There is a malfunction in the fuel system.	Carry out a check for leaks (visual check). Call authorized service engineer to check.
The engine's output is poor (lack of power).	The air filter is dirty or blocked.	Replace the air filter element.
	The charge-air temperature is too high; the exterior of the charge-air cooler or engine radiator is dirty.	Clean the exterior of the charge-air cooler and engine radiator.
	The coolant temperature is too high.	Check the fan speed. Please consult authorized service engineer.
	Malfunction in the fuel system (blocked, leaking).	Visual inspection for leaks. Please consult authorized Service engineer.
	Poor fuel grade.	Use the specified type of fuel and fuel grade
	The charge-air system is leaking; the hose clip on the charge-air hose is loose or damaged.	Check the charge-air system for leaks. Please consult authorized Service engineer.
	An operating restriction is activated due to an emissions-relevant malfunction.	Observe the notes on warning and indicator lamps
There is an interruption in the tractive power.	The cause must be established in authorized service engineer.	Please consult authorized Service engineer.
The engine braking effect is poor.	The cause must be established in authorized service engineer.	Please consult authorized Service engineer.
Fuel consumption is too high.	See the operating notes in the fuel consumption section	If the problems cannot be fixed, consult authorized Service engineer.
The engine gets too hot (according to the coolant temperature gauge).	There is not enough coolant in the coolant circuit.	Add coolant and bleed the system.
	The coolant temperature sensor or display is faulty.	Please consult authorized Service engineer.
	The poly-V-belt is damaged.	Please consult authorized Service engineer.
	The fan does not switch on correctly.	Please consult authorized Service engineer.
	The engine radiator is dirty on the inside; the engine radiator is very dirty on the outside.	Clean the engine radiator.

	The thermostat is faulty.	Please consult authorized Service engineer.
Indicator lamps do not light up at IGNITION ON.	The lamps are faulty or the electrical cables are interrupted.	Please consult authorized Service engineer.
The charge current indicator lamp lights up when the engine is running.	The poly-V-belt slipping.	check the belt tensioner function. Check That the poly-V-belt contact surfaces are not torn, damaged, oily or worn down. Please consult authorized Service engineer.
	The poly-V-belt is torn.	Please consult authorized Service engineer.
	The alternator or sensor is faulty.	Please consult authorized Service engineer.
The engine is knocking .	The engine is misfiring.	The wrong fuel or fuel of lower quality has refilled (see the service products section on diesel fuel) Exchange the fuel in the tank Please consult authorized Service engineer.
	There is bearing damage.	Please consult authorized Service engineer.
There are abnormal sounds	The air intake pipe and exhaust gas pipe are leaking, causing a whistling noise.	Please consult authorized Service engineer.
	The turbing or compressor wheel is scraping the housing; There are foreign objects in the compressor or turbine housing; bearing have seized on the rotating parts.	Call authorized service engineer to check the exhaust gas turbocharger.
	The valve clearance is excessive.	Please consult authorized Service engineer.
	The poly-V-belt is slipping.	Check that the poly-V-belt contact surfaces are not torn, damaged, oily or worn down. Consult authorized Service engineer.

Troubleshooting guide (Hydraulic system)

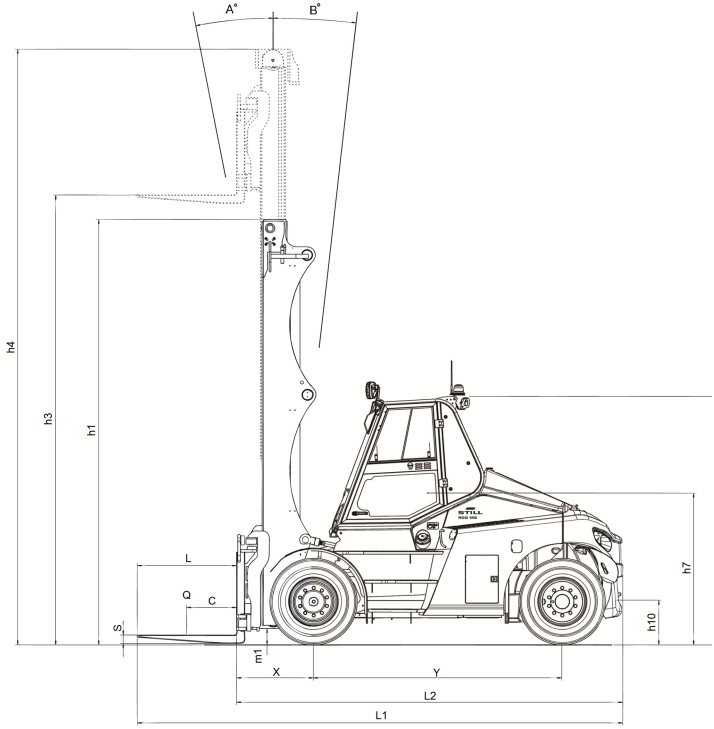
Abnormal noise	Suction filter restricted.	Renew the filter.
	Suction hoses leaking, oil foaming.	Tighten lines. Replace suction hoses. Check oil level, top up if necessary.
	Incorrect oil viscosity, low oil level in tank or in hydraulic pump.	Change oil, be sure to use the correct viscosity, top up oil.
	Hydraulic pump or motor failure, seals defective, causing air intake.	Contact your service partner.
No or too low pressure in system	Pipe broken or leaking.	Replace or tighten line.
	Oil of low viscosity, causing high leakage losses.	Change oil, be sure to use oil of correct viscosity.
	Oil temperature warning lamp illuminated.	Check oil level, clean oil cooler.
	Pump suction defective, noise.	Change oil, top up oil. Contact your service partner.
	Pump failure, leakages, pressure valves do not close, valve seat damage.	Contact your service partner.
Oil pressure fluctuating	Mast does not extend completely or retracts slightly after being extended.	Top up hydraulic oil.
	Cause as under abnormal noise.	See abnormal noise.
	Pressure limiting valves or boost pressure valves sticking.	Contact your service partner.
	Lift and tilt cylinders have tight spots.	Contact your service partner.
No oil flow or low oil flow	Filter restricted (if accompanied by noise).	Clean or replace filter.
	Pipe broken or leaking.	Tighten or replace line.
	Hydraulic system overheating.	Check oil level, use specified oil, clean oil cooler, if needed.
	Valves restricted.	Contact your service partner.
	Pump failure, leakages, pressure limiting valves do not close, valve seat damaged.	Contact your service partner.

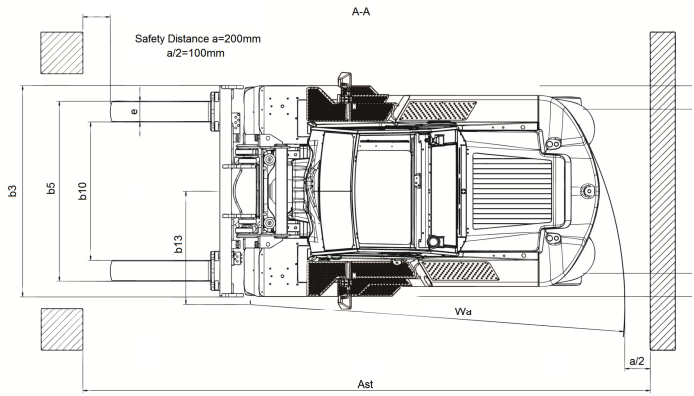
Hydraulic oil temperature too high	Oil level too low or oil cooler defective.	Check oil level, if necessary top up oil. Clean cooler and check for leaks. If defective, contact your service partner.
	Pump failure, valves leaking.	Contact your service partner.

6

Technical data

Truck dimensions





Overview of type sheets - 600mm load centre

All data refers to standard equipment with standard lift masts.
All data must be observed without fail.

1 Key data				
1.1	Manufacturer			Still
1.2	Manufacturer's type designation			RCD100/600
				RCD120/600
				RCD140/600
				RCD150/600
				RCD160/600
				RCD180/600
1.3	Drive			Diesel
1.4	Operation			Seated
1.5	Load capacity/load	RCD100	Q [t]	10
		RCD120		12
		RCD140		14
		RCD150		15
		RCD160		16
		RCD180		18
1.6	Load centre of gravity	RCD100, RCD120, RCD140, RCD150, RCD160, RCD180	c [mm]	600
1.8	Load distance	RCD100, RCD120	x [mm]	847
		RCD140, RCD150, RCD160, RCD180		884
1.9	Wheelbase	RCD100, RCD120, RCD140	y [mm]	3000
		RCD150, RCD160, RCD180		3250

2 Weight				
2.1	Net weight	RCD100	kg	16299
		RCD120		16453
		RCD140		19082

2 Weight				
		RCD150		19253
		RCD160		19721
		RCD180		21591
2.2	Axle load with front/rear load	RCD100	kg	23150/3149
		RCD120		26163/2290
		RCD140		30496/2586
		RCD150		31500/2753
		RCD160		32935/2786
		RCD180		36144/3447
2.3	Axle load without front/rear load	RCD100	kg	8327/7971
		RCD120		8375/8078
		RCD140		9570/9511
		RCD150		9651/9602
		RCD160		9629/10091
		RCD180		9675/11916

3 Wheels, chassis frame				
3.1	Tyres: solid rubber, super elastic, pneumatic, polyurethane			p/p
3.2	Front tyre size	RCD100, RCD120		10.00 x 20 16pr
		RCD140, RCD150, RCD160, RCD180		12.00 x 20 20pr
3.3	Rear tyre size	RCD100, RCD120		10.00 x 20 20pr
		RCD140, RCD150, RCD160, RCD180		12.00 x 20 20pr
3.4	Wheels, number, front/rear (x = driven)	RCD100, RCD120, RCD140, RCD150, RCD160, RCD180		4x/2
3.6	Front track width	RCD100, RCD120, RCD140, RCD150, RCD160, RCD180	b_{10} [mm]	1874

3 Wheels, chassis frame				
3.7	Rear track width	RCD100, RCD120, RCD140, RCD150, RCD160, RCD180	b_{11} [mm]	1970
3.8	Rolling radius	RCD100, RCD120	r_1 [mm]	539
		RCD140, RCD150, RCD160, RCD180		569

4 Basic dimensions				
4.1	Lift mast/fork carriage tilt, forwards/backwards		α/β (°)	15/10
4.2	Height with lift mast retracted	RCD100, RCD120	h_1 [mm]	3404
		RCD140, RCD150, RCD160, RCD180		3736
4.4	Lift	RCD100, RCD120, RCD140, RCD150, RCD160, RCD180	h_3 [mm]	4000
4.5	Height with lift mast extended	RCD100, RCD120	h_4 [mm]	5329
		RCD140, RCD150, RCD160, RCD180		5661
4.7	Height above overhead guard (cab)	RCD100, RCD120	h_6 [mm]	3010
		RCD140, RCD150, RCD160, RCD180		3035
4.8	Seated height/standing height	RCD100, RCD120	h_7 [mm]	1974
		RCD140, RCD150, RCD160, RCD180		2004

4 Basic dimensions				
4.12	Coupling height	RCD100, RCD120	h_{10} [mm]	550
		RCD140, RCD150, RCD160, RCD180		580
4.19	Total length	RCD100, RCD120	l_1 [mm]	5984
		RCD140		6066
		RCD150, RCD160		6316
		RCD180		6516
4.20	Length including fork back	RCD100, RCD120	l_2 [mm]	4584
		RCD140		4666
		RCD150, RCD160		4916
		RCD180		5116
4.21	Total width	RCD100, RCD120	b_1	2530
		RCD140, RCD150, RCD160, RCD180		2565
4.22	Fork arm dimensions	RCD100, RCD120	s/e/l [mm]	90 x 200 x 1400
		RCD140, RCD150, RCD160, RCD180		100 x 200 x 1400
4.23	Fork carriage according to ISO 2328, class/form A, B			Hydraulic fork positioner
4.24	Fork carriage width	RCD100, RCD120, RCD140, RCD150, RCD160, RCD180	b_3 [mm]	2545
4.25	Fork spread	RCD100, RCD120	b_5 [mm]	610 / 2274
		RCD140, RCD150, RCD160, RCD180		620 / 2220

4 Basic dimensions				
4.31	Ground clearance with load under lift mast	RCD100, RCD120	m_1 [mm]	172
		RCD140, RCD150, RCD160, RCD180		200
4.32	Ground clearance at centre of wheelbase	RCD100, RCD120	m_2 [mm]	346
		RCD140, RCD150, RCD160, RCD180		376
4.33	Aisle width for pallet 1000 x 1200 crosswise	RCD100, RCD120	A_{st} [mm]	6149
		RCD140		6186
		RCD150, RCD160		6422
		RCD180		6596
4.34	Aisle width for pallet 800 x 1200 lengthwise	RCD100, RCD120	A_{st} [mm]	6349
		RCD140		6386
		RCD150, RCD160		6622
		RCD180		6796
4.35	Turning radius	RCD100, RCD120, RCD140	W_a [mm]	4102
		RCD150, RCD160		4338
		RCD180		4512
4.36	Smallest pivot point distance	RCD100, RCD120, RCD140	b_{13} [mm]	1362
		RCD150, RCD160, RCD180		1405

5 Performance data				
5.1	Driving speed with/without load	RCD100	km/h	27.9/29.1
		RCD120		27.6/29.1
		RCD140, RCD150		28.3/30.2
		RCD160		28.1/30.1

5 Performance data				
		RCD180		28.1/29.8
5.2	Lifting speed with/without load	RCD100, RCD120, RCD150	m/s	0.40/0.42
		RCD140, RCD180		0.37/0.40
		RCD160		0.40/0.42
5.3	Lowering speed with/without load	RCD100, RCD120, RCD150, RCD160	m/s	0.45/0.40
		RCD140, RCD180		0.42/0.38
5.5	Tractive force with/without load	RCD100	kN	98.5 / 100.5
		RCD120		98.3 / 100.6
		RCD140		92.8 / 95.5
		RCD150		103.0 / 105.9
		RCD160		102.7 / 105.8
		RCD180		102.6 / 105.3
5.7	Climbing capability with/without load	RCD100	%	41.3 / 80.8
		RCD120		37.6 / 79.7
		RCD140		29.8 / 59.3
		RCD150		32.2 / 67.7
		RCD160		30.6 / 65.3
		RCD180		30.3 / 55.6
5.10	Service brake			Wet disc

6 Battery voltage, rated capacity				
6.1		RCD100, RCD120 RCD140, RCD150, RCD160, RCD180	V/aH	2 x 12 / 95

7 Drive/engine				
7.1	Engine manufacturer/model			Mercedes MTU 4R1000
7.2	Engine power rating in accordance with ISO 1585	RCD100, RCD120, RCD140	kW	129 or above

7 Drive/engine				
		RCD150, RCD160		150 or above
		RCD180		170
7.3	Nominal speed		rpm	2200
7.4	Number of cylinders/displacement		cm^3	4/5100

8 Other			
8.1	Traction controller type		Torque converter 3/3
8.2	Working pressure for attachments	bar	250
8.3	Oil flow for attachments	l/min	5-130
8.4	Noise level at the driver's ear	dB (A)	70
8.5	Tow coupling, type/model	∅ (mm)	50

Overview of type sheets - 1200 mm load centre

All data refers to standard equipment with standard lift masts.
All data must be observed without fail.

1 Key data				
1.1	Manufacturer			Still
1.2	Manufacturer's type designation			RCD100/1200
				RCD120/1200
				RCD140/1200
				RCD150/1200
				RCD160/1200
1.3	Drive			Diesel
1.4	Operation			Seated
1.5	Load capacity/load	RCD100	Q [t]	10
		RCD120		12
		RCD140		14
		RCD150		15
		RCD160		16
1.6	Load centre of gravity	RCD100, RCD120, RCD140, RCD150, RCD160	c [mm]	1200

Overview of type sheets - 1200 mm load centre

1 Key data				
1.8	Load distance	RCD100, RCD120	x [mm]	884
		RCD140, RCD150, RCD160		929
1.9	Wheelbase	RCD100	y [mm]	3000
		RCD120, RCD140		3250
		RCD150, RCD160		3500

2 Weight				
2.1	Net weight	RCD100	kg	19273
		RCD120		20725
		RCD140		22113
		RCD150		21981
		RCD160		22785
2.2	Axle load with front/rear load	RCD100	kg	27238/2036
		RCD120		30464/2261
		RCD140		33565/2548
		RCD150		34553/2428
		RCD160		36156/2629
2.3	Axle load without front/rear load	RCD100	kg	10141/9133
		RCD120		10769/9956
		RCD140		10394/11719
		RCD150		10429/11552
		RCD160		10424/12362

3 Wheels, chassis frame				
3.1	Tyres: solid rubber, super elastic, pneumatic, polyurethane			p/p
3.2	Front tyre size	RCD100, RCD120, RCD140, RCD150, RCD160		12.00 x 20 / 20pr
3.3	Rear tyre size	RCD100, RCD120, RCD140, RCD150, RCD160		12.00 x 20 / 20pr

3 Wheels, chassis frame				
3.4	Wheels, number, front/rear (x = driven)	RCD100, RCD120, RCD140, RCD150, RCD160		4x / 2
3.6	Front track width	RCD100, RCD120, RCD140, RCD150, RCD160	b_{10} [mm]	1874
3.7	Rear track width	RCD100, RCD120, RCD140, RCD150, RCD160	b_{11} [mm]	1970
3.8	Rolling radius	RCD100, RCD120, RCD140, RCD150, RCD160	r_1 [mm]	569

4 Basic dimensions				
4.1	Lift mast/fork carriage tilt, forwards/backwards		α/β (°)	15/10
4.2	Height with lift mast retracted	RCD100, RCD120, RCD140, RCD150, RCD160	h_1 [mm]	3736
4.4	Lift	RCD100, RCD120, RCD140, RCD150, RCD160	h_3 [mm]	4000
4.5	Height with lift mast extended	RCD100, RCD120, RCD140, RCD150, RCD160	h_4 [mm]	5661
4.7	Height above overhead guard (cab)	RCD100, RCD120, RCD140, RCD150, RCD160	h_6 [mm]	3035

4 Basic dimensions				
4.8	Seated height/standing height	RCD100, RCD120, RCD140, RCD150, RCD160	h_7 [mm]	2004
4.12	Coupling height	RCD100, RCD120, RCD140, RCD150, RCD160	h_{10} [mm]	580
4.19	Total length,	RCD100	l_1 [mm]	6984
		RCD120		7316
		RCD140		7516
		RCD150, RCD160		7766
4.20	Length including fork back	RCD100	l_2 [mm]	4584
		RCD120		4916
		RCD140		5116
		RCD150, RCD160		5366
4.21	Total width	RCD100, RCD120, RCD140, RCD150, RCD160	b_1	2565
4.22	Fork arm dimensions	RCD100, RCD120	s/e/l [mm]	100 x 200 x 2400
		RCD140, RCD150, RCD160		100 x 250 x 2400
4.23	Fork carriage according to ISO 2328, class/form A, B			Hydraulic fork positioner
4.24	Fork carriage width	RCD100. RCD120, RCD140, RCD150, RCD160	b_3 [mm]	2545
4.25	Fork spread	RCD100, RCD120	b_5 [mm]	620 / 2220
		RCD140, RCD150, RCD160		720 / 2290

4 Basic dimensions				
4.31	Ground clearance with load under lift mast	RCD100, RCD120, RCD140, RCD150, RCD160	m_1 [mm]	200
4.32	Ground clearance at centre of wheel-base	RCD100, RCD120, RCD140, RCD150, RCD160	m_2 [mm]	376
4.33	Aisle width for pallet 1000 x 1200 cross-wise	RCD100	A_{st} [mm]	6186
		RCD120		6422
		RCD140		6641
		RCD150, RCD160		6883
4.34	Aisle width for pallet 800 x 1200 length-wise	RCD100	A_{st} [mm]	6386
		RCD120		6622
		RCD140		6841
		RCD150, RCD160		7083
4.35	Turning radius	RCD100	W_a [mm]	4102
		RCD120		4338
		RCD140		4512
		RCD150, RCD160		4754
4.36	Smallest pivot point distance	RCD100	b_{13} [mm]	1362
		RCD120, RCD140		1405
		RCD150, RCD160		1448

5 Performance data				
5.1	Driving speed with/without load	RCD100	km/h	28.8 / 30.1
		RCD120		28.4 / 29.9
		RCD140		28.1 / 29.8
		RCD150		27.9 / 29.8
		RCD160		27.7 / 29.7
5.2	Lifting speed with/without load	RCD100	m/s	0.37/0.40
		RCD120, RCD140, RCD150		0.40/0.42
		RCD160		0.37/0.42

5 Performance data				
5.3	Lowering speed with/without load	RCD100	m/s	0.42/0.38
		RCD120, RCD140, RCD150, RCD160		0.45/0.40
5.5	Tractive force with/without load	RCD100	N	93.5 / 95.5
		RCD120		92.9 / 95.2
		RCD140		102.6 / 105.3
		RCD150		102.4 / 105.4
		RCD160		102.1 / 105.2
5.7	Climbing capability with/without load	RCD100	%	34.4 / 58.5
		RCD120		30.2 / 53.0
		RCD140		30.3 / 55.6
		RCD150		29.4 / 56.0
		RCD160		27.8 / 53.4
5.10	Service brake			Wet disc

6 Battery voltage, rated capacity				
6.1		RCD100, RCD120, RCD140, RCD150, RCD160	V/aH	2 x 12 / 95

7 Drive/engine				
7.1	Engine manufacturer/model			Mercedes MTU 4R1000
7.2	Engine power rating in accordance with ISO 1585	RCD100, RCD120	kW	129 or above
		RCD140, RCD150, RCD160		150 or above
7.3	Nominal speed		rpm	2200
7.4	Number of cylinders/displacement		cm^3	4/5100

8 Other			
8.1	Traction controller type		Torque converter 3 / 3
8.2	Working pressure for attachments	bar	250
8.3	Oil flow for attachments	l/min	5-130

8 Other			
8.4	Noise level at the driver's ear	dB (A)	70
8.5	Tow coupling, type/model	∅ (mm)	50

Description of technical datasheet

⚠ CAUTION

The parameters listed in the technical datasheet are examples of parameters for a specific configuration model in this range and are for reference only.

The model configuration delivered to the user may differ from the technical datasheet. For details, please refer to the forklift product datasheet provided with the vehicle or in the sales contract/quotation signed externally by the manufacturer or with the delivery receipt.

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