



Diesel truck

Linde Material Handling

Linde

Original instructions

Series 396-02

**H50D-02, H60D-02,
H70D-02, H80D-02**

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Linde – Your Partner



With over 100,000 fork lift trucks and warehouse machines sold annually, Linde is one of the world's leading manufacturers of material handling equipment. There are many reasons for this success: Linde products are renowned not only for their innovative, cutting-edge technology, but also for their low energy and operating costs, which are up to 40 per cent lower than those of their competitors.

The high quality of Linde products is also matched by the quality of our service. With ten production plants worldwide and an extensive network of sales partners, we are at your service round the clock and around the world.

Your local Linde partner can offer you a complete package from a single source; ranging from expert advice on all aspects of sales and service through, of course, to appropriate finance options. Our leasing, hire or lease-purchase agreements provide you with the flexibility to tailor decision-making to your individual business requirements.

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1	Introduction	
	Your forklift truck	2
	Intended use	3
	Impermissible use	4
	Description of use and climatic conditions	5
	Symbols used	5
	Technical description	5
	Taking delivery of the industrial truck	7
	Legal requirements for placing on the market	8
2	Safety	
	Safety guidelines	10
	Residual risks	11
	Stability	12
	In the case of tip-over	12
	Handling consumables	12
	Competent person	13
	Regulations	13
	Instructions for fitting attachments	14
	Fork carriage emergency lowering	15
	Emergency exit with attached rear window	16
3	Overview	
	Identification plates	20
	Truck overview	22
	Controls	23
	Switch panel	24
4	Operation	
	Service plan before initial commissioning	26
	Instructions for running-in	26
	Standard equipment	27
	Entering and exiting the truck	27
	Adjusting the standard driver's seat and comfort driver's seat	27

Adjusting the height-adjustable comfort driver's seat	29
Adjusting the luxury driver's seat	31
Adjusting the armrest	34
Setting the clock	35
Seat belt	35
Starting and stopping the internal combustion engine (dual-pedal operation)	37
Driving (dual-pedal operation)	40
Starting and stopping the internal combustion engine (single-pedal operation)	43
Driving (single-pedal operation)	48
Steering system	51
Brake system	51
Signal horn	53
Joystick with central lever operation	54
Joystick with single lever operation	60
Particle filter regeneration	67
Special equipment	78
Depressurisation	78
Driver's cab	78
Lighting	79
Windscreen wiper	81
Window heater	85
Heating system, air conditioning	85
Linde Forklift Data Management (LFM)	91
Adjusting the driver's seat with rotating device	98
Lift mast positioning	99
Sweeper function	101
Working with a load	105
Before picking up a load	105
Adjusting the fork arm distance	106
Taking up loads	107
Travelling with load	108
Setting down loads	109
Towing device	109
Before exiting the truck	111
Before leaving the truck	111
Loading/transporting	112
Removing the lift mast	112
Securing the overhead guard against moving forwards or backwards	112
Loading	112
Transportation by lorry or low-bed semi-trailer	114

5 Maintenance

General information	116
Inspection and maintenance data	117
Recommendations for consumables	118
Inspection and maintenance overview	121
Service plan as required	121
50-hour service plan	122
1000-hour service plan	123
2000-hour service plan	125
3000-hour service plan	127
6000-hour service plan	129
Engine	132
Checking the engine oil level	132
Changing the engine oil	133
Changing the engine oil filter	135
Fuel	136
Draining water from the fuel pre-filter	138
Changing the fuel filter	139
Changing the fuel pre-filter	140
Bleeding the fuel system	142
Cleaning the fuel tank ventilation hose	143
Checking the coolant level	144
Changing the coolant	145
Checking the coolant concentration	148
Cleaning the water cooler and hydraulic oil cooler, and checking them for leaks	149
Checking the condition and secure positioning of the engine support and engine mounting	151
Checking the condition and tension of the V-ribbed belt	152
Changing the V-ribbed belt	153
Changing the air filter cartridge, checking the vacuum-operated switch	154
Changing the air filter safety cartridge	155
Checking the dust discharge valve	156
Cleaning the prefilter (special equipment)	157
Cleaning the oil bath air filter (special equipment)	158
Changing the oil in the oil bath air filter (special equipment)	159
Checking the intake and exhaust pipes for leaks	160
Draining water from the intercooler	160
Checking the valve clearance	160
Checking the particle filter system	161
Changing spark plugs on the burner of the particle filter	161
Changing the crankcase bleeder valve	161

Gearbox	162
Planetary transmission: Checking the oil level and checking for leaks	162
Planetary transmission: Changing the oil and cleaning the magnetic plug	162
Checking the fastenings of the axle clamps	164
Checking the hydraulic pump's mounting on the engine	164
Chassis, bodywork and fittings	166
Cleaning the truck	166
Bonnet	166
Floorplate	167
Maintaining the heating system and air conditioning (special equipment)	168
Checking the seat belt for condition and function	170
Checking the mounting of the chassis, tilt cylinders and steering axle	172
Lubricating the overhead guard bearings and tilt cylinder bearings	172
Checking and oiling other bearing points and joints	173
Washer system: Topping up the water tank	173
Chassis frame	175
Wheel change	175
Tightening the wheel fastenings	176
Checking tyres for damage and foreign objects	176
Check the tyre pressure	177
Checking the condition of the antistatic belt	179
Cleaning and greasing the steering axle	179
Checking the mountings of the steering cylinder and steering pivot pin	180
Operating devices	181
Checking the parking brake for correct operation	181
Checking the pedal group	181
Checking the bellows at the actuating lever	182
Electrics	183
Checking the condition and secure positioning of electric cables, cable connectors and connections	183
Battery: checking the condition, acid level and acid density	183
Hydraulics	187
Changing the hydraulic oil	187
Hydraulic system: Checking the oil level	189
Hydraulic system: changing the filters	190
Checking the bleeder valve on the hydraulic tank for correct operation	194
Checking the hydraulic system for leaks	195
Checking the pre-load of the double hoses	196
Load lift system	197
Working on the lift mast and at the front of the truck	197

Cleaning and spraying the lift mast chain	199
Checking the mounting, condition and function of the lift mast, lift mast chains, lift cylinders and end stops	200
Adjusting the lift mast chain	200
Checking fork arms and arm safety devices	202
Lubricating the mast fixation	203
Self-help	204
Opening the cover to the electrical system	204
Fuses for special electrical equipment	204
Opening the central electrical system cover	206
Fuses for basic electrical equipment	207
Fuses for heating system, air conditioning (special equipment)	208
Diagnostic connector	208
Malfunctions during operation	209
Malfunctions, Causes and Remedies (diesel engine)	211
Malfunctions, causes and remedies — hydraulic system	214
Jump start	216
Towing	217
Shutting down	222
Shutting down the truck	222
Disposal of old trucks	223

6 Technical data

Type sheet H50D-02, as at 07/2012	226
Type sheet H60D-02, as at 07/2012	229
Type sheet H70D-02, as at 07/2012	232
Type sheet H80D-02, as at 07/2012	235
Type sheet H80D-02/900, as at 07/2012	238
Type sheet H80D-02/1100, as at 07/2012	241
Truck configuration	244
Tyre variants and rim sizes	245
Load capacity diagrams and lift mast data as at 11/2011	247
Additional capacity rating plate for attachments	250
Noise emission values	251
Vibration characteristic values for bodily vibrations	252

Introduction

1 Introduction

Your forklift truck

Your forklift truck

offers optimum economic efficiency, safety and driving comfort. It is primarily down to you to maintain these characteristics for a long time and take advantage of the resulting benefits.

During manufacture:

- all safety requirements of the relevant EC directives were observed
- all conformity assessment procedures stipulated in the applicable directives were carried out

This is attested by the CE mark shown on the nameplate.

These operating instructions contain everything you need to know about commissioning, driving and maintenance.

Carry out the specified work regularly, at the due times and using the consumables envisaged for this purpose in accordance with the inspection and maintenance overview. Please make sure that you record any work performed in the registration document for the industrial truck; this is essential for any warranty claims.

The designations used in the text (front, back, left, right) always refer to the installation position of the parts described, with forwards as the drive direction for the truck (fork arms forwards).

Servicing work not described here will require specialist knowledge, measuring devices and frequently also special tools. Please ask your authorised dealer to carry out this work.

Servicing should only be carried out by qualified personnel approved by Linde (specialists).

With orders for parts, please specify the following along with the parts numbers:

Truck model:	
Chassis number/year of manufacture:	
Handover date:	

to be specified. The production number must also be specified for parts from the following units: engine, lift mast, hydraulic variable displacement pump, planetary transmission and steering axle.

Engine number:	
Lift mast number:	
Lift mast lift:	
Hydraulic variable displacement pump number:	
Working hydraulics hydraulic pump number:	
Steering hydraulics hydraulic pump number:	
Planetary transmission number:	
Steering axle number:	

When taking over the truck, this data should be copied from the identification plates of the units into these operating instructions.

NOTE

In the event of repairs, only use genuine Linde spare parts. This is the only way to guarantee that your truck remains in the same technical condition as at the time of reception.

Please address all queries and orders for spare parts relating to your truck only to your authorised dealer, stating your mailing address.

Linde is constantly engaged in the further development of its products. We ask for your

understanding that figures and technical data are subject to technical modification in terms of form, equipment and expertise in the interest of progress.

For this reason, no claims can be asserted on the basis of the following data, figures and descriptions in these operating instructions.

Intended use

The industrial truck may only be used as permitted.

The industrial truck is used for moving and lifting the loads indicated on the capacity rating plate.

Damages and defects

Damages and other defects to industrial trucks or to attachments must be reported to the Supervisor immediately. Industrial trucks and attachments which are not safe to operate may not be used until they have been properly repaired.

Safety installations and switches may not be removed or rendered unusable. Specified settings may only be changed with the approval of the manufacturer.

Danger areas

Danger areas are those areas in which persons are in danger as a result of the movements of industrial trucks, their operating equipment, their load carrying devices (e.g. their attachments) or the loaded goods. This also includes the area which can be reached by falling goods or lowering or falling operating equipment and devices.

No other persons may stand in the danger area of an industrial truck.

Working areas

Only the areas approved by the operator or his representative may be used for transportation purposes. Loads may only be deposited or stored at the intended places.

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

In operating areas with magnetic fields that have a magnetic flux density greater than 5 mT, unintentional truck and lift mast movements cannot be entirely excluded under unfavourable circumstances. In this case components developed especially for this purpose must be used.

Driving routes

Driving routes shall be sufficiently paved, level and free of objects. Drain channels and railways crossings, etc., shall be levelled and, if necessary, covered with ramps in such a way that they can be driven over without bumps as far as possible.

Industrial trucks shall only be used on routes without sharp curves, excessive slopes and gates which are too narrow or too low.

Inclines used by industrial trucks shall not exceed the limits specified by the manufacturer and must have an adequately rough surface. Level and smooth transitions at the upper and lower end shall prevent the load from touching the floor or causing damages to the chassis.

The admissible area and point load of driving lanes or routes may not be exceeded. There shall be an adequate clearance between the highest parts of industrial trucks or the load and the fixed parts of the surrounding areas.

The EU Directive 89/654/EEC (Minimum Regulations for Health and Safety at Work) shall be observed. The respective national regulations apply for non-EU countries.

Danger points on driving lanes or routes shall be secured or marked by the customary road

1 Introduction

Impermissible use

traffic signs and by additional warning signs, if necessary.

When driving on public roads, the corresponding regulations must be observed, as well as country-specific restrictions for winter road conditions.

Fire protection

The operator is responsible for adequate fire protection in the vicinity of the industrial truck. Depending on the form of use, he is responsible for additional fire protection on the industrial truck. Enquiries should be directed to the responsible supervisory authority in case of doubt.

Attachments

Attachments shall only be used as permitted. The driver shall be instructed in the handling of attachments.

The attachment operating instructions are enclosed for trucks that are delivered from the factory with an attachment. Before commissioning a truck with an attachment, you must check that loads are handled securely. Depending on the type of attachment, it may be necessary to make adjustments, e.g. pressure settings or adjusting stops and operating speeds. See the attachment operating instructions for the corresponding instructions.

If attachments are not supplied with the industrial truck, the specifications of the industrial

truck manufacturer and the attachment manufacturer must be observed.

The attachments and the connection of power supplies for powered attachments may only be made by specialists in accordance with the specifications of the manufacturer. The proper functioning of the attachments shall be checked after each installation before initial use.

The permissible carrying capacity of the attachments and the permitted load of the industrial truck (carrying capacity and load moment) combined with the attachments shall not be exceeded., refer to additional capacity rating plate.

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

Trailers

Industrial trucks may only be used to tow trailers if they are intended for this purpose by the manufacturer and if they are fitted with the appropriate trailer coupling. The maximum towed load specified in the operating instructions for unbraked or braked trailers must not be exceeded.

The towing industrial truck must be operated in such away that safe driving and braking of the towed vehicle is ensured for all driving movements.

Impermissible use

DANGER

High risk of property damage, injury and death.

Avoid impermissible use.

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

The following list is exemplary and is not intended to be exhaustive.

It is not permitted:

- To use the truck to transport people (if the truck is not designed for this purpose)
- in areas where there is a risk of fire or explosion
- for stacking/unstacking operations on slopes
- To stand on the fork arms when raised

- To exceed the truck's maximum load capacity
- To increase the truck's load capacity, e.g. by attaching an additional weight.

Description of use and climatic conditions

Normal use

- Indoor and outdoor use
- Ambient temperature in tropical and Nordic regions range from -15°C to 45°C
- Start capability at -15°C to 45°C
- Maximum start time of 20 seconds
- Use at up to 2000 metres above sea level.

Special use (partly with special measures)

- Use, e.g. in the event of abrasive dust (such as AL203), lint, acid, leach, salt, corundum, incombustible substances
- Ambient temperature in tropical regions up to 55 °C
- Start capability to -25 °C
- Use at up to 3500 metres above sea level.

Symbols used

The terms DANGER, WARNING, CAUTION, NOTE and ENVIRONMENT NOTE are used in these operating instructions for notes on particular hazards or for unusual information that needs to be highlighted:

DANGER

Means that failure to comply can cause risk to life and/or major damage to property.

WARNING

Means that failure to comply can cause risk of serious injury and/or major damage to property.

CAUTION

Means that failure to comply can cause risk of material damage or destruction.



NOTE

Means that particular attention is drawn to combinations of technical factors which may not be evident even to a specialist.



ENVIRONMENT NOTE

The instructions listed here must be complied with as otherwise environmental damage may result.



CAUTION

This label is found on the truck in the areas where particular care and attention are required.

You should refer to the appropriate section in these operating instructions.

For your safety, additional symbols are also used. Please heed the various symbols.

Technical description

Forklift trucks in the 396 series are designed to handle loading and palletising operations for

loads up to 5 t with the H 50, up to 6 t with the

1 Introduction

Technical description

H 60, up to 7 t with the H 70 and up to 8 t with the H 80 at a load distance of 600 mm.

Forklift trucks H 80-900 or H 80-1100 are designed to handle loading and palletising operations for loads up to 8 t at a load distance of 900 mm or 1100 mm.

Details on the exact lift-height-specific maximum loads are available in the load capacity diagram.

The trucks are eco-friendly and their quiet operational noise and low emission levels benefit both the driver and the environment. They excel on account of their compact and low design. With a low centre of gravity and optimum weight distribution, this model series ensures the best level of stability in all operating conditions.

Engine

The drive engine is a 4-cylinder four-stroke diesel engine with a turbocharger and inter-cooler. It drives the truck's hydraulic pumps at the required speed. The engine is cooled by means of a closed coolant circuit with expansion tank.

Forced circulation lubrication with an oil pump in the oil sump is used for engine lubrication. The combustion air is cleaned by means of a dry air filter with a paper insert. There is also a safety cartridge located in the dry air filter. Diesel engines with state-of-the-art engine technology are used for:

- High torque
- Low fuel consumption
- Low exhaust emissions
- Low particulate emissions
- Low noise levels

Hydraulic system

The drive unit consists of a hydraulic variable displacement pump, two hydraulic variable wheel motors (assembled as a drive axle unit) and a hydraulic pump for the working hydraulics and one for the steering hydraulics.

Drive direction and driving speed are regulated by means of two accelerator pedals via the hydraulic variable displacement pump.

The hydraulic variable wheel motors in the drive axle are supplied by the hydraulic variable displacement pump and are used to power the drive wheels via two side gearboxes.

Operation

One accelerator pedal each for forward travel and reverse travel (dual pedal operation) is used to simultaneously regulate the hydraulic variable displacement pump and the engine speed. The hydrostatic drive enables the driving speed to be continuously varied in both directions, ranging from standstill to the maximum speed. The dual-pedal control means that operation of the truck is simple, safe, non-fatiguing and efficient.

The driver always has both hands free for steering and controlling operational movements. This results in fast reversing and efficient stacking.

An optional version is also available whereby the driving speed is regulated by an accelerator pedal (single-pedal operation) and the drive direction is controlled by means of a drive direction switch.

To control the operational movements of lifting, lowering and tilting, there is only one actuating lever (joystick). Another joystick is fitted for actuation of additional attachments. Operational movements can also be controlled using two joysticks (single-lever operation version).

Linde load control.

The truck's Linde Load Control (LLC) control electronics system enables:

- Millimetre-precise and secure load handling
- Effortless finger-tip control of all lift mast functions
- Entirely separate drive and lifting functions

Linde Truck Control

The truck's Linde Truck Control (LTC) control electronics system offers:

- Reliable electronics
- A high level of safety thanks to multiple monitoring systems
- Automatic, load-dependent control of engine speed
- Protection from dust and dirt through use of a fully enclosed housing.

Brakes

The hydrostatic drive is used as the service brake. This means that the service brake is maintenance-free. Two multi-disc brakes built into the wheel motors are used as the parking brake. When the engine is switched off, the multi-disc brakes engage, meaning that the truck has an automatic brake function. Always apply the parking brake when parking the truck.

Steering

The steering is a hydrostatic steering system, in which the steering wheel acts on the steering cylinder to actuate the rear wheels. If the power applied to the steering wheel is

increased, the steering system can also be operated when the engine has been switched off.

Lift mast

The free-view lift mast enables:

- Ideal visibility due to the slim lift mast profiles
- Full load capacity up to maximum lift heights
- Enormous residual load capacity
- Electronic tilt angle limitation

Linde torsion support

- Approx. 30 % reduction in lift mast rotations
- Minimised levels of strain and wear to chassis and lift mast
- Greater safety. The powerful leverage enables a significantly greater residual load capacity at great lift heights.

Electrical system

The electrical system is powered by the three-phase generator with 12 V DC voltage. A 12 V battery with 88 Ah has been installed for starting the engine. The battery is located on the left-hand side of the truck behind the cover of the bottom step.

Taking delivery of the industrial truck

Before the industrial truck leaves our factory, it undergoes a thorough inspection process in order to guarantee that it is in perfect condition and that it contains all of the equipment specified in the order.

In order to prevent complaints from occurring further down the line, the exact condition of the industrial truck and the integrity of the equipment are checked and the proper handover/acceptance of the truck is confirmed by the dealer.

The following technical documents belong to each industrial truck:

- Operating instructions for the truck
- Operating instructions for the attachment (only applies to trucks delivered from the factory with an attachment)
- EC declaration of conformity
- Rules for proper use of industrial trucks (VDMA)
- Registration document for the industrial truck, which is issued by authorised dealers as part of the handover.

Legal requirements for placing on the market

Legal requirements for placing on the market

Declaration

Linde Material Handling GmbH
Carl-von-Linde-Platz
D-63743 Aschaffenburg, Germany

We declare that the machine

Industrial truck **according to these operating instructions**

Model **according to these operating instructions**

complies with the most recent version of machinery directive 2006/42/EC.

Personnel authorised to compile the technical documents:

see EC declaration of conformity

Linde Material Handling GmbH

EC declaration of conformity

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

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

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

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

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

2

Safety

2 Safety

Safety guidelines

Safety guidelines

It is essential that operating personnel and repair personnel observe the "rules for the proper use of industrial trucks" enclosed with these operating instructions.

Examples of those listed are:

- Operating industrial trucks
- Driving licence
- Driveways and working areas
- Rights, duties and rules of behaviour for the driver
- Special operating areas
- Information regarding setting off, driving and braking
- Information for maintenance and repair
- Regular tests
- Disposal of greases, oils and batteries

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

During training, the driver must familiarise themselves with the following:

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

Practise driving, control and steering operations with an unloaded truck until they are completely mastered. Only then can a loaded industrial truck be used for practice.

Safety information

DANGER

The industrial truck must not be used by unauthorised persons.

Only trained persons and those authorised for operation may have access to the industrial truck.

DANGER

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

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

Contact your authorised dealer.

DANGER

Safety systems (e.g. the seat switch) are there for safety.

Safety systems must never be disabled, regardless of the kind.

DANGER

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

It is therefore strictly prohibited to drill holes in the overhead guard or to weld to it.

CAUTION

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

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

CAUTION

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

They must only be removed when not under compression and must not be opened without instructions. Any kind of damage, lateral forces, buckling, temperatures in excess of 80° C and heavy contamination must be avoided under all circumstances.

Damaged or defective gas springs must be replaced immediately.

Contact your authorised dealer.

⚠ WARNING

In trucks with an accumulator, serious injuries can occur if the accumulator is not properly handled.

Before starting work on the accumulator it must be depressurised.

Contact your authorised dealer.


⚠ WARNING

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

Protective equipment must therefore be worn.

⚠ WARNING

The truck working area must be sufficiently lit.

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

⚠ CAUTION

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

The driver is always responsible for safe operation.

⚠ CAUTION

If drivers have active medical equipment, e. g. pace makers or hearing aids, these may be impaired.

Check with a doctor or the medical equipment manufacturer whether the equipment is sufficiently protected against electromagnetic interference.


NOTE

If your truck is equipped with a fire extinguisher, make sure that you familiarise yourself with it in case of an emergency. Handling information is provided on the fire extinguisher.

Residual risks

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

The industrial truck and its possible attachments comply with current safety regulations. Nevertheless, even when the truck is used for its proper purpose and all instructions are followed, some residual risk cannot be excluded.

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

⚠ DANGER

Persons in the vicinity of the industrial truck must be instructed with regard to the dangers that arise through use of the truck.

These operating instructions also contain additional safety regulations.

Residual dangers can include:

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

Handling consumables

- Risk caused by insufficient maintenance or testing,
- Risk caused by using the wrong consumables.

Stability

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

Stability will not be guaranteed in the event of:

- cornering at excessive speeds,
- moving with the load raised,
- moving with a load that is protruding to the side (e.g. sideshift),
- turning and driving diagonally across descents or ascents,
- driving on descents or ascents with the load on the downhill side,
- loads that are too wide,
- driving with a swinging load,
- ramp edges or steps.

In the case of tip-over



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

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

Handling consumables



ENVIRONMENT NOTE

Consumables must be handled properly and in accordance with the manufacturer's instructions.

- Consumables should only be stored in containers complying with applicable regulations and at the locations stipulated.
- Do not bring flammable consumables into contact with hot objects or a naked flame.
- When topping up consumables, use only clean containers.
- Observe the manufacturer's instructions relating to safety and disposal.
- Avoid spilling.
- Remove any spilled fluid immediately with a suitable binder and dispose of it according to applicable regulations.
- Old and contaminated operating materials should be disposed of according to the regulations.
- Comply with the statutory provisions.
- Before performing greasing, filter changes or any work on the hydraulic system,

carefully clean the area around the part involved.

- Dispose of used spare parts in an environmentally friendly manner.

WARNING

The penetration of pressurised hydraulic fluid into the skin, e.g. due to leakage, is hazardous. If an injury of this type occurs, always consult a doctor.

Protective equipment must be worn.

WARNING

The improper handling of coolant and coolant additives presents a risk to health and the environment.

Observe the manufacturer's instructions without fail.

Competent person

A competent person is a specialist in the field of industrial trucks who has:

- Successfully completed training, as at least a service engineer for industrial trucks
- Many years of professional experience with industrial trucks
- Knowledge of the accident prevention regulations
- Knowledge of the relevant national technical regulations

The competent person is able to assess the condition of industrial trucks in terms of health and safety.

Regulations

Periodic safety inspection

Periodic safety inspections are required in order to maintain the function and security of the industrial truck.

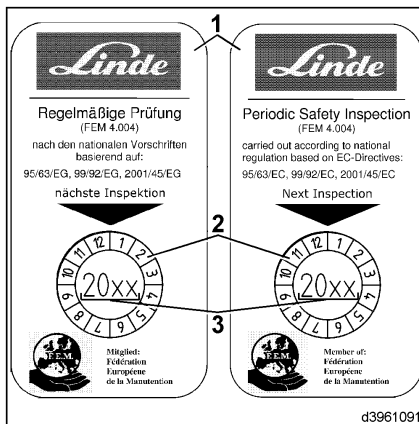
Comply with the national regulations for your country.

In Europe, the national laws are based on the directives 95/63/EC, 99/92/EC and 2001/45/EC. These stipulate that periodic safety inspections of the industrial truck must be carried out by competent personnel, in order to ensure proper condition.

Instructions for fitting attachments

There is a recommendation setting out the scope of the periodic safety inspection —FEM 4.004 of the European Industrial Truck Association— which defines a test log to document the current safety inspection and an inspection sticker for the next safety inspection. The next safety inspection date is shown by the year number (3) on an adhesive label (2), which changes colour every year and is found on a label (1).

The scope of the safety inspection is added by the manufacturer in accordance with the specific truck type. Please ask your authorised dealer to carry out this work.



Diesel engine emissions

Diesel engine emissions include carcinogenic hazardous materials. These should not be allowed to infiltrate the air in workplaces.

If trucks with diesel engines are used in fully or partially enclosed spaces, this must first be reported to the relevant occupational health and safety authorities. Operating instructions must be displayed in the working areas.

The national regulations must be observed without fail.

Checking the particle filter system

Particle filter systems must be maintained and tested every 6 months by a competent person. The test results must be recorded and enclosed with the report book. Observe the national regulations for your country.

Instructions for fitting attachments

To depressurise the oil in the lines **before** fitting an attachment, the hydraulic system for the auxiliary hydraulics can be connected using an accumulator (Special equipment) depressurised

See the section entitled "Depressurisation".

WARNING

Improper handling of the accumulator may lead to serious injuries.

Before starting work on the accumulator, it must be depressurised. Contact your authorised dealer.

Fork carriage emergency lowering

If there is a malfunction, the fork carriage can be lowered manually.



DANGER

Risk of accident or danger to life when lowering the fork carriage with fork arms.

People are not allowed to stand in the vicinity of the fork arms when they are being lowered.

During lowering, leave the socket wrench on the threaded stud (1) on the valve block to enable lowering to be interrupted at any time.

➤ Remove floormat.

➤ Open the bonnet.



WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.



WARNING

When the engine is hot, the fan may start automatically.

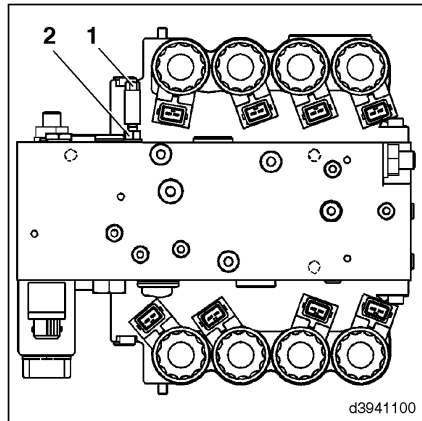
Do not touch rotating parts.

➤ Take out the right-hand floorplate.

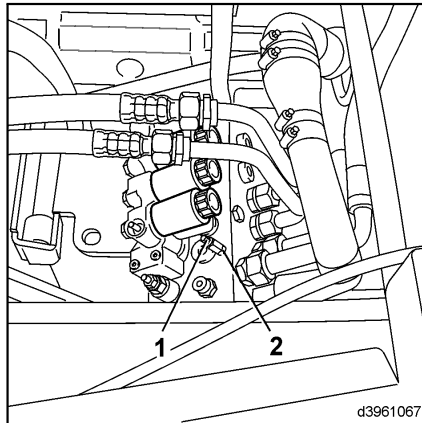
2 Safety

Emergency exit with attached rear window

- Using the socket wrench slowly rotate the threaded stud (1) approx. 3 turns anti-clockwise until the fork carriage has been completely lowered.
- Undo the self-locking nut (2) about 2 turns.



- Screw the threaded stud (1) back in clockwise. Otherwise it will not be possible to lift the fork carriage using the joystick.



Tightening torque 10 Nm.

- Retighten the self locking nut (2).

Tightening torque 9.5 Nm



NOTE

After emergency lowering has been performed three times, a new threaded stud with self locking nut must be used.

- Fit the floorplate and close the bonnet.
- Insert the floormat.

Emergency exit with attached rear window

If a truck with an attached front and rear window breaks down in a narrow aisle, the driver may possibly be unable to exit the truck at the side. In the event of acute danger, the driver can exit the truck via the rear window. For this purpose, the rear window must be broken with an emergency hammer.

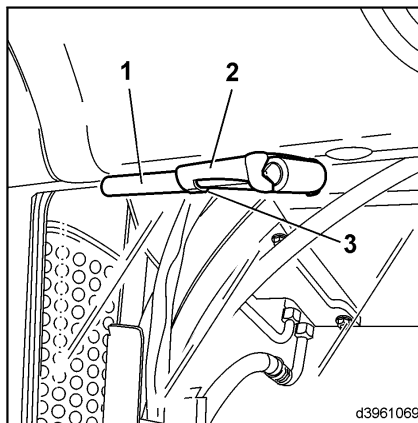
Emergency exit with attached rear window

- Bend open the split pin (3) from the support mounting (2) behind the driver's seat on the upper right part of the cab roof.

⚠ WARNING

Glass splinters may cause injuries.
Remove glass splinters carefully.

- Take the emergency hammer (1) out of the support mounting (2) and carefully break the rear window.
- Climb out carefully.





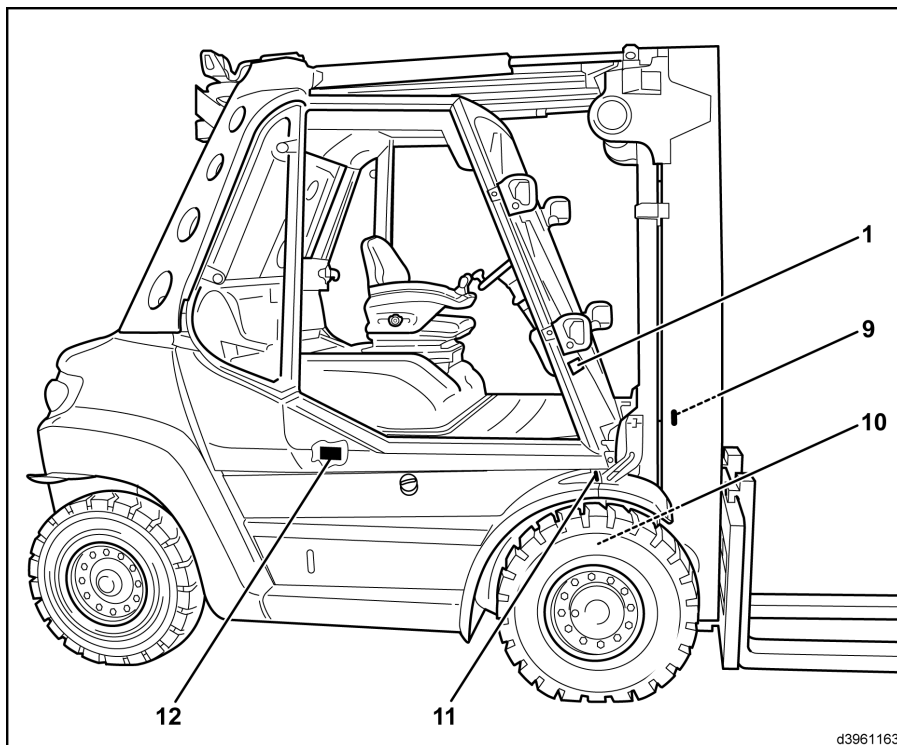
2 Safety

Emergency exit with attached rear window

Overview

Identification plates

Identification plates



d3961163

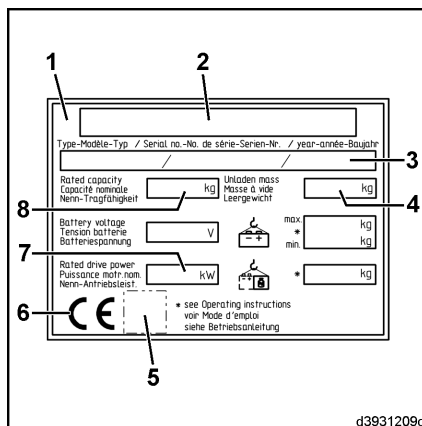
- 1 Nameplate
- 9 Lift mast number (adhesive label)
- 10 Right drive wheel unit identification plate (adhesive label on the housing)
- 11 Chassis number (stamped)
- 12 Engine identification plate

Nameplate

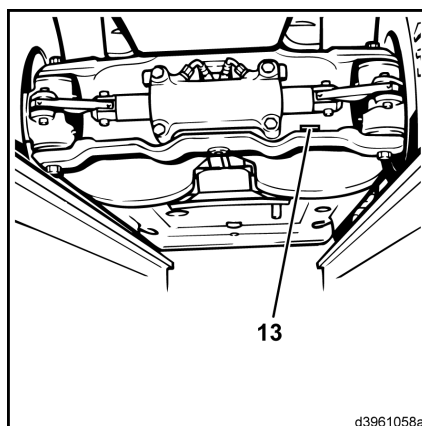
- 1 Nameplate
- 2 Manufacturer
- 3 Type/chassis number/year of manufacture
- 4 Tare weight
- 5 Placeholder for "data matrix code"
- 6 CE mark
- 7 Rated driving power
- 8 Rated load capacity

**NOTE**

The CE mark confirms compliance with the EC machinery directive and with all regulations applicable to the truck.

**Steering axle identification plate**

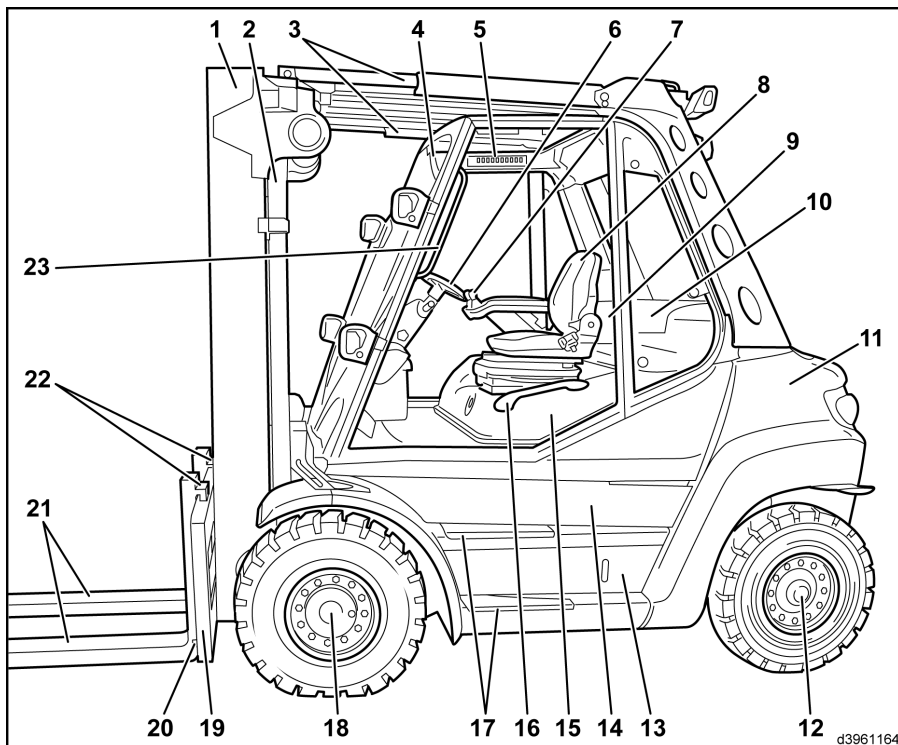
- 13 Steering axle identification plate



3 Overview

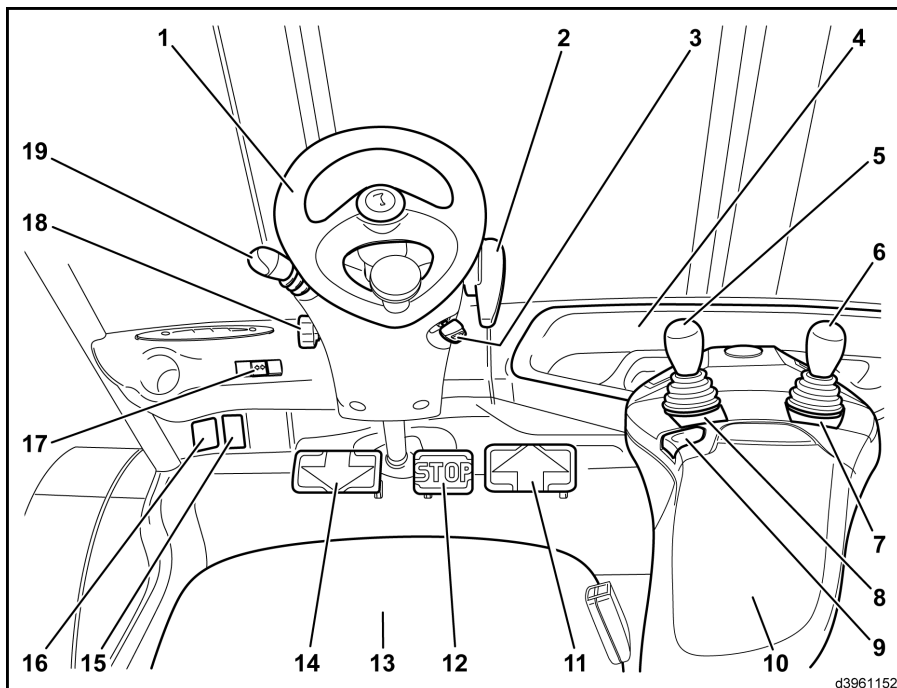
Truck overview

Truck overview



- | | | | |
|----|--|----|---|
| 1 | Lift mast | 12 | Steering axle |
| 2 | Lift cylinders | 13 | Battery compartment cover |
| 3 | Tilt cylinders | 14 | Central electrical system cover |
| 4 | Display unit | 15 | Bonnet |
| 5 | Switch panel for toggle switch (special equipment) | 16 | Handle for opening the bonnet |
| 6 | Steering wheel/hydrostatic steering | 17 | Steps for entering and exiting the truck |
| 7 | Joystick | 18 | Left drive wheel unit |
| 8 | Driver's seat | 19 | Fork carriage |
| 9 | Fuses (behind the cover) | 20 | Fork arm safety devices |
| 10 | Electrical system cover | 21 | Fork arms |
| 11 | Counterweight | 22 | Fork arm latch |
| | | 23 | Handhold for entering and exiting the truck |

Controls



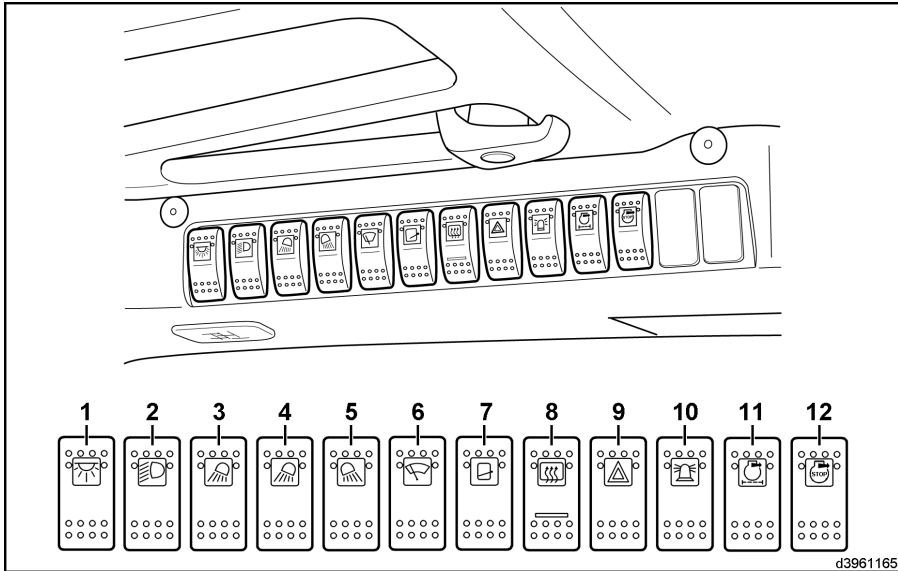
d3961152

- | | | | |
|----|---|----|---|
| 1 | Steering wheel/hydrostatic steering | 12 | Stop pedal |
| 2 | Parking brake lever | 13 | Driver's seat |
| 3 | Starting switch with switch key | 14 | Reverse travel accelerator pedal |
| 4 | Compartment | 15 | "Truck configuration" label (for description, see "truck configuration label") |
| 5 | Joystick for working hydraulics | 16 | "Guaranteed sound power level" label |
| 6 | Joystick for auxiliary hydraulics (attachments) (special equipment) | 17 | Indicator light for direction indicator and hazard warning system (green) (special equipment) |
| 7 | Symbol sticker for auxiliary hydraulics (attachments) (special equipment) | 18 | Clamping screw for adjusting the steering column |
| 8 | Symbol sticker for working hydraulics | 19 | Multifunction lever for wiper/washer system and turn indicator (special equipment) |
| 9 | Signal button | | |
| 10 | Armrest on driver's seat | | |
| 11 | Forward travel accelerator pedal | | |

3 Overview

Switch panel

Switch panel



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

- | | | | |
|---|--|----|--|
| 1 | Interior lighting | 7 | Roof panel wiper - intermittent mode or continuous operation on/off (washer system is activated) |
| 2 | Standard or higher lighting | 8 | Rear window heating |
| 3 | Working spotlight position 1/2 | 9 | Strobe beacon |
| 4 | Working spotlight position 3/4 or working spotlight position 5/6 | 10 | Rotating beacon or flashing beacon |
| 5 | Working spotlight position 7/8 | 11 | Particle filter push button |
| 6 | Front windscreen wiper and rear window wiper — continuous operation on/off (inter- | 12 | Particle filter stop button |



NOTE

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

4

Operation

Instructions for running-in

Service plan before initial commissioning

	Carried out	
	✓	*
Engine		
Fill up with fuel		
Check the engine oil level		
Check the coolant level		
Gearbox		
Check the oil level in the planetary transmission.		
Chassis frame		
Tighten the wheel fastenings		
Check the tyre pressure		
Check the brake system		
Check the steering system		
Electrics/electronics		
Check the battery condition, acid level and acid density		
Hydraulics		
Hydraulic system: Check the oil level		
Check the lifting system and attachments.		

Instructions for running-in

The forklift truck can be run at high speeds straight away. However, in the first 50 operating hours avoid subjecting either the working hydraulics or the traction drive to high continuous loads. The wheel fastenings should be tightened before the initial start-up and whenever the wheels are changed. After this

tightening should be performed after 100 operating hours at the latest. The wheel fastenings should be tightened crosswise with a torque of

front: 640 Nm

rear: 640 Nm

Standard equipment

Entering and exiting the truck

WARNING

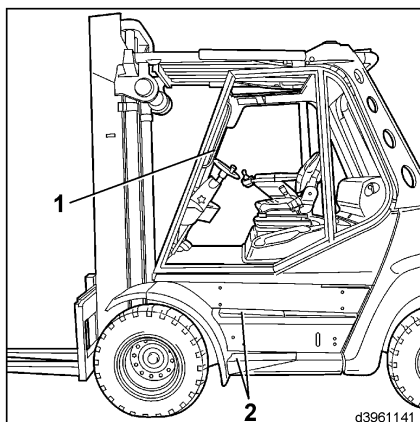
Entering and exiting the truck can result in injuries to the feet or back.

Always face the truck when you enter or exit the truck.

NOTE

Do not use the steering wheel or the actuating levers as an aid to get in or out.

- Use handle (1) and step (2).



Adjusting the standard driver's seat and comfort driver's seat

WARNING

If the seat is not adjusted correctly, this may cause injury to the driver's back. The adjustment controls for the driver's seat should not be used during operation.

Before starting the truck and whenever changing drivers, adjust the seat to correspond to the driver's weight and make sure that the settings have all engaged properly. Do not place any objects in the driver's rotation range.

4 Operation

Standard equipment

NOTE

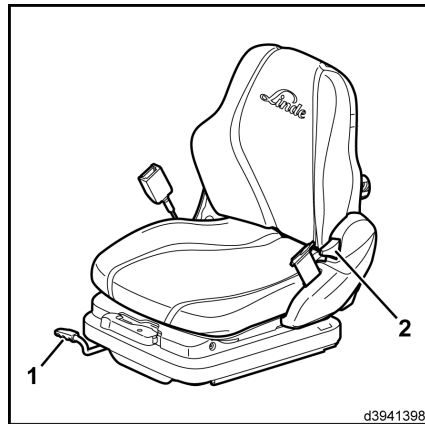
Sitting for long periods of time puts a lot of pressure on the spine. Try to compensate for this by performing regular simple gymnastic movements.

Longitudinal adjustment

- Pull lever (1) upwards.
- Move the driver's seat backwards or forwards on the runners to find the most comfortable position for the driver in relation to the steering wheel and the accelerator pedals.
- Allow lever (1) to snap into place.

Adjusting the seat backrest

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



Setting the driver's weight

NOTE

The individual driver's weight must be set when the driver's seat is under load.

- 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).

Adjust the driver's weight as necessary.

- Pull out the lever (3).
- 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) ▷**i NOTE**

The lumbar support enables optimum configuration of the seat back contour to the driver's body.

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

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

**Adjusting the height-adjustable comfort driver's seat****⚠ WARNING**

If the seat is not adjusted correctly, this may cause injury to the driver's back. The adjustment controls for the driver's seat should not be used during operation.

Before starting the truck and whenever changing drivers, adjust the seat to correspond to the driver's weight and make sure that the settings have all engaged properly. Do not place any objects in the driver's rotation range.

i NOTE

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

4 Operation

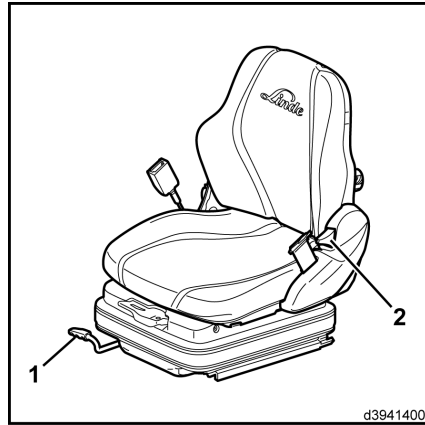
Standard equipment

Longitudinal adjustment

- Pull lever (1) upwards.
- Move the driver's seat backwards or forwards on the runners to find the most comfortable position for the driver in relation to the steering wheel and the accelerator pedals.
- Allow lever (1) to snap into place.

Adjusting the seat backrest

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



Setting the driver's weight

NOTE

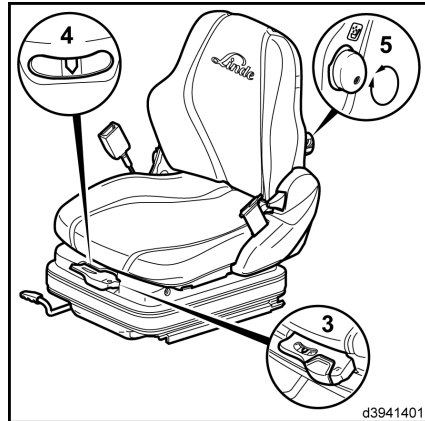
The individual driver's weight must be set when the driver's seat is under load.

- 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).

Adjust the driver's weight as necessary.

- Pulling the lever (3) upwards signifies a higher weight.
- Pushing the lever (3) downwards signifies a lower weight.



Adjusting the lumbar support

NOTE

The lumbar support enables optimum configuration of the seat back contour to the driver's body.

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

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



Adjusting the seat height

Adjust the seat height as required.

- Pulling the lever (3) upwards means that the seat moves upwards.
- Pushing the lever (3) downwards means that the seat moves downwards.

NOTE

After making the adjustment, the arrow in the inspection window (4) may deviate somewhat from the centre position.



Adjusting the luxury driver's seat

WARNING

If the seat is not adjusted correctly, this may cause injury to the driver's back. The adjustment controls for the driver's seat should not be used during operation.

Before starting the truck and whenever changing drivers, adjust the seat to correspond to the driver's weight and make sure that the settings have all engaged properly. Do not place any objects in the driver's rotation range.

4 Operation

Standard equipment

NOTE

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

Longitudinal adjustment

- Pull lever (1) upwards.
- Move the driver's seat backwards or forwards on the runners to find the most comfortable position for the driver in relation to the steering wheel and the accelerator pedals.
- Allow lever (1) to snap into place.

Adjusting the seat backrest

- Push lever (2) upwards and hold in place.
- Move the seat backrest forwards or backwards until a comfortable seating position for the driver is found.
- Release 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 lever (3) upwards.

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

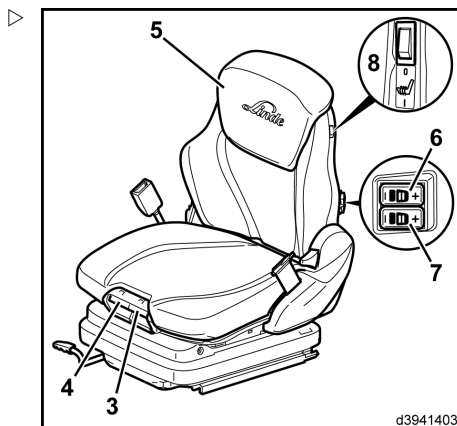
Adjusting the seat depth

- Pull lever (4) upwards.

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

Adjusting the backrest extension

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



d3941403

Adjusting the lumbar support



NOTE

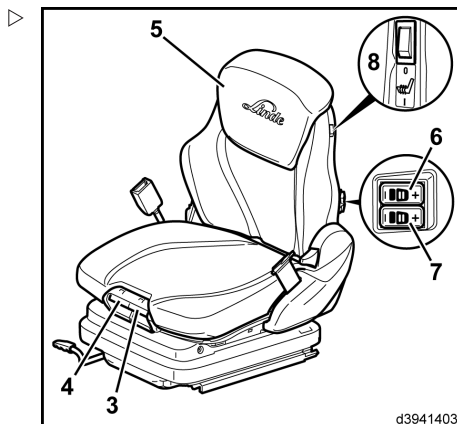
The lumbar support enables optimum configuration of the seat back contour to the driver's body.

- 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.



d3941403

Activating the seat heater (luxury driver's seat)

- 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.

4 Operation

Standard equipment

Adjusting the luxury active driver's seat

The luxury active driver's seat is operated in exactly the same way as the luxury driver's seat. Only the activation of the seat heater is different.

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.

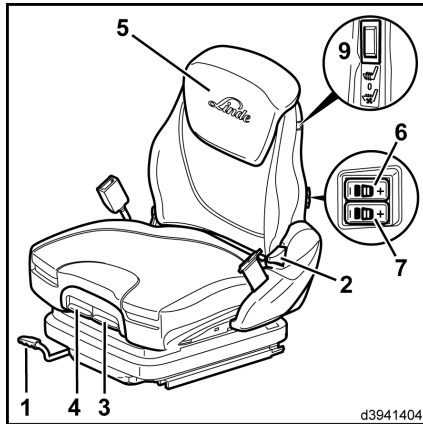
Activating the seat air-conditioning (luxury active seat)

- 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.



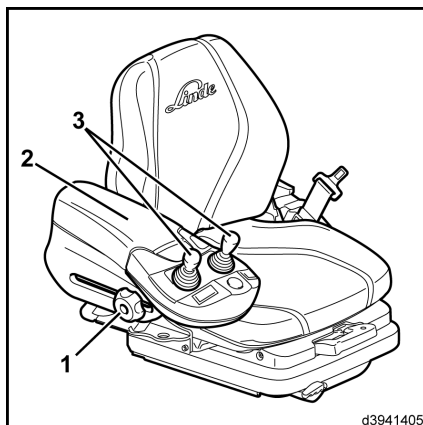
NOTE

The maximum temperature is predefined.



Adjusting the armrest

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



Setting the clock

NOTE

The time is displayed in 24-hour format. It is possible to change to 12-hour format using the diagnostic device. Please contact your authorised dealer.

- Press both push buttons (2) and (3) simultaneously for 3 seconds. ➤

The hour readout in the time display (1) blinks.

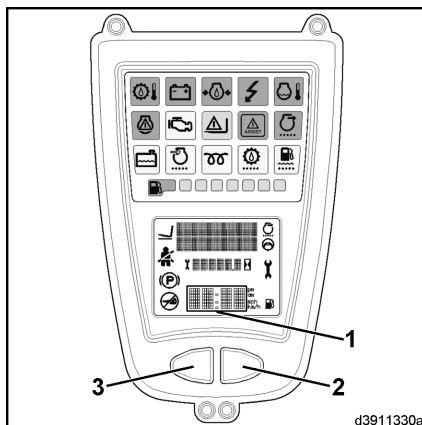
NOTE

The hours or minutes can be adjusted gradually by pressing push button (2) or quickly by holding down the push button.

- Depress button (2) to set the hours.
- Depress button (3) to confirm the hour setting.

Now the minute readout blinks.

- Depress button (2) to set the minutes
- Depress button (3) to confirm the setting of the minutes.



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.

4 Operation

Standard equipment



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.

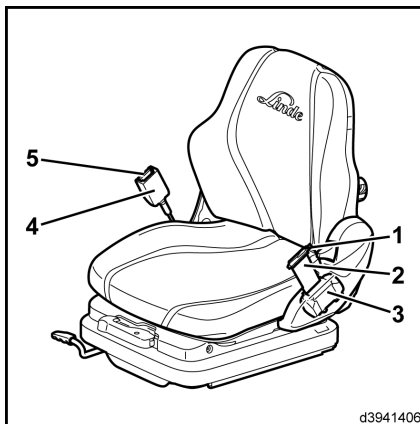
Fastening the seat belt

- 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).



d3941406

**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.

Starting and stopping the internal combustion engine (dual-pedal operation)**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.

- The actuating levers (joysticks) must be in the neutral position.
- Sit down on the driver's seat.

4 Operation

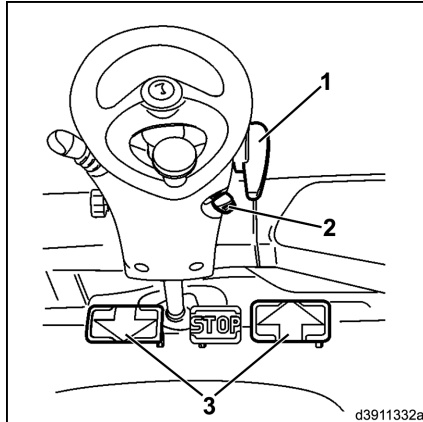
Standard equipment

- Fasten the seat belt.
- Place both feet on the accelerator pedals (3).
- Turn the parking brake lever (1) clockwise until it engages.

The parking brake is actuated (it is only possible to start the engine with the parking brake actuated).

- Insert the switch key (2) into the ignition and starting switch and turn it from the zero position to position "I".

The electrical system is switched on.



- Observe the display unit (4).

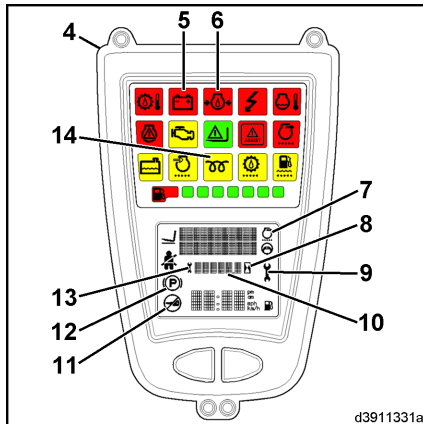


NOTE

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 in the display field (10) of the display unit (4). During this time, the symbol (13) remains lit. After 5 seconds, the display automatically reverts to the operating hours. If the symbol (9) flashes or lights up, the preset service interval has been exceeded. The maintenance work that is due must be performed. Contact your authorised dealer.

The following indicators light up:

- Parking brake applied symbol (12),
- Engine oil pressure indicator (6) (does **not** illuminate in the 396 diesel family),
- Charging indicator (5),
- Glow plug indicator (14),
- Symbol for (7) particle filter.



- Wait until the glow plug indicator (14) goes out

- Turn the switch key to position "II".

As soon as the engine starts

- Release the switch key.

Symbol (8) flashes.

⚠ CAUTION

If the exhaust continues to be very smoky, switch off the truck. Contact your authorised dealer.

Every time the engine is started, watch the exhaust port for about 5 seconds.

If the engine fails to start:

- After the glow plugs have heated up, keep turning the starter motor until the engine runs at idle speed. Depending on the truck, temperature and altitude, this may take over 1 minute.

If the engine stalls, the "Do not start the engine" (11) symbol will appear.



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.

Leave a break of at least one minute between each engine starting procedure to protect the battery. If the engine still does not start at the third start attempt, see: Malfunctions, causes and remedies.

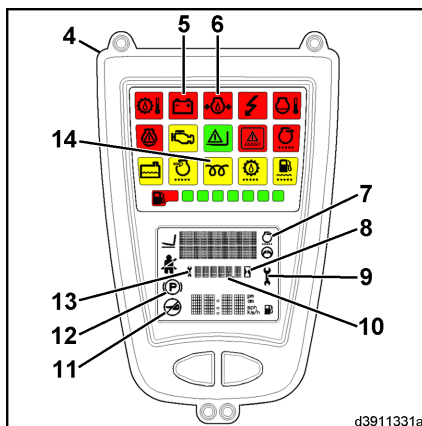
The charging and engine oil pressure indicators must go out as soon as the engine is running smoothly.

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



4 Operation

Standard equipment

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 ($\geq 100,000$ rpm at full load) could cause the shaft bearing to run dry through lack of lubrication, thus damaging it.

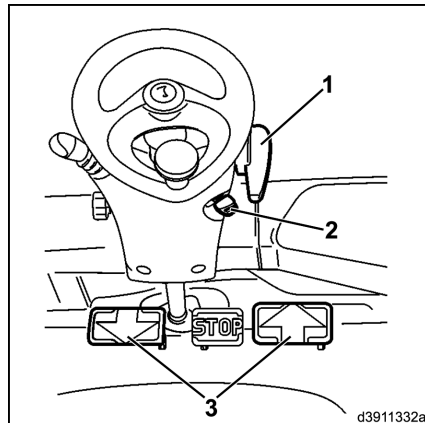
Do not switch off engine under full load, but rather allow it to run on for a few minutes at low speed.

- Take your feet off the accelerator pedals (3).
- Turn the switch key (2) to the zero position.

i NOTE

The brake is applied when the engine is switched off.

- Turn the parking brake lever (1) clockwise until it engages.
- The parking brake is now applied.
- Remove the switch key (2) when leaving the truck.



Driving (dual-pedal operation)

⚠ WARNING

It is generally not permitted to drive on long gradients over 15% due to specified minimum braking and stability values. Please contact your authorised dealer before driving on larger gradients. The climbing capability values given in the type sheet have been determined from the pulling force and only apply when overcoming obstacles on the road-way and for small height differences.

You should always adapt your driving to the conditions of the route used (unevenness etc.), especially hazardous work areas and your load.

⚠ WARNING

When using mirrors, remember that the rear-view mirror is only designed for monitoring the area behind the vehicle.

Reverse travel is therefore only permitted when looking directly behind you.

⚠ CAUTION

Any side doors attached must be protected from damage when driving.

Please therefore ensure that both side doors are closed and locked before setting off.

i NOTE

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

- Start the engine.
- Raise the fork arms slightly and tilt the lift mast backwards.
- Release the parking brake (unlock the parking brake lever (1) and move it downwards as far as the stop).

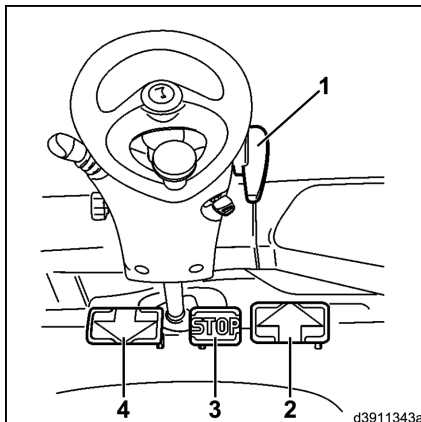
Forwards travel

- Carefully operate the right accelerator pedal (2).

The driving speed of the truck increases as the actuation distance of the pedal increases.

i NOTE

Pressing down the accelerator pedal hard is to no advantage as the maximum acceleration rate is controlled automatically.

**Reverse travel**

- Carefully operate the left accelerator pedal (4).

The truck will reverse slowly or quickly depending on the accelerator pedal position.

Changing direction of travel

- Release accelerator pedal pressed.

4 Operation

Standard equipment

The hydrostatic drive will act as a service brake.

- Press the accelerator pedal for the opposite direction of travel.

The forklift truck will now accelerate in the specified direction.

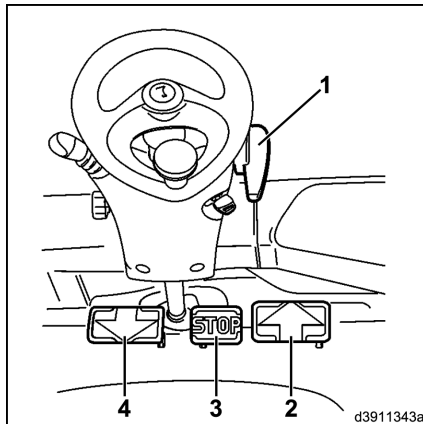
- Both feet should be left on the accelerator pedals so that the truck is easily controlled in every driving movement.

The accelerator pedals can be switched over directly. The hydrostatic drive brakes the truck until it comes to a standstill and then accelerates in the opposite drive direction.

Approaching gradients

- Press the stop pedal (3) all the way down. ▷
- Release the parking brake lever (1) and move it downwards as far as the stop.
- Take your foot half way off the stop pedal.
- Actuate accelerator pedal (2) or (4).
- Slowly take your foot completely off the stop pedal.

The brake has been released and the truck will now move without rolling backwards.



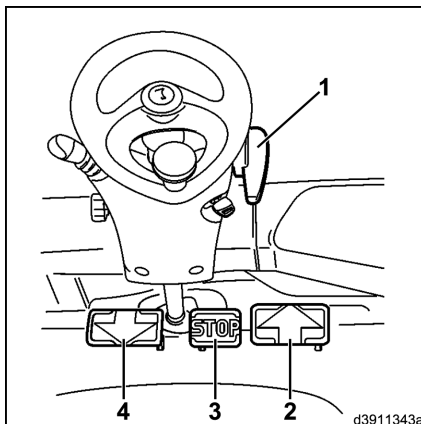
Stopping

- Slowly release the accelerator pedal after pressing it.

The hydrostatic drive will act as a service brake.

- When stopping on inclines, leave both feet on the pedals and press the pedal in the "uphill" drive direction down slightly to counterbalance the slip of the drive. This slip is caused by technical factors.

- If stopping for an extended period of time, press the stop pedal (3).
- If you ever have to leave the truck with the engine still running, e.g. to do minor jobs in the direct vicinity of the truck (opening doors, disconnecting trailers etc.), it is essential to activate the parking brake (turn the parking brake lever (1) in a clockwise direction until it engages), and unlatch the seat belt. If you are leaving the truck for a longer period of time, switch off the engine and activate the parking brake.
- When leaving the truck, remove the ignition key.



Starting and stopping the internal combustion engine (single-pedal operation)

Starting the engine



⚠ DANGER

Danger of poisoning!

Do not leave the engine running in unventilated areas.



NOTE

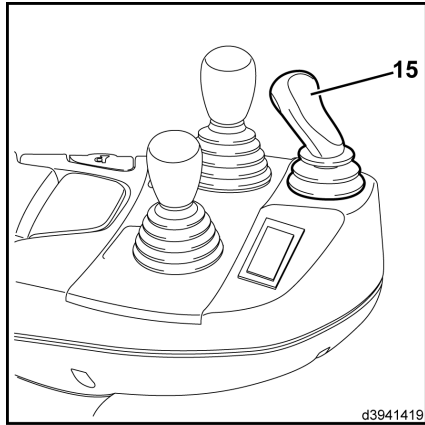
Where possible, avoid frequently starting and stopping the engine over short periods of time, since this prevents the internal combustion engine from reaching its operating temperature. Frequent cold starts increase wear.

- Sit down on the driver's seat.
- Fasten the seat belt.

4 Operation

Standard equipment

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

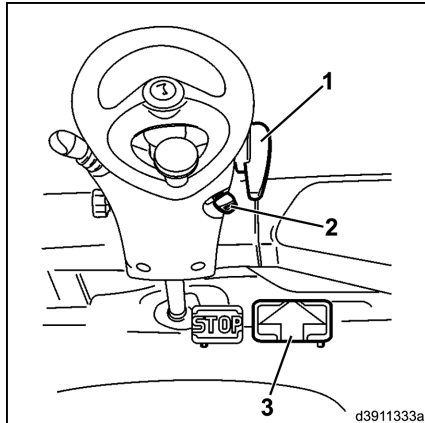


- Place your foot on the accelerator pedal (3). ▷
- Turn the parking brake lever (1) clockwise until it engages.

The parking brake is actuated (it is only possible to start the engine with the parking brake actuated).

- Insert the switch key (2) into the ignition and starting switch and turn it from the zero position to position "I".

The electrical system is switched on.



- Observe the display unit (4).



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 in the display field (10) of the display unit (4). During this time, the symbol (13) remains lit. After 5 seconds, the display automatically reverts to the operating hours. If the symbol (9) flashes or lights up, the preset service interval has been exceeded. The maintenance work that is due must be performed. Contact your authorised dealer.

The following indicators light up:

- Parking brake applied symbol (12),
- Engine oil pressure indicator (6) (does **not** illuminate in the 396 diesel family),
- Charging indicator (5),
- Glow plug indicator (14),
- Symbol for (7) particle filter.

- Wait until the glow plug indicator (14) goes out
- Turn the switch key to position "II".

As soon as the engine starts

- Release the switch key.

Symbol (8) flashes.

CAUTION

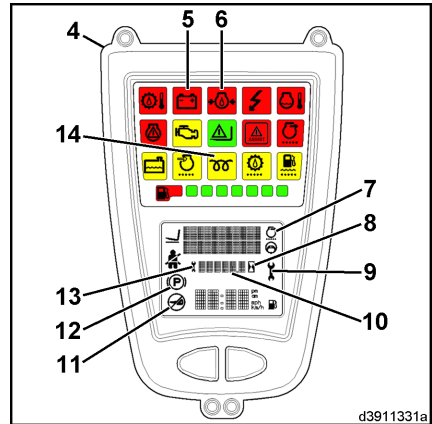
If the exhaust continues to be very smoky, switch off the truck. Contact your authorised dealer.

Every time the engine is started, watch the exhaust port for about 5 seconds.

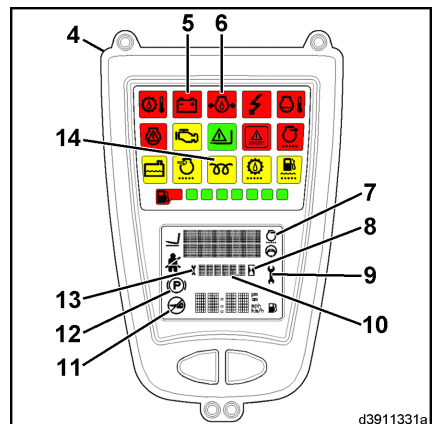
If the engine fails to start:

- After the glow plugs have heated up, keep turning the starter motor until the engine runs at idle speed. Depending on the truck, temperature and altitude, this may take over 1 minute.

If the engine stalls, the "Do not start the engine" (11) symbol will appear.



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4 Operation

Standard equipment



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.

Leave a break of at least one minute between each engine starting procedure to protect the battery. If the engine still does not start at the third start attempt, see: Malfunctions, causes and remedies.

The charging and engine oil pressure indicators must go out as soon as the engine is running smoothly.

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.

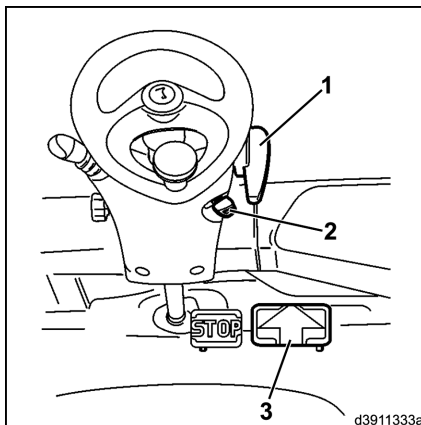
Switching off the engine

CAUTION

For engines with a turbocharger, there is a risk that the high speed of the turbocharger shaft ($\geq 100,000$ 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).

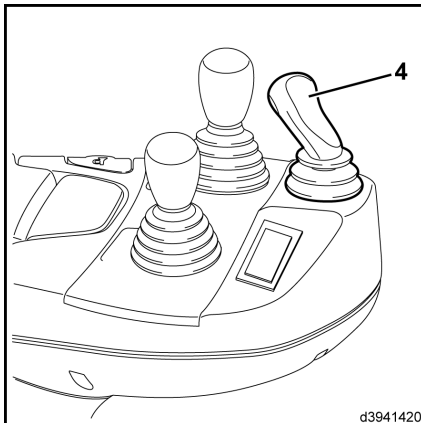


- Move the direction selection lever (4) to the neutral position.
- Turn the switch key (2) to the zero position.

**NOTE**

The brake is applied when the engine is switched off.

- Turn the parking brake lever (1) clockwise until it engages.
- Remove the switch key (2) when leaving the truck.



Driving (single-pedal operation)

WARNING

It is generally not permitted to drive on long gradients over 15% due to specified minimum braking and stability values. Please contact your authorised dealer before driving on larger gradients. The climbing capability values given in the type sheet have been determined from the pulling force and only apply when overcoming obstacles on the roadway and for small height differences.

You should always adapt your driving to the conditions of the route used (unevenness etc.), especially hazardous work areas and your load.

WARNING

When using mirrors, remember that the rear-view mirror is only designed for monitoring the area behind the vehicle.

Reverse travel is therefore only permitted when looking directly behind you.

CAUTION

Any side doors attached must be protected from damage when driving.

Please therefore ensure that both side doors are closed and locked before setting off.



NOTE

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

- Start the engine.
- Raise the fork arms slightly and tilt the lift mast backwards.

- Release the parking brake (unlock the parking brake lever (1) and move it downwards as far as the stop).

Forwards travel

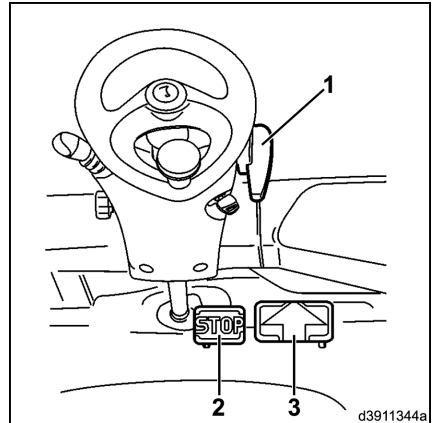
- Move the direction of travel lever (4) forwards.
- Press the accelerator pedal (3) carefully.

The driving speed of the truck increases as the actuation distance of the pedal increases.



NOTE

Pressing down the accelerator pedal hard is to no advantage as the maximum acceleration rate is controlled automatically.



Reverse travel

- Move the direction of travel lever (4) backwards.
- Press the accelerator pedal (3) carefully.

The truck will reverse slowly or quickly depending on the accelerator pedal position.

Changing direction of travel

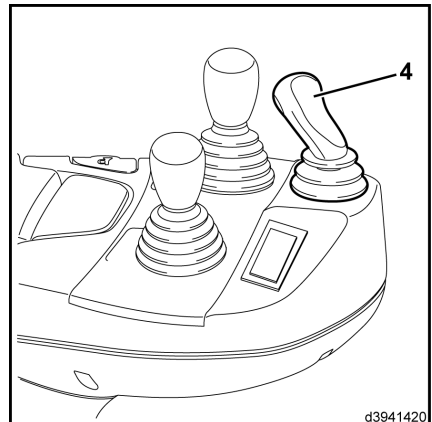
- Release accelerator pedal.

The hydrostatic drive will act as a service brake.

- Operate direction selection lever (4) for the opposite drive direction.

The forklift truck will now accelerate in the specified direction.

The direction selection lever can be switched over directly. The hydrostatic drive brakes the truck until it comes to a standstill and then accelerates in the opposite drive direction.



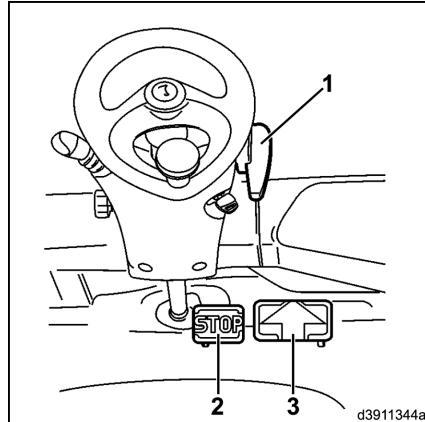
4 Operation

Standard equipment

Approaching gradients

- Press the stop pedal (2) all the way down. ▷
- Release the parking brake lever (1) and move it downwards as far as the stop.
- Take your foot half way off the stop pedal.
- Press accelerator pedal (3).
- Slowly take your foot completely off the stop pedal.

The brake has been released and the truck will now move without rolling backwards.

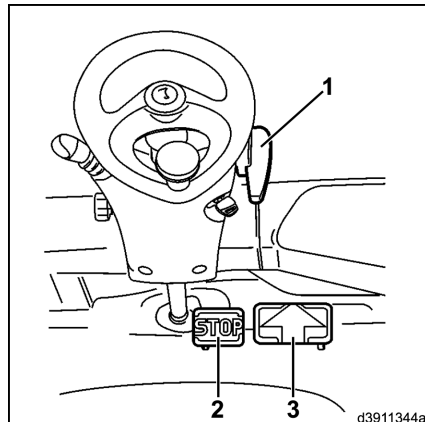


Stopping

- Slowly release the accelerator pedal.

The hydrostatic drive will act as a service brake.

- When stopping on inclines, leave your foot on the accelerator pedal, switch the direction selection lever (4) to "uphill" drive direction and press the pedal down slightly to counterbalance the slip of the drive. This slip is caused by technical factors.
- If stopping for an extended period of time, press the stop pedal (2). ▷
- If you ever have to leave the truck with the engine still running, e.g. to do minor jobs in the direct vicinity of the truck (opening doors, disconnecting trailers etc.), it is essential to activate the parking brake (turn the parking brake lever (1) in a clockwise direction until it engages), and unlatch the seat belt. If you are leaving the truck for a longer period of time, switch off the engine and activate the parking brake.
- When leaving the truck, remove the ignition key.



Steering system

Steering

The hydrostatic steering system means that very little effort is required for the steering wheel turning movement. This is particularly advantageous when palletising in narrow aisles.

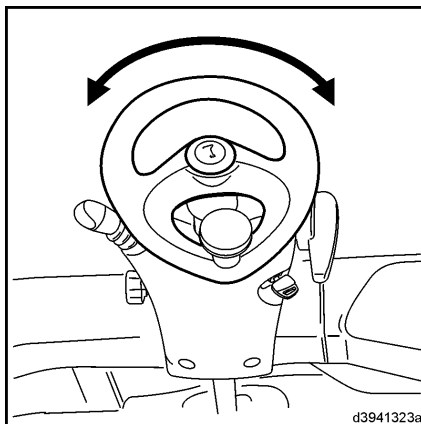
- Starting and driving.
- Turn the steering wheel to the left and right as far as it will go.

The steering wheel can be moved beyond the stop if sufficient force is applied, without the position of the wheels changing on the steering axle.

DANGER

The forklift truck must not be driven if the steering system is defective.

If the steering is stiff or has too much play, contact your authorised dealer.



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Brake system

Service brake

- Allow accelerator pedals (1) to move to the neutral position.

The hydrostatic drive will act as a service brake. Slow or quick release of the accelerator pedals to the neutral position allows the braking effect to be sensitively controlled, from gentle to hard braking.

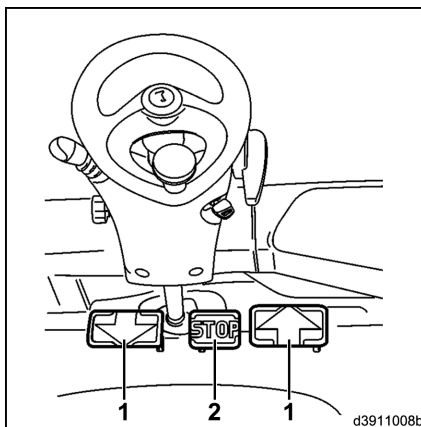


NOTE

For emergency braking, press the stop pedal (2) positioned between the accelerator pedals. This will result in full application of the brake.

Stop pedal

The stop pedal (2) is not a sensitive service brake but a sharply applied parking brake. Its use should be avoided whilst driving, because this can cause the drive wheels to lock and, in



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4 Operation

Standard equipment

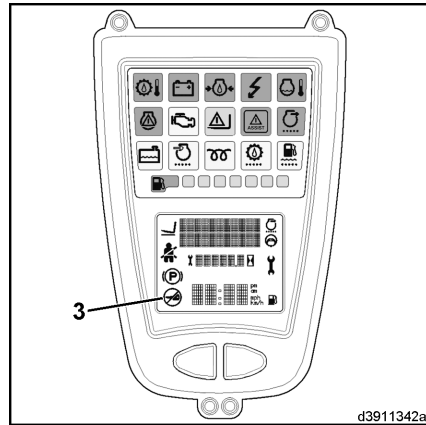
certain circumstances, can cause the load to slip from the fork arms.

In unfavourable situations, the engine can also stall; as a result the "Do not start the engine" symbol (3) appears in the display unit. A block against repeat starting is active and the engine cannot be started. Always leave the ignition switched on until the "Do not start the engine" symbol (3) goes out. In this time, the variable displacement pump of the drive unit swivels to the neutral position. Afterwards, the engine can be started again.



NOTE

It is recommended that drivers familiarise themselves with the function and effect of this brake when there is no load on the truck. For this purpose they should choose a route with no other traffic, travelling at a low speed.



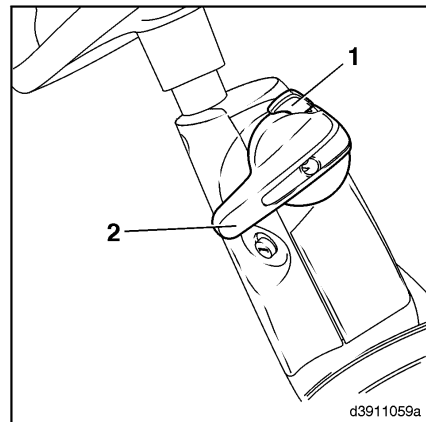
Parking brake

The multi-disc brakes are used as the parking brake of the fork-lift truck.

Operating the parking brake

- Turn the parking brake lever (2) in a clockwise direction to the stop.

The interlock (1) engages and the symbol in the display unit lights up.



Releasing the parking brake



NOTE

The multi-disc brake will release only if the engine is running.

- Turn the parking brake lever (2) gently in a clockwise direction to release the interlock.

- Press the button (1).

The parking brake is unlocked.

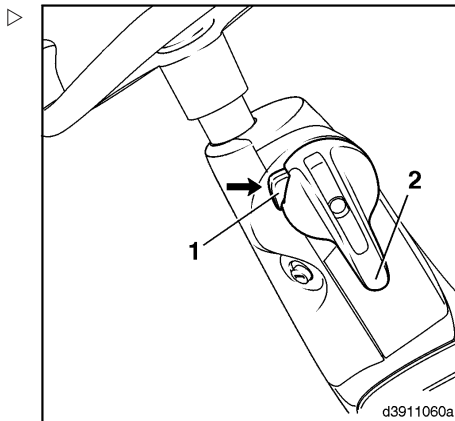
- Move the parking brake (2) down as far as the stop.

The symbol on the indicator unit will go out.

⚠ DANGER

The forklift truck must not be driven if the braking system is defective.

Should there be any defects or wear apparent in the brake system, please contact your authorised dealer at once.

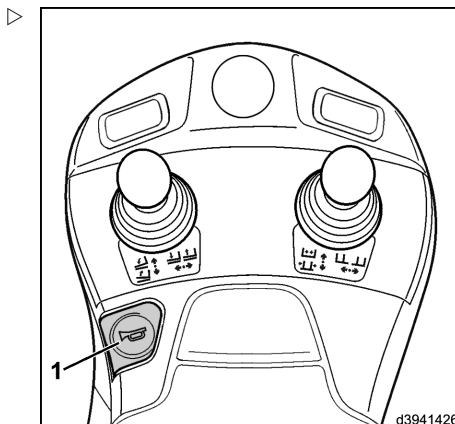


Signal horn

Operating the horn

The horn is used as a warning signal, e.g. at blind spots and junctions.

- Push in the horn button (1) on the armrest until the horn sounds.



Joystick with central lever operation



⚠ WARNING

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

Therefore, never reach into or enter the lift mast or the area between the lift mast and the truck.

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

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

Bear the maximum lift height in mind.



NOTE

When working with a shovel, see "Using the truck during shovel operation".

Operating the lift and tilt attachments



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).

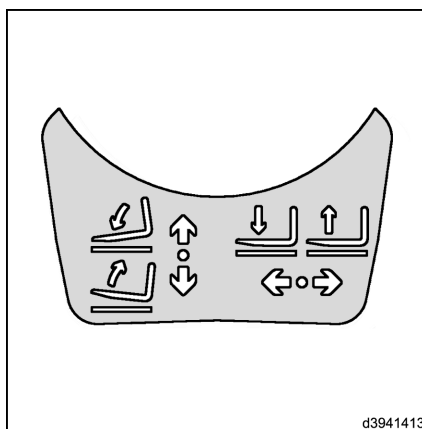
➤ Take note of the switching symbols with arrows.

The joystick must always be operated gently, never jerkily. Moving the joystick determines the lifting, lowering and tilt speed. After the joystick is released, it automatically returns to its initial position.



NOTE

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



d3941413

Lifting the fork carriage

⚠ DANGER

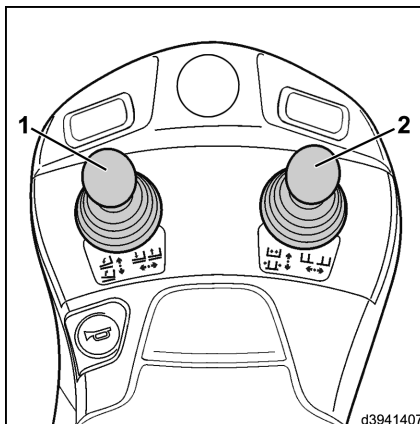
There is an increased risk of falling and crushing when lifting the lift mast.

For this reason, it is not permitted to step onto the raised fork arms.

- Push joystick (1) to the right.

Lowering the fork carriage

- Push joystick (1) to the left.



Tilting the lift mast forwards

- Push the joystick (1) forwards.

Tilting the lift mast back

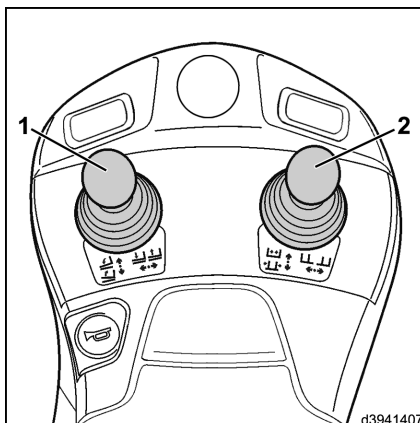
- Pull the joystick (1) backwards.

Operating the attachments

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

i NOTE

Before fitting an attachment, depressurisation (special equipment) can be performed to depressurise the hydraulic system for the auxiliary hydraulics so that the connection on the attachment can be affixed to the connection on the fork carriage (see "Depressurisation" under special equipment).



4 Operation

Standard equipment

CAUTION

Attachments affect the load capacity and stability of the truck.

Attachments that are not supplied with the truck should only be used if the authorised dealer has checked that the arrangement in terms of load capacity and stability ensures safe operation.

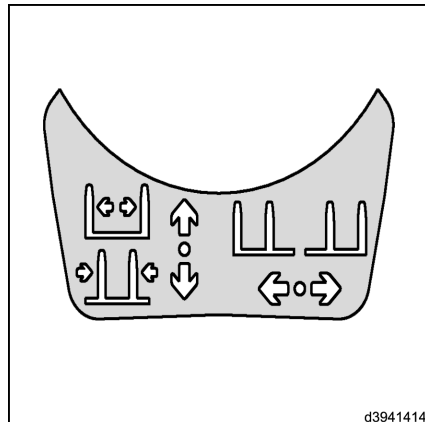
NOTE

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

- Take note of the switching symbols with arrows.

NOTE

For every attachment, a label stating the load capacity of the truck plus attachment (for a description, see "Additional capacity rating plate for attachments") must be affixed within the driver's range of vision and a symbol label for the relevant attachment must be affixed behind the joystick.



Operating the sideshift

NOTE

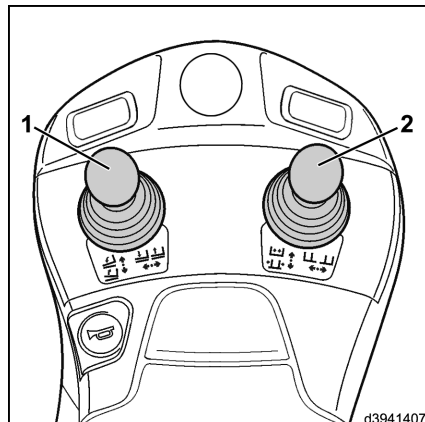
In order to prevent damage, do not activate the sideshift when the fork arms are on the ground.

- Push joystick (2) to the left.

Sideshift moves to the left.

- Push joystick (2) to the right.

Sideshift moves to the right.



Operating the fork prong positioner

NOTE

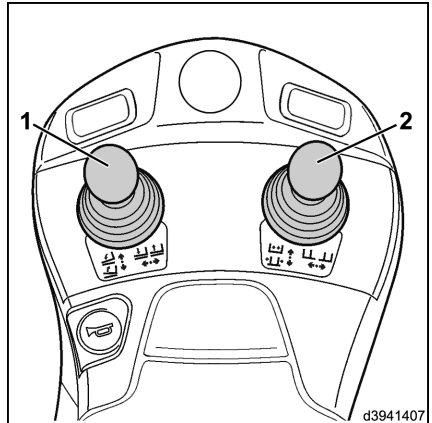
In order to prevent damage, do not activate the fork prong positioner with a load, or with the fork arms on the ground. Do not use the fork prong positioner as a clamp.

➤ Push the joystick (2) forwards.

Fork arms move outwards.

➤ Pull the joystick (2) backwards.

Fork arms move inwards.



Operating the clamp

DANGER

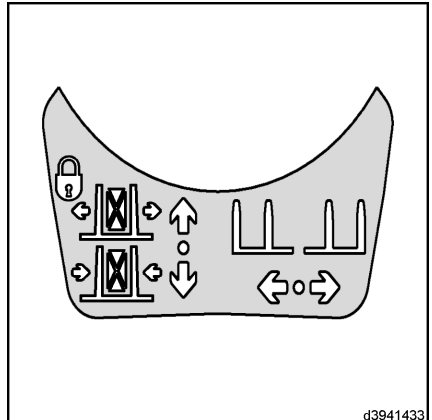
Increased risk of accident from a falling load.

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 authorised dealer.

Version 1: Electronically locked

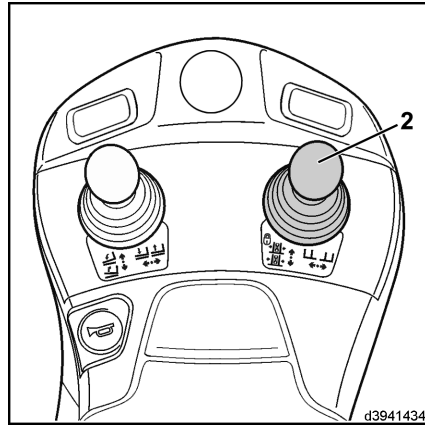
➤ Take note of the switching symbols with arrows.



4 Operation

Standard equipment

- Push joystick (2) forwards by at least 40% and then move to the zero position.



Joystick is unlocked for approx. one second and the display (3) lights up in the display unit.



NOTE

If the joystick is not moved forwards within this time period, it is locked again.

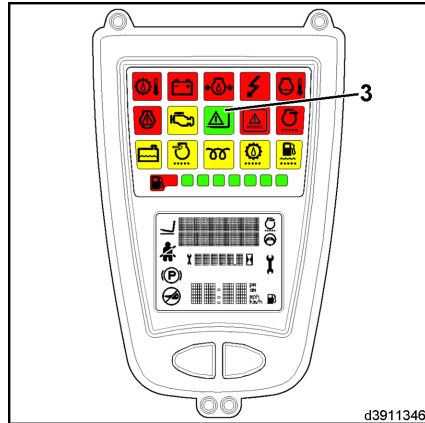
- Push the joystick (2) forwards.

Clamp opens.

Once the joystick has been released, it is locked again within one second.

- Pull the joystick (2) backwards.

Clamp closes.



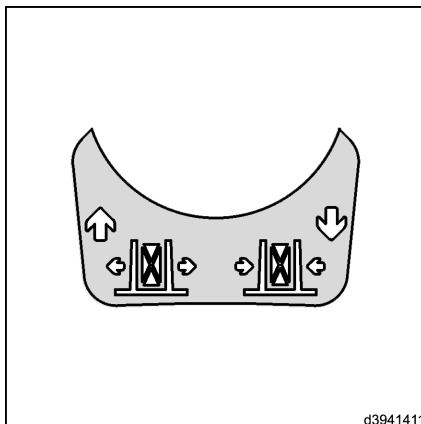
Version 2: Mechanically locked



NOTE

The joystick (single lever) is recognisable by the somewhat wider design of the bellows.

- Take note of the switching symbols with arrows.



- Unlock the joystick (4) (depending on the version) by pressing the knob downwards.



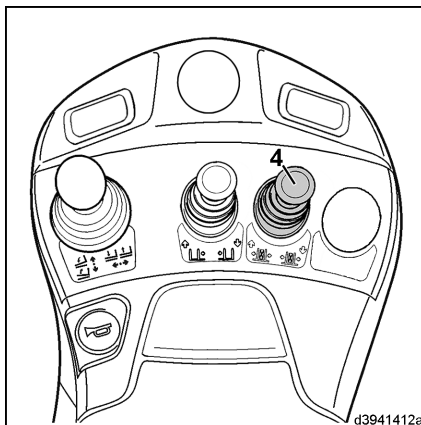
- Push the joystick (4) forwards.

Clamp opens.

- Pull the joystick (4) backwards.

Clamp closes.

Once the joystick has been released, it is locked again.



Joystick with single lever operation



⚠ WARNING

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

Therefore, never reach into or enter the lift mast or the area between the lift mast and the truck.

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

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

Bear the maximum lift height in mind.



NOTE

When working with a shovel, see "Using the truck during shovel operation".

Operating the lift and tilt attachments

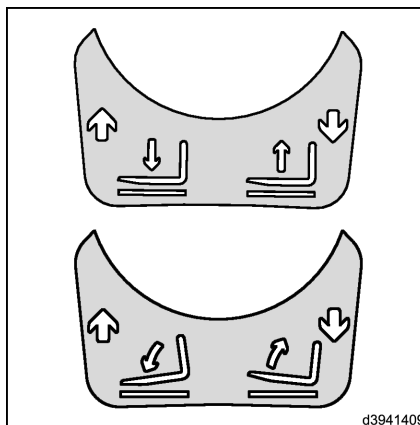
- Take note of the switching symbols with arrows.

The joystick must always be operated gently, never jerkily. Moving the joystick determines the lifting, lowering and tilt speed. After the joystick is released, it automatically returns to its initial position.



NOTE

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



Lifting the fork carriage

DANGER

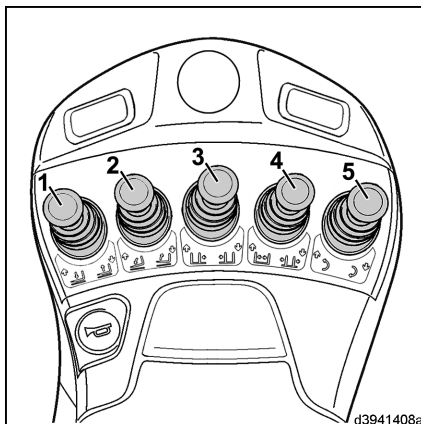
There is an increased risk of falling and crushing when lifting the lift mast.

For this reason, it is not permitted to 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

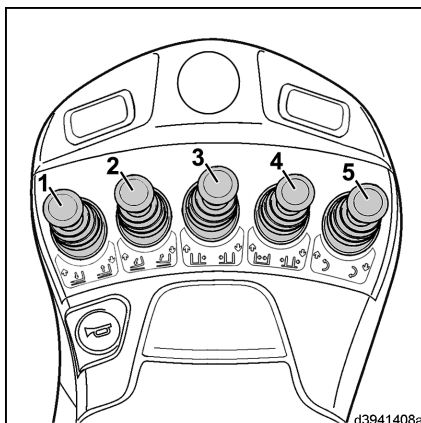
- Push the joystick (2) forwards.

Tilting the lift mast back

- Pull the joystick (2) backwards.

Operating the attachments

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



NOTE

Before fitting an attachment, depressurisation (special equipment) can be performed to depressurise the hydraulic system for the auxiliary hydraulics so that the connection on the attachment can be affixed to the connection on the fork carriage (see "Depressurisation" under special equipment).

4 Operation

Standard equipment

⚠ CAUTION

Attachments affect the load capacity and stability of the truck.

Attachments that are not supplied with the truck should only be used if the authorised dealer has checked that the arrangement in terms of load capacity and stability ensures safe operation.

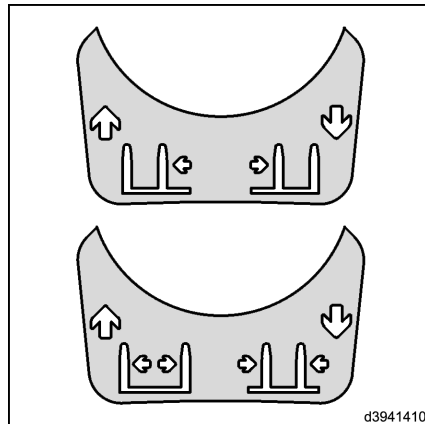
i NOTE

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

- Take note of the switching symbols with arrows.

i NOTE

For every attachment, a label stating the load capacity of the truck plus attachment (for a description, see "Additional capacity rating plate for attachments") must be affixed within the driver's range of vision and a symbol label for the relevant attachment must be affixed behind the joystick.



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Operating the sideshift

i NOTE

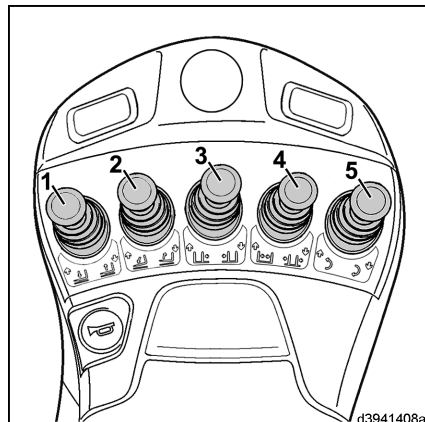
In order to prevent damage, do not activate the sideshift when the fork arms are on the ground.

- Push the joystick (3) forwards.

Sideshift moves to the left.

- Pull the joystick (3) backwards.

Sideshift moves to the right.



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Operating the fork prong positioner**i NOTE**

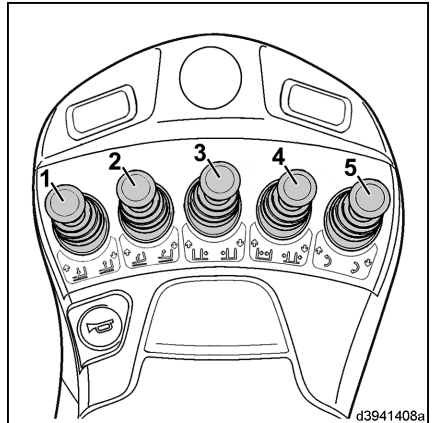
In order to prevent damage, do not activate the fork prong positioner with a load, or with the fork arms on the ground. Do not use the fork prong positioner as a clamp.

- Push the joystick (4) forwards.

Fork arms move outwards.

- Pull the joystick (4) backwards.

Fork arms move inwards.



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Operating the rotator**i NOTE**

Ensure that there is sufficient distance when the rotator is turning, in order to prevent damage occurring.

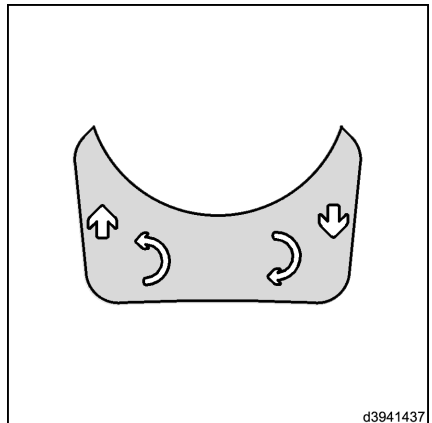
- Take note of the switching symbols with arrows.

- Push the joystick (5) forwards.

Unit moves anticlockwise.

- Pull the joystick (5) backwards.

Unit moves clockwise.



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Operating the clamp**⚠ 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.

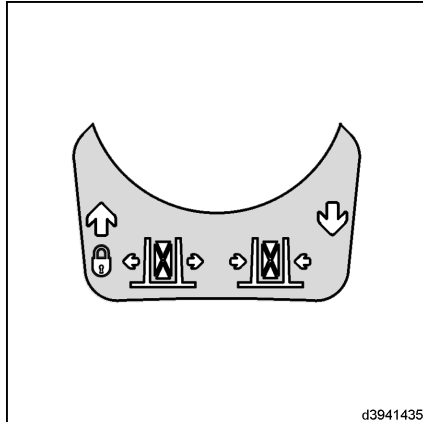
If your truck is not fitted with this equipment, please contact your authorised dealer.

4 Operation

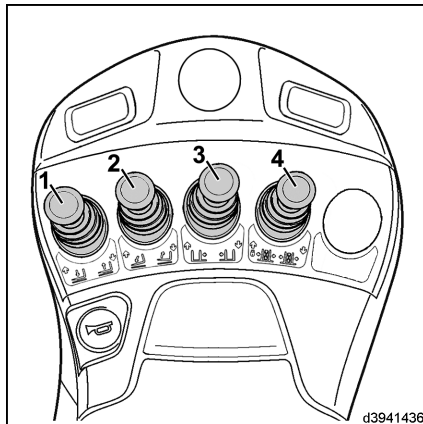
Standard equipment

Version 1: Electronically locked

- Take note of the switching symbols with arrows.



- Push joystick (4) (depending on the version) forwards by at least 40% and then move to the zero position.



Joystick is unlocked for approx. one second and the display (6) lights up in the display unit. ▷

i NOTE

If the joystick is not moved forwards within this time period, it is locked again.

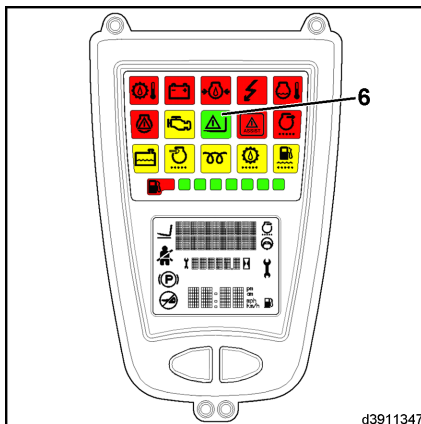
- Push the joystick (4) forwards.

Clamp opens.

Once the joystick has been released, it is locked again within one second.

- Pull the joystick (4) backwards.

Clamp closes.



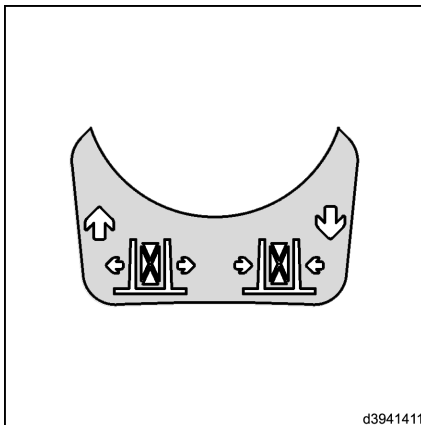
d3911347

Version 2: Mechanically locked

i NOTE

The joystick is recognisable by the somewhat wider design of the bellows.

- Take note of the switching symbols with arrows. ▷



d3941411

4 Operation

Standard equipment

➤ Unlock the joystick (4) (depending on the version) by pressing the knob downwards.

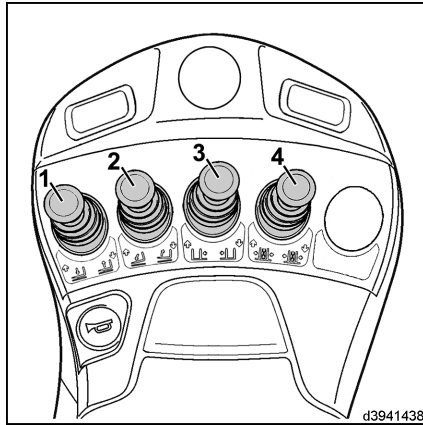
➤ Push the joystick (4) forwards.

Clamp opens.

➤ Pull the joystick (4) backwards.

Clamp closes.

Once the joystick has been released, it is locked again.



Particle filter regeneration

⚠ DANGER

Do not handle fuel while regeneration is in progress.

Do not refuel the truck while regeneration is in progress.

Particle filter levels of build-up

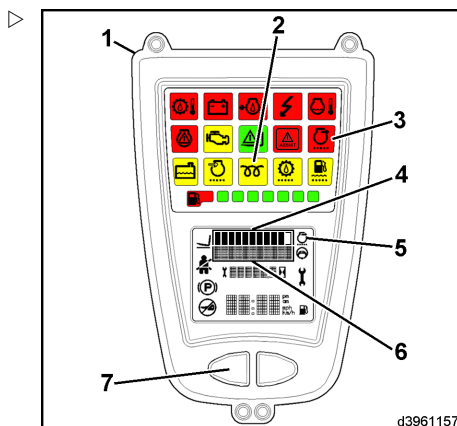
Build-up display (only if the build-up is displayed):

- 0 bars blacked out => particle filter empty.
- 10 bars blacked out => particle filter full.
- 11 bars blacked out => particle filter overloaded.

i NOTE

Regeneration should take place when a build-up of 10 bars blacked out is shown. This results in a long service life of the particle filter.

The following levels of particle filter build-up are activated:



Build-up:	Functions for when no regeneration is requested:
Level 1	- In text field (4) of display unit (1), the particle filter build-up (10 bars) flashes (only if the build-up is displayed). - Buzzer sounds briefly.
Level 2	- In text field (4) of display unit (1), the particle filter build-up (11 bars) flashes. - Buzzer sounds every 180 seconds.
Level 3	- In text field (4) of display unit (1), the particle filter build-up (11 bars) flashes. - Buzzer sounds continuously. - Particle filter warning (3) illuminates.
Level 4	- In text field (4) of display unit (1), the particle filter build-up flashes OVERLOAD. - Buzzer sounds continuously. - Particle filter warning (3) illuminates. - Creep speed.

i NOTE

To switch off the continuous tone of the buzzer, actuate the reset button (7). The buzzer then sounds every 60 seconds.

4 Operation

Standard equipment



⚠ WARNING

During regeneration, high temperatures occur in the particle filter, the exhaust system and in their vicinity.

Do not carry out regeneration in the vicinity of combustible materials. Do not touch — risk of burns.

- During regeneration, look out for leakages in the exhaust system. If you notice any, shut down the truck. Then contact your authorised dealer.

Version 1: Automatic mode without display

Regeneration is started automatically if the particle filter is full.

If symbol (5) flashes in display unit (1), regeneration is requested. At the same time, a check is carried out to determine whether the engine is at operating temperature.



NOTE

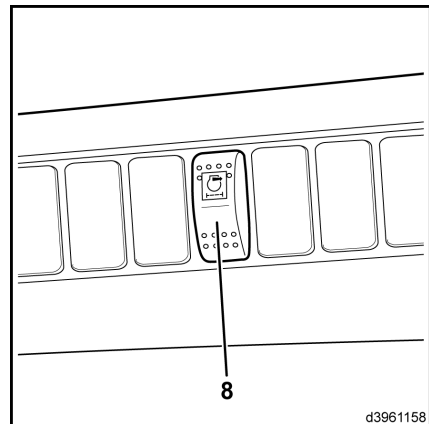
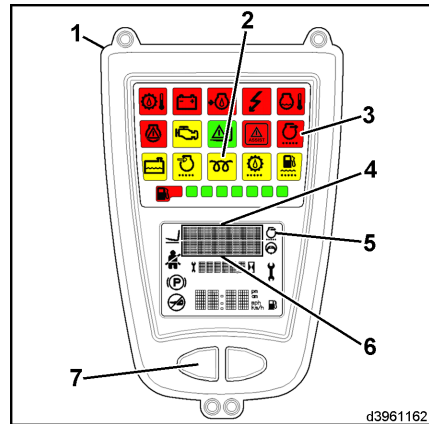
Regeneration is only started when the engine is at operating temperature. If necessary, run the engine until it is at operating temperature.

Symbol (5) remains lit during regeneration (about 30 minutes).

Using push button (8), the following actions can be triggered:

Interrupt regeneration.

- Press push button (8).



Regeneration is interrupted and in text field (4) of the display unit, OFF is displayed with the build-up. ▷

➤ Press push button (8) again.

Regeneration is restarted and the build-up in text field (4) disappears.

The automatic mode is activated again.

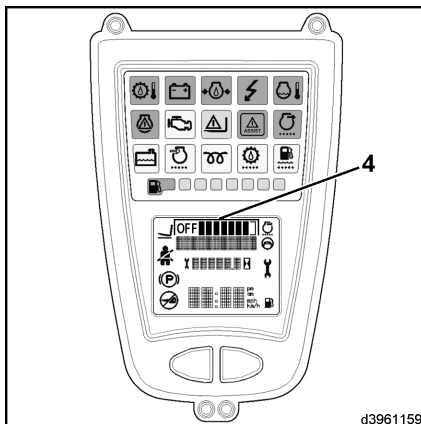
Prevent regeneration from starting.

➤ Press push button (8).

Regeneration is prevented from starting automatically.

➤ Press push button (8) again.

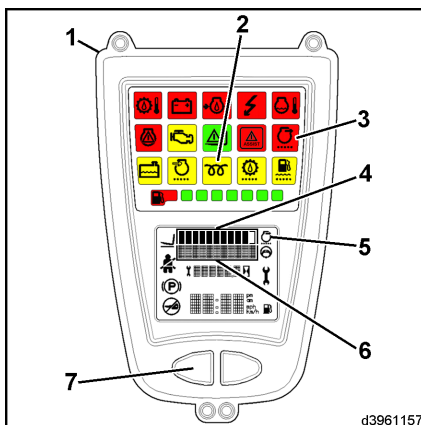
The automatic mode is activated again.



NOTE

Regeneration is interrupted when the truck is switched off. When the truck is switched on, the automatic mode is activated again.

In the event of an error occurring during regeneration, the preheating indicator (2) or particle filter warning (3) flashes and a buzzer sounds. To switch off the buzzer, press the reset button (7). Then contact your authorised dealer. ▷



4 Operation

Standard equipment

Version 2: Automatic mode with display ▷

In text field (4) of display unit (1), the particle filter build-up is displayed.

Regeneration is started automatically if the particle filter is full (10 bars of build-up are displayed in text field (4)).

If symbol (5) flashes in display unit (1), re-generation is requested. At the same time, a check is carried out to determine whether the engine is at operating temperature.



NOTE

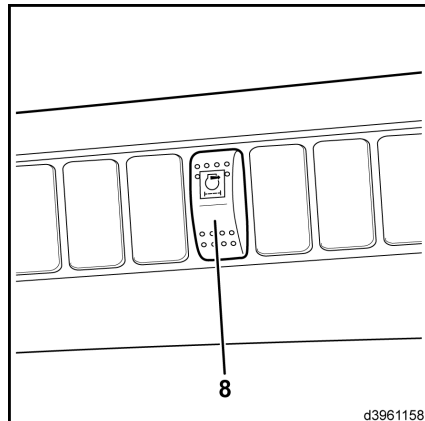
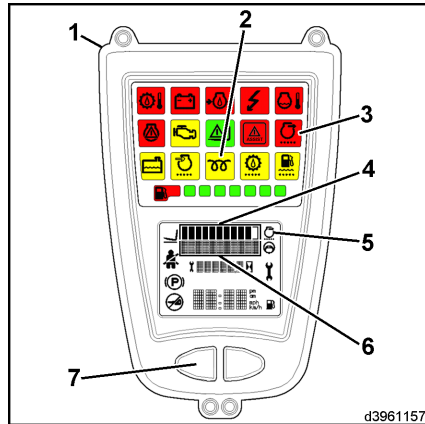
Regeneration is only started when the engine is at operating temperature. If necessary, run the engine until it is at operating temperature.

Symbol (5) remains lit during regeneration (about 30 minutes).

Using push button (8), the following additional actions can be triggered: ▷

Interrupt regeneration.

➤ Press push button (8).

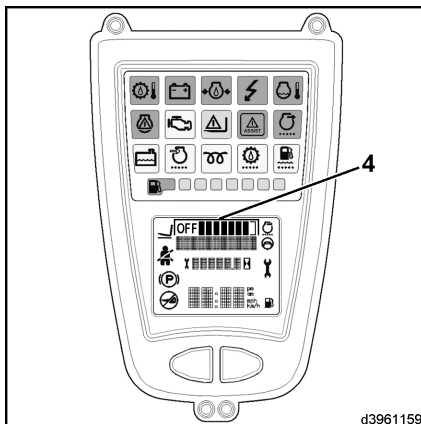


Regeneration is interrupted and in text field (4) of the display unit, OFF is displayed with the build-up. ▷

➤ Press push button (8) again.

Regeneration is restarted.

The automatic mode is activated again.



Start regeneration prematurely.

Regeneration can also be started prematurely. This is only possible if 5 bars of build-up are displayed in text field (4). ▷

➤ Press push button (8) for about 3 seconds.

Regeneration is started manually and in text field (4) of the display unit, ON is displayed with the build-up. Symbol (5) flashes. At the same time, a check is carried out to determine whether the engine is at operating temperature.



NOTE

Regeneration is only started when the engine is at operating temperature. If necessary, run the engine until it is at operating temperature.

Symbol (5) remains lit during regeneration (about 30 minutes).

After premature regeneration, the automatic mode is activated again.

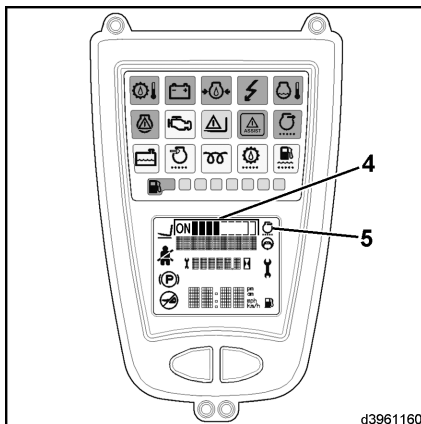
Prevent regeneration from starting.

➤ Press push button (8).

Regeneration is prevented from starting automatically.

➤ Press push button (8) again.

The automatic mode is activated again.



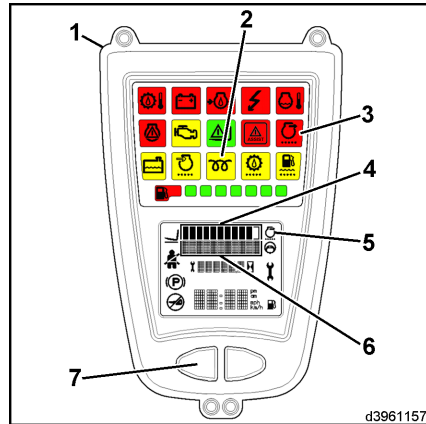
4 Operation

Standard equipment

NOTE

Regeneration is interrupted when the truck is switched off. When the truck is switched on, the automatic mode is activated again.

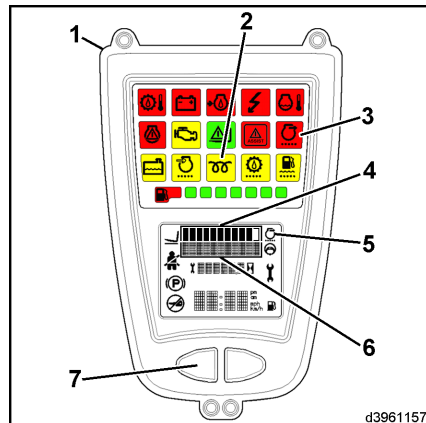
In the event of an error occurring during regeneration, the preheating indicator (2) or particle filter warning (3) flashes and a buzzer sounds. To switch off the buzzer, press the reset button (7). Then contact your authorised dealer.



Version 3: Manual mode

In text field (4) of display unit (1), the particle filter build-up is displayed.

Regeneration must be started manually if the particle filter is full. This is required at the latest when 10 bars of build-up are displayed in text field (4). The bars of build-up will also blink as a visual display and a buzzer will sound briefly.

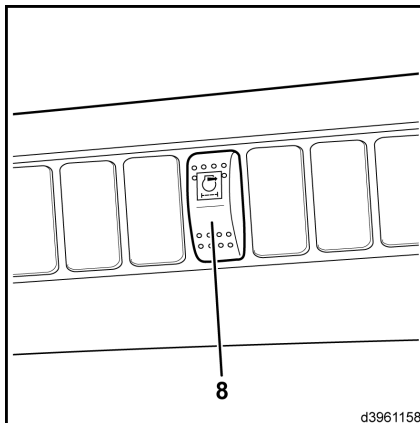


- Press push button (8) for about 3 seconds.

Regeneration is requested manually. The build-up stops flashing and in text field (4) of the display unit, ON is displayed with the build-up. Symbol (5) flashes. At the same time, a check is carried out to determine whether the engine is at operating temperature.

i NOTE

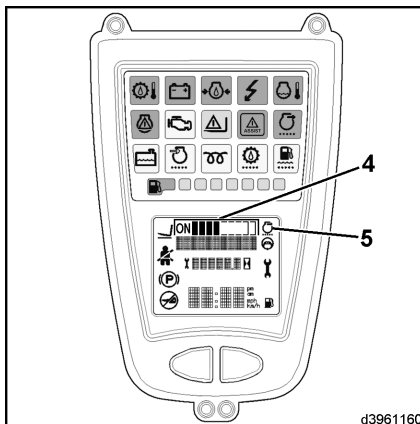
Regeneration is only started when the engine is at operating temperature. If necessary, run the engine until it is at operating temperature.



d3961158

Symbol (5) remains lit during regeneration (about 30 minutes).

The truck can still be driven during regeneration.



d3961160

4 Operation

Standard equipment

Using push button (8), the following additional actions can be triggered: ▷

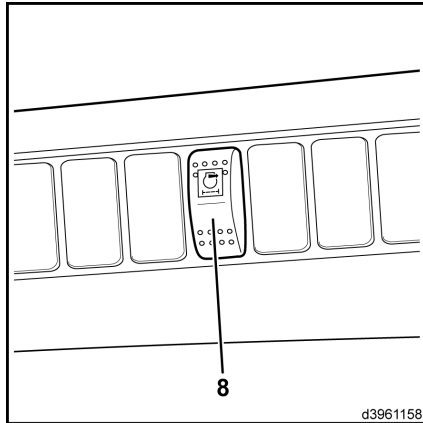
Interrupt regeneration.

- Press push button (8).

Regeneration is interrupted and the build-up is displayed in the text field (4) on the display unit.

- Press push button (8) again.

Regeneration is restarted.



d3961158

Start regeneration prematurely.

Regeneration can also be started prematurely. This is only possible if 5 bars of build-up are displayed in text field (4).

- Press push button (8) for about 3 seconds.

Regeneration is started manually and in text field (4) of the display unit, ON is displayed with the build-up. The symbol (5) flashes. At the same time, a check is carried out to determine whether the engine is at operating temperature.

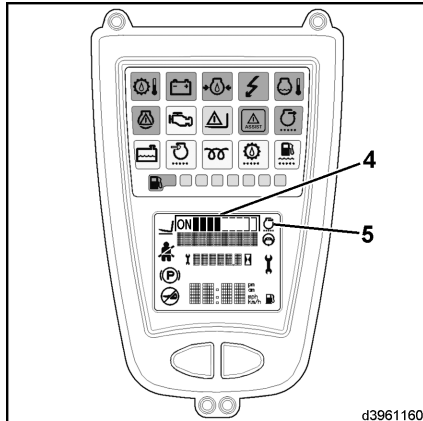
NOTE

Regeneration is only started when the engine is at operating temperature. If necessary, run the engine until it is at operating temperature.

Symbol (5) remains lit during regeneration (about 30 minutes).

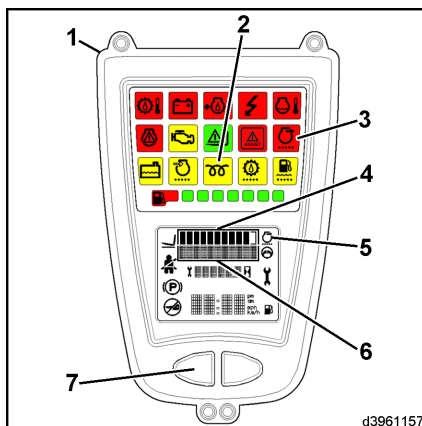
NOTE

When the truck is switched off, regeneration is interrupted and must be requested again when switched back on.



d3961160

In the event of an error occurring during regeneration, the preheating indicator (2) or particle filter warning (3) flashes and a buzzer sounds. To switch off the buzzer, press the reset button (7). Then contact your authorised dealer.



d3961157

Version 4: Stationary regeneration (special equipment)



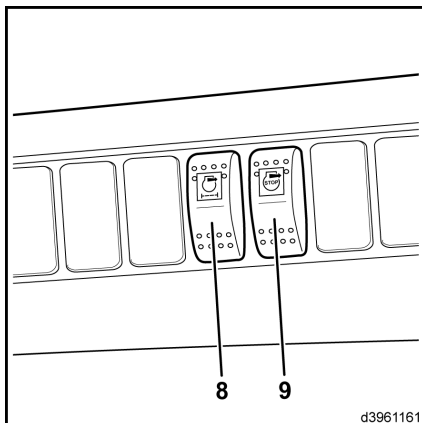
⚠ WARNING

During regeneration, high temperatures occur in the particle filter, the exhaust system and in their vicinity. For reasons of fire safety, do not allow the regeneration exhaust gases to be drawn into a fume extraction system.

Regeneration must only be carried out under supervision at a suitable place outside and not in the vicinity of combustible materials. Do not touch — risk of burns.

The cab must remain accessible at all times so that regeneration can be interrupted with the stop button (9) as required.

- Check for cleanliness in the area of the exhaust gas routing. Clean as required.
- During regeneration, look out for leakages in the exhaust system. If you notice any, shut down the truck. Then contact your authorised dealer.



d3961161

4 Operation

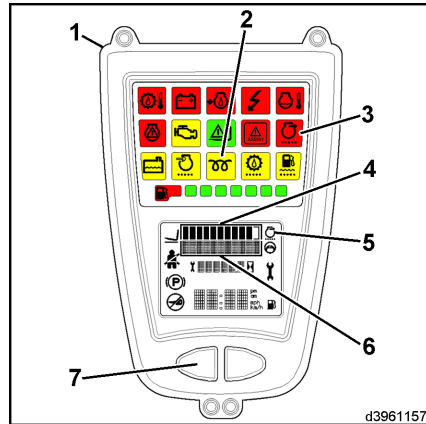
Standard equipment

In text field (4) of display unit (1), the particle filter build-up is displayed. ▷

Regeneration must be started manually if the particle filter is full. This is required at the latest when 10 bars of build-up are displayed in text field (4). The bars of build-up will also blink as a visual display and a buzzer will sound briefly.

Regeneration can also be started prematurely. This is only possible if 5 bars of build-up are displayed in text field (4).

- Park the truck outside in a suitable place and **do not** switch off the engine.
- Actuate the parking brake (turn the parking brake lever clockwise until it engages).



- Press push button (8) for about 3 seconds. ▷

Regeneration is requested manually. The build-up stops flashing and in text field (4) of the display unit, ON is displayed with the build-up. The symbol (5) flashes. At the same time, a check is carried out to determine whether the engine is at operating temperature.

NOTE

Regeneration is only started when the engine is at operating temperature. If necessary, run the engine until it is at operating temperature.

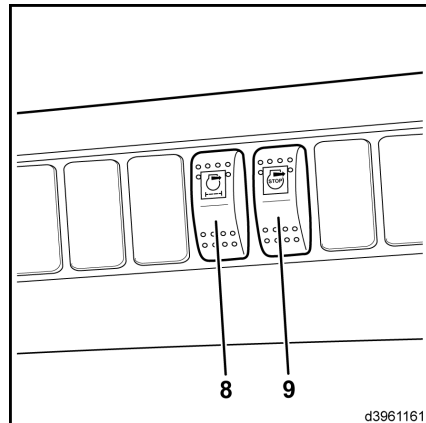
Symbol (5) lights up continuously after regeneration starts.

Do not turn the switch key to the zero position until regeneration has started.

- Turn the switch key to the zero position and remove it.

The engine is **not** turned off while regeneration runs. The display unit is turned off during regeneration.

Once regeneration has finished, the engine is turned off automatically. (after 60 minutes at the latest)



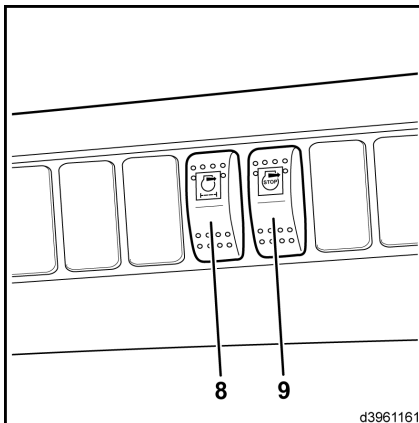
Regeneration can be interrupted using the stop button (9) in the switch panel.

➤ Push the stop button (9).

Regeneration is interrupted and the engine is turned off automatically.

i NOTE

Regeneration must be requested again after the engine is started.

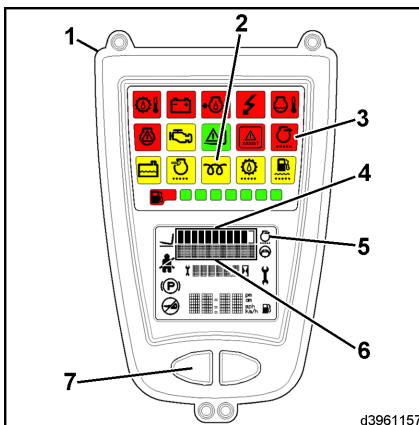


d3961161

In the event of an error occurring during regeneration, the preheating indicator (2) or particle filter warning (3) flashes and a buzzer sounds. To switch off the buzzer, press the reset button (7). Then contact your authorised dealer.

i NOTE

A "stationary regeneration with automatic mode" combination is possible. The engine cannot be turned off during regeneration without the stop button (9), as is the case for stationary regeneration.



d3961157

4 Operation

Special equipment

Special equipment

Depressurisation

When replacing hydraulic components or connecting operating equipment to the quick-release couplings of the working hydraulics, the hydraulic system must be depressurised.

- Switch off the engine.
- Switch on the ignition.
- Actuate the joystick of the corresponding auxiliary hydraulics repeatedly.
- Unscrew the union nuts on the fork carriage.
- Screw on the lines from the attachment or connect the plug connectors.

Driver's cab

Opening the cab door

- Push handle (3) upwards.
- Open driver's door outwards.

Closing the cab door



NOTE

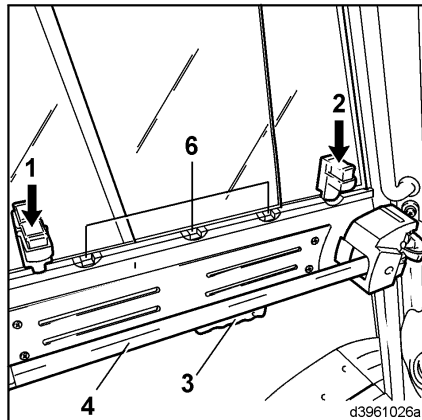
To make it easier to close the door, open the side window slightly.

- 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.



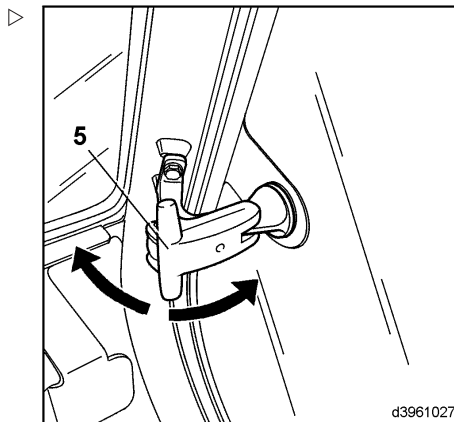
Opening the quarter window

- Pull the lever (5) forwards.

The window will open.

- Push the lever (5) backwards.

The window will close.



Lighting

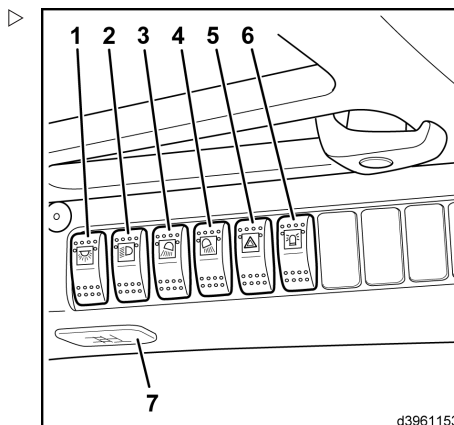
NOTE

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 interior lighting

- Press the toggle switch (1).

Interior lighting (7) is switched on.



4 Operation

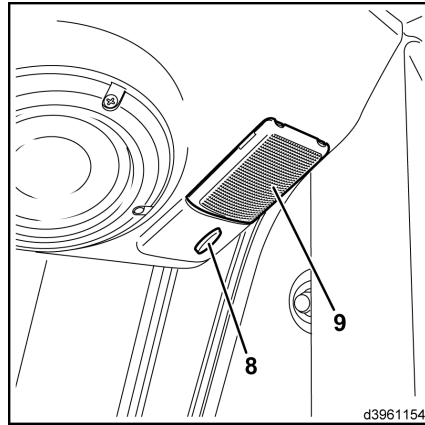
Special equipment

- Press the pressure switch (8).
- Interior lighting (9) is switched on.



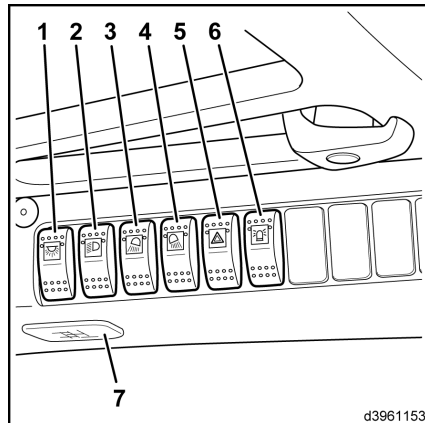
NOTE

In pressure switches (8) that have previously been actuated, 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

Depending on the equipment, there are two different versions.

Version 1 (single-stage switch):

- Press the toggle switch (6).

The rotating beacon is always in operation.

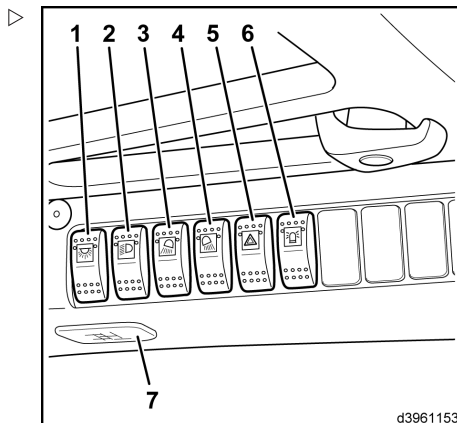
Version 2 (two-stage switch):

- Move the toggle switch (6) to the centre position.

The rotating beacon is in operation for reverse travel only.

- Switch the toggle switch (6) as far as it will go.

The rotating beacon is always in operation.



d3961153

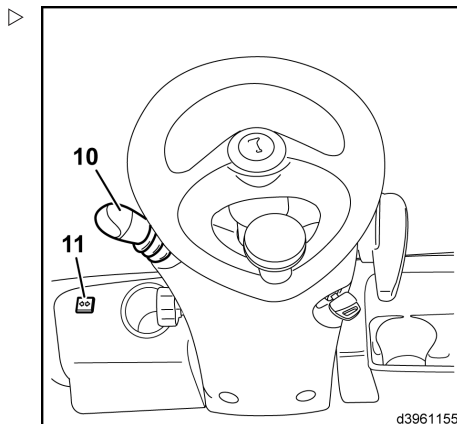
Switching on the direction indicators

- Move the actuating lever (10) on the steering wheel forwards.

The direction indicators flash on the right. The indicator light (11) flashes.

- Move the actuating lever (10) on the steering wheel backwards.

The direction indicators flash on the left. The indicator light (11) flashes.



d3961155

Windscreen wiper



NOTE

The various wiper functions can be turned both on and off using the central actuating lever (1) depending on what has been preselected at the relevant toggle switches (2, 3); it is different for forwards and reverse travel.

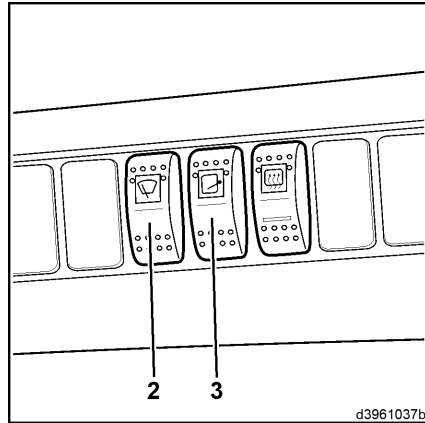
4 Operation

Special equipment

Switching on the front windscreen wiper

Truck at a standstill or in forwards travel:

- Switch toggle switch (2) and (3) to the zero position. ▷

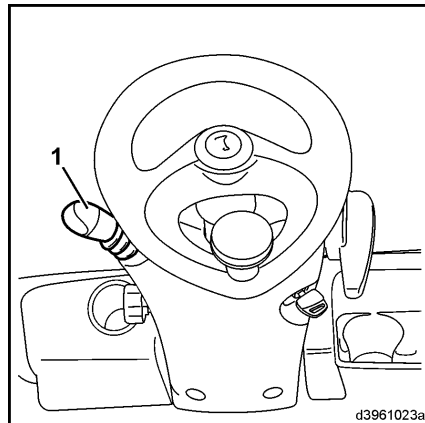


- Move the actuating lever (1) on the steering wheel upwards from the centre position. ▷

The front windscreen wiper remains in intermittent mode as long as the lever is actuated.

- Press the actuating lever (1) on the steering wheel downwards from the centre position.

The front windscreen wiper is in intermittent mode.



Switching on the rear window wiper

Truck in reverse travel:

- Switch toggle switch (2) and (3) to the zero position.
- Move the actuating lever (1) on the steering wheel upwards from the centre position.

The rear window wiper remains in intermittent mode as long as the lever is actuated.

- Press the actuating lever (1) on the steering wheel downwards from the centre position.

The rear window wiper is in intermittent mode.

Switching on the front windscreen wiper and rear window wiper

- Move toggle switch (2) to centre position. ➤

Truck at a standstill or in forwards travel:

- Move the actuating lever (1) on the steering wheel upwards from the centre position.

As long as the lever is actuated, the front windscreen wiper remains in continuous mode and the rear window wiper remains in intermittent mode.

- Press the actuating lever (1) on the steering wheel downwards from the centre position.

The front windscreen wiper is in continuous mode and the rear window wiper is in intermittent mode.

Truck in reverse travel:

- Move the actuating lever (1) on the steering wheel upwards from the centre position. ➤

As long as the lever is actuated, the front windscreen wiper remains in intermittent mode and the rear window wiper remains in continuous mode.

- Press the actuating lever (1) on the steering wheel downwards from the centre position.

The front windscreen wiper is in intermittent mode and the rear window wiper is in continuous mode.

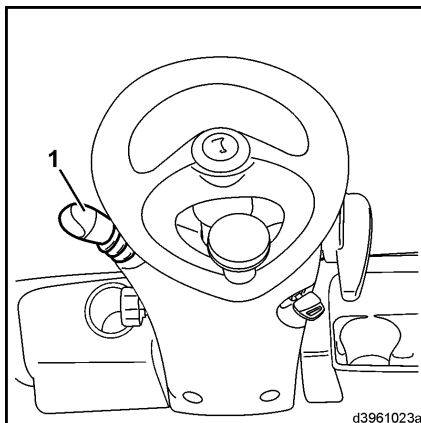
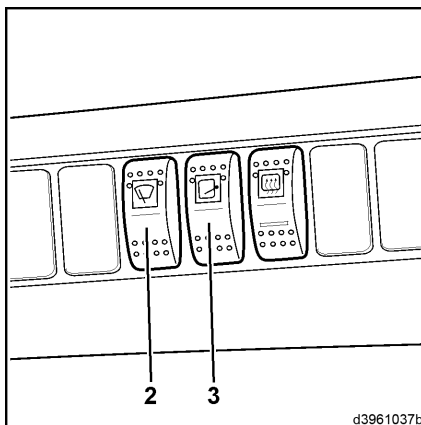
Truck at a standstill or in forwards/reverse travel:

- Switch toggle switch (2) as far as it will go.
- Move the actuating lever (1) on the steering wheel upwards from the centre position.

As long as the lever is actuated, the front windscreen wiper and rear window wiper remain in continuous mode.

- Press the actuating lever (1) on the steering wheel downwards from the centre position.

The front windscreen wiper and rear window wiper are in continuous mode.



4 Operation

Special equipment

Switching on the front windscreen wiper and roof panel wiper

- Move toggle switch (3) to centre position. ▷
- Move the actuating lever (1) on the steering wheel upwards from the centre position.

As long as the lever is actuated, the front windscreen wiper and roof panel wiper remain in intermittent mode.

- Press the actuating lever (1) on the steering wheel downwards from the centre position.

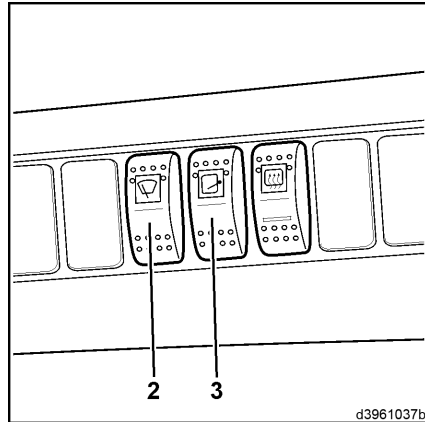
The front windscreen wiper and roof panel wiper are in intermittent mode.

- Switch toggle switch (3) as far as it will go.
- Move the actuating lever (1) on the steering wheel upwards from the centre position.

As long as the lever is actuated, the front windscreen wiper remains in intermittent mode and the roof panel wiper remains in continuous mode.

- Press the actuating lever (1) on the steering wheel downwards from the centre position.

The front windscreen wiper is in intermittent mode and the roof panel wiper is in continuous mode.



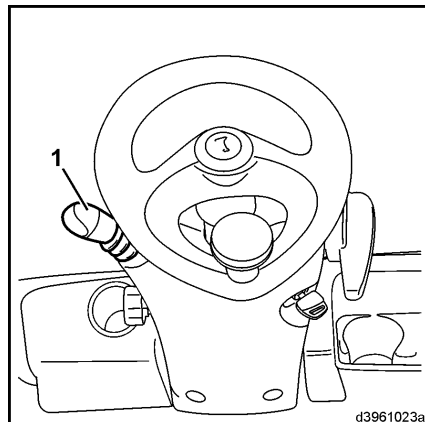
Switching on the wiper/washer system

- Press the actuating lever (1) fully in. ▷

The wiper/washer system is activated for the windscreen and rear window as long as the lever is pressed.

- Switch on the toggle switch (3).

The wiper/washer system is activated for the windscreen, rear window and roof panel as long as the lever is pressed.



Window heater

Switching on the rear window heating

- Press push button (1).

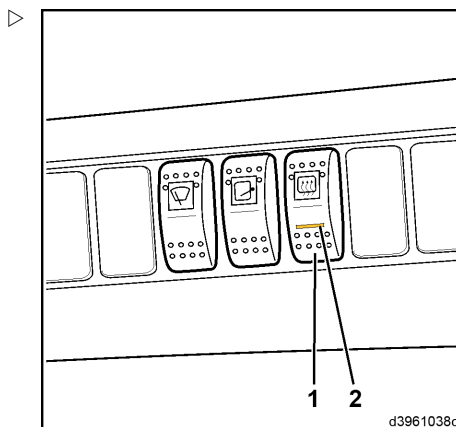
Dummy (2) test.

- 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

Automatic heating

The heating system has two different operating modes:

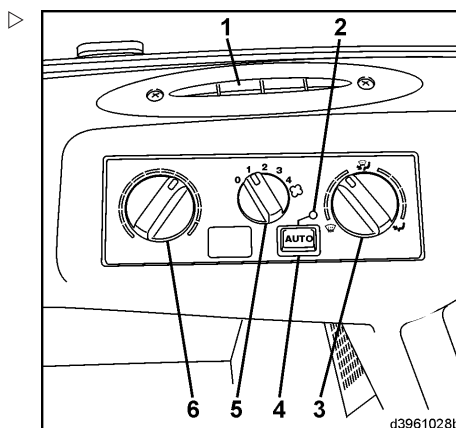
- Manual heating system
- Automatic heating system

Controls

- Cab air vents (1)
- Function display (2)
- Turning knob (3) for setting the vent positions for windscreen defrosting / footwell ventilation
- Pressure switch (4) for switching automatic heating on and off
- Rotary switch (5) for setting the blower positions
- Turning knob (6) for temperature control

Manual heating operation:

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



Switching on the heating system

- Turn switch (5).

4 Operation

Special equipment

The blower is switched on and there are four air flow settings.

For normal heating operation, the following rules apply:

- Select the temperature using turning knob (6) (far left → cold / far right → hot)
- Use blower switch (5) (level 1 to 4), air distribution vent (turning knob (3)), cab air vents (1) and the two vents on the left and right to select the most comfortable temperature and temperature distribution.

Defrosting the windows

➤ For maximum defrosting, set the

- Turning knob (6) to the far right position
- Turning knob (3) to the far left position
- Rotary switch (5) to level 4
- Open the left and right cab air vents and set the fins towards the windscreen.

Automatic heating operation:

- Set the desired temperature using turning knob (6).
- Press push-button (4).

The automatic heating is switched on and function display (2) lights up green. The blower setting is now controlled automatically.

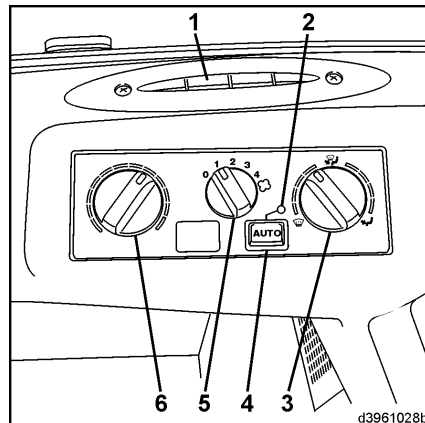
⚠ CAUTION

If the function display (2) flashes 5x after switching on and then goes out, there is an error in the automatic heating.

Please contact your authorised dealer.

NOTE

If the position of rotary switch (5) for the blower setting is changed manually, the system reverts immediately to "manual heating operation".



Automatic heating/air conditioning

⚠ CAUTION

The moving parts must be lubricated and the compressor prevented from seizing.

Therefore switch on the air conditioning briefly every 3 months. In addition, the air conditioning must be serviced once a year by your authorised dealer, preferably before the season starts, and a record must be kept of the servicing. Otherwise, the warranty will be void.

i NOTE

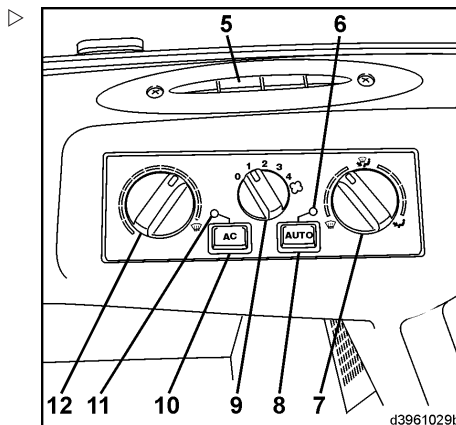
It is normal for condensation water to build up in the hoses and under the truck when the air conditioning is in operation.

The automatic heating/air conditioning has four different operating modes:

- Manual air conditioning
- Automatic air conditioning
- Manual heating system
- Automatic heating system

Controls

- Cab air vents (5)
- Function display (6)
- Turning knob (7) for setting the vent positions for windscreen defrosting / footwell ventilation
- Push-button (8) for switching the automatic function on and off
- Rotary switch (9) for setting the blower positions
- Push-button (10) for switching the air conditioning on
- Function display (11)
- Turning knob (12) for temperature control



Manual air conditioning operation

- Push-button (8) for automatic operation must be switched off.

Switching on the air conditioning

i NOTE

The air conditioning operates only when the engine is running and the blower switch is

4 Operation

Special equipment

switched on (setting 1, 2, 3 or 4). The fans in the roof switch on when necessary. They can come to a standstill from time to time.

- Turn switch (9).

The blower is switched on and there are four air flow settings.

- Press push-button (10).

The function display (11) lights up green.

CAUTION

If the function display (11) flashes 5x after switching on and then goes out, there is an error in the air conditioning.

Please contact your authorised dealer.

To raise the temperature in the cab:

- Turn turning knob (12) clockwise and reduce the blower speed using switch (9).

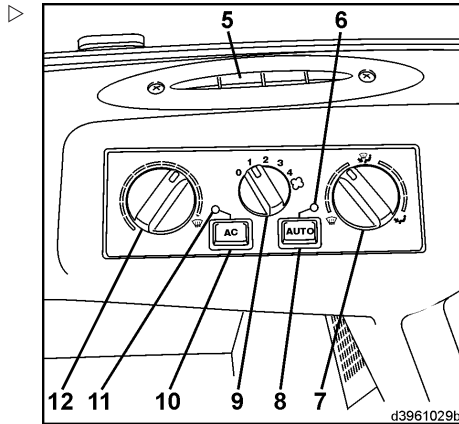
To lower the temperature in the cab:

- Close windows and doors, turn turning knob (12) anti-clockwise and increase the blower speed using switch (9).

NOTE

To achieve maximum cooling in the cab:

- the air conditioning must be switched on,
- the turning knob (12) must be fully turned to the left stop,
- the blower must be set to its highest blower position,
- the left and right cab air vents must be open,
- the windows and doors must be closed.



Automatic air conditioning operation

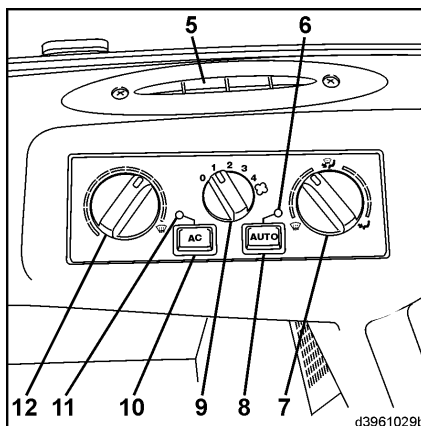
- Set the desired temperature using turning knob (12).
- Press push-button (8).

The automatic air conditioning is switched on and function displays (6) and (11) light up green. The blower setting is now controlled automatically.

⚠ CAUTION

If the function display (6) or (11) flashes 5x after switching on and then goes out, there is an error in the automatic heating/air conditioning or in the air conditioning.

Please contact your authorised dealer.

**NOTE**

If the position of rotary switch (9) for the blower setting is changed manually, or the automatic setting is switched off by pressing push-button (8), the system reverts immediately to "manual air conditioning operation". If the air conditioning function is switched off by pressing push-button (10), the system switches to "automatic heating operation".

Manual heating operation:

- Push-buttons (10) for the air conditioning function and (8) for automatic function must be switched off.

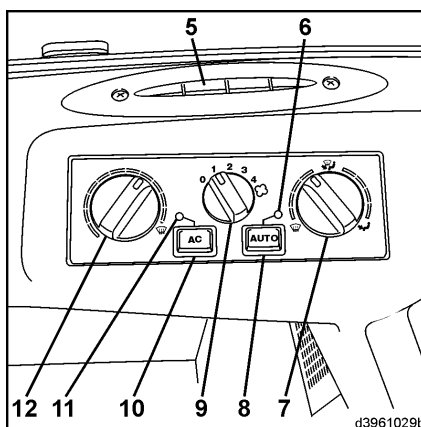
Switching on the heating system

- Turn switch (9).

The blower is switched on and there are four air flow settings.

For normal heating operation, the following rules apply:

- Select the temperature using turning knob (12) (far left → cold / far right → hot)
- Use blower switch (9) (level 1 to 4), air distribution vent (turning knob (7)), cab air vents (5) and the two vents on the left and right to select the most comfortable temperature and temperature distribution.

**Defrosting the windscreen/demisting the windows**

4 Operation

Special equipment

- To achieve maximum windscreen defrosting or demisting, set
 - Turning knob (12) to the far right position
 - Turning knob (7) to the windscreen defrosting position (far left position)
 - Rotary switch (9) to level 4
 - Open the left and right cab air vents and set the fins towards the windscreen.

Automatic heating operation

- Push-button (10) for the air conditioning function must be switched off.
- Push-button (8) for automatic function must be switched on.

The function display (6) lights up green

CAUTION

If the function display (6) flashes 5x after switching on and then goes out, there is an error in the automatic heating.

Please contact your authorised dealer.

- Set the desired temperature using turning knob (12).

Automatic heating is switched on and the blower setting and temperature are controlled automatically.



NOTE

If the position of rotary switch (9) for the blower setting is changed manually, the system reverts immediately to "manual heating operation". Windscreen defrosting can be performed only in manual operation.

Linde Forklift Data Management (LFM)

Truck data acquisition

The truck 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 truck can only be operated by authorised personnel.

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

NOTE

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

Status code

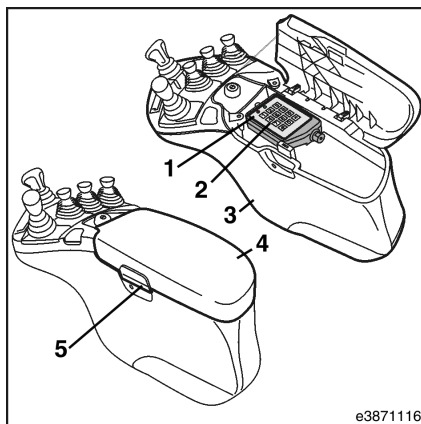
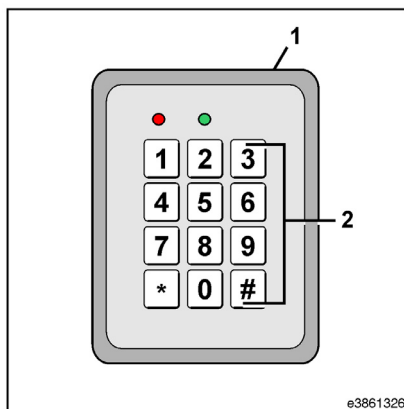
NOTE

The code indicates the status of the truck.

The following codes are available:

- **[0]** = Truck OK
- **[1]** = Request service (truck will not start)
- **[2]** = Request maintenance (truck starts)
- **[3]** = Problem with driving
- **[4]** = Problem with lifting
- **[5]** = Problem with steering
- **[6]** = Accident damage
- **[7]** = User-defined
- **[8]** = User-defined
- **[9]** = User-defined

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



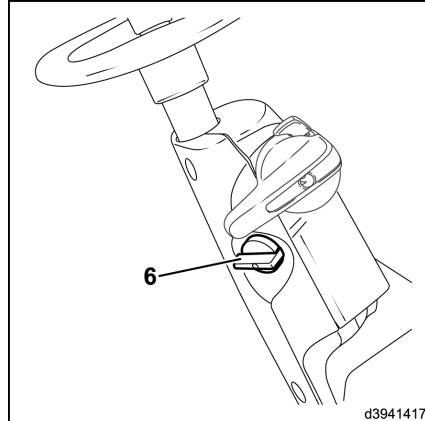
4 Operation

Special equipment

NOTE

If you only notice one of these statuses (such as a problem with driving) after you have input the status code  (truck OK), you have to log off.

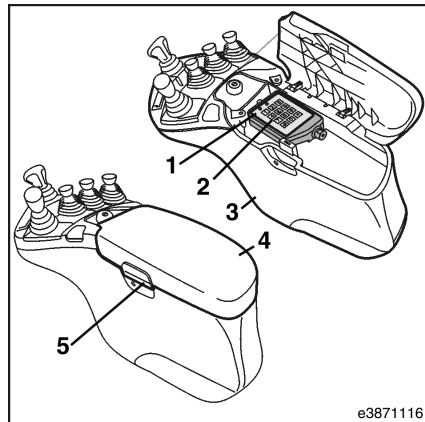
- Rotate the turning knob (6) anticlockwise to the stop. ▷
- Log in again with status message  (problem with driving)



Truck data acquisition — standard setting (PIN and status code) ▷

Logging on and starting the truck:

- Apply the parking brake.
- Flip up the armrest support (4) on the side to the right via opening (5).



- Press the  (4) button to start the input device.

The green LED (2) flashes.

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

Therefore, for a properly set-up truck, the PIN should be as follows:      .



NOTE

If the PIN was input incorrectly, press the  button (4) and enter the correct PIN.

- Confirm the entry with the  button (3).

The green LED (2) lights up with a steady light.



NOTE

If the red LED (1) lights up, an incorrect PIN was entered. Press the  button (4) and enter it again. If more than three incorrect entries are made (factory setting), the red LED (1) lights up and the green LED (2) flashes. The input of a valid PIN is blocked for 10 minutes. The blocking time can be interrupted by inputting a special PIN. Please contact your fleet manager.

- Rotate the turning knob (6) clockwise to the stop and start the truck.



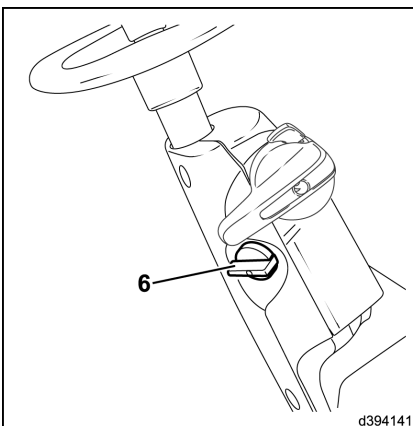
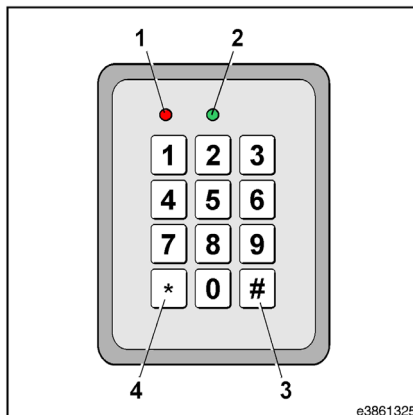
NOTE

If the truck does not start properly the first time, the starting procedure can be repeated until the turning knob (6) is returned to the zero position, and the PIN is discarded after expiry of the delay time.



NOTE

If the green (2) and red (1) LEDs both light up as steady lights, the data must be read out. Please inform your fleet manager at once.



4 Operation

Special equipment

Switch off the truck and log off:

- Rotate the turning knob (6) anticlockwise to the stop.

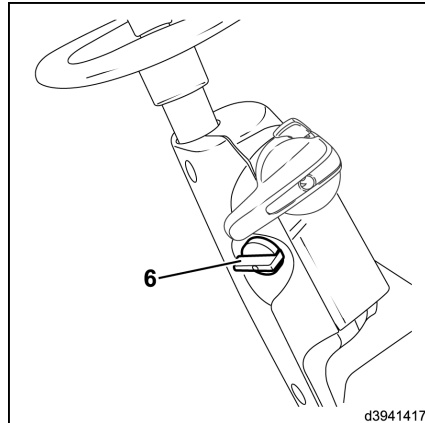
The engine is turned off.



NOTE

After a delay time (factory setting = 10 seconds) the red LED (1) lights up briefly, and the green (2) and red (1) LEDs then flash for approx. 3 seconds. During this period, the truck can be started at any time. The LEDs then go out, and the PIN is discarded. The delay time can be set to between 10 seconds and 10 minutes using the diagnostic device. Please contact your authorised dealer.

Pressing the  button (3) after switching off the engine terminates the delay time immediately and the PIN is deleted.

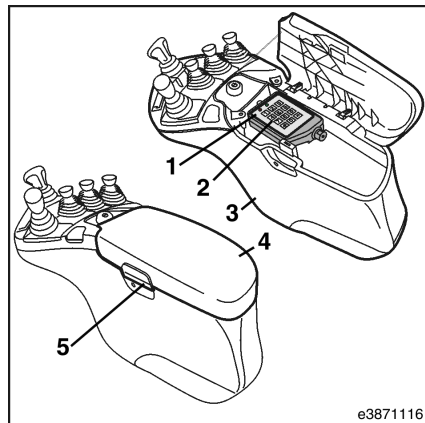


Truck data acquisition — special setting (PIN)



Logging on and starting the truck:

- Apply the parking brake.
- Flip up the armrest support (4) on the side to the right via opening (5).



- Press the  (4) to start the input device.

The green LED (2) flashes.

- Enter personal PIN (factory setting =    ).



NOTE

If the PIN was input incorrectly, press the  button (4) and enter the correct PIN.

- Confirm the entry with the  button (3).

The green LED (2) lights up with a steady light.



NOTE

If the red LED (1) lights up, an incorrect PIN was entered. Press the  button (4) and enter it again. If more than three incorrect entries are made (factory setting), the red LED (1) lights up and the green LED (2) flashes. The input of a valid PIN is blocked for 10 minutes. The blocking time can be interrupted by inputting a special PIN. Please contact your fleet manager.

- Rotate the turning knob (6) clockwise to the stop and start the truck.



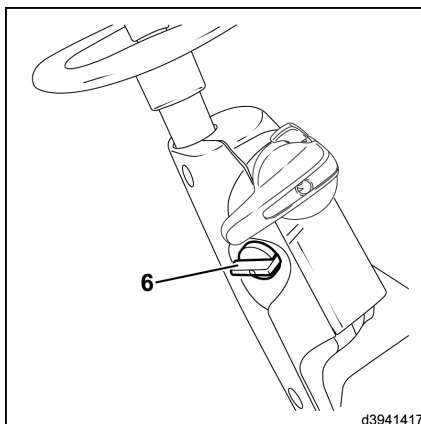
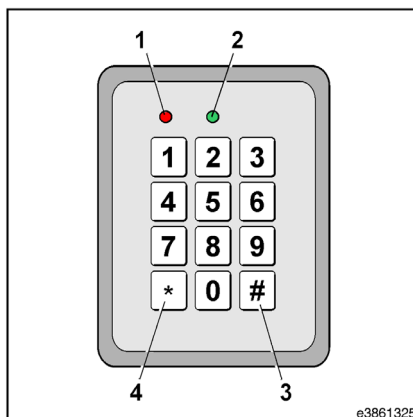
NOTE

If the truck does not start properly the first time, the starting procedure can be repeated until the turning knob (6) is returned to the zero position, and the PIN is discarded after expiry of the delay time.



NOTE

If the green (2) and red (1) LEDs both light up as steady lights, the data must be read out. Please inform your fleet manager at once.



4 Operation

Special equipment

Switch off the truck and log off: ▷

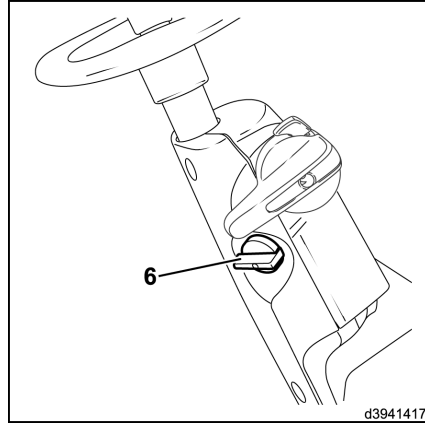
- Rotate the turning knob (6) anticlockwise to the stop.

The engine is turned off.

NOTE

After a delay time (factory setting = 10 seconds) the red LED (1) lights up briefly, and the green (2) and red (1) LEDs then flash for approx. 3 seconds. During this period, the truck can be started at any time. The LEDs then go out, and the PIN is discarded. The delay time can be set to between 10 seconds and 10 minutes using the diagnostic device. Please contact your authorised dealer.

Pressing the  button (3) after switching off the engine terminates the delay time immediately and the PIN is deleted.

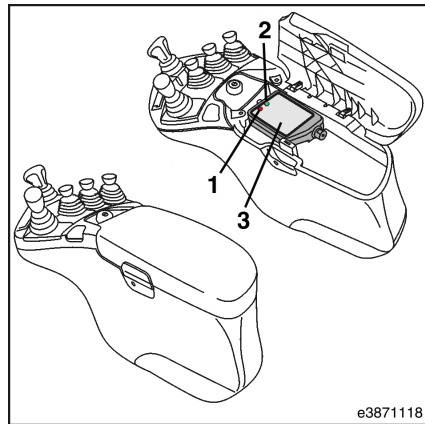


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Truck data acquisition with a transponder (chip or magnetic strip card) ▷

NOTE

The input device has a field (3) onto which the corresponding transponder (chip or magnetic strip card) must be placed. Only then can the truck be started.



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Logging on and starting the truck:

- Apply the parking brake.
- Fold open the armrest support on the side to the right.
- Place the valid transponder on the field (3).

Data is read in and the green LED (2) lights up with a steady light.

- Remove transponder.

** NOTE**

If the red LED (1) lights up, the transponder is invalid or there was a reading error. The input device is reactivated automatically when a valid transponder is used and read in.

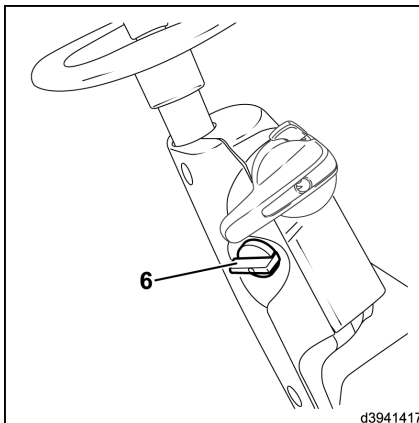
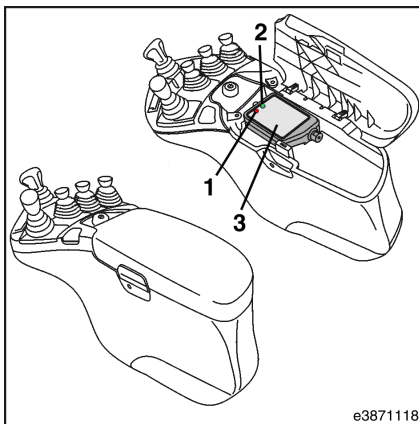
- Rotate the turning knob (6) clockwise to the stop and start the truck.

** NOTE**

If the truck does not start properly the first time, the starting procedure can be repeated until the turning knob (6) is returned to the zero position.

** NOTE**

If the green (2) and red (1) LEDs both light up as steady lights, the data must be read out. Please inform your fleet manager at once.



4 Operation

Special equipment

Switch off the truck and log off:

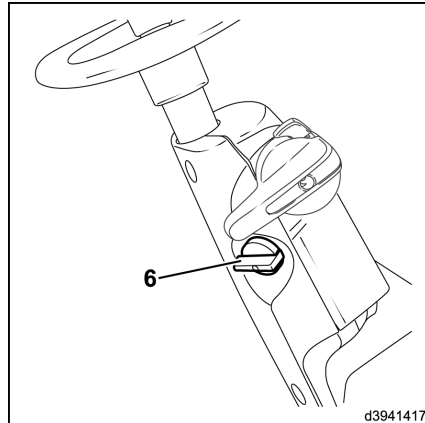
- Rotate the turning knob (6) anticlockwise to the stop.

The engine is turned off.



NOTE

After a delay time (factory setting = 10 seconds) the red LED (1) lights up briefly, and the green (2) and red (1) LEDs then flash for approx. 3 seconds. During this period, the truck can be started at any time. The LEDs then go out, and the PIN is discarded. The delay time can be set to between 10 seconds and 10 minutes using the diagnostic device. Please contact your authorised dealer.



Adjusting the driver's seat with rotating device

⚠ CAUTION

The driver's seat must not rotate while the 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.

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

The rotating device is maintenance free.

⚠ WARNING

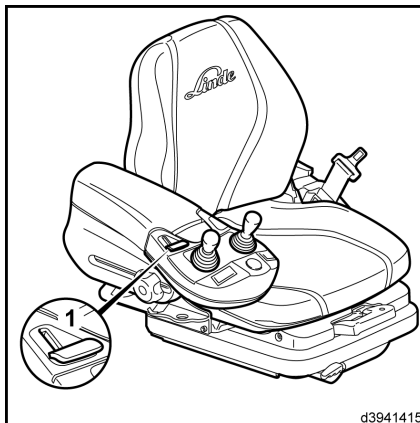
Increased risk of accident when travelling on public roads.

When driving forwards on public roads, the driver's seat must be in the straight-ahead position.

- Pull the locking lever (1) backwards.

The rotating device is enabled and allows the seat to be rotated 17° to the right. It can be locked at 0° and at 17°.

- Allow the locking bolt to snap audibly into place.

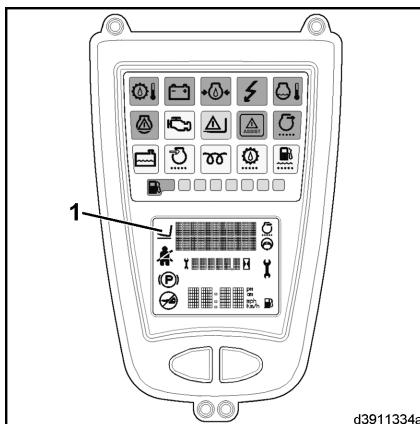


Lift mast positioning

Programming

The tilt angle sensor system allows a specific lift mast tilt angle to be programmed. When this function is enabled, symbol (1) lights up in the display unit.

- Tilt lift mast to required angle.



4 Operation

Special equipment

- Press the push button (2) at the front left-hand side of the armrest for longer than 2 seconds.

The tilt angle is now permanently stored. As confirmation, a double acoustic signal sounds from the display unit and the light in the button (2) flashes briefly several times.

The lift mast tilt angle is stored in relation to the truck. The lift mast tilt angle in relation to the ground depends on a variety of influencing factors, such as the tyre wear, the tyre pressure of pneumatic tyres, the load, and the unevenness and gradient of the ground.

Operation



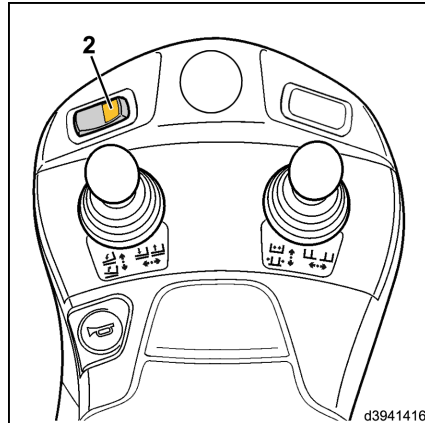
NOTE

The lift mast positioning function is designed to aid the driver and is purely a comfort feature. The responsibility and control for activating the required mast position always lie with the driver.

- Briefly press button (2) at the front left-hand side of the armrest. The lamp in the button lights up and the lift mast positioning detection is switched on.
- Operate the joystick and move to the stored tilt angle. (For safety reasons, tilting is permitted only in the direction of the stored tilt angle, and must be reactivated with each lift mast positioning).

When the stored lift mast position has been reached, the lift mast remains stationary and an acoustic signal sounds in the display unit.

- Release the joystick or press button (2) again briefly. The light in the push button goes out, and the lift mast positioning is switched off.
- The lift mast can now be operated normally using the joystick.
- Briefly press push button (2) again. Lift mast position identification is switched on again.



Sweeper function

DANGER

High risk of property damage, injury and death.

The sweeper function must not be used for other attachments.



WARNING

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

Therefore, never reach into or enter the lift mast or the area between the lift mast and the truck.

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

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

Take note of the maximum lift height.

Operating the attachments

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



NOTE

Before fitting an attachment, depressurisation (special equipment) can be performed to depressurise the hydraulic system for the auxiliary hydraulics so that the connection on the attachment can be connected to the connection on the fork carriage (see "Depressurisation" under Special equipment).

CAUTION

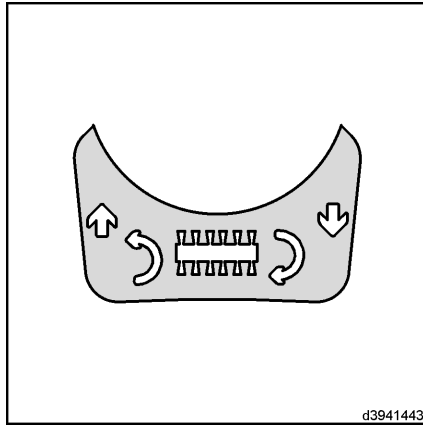
Attachments alter the load capacity and stability of the truck.

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

4 Operation

Special equipment

- Take note of the switching symbols with arrows.



Continuous operation — activating the sweeper function



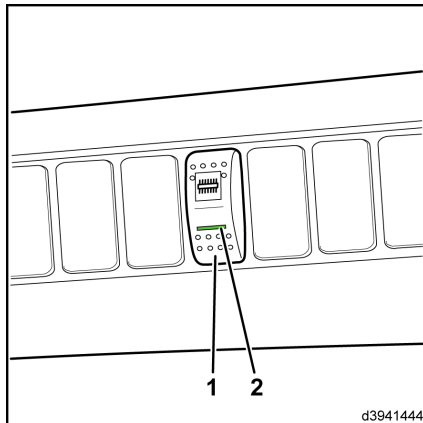
- Press the push button (1) in the switch panel.

The green LED in the push button (2) flashes.



NOTE

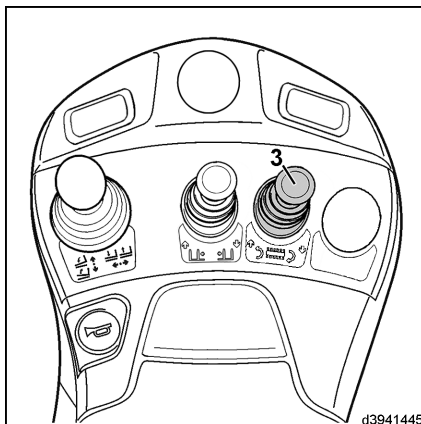
The sweeper function can only be activated via the joystick (3) as long as the green LED is flashing.



- Move the joystick (3) to the stop in both directions (in any order) and move to the zero position afterwards.

The sweeper is set in rotation with a slowly increasing speed.

The green LED in the switch (2) lights up.



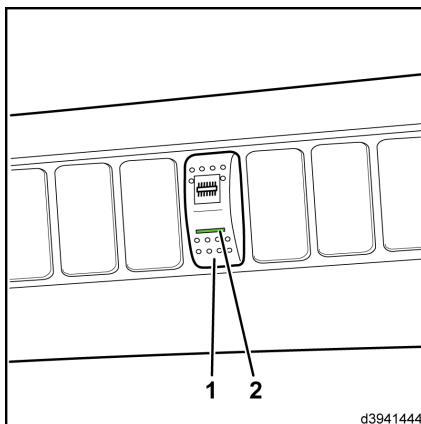
Continuous operation — deactivating the sweeper function ▷

The sweeper can be deactivated by means of one of the following actions:

- Press the push button (1) or move the joystick (3) out of the zero position.

For safety reasons, the sweeper is also deactivated by means of one of the following actions:

- Pressing the stop pedal, turning the parking brake lever clockwise until it engages, leaving the driver's seat and turning off the truck via the switch key.



4 Operation

Special equipment

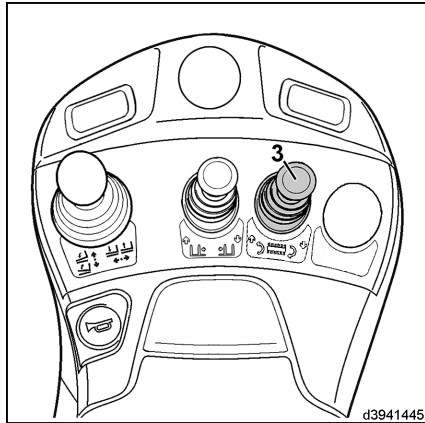
Short-term operation — activating the sweeper function

➤ Push the joystick (3) forwards.

The sweeper turns to the front.

➤ Pull the joystick (3) backwards.

The sweeper turns to the rear.



Working with a load

Before picking up a load

Before picking up a load, observe the load capacity diagram to the right of the driver's seat on the bonnet.

- 1 Max. weight of loads that can be picked up in kg
- 2 Lift height in mm
- 3 Lift mast series
- 4 Series designation of the truck with max. load capacity
- 5 Distance between load centre of gravity and fork back in mm

⚠ DANGER

The residual load capacity of a truck is determined by the lift mast type (standard, duplex, triplex), the lift height of the installed mast, the tyres on the front axle, the use of attachments or additional equipment and the backwards tilt restriction. If one of these parameters is changed, this can have a considerable effect on the residual load capacity.

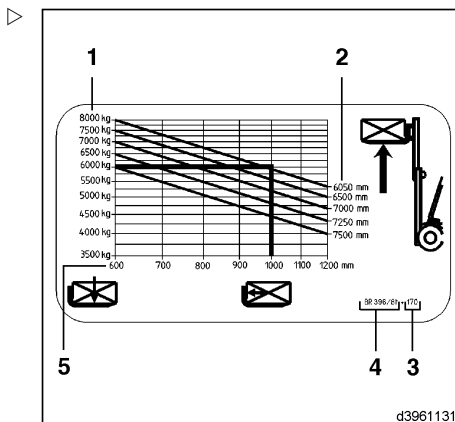
For some conversions, the new residual load capacity of the truck must be determined and the load capacity diagram must be changed as necessary. Contact your authorised dealer.

The max. load that can be picked up is determined by the distance between the load centre of gravity and the back of the fork arms, and the lift height.

⚠ DANGER

The values specified in the load capacity diagram and capacity rating plate apply to compact homogeneous loads and must not be exceeded, as this will impair the stability of the truck and the strength of the fork arms and lift mast.

When using attachments, observe the capacity rating plate for each attachment.



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4 Operation

Working with a load

NOTE

Observe the load restriction and consult your authorised dealer.

- *Before transporting off-centre or swinging loads*
- *Before transporting loads with the lift mast tilted forward or the load not close to the ground*
- *Loads with a large centre of gravity distance*
- *Before transporting loads in a wind force of 6 and upwards*

Example

Load centre of gravity distance: 1000 mm

Load height to be lifted: 6050 mm

- Trace a vertical line from a load distance of 1000 mm to its point of intersection with the line for a lift height of 6050 mm.
- Read off the max. load that can be picked up to the left of the point of intersection with the horizontal line.

The maximum load in this example is 6000 kg

Use the same procedure for other lift heights and centre of gravity distances. The determined values refer to both fork arms and evenly distributed loads.

Adjusting the fork arm distance

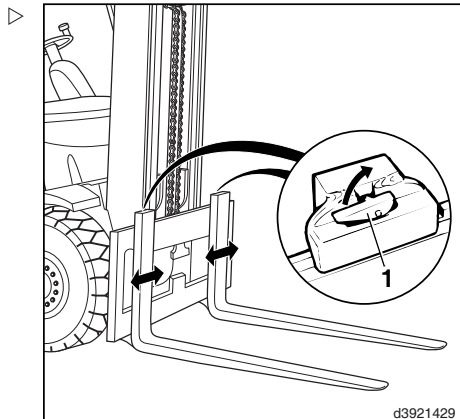
NOTE

The load centre should be in the centre between the forks.

- Raise the fork quick-release levers(1).
- Adjust the fork arms inwards or outwards according to the load to be lifted.

Make sure that both forks are equally distant from the truck centre.

- Allow the quick-release levers to engage in a notch on the fork carriage.



d3921429

Taking up loads



DANGER

Danger of a falling load. Standing or walking in the vicinity of an elevated mast is extremely dangerous.

During stacking and de-stacking operations do not allow people to stand or walk in the working area of the truck.

Trucks should only be driven with the load lowered and tilted back. Look out for people.



DANGER

Risk of falling and crushing.

Never allow people to be lifted on either the forks, or on a pallet placed on the forks.

If the truck is to be used for lifting people then it must be fitted with a purposely designed working platform. Ensure that the platform, platform securing method and platform interlocks have been approved for the truck.

Please contact your local distributor.

DANGER

Loads should be arranged so that they do not project beyond the edge of the truck loading surface and cannot slip, topple over or fall off.

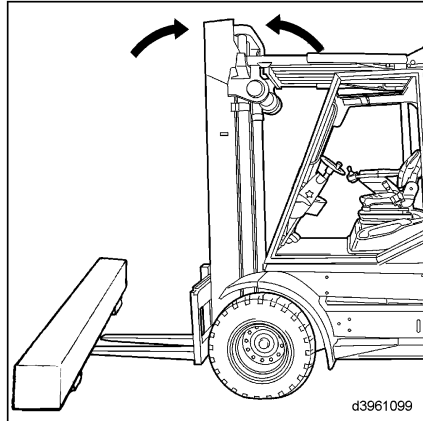
If necessary, use a load backrest (special equipment).

- Approach the load to be taken up carefully and as accurately as possible.

4 Operation

Working with a load

- Set the lift mast to vertical.
- Lift or lower the fork carriage to the necessary height.
- Carefully steer the truck forks beneath the centre of the load to be taken up, where possible so the load touches the fork back, taking account of adjacent loads.
- Lift fork carriage until the load is no longer in contact with the supporting surface.
- Reverse the truck until the load is free.
- Tilt the lift mast backwards.



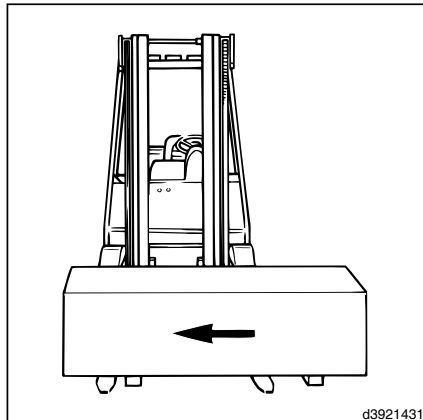
Travelling with load



NOTE

When transporting cargo, the sender must ensure that the goods are safely loaded for transportation and secured if necessary. Please therefore make sure that goods are properly stacked and there is no damage to packaging, pallets etc. The carrier must ensure safe loading.

- Do not transport loads if they are shifted to the side (e.g. with sideshift).
- Transport loads close to the floor.
- On ascending/descending routes, always travel with the load facing uphill; never travel diagonally or turn around.
- If visibility is poor, instructions should be provided by a second person.
- If the load to be transported is stacked so high as to obstruct visibility in the direction of travel, the truck must only be driven in reverse.



Setting down loads

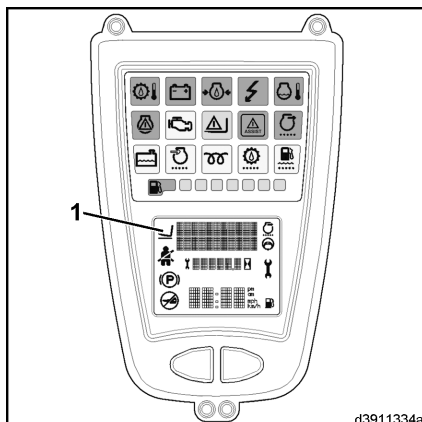
DANGER

Never stop and leave the vehicle with the load still raised.

Let down the fork carriage until the fork arms touch the ground.

- Carefully move the forklift truck to the load / storage area.
- Lift the fork carriage to the necessary height.
- Position the lift mast vertically (load horizontal).
- Observe the lift mast positioning identification symbol (1) on the display unit if the truck is equipped with automatic lift mast positioning.
- Carefully move the load over the load / storage area.
- Carefully lower the load until the fork arms are clear.
- Back the forklift truck away.

▷



d3911334a

Towing device

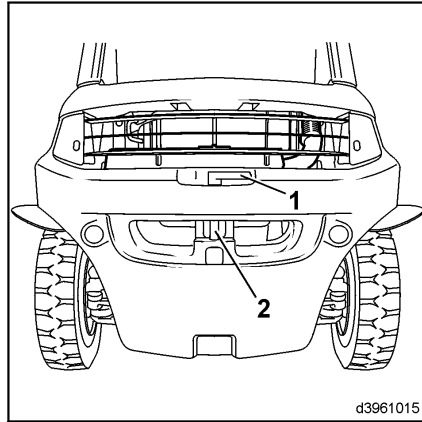
NOTE

The towing device is only used to tow light trolleys on the factory premises. The national regulations for the use of unbraked trailers on industrial trucks must be observed.

4 Operation

Working with a load

- Turn the handle (1) of the towing pin 90° towards the rear and lift it up. ▷
- Insert the towing jaws in the coupling sleeve (2).
- Push the towing pin down against the spring pressure, turn 90° and allow it to snap into place in the catch.



Before exiting the truck

Before leaving the truck

- Set down load / lower fork carriage.
- Tilt the lift mast forwards slightly.

The fork arms must touch the ground.



CAUTION

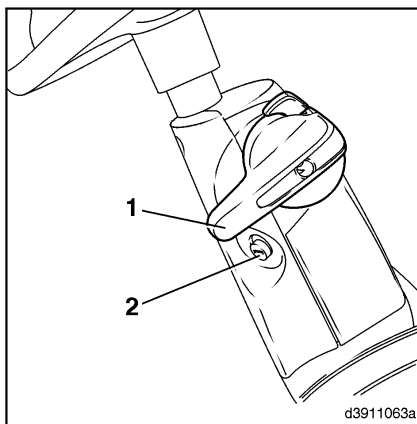
The tractor must be secured against rolling away.

Apply the parking brake.

- Rotate the parking brake lever (1) in a clockwise direction until it engages.

The parking brake is now applied.

- Switch off the engine.
- Remove the ignition key (2).



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Loading/transporting

Loading/transporting

Removing the lift mast

WARNING

A special tool and specialist knowledge is required for this work.

Contact your authorised dealer.

Securing the overhead guard against moving forwards or backwards

WARNING

A special tool and specialist knowledge is required for this work.

Contact your authorised dealer.

Loading

Crane loading



DANGER

When using a crane to load the truck, be particularly careful to ensure that no-one is in the working area of the crane! Observe loading weight according to nameplate.

Do not walk under suspended loads!
Only use round slings and a loading crane with a sufficient load capacity.

WARNING

When a crane is used to load the truck, the tilt cylinders can be damaged.

Before lifting, retract the lift mast and retract the tilt cylinders to the stop.

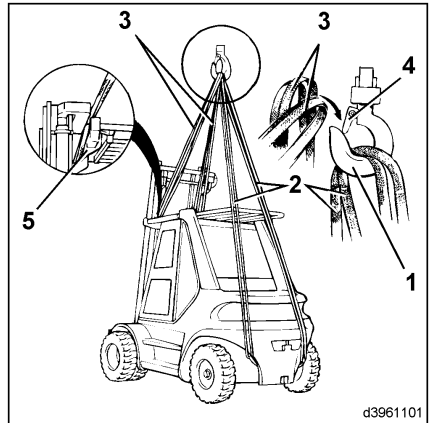
➤ Attach round slings to the lifting points.

The lifting positions on the truck are not marked.

- Run round slings (2) (min. load capacity: 7000 kg) around the underside of the counterweight and past the outside of the overhead guard, and loop them over the crane hook (1).
- Use edge protectors as a safeguard from sharp edges on the bridge piece.
- Place round slings (3) (min. load capacity: 3000 kg) round the tilt cylinder mountings (5) to the left and right of the outer mast.
- Insert all ends into the crane hook (1).
- Make sure that the safety lock (4) is closed.

**NOTE**

When lifting, the lifting gear must not come into contact with the overhead guard or any attachments.

**Crane loading with lifting eyes**
CAUTION

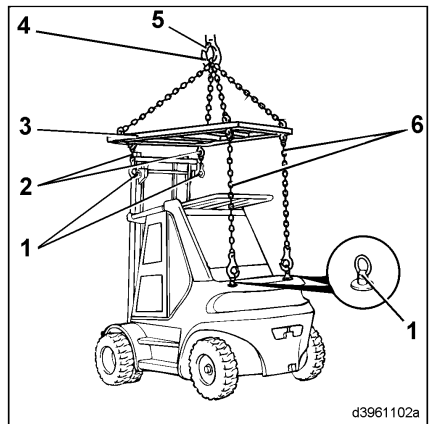
If crane loading is carried out at an angle, the lifting eyes may break off.

Crane loading with lifting eyes (1) should only be carried out with the appropriate lifting gear (3), whereby the chains (2, 6) lead up vertically from the lifting eyes (1). The truck must be horizontal when suspended from the lifting gear.

- Attach chains (6) (min. load capacity: 7000 kg) to the lifting eyes (1) on the counterweight.
- Attach chains (2) (min. load capacity 3000 kg) to the lifting eyes (1) welded onto the left and right of the lift mast.
- Make sure that the safety lock (5) is closed.

**NOTE**

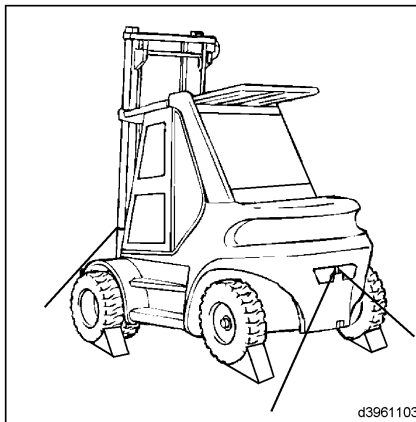
When lifting, the lifting gear must not come into contact with the overhead guard or any attachments.



Transportation by lorry or low-bed semi-trailer



- Lower the lift mast.
- Apply the parking brake.
- Place chocks underneath.
- Lash down forklift truck.



d3961103

Maintenance

General information

General information

Your forklift truck will only remain in a state ready for use at all times if you perform a small number of maintenance and inspection tasks according to the information in the registration document for the industrial truck and the data or instructions in the operating manual at regular intervals. Servicing may be performed only by qualified persons authorised by the manufacturer. You can agree to have this work performed on the basis of a maintenance contract with your authorised dealer.

If you wish to perform this work yourself, we recommend having at least the first three customer service checks carried out by the dealer's service technician in the presence of your workshop representative so your own workshop staff can be instructed accordingly.

Whenever performing maintenance, the forklift truck should be parked on a flat surface and secured so that it cannot roll away. The engine must be switched off and the ignition key removed.

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

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

No modifications, in particular attachment or conversion, should be made to your forklift truck without the manufacturer's approval.

All servicing work on the forklift truck should be followed by a functional check and a test run.

 WARNING

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

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

 CAUTION

The truck must always be properly labelled.

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

**ENVIRONMENT NOTE**

Observe information regarding working with consumables.

**NOTE**

When using forklift trucks in extreme conditions (e.g. extreme heat or cold, high levels of dust etc.), the time periods specified in the maintenance overview must be reduced accordingly.

Maintenance intervals

Under certain conditions, there is the possibility of changing the intervals of some service operations listed in the maintenance overview. Please use the prescribed consumables, engine oil and coolant. The qualities required in this regard are described in the section "Recommendations for consumables". The inspection and maintenance intervals depend on the operating and application conditions of the truck. For more difficult conditions we recommend shorter intervals. Please contact your authorised dealer.

Inspection and maintenance data

Unit	Devices/consumables	Filling quantity/set values
Engine	Engine oil	With filter change: approx. 9.0 l
Fuel tank	Diesel	Approx. 80.0 l
Cooling system	Coolant additive/drinking water	With heating system/air conditioning: approx. 16.5 l
		Without heating system/air conditioning: approx. 14.0 l
Hydraulic system	Hydraulic oil	Mark 1 on oil dipstick: approx. 86.0 l
		Mark 2 on oil dipstick: approx. 92.0 l
		Mark 3 on oil dipstick: approx. 110.0 l
Planetary transmission	Gearbox oil	Top-up quantity for oil change: approx. 1.5 l each
Battery	Distilled water	As required
Tyres	Air	See information on adhesive label
Wheel fastenings	Tighten	Front: 640 Nm
		Rear: 640 Nm
Lift mast chains/lift mast guides	Linde chain spray	As required
Air conditioning	Refrigerant	1750 grams

Recommendations for consumables

Recommendations for consumables

Diesel fuel

The following diesel fuel specifications are permitted in accordance with Deutz TR 0199-99-1218 (latest edition):

- EN 590 with sulphur content ≤ 10 mg/kg and cetane number ≥ 51 .
- ASTM D 975 Grade 1-D S15 with sulphur content ≤ 15 mg/kg and cetane number ≥ 51 .
- ASTM D 975 Grade 2-D S15 with sulphur content ≤ 15 mg/kg and cetane number ≥ 51 .

 CAUTION

Damage to the engine possible.

Use only the named diesel fuels with the corresponding specifications.

The use of organic diesel fuel (RME in accordance with EN 14214) is not permissible.

 NOTE

As the outside temperature falls, the fluidity of the diesel fuel is reduced due to paraffin segregation. If "summer" diesel fuels are used at low outside temperatures, this can lead to malfunctions. For this reason, cold-resistant "winter" diesel fuel is available during the colder part of the year, which can be used reliably at temperatures down to about -22°C.

In winter, use only winter diesel fuel, so that the fuel lines do not become blocked by segregated paraffin. Very low temperatures may cause paraffin segregation even in winter diesel fuel. Contact your authorised dealer.

Hydraulic oil

 NOTE

The working temperature is the critical factor to be considered when selecting the correct oil for hydrostatic drive units. The recommendations for oils given below can only be guide values.

Hydraulic oil recommendations for **normal** use:

Hydraulic oil **ISO-L-HM 68 to ISO 6743-4 or HLP ISO VG 68** to DIN 51524, T.2 (factory filling) average constant oil temperature 60°C–80°C.

Hydraulic oil recommendations for **heavy-duty** use:

Hydraulic oil **ISO-L-HM 100 to ISO 6743-4 or HLP ISO VG 100** to DIN 51524, T.2 for heavy-duty and multi-shift use, operation in hot climate zones or at high ambient temperatures, average constant oil temperature over 80°C.

Hydraulic oil recommendations for normal and heavy-duty use:

Hydraulic oil ISO-L-HV 68 to ISO 6743-4 or HVLP ISO VG 68 to DIN 51524, T.3 (multi-grade oil)

Bio hydraulic oil

Highly biodegradable hydraulic fluid

CASTROL Carelube HFS 46

 CAUTION

Bio-oils must not be mixed with mineral oils.

No recommendations for other fluids from other manufacturers can be made at the present time.

 NOTE

If in doubt, we recommend obtaining the advice of your authorised dealer. Recommendations made by representatives from the mineral oil industry should also be agreed with your authorised dealer. Manufacturer's approval only exists for the oils specified above. Mixing with or using other hydraulic fluids may result in costly damage.

Gearbox oil

Preferably SAE 80 W - 90 API GL 5;
SAE 85 W - 90 API GL 4 (to DIN 51512) is also suitable.

Lubricating grease

Linde heavy-duty grease, lithium-saponified with EP active ingredients and MoS₂. Designation according to DIN 51825-KPF 2N-20 (order no.: see spare parts catalogue).

Mixing with soap-based lubricating grease types other than lithium-saponified is not permitted.

Coolant



NOTE

The longest time a filling of coolant may remain in the system is 2 years or 6000 operating hours. Irrespective of the change interval, the coolant should be changed at least every 2 years.

CAUTION

Refer to the coolant specifications! Products from different product groups (A and B) may not be mixed with each other.

Use only coolant additive to VW standard TL 774-F or TL 774-D, or coolant additive in the same product groups in accordance with Deutz TR 0199-99-1115 (latest edition).

Coolant additive "TL 774-F (G12+)" is added at the factory.

This additive must be mixed with water (total hardness of water must not be more than 20° according to German hardness standards). A maximum of 60% coolant additive can be used.

Temperature	Coolant additive	Drinking water
-25°C	40%	60%
-30°C	45%	55%
-35°C	50%	50%
-40°C	60%	40%



NOTE

As a rule, different coolant additives (VW standard with Deutz TR) should not be mixed.

Products from product group A and B should not be mixed either, in accordance with Deutz TR. However, after repairs have been carried out and the coolant has been drained off and only residual quantities remain in the engine, group A products can be mixed with coolant additive to VW standard TL 774-F. Avoid mixing product group B products with coolant additives to VW standard.

Refrigerant for air conditioning

R 134a

Battery grease

Acid-free lubricating grease (battery grease).

Chain spray

Linde chain spray (order no.: see spare parts catalogue).

Engine oil

When the engine is running, not only is some of the engine oil for piston lubrication burnt off ("consumed"), but the temperature stress and the fuel combustion products that enter the oil lead to "wear", especially affecting chemical "additives" in the oil. For this reason, the entire filling of engine oil must be renewed at specified intervals.

Since this "oil wear" depends on the operating conditions, the fuel quality and the oil quality (the performance characteristics of the oil), oil change intervals vary.

The longest time a filling of lubricating oil may remain in the engine is 12 months. Irrespective of the change intervals, the lubricating oil must be changed at least every 12 months.

Only engine oils that conform to the following are approved for use in the Deutz engine:

- DQC III-10 LA (LA = low-ash engine oil).
- DQC IV-10 LA (LA = low-ash engine oil).
- Comparable quality classes according to Deutz TR 0199-99-1217 (latest edition).

5 Maintenance

Recommendations for consumables

NOTE

API or ACEA oils are only permitted if they conform to the Deutz lubricating oil quality class for the engine mentioned above.

The truck is factory filled with a high-quality engine oil of viscosity 10W-40.

In more difficult application conditions (e.g. ambient temperatures that are too high or too low), the engine oil change intervals must be halved.

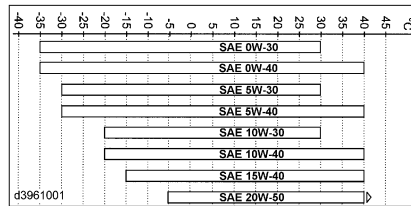
Since a good engine oil is a pre-requisite for problem-free operation and a long service life for the engine, use only good quality engine oil even when topping up and also during oil change. Due to their limited viscosity range, single-grade oils should generally not be used all year round. These oils should be used only in extreme climate zones.

NOTE

No additional lubricants of any sort should be mixed in with the lubricating oils.

The ambient temperature in the area where the truck is used is the determining factor when selecting the correct viscosity class. A

viscosity that is too high can lead to difficulties in starting; a viscosity that is too low can provide insufficient lubrication and cause a high rate of lubricating oil consumption. At ambient temperatures below -40°C, the lubricating oil must be pre-heated. Depending on the ambient temperature, the following current viscosity classes are recommended:



ENVIRONMENT NOTE

Used oil must be kept away from children until disposed of according to the regulations. Under no circumstances should oil be allowed to penetrate the mains drainage or the ground.

Because of the problems of disposal and the special tools and knowledge required, engine oil and filter changes should only be performed by your authorised dealer.

Inspection and maintenance overview

Service plan as required

	Carried out	
	✓	✗
Engine		
Clean the fuel tank ventilation hose		
Drain water from the fuel pre-filter		
Bleed the fuel system		
Change the air filter cartridge (after 1000 operating hours at the latest)		
Change the safety cartridge in the air filter (after 3000 operating hours at the latest)		
Check the dust discharge valve		
Change the oil in the oil bath air filter		
Clean the prefilter		
Clean the water cooler and hydraulic oil cooler, and check them for leaks		
Chassis, bodywork and fittings		
Clean the truck		
Service the heating system and air conditioning		
Check the seat belt for condition and function		
Top up the water tank in the washer system		
Chassis frame		
Change wheels		
Clean and lubricate the steering axle (after 1000 operating hours at the latest)		
Check the tyres for damage and foreign objects		
Tighten the wheel fastenings (after each maintenance or repair, after no longer than 100 operating hours)		
Load lift system		
Clean and adjust the lift mast chain and apply chain spray.		

50-hour service plan

At operating hours										Carried out	
50										✓	✗
Preparation tasks											
Clean the truck (if necessary)											
Read out the error memory and delete											
Calibrate the drive potentiometer and joysticks											
Enter the next maintenance interval											
Gearbox											
Planetary transmission: Change the oil, clean the magnetic plug and check for leaks											
Chassis, bodywork and fittings											
Lubricate the overhead guard bearings and tilt cylinder bearings											
Chassis frame											
Tighten the wheel fastenings (after each maintenance or repair, after no longer than 100 operating hours)											
Check the parking brake for correct operation											
Electrics											
Check the condition and secure positioning of the electric cables, cable connectors and connections											
Hydraulics											
Check the hydraulic system, drive axle, hydraulic pumps and cables for leaks (visual inspection)											
Load lift system											
Check the lift mast, lift mast chain, lift cylinder and end stops for condition, secure mounting and function											
Adjust the lift mast chain and apply chain spray											
Lubricate the lift mast bearings											
Final tasks											
Carry out functional test and test drive											
Attach maintenance sticker											

1000-hour service plan

At operating hours										Carried out	
1000		5000		7000		11000		13000			
17000		19000								✓	✗
Notes about the service plan											
Dependent on the consumables used, the driving style and the application conditions, but at least every 12 months. Refer also to the recommendation for consumables.											
Preparation tasks											
Clean the truck (if necessary)											
Read out the error memory and delete											
Calibrate the drive potentiometer and joysticks											
Enter the next maintenance interval											
Engine											
Change the engine oil											
Change the engine oil filter											
Change the fuel filter											
Change the fuel pre-filter											
Check the condition and secure positioning of the engine support and engine mounting											
Check the condition of the V-ribbed belt											
Clean the water cooler and the hydraulic oil cooler											
Check the coolant concentration											
Change the air filter cartridge, check the vacuum-operated switch											
Drain water from the intercooler											
Clean the oil bath air filter											
Check the intake and exhaust pipes for leaks											
Check the particle filter system											
Gearbox											
Planetary transmission: Change the oil and clean the magnetic plug (only once after the first 1000 operating hours; further oil changes at 3000 operating hours and then every 3000 operating hours)											
Planetary transmission: Check the oil level and check for leaks											
Axle clamps: Check the mounting											
Chassis, bodywork and fittings											

Inspection and maintenance overview

At operating hours									Carried out	
1000		5000		7000		11000		13000		
17000		19000								✓ x
Check the mounting of the chassis, tilt cylinders and steering axle										
Lubricate the overhead guard and tilt cylinder bearings										
Check and lubricate the other bearings and joints										
Chassis frame										
Check the parking brake for correct operation										
Clean and lubricate the steering axle										
Check the mounting of the steering cylinders and steering pivot pin										
Operating devices										
Check and oil the pedal group										
Electrics										
Check the condition and secure attachment of the electric cables, cable connectors and connections										
Battery: Check the condition, acid level and acid density (even for maintenance-free batteries)										
Hydraulics										
Hydraulic system: Check the oil level										
Check the bleeder valve on the hydraulic tank for correct operation										
Check the hydraulic system for leaks										
Double hoses: Check the pre-load										
Load lift system										
Check the lift mast, lift mast chain, lift cylinder and end stops for condition, secure mounting and function										
Adjust the lift mast chain and apply chain spray										
Check the fork arms and fork arm safety devices										
Lubricate the lift mast bearings										
Final tasks										
Carry out functional test and test drive										
Attach maintenance sticker										

2000-hour service plan

At operating hours										Carried out	
2000		4000		8000		10000		14000		✓	✗
16000		20000									
Preparation tasks											
Clean the truck (if necessary)											
Read out the error memory and delete											
Calibrate the drive potentiometer and joysticks											
Enter the next maintenance interval											
Engine											
Change the engine oil											
Change the engine oil filter											
Change the fuel filter											
Change the fuel pre-filter											
Check the valve clearance											
Check the condition and secure positioning of the engine support and engine mounting											
Check the condition of the V-ribbed belt											
Clean the water cooler and the hydraulic oil cooler											
Check the coolant concentration											
Change the air filter cartridge, check the vacuum-operated switch											
Drain water from the intercooler											
Clean the oil bath air filter											
Check the intake and exhaust pipes for leaks											
Check the particle filter system											
Gearbox											
Planetary transmission: Check the oil level and check for leaks											
Axle clamps: Check the mounting											
Chassis, bodywork and fittings											
Check the mounting of the chassis, tilt cylinders and steering axle											
Lubricate the overhead guard and tilt cylinder bearings											
Check and lubricate the other bearings and joints											
Chassis frame											

Inspection and maintenance overview

At operating hours									Carried out	
2000		4000		8000		10000		14000		
16000		20000								✓ *
Check the parking brake for correct operation										
Clean and lubricate the steering axle										
Check the mounting of the steering cylinders and steering pivot pin										
Operating devices										
Check and oil the pedal group										
Electrics										
Check the condition and secure attachment of the electric cables, cable connectors and connections										
Battery: Check the condition, acid level and acid density (even for maintenance-free batteries)										
Hydraulics										
Hydraulic system: Check the oil level										
Check the bleeder valve on the hydraulic tank for correct operation										
Check the hydraulic system for leaks										
Double hoses: Check the pre-load										
Load lift system										
Check the lift mast, lift mast chain, lift cylinder and end stops for condition, secure mounting and function										
Adjust the lift mast chain and apply chain spray										
Check the fork arms and fork arm safety devices										
Lubricate the lift mast bearings										
Final tasks										
Carry out functional test and test drive										
Attach maintenance sticker										

3000-hour service plan

At operating hours										Carried out	
3000		9000		15000						✓	*
Notes about the service plan											
Dependent on the consumables used, the driving style and the application conditions, but at least every two years. Refer also to the recommendation for consumables.											
Preparation tasks											
Clean the truck (if necessary)											
Read out the error memory and delete											
Calibrate the drive potentiometer and joysticks											
Enter the next maintenance interval											
Engine											
Change the engine oil											
Change the engine oil filter											
Change the fuel filter											
Change the fuel pre-filter											
Check the condition and secure positioning of the engine support and engine mounting											
Check the condition of the V-ribbed belt											
Clean the water cooler and the hydraulic oil cooler											
Check the coolant concentration											
Change the air filter cartridge, check the vacuum-operated switch											
Change the safety cartridge in the air filter											
Drain water from the intercooler											
Clean the oil bath air filter											
Check the intake and exhaust pipes for leaks											
Check the particle filter system											
Change the spark plugs at the burner of the particle filter (in the US version, only change the spark plugs every 4500 operating hours)											
Gearbox											
Planetary transmission: Change the oil and clean the magnetic plug											
Planetary transmission: Check the oil level and check for leaks											
Axle clamps: Check the mounting											

Inspection and maintenance overview

At operating hours									Carried out	
3000		9000		15000					✓	✗
Hydraulic pump on engine: Check the mountings										
Chassis, bodywork and fittings										
Check the mounting of the chassis, tilt cylinders and steering axle										
Lubricate the overhead guard and tilt cylinder bearings										
Check and lubricate the other bearings and joints										
Chassis frame										
Check the parking brake for correct operation										
Clean and lubricate the steering axle										
Check the mounting of the steering cylinders and steering pivot pin										
Operating devices										
Check and oil the pedal group										
Check the bellows at the actuating lever										
Electrics										
Check the condition and secure attachment of the electric cables, cable connectors and connections										
Battery: Check the condition, acid level and acid density (even for maintenance-free batteries)										
Hydraulics										
Hydraulic system: Check the oil level										
Check the bleeder valve on the hydraulic tank for correct operation										
Change the feed/pressure/suction/breather filter of the hydraulic system										
Check the hydraulic system for leaks										
Double hoses: Check the pre-load										
Load lift system										
Check the lift mast, lift mast chain, lift cylinder and end stops for condition, secure mounting and function										
Adjust the lift mast chain and apply chain spray										
Check the fork arms and fork arm safety devices										
Lubricate the lift mast bearings										
Final tasks										
Carry out functional test and test drive										
Attach maintenance sticker										

6000-hour service plan

At operating hours										Carried out	
6000		12000		18000						✓	*
Notes about the service plan											
Dependent on the consumables used, the driving style and the application conditions, but at least every three years. Refer also to the recommendation for consumables.											
Preparation tasks											
Clean the truck (if necessary)											
Read out the error memory and delete											
Calibrate the drive potentiometer and joysticks											
Enter the next maintenance interval											
Engine											
Change the engine oil											
Change the engine oil filter											
Change the fuel filter											
Change the fuel pre-filter											
Check the condition and secure positioning of the engine support and engine mounting											
Change the V-ribbed belt and tensioning pulley (after 2 years at the latest)											
Check the valve clearance											
Change the crankcase bleeder valve (only in the US version)											
Clean the water cooler and the hydraulic oil cooler											
Change the coolant (at least after 2 years)											
Change the air filter cartridge, check the vacuum-operated switch											
Change the safety cartridge in the air filter											
Drain water from the intercooler											
Clean the oil bath air filter											
Check the intake and exhaust pipes for leaks											
Check the particle filter system											
Change the spark plugs at the burner of the particle filter (in the US version, only change the spark plugs every 4500 operating hours)											
Gearbox											
Planetary transmission: Change the oil and clean the magnetic plug											

Inspection and maintenance overview

At operating hours									Carried out	
6000		12000		18000					✓	✗
Planetary transmission: Check the oil level and check for leaks										
Axle clamps: Check the mounting										
Hydraulic pump on engine: Check the mountings										
Chassis, bodywork and fittings										
Check the mounting of the chassis, tilt cylinders and steering axle										
Lubricate the overhead guard and tilt cylinder bearings										
Check and lubricate the other bearings and joints										
Chassis frame										
Check the parking brake for correct operation										
Clean and lubricate the steering axle										
Check the mounting of the steering cylinders and steering pivot pin										
Operating devices										
Check and oil the pedal group										
Check the bellows at the actuating lever										
Electrics										
Check the condition and secure attachment of the electric cables, cable connectors and connections										
Battery: Check the condition, acid level and acid density (even for maintenance-free batteries)										
Hydraulics										
Changing the hydraulic oil										
Check the bleeder valve on the hydraulic tank for correct operation										
Change the feed/pressure/suction/breather filter of the hydraulic system										
Check the hydraulic system for leaks										
Double hoses: Check the pre-load										
Load lift system										
Check the lift mast, lift mast chain, lift cylinder and end stops for condition, secure mounting and function										
Adjust the lift mast chain and apply chain spray										
Check the fork arms and fork arm safety devices										
Lubricate the lift mast bearings										
Final tasks										

Inspection and maintenance overview

At operating hours										Carried out	
6000		12000		18000						✓	✗
Carry out functional test and test drive											
Attach maintenance sticker											

Engine

Engine

Checking the engine oil level

**ENVIRONMENT NOTE**

Observe information regarding working with consumables

**⚠ WARNING**

When topping up the oil, no oil should drip on to hot engine parts — Risk of fire!

Fill carefully.

⚠ CAUTION

Different oil specifications.

Observe the recommendations for consumables.

⚠ CAUTION

The oil level should never be above the upper mark.

Drain engine oil if necessary.

➤ Park the forklift truck on level ground.

➤ Open the bonnet.

**⚠ WARNING**

Beware of hot engine and exhaust components.

Wear protective equipment.

**⚠ WARNING**

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

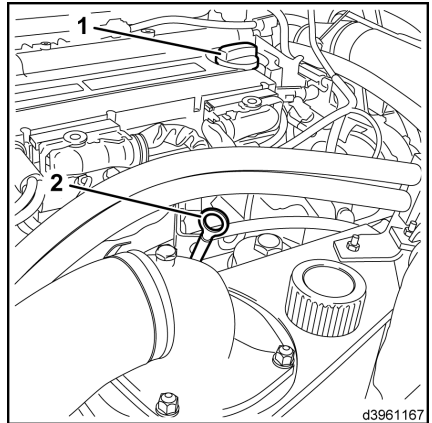
- Take the oil dipstick (2) out of the engine.
- Wipe the oil dipstick with a clean cloth.
- Push the oil dipstick fully back in and remove it again.

Oil level should be between the marks.

- If necessary, pour in engine oil through the filling opening until it reaches the upper mark.
- To do so, remove filler cap (1) from the filling opening.

Difference in quantity between min. and max. mark: 2.0 l

- Fit filler cap and turn to tighten.
- Close the bonnet.



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Changing the engine oil

(after 12 months at the latest)

Draining the engine oil



WARNING

Risk of scalding when draining hot engine oil!
Wear protective equipment.



ENVIRONMENT NOTE

Observe information regarding working with consumables.



NOTE

Only change engine oil when the engine is at operating temperature.

- Drive truck over pit.
- Switch off the engine.
- Place a collection container under the truck chassis.
- Open the bonnet.

**⚠ WARNING**

Beware of hot engine and exhaust components.

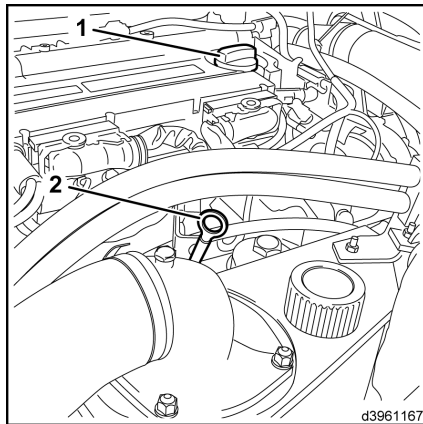
Wear protective equipment.

**⚠ WARNING**

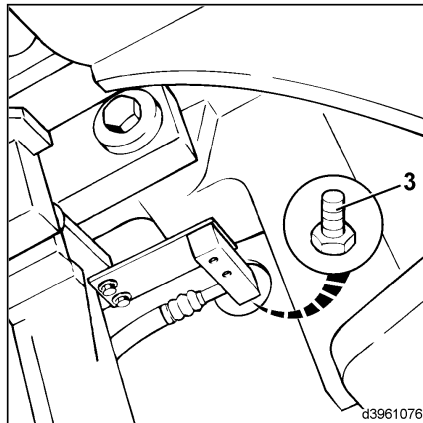
When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

- Remove the filler cap (1) from the filling opening.
- Remove cover on floor of chassis.
- Unscrew the engine oil drain plug (3) from below.
- Allow all of the oil to drain off into the collection container.



- Fit the drain plug (3) with a new sealing ring.
- Tightening torque: 25 Nm
- Refit the cover.
- Refit the filler cap (1) and turn to tighten.



Topping up with engine oil

- Open the filler cap (1) of the filling opening.
- Pour new engine oil into the filling opening in accordance with the recommendations for consumables.

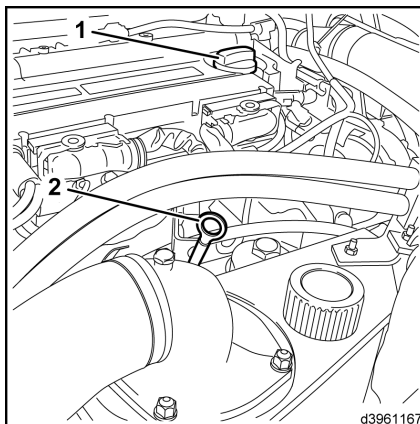
Filling quantity with filter change: approx. 9.0 l

- Using the dipstick (2), check the engine oil level after adding oil and top up to max. mark.
- Fit filler cap (1) and turn to tighten.
- Close the bonnet.



NOTE

After changing the oil and the filter, carry out an engine test run, checking the oil pressure display and the tightness of the oil drain plug and oil filter. For an accurate oil level check (particularly after changing the oil filter) the engine must be switched off again and the oil level check must be carried out after approx. one minute.



Changing the engine oil filter



WARNING

Risk of scalding with hot engine oil!
Wear protective equipment.



ENVIRONMENT NOTE

Observe information regarding working with consumables.

- Open the bonnet.



WARNING

Beware of hot engine and exhaust components.
Wear protective equipment.

5 Maintenance

Engine



⚠ WARNING

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

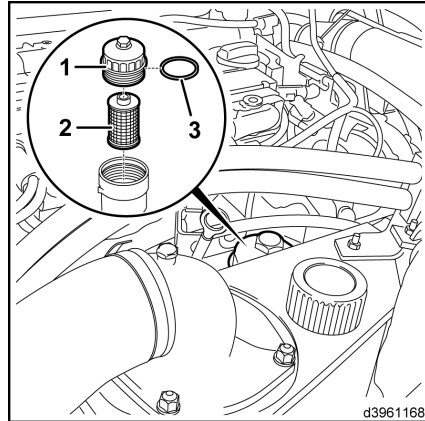
- Use a socket wrench to loosen the filter cover (1) on the engine oil filter housing; unscrew the cover by hand.

Slowly pull out the oil filter (2).

- Collect oil that escapes from the oil filter and dispose of it and the oil filter in an environmentally friendly manner.
- Insert a new oil filter.
- Replace the O-ring (3) on the filter cover.
- Screw the filter cover on by hand until the O-ring is seated.
- Tighten filter cover.

Tightening torque: 25 Nm

- Close the bonnet.



NOTE

After changing the oil and the filter, carry out an engine test run, checking the oil pressure display and the tightness of the oil drain plug and oil filter. For an accurate oil level check (particularly after changing the oil filter) the engine must be switched off again and the oil level check must be carried out after approx. one minute.

Fuel

Checking the fuel level



ENVIRONMENT NOTE

Observe information regarding working with consumables.

- Switch on the ignition.

The fuel tank level display on the display unit (4) shows the current fuel level. ▷

The tank is full when all 7 LEDs (2) and the petrol pump illuminated field (1) light up green.

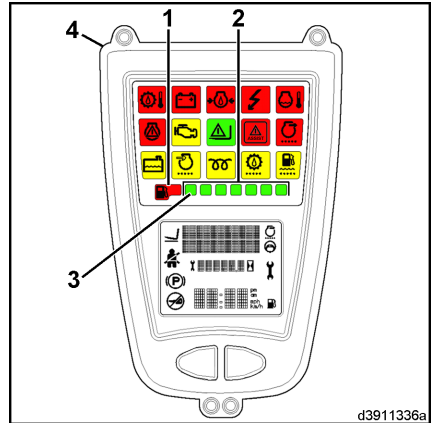
As the fuel tank empties, the LEDs are extinguished, starting from the right. Once the reserve is reached, the petrol pump illuminated field (1) turns red and the LEDs (3) light up green. There is only approx. 6.0 litres of fuel left in the tank and more fuel must be added.

If only the petrol pump illuminated field (1) is lit up red, the tank is empty.

CAUTION

Air intake can cause operational faults in the fuel injection system.

Therefore, never empty the fuel tank completely.



Filling up with fuel

WARNING

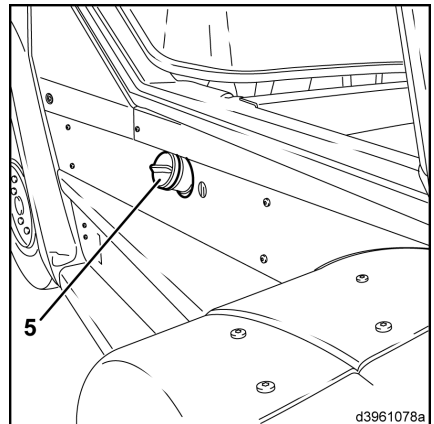
Carelessness when refuelling can cause fires, explosions or environmental damage.

- Do not smoke or use an open flame,
- Do not spill any fuel on the ground or on hot parts,
- Comply with regulations on handling diesel fuel.

- Open the filler cap (5) on the fuel tank and add clean diesel fuel. ▷

Max. filling quantity: 80 l

- Fit filler cap and turn to tighten.



Draining water from the fuel pre-filter



ENVIRONMENT NOTE

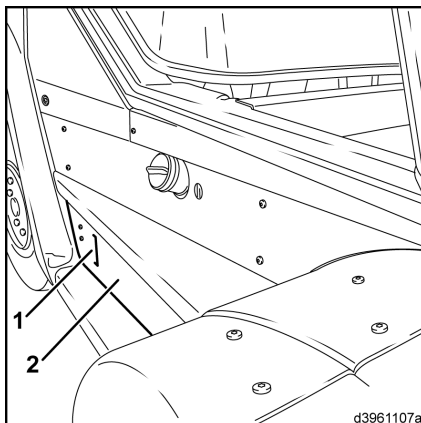
Observe information regarding working with consumables.



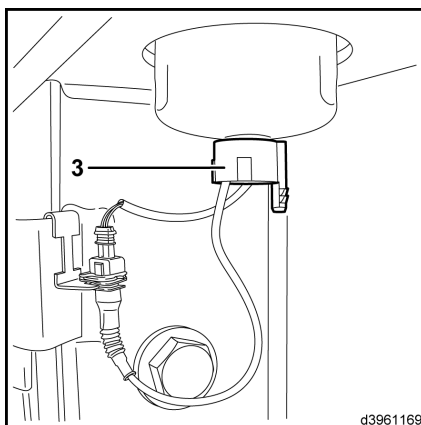
NOTE

The drainage screw for the fuel pre-filter is located on the right-hand side of the truck behind the cover sheet of the bottom step.

- Grasp the slot (1) and open the cover (2).



- Open the draining screw (3) on the fuel pre-filter and drain approx. 100 cm³ into a container until clean fuel emerges.



ENVIRONMENT NOTE

Dispose of the liquid in an environmentally friendly manner.

- Tighten the drainage screw again.
- Close the covering until the latch engages.

Changing the fuel filter

(at the latest after 12 months)



ENVIRONMENT NOTE

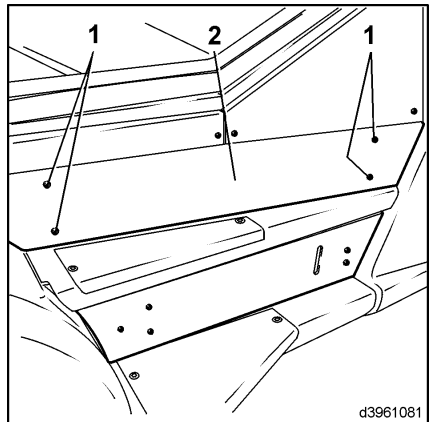
Observe information regarding working with consumables.



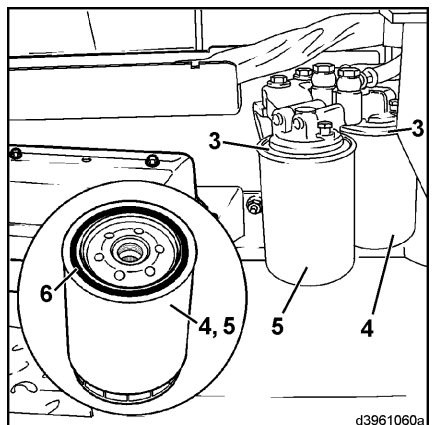
NOTE

The fuel filter is located on the left-hand side of the truck behind the cover of the top step and comprises two filter cartridges.

- Undo the 4 screws (1).
- Take off the covering (2).



- Place a collection vessel under fuel filters (4) and (5).
- Clean the outside of the fuel filter.
- Unscrew both used filters (4) and (5) and dispose of them in an environmentally friendly manner.
- Clean the sealing surfaces on the filter tops (3).
- Top up the new filter (4) with clean fuel.
- Lightly wet the new sealing ring (6) with fuel.
- Tighten the new filter (4) until the sealing ring touches the filter top (3).
- Fully tighten the filter by hand.
- Top up the new filter (5) with clean fuel.
- Lightly wet the new sealing ring (6) with fuel.



5 Maintenance

Engine

- Tighten the new filter (5) until the sealing ring touches the filter top (3).
 - Fully tighten the filter by hand.
 - Start the engine and check for leaks.
- If necessary, tighten the filter further by hand.
- Refit the covering.

Changing the fuel pre-filter

(after 12 months at the latest)



ENVIRONMENT NOTE

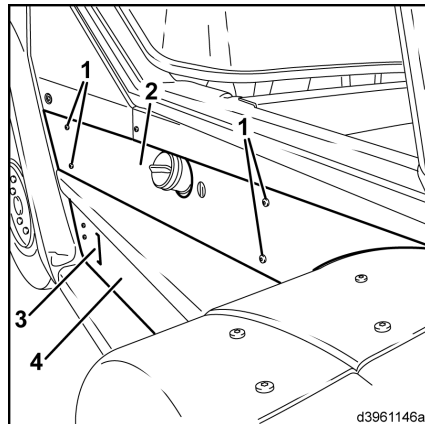
Observe information regarding working with consumables.



NOTE

The fuel pre-filter is located on the right-hand side of the truck behind the cover sheets of the top and bottom steps.

- Unscrew the screws (1).
- Take off the cover (2).
- Grasp the slot (3) and open the cover (4).

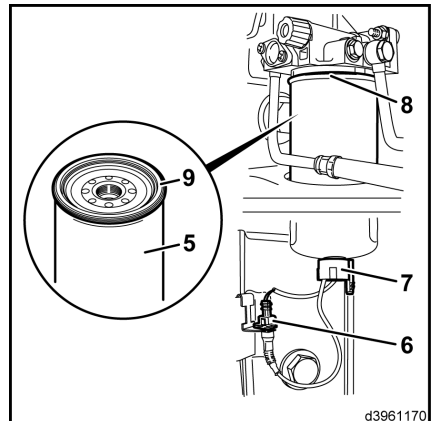
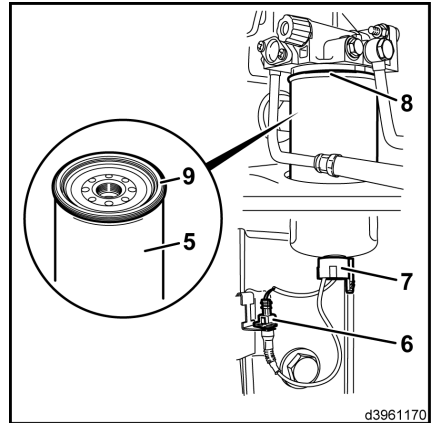


- Place a collection vessel under the fuel pre-filter (5).
- Clean the outside of the fuel pre-filter.
- Open the drainage screw (7) on the fuel pre-filter and allow the fuel to drain off.

**ENVIRONMENT NOTE**

Dispose of the liquid in an environmentally friendly manner.

- Pull out the plug (6) from the fuel pre-filter monitoring system.
- Unscrew and clean the lower part of the fuel pre-filter (7).
- Unscrew the used filter cartridge (5) and dispose of it in an environmentally friendly manner.
- Clean the sealing face of the filter top (8).
- Turn lower part of the fuel pre-filter (7) until sealing ring is adjoining the new filter cartridge (5).
- Fully tighten the lower part of the fuel pre-filter by hand.
- Fill up new filter cartridge (5) with clean fuel.
- Lightly wet the new sealing ring (9) of the new filter cartridge (5) with fuel.
- Tighten the filter cartridge (5) until the sealing ring (8) touches the filter top.
- Fully tighten the filter cartridge by hand.
- Attach the plug (6) for the fuel pre-filter monitoring system.



Bleeding the fuel system

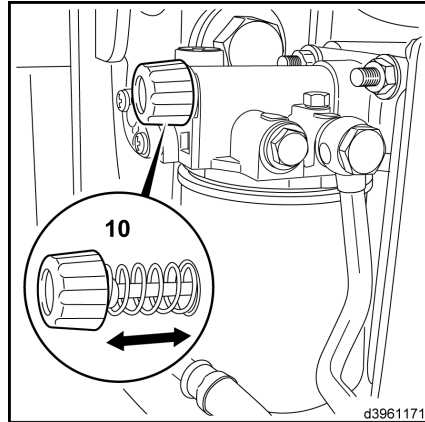
- Push in the bayonet catch (10) and turn anti-clockwise.

The bayonet catch is unlocked and is pushed out by the spring force.

- Operate the pump piston until you feel greater resistance and it is only possible to pump slowly.
- Operate the pump another few times until the return line is filled.
- Press in the bayonet catch (10) to the stop and lock it by turning it in a clockwise direction.
- Start the engine and check for leaks.

Tighten fuel pre-filter by hand as required.

- Fit the covers.



Bleeding the fuel system

ENVIRONMENT NOTE

Observe information regarding working with consumables.

CAUTION

Always ensure you have sufficient fuel in the tank
When the residual quantity display lights up, fill up with fuel.

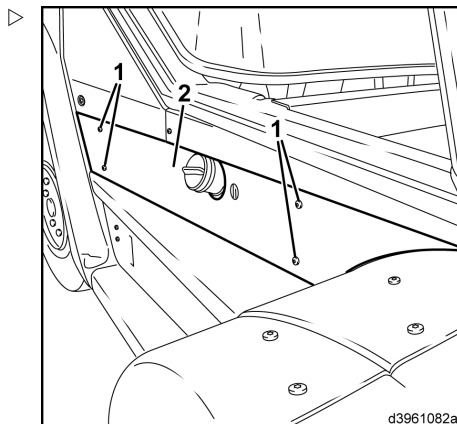
NOTE

If the fuel tank is inadvertently emptied, the fuel system must be bled manually.

NOTE

The pump for bleeding the fuel system is located on the fuel pre-filter on the right-hand side of the truck behind the cover sheet of the top step.

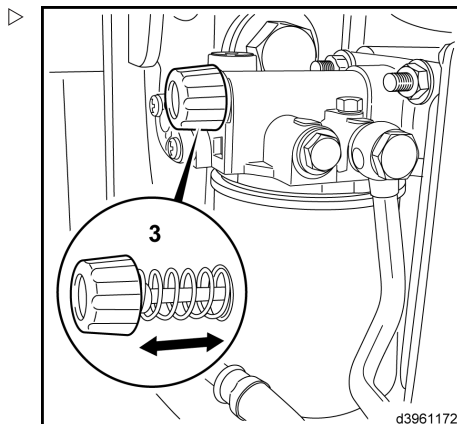
- Unscrew the screws (1).
- Take off the cover (2).



- Push in the bayonet catch (3) and turn anti-clockwise.

The bayonet catch is unlocked and is pushed out by the spring force.

- Operate the pump piston until you feel greater resistance and it is only possible to pump slowly.
- Operate the pump another few times until the return line is filled.
- Press in the bayonet catch (3) to the stop and lock it by turning it in a clockwise direction.
- Fit the cover.



Cleaning the fuel tank ventilation hose

When operating the truck in dusty and dirty conditions, the ventilation hose (1) to the fuel tank can become blocked. It must therefore be cleaned at regular intervals, depending on how much it is used.



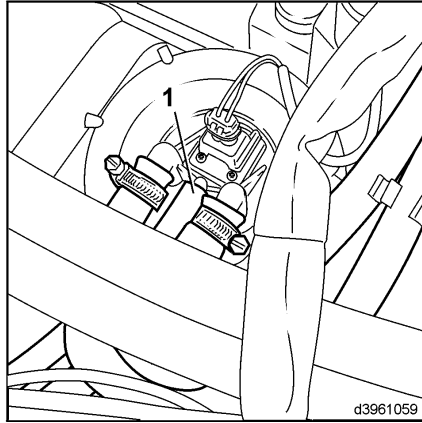
NOTE

If the ventilation hose is clogged, the engine will switch off or will not start up.

5 Maintenance

Engine

- Disconnect the hose (1) from the pipe union at the fuel signal transmitter and blow dry compressed air through it.
- Slide the hose (1) onto the pipe union as far as the stop.



Checking the coolant level

ENVIRONMENT NOTE

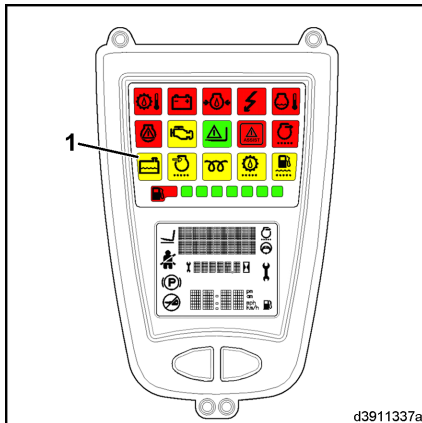
Observe information regarding working with consumables.

NOTE

If the display (1) lights up, the coolant level is too low and the coolant must be topped up.

NOTE

The coolant level can also be checked independently of the display (1) in the expansion reservoir. The expansion reservoir is located under the cover (2).



CAUTION

Only use an approved coolant.

Observe the recommendations for consumables.



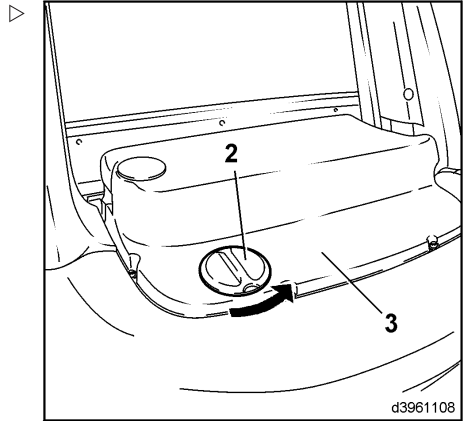
WARNING

The expansion reservoir is under pressure! Risk of scalding due to hot coolant.

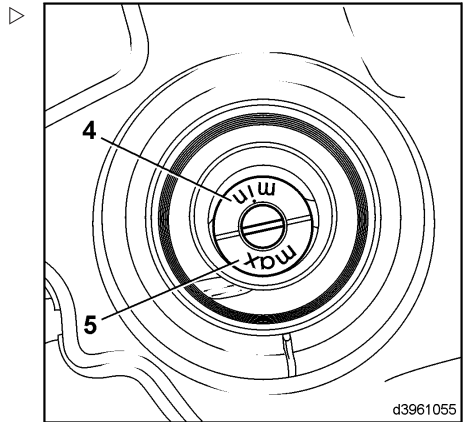
Unscrew the filler cap slowly, and only if the expansion reservoir is not hot.

- Open the cover (2) in the counterweight cover sheet (3) approx. 90° anticlockwise.
- Take off the cover.
- Twist and remove the filler cap anticlockwise from the expansion reservoir.

The coolant must not fall below the min. mark (4) in the expansion reservoir.



- If necessary, top up the coolant to the max. mark (5).
- Fit the expansion reservoir filler cap and turn clockwise to tighten until it audibly engages.
- Fit the cover (2).



Changing the coolant

The cooling system must be filled all-year-round with a mixture of water and phosphate-free, glycol-based coolant additive with anti-corrosion additives to prevent the deposit of lime scale and damage caused by frost and corrosion, and to raise the boiling temperature.

i NOTE

Observe the recommendations for consumables.

5 Maintenance

Engine



⚠ WARNING

Never open the expansion reservoir filler cap or the drain plug when the engine is hot. Risk of scalding!

Wait until the coolant has cooled down.



ENVIRONMENT NOTE

Observe information regarding working with consumables.

- Position the truck on level ground.
- Open the bonnet.



⚠ WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.



⚠ WARNING

When the engine is hot, the fan may start automatically.

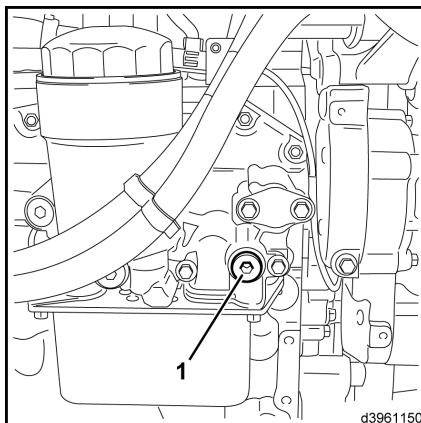
Do not touch rotating parts.

- Place a collection container under the drain plug (1) on the left side of the engine. ▷
- Unscrew drain plug. (In the heating system version, unscrew the coolant line at this point)
- Drain off all coolant.
- Screw the drain plug back in again. (In the heating system version, screw the coolant line back in)

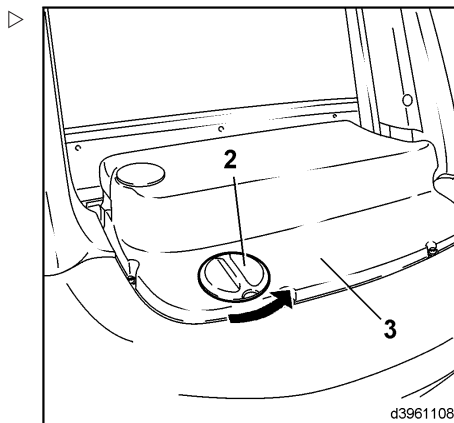


ENVIRONMENT NOTE

Dispose of removed coolant in an environmentally friendly manner.



- Open the cover (2) in the counterweight cover sheet (3) approx. 90° anticlockwise.
- Take off the cover.
- Unscrew the expansion reservoir filler cap anticlockwise.
- Add new coolant to the expansion reservoir.



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Coolant level must be between min. (4) and max. (5) marks on the filler neck.

Difference in quantity between min. and max.: approx. 0.5 l

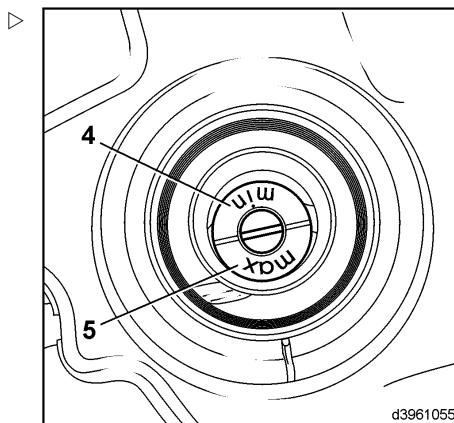
Filling quantity in cooling system

Without heating system and air conditioning: approx. 14.0 l

With heating system and air conditioning: approx. 16.5 l

The frost protection should be sufficient for temperatures down to -25 °C. The mixture ratio required here is 40% coolant additive and 60% drinking water.

Mixture ratio for lower temperatures:



d3961055

Temperature	Coolant additive	Drinking water
-30°C	45%	55%
-35°C	50%	50%
-40°C	60%	40%

- Run engine until cooling system has been bled of air.
- Check coolant level.
- Place the filler cap on the expansion reservoir filler neck and turn it clockwise until it audibly clicks home.

5

Maintenance

Engine

- Fit the cover (2).
- Close the bonnet.

Checking the coolant concentration

The cooling system must be filled all-year-round with a mixture of water and phosphate-free, glycol-based coolant additive with anti-corrosion additives to prevent the deposit of lime scale and damage caused by frost and corrosion, and to raise the boiling temperature.



 **WARNING**

Never open the expansion reservoir filler cap when the engine is hot. Risk of scalding!

Wait until the coolant has cooled down.

 ENVIRONMENT NOTE

Observe information regarding working with consumables.

- Check the coolant concentration at the filling opening (2).

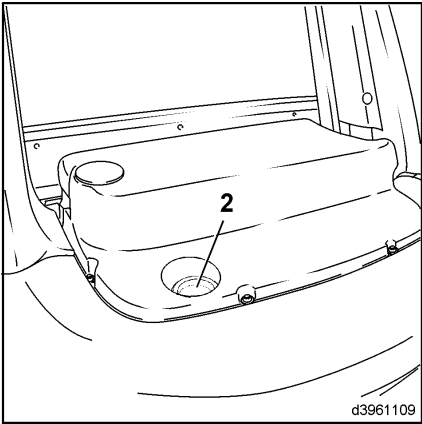
The frost protection should be sufficient for temperatures down to -25 °C. The mixture ratio required here is 40% coolant additive and 60% drinking water.

Mixture ratio for lower temperatures:

Temperature	Coolant additive	Drinking water
-30°C	45%	55%
-35°C	50%	50%
-40°C	60%	40%

If coolant additive level is too low:

- Position the truck on level ground.
- Open the bonnet.



**⚠ WARNING**

Beware of hot engine and exhaust components.

Wear protective equipment.

**⚠ WARNING**

When the engine is hot, the fan may start automatically.

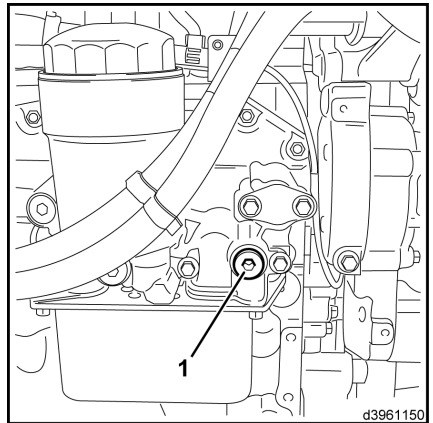
Do not touch rotating parts.

- Place a collection container under the drain plug (1) on the left side of the engine.
- Unscrew drain plug. (In the heating system version, unscrew the coolant line at this point)
- Drain off some of the coolant.
- Screw the drain plug back in again. (In the heating system version, screw the coolant line back in)

**ENVIRONMENT NOTE**

Dispose of removed coolant in an environmentally friendly manner.

- Add coolant additive to the filling opening (2) until the correct mixture ratio is achieved.
- Check the coolant level at the filling opening.
- Place the filler cap on the expansion reservoir and tighten it.
- Fit the cover in the cover sheet.
- Close the bonnet.



Cleaning the water cooler and hydraulic oil cooler, and checking them for leaks

**NOTE**

Only clean the water cooler and hydraulic oil cooler when the engine is switched off and has cooled down.

- Open the bonnet.

**⚠ WARNING**

Beware of hot engine and exhaust components.

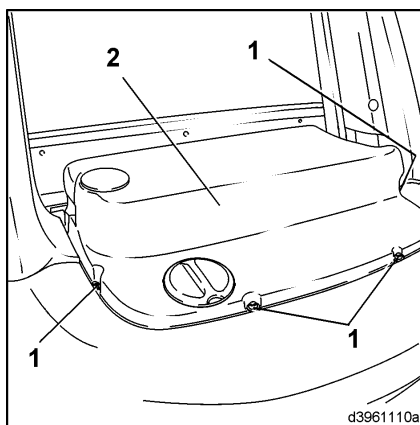
Wear protective equipment.

**⚠ WARNING**

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

- Release the 4 screws (1).
- Remove the cover sheet (2) from the rear.



Cleaning with compressed air

- Blow out the cooler (3) from the engine side using compressed air. ➤
- Rinse out the released dirt using a water jet.

Cleaning with cleaner solvent

⚠ CAUTION

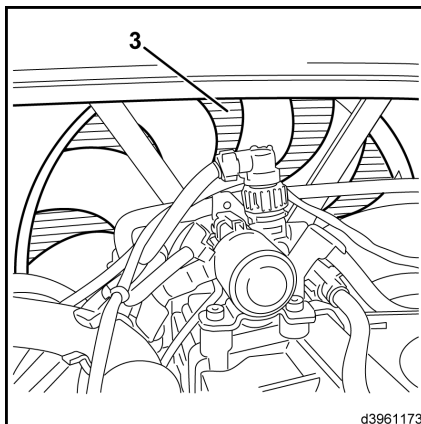
Humidity must not penetrate the three-phase alternator.

Therefore, protect it from direct contact with the water jet.

- Spray the cooler (3) with a conventional cleaner solvent and leave it to work for approx. 10 minutes.
- Spray the cooler from the engine side with a direct water jet until it is clean.
- Warm up the engine.

This evaporates the water residue to prevent the formation of rust.

- Check the connection screw joints, coolant hoses and the pipes on the water cooler and hydraulic cooler for leaks.
- If necessary, retighten the hose clips.
- Change porous hoses.
- Attach cover sheet (2).



d3961173

Checking the condition and secure positioning of the engine support and engine mounting

The elastic bearings used for the engine suspension are subjected to high loads. Their service life is limited by the operating conditions.

- Check rubber elements for cracks and severe deformation; if necessary, exchange them.

Contact your authorised dealer.

5 Maintenance

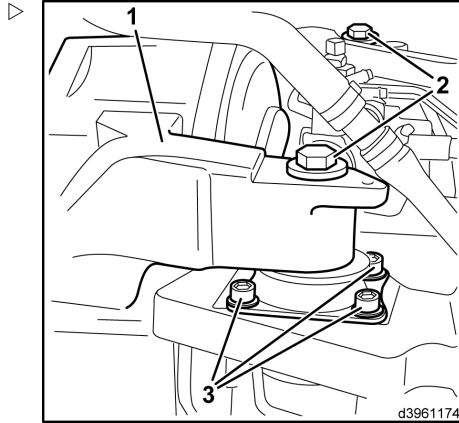
Engine

- Check all screws and nuts in the engine support and engine mountings for secure positioning and damage.

Tightening torques for the mounting screws:

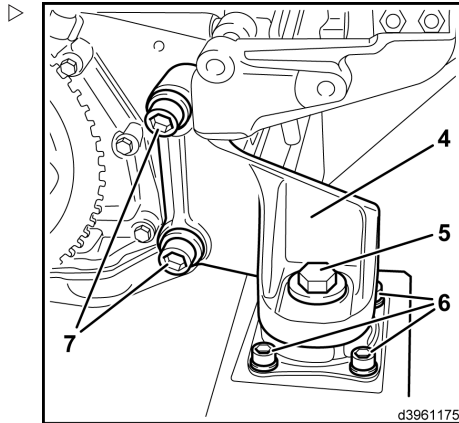
Engine supports (1) at the front of the engine at the left and right-hand sides:

1 SKS M 16 each (2)	195 Nm
4 ZS M 10 each (3)	46 Nm



Engine supports (4) at the rear of the engine on the left- and right-hand sides:

1 SKS M 16 each (5)	195 Nm
4 ZS M 10 each (6)	46 Nm
2 ZS M 16 each (7)	275 Nm



Checking the condition and tension of the V-ribbed belt

⚠ WARNING

Rotating parts.

Stop the engine and remove the switch key.



NOTE

A defective or loose V-ribbed belt will affect the on-board power supply.

- Open the bonnet.


⚠ WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.


⚠ WARNING

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

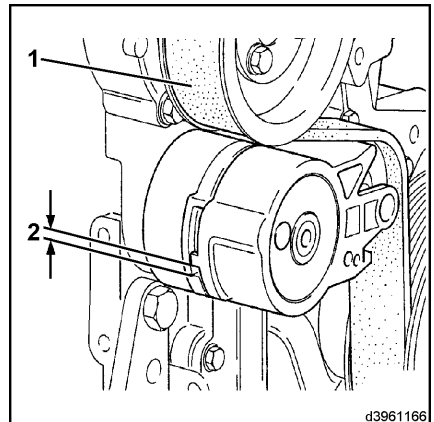
- Check the V-ribbed belt (1) for excessive wear, frayed edges, cracks across the belt and traces of oil.
- Replace the damaged V-ribbed belt.

⚠ CAUTION

A special tool and specialist knowledge is required for this work.

Contact your authorised dealer.

- Measure the remaining travel (2) of the belt tensioner. If the distance is less than 3 mm, also change the V-ribbed belt.
- Close the bonnet.



Changing the V-ribbed belt

⚠ CAUTION

A special tool and specialist knowledge is required for this work.

Contact your authorised dealer.

Changing the air filter cartridge, checking the vacuum-operated switch

(After 1000 operating hours at the latest)

NOTE

The air filter cartridge must not be cleaned. The air filter cartridge must be changed when the vacuum display (1) lights up in the display unit.

- Open the bonnet.



WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.



WARNING

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

- Open snap closures (3) and (4) and remove air filter cover (2).

- Release the air filter cartridge (6) by turning it anti-clockwise.

- Pull out the air filter cartridge.

CAUTION

Clean the inside of the air filter housing thoroughly. Do not blow it out with compressed air.

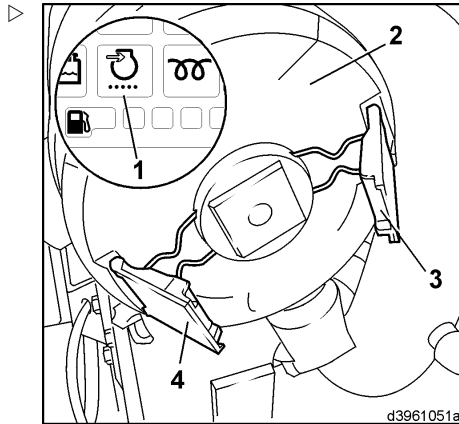
Wipe the housing clean with a clean cloth.

- Install a new air filter cartridge (6) in the housing and fasten in place by turning it clockwise.

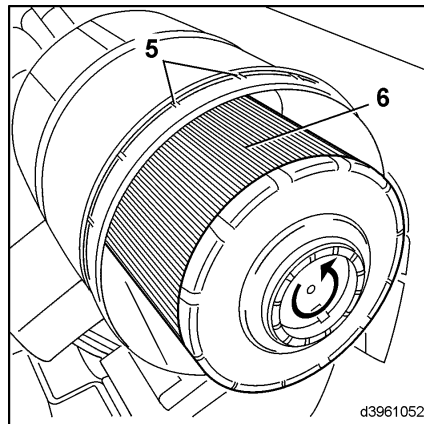
When installing, ensure that the air filter cartridge is not damaged and that the seal on the filter housing is securely in place.

- Fit the air filter cover.

The correct position has been reached when the lugs (5) on the housing sit in the recess of the cover.



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- With the engine running, slowly close the air filter intake opening by covering it (e.g. with a board or plate) until the air filter indicator light (1) illuminates in the display unit.

In order to avoid damage, the intake opening must not be closed any further once the indicator light has illuminated. If the air filter indicator light does not illuminate, contact your authorised dealer.

Changing the air filter safety cartridge

- Change the safety cartridge (1):
 - Two years after it has entered operation at the latest.
 - If the air filter vacuum display lights up again immediately after the air filter cartridge has been serviced.
 - If you have a defective air filter cartridge.

CAUTION

Safety cartridges must not be cleaned or reused. Do not start the engine without an air filter cartridge.

The function of the safety cartridge is to prevent dust penetration while the main cartridge is being changed or if a damaged main cartridge is accidentally used.

- Switch off the engine.
- Open the bonnet.



WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.

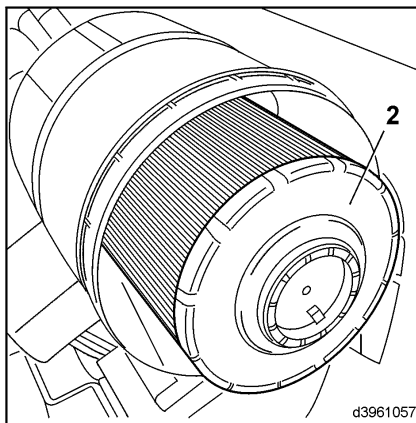


WARNING

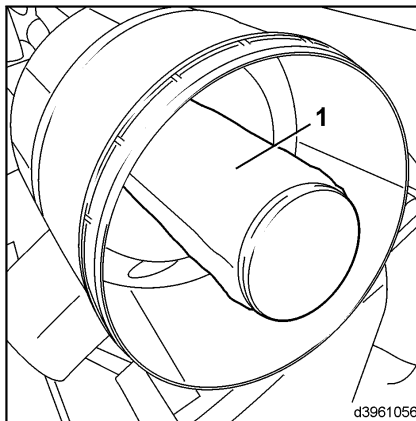
When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

- Take off the air filter cover and remove the air filter cartridge (2).



- Pull out the safety cartridge (1).
- Insert the new safety cartridge.
- Fit the air filter cartridge and attach the air filter cover.
- Close the bonnet.



Checking the dust discharge valve

The dust discharge valve (1) is largely maintenance-free.

- Open the bonnet.



WARNING

Beware of hot engine and exhaust components.

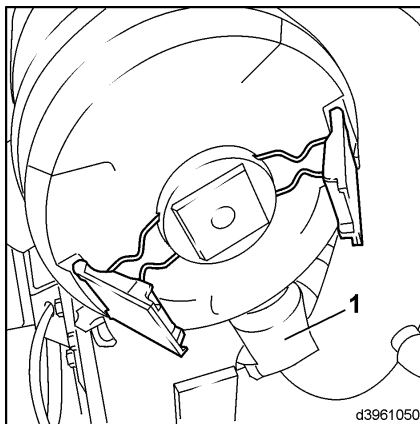
Wear protective equipment.

**⚠ WARNING**

When the engine is hot, the fan may start automatically.

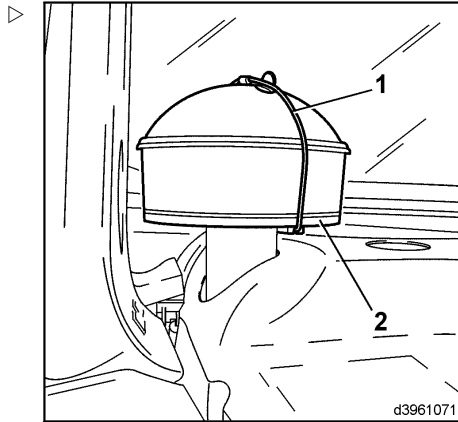
Do not touch rotating parts.

- Squeeze the valve (1) and remove the dust residue. ▷
- If the valve is damaged, replace it.
- Close the bonnet.

**Cleaning the prefilter (special equipment)****NOTE**

The dust collecting tank must never be more than half full with dust. If there is a heavy accumulation of dust, the tank must be emptied every day.

- Release bracket (1).
- Remove and empty the dust collecting tank (2).
- Reattach the dust collecting tank and secure it in place with the bracket.



Cleaning the oil bath air filter (special equipment)



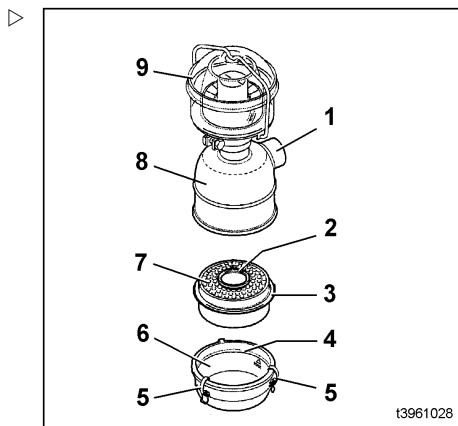
ENVIRONMENT NOTE

Observe information regarding working with consumables.

- Switch off the engine.
- Open fasteners (5) on oil tank (6).
- Remove oil tank (downwards), then empty and clean.
- Clean and check seals (2) and (3), and change if damaged.
- Loosen the air hose clip on the clean air connection (1) and remove the hose.
- Detach and clean dust collecting tank (9).
- Detach upper part of filter (8) on overhead guard.
- Wash out the upper part of the filter and filter insert (7) with diesel fuel.

The filter and knotted steel inserts can be cleaned with a steam jet.

- Thoroughly dry the cleaned filter.
- Fit upper part of filter and secure air hose with hose clip.



- Fit the dust collecting tank (9).
- Fill the oil tank (6) with engine oil as far as mark (4).

Use engine oil 20W/20

Filling quantity approx. 2.5 l

- Fit the oil tank (6) to the upper part of the filter (8), ensuring that it is correctly positioned, then secure with fasteners (5).

Changing the oil in the oil bath air filter (special equipment)



NOTE

The oil must be changed if the dirt deposits reach halfway up the oil level; or at least when changing the filter insert. Oil must not be added between individual oil changes.



ENVIRONMENT NOTE

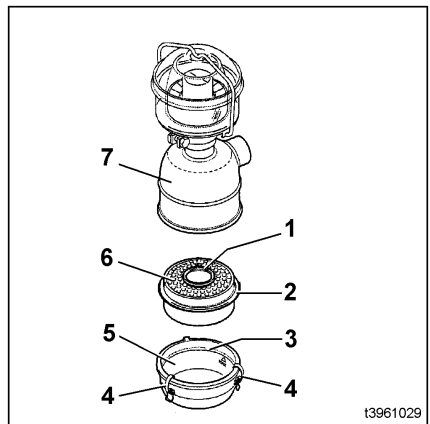
Observe information regarding working with consumables.

- Switch off the engine.
- Open fasteners (4) on oil tank (5).
- Remove oil tank (downwards), then empty and clean.
- Clean and check seals (1) and (2), and change if damaged.
- Check the filter insert (6), and clean if soiled. Fill the oil tank (5) with engine oil as far as mark (3).

Use engine oil 20W/20

Filling quantity approx. 2.5 l

- Fit the oil tank (5) to the upper part of the filter (7), ensuring that it is correctly positioned, then secure with fasteners (4).



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Checking the intake and exhaust pipes for leaks

- Check the condition and tightness of the intake air hoses on the air filter.

If you discover leaks, re-tighten the hose clips or change the porous pipes.

- Check the inlet and exhaust manifold on the cylinder head for leaks.

If you discover leaks, re-tighten the mounting screws or change the seals.

- Check the exhaust pipe connection on the manifold for leaks. If necessary, re-tighten the fixing screws or change the seal.

- Remove the cover on the counterweight.

- Check mounting, connections and tightness of the exhaust pipe and particle filter in the counterweight.

DANGER

Poisonous emissions may escape, or high escaping heat may cause fire.

The clips on the particle filter must not be tightened further because they may start leaking. If you discover any leaks, contact your authorised dealer.

- Refit the cover on the counterweight.

Draining water from the intercooler

- Open the bonnet.



WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.



WARNING

When the engine is hot, the fan may start automatically.

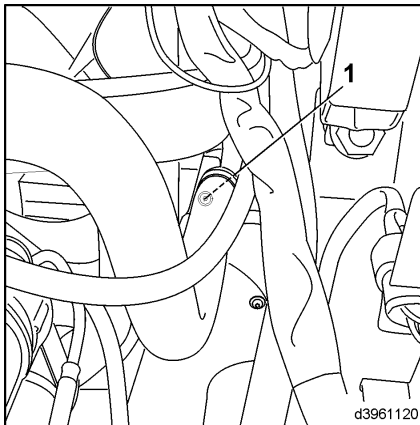
Do not touch rotating parts.

- Unscrew screw plug (1) at the rear of the radiator underneath the air hose using a hexagon socket wrench.

- Allow water residue to escape.

- Refit the screw plug.

- Close the bonnet.



Checking the valve clearance



NOTE

Irrespective of the operating time in years, the valve clearance must be adjusted after

every 2000 operating hours, but only when the engine is cold.

⚠ CAUTION

A special tool and specialist knowledge is required for this work.

Contact your authorised dealer.

Checking the particle filter system

⚠ CAUTION

A special tool and specialist knowledge is required for this work.

Contact your authorised dealer.

Changing spark plugs on the burner of the particle filter

⚠ CAUTION

A special tool and specialist knowledge is required for this work.

Contact your authorised dealer.

Changing the crankcase bleeder valve

(only in USA version)

⚠ CAUTION

A special tool and specialist knowledge is required for this work.

Contact your authorised dealer.

Gearbox

Gearbox

Planetary transmission: Checking the oil level and checking for leaks

**ENVIRONMENT NOTE**

Observe information regarding working with consumables.

- Position the truck so that the vertical and horizontal centre lines lie between the wheel bolts (2) and (3).

The checking screw (1) is then positioned approx. 22 mm under the horizontal centre.

- Clean the area around checking screw (1).
- Unscrew the checking screw (1).

The oil level should be up to the lower edge of the hole.

- If necessary, top up the gear lubricant oil to the lower edge of the hole.

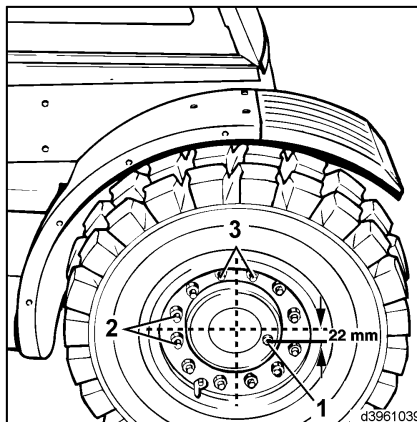
To do this, the wheel must be removed (see Planetary transmission: Changing the oil).

- Screw the checking screw with a new sealing ring into the bore and tighten.

Tightening torque: 37 Nm

- Check the oil level of the gear on the opposite side in the same way.
- Carry out a visual inspection of the left and right planetary transmission to check for leaks.

If you discover any leaks, contact your authorised dealer.



Planetary transmission: Changing the oil and cleaning the magnetic plug

**NOTE**

Change the gearbox oil only when the planetary transmission is at normal operating temperature.

**ENVIRONMENT NOTE**

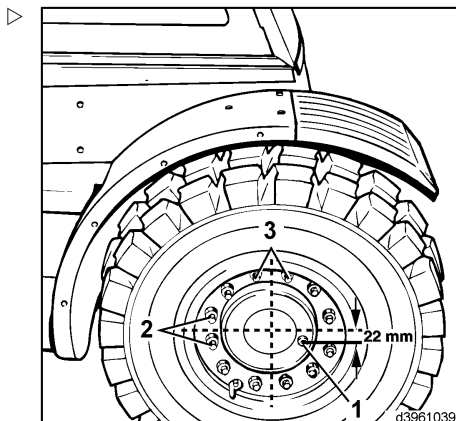
Observe information regarding working with consumables.

- Position the truck so that the vertical and horizontal centre lines lie between the wheel bolts (2) and (3).

The checking screw (1) is then positioned approx. 22 mm under the horizontal centre.

- Raise the front of the truck using a hydraulic jack at the right or left, and support it securely on square timber supports.
- Take the wheel off (see Changing a wheel).
- After the wheel has been removed, align the truck so that both planetary transmissions are horizontal.

Only then can the gear lubricant oil drain out and leave no residue.



- Clean around the checking screw (1), filling screw (4) and drain plug (5).
- Unscrew the checking screw (1), filling screw (4) and drain plug (5) and allow all of the gearbox oil to drain out.
- Clean the magnet on the drain plug (5).
- Fit a new sealing ring to the drain plug (5) and screw it back in.

Tightening torque: 45 Nm

- Slowly pour gear lubricant oil into the filler hole.

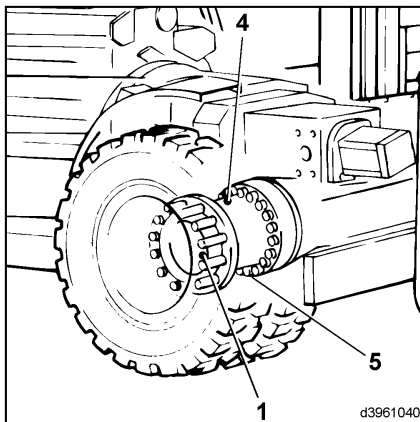
Filling quantity max. 1.5 l per side.

After about 5 minutes, check the gearbox oil level and top up as required. The oil level must be up to the bottom edge of the checking screw bore.

- Screw in the filling and checking screws, and tighten them.

Tightening torque for the checking screw (1): 37 Nm

Tightening torque for the filling screw (4): 37 Nm

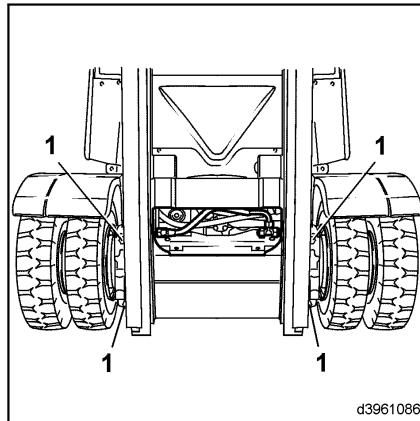


- Refit the wheel and lower the truck.
- Repeat the procedure for the second gear.
- Carry out a visual inspection of the left and right planetary transmission to check for leaks.

If you discover any leaks, contact your authorised dealer.

Checking the fastenings of the axle clamps

- Check that the 4 fixing screws (M 30) (1) of the axle clamps have a tightening torque of 1350 Nm. ▷



Checking the hydraulic pump's mounting on the engine

- Open the bonnet.



⚠ WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.



⚠ WARNING

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

- Tighten the 4 M12 hexagon head screws to the specified tightening torque of 110 Nm.
- Close the bonnet.

Chassis, bodywork and fittings

Chassis, bodywork and fittings

Cleaning the truck

Cleaning requirements depend on the use of the truck. For operations with highly abrasive materials, e.g. salt water, fertiliser, chemicals, cement etc., thorough cleaning should be carried out after the task is complete.

Hot steam or cleaning materials with a powerful degreasing effect should only be used with great caution as they will affect the grease filling of bearings with lifetime lubrication, causing it to escape. As relubrication is not possible, the bearings will be irreparably damaged.

Switch off the engine and wait for it to cool down before cleaning the truck.

Deposits/accumulations of combustible materials, especially on or in the vicinity of parts with high temperatures (e.g. exhaust pipes) must be removed regularly.

 CAUTION

When cleaning with a water jet (high-pressure or steam cleaner etc.), it should not be applied directly to the electric and electronic components, plug connectors, air duct plastic pipes, any of the hydraulic and coolant hoses or the area with hose clips. Water should not be used for cleaning in the area of the central electrical system and switch console.

If this cannot be avoided, the affected parts must be covered in advance or only cleaned using a dry cloth or clean compressed air

When using high-pressure cleaners, the minimum distance between the steel pipe and the truck should be approx. 300 mm.

When using compressed air for cleaning, remove stubborn contamination with a cleaner solvent.

Pay particular attention to cleaning the oil filling openings, their surroundings and the lubricating nipples before lubricating.

Bonnet

Opening the bonnet


 WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.

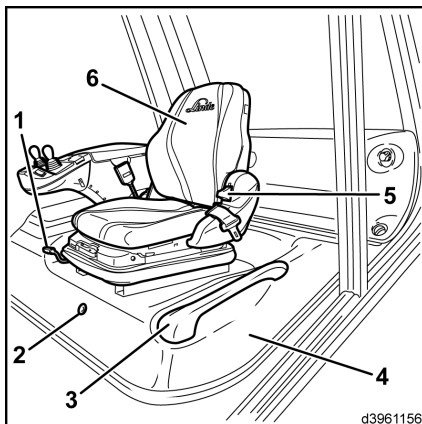

 WARNING

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

- Move steering column all the way forwards and clamp in place.
- Completely fold down the armrest.

- Pull the lever (1) upwards and push the driver's seat all the way forwards.
- Release the lever (1) and allow the seat to engage.
- Only if a rear window is installed — push the lever (5) upwards and hold, fold the seat backrest (6) all the way forwards and release the lever (5).
- Push your finger into the bore (2) to release the bonnet catch; while doing so, release the pressure on the bonnet catch by pressing the bonnet (4) downwards.
- Open the bonnet (4) using the handle (3) and swing it back as far as the stop.



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**NOTE**

The bonnet is kept open by a gas spring.

Closing the bonnet

- Close the bonnet (4) using the handle (3) and push it down until the catch audibly engages.

Floorplate**Removing the floorplates**

Some maintenance operations require that the bottom plate is removed.

- Open the bonnet.

**⚠ WARNING**

Beware of hot engine and exhaust components.
Wear protective equipment.

**⚠ WARNING**

When the engine is hot, the fan may start automatically.
Do not touch rotating parts.

- Remove floormat.

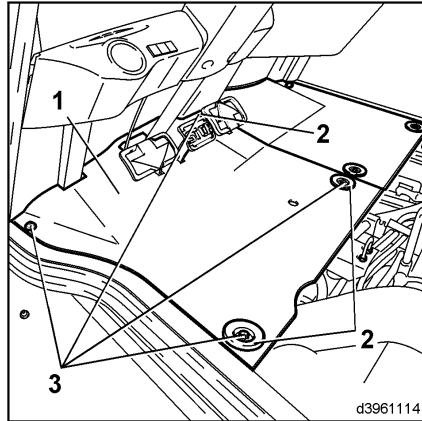
Remove the left-hand floorplate (1):

5 Maintenance

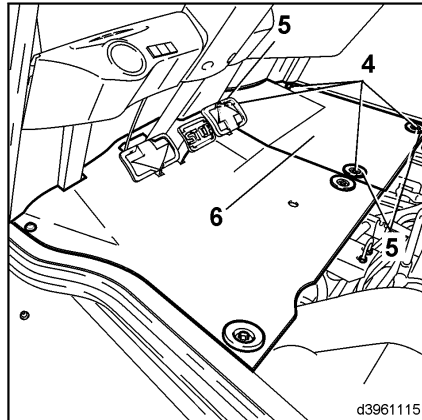
Chassis, bodywork and fittings

- Unscrew the 4 fixing screws (3) from the floorplate.
- Take out the screws with 3 washers (2).
- Lift the floorplate out of the truck.

Remove the right hand floorplate (6):



- Unscrew the 4 fixing screws (4) from the floorplate.
- Take out the screws with 3 washers (5).
- Lift the floorplate out of the truck.



Installing bottom plates

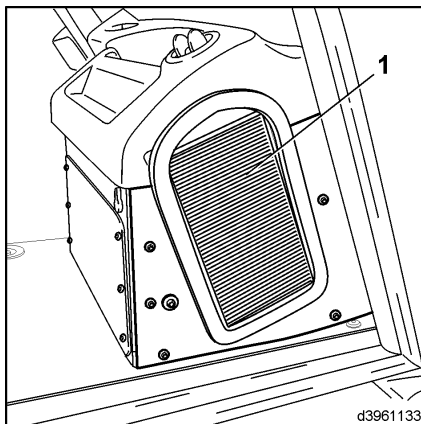
- Lift the right-hand bottom plate into the truck, align it and secure it with 4 mounting screws and 3 washers.
- Lift the left-hand bottom plate into the truck, align it and secure it with 4 mounting screws and 3 washers.
- Lay the floormats on the floorplates.
- Close the bonnet.

Maintaining the heating system and air conditioning (special equipment)

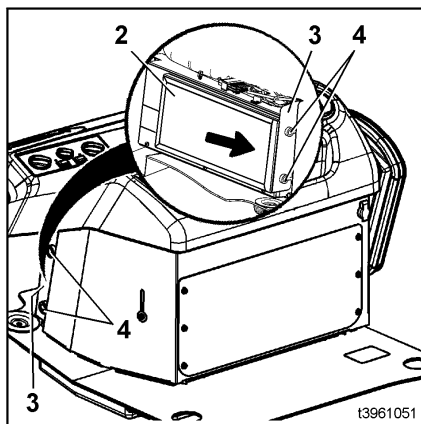
Maintaining the heating system and air conditioning console

- Open the right-hand driver's door and secure in place.

- Remove the filter (1) and clean or replace.
- Reinstall filter.



- Remove the screws (4) at the bottom right of the driver's cab.
- Lift up and remove the cover sheet (3).
- Remove the filter plate (2) from the chassis in the direction of the arrow and clean or replace.
- Push the filter back into the frame.
- Reinsert the cover sheet and fit with the screws.



Servicing the air conditioning

The following maintenance work must be carried out at the beginning, middle and end of a season:

5 Maintenance

Chassis, bodywork and fittings

- Clean the condenser (5).

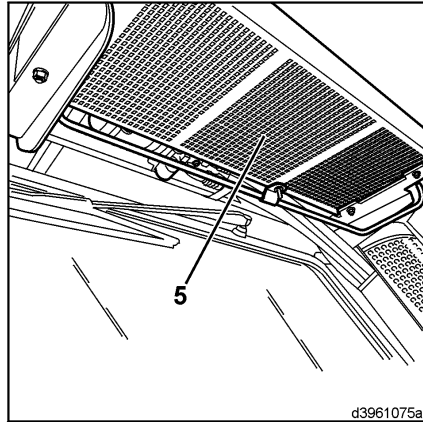
The condenser fins must be cleaned gently without any high pressure being applied. Otherwise, they will be damaged and impair the air flow.

- Check the belt tension on the compressor, and check for good condition.



NOTE

Specialist knowledge and special tools are required for carrying out further maintenance work. Please contact your authorised dealer.



Checking the seat belt for condition and function

DANGER

Risk of accident or danger to life if the restraint system is faulty

Do not operate the industrial truck if the restraint system is faulty.



NOTE

For safety reasons, check the restraint system regularly (once a month) for condition and function.

Screw connections should be checked regularly to make sure that they are secure.

The seat belt must be replaced after an accident.

The driver's seat and the driver's seat mounting must also be checked after an accident by an authorised technician.

If you notice any irregularities in the functioning of the seat (e.g. seat suspension) or the seat belt, contact your authorised dealer immediately to eliminate the cause.

i NOTE

In extreme conditions, the restraint system must be checked for function and condition daily prior to the truck being commissioned.

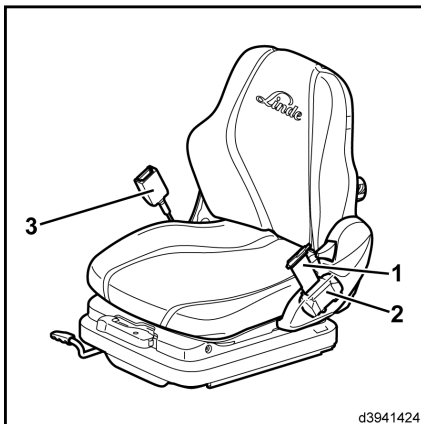
- Pull belt (1) completely out and check for fraying and torn stitching.
- Check that the buckle (3) functions correctly and that the belt retracts properly.
- Check the covers and attachment points for damage.

Test the automatic blocking mechanism.

- Park the truck in a horizontal position.
- Pull out the belt with a jerk.

The automatic mechanism should block the belt from being extended from the belt retractor (2).

- Push the driver's seat all the way forwards.
- Fold the seat backrest all the way forwards.

**i NOTE**

When opening the bonnet, remember that the rear window may have been installed.

- Open the bonnet with driver's seat (4) by approx. 30°.

**▲ WARNING**

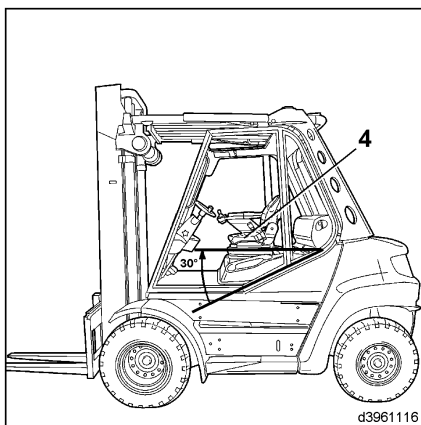
Beware of hot engine and exhaust components.

Wear protective equipment.

**▲ WARNING**

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

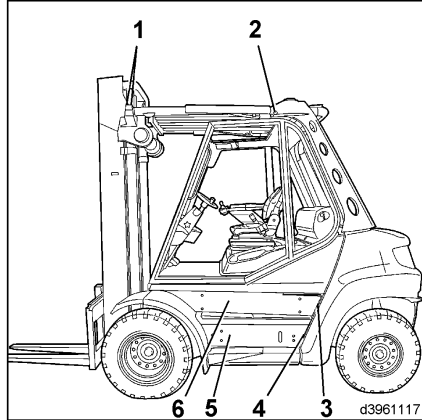


The automatic mechanism should block the belt from being extended from the belt retractor (2).

Chassis, bodywork and fittings

Checking the mounting of the chassis, tilt cylinders and steering axle

- Check that each of the 4 mounting screws (M 10) (1) of the tilt cylinders on the front left and right has a tightening torque of 46 Nm.
- Check that the 1 mounting screw (M 10) (2) of the tilt cylinder pins on the rear left and right has a tightening torque of 46 Nm.
- Check that each of the 3 mounting screws (M 30) (3) on the left and right of the chassis at the counterweight has a tightening torque of 1350 Nm. 2 can be accessed after removing covering (6), 1 can be accessed after opening the bonnet in the engine compartment.



⚠ WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.



⚠ WARNING

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

- Check that the 1 mounting screw (M 30) (4) on the left and right of the chassis at the counterweight has a tightening torque of 1350 Nm. Can be accessed after removing cover (5).
- Check that each of the 4 mounting screws (M 20) of the steering axle has a tightening torque of 385 Nm.

Lubricating the overhead guard bearings and tilt cylinder bearings



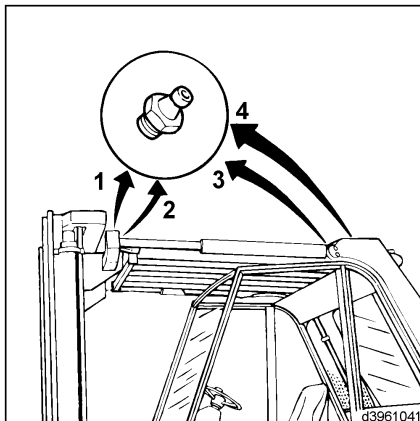
NOTE

Lubricating grease must be used for lubrication.

**ENVIRONMENT NOTE**

Observe information regarding working with consumables.

- Use lubricating grease to lubricate lubricating nipples (1) and (3) of the tilt cylinder bearings, lubricating nipple (2) of the overhead guard bearings and lubricating nipple (4) of the guide roller bearings on the left and right side of the truck.
- Lubricate using a grease gun until some fresh grease escapes from the bearings.



Checking and oiling other bearing points and joints

**ENVIRONMENT NOTE**

Follow the precautions for handling fluids and lubricants.

- Inspect and oil the pivots and mountings of:
 - Seat guide
 - Bonnet pivot pin
 - Wiper mounting (option)
 - Cab door hinges and locks (option)
 - Grease the bonnet latch.

Washer system: Topping up the water tank

The water tank is located behind the cover on the bottom right-hand step.

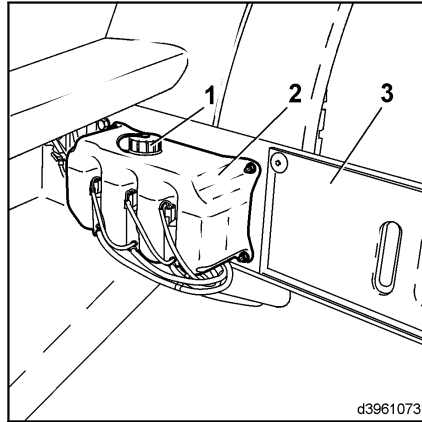
5 Maintenance

Chassis, bodywork and fittings

- Flip up the covering (3).
- Remove the filler cap (1) from the water tank (2).
- Top up with clean water, ensuring that the nozzles do not become blocked. To increase the cleaning effect, add some cleaning agent and anti-freeze.

The cleaning agent and anti-freeze will ensure that the washer system remains frost-proof in winter.

Frost protection up to	Mixture ratio Cleaning agent and anti-freeze to water
-5°C	1:3
-10°C	1:2
-20°C	1:1
-30 °C	2:1



- Close the filler cap (1).
- Close the covering (3) until the latch engages.

Chassis frame

Wheel change

⚠ DANGER

Risk of tipping.

All tyres on any one axle must be of the same dimensions, from the same manufacturer and of the same type and profile.

⚠ WARNING

Note the tare weight of the truck.

Use only jacks with a min. load capacity of 6500 kg.

⚠ CAUTION

Electrostatic charge.

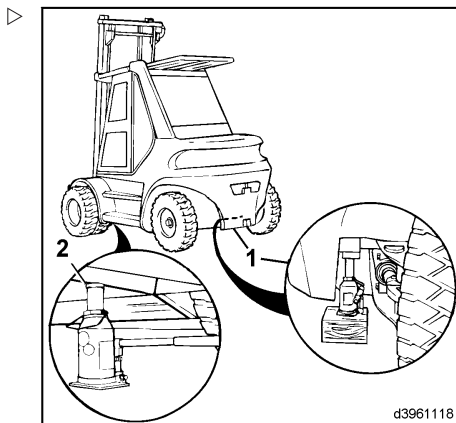
When using non-marking tyres (light-coloured tyres), the electrical potential equalisation must be ensured with an antistatic belt

The antistatic belt must always be in contact with the ground.

- Release the wheel fastenings on the wheel in question.
- Place a jack at the rear, only in the centre under the counterweight (1) in front of the steering axle.
- Place jacks at the front, only under the edge (2) perpendicular to the chassis carrier at the left and right.

The truck may be jacked up only at these lifting points at the front left, front right and the rear centre.

- Raise truck with jack until wheels are off the ground.
- Prop up securely using square timber supports at the chassis or counterweight.
- Unscrew the wheel fastenings.
- Change the wheel.
- Position wheel fastenings and tighten them manually.
- Lower truck.
- Tighten wheel fastenings



Tightening torque:

Front	640 Nm
Rear	640 Nm

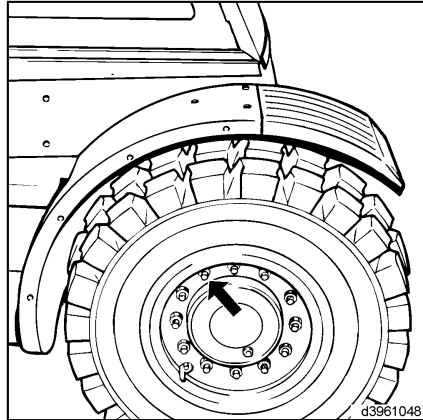
Tightening the wheel fastenings

The wheel fastenings should be tightened before initial start-up and whenever wheels are changed or repairs are made.

After this tightening should be performed after 100 operating hours at the latest.

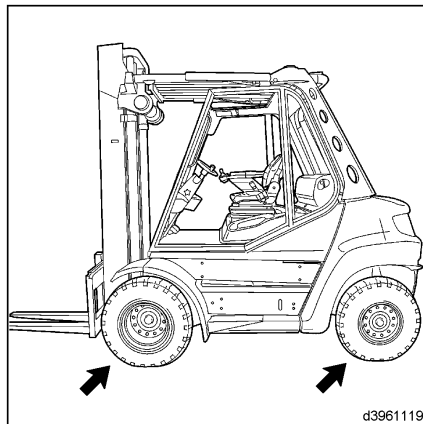
The wheel fastenings should be tightened crosswise with a torque of:

Front	640 Nm
Rear	640 Nm



Checking tyres for damage and foreign objects

- Secure the truck against rolling away (activate the parking brake).
- Place a wheel chock under a wheel that is not to be lifted.
- Raise truck with jack until the wheels are off the ground.
- Place timber beams underneath.
- Check for free movement of the wheels and remove anything hindering their movement.

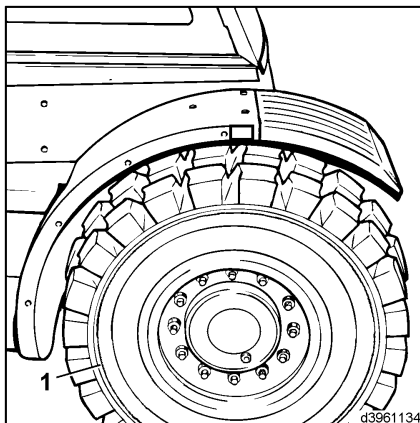


The upper edge of the 60 Joule indicator (1) is the maximum limit for wear and regrooving. The decision about whether to regroove the tyres should be based on the application conditions.

A minimum tread depth is not required with solid rubber tyres.

It must be ensured that the degree of wear on the tyres on one axle is the same.

- Change worn or damaged tyres.



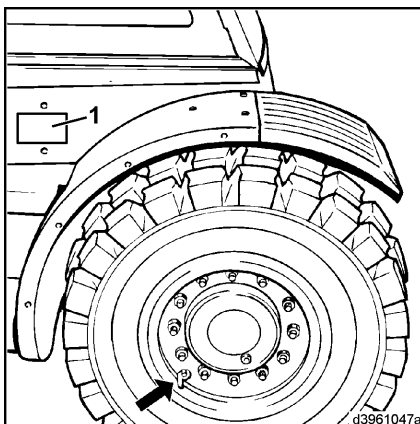
Check the tyre pressure

⚠ CAUTION

If the air pressure is too low, the tyres' service life will be reduced and the stability of the truck will be compromised.

Therefore, regularly check tyre pressures.

- Check that the tyres have the prescribed air pressure.
- If necessary, adjust the tyre pressures in accordance with the information on the adhesive label (1) on the right-hand side of the truck next to the drive wheel:



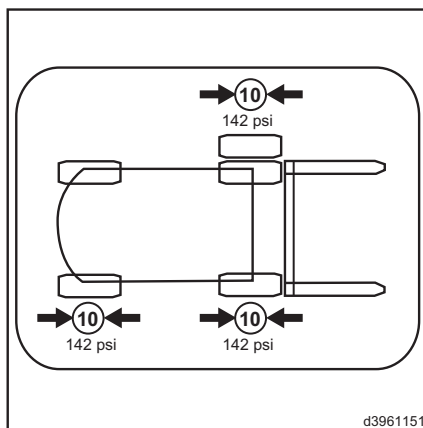
Chassis frame

Example:

Tyre pressure adhesive label (1)

Drive axle	
Single tyre	10.0 bar
Twin tyres	10.0 bar

Steering axle	
Single tyre	10.0 bar



Checking the condition of the antistatic belt



NOTE

Under certain circumstances the truck may become electrostatically charged.

- *The charging level depends on a number of factors such as type of tyre, air humidity, floor covering etc.*
- *Excessive electrostatic charging is noticed when the electrostatic charge is discharged to the ground via the body of a person who touches the truck (electric shock) or when a spark passes from the truck to an earthed part (e.g. a metal shelf).*
- *With standard types of tyre (black pneumatic or solid rubber tyres), the high graphite content means that electrostatic charging is relatively rare.*
- *However, if non-scrubbing tyres (light-coloured tyres) are used and the truck is*

driven into an area with a sealed floor, the electrostatic charging effect occurs very often.

- *Non-scrubbing tyres are identified by the safety information on the tyre wall.*

For this case, an antistatic belt is fitted to the underside of the truck and is connected to the truck chassis.

- **Check that the antistatic belt is securely seated on the frame floor and check for wear.**
- **Change the antistatic belt if it is damaged.**



NOTE

The antistatic belt must always be in contact with the ground.

Cleaning and greasing the steering axle



ENVIRONMENT NOTE

Observe information regarding working with consumables.

When used indoors in clean, dry conditions, it is generally sufficient to perform maintenance every 1000 operating hours. It is advisable to halve these lubrication intervals if the vehicle is used both indoors and outdoors.

If used in areas with constant exposure to dust, dirt, water, road salt or chemicals, weekly lubrication will considerably lengthen the service life of the spherical bearings.



NOTE

It is better to apply a little grease to the bearings frequently than a lot of grease infrequently.

5 Maintenance

Chassis frame

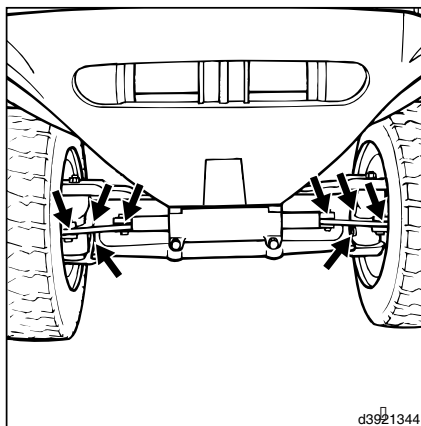
- Clean steering axle with water or cleaner solvent.



NOTE

Lubricating grease should be used for greasing in accordance with consumables recommendations. First grease the axle stub bearings on top, then underneath.

- Grease the tie rod and axle stubs at the lubricating nipples (see arrows) using lubricating grease.
- Grease with grease gun until fresh lubricating grease escapes at bearings.



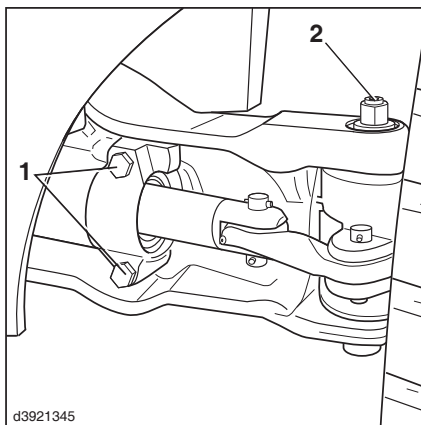
Checking the mountings of the steering cylinder and steering pivot pin

- Check that the 4 fixing screws M 24x2 (1) are securely attached.

Tightening torque: 1000 Nm

- Check that the nut (2) on the steering pivot pin is securely attached.

Tightening torque: 600 Nm



Operating devices

Checking the parking brake for correct operation

- Drive the fork lift truck, carrying its maximum load, up a gradient of 15 %.
- Place the parking brake (2) in a horizontal position. ▷

The vehicle must remain stationary.

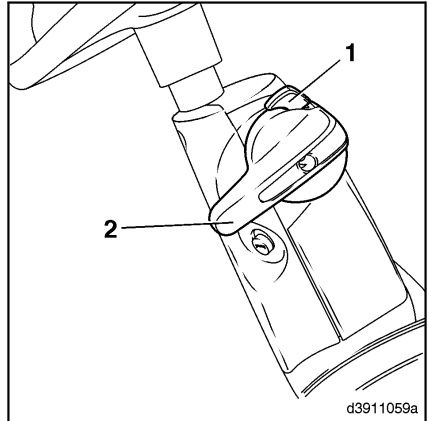
- Switch off the engine.
- Press the button (1) and unlock the parking brake lever (2).
- Move the parking brake 90° downwards.

The vehicle must remain stationary.



NOTE

If the parking brake fails this test, contact your authorised dealer.



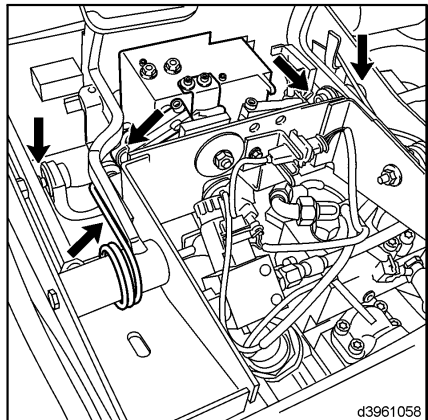
Checking the pedal group



ENVIRONMENT NOTE

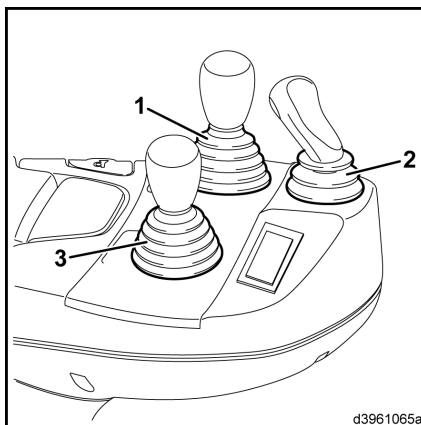
Observe information regarding working with consumables.

- Remove the left floorplate.
- Check the pedal group for freedom of movement.
- If necessary, grease the bearings slightly.
- Lightly oil rod bearings and fork clevises as necessary.
- Check bolt and joint fastenings for secure positioning.
- Check correct operation of leg springs.
- Install floorplate.



Checking the bellows at the actuating lever

- Check that the bellows (1), (2) and (3) (depending on the version) are securely positioned and show no signs of damage. Change if necessary.



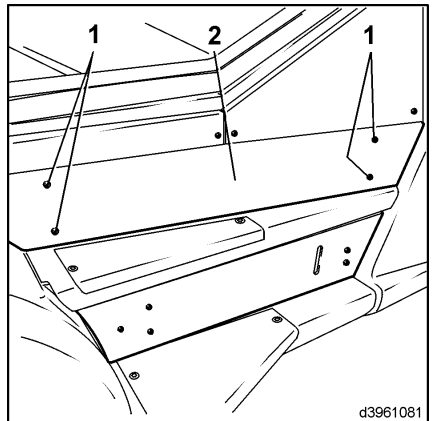
Electrics

Checking the condition and secure positioning of electric cables, cable connectors and connections

NOTE

Oxidised connections and brittle cables lead to voltage drops and thus to difficulties during start-up and operation.

- Remove the 4 screws (1) on the cover for the electrical system on the left side of the truck at the top step
- Take off the cover (2).
- Check cable connections for secure attachment and oxidation residues.
- Check earth wire for secure attachment.
- Check the electric wiring in the engine compartment for abrasion and secure positioning.
- Remove oxidation residues and replace brittle cables.
- Refit the cover for the electrical system.



Battery: checking the condition, acid level and acid density

When handling starter batteries, the following should be complied with:

- Wear industrial goggles and a protection suit.
- Before touching the battery, first grasp conductive parts of the frame to discharge any static charge.
- Avoid producing sparks when connecting/disconnecting.
- When recharging new batteries, ensure good degassing (unscrew any plugs present).

5 Maintenance

Electrics

- After charging the battery, leave it standing for at least 8 hours before reconnecting, if possible.
- When filling up or recharging, remove any packaging film beforehand to ensure gas venting.
- Do not use plastic adhesive tape, in particular on the battery lid and the ventilation openings of the plugs.
- Before recharging, first check battery without electric load to make sure that only intact batteries undergo charging.
- During electrical charging, batteries produce hydrogen and oxygen gas which under certain conditions may result in an explosive mixture. Battery should only be filled and charged in well ventilated rooms.
- Avoid rubbing textiles against the battery.
- The electrolyte level must always be maintained between max. and min. markers (to avoid large gas volumes).
- Due to the possibility of static charges, do not rub batteries with dry cloths. Use damp cloths instead.



WARNING

Battery acid is highly corrosive. Contact with battery acid should therefore always be avoided. If the clothing, skin or eyes have come into contact with battery acid, the affected areas should be rinsed with water immediately. In the event of contact with the eyes, please consult a doctor at once! Any spilt battery acid should be neutralised straight away!

Wear protective equipment.

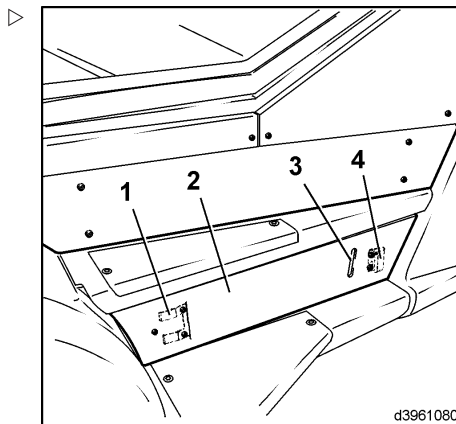


NOTE

Even in the case of maintenance-free batteries, it is necessary to check the condition and acid density/level.

The battery is located on the left-hand side of the truck behind the covering of the bottom step.

- Grasp the slot (3) in the covering (2), pull and release the catch (4), then pull it sideways out of the support mounting (1).
- Disconnect the earthing terminal.



- Release the battery holder (5) and pull the battery forward (6).

⚠ WARNING

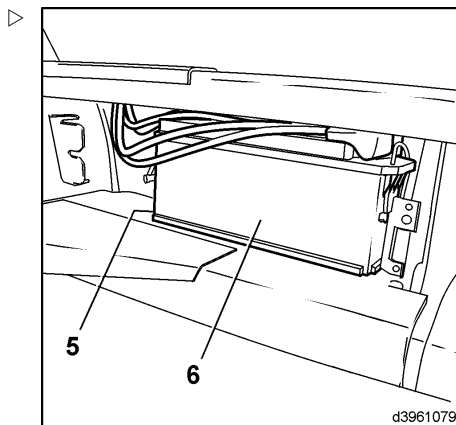
The positive terminal must not come into contact with the chassis, otherwise this will lead to a short circuit in the electrical system, or the battery can explode.

Carefully take out the battery.

- Inspect battery for cracked housing and acid leaks.
- Unscrew the sealing plugs and check the acid level.

In the case of batteries with level checking inserts, the fluid must reach the bottom of the insert, and for batteries without level checking inserts, it must lie 10–15 mm above the lead plates.

- Any lack of fluid should only be made up with distilled water.
- Remove any oxidation residues on the battery terminals and then apply acid-free grease.
- Check that the + terminal is securely attached.
- Check acid density with an acid siphon. The density value must be 1.24–1.28 kg/l.
- Screw the sealing plugs back in.



Electrics

- Push the battery back and secure in holder (5).
- Reattach the earthing terminal.
- Slide the covering (2) into the holder (1) from left to right and push the right-hand side until the catch (4) on the cover engages; observe the centring pin while doing so.

Hydraulics

Changing the hydraulic oil

Draining the hydraulic oil



ENVIRONMENT NOTE

Observe information regarding working with consumables.

- Drive truck over pit.
- Fully lower the fork carriage and lift mast.
- Place a collection container under the left side of the truck floor.
- Open the bonnet.



⚠ WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.

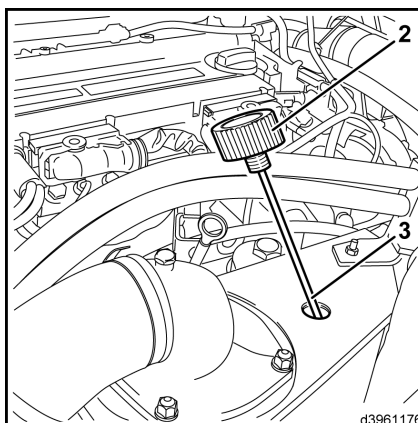


⚠ WARNING

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

- Unscrew the breather filter (2) with oil dipstick (3).

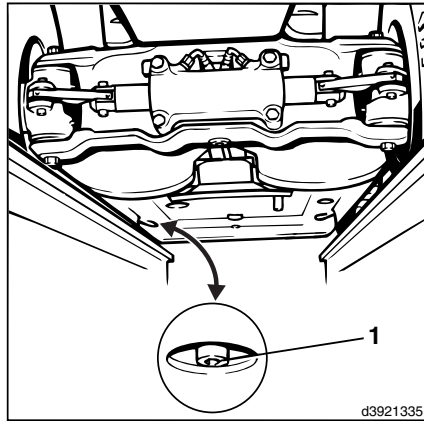


5 Maintenance

Hydraulics

- Unscrew the hydraulic oil drain plug (1) at the bottom of the hydraulic oil tank using hexagon socket wrench SW 6.
- Allow all the oil to drain out.
- Clean area around the oil drain thoroughly.
- Refit drain plug.

Tightening torque: 25 Nm



Topping up the hydraulic oil

- Add hydraulic oil to filling opening.



NOTE

The oil dipstick has 3 markings, which are valid for the different lift heights.

- (4) = Marking on the oil dipstick
- (5) = Lift mast version
 - (St) = Standard lift mast
 - (Tr) = Triplex lift mast
- (6) = Lift mast load-bearing capacity
- (7) = Lift heights

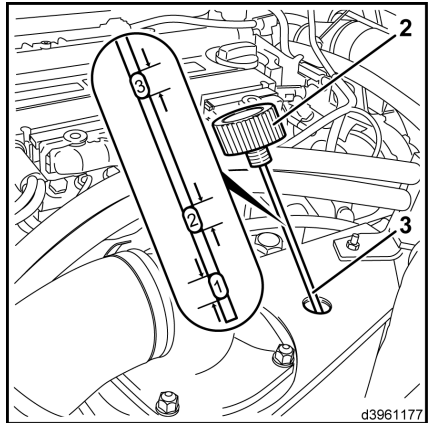
Total filling quantity in the hydraulic oil tank at (4):

Marking 1	86.0 l
Marking 2	92.0 l
Marking 3	110.0 l

5 / 6 t		7 / 8 t	
St	Tr	St	Tr
8255	7980	6455	6180
-	-	-	-
8850	9775	8850	9775
6455	6180	5255	4680
-	-	-	-
8250	7975	6450	6175
3550	4225	2750	4205
-	-	-	-
6450	6175	5250	4675

d3961123a

- Screw the breather filter (2) with oil dipstick in completely and then unscrew it again.
 - Check the oil level at the dipstick (3) and continue to fill up, until the oil reaches the upper marking for the corresponding lift height on the dipstick.
 - Allow the engine to run for approx. 3 minutes in the upper idling speed (with the parking brake applied and the accelerator pedal depressed).
 - Check oil level again (do not drive).
- Only then should the suction filter be changed.
- Close the bonnet.



NOTE

The hydraulic system will bleed itself automatically when the engine is running.

Hydraulic system: Checking the oil level

ENVIRONMENT NOTE

Observe information regarding working with consumables.

NOTE

Oil specifications: see recommendations for consumables.

- Fully lower the fork carriage.
- Open the bonnet.



WARNING

Beware of hot engine and exhaust components.
Wear protective equipment.



WARNING

When the engine is hot, the fan may start automatically.
Do not touch rotating parts.

5 Maintenance

Hydraulics

- Unscrew the breather filter (1) with oil dipstick (2) on the left-hand side of the truck.



NOTE

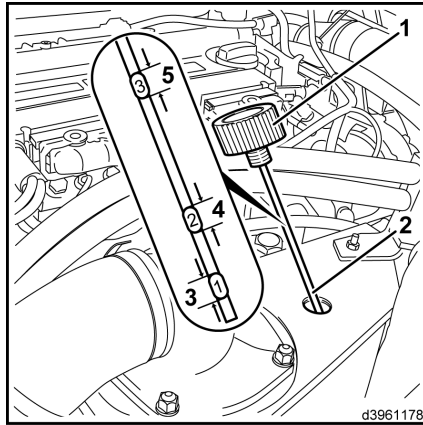
Tank under low pressure. A small amount of air will escape.

- Wipe the oil dipstick with a clean cloth.



NOTE

Three markings (3, 4, 5,) are stamped on the oil dipstick (2). These apply to the different lift mast versions (6), lift heights (8) and load capacities (7).



- Only check the marking which applies to your truck.
- Screw the breather filter with oil dipstick back in completely and then unscrew it again.

The oil level on the dipstick should be between the two markings for the corresponding lift height.

- If necessary, add more hydraulic oil until it reaches the corresponding marking for your truck.

Difference in quantity between max. and min. marks: approx. 1.3 l.

- Close the bonnet.

	5 / 6 t		7 / 8 t	
	St	Tr	St	Tr
3	8255 - 8850	7980 - 9775	6455 - 8850	6180 - 9775
4	6455 - 8250	6180 - 7975	5255 - 6450	4680 - 6175
5	3550 - 6450	4225 - 6175	2750 - 5250	4205 - 4675

Hydraulic system: changing the filters

Feed and pressure filters



ENVIRONMENT NOTE

Observe information regarding working with consumables.

- Lower lift mast completely.
- Open the bonnet.

**⚠ WARNING**

Beware of hot engine and exhaust components.

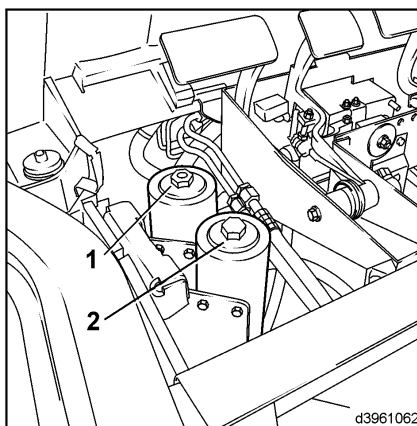
Wear protective equipment.

**⚠ WARNING**

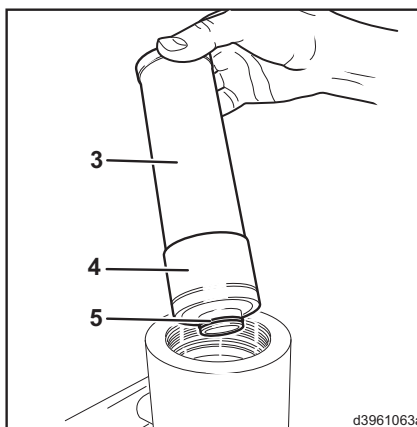
When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

- Remove the left-hand bottom plate.
- Loosen the pressure filter cover (1) and the feed pressure filter cover (2) at the hexagonal.
- Unscrew the filter covers by hand.



- Remove the filter cartridges (3) from the housing slowly, to allow the oil to flow back.
- Remove dirt trap (4) from each filter cartridge (3) and clean.

**ENVIRONMENT NOTE**

Dispose of the filter cartridges in an environmentally friendly manner.

- Fit dirt trap (4) to each new filter cartridge (3).
- Wet the sealing rings (5) of the new filter cartridges with oil.
- Lower the filter cartridges with sealing ring (5) into the housing.

5 Maintenance

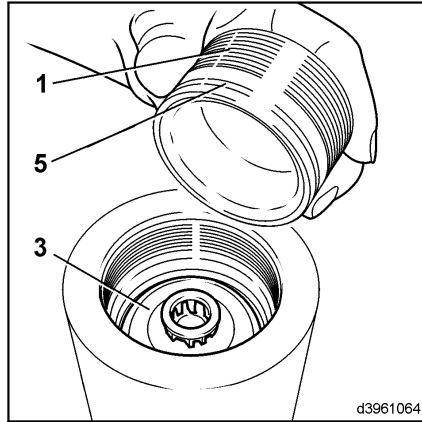
Hydraulics

- Check the sealing ring (5) on the filter cover and change if damaged. ▷

- Screw on filter covers (1) and (2).

Tightening torque: 10^{+5} Nm.

- Check the filters for leaks during the test run.
- Refit the left bottom plate.



Suction filter

⚠ CAUTION

The oil must have an optimal purity level at all times. For this reason, it is imperative that during the 6000, 12,000 or 18,000-hour maintenance the hydraulic oil is changed first, before changing the suction filter.

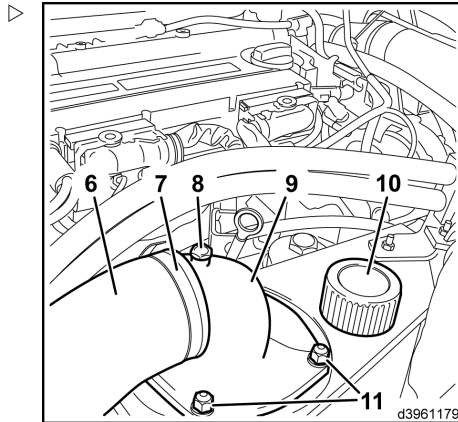
- Open the breather filter (10).

This allows the air to escape so that the oil will not overflow when the filter cartridge is inserted.

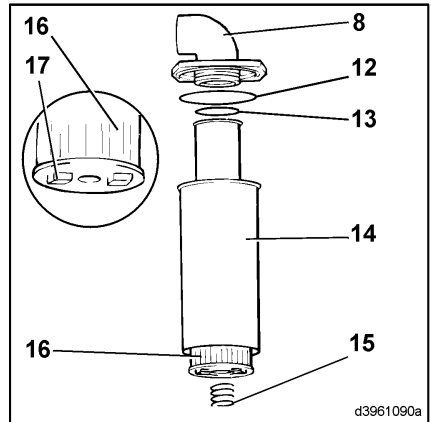
- Open screw plug (8).

The oil flows back into the tank as the air enters.

- Disconnect the hose clip (7) from the intake hose (6).
- Remove the intake hose from the suction filter top (9).
- Unscrew the 4 nuts (11) on the suction filter top (9).
- Slowly lift the suction filter top (9) with the filter housing (14) part-way out, so that the hydraulic oil can flow back into the container. Only then lift it out fully.
- Remove the filter top from the filter housing.



- Check the O-rings (12) and (13) of the filter top; change if damaged.
 - Unscrew the compression spring (15) out of the filter cartridge (16) in an anti-clockwise direction.
 - Insert a screwdriver through the opening (17) on the filter cartridge and rotate in an anti-clockwise direction.
 - Unscrew the filter cartridge and dispose of it in an environmentally friendly manner.
 - Carefully insert the new filter cartridge into the filter housing and screw it in with a screwdriver through the opening (17) in a clockwise direction.
 - Screw the compression spring (15) into the filter cartridge in a clockwise direction.
 - Place the filter housing in the hydraulic oil tank and fit the filter top with O-rings.
- Ensure that it is correctly centred in the filter end.
- Attach the intake hose to the filter top.
 - Screw the breather filter on.
 - Fit the screw plug.
 - Check the filter covers for leaks during the test run.
- The hydraulic system will bleed itself automatically when the engine is running.



Breather filter



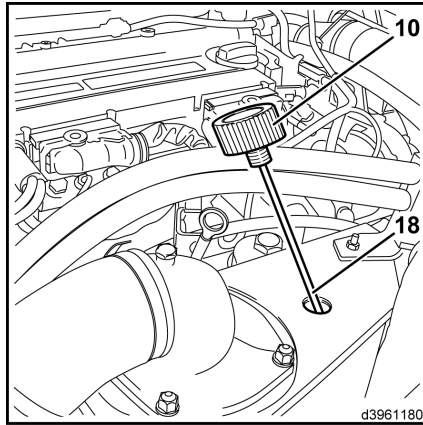
NOTE

If there is heavy dust accumulation, it may be necessary to change the filter earlier.

5 Maintenance

Hydraulics

- Unscrew the filter (10) from the filler neck. ▷
- Remove the dipstick (18) from the breather filter and attach it to the new filter.
- Screw in the filter and tighten it.
- Dispose of the old breather filter in an environmentally friendly manner.
- Close the bonnet.



Checking the bleeder valve on the hydraulic tank for correct operation



NOTE

The breather filter for the hydraulic oil tank is fitted with a bleeder valve that allows a small amount of pressure in the tank.

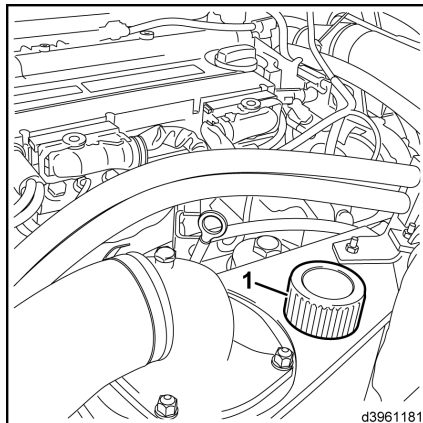


ENVIRONMENT NOTE

Observe information regarding working with consumables.

- Close breather filter (1) and/or check whether the breather valve is fitted securely. ▷
- Start engine.
- Extend the lift mast several times to the stop and lower it again.
- Switch off the engine. Open breather filter (1) on the hydraulic oil tank.

Air must be able to be heard escaping from the tank. If air cannot be heard escaping, replace the breather filter.



Checking the hydraulic system for leaks

- Open the bonnet.



WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.



WARNING

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

- Take out the floorplates.
- Check all connections between the oil tank, drive motors, 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.
- Refit the floorplates.
- Close the bonnet.

Checking the pre-load of the double hoses ▷

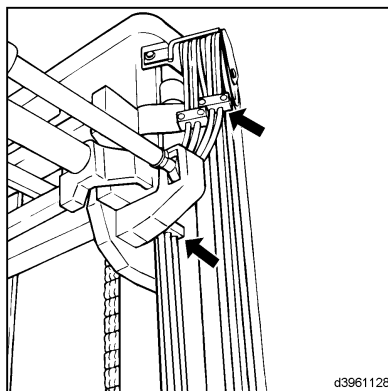


NOTE

The pre-load of the double hoses must only be checked when auxiliary hydraulics are being fitted to the standard lift mast.

The pre-load of the double hoses should be 5-10 mm per metre, according to the initial length.

- Adjust the pre-load by sliding the hoses in the retaining clips to the measurement specified.



Load lift system

Working on the lift mast and at the front of the truck

DANGER

When working in the area of the lift mast, there is a risk of becoming trapped and/or the lift mast accidentally lowering.

If the lift mast or fork carriage is raised, no work must be performed on the lift mast or at the front of the forklift truck without observing the following safety measures! These safety precautions are sufficient only for general maintenance on the truck (inspection and greasing). For repairs (e.g. changing chains, dismantling lift cylinders), additional safety precautions must be taken. Contact your authorised dealer.

Securing against tilting backwards

The lift mast must be secured against accidentally tilting backwards

- Tilt the lift mast all the way back.
- Switch off the engine.
- Remove the ignition key.

Standard lift mast

FUNCTION: When raising the inner mast, the chain rollers are moved up with the chains so that the fork carriage is lifted with a transmission ratio of 2:1, due to the chain deflection.

Securing the raised standard lift mast

DANGER

Check chain load!

Select the safety chain with sufficient load-bearing capacity for the respective lift mast. Take the maximum lift height into account.

- Extend the lift mast.

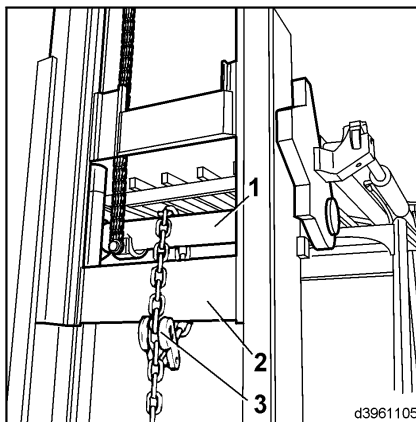
5 Maintenance

Load lift system

- Connect the chain (3) over the cross beam of the outer mast (1) and under the cross beam of the inner mast (2).
- Lower the inner mast until it reaches the chain (3).

Triplex lift mast

FUNCTION: The fork carriage is raised to the special free lift height via the chain guide pulley of the centre cylinder. Two lift cylinders then raise the inner mast. Once the inner mast is fully extended, two additional lift cylinders raise the middle mast, which is lifted together with the inner mast and the fork carriage. The centre cylinder is positioned on the extendable inner mast.



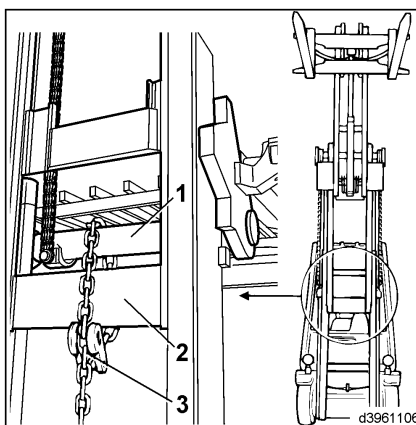
Securing the raised triplex lift mast

DANGER

Check chain load!

Select the safety chain with sufficient load-bearing capacity for the respective lift mast. Take the maximum lift height into account.

- Extend the lift mast.
- Connect the chain (3) over the cross beam of the outer mast (1) and under the cross beam of the middle mast (2).
- Lower the lift mast to the end of the chain (3).
- Lower fork carriage as far as it will go.



Cleaning and spraying the lift mast chain

DANGER

Lift mast chains are safety elements. Using the incorrect cleaning materials may damage the chains.

Do not use cleaner solvent, chemical cleaners or fluids that are corrosive or contain acid or chlorine.

If the lift mast chain is so dusty that penetration of the lubricating oil cannot be guaranteed, the chain must be cleaned.

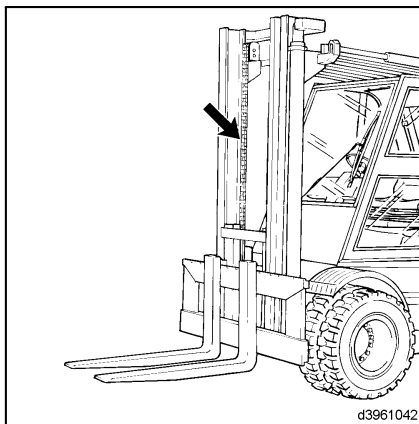
- Place a collection container under the lift mast.
- Clean lift mast chain with paraffin derivatives, such as benzine.

Take note of the manufacturer's safety information. When cleaning with a steam jet, do not use additives.

- After cleaning, immediately use compressed air to remove any water remaining on the surface of the chain and in the chain joints.

The chain should be moved several times during this process.

- Immediately apply Linde chain spray to chain, moving chain while doing so.

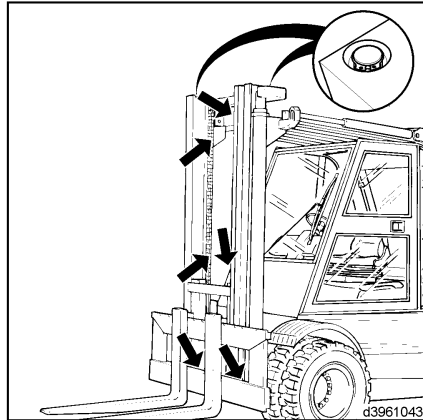


Checking the mounting, condition and function of the lift mast, lift mast chains, lift cylinders and end stops

- Clean lift mast guides and chain.
- Check chain for condition and wear, especially around the guide pulleys.
- Check secure fastening of chain to chain anchor.
- Replace damaged chains.
- Check the condition and mounting of the lift mast, guide surfaces and rollers.
- Check the condition, secure fastening and correct operation of the end stops.
- Check the mounting of the lift mast bearings.

Tightening torque: 385 Nm

- Check the secure fastening of the lift cylinders.
- Check that the locking ring of the piston rod mounting at the top of the lift mast is seated correctly.



Adjusting the lift mast chain

Standard lift mast



NOTE

The lift mast chain stretches during operation and therefore has to be readjusted on the right and left sides.

- Lower lift mast completely.

- Loosen locknut (1).
- Adjust chain at adjustment nut (2) of chain anchor.

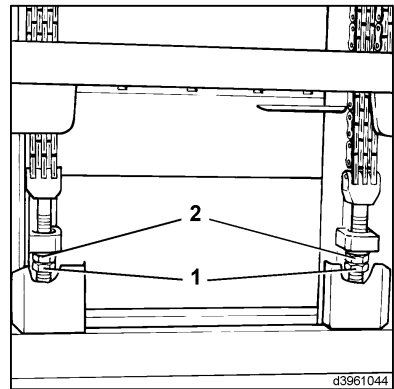
The lower guide roller on the fork carriage must only protrude max. 45 mm from the inner lift mast guide rail.

- Tighten the locknut (1).
- Also adjust second chain.

CAUTION

When extending the lift mast, it must not touch the end stops.

Fully extend the lift mast and check clearance to end stops.



Apply chain spray.

NOTE

In the case of trucks that are used in the food production sector, chain spray should not be used. Instead, use a low-viscosity oil approved for use in the food industry.

- Apply Linde chain spray to guide surfaces and chain.

Triplex lift mast

NOTE

The lift mast chain stretches during operation and therefore has to be readjusted.

- Lower the lift mast and fork carriage completely.

5 Maintenance

Load lift system

- Loosen lock nut (4). Adjust chain at the adjustment nut (3) of chain anchor.

The lower guide roller on the fork carriage must only protrude max. 45 mm from the inner lift mast guide rail.

- Tighten the locknut (4).

CAUTION

When extending the lift mast, it must not touch the end stops.

Fully extend the lift mast and check clearance to end stops.

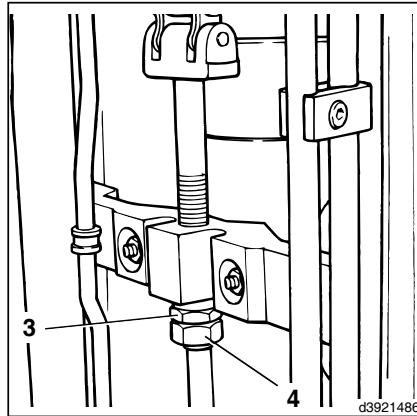
Apply chain spray.



NOTE

In the case of trucks that are used in the food production sector, chain spray should not be used. Instead, use a low-viscosity oil approved for use in the food industry.

- Apply Linde chain spray to guide surfaces and chain.



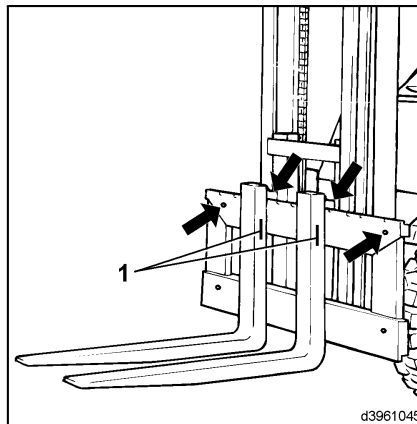
Checking fork arms and arm safety devices

- Check fork arms for visible deformation, wear and damage.
- Check that the screws of the arm safety devices and the fork arm catch are properly positioned and show no signs of damage.
- Replace defective parts.



NOTE

On the H 80-1100 truck it must be ensured that the fork arms have a load capacity of 4000 kg for a load centre of gravity of 1100 mm. This can be seen from the label (1) on the side of the fork back.



Lubricating the mast fixation



ENVIRONMENT NOTE

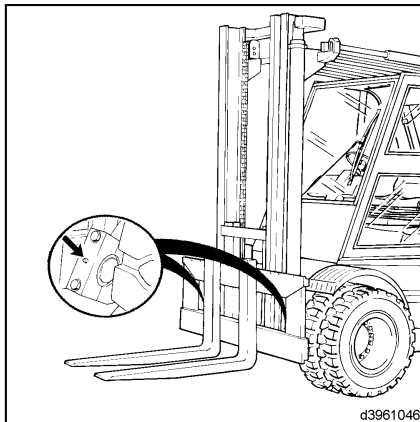
Observe information regarding working with consumables.



NOTE

Lubricating grease should be used for lubrication.

- Lower lift mast completely.
- Lubricate the mast fixation lubricating nipple on the left and right sides of the chassis. ▷
- Lubricate using a grease gun until fresh grease leaks from the bearing points.



5 Maintenance

Self-help

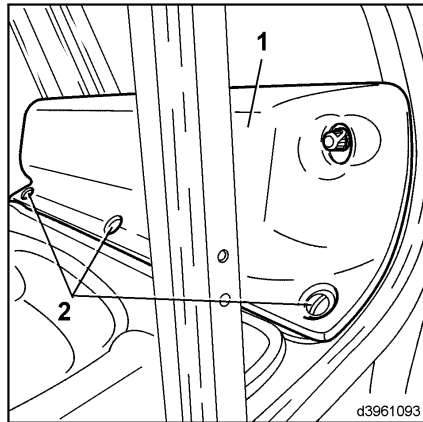
Self-help

Opening the cover to the electrical system

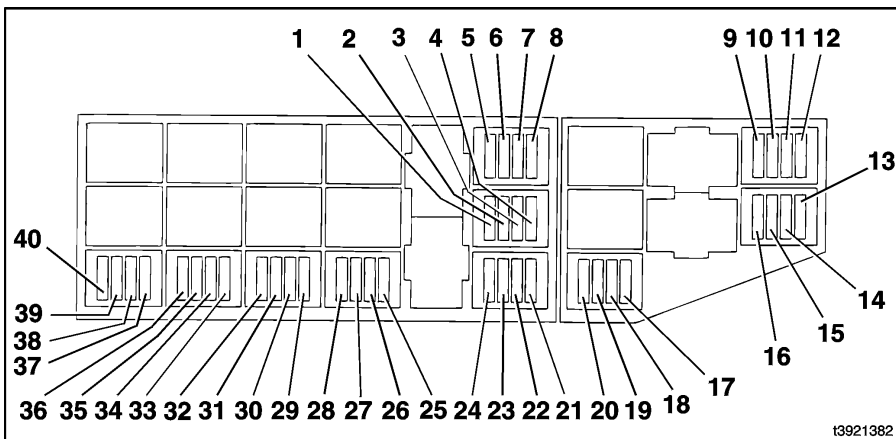
Up to 40 fuses can be fitted to protect the electrical equipment. The fuse box is accessible after removal of the cover to the electrical system, behind the driver's seat at the rear wall of the chassis.

- Unscrew the three knobs (2) anticlockwise. ➤
- Take off the cover (1).
- Take off the fuse box cover.

An additional fuse box for the central electrical system is located on the left side of the truck, behind the cover in the top step.



Fuses for special electrical equipment



1 Lighting for shut-off delay (F19), 5 A

2 Reading lamp (5F17), 5 A

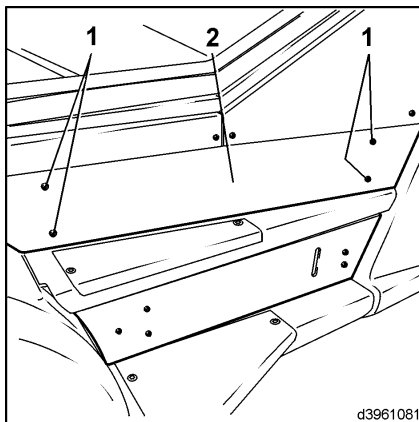
3	Switchable speed limitation (1F1), 5 A	22	Rear window heating (9F5), 20 A
4	Flashing and rotating beacon (4F3), 7.5 A	23	Roof panel wiper (9F3), 7.5 A
5	Working spotlight position 1, 2 (5F1), 15 A	24	Rear window wiper (9F10), 7.5 A
6	Working spotlight position 3, 4 (5F2), 15 A	25	Truck data management (6F1), 5 A
7	Working spotlight position 5, 6 (5F3), 15 A	26	Reverse travel (4F1), 10 A
8	Working spotlight position 7, 8 (5F4), 15 A	27	Radio terminal 58 (9F8), 10 A
9	Not assigned	28	Radio terminal 30 (9F7), 5 A
10	Not assigned	29	Four-stage pressure reduction (2F1), 10 A
11	Electric engine preheating (9F13), 5 A	30	Wash pumps (9F4), 15 A
12	Not assigned	31	Front windscreen wiper (9F2), 15 A
13	Not assigned	32	Windscreen wiper (9F1), 5 A
14	Not assigned	33	Interior light (5F12), 5 A
15	Not assigned	34	Brake light (5F7), 5 A
16	Not assigned	35	Hazard warning system (5F6/5F13), 10 A
17	Not assigned	36	Lighting (5F5), 15 A
18	Not assigned	37	Right sidelights (5F11), 5 A
19	Not assigned	38	Left sidelights (5F10), 5 A
20	Not assigned	39	Right headlight (5F9), 7.5 A
21	Not assigned	40	Left headlight (5F8), 7.5 A

Self-help

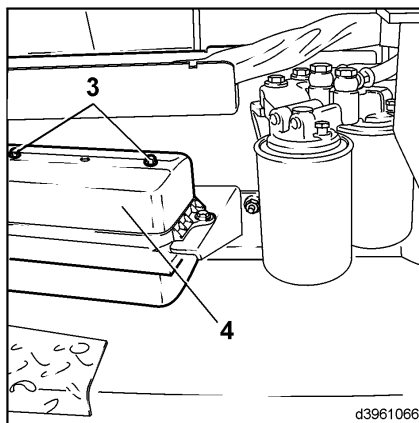
Opening the central electrical system cover

Up to 22 fuses can be fitted to protect the basic electrical equipment. The fuse box can be accessed once the central electrical system cover has been removed. This can be found on the left-hand side of the truck at the top step.

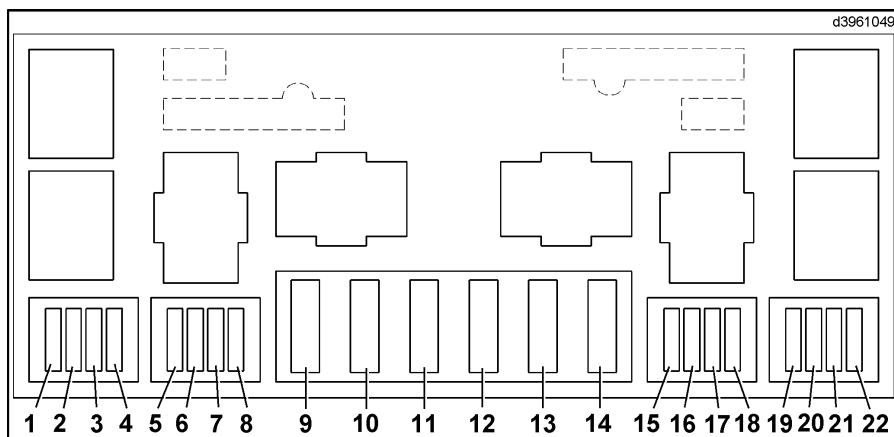
- Unscrew the 4 socket head screw screws (1).
- Take off the covering (2).



- Unscrew the 2 knurled nuts (3) on the fuse box cover.
- Take off the fuse box cover (4).



Fuses for basic electrical equipment



Fuses

- 1 Speedometer (6F2)*, 5 A
- 2 Spark ignition control unit for particle filter (F21), 15 A
- 3 Glow plug controller for particle filter (F20), 25 A
- 4 Exhaust gas recirculation (F19), 15 A
- 5 Seat heater (F18)*, 20 A
- 6 12 V socket (F17)*, 15 A
- 7 Heating system (F16)*, 10 A
- 8 Terminal 15 (F15)*, 10 A

Main fuses

- 9 Full basic equipment (F1), 30 A
- 10 Air pump for particle filter (F2), 60 A
- 11 Special equipment (F3)*, 70 A

- 12 Special equipment (F4)*, 40 A
- 13 Heating system (F5)*, 20 A
- 14 Air conditioning (F5)*, 50 A
- Not assigned

Fuses

- 15 Display unit for terminal 30 (F7), 5 A
- 16 Display unit for terminal 15 (F8), 5 A
- 17 Signal horn (F9), 15 A
- 18 Traction controller/lift control for terminal 15 (F10), 5 A
- 19 Traction controller/lift control for terminal 30, (F11), 15 A
- 20 Engine controller for terminal 15 (F12), 10 A
- 21 Engine controller for terminal 30 (F13), 30 A
- 22 Start relay for terminal 50 (F14), 5 A

* Special equipment

Fuses for heating system, air conditioning (special equipment)

The fuses for the heating system and air conditioning are behind side cover sheet (2).

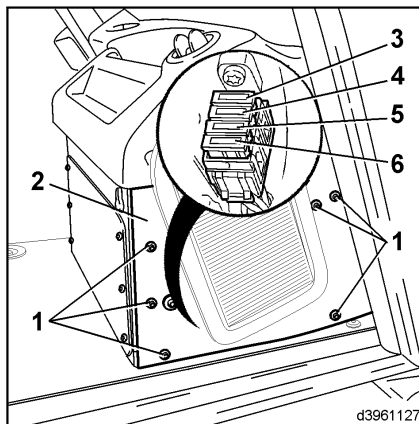
➤ Unscrew the 6 screws (1).

➤ Remove cover sheet (2).

The following components are protected with fuses:

- Fuse (F1) (3) for the blower motor, 25 A
- Fuse (F4) (4) for fan motor 3, 15 A
- Fuse (F3) (5) for fan motor 2, 15 A
- Fuse (F2) (6) for fan motor 1, 15 A

➤ Refit the cover sheet.



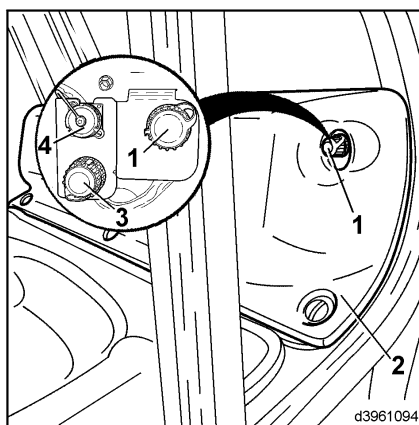
Diagnostic connector

The diagnostic connector (1) is located to the left behind the driver's seat for truck diagnostics.

Once the covering (2) for the electrical equipment has been removed, two additional diagnostic connectors are accessible for the engine diagnostics.

- Linde diagnostic connector (3) — engine diagnostics.
- Engine manufacturer diagnostic connector (4) — engine diagnostics.

➤ When troubleshooting, connect the diagnostic device with the appropriate diagnostic software to the diagnostic connector. In addition, truck data can be read in and out, adjustments made and maintenance intervals reset or amended.



Please contact your authorised dealer.

Malfunctions during operation

⚠ CAUTION

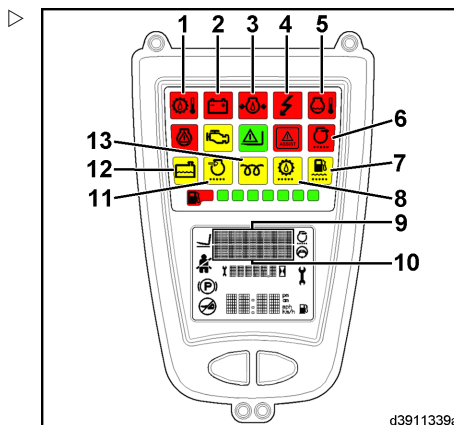
If one of the following indicator lights illuminates in the display unit and the buzzer sounds during operation, a malfunction has occurred.

The engine must be shut down immediately and the malfunction dealt with. (Refer to the notes below or "Malfunctions, causes and remedies")

- Hydraulic oil temperature indicator (1) and buzzer
- Charging indicator (2)
- Engine oil pressure indicator (3) and/or engine oil level indicator and buzzer
- Indicator light: error in electronic control (4)
- Engine coolant temperature indicator (5) and buzzer
- Particle filter warning indicator light (6)
- (7) Water in the fuel filter
- Hydraulic oil microfilter indicator (8) (special equipment)
- Air filter vacuum indicator (11)
- Coolant level indicator (12)
- Engine or engine control unit fault indicator light (13)

i NOTE

- *If the indicator light (4) flashes, there is an error in the electronic control. Depending on the setting and error, it may only be possible to drive the truck at low speed or not at all. Each error is indicated by a numerical code or symbols in the text field (10). Contact your authorised dealer.*
- *If the particle filter load indicator (9) flashes and the buzzer sounds at intervals, the filter must be regenerated.*
- *If the particle filter load indicator (9) flashes and the red particle filter warning (6) illuminates and the buzzer sounds continuously, the filter must be regenerated immediately.*
- *When an error occurs during regeneration, the red particle filter warning (6) flashes or the yellow indicator light (13) flashes and a buzzer sounds as well. Contact your authorised dealer.*



Self-help

- *If the air filter vacuum indicator (11) lights up on the display unit, maintenance must be performed on the air filter.*
- *If the indicator light (13) flashes, there is an error in the engine or the engine control unit. Switch off the engine. Contact your authorised dealer.*

Malfunctions, Causes and Remedies (diesel engine)

Engine will not start.

Possible cause	Remedy
Fuel tank empty.	Fill up the tank.
Fuel filter clogged.	Change the filter.
Water in the fuel pre-filter.	Drain water from the fuel pre-filter.
Leak in fuel line.	Check all fuel line connectors for leaks and tighten screw joints.
The display unit does not light up.	Contact your authorised dealer.
Engine idle speed incorrect. Preheating system faulty. Fuel delivery pump faulty. Fuel injection system faulty.	Contact your authorised dealer.

Engine starting performance is poor.

Possible cause	Remedy
Battery power too low.	Have the battery checked, clean the connecting terminals, tighten them and smear them with acid-free grease.
Fuel supply insufficient. Blockages or air locks in the fuel system, caused in winter by paraffin segregation.	Change fuel filter, check fuel line connectors for leaks and tighten screw joints. In cold climates, use winter fuel.
Air in the fuel system.	Bleed the fuel system.

"Particle filter warning" indicator light illuminates and buzzer sounds continuously.

Possible cause	Remedy
Load period of the particle filter is exceeded.	Request regeneration.
Regeneration does not start because the motor is too cold.	Run motor until at operating temperature and request regeneration.
Regeneration in automatic mode/manual mode stops constantly.	Operate/Move trucks until regeneration is complete (about 30 minutes).
Malfunction in the particle filter system.	Contact your authorised dealer.

"Particle filter alarm" indicator light illuminates, buzzer sounds continuously and the truck only moves at creep speed.

Possible cause	Remedy
Load period of the particle filter is exceeded.	Request regeneration.
Regeneration does not start because the motor is too cold.	Run motor until at operating temperature and request regeneration.

"Particle filter alarm" indicator light illuminates, buzzer sounds continuously and the truck only moves at creep speed.

Possible cause	Remedy
Regeneration in automatic mode/manual mode stops constantly.	Operate truck at standstill until regeneration is complete (about 30 minutes).
Malfunction in the particle filter system.	Contact your authorised dealer.

Engine does not run smoothly and loses power.

Possible cause	Remedy
Fuel supply insufficient. Clogging and/or air in the fuel system.	Change fuel filter, check fuel line connectors for leaks and tighten screw joints.
Engine oil level too high.	Drain oil until oil level is at upper dipstick mark.
Fuel injection system faulty.	Contact your authorised dealer.

Very smoky exhaust.

Possible cause	Remedy
Fault in motor or particle filter system.	Contact your authorised dealer.

Irregular idling.

Possible cause	Remedy
Fuel supply problems.	Drain water from fuel filter, or exchange it. Check fuel lines or fuel injection lines for leaks.
Engine speed incorrectly set.	Contact your authorised dealer.

Engine overheating, red indicator light in the display unit lights up. Switch off engine immediately.

Possible cause	Remedy
Insufficient coolant in cooling system.	Check the cooling system for leaks and seal as required. Top up the coolant.
Water cooler radiator fins partially clogged by dirt or foreign bodies.	Clean the water cooler and the hydraulic oil cooler.
Coolant pump defective.	Contact your authorised dealer.
Fuel injection system setting incorrect.	Contact your authorised dealer.

Engine oil pressure too low. Switch off engine immediately.

Possible cause	Remedy
Oil level too low	Top up with engine oil.
Leaks in lubrication system.	Contact your authorised dealer.

Charging current indicator lamp lights up during operation.

Possible cause	Remedy
Three-phase generator speed too low.	Check ribbed V-belt tension. If the problem persists, contact your authorised dealer.
Three-phase generator does not charge the battery; three-phase generator or cut-out relay faulty.	Contact your authorised dealer

Level indicator in the display unit lights up, truck only moves at creep speed, the buzzer sounds and an error code appears in the text field of the display unit.

Possible cause	Remedy
Engine oil level too low.	Top up engine oil.
Coolant level too low.	Top up coolant.

Indicator light in the display unit lights up, the truck only moves at creep speed, the buzzer sounds and an error code appears in the text field of the display unit.

Possible cause	Remedy
Engine oil level too low.	Top up engine oil.
Engine oil pressure too low.	Top up engine oil. If the problem persists, contact your authorised dealer.
Coolant level too low.	Top up coolant.
Engine temperature too high.	Top up coolant. Clean the water cooler. If the problem persists, contact your authorised dealer.
Air filter contaminated.	Change the air filter.
Water in the fuel pre-filter.	Drain water from the fuel pre-filter.

Malfunctions, causes and remedies — hydraulic system

Abnormal noise.

Possible cause	Remedy
Clogged suction filter.	Change the filter.
Leaking suction lines, oil foams.	Seal the lines. Check the hydraulic oil, top up if necessary.
Incorrect oil viscosity, too little oil in tank.	Change the hydraulic oil, observe the prescribed viscosity. Top up hydraulic oil.
Hydraulic pump or engine damage, faulty seals, causing air intake.	Contact your authorised dealer.

No pressure or too little pressure in the system.

Possible cause	Remedy
Hose line or pipe line broken or leaking.	Change or seal the line.
Oil temperature warning is displayed.	Check the hydraulic oil level, clean the hydraulic oil cooler.
Pump faulty, leakage loss, pressure valves do not shut, valve seat damaged.	Contact your authorised dealer.

Oil pressure fluctuation.

Possible cause	Remedy
Lift mast does not extend completely.	Top up hydraulic oil.
For cause, see Abnormal noise.	See: Abnormal noise.
Pressure relief valve or feed pressure valves are seizing.	Contact your authorised dealer.
Lift and tilt cylinders show friction points.	Contact your authorised dealer.

No or too little supply flow.

Possible cause	Remedy
Hose line or pipe line broken or leaking.	Change or seal the line.
Hydraulic system overheated.	Check hydraulic oil level, use prescribed hydraulic oil if necessary, clean the hydraulic oil cooler.
Pump faulty, leakage loss, pressure valves do not shut, valves damaged.	Contact your authorised dealer.

Hydraulic oil temperature too high.

Possible cause	Remedy
Too little oil in the tank or oil cooler clogged.	Check the hydraulic oil level, top up the hydraulic oil if necessary. Clean the hydraulic oil cooler and check for leakages; if faults are found, contact your authorised dealer.
Pump damage.	Contact your authorised dealer.

Indicator light in the display unit lights up, the truck only moves at creep speed, the buzzer sounds and an error code appears in the text field of the display unit.

Possible cause	Remedy
Hydraulic oil temperature too high.	Check the hydraulic oil level. Clean the hydraulic oil cooler.

Self-help

Jump start



NOTE

In the event of a discharged truck battery, another battery can be used with a jump lead to start the truck. The following must be taken into consideration when doing this:

- *Both batteries must have the same nominal voltage.*
- *The capacity (Ah) of the current-giving battery must not be significantly lower than the capacity of the discharged battery.*
- *Use a jump lead with a sufficient cross-section and insulated terminal clips.*

WARNING

A discharged battery can freeze at temperatures below 0°C. There is then a risk of explosion.

Before connecting the jump lead, it is essential that a frozen battery is thawed.

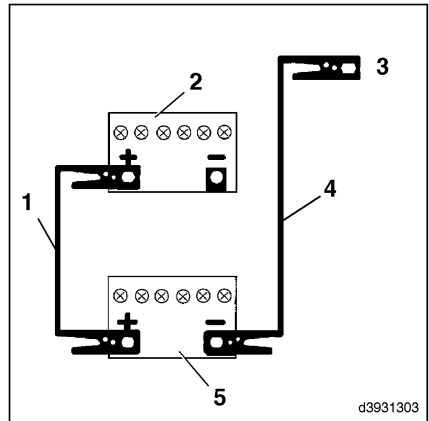
- Switch off all current consumers (heater, air conditioning, lighting).
- Remove the cover from the lower step on the left-hand side of the truck.
- Take out the battery.

WARNING

The positive terminal must not come into contact with the chassis, otherwise this will lead to a short circuit in the electrical system, or the battery may explode.

Carefully take out the battery.

- Connect one end of the positive cable (1) to the positive terminal (+) of the discharged truck battery (2).
- Connect the other end of the positive cable (1) to the positive terminal (+) of the current-giving battery (5).
- Connect one end of the negative cable (4) to the negative terminal (-) of the current-giving battery (5).
- Connect the other end of the negative cable (4) as far away as possible from the discharged truck battery (2) to a solid metal component securely connected to the engine block or to the engine block itself (3).

**NOTE**

If the battery being used to jump-start the truck is housed in another vehicle, start the vehicle's engine and allow to idle.

- Start the engine.

If the engine does not start straight-away, stop the starting process after 1 minute and try again after around 2 minutes.

- Once the engine is running, disconnect the negative cable (4) from the engine block (3) first, and then from the current-giving battery (5).
- Disconnect the positive cable (1) from the current-giving battery (5) first, then from the discharged battery (2).

Towing

If the truck needs to be towed away in an emergency, the towing unit can:

- Short-circuit the hydraulic oil circuit
- Release the multi-disc brakes in the wheel drive units.

Self-help

WARNING

It is no longer possible to brake the truck. The parking brake does not function either.

To tow the forklift truck, a towing vehicle with sufficient pulling and braking force for the unbraked towed load is required. The truck may only be towed using a fixed connection (towing bar).

Towing procedure

- Lower the load so far that the fork arms do not scrape on the ground while towing.
- Remove the load.
- Attach towing vehicle (ensure sufficient pulling and braking force) to the truck's towing pin using the tow bar.

Opening the hydraulic system shorting plunger

- Open the bonnet.



WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.



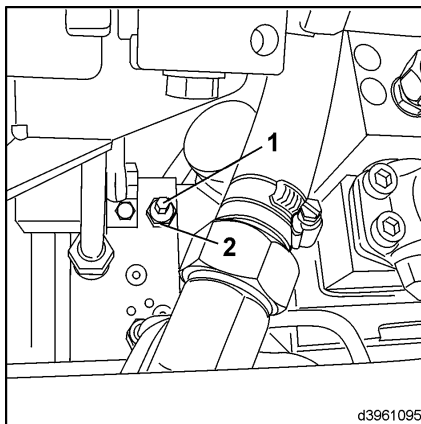
WARNING

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

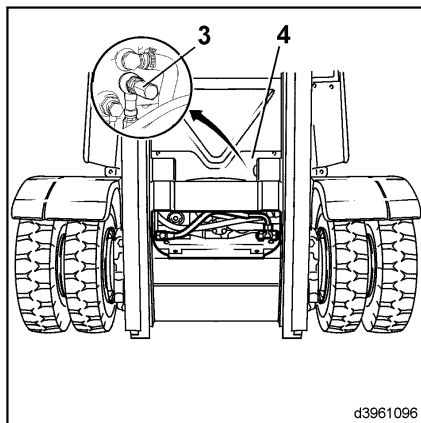
- Remove floor mat.
- Remove the left-hand bottom plate.

- Undo the self-locking nut (2) (spanner size 19 mm) on the variable displacement pump using a socket.
- Unscrew threaded stud (1) (spanner size 8 mm) 2 turns using the socket.
- Lock the threaded stud with the self-locking nut (2) and tighten to 50 Nm.
- Close the bonnet.



Releasing the multi-disc brake

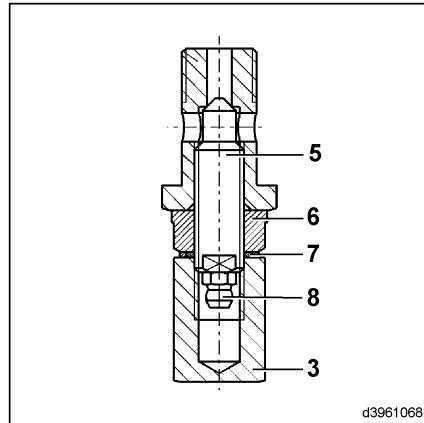
- Remove the left front cover sheet (4) from the truck.
- Unscrew the dome nut (3) on the accelerator and remove it together with the sealing ring (7).



5 Maintenance

Self-help

- Loosen locknut (6).
- Screw in the threaded pin (5) as far as the stop and tighten it to 25 Nm.
- Press in approx. 4 strokes of grease from a grease gun into the grease nipple (8) until the brake is released.



After towing

- Secure with chocks on downhill side.
- Open the bonnet.



WARNING

Beware of hot engine and exhaust components.

Wear protective equipment.



WARNING

When the engine is hot, the fan may start automatically.

Do not touch rotating parts.

- Loosen self-locking nut (2) on the variable displacement pump.
- Screw in threaded stud (1) (spanner size 8 mm), and tighten to 20⁺⁵ Nm.
- Lock threaded stud with self-locking nut (2).
- Tighten nut to 50 Nm.

Establishing braking readiness

- Loosen locknut (6).
- Screw the threaded pin (5) back four turns.
- Lock the threaded pin with a nut (6); tighten it to 25 Nm.
- Insert the sealing ring (7).
- Screw on the dome nut (3); tighten it to 30 Nm.
- Fit the floorplate.
- Replace floormat and close bonnet.
- Fit the front left cover sheet.

⚠ DANGER

The forklift truck must not be driven if the brake system is defective.

After repairs have been made to the brake system, check for correct operation. If there are any defects in the brake system, contact your authorised dealer.

Shutting down

Shutting down

Shutting down the truck

Measures before shutdown

If the truck is to be shut down for more than two months, e.g. for operational reasons, it must only be stored in a well ventilated, clean and dry room that is frost-protected. The following measures must be implemented.

- Clean forklift truck thoroughly.
- Raise the fork carriage several times to the end stop.
- Tilt the lift mast forwards and backwards repeatedly and actuate the attachment repeatedly, if applicable.
- Lower the fork carriage to a supporting surface until the chains are relieved of load.
- Check the hydraulic oil level and top up if necessary.
- Fill up with fuel.
- Coat all unpainted mechanical components with a thin film of oil or grease.
- Grease vehicle.
- Disconnect the battery.
- Check the condition of the battery.
- Lubricate battery terminals with acid-free grease. (Follow the battery manufacturer's instructions.)
- Apply a suitable contact spray to all exposed electrical contacts.
- Jack up the vehicle so all wheels are off the ground.

This will prevent permanent deformation of the tyres.

 NOTE

Do not cover with plastic foil, as this will encourage condensation water to form and collect.

 NOTE

If the truck is to be shut down for more than six months, further measures must be agreed with your authorised dealer.

Returning to service after being shut-down

- Clean forklift truck thoroughly.
- Lubricate the forklift truck.
- Connect the battery.
- Clean the battery and lubricate battery terminals with acid-free grease
- Check the condition of the battery and recharge if necessary.
- Check the engine oil for condensation water and replace if necessary.
- Check the hydraulic oil for condensation water and replace if necessary.
- Perform maintenance as before initial commissioning.
- Put forklift truck into service.

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.

The following minimum requirements must also 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 are also to 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, engine oil, hydraulic oil, coolant 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, engine oil, coolant, 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

Shutting down

Technical data

Type sheet H50D-02, as at 07/2012

All data refers to standard equipment with a standard 3550 mm lift mast.
The following must be observed without fail:

1 Characteristics

1.1	Manufacturer		Linde
1.2	Manufacturer's type designation		H50D-02
1.3	Drive		Diesel
1.4	Operation		Seated
1.5	Load capacity/load	Q [kg]	5000
1.6	Load centre of gravity	c [mm]	600
1.8	Load distance	x [mm]	630
1.9	Wheelbase	y [mm]	2160

2 Weight

2.1	Net weight	kg	10003
2.2	Axle load with front/rear load	kg	12720/2282
2.3	Axle load without front/rear load	kg	4873/5130

3 Wheels, chassis frame

3.1	Tyres: solid rubber, superelastic, pneumatic, polyurethane		Superelastic
3.2	Front tyre size		355/65-15
3.3	Rear tyre size		8.25-15
3.5	Number of wheels, front/rear (x = driven)		2x/2
3.6	Front track width	b ₁₀ [mm]	1594 ¹
3.7	Rear track width	b ₁₁ [mm]	1600

4 Basic dimensions

4.1	Lift mast/fork carriage tilt, forwards/backwards	α/β (°)	5.0/9.0
4.2	Height with lift mast retracted	h ₁ [mm]	2735 ² ,
4.3	Free lift	h ₂ [mm]	150
4.4	Lift	h ₃ [mm]	3550

¹ The track width may deviate from the specified value, depending on the tyre variant.

² Free lift at 150 mm on standard lift mast.

4 Basic dimensions

4.5	Height with lift mast extended	h ₄ [mm]	4448
4.7	Height above overhead guard (cab)	h ₆ [mm]	2746
4.8	Seat height/standing height	h ₇ [mm]	1503
4.12	Coupling height	h ₁₀ [mm]	847
4.19	Total length	l ₁ [mm]	4639
4.20	Length including fork back	l ₂ [mm]	3439
4.21	Total width	b ₁ /b ₂ [mm]	1900/1870
4.22	Fork arm dimensions	s/e/l [mm]	60 x 130 x 1200
4.23	ISO 2328 fork carriage, class/design A, B		4 A
4.24	Fork carriage width	b ₃ [mm]	1800
4.31	Ground clearance with load under lift mast	m ₁ [mm]	207
4.32	Ground clearance at centre of wheelbase	m ₂ [mm]	247
4.33	Aisle width for pallet 1000 x 1200 crosswise	A _{st} [mm]	4890
4.34	Aisle width for pallet 800 x 1200 lengthwise	A _{st} [mm]	5090
4.35	Turning radius	W _a [mm]	3060
4.36	Smallest pivot point distance	b ₁₃ [mm]	975

5 Performance data

5.1	Driving speed with/without load	km/h	22/23
5.2	Lifting speed with/without load	m/s	0.54/0.54
5.3	Lowering speed with/without load	m/s	0.54/0.50
5.5	Tractive force with/without load	N	35000/34000
5.7	Climbing capability with/without load	%	26/34
5.9	Acceleration time with/without load	s	5.4/4.8
5.10	Service brake		Hydrostatic

7 Drive/engine

7.1	Engine manufacturer/model		Deutz TCD 4.1 L4
7.2	Engine power rating as per ISO 1585	kW	85
7.3	Nominal speed	rpm	2200
7.4	Number of cylinders/displacement	cm ³	4/4038
7.5	Fuel consumption in accordance with VDI cycle	l/h	7.6

6 Technical data

Type sheet H50D-02, as at 07/2012

8 Miscellaneous

8.1	Traction controller type		Hydrostatic/continuously variable
8.2	Working pressure for attachments	bar	265
8.3	Oil volume for attachments	l/min	95
8.4	Noise level at the driver's ear	dB (A)	77
8.5	Tow coupling, type/model		DIN 15170-H

Type sheet H60D-02, as at 07/2012

**All data refers to standard equipment with a standard 3550 mm lift mast.
The following must be observed without fail:**

1 Characteristics

1.1	Manufacturer		Linde
1.2	Manufacturer's type designation		H60D-02
1.3	Drive		Diesel
1.4	Operation		Seated
1.5	Load capacity/load	Q [kg]	6000
1.6	Load centre of gravity	c [mm]	600
1.8	Load distance	x [mm]	630
1.9	Wheelbase	y [mm]	2160

2 Weight

2.1	Net weight	kg	10186
2.2	Axle load with front/rear load	kg	14283/1902
2.3	Axle load without front/rear load	kg	4867/5319

3 Wheels, chassis frame

3.1	Tyres: solid rubber, superelastic, pneumatic, polyurethane		Superelastic
3.2	Front tyre size		355/65-15
3.3	Rear tyre size		8.25-15
3.5	Number of wheels, front/rear (x = driven)		2x/2
3.6	Front track width	b ₁₀ [mm]	1594 ³
3.7	Rear track width	b ₁₁ [mm]	1600

4 Basic dimensions

4.1	Lift mast/fork carriage tilt, forwards/backwards	α/β (°)	5.0/9.0
4.2	Height with lift mast retracted	h ₁ [mm]	2735 ⁴ ,
4.3	Free lift	h ₂ [mm]	150
4.4	Lift	h ₃ [mm]	3550

³ The track width may deviate from the specified value, depending on the tyre variant.

⁴ Free lift at 150 mm on standard lift mast.

4 Basic dimensions

4.5	Height with lift mast extended	h4 [mm]	4448
4.7	Height above overhead guard (cab)	h6 [mm]	2746
4.8	Seat height/standing height	h7 [mm]	1503
4.12	Coupling height	h10 [mm]	846
4.19	Total length	l1 [mm]	4639
4.20	Length including fork back	l2 [mm]	3439
4.21	Total width	b1/b2 [mm]	1900/1870
4.22	Fork arm dimensions	s/e/l [mm]	60 x 130 x 1200
4.23	ISO 2328 fork carriage, class/design A, B		4 A
4.24	Fork carriage width	b3 [mm]	1800
4.31	Ground clearance with load under lift mast	m1 [mm]	204
4.32	Ground clearance at centre of wheelbase	m2 [mm]	247
4.33	Aisle width for pallet 1000 x 1200 crosswise	Ast [mm]	4890
4.34	Aisle width for pallet 800 x 1200 lengthwise	Ast [mm]	5090
4.35	Turning radius	Wa [mm]	3060
4.36	Smallest pivot point distance	b13 [mm]	975

5 Performance data

5.1	Driving speed with/without load	km/h	22/23
5.2	Lifting speed with/without load	m/s	0.54/0.54
5.3	Lowering speed with/without load	m/s	0.54/0.50
5.5	Tractive force with/without load	N	38000/35000
5.7	Climbing capability with/without load	%	24/34
5.9	Acceleration time with/without load	s	5.6/5.0
5.10	Service brake		Hydrostatic

7 Drive/engine

7.1	Engine manufacturer/model		Deutz TCD 4.1 L4
7.2	Engine power rating as per ISO 1585	kW	85
7.3	Nominal speed	rpm	2200
7.4	Number of cylinders/displacement	cm ³	4/4038
7.5	Fuel consumption in accordance with VDI cycle	l/h	8.0

8 Miscellaneous			
8.1	Traction controller type		Hydrostatic/continuously variable
8.2	Working pressure for attachments	bar	265
8.3	Oil volume for attachments	l/min	95
8.4	Noise level at the driver's ear	dB (A)	77
8.5	Tow coupling, type/model		DIN 15170-H

Type sheet H70D-02, as at 07/2012

All data refers to standard equipment with a standard 3150 mm lift mast.
The following must be observed without fail:

1 Characteristics

1.1	Manufacturer		Linde
1.2	Manufacturer's type designation		H70D-02
1.3	Drive		Diesel
1.4	Operation		Seated
1.5	Load capacity/load	Q [kg]	7000
1.6	Load centre of gravity	c [mm]	600
1.8	Load distance	x [mm]	640
1.9	Wheelbase	y [mm]	2160

2 Weight

2.1	Net weight	kg	11400
2.2	Axle load with front/rear load	kg	16158/2242
2.3	Axle load without front/rear load	kg	5140/6260

3 Wheels, chassis frame

3.1	Tyres: solid rubber, superelastic, pneumatic, polyurethane		SE, twin tyres
3.2	Front tyre size		8.25-15
3.3	Rear tyre size		8.25-15
3.5	Number of wheels, front/rear (x = driven)		4x/2
3.6	Front track width	b ₁₀ [mm]	1742 ⁵
3.7	Rear track width	b ₁₁ [mm]	1600

4 Basic dimensions

4.1	Lift mast/fork carriage tilt, forwards/backwards	α/β (°)	5.0/9.0
4.2	Height with lift mast retracted	h ₁ [mm]	2738 ⁶ ,
4.3	Free lift	h ₂ [mm]	150
4.4	Lift	h ₃ [mm]	3150

⁵ The track width may deviate from the specified value, depending on the tyre variant.

⁶ Free lift at 150 mm on standard lift mast.

4 Basic dimensions

4.5	Height with lift mast extended	h4 [mm]	4245
4.7	Height above overhead guard (cab)	h6 [mm]	2745
4.8	Seat height/standing height	h7 [mm]	1503
4.12	Coupling height	h10 [mm]	841
4.19	Total length	l1 [mm]	4649
4.20	Length including fork back	l2 [mm]	3449
4.21	Total width	b1/b2 [mm]	2232/1870
4.22	Fork arm dimensions	s/e/l [mm]	70 x 150 x 1200
4.23	ISO 2328 fork carriage, class/design A, B		4 A
4.24	Fork carriage width	b3 [mm]	1800
4.31	Ground clearance with load under lift mast	m1 [mm]	207
4.32	Ground clearance at centre of wheelbase	m2 [mm]	246
4.33	Aisle width for pallet 1000 x 1200 crosswise	A _{st} [mm]	4900
4.34	Aisle width for pallet 800 x 1200 lengthwise	A _{st} [mm]	5100
4.35	Turning radius	W _a [mm]	3060
4.36	Smallest pivot point distance	b13 [mm]	975

5 Performance data

5.1	Driving speed with/without load	km/h	22/23
5.2	Lifting speed with/without load	m/s	0.49/0.53
5.3	Lowering speed with/without load	m/s	0.56/0.45
5.5	Tractive force with/without load	N	45000/41000
5.7	Climbing capability with/without load	%	24/33
5.9	Acceleration time with/without load	s	5.8/5.2
5.10	Service brake		Hydrostatic

7 Drive/engine

7.1	Engine manufacturer/model		Deutz TCD 4.1 L4
7.2	Engine power rating as per ISO 1585	kW	85
7.3	Nominal speed	rpm	2200
7.4	Number of cylinders/displacement	cm ³	4/4038
7.5	Fuel consumption in accordance with VDI cycle	l/h	8.4

6 Technical data

Type sheet H70D-02, as at 07/2012

8 Miscellaneous

8.1	Traction controller type		Hydrostatic/continuously variable
8.2	Working pressure for attachments	bar	265
8.3	Oil volume for attachments	l/min	95
8.4	Noise level at the driver's ear	dB (A)	77
8.5	Tow coupling, type/model		DIN 15170-H

Type sheet H80D-02, as at 07/2012

**All data refers to standard equipment with a standard 3150 mm lift mast.
The following must be observed without fail:**

1 Characteristics

1.1	Manufacturer		Linde
1.2	Manufacturer's type designation		H80D-02
1.3	Drive		Diesel
1.4	Operation		Seated
1.5	Load capacity/load	Q [kg]	8000
1.6	Load centre of gravity	c [mm]	600
1.8	Load distance	x [mm]	640
1.9	Wheelbase	y [mm]	2160

2 Weight

2.1	Net weight	kg	12322
2.2	Axle load with front/rear load	kg	17877/2445
2.3	Axle load without front/rear load	kg	5285/7037

3 Wheels, chassis frame

3.1	Tyres: solid rubber, superelastic, pneumatic, polyurethane		SE, twin tyres
3.2	Front tyre size		8.25-15
3.3	Rear tyre size		315/70-15 (300-15)
3.5	Number of wheels, front/rear (x = driven)		4x/2
3.6	Front track width	b ₁₀ [mm]	1742 ⁷
3.7	Rear track width	b ₁₁ [mm]	1550

4 Basic dimensions

4.1	Lift mast/fork carriage tilt, forwards/backwards	α/β (°)	5.0/9.0
4.2	Height with lift mast retracted	h ₁ [mm]	2737 ⁸ ,
4.3	Free lift	h ₂ [mm]	150
4.4	Lift	h ₃ [mm]	3150

⁷ The track width may deviate from the specified value, depending on the tyre variant.

⁸ Free lift at 150 mm on standard lift mast.

4 Basic dimensions

4.5	Height with lift mast extended	h4 [mm]	4244
4.7	Height above overhead guard (cab)	h6 [mm]	2746
4.8	Seat height/standing height	h7 [mm]	1504
4.12	Coupling height	h10 [mm]	845
4.19	Total length	l1 [mm]	4649
4.20	Length including fork back	l2 [mm]	3449
4.21	Total width	b1/b2 [mm]	2232/1870
4.22	Fork arm dimensions	s/e/l [mm]	70 x 150 x 1200
4.23	ISO 2328 fork carriage, class/design A, B		4 A
4.24	Fork carriage width	b3 [mm]	2180
4.31	Ground clearance with load under lift mast	m1 [mm]	204
4.32	Ground clearance at centre of wheelbase	m2 [mm]	245
4.33	Aisle width for pallet 1000 x 1200 crosswise	Ast [mm]	4900
4.34	Aisle width for pallet 800 x 1200 lengthwise	Ast [mm]	5100
4.35	Turning radius	Wa [mm]	3060
4.36	Smallest pivot point distance	b13 [mm]	975

5 Performance data

5.1	Driving speed with/without load	km/h	22/23
5.2	Lifting speed with/without load	m/s	0.49/0.53
5.3	Lowering speed with/without load	m/s	0.56/0.45
5.5	Tractive force with/without load	N	50000/42000
5.7	Climbing capability with/without load	%	25/36
5.9	Acceleration time with/without load	s	6.0/5.3
5.10	Service brake		Hydrostatic

7 Drive/engine

7.1	Engine manufacturer/model		Deutz TCD 4.1 L4
7.2	Engine power rating as per ISO 1585	kW	85
7.3	Nominal speed	rpm	2200
7.4	Number of cylinders/displacement	cm ³	4/4038
7.5	Fuel consumption in accordance with VDI cycle	l/h	8.8

8 Miscellaneous			
8.1	Traction controller type		Hydrostatic/continuously variable
8.2	Working pressure for attachments	bar	265
8.3	Oil volume for attachments	l/min	95
8.4	Noise level at the driver's ear	dB (A)	77
8.5	Tow coupling, type/model		DIN 15170-H

Type sheet H80D-02/900, as at 07/2012

All data refers to standard equipment with a standard 2750 mm lift mast.
The following must be observed without fail:

1 Characteristics

1.1	Manufacturer		Linde
1.2	Manufacturer's type designation		H80D-02/900
1.3	Drive		Diesel
1.4	Operation		Seated
1.5	Load capacity/load	Q [kg]	8000
1.6	Load centre of gravity	c [mm]	900
1.8	Load distance	x [mm]	670
1.9	Wheelbase	y [mm]	2510

2 Weight

2.1	Net weight	kg	13970
2.2	Axle load with front/rear load	kg	19740/2229
2.3	Axle load without front/rear load	kg	6736/7234

3 Wheels, chassis frame

3.1	Tyres: solid rubber, superelastic, pneumatic, polyurethane		SE, twin tyres
3.2	Front tyre size		8.25-15
3.3	Rear tyre size		315/70-15 (300-15)
3.5	Number of wheels, front/rear (x = driven)		4x/2
3.6	Front track width	b ₁₀ [mm]	1742 ⁹
3.7	Rear track width	b ₁₁ [mm]	1550

4 Basic dimensions

4.1	Lift mast/fork carriage tilt, forwards/backwards	α/β (°)	5.0/9.0
4.2	Height with lift mast retracted	h ₁ [mm]	2735 ¹⁰
4.3	Free lift	h ₂ [mm]	150
4.4	Lift	h ₃ [mm]	2750

⁹ The track width may deviate from the specified value, depending on the tyre variant.

¹⁰ Free lift at 150 mm on standard lift mast.

4 Basic dimensions

4.5	Height with lift mast extended	h ₄ [mm]	4144
4.7	Height above overhead guard (cab)	h ₆ [mm]	2746
4.8	Seat height/standing height	h ₇ [mm]	1503
4.12	Coupling height	h ₁₀ [mm]	845
4.19	Total length	l ₁ [mm]	5629
4.20	Length including fork back	l ₂ [mm]	3829
4.21	Total width	b ₁ /b ₂ [mm]	2232/1870
4.22	Fork arm dimensions	s/e/l [mm]	70 x 200 x 1800
4.23	ISO 2328 fork carriage, class/design A, B		4 A
4.24	Fork carriage width	b ₃ [mm]	2180
4.31	Ground clearance with load under lift mast	m ₁ [mm]	201
4.32	Ground clearance at centre of wheelbase	m ₂ [mm]	246
4.33	Aisle width for pallet 1000 x 1200 crosswise	A _{st} [mm]	5215
4.34	Aisle width for pallet 800 x 1200 lengthwise	A _{st} [mm]	5415
4.35	Turning radius	W _a [mm]	3345
4.36	Smallest pivot point distance	b ₁₃ [mm]	975

5 Performance data

5.1	Driving speed with/without load	km/h	22/23
5.2	Lifting speed with/without load	m/s	0.49/0.53
5.3	Lowering speed with/without load	m/s	0.56/0.45
5.5	Tractive force with/without load	N	51000/46000
5.7	Climbing capability with/without load	%	24/34
5.9	Acceleration time with/without load	s	6.2/5.4
5.10	Service brake		Hydrostatic

7 Drive/engine

7.1	Engine manufacturer/model		Deutz TCD 4.1 L4
7.2	Engine power rating as per ISO 1585	kW	85
7.3	Nominal speed	rpm	2200
7.4	Number of cylinders/displacement	cm ³	4/4038
7.5	Fuel consumption in accordance with VDI cycle	l/h	9.1

6 Technical data

Type sheet H80D-02/900, as at 07/2012

8 Miscellaneous

8.1	Traction controller type		Hydrostatic/continuously variable
8.2	Working pressure for attachments	bar	265
8.3	Oil volume for attachments	l/min	95
8.4	Noise level at the driver's ear	dB (A)	77
8.5	Tow coupling, type/model		DIN 15170-H

Type sheet H80D-02/1100, as at 07/2012

**All data refers to standard equipment with a standard 2750 mm lift mast.
The following must be observed without fail:**

1 Characteristics

1.1	Manufacturer		Linde
1.2	Manufacturer's type designation		H80D-02/1100
1.3	Drive		Diesel
1.4	Operation		Seated
1.5	Load capacity/load	Q [kg]	8000
1.6	Load centre of gravity	c [mm]	1100
1.8	Load distance	x [mm]	670
1.9	Wheelbase	y [mm]	2810

2 Weight

2.1	Net weight	kg	14802
2.2	Axle load with front/rear load	kg	20493/2309
2.3	Axle load without front/rear load	kg	7454/7348

3 Wheels, chassis frame

3.1	Tyres: solid rubber, superelastic, pneumatic, polyurethane		SE, twin tyres
3.2	Front tyre size		315/70-15 (300-15)
3.3	Rear tyre size		315/70-15 (300-15)
3.5	Number of wheels, front/rear (x = driven)		4x/2
3.6	Front track width	b ₁₀ [mm]	1752 ¹¹
3.7	Rear track width	b ₁₁ [mm]	1550

4 Basic dimensions

4.1	Lift mast/fork carriage tilt, forwards/backwards	α/β (°)	5.0/9.0
4.2	Height with lift mast retracted	h ₁ [mm]	2737 ¹² ,
4.3	Free lift	h ₂ [mm]	150

¹¹ The track width may deviate from the specified value, depending on the tyre variant.

¹² Free lift at 150 mm on standard lift mast.

4 Basic dimensions

4.4	Lift	h ₃ [mm]	2750
4.5	Height with lift mast extended	h ₄ [mm]	4146
4.7	Height above overhead guard (cab)	h ₆ [mm]	2747
4.8	Seat height/standing height	h ₇ [mm]	1505
4.12	Coupling height	h ₁₀ [mm]	844
4.19	Total length	l ₁ [mm]	6329
4.20	Length including fork back	l ₂ [mm]	4129
4.21	Total width	b ₁ /b ₂ [mm]	2305/1870
4.22	Fork arm dimensions	s/e/l [mm]	70 x 200 x 2200
4.23	ISO 2328 fork carriage, class/design A, B		4 A
4.24	Fork carriage width	b ₃ [mm]	2180
4.31	Ground clearance with load under lift mast	m ₁ [mm]	208
4.32	Ground clearance at centre of wheelbase	m ₂ [mm]	247
4.33	Aisle width for pallet 1000 x 1200 crosswise	A _{st} [mm]	5505
4.34	Aisle width for pallet 800 x 1200 lengthwise	A _{st} [mm]	5705
4.35	Turning radius	W _a [mm]	3635
4.36	Smallest pivot point distance	b ₁₃ [mm]	975

5 Performance data

5.1	Driving speed with/without load	km/h	22/23
5.2	Lifting speed with/without load	m/s	0.49/0.53
5.3	Lowering speed with/without load	m/s	0.56/0.45
5.5	Tractive force with/without load	N	54000/50000
5.7	Climbing capability with/without load	%	25/34
5.9	Acceleration time with/without load	s	6.3/5.5
5.10	Service brake		Hydrostatic

7 Drive/engine

7.1	Engine manufacturer/model		Deutz TCD 4.1 L4
7.2	Engine power rating as per ISO 1585	kW	85
7.3	Nominal speed	rpm	2200
7.4	Number of cylinders/displacement	cm ³	4/4038
7.5	Fuel consumption in accordance with VDI cycle	l/h	9.4

8 Miscellaneous			
8.1	Traction controller type		Hydrostatic/continuously variable
8.2	Working pressure for attachments	bar	265
8.3	Oil volume for attachments	l/min	95
8.4	Noise level at the driver's ear	dB (A)	77
8.5	Tow coupling, type/model		DIN 15170-H

Truck configuration

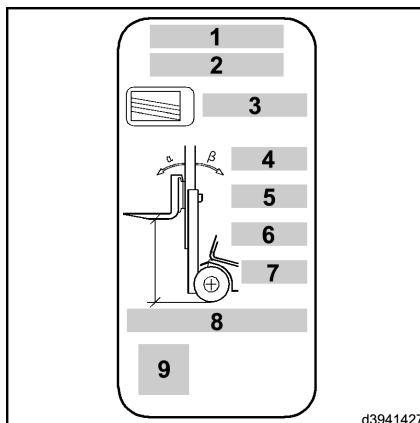
Truck configuration

"Truck configuration" sign



NOTE

If attachments and conversions are required, please contact your authorised dealer. A new "truck configuration" sign must then be created and attached to the truck by the authorised dealer.



- 1 Frame number
 - 2 Lift mast number or identification: "CO"*
 - 3 Capacity rating plate number
 - 4 Maximum permissible forwards/backwards tilt angle
 - 5 Attachment:
"GTR/FC/PF" means fork carriage
"ISS/ISS/TI" means integrated sideshift
"IZVG/IFP/IPF" means integrated fork prong positioner
"CO/CO/CO" means customer-specific option (without attachment)
 - 6 Lift mast series/version:
"St" means standard lift mast
"Du" means duplex lift mast
"Tr" means triplex lift mast
"CO"*
 - 7 Lift height in mm or identification: "CO"*
 - 8 Front tyres:
"SE/SE/SE" means solid rubber tyres
"SE Zw./SE tw./SE jum." means solid rubber dual tyres
"Luft/Pneu./Gonf." means pneumatic tyres
"Luft Zw./Pneu. tw./Gonf. jum." means pneumatic dual tyres
"Bandage/Cushion/Bandage" means bandage tyres
 - 9 Placeholder for "data-matrix code"
- "CO"* means customer-specific option (without lift mast or with released non-original lift mast)

Tyre variants and rim sizes

WARNING

Effect on load capacity.

Only the tyres and rims named here may be used.
The specified air pressure must be maintained in pneumatic tyres.

Tyre variants

Single tyre on the drive axle					
	SE solid rubber tyres			Pneumatic tyres	
H 50	300-15	SE		300-15/22 PR	10.0 bar
				300 R15-XZM	10.0 bar
				315/70 R15	10.0 bar
H 50/60/70				355/65-15/24 PR	10.0 bar
				355/65 R15-XZM	10.0 bar
H 50/60/70/80	355/50-20	SE			
	355/65-15	SE			
	840/350-559	Solid cushion tyre(s)			

Dual tyres on the drive axle					
	SE solid rubber tyres			Pneumatic tyres	
H 50/60/70/80/80-900	8.25-15	SE		8.25-15/18 PR	10.0 bar
				8.25 R15	10.0 bar
H 50/60/70/80/80-900/80-1100	300-15	SE		300-15/22 PR	10.0 bar
				300 R15-XZM	10.0 bar
				315/70 R15	10.0 bar

Tyre variants and rim sizes

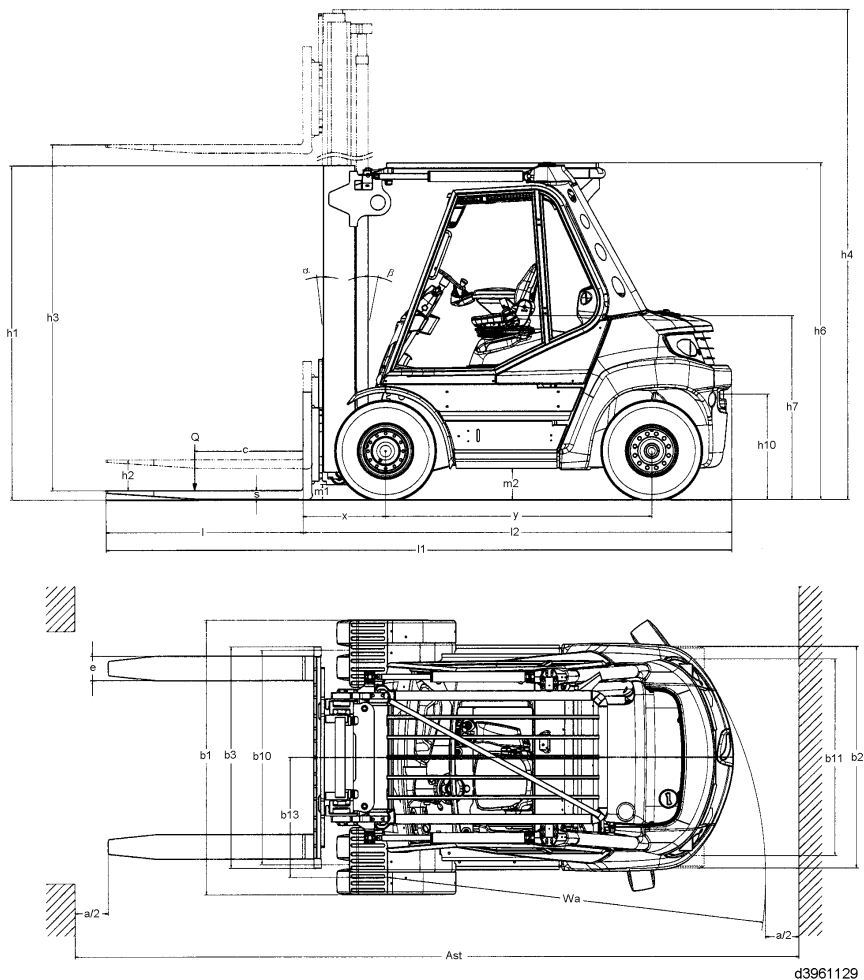
Steering axle tyres					
	SE solid rubber tyres			Pneumatic tyres	
H 50/60/70	8.25-15	SE		8.25-15/18 PR	10.0 bar
				8.25 R15	10.0 bar
H 50/60/70/80/80- 900/80-1100	300-15	SE		300-15/22 PR	10.0 bar
				300 R15-XZM	10.0 bar
				315/70 R15	10.0 bar

Rim sizes

Rim size	Tyre size
6.5-15	8.25-15
8.00-15	300-15
8.00-15	315-15
9.75-15	355/65-15
10.0-20	355/50-20 (SE)

Load capacity diagrams and lift mast data as at 11/2011

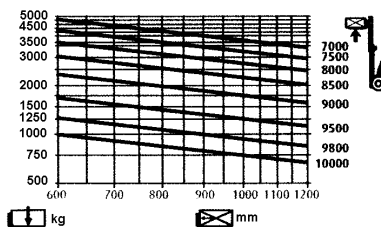
Main dimensions



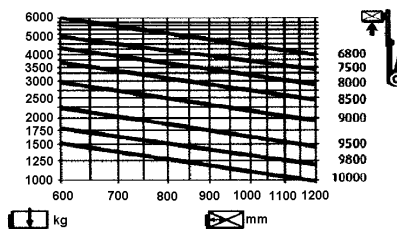
Load capacity diagrams and lift mast data as at 11/2011

Load capacity diagrams

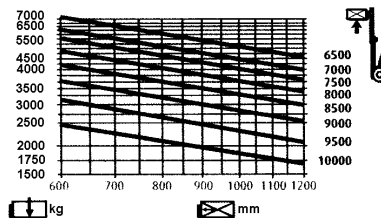
H 50



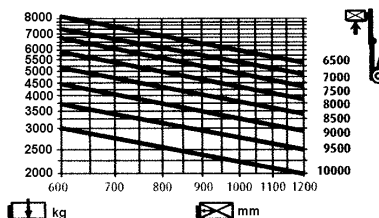
H 60



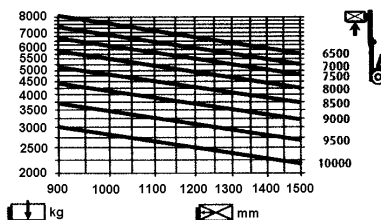
H 70



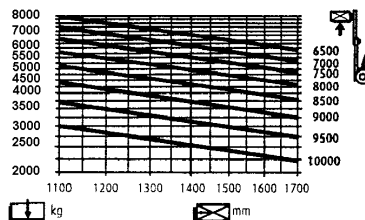
H 80



H 80/900



H 80/1100



d3961130a

The load capacity diagrams apply to standard and triplex lift masts with solid rubber tyres and a fork carriage.

Lift mast data

The lift mast data applies to standard equipment with solid rubber tyres and a fork carriage.

Standard lift mast (in mm)							
Overall height when retracted (with 150-mm free lift)	h 1	H 50 - H 80/1100	2730	3030	3230	3580	3980
Lift	h 3	H 50, H 60	3550	4150	4550	5250	6050
		H 70, H 80	3150	3750	4150	4850	5650
		H 80/900, H 80/1100	2750	3350	3750	4450	5250
Overall height when extended with 4-roller fork carriage	h 4	H 50, H 60	4440	5040	5440	6140	6940
		H 70, H 80	4240	4840	5240	5940	6740
Overall height when extended with 6/8-roller fork carriage	h 4	H 50, H 60	4640	5240	5640	6340	7140
Overall height when extended with 8-roller fork carriage	h 4	H 70, H 80	4540	5140	5540	6240	7040
		H 80/900, H 80/1100	4140	4740	5140	5840	6640

Triplex lift mast (in mm)							
Overall height when retracted	h 1	H 50 - H 60	2770	3010	3210	3560	3960
		H 70 - H 80/1100	2710	3010	3210	3560	3960
Lift	h 3	H 50, H 60	4770	5820	6420	7470	8670
		H 70, H 80	4705	5605	6205	7255	8455
		H 80/900, H 80/1100	4205	5105	5705	6755	7955
Overall height when extended with 4-roller fork carriage	h 4	H 50, H 60	5660	6710	7310	8360	9560
		H 70, H 80	5795	6695	7295	8345	9545
Overall height when extended with 6/8-roller fork carriage	h 4	H 50, H 60	5860	6910	7510	8560	9760
Overall height when extended with 8-roller fork carriage	h 4	H 70, H 80	6095	6995	7595	8645	9845
		H 80/900, H 80/1100	5595	6495	7095	8145	9345

Additional capacity rating plate for attachments

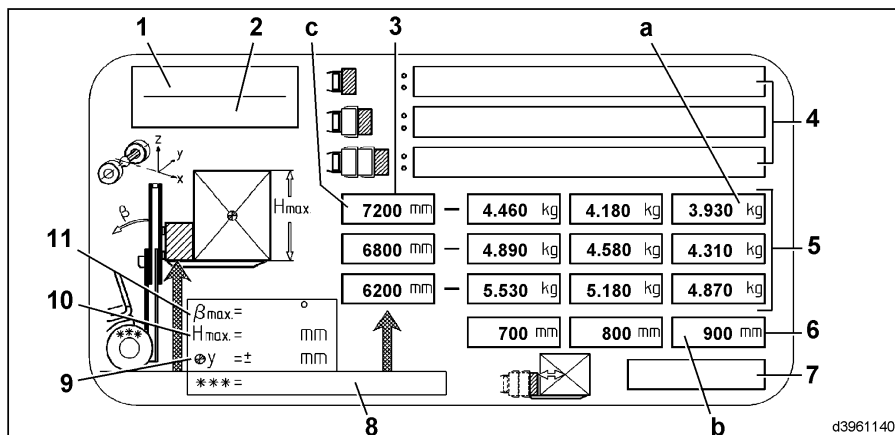
Additional capacity rating plate for attachments

⚠ DANGER

The entries in the following capacity rating plates are examples. The information will vary depending on the truck series, lift mast series, truck equipment and attachment. If an attachment is fitted, an additional capacity rating plate must be attached to your truck within the driver's field of vision.

If the label is missing or if the information about the truck equipment, attachments, load data etc. is not accurate, please contact your authorised dealer, who will calculate the data using a program authorised by Linde.

Additional capacity rating plate for attachments with loads that are not clamped



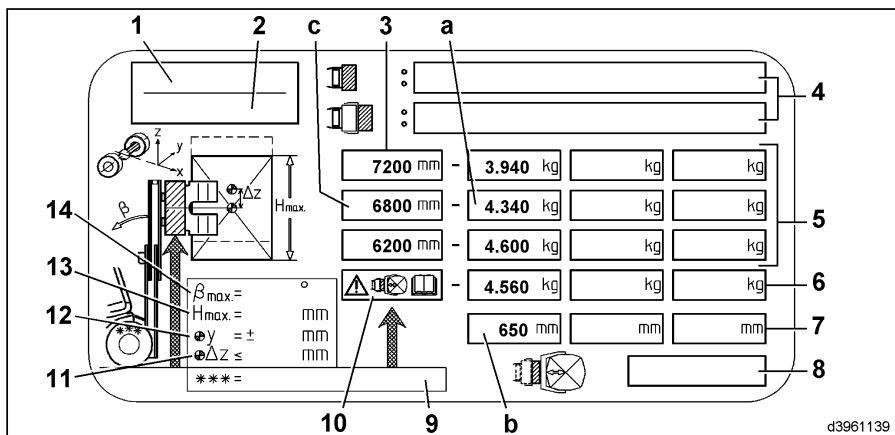
- 1 Truck series (year of manufacture, from - to)
- 2 Lift mast type (series)
- 3 Lift heights
- 4 Attachments
- 5 Load capacities
- 6 Load centres of gravity

- 7 Reference number and note about person calculating the load capacity
- 8 Front tyres
- 9 Maximum permissible centre offset of load
- 10 Maximum permissible load height
- 11 Maximum permissible lift mast backwards tilt

**NOTE**

Example for reading the load capacity:

- $a = 3930 \text{ kg}$ at load centre of gravity $b = 900 \text{ mm}$ to lift height $c = 7200 \text{ mm}$.

Additional capacity rating plate for attachments with loads that are fixed or clamped

- 1 Truck series (year of manufacture, from - to)
- 2 Lift mast type (series)
- 3 Lift heights
- 4 Attachments
- 5 Load capacities
- 6 Reduced load capacities
- 7 Load centres of gravity
- 8 Reference number and note about person calculating the load capacity
- 9 Front tyres
- 10 Note — If there is sufficient visibility for forwards travel when transporting loads, we recommend that the calculated residual load capacity based on the roller height / load height (value = maximum permissible load height (13)) is limited to the following in order to achieve a more dynamic driving

- 11 behaviour: at a load centre of gravity 650 mm = 4,560 kg. Specifies in mm how much the load centre of gravity is offset vertically upwards to the centre of the attachment (e.g. roller / bale taken off). Also applicable for attachments with a rotate function: The actual centre of gravity of the load during rotation must not lie outside the pivot point by more than 100 mm (truck rated capacity ≤ 6300 kg) or 150 mm (truck rated capacity > 6300 kg and $\leq 10,000$ kg)!
- 12 Maximum permissible centre offset of load
- 13 Maximum permissible load height
- 14 Maximum permissible lift mast backwards tilt

NOTE

Example for reading the load capacity:

- *a = 4340 kg at load centre of gravity b = 650 mm to lift height c = 6800 mm.*

Noise emission values

Calculated in the test cycle in accordance with EN 12053 from the weighted values for the DRIVE, LIFT and IDLING operating states.

Vibration characteristic values for bodily vibrations

Sound pressure level in the driver's compartment			
H 50, H 60, H 70, H 80, H 80-900, H 80-1100	LPAZ	=	77 dB (A)
In the LIFT operating status	LPa	=	80 dB (A)
In the IDLING operating status	LPb	=	66 dB (A)
In the DRIVE operating status	LPc	=	84 dB (A)
Uncertainty	KPA	=	4 dB (A)

Sound power level			
H 50, H 60, H 70, H 80, H 80-900, H 80-1100	LWAZ	=	98 dB (A)
In the LIFT operating status	LWA	=	98 dB (A)
In the IDLING operating status	LWb	=	84 dB (A)
In the DRIVE operating status	LWc	=	104 dB (A)
Uncertainty	KWA	=	2 dB (A)

Guaranteed sound power level			
In accordance with 2000/14/EC Directive	LWA	=	104 dB (A)

Under the terms of the directive, it is a statutory requirement to provide this information. The value is calculated from the sound power levels of the "Lift" and "Drive" operating statuses. It can only be used as a comparison value for different forklift trucks. The value is less suitable for determining real environmental impact levels, as it is not representative for normal truck operation, which includes the "Idling" operating status.

 NOTE

Lower or higher noise values may occur when using industrial trucks, for instance, due to the method of operation, ambient factors and other sources of noise.

Vibration characteristic values for bodily vibrations

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

Specified vibration characteristic in accordance with EN 12096		
Measured vibration characteristic	aw,zs	< 0.5 m/s ²

Specified vibration characteristic for hand-arm vibrations	
Vibration characteristic	< 2.5 m/s ²

 NOTE

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

A

Accumulator	14
Additional capacity rating plate for attachments	250
with loads that are fixed or clamped	251
with loads that are not clamped	250
Adjusting the driver's seat with rotating device	98
Adjusting the fork arm distance	106
Adjusting the lift mast chain	
Standard lift mast	200
Triplex lift mast	201
After towing	220
Air conditioning	
Maintaining	168
Switching on	87
Air conditioning operation	
Automatic	89
Manual	87
Air filter	
Changing the cartridge	154
Approaching gradients	42, 50
Armrest	
Adjusting	34
Attachments	
Instructions for fitting	14
Automatic air conditioning	87
Automatic heating	85, 87

B

Battery grease	119
Battery: checking the condition, acid level and acid density	183
Before picking up a load	105
Bio hydraulic oil	118
Bleeding the fuel system	142
Bonnet	
Closing	167
Opening	166
Bottom plates	
Installing	168
Brake system	51

C

Cab door	
closing	78
opening	78
Chain spray	119
Change the breather filter	193
Change the suction filter	192
Changing	
the fuel filter	139
Changing direction of travel	41, 49
Changing spark plugs on the burner of the particle filter	161
Changing the coolant	145
Changing the crankcase bleeder valve	161
Changing the feed pressure filter	190
Changing the pressure filter	190
Changing the safety cartridge	155
Check the tyre pressure	177
Checking and oiling other bearing points and joints	173
Checking exhaust pipes for leaks	160
Checking suction pipes for leaks	160
Checking the bellows at the actuating lever	182
Checking the bleeder valve on the hydraulic tank for correct operation	194
Checking the condition and secure positioning of electric cables	183
Checking the condition and secure positioning of the cable connections	183
Checking the condition and secure positioning of the cable connectors	183
Checking the condition and secure positioning of the engine mounting	151
Checking the condition and secure positioning of the engine support	151
Checking the condition of the antistatic belt	179
Checking the coolant concentration	148
Checking the coolant level	144

Checking the dust discharge valve	156	Competent person	13
Checking the fastenings of the axle clamps	164	Consumables	12
Checking the fork arm safety devices	202	Controls	23
Checking the fork arms	202	Coolant	119
Checking the hydraulic pump's mounting on the engine	164	Crane loading	112
Checking the mounting of the chassis	172	Crane loading with lifting eyes	113
Checking the mounting of the tilt cylinders	172	D	
Checking the mounting, condition and function of the lift mast, lift mast chains, lift cylinders and end stops	200	Defrosting the windows	86
Checking the mountings of the steering cylinder	180	Depressurisation	14, 78
Checking the mountings of the steering pivot pin	180	Description of use	5
Checking the particle filter sys- tem	14, 161	Diagnostic connector	208
Checking the pedal group	181	Diesel engine emissions	14
Checking the pre-load of the double hoses	196	Diesel fuel	118
Checking the vacuum-operated switch	154	Disposal of old trucks	223
Checking the valve clearance	160	Draining water from the intercooler	160
Checking tyres for damage and foreign objects	176	Driver's cab	78
Cleaning		Driver's seat (comfort seat with height adjustment)	
Lift mast chain	199	Adjusting	29
Oil bath air filter	158	Adjusting the lumbar support	31
Prefilter	157	Adjusting the seat backrest	30
Steering axle	179	Adjusting the seat height	31
Truck	166	Longitudinal adjustment	30
Water cooler and hydraulic oil cooler	149	Setting the driver's weight	30
Cleaning and spraying the lift mast chain	199	Driver's seat (luxury active driver's seat)	
Cleaning the fuel tank ventilation hose	143	Activating the seat air-conditioning	34
Cleaning the prefilter	157	Activating the seat heater	34
Cleaning the truck	166	Adjusting	34
Climatic conditions	5	Driver's seat (luxury driver's seat)	
Clock		Activating the seat heater	33
setting	35	Adjusting	31
		Adjusting the backrest extension	33
		Adjusting the lumbar support	33
		Adjusting the seat angle	33
		Adjusting the seat backrest	32
		Adjusting the seat depth	33
		Longitudinal adjustment	32
		Setting the driver's weight	32

Driver's seat (standard seat and comfort seat)		Fuel	
Adjusting	27	Checking the level	136
Adjusting the lumbar support (only with a comfort seat)	29	Topping up	137
Adjusting the seat backrest	28	Fuel pre-filter	
Longitudinal adjustment	28	Changing	140
Setting the driver's weight	28	Draining water from	138
Driving		Fuses	
Dual-pedal operation	40	Basic electrical equipment	207
Single-pedal operation	48	Heating system, air conditioning	208
With load	108	special electrical equipment	204
E		G	
EC declaration of conformity	8	Gearbox oil	118
Emergency exit with attached rear window	16	General information	116
Emergency lowering	15	H	
Engine		Handling consumables	12
Starting (dual-pedal operation)	37	Heating operation	
Starting (single-pedal operation)	43	Automatic	86, 90
Switching off (dual-pedal operation)	40	Manual	85, 89
Switching off (single-pedal operation)	46	Heating system	
Engine oil	119	Maintaining	168
Changing	133	Switching on	85, 89
Changing the filter	135	Hydraulic oil	118
Checking the level	132	Changing	187
Draining	133	Draining	187
Topping up	135	Topping up	188
Entering the truck	27	Hydraulic oil cooler	
Establishing braking readiness	220	Checking for leaks	149
Exiting the truck	27	Cleaning	149
F		Hydraulic system	
Fire extinguisher	11	Changing the filters	190
Floorplates		Checking for leaks	195
removing	167	Checking oil level	189
Fork carriage emergency lowering	15	I	
Forklift Data Management	91	Identification plates	20
Forwards travel	41, 49	Impermissible use	4
		Inspection data	117
		Instructions for running-in	26
		Intended use	3

J

Joysticks

Central lever operation 54

Single lever operation 60

Jump start 216

L

Leaving the truck 111

Legal requirements for placing on the market 8

Lift mast data 249

Lift mast positioning 99

Lifting the fork carriage

Central lever operation 55

Single lever operation 61

Lighting

Switching on 80

Load capacity diagrams 248

Lowering the fork carriage

Central lever operation 55

Single lever operation 61

Lubricating grease 119

Lubricating the mast fixation 203

Lubricating the tilt cylinder bearings

Lubricating the overhead guard bearings 172

M

Main dimensions 247

Maintenance data 117

Maintenance intervals 116

Malfunctions during operation 209

Malfunctions, causes and remedies

Diesel engine 211

Hydraulic system 214

Measures before shutdown 222

N

Noise emission values 251

O

Oil bath air filter

Changing the oil 159

Cleaning 158

Opening the central electrical system cover 206

Opening the cover to the electrical system 204

Opening the hydraulic system shorting plunger 218

Operating the attachments

Central lever operation 55

Single lever operation 61

Operating the clamp

Central lever operation 57

Single lever operation 63

Operating the fork prong positioner

Central lever operation 57

Single lever operation 63

Operating the horn 53

Operating the lift and tilt attachments

Single lever operation 54, 60

Operating the rotator

Single lever operation 63

Operating the sideshift

Central lever operation 56

Single lever operation 62

P

parking brake 52

Parking brake

Operating 52

Releasing 52

Parking brake.

Checking for correct operation 181

Particle filter

Changing spark plugs on the burner 161

Particle filter regeneration	67	Scope of service	
Automatic mode with display	70	1000 h	123
Automatic mode without display	68	2000 hours	125
Manual mode	72	3000 h	127
Particle filter levels of build-up	67	50 h	122
Stationary regeneration (special equipment)	75	6000 h	129
Periodic safety inspection	13	As required	121
Planetary transmission		Before initial commissioning	26
Changing the oil	162	Seat belt	
Checking for leaks	162	Checking the condition and function	170
Checking the oil level	162	Fastening	37
Cleaning the magnetic plug	162	Unfastening	37
Q		Securing the lift mast against tilting backwards	197
Quarter window		Securing the overhead guard against moving forwards or backwards	112
Opening	79	Service brake	51
R		Setting down loads	109
Recommendations for consumables	118	Shutting down the truck	222
Refrigerant for air conditioning	119	Side window	
Regulations	13	Closing	78
Releasing the multi-disc brake	219	Opening	78
Removing the lift mast	112	Stability	12
Residual risks	11	Standard lift mast	197
Returning to service after being shutdown	222	Securing the raised mast	197
Reverse travel	41, 49	Status code	91
Rim sizes	246	Steering	51
S		Steering axle	
Safety guidelines	10	Checking mountings	172
Safety information	10	Cleaning	179
active medical equipment	11	greasing	179
Driver's field of vision	11	Steering system	51
Gas springs	10	Stop pedal	51
Speed reduction	11	Stopping	42, 50
Welding operations	10	Sweeper function	101
		Activating continuous operation	102
		Activating short-term operation	104
		Deactivating continuous operation	103
		Switch panel	24
		Switching on the direction indicators	81
		Switching on the hazard warning system	80
		Switching on the interior lighting	79

Switching on the rear window heating . . .	85
Switching on the rotating beacons	81
Switching on the wiper/washer system . .	84
Switching on the working spotlight	80
Symbols	5

T

Taking delivery of the industrial truck	7
Taking delivery of the truck	7
Taking up loads	107
Technical description	5
Brakes	7
Electrical system	7
Engine	6
Hydraulic system	6
Lift mast	7
Linde load control.	6
Linde torsion support	7
Linde Truck Control	7
Operation	6
Steering	7
Tightening the wheel fastenings	176
Tilting the lift mast back	
Central lever operation	55
Single lever operation	61
Tilting the lift mast forwards	
Central lever operation	55
Single lever operation	61
Tip-over of the truck	12
Topping up the washer system water tank	173
Towing	217
Towing device	109
Towing procedure	218
Transportation by lorry or low-bed semi-trailer	114
Triplex lift mast	198
Securing the raised mast	198
Truck configuration sign	244
Truck data acquisition	91
Transponder (chip or magnetic strip card)	96

Truck data acquisition — special setting	
PIN	94
Truck data acquisition — standard setting	
PIN and status code	92
Truck overview	22
Type sheet H50D-02	226
Type sheet H60D-02	229
Type sheet H70D-02	232
Type sheet H80D-02	235
Type sheet H80D-02/1100	241
Type sheet H80D-02/900	238
Tyre variants	245

V

V-ribbed belt	
Changing	153
Checking tension	152
Checking the condition	152
Vibration characteristic values for bodily vibrations	252

W

Warnings	5
Washer system: Topping up the water tank	173
Water cooler	
Checking for leaks	149
Cleaning	149
Wheel change	175
Windscreen defrosting	89
Windscreen wiper	81
Windscreen wipers	
Switching on at the front	82
Switching on at the front and on the roof	84
Switching on at the front and rear	83
Switching on at the rear	82
Working on the lift mast and at the front of the truck	197

