

HC 110

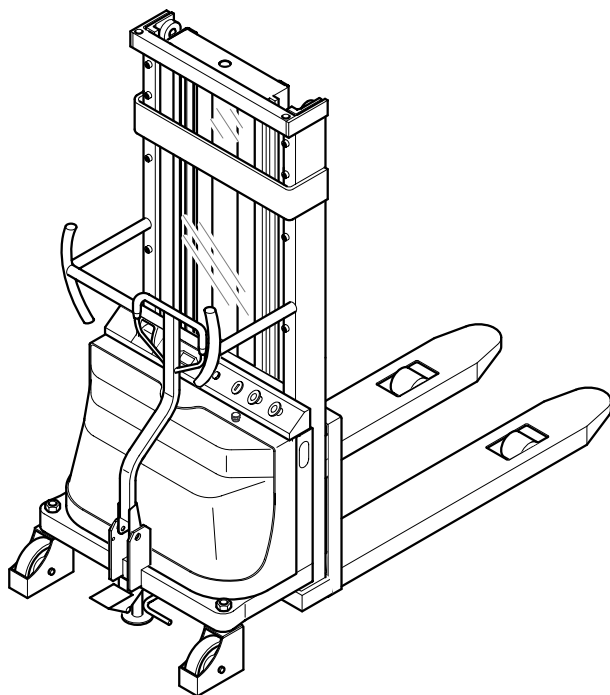
12.05 -

Operator Manual



51017163

07.08



Foreword

The present ORIGINAL OPERATING INSTRUCTIONS are designed to provide sufficient instruction for the safe operation of the industrial truck. The information is provided clearly and concisely. The chapters are arranged by letter. Each chapter starts with page 1. The page identification consists of a chapter letter and a page number.

For example: Page B 2 is the second page in chapter B.

The operating instructions detail different truck models. When operating and servicing the truck, make sure that the instructions apply to your truck model.

Safety instructions and important explanations are indicated by the following graphics:



Used before safety instructions which must be observed to avoid danger to personnel.



Used before notices which must be observed to avoid material damage.



Used before notices and explanations.



Used to indicate standard equipment.



Used to indicate optional equipment.

Our trucks are subject to ongoing development. Jungheinrich reserves the right to alter the design, equipment and technical features of the truck. No guarantee of particular features of the truck should therefore be inferred from the present operating instructions.

Copyright

Copyright of these operating instructions remains with *JUNGHEINRICH AG*.

Jungheinrich Aktiengesellschaft

Am Stadtrand 35
22047 Hamburg - GERMANY

Telephone: +49 (0) 40/6948-0

www.jungheinrich.com

Table of contents

A	Correct use and application	
B	Truck Description	
1	Application	B 1
2	Assemblies	B 2
2.1	Truck	B 3
3	Standard Version Specifications	B 4
3.1	Performance data for standard trucks	B 4
3.2	Dimensions	B 4
3.3	EN norms	B 6
3.4	Conditions of use	B 6
4	Identification points, warning labels and data plates	B 7
4.1	Truck data plate	B 8
4.2	Capacity	B 9
C	Transport and Commissioning	
1	Lifting by crane	C 1
2	Securing the truck during transport	C 2
3	Using the truck for the first time	C 2
D	Battery Maintenance, Charging & Replacement	
1	Safety regulations for handling acid batteries	D 1
2	Battery types	D 2
3	Charging the battery with an on-board charger	D 2
4	Battery removal and installation	D 4
5	Battery Displays	D 5
5.1	Charge status display	D 5
5.2	Battery discharge indicator	D 5
E	Operation	
1	Safety Regulations for the Operation of Forklift Trucks	E 1
2	Controls and Displays	E 2
3	Starting up the truck	E 4
4	Using the industrial truck	E 5
4.1	Safety regulations for truck operation	E 5
4.2	Travel, steering, braking	E 6
4.3	Lifting and depositing loads	E 7
4.4	Parking the truck safely	E 7
4.5	Troubleshooting	E 8

F Industrial Truck Maintenance

1	Operational Safety and Environmental Protection	F 1
2	Maintenance Safety Regulations	F 1
3	Servicing and Inspection	F 3
4	Maintenance checklist	F 4
5	Lubrication Schedule	F 5
5.1	Consumables	F 6
6	Maintenance Instructions	F 7
6.1	Preparing the truck for maintenance and repairs	F 7
6.2	Checking electrical fuses	F 8
6.3	Recommissioning	F 9
7	Decommissioning the industrial truck	F 9
7.1	Prior to decommissioning:	F 9
7.2	During decommissioning:	F 9
7.3	Returning the truck to operation after decommissioning	F 10
8	Safety checks to be performed at regular intervals and following any unusual incidents	F 10
9	Final de-commissioning, disposal	F 10

A Correct use and application



The "Guidelines for the Correct Use and Application of Industrial Trucks" (VDMA) are supplied with the truck. The guidelines form part of these operating instructions and must be observed. National regulations apply in full.

The truck described in the present operating instructions is an industrial truck designed for lifting and transporting loads.

It must be used, operated and serviced in accordance with the present instructions. All other types of use lie beyond the scope of application and can result in damage to personnel, the truck or property. In particular, avoid overloading the truck with loads which are too heavy or placed on one side. The data plate attached to the truck or the load chart are binding for the maximum load capacity. The industrial truck must not be used in fire or explosion endangered areas, or areas threatened by corrosion or excessive dust.

Proprietor responsibilities: For the purposes of the present operator manual the "proprietor" is defined as any natural or legal person who either uses the industrial truck himself, or on whose behalf it is used. In special cases (e.g. leasing or renting) the proprietor is considered the person who, in accordance with existing contractual agreements between the owner and user of the industrial truck, is charged with operational duties.

The proprietor must ensure that the truck is used only for the purpose it is intended for and that danger to life and limb of the user and third parties are excluded. Furthermore, accident prevention regulations, safety regulations and operating, servicing and repair guidelines must be followed. The owner must ensure that all users have read and understood these operating instructions.



Failure to comply with the operating instructions shall invalidate the warranty. The same applies if improper work is carried out on the truck by the customer or third parties without the permission of the manufacturer's customer service department.

Attaching accessories: The mounting or installation of additional equipment which affects or enhances the performance of the industrial truck requires the written permission of the manufacturer. In some cases, local authority approval shall be required.

Approval of the local authorities however does not constitute the manufacturer's approval.

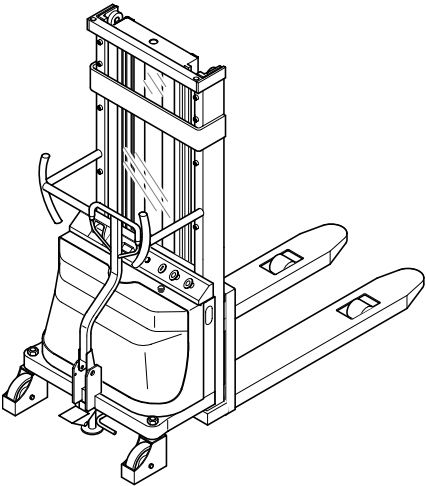
B Truck Description

1 Application

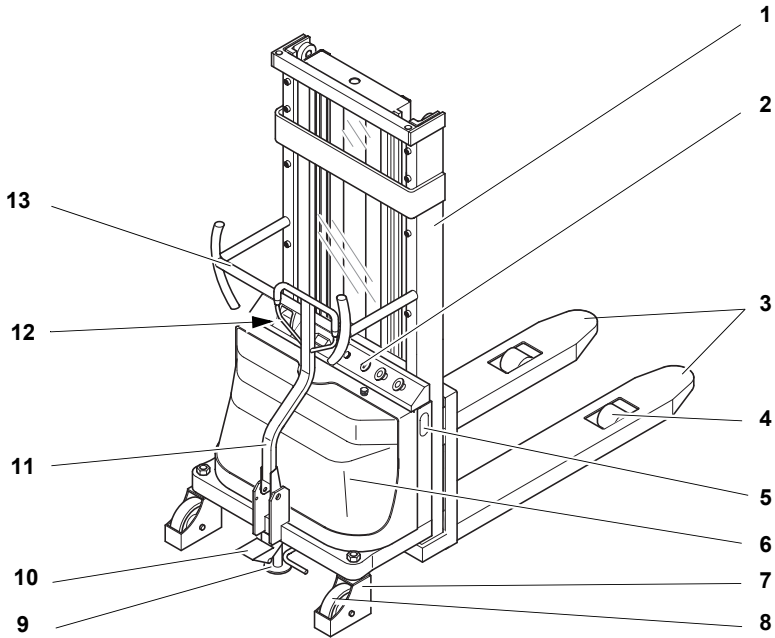
The truck is designed for transporting goods on level surfaces. Open bottom pallets or roll cages can be lifted. The capacity is shown on the data capacity plate Q_{max} .

Truck types, capacity and motor output:

Model	Rated capacity	Engine output
HC 110	1,000 kg	1.6 kW



2 Assemblies



Item		Description
1	●	Mast
2	●	Control panel
3	●	Fork
4	●	Load wheels
5	●	Battery charging lead 230 volts AC (on-board battery charger)
6	●	Front panel
7	●	Castor wheel assembly support
8	●	Steer wheels
9	●	Parking brake
10	●	Brake pedal (parking brake)
11	●	Tiller
12	●	Battery connector (Emergency Disconnect) ¹⁾
13	●	Push handles

● = Standard equipment

○ = Optional Equipment



¹⁾The truck must not be operated without the Emergency Disconnect (see page C 2).

2.1 Truck

Structure: The HC is a four-wheel truck with two steer wheels (8) and two load wheels (9). An smooth opening panel provides easy access to all the components. The controls are arranged on the panel.

Safety mechanisms:

– The castor wheel assembly support (7) protects the operator's feet.

Controls and Displays: The lift and lower controls are arranged on the panel. The truck is fitted with a battery discharge indicator.

Steering: The tiller (11) is used for steering in a range of approx. 90° on either side.

Brake system: Below the tiller (11) a parking brake (9) is fitted, which is operated via a brake pedal (10).

Hydraulic system: Lifting and lowering are activated via the lift and lower buttons. The pump unit starts with lifting is activated. The hydraulic oil is pumped from the oil reservoir into the cylinder. The load fork (3) raises.

Electrical System: 12 volt system.

3 Standard Version Specifications



Technical specification details in accordance with VDI 2198. Technical modifications and additions reserved.

3.1 Performance data for standard trucks

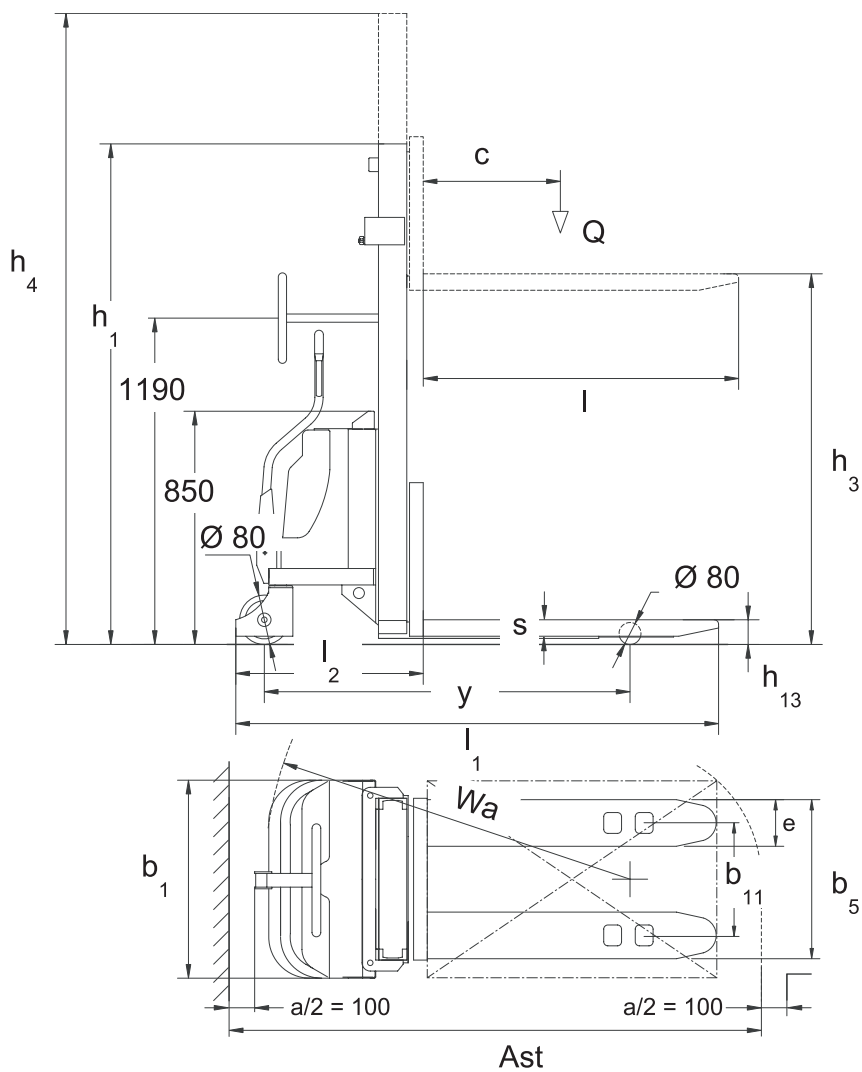
	Description	HC	
Q	Rated capacity	1000	kg
C	Load centre of gravity distance	600	mm
	Lift speed (lift) w / w.o. load	8 / 10	cm/sec
	Lift speed (lower) w / w.o. load	27 / 15	cm/sec

3.2 Dimensions

	Description	HC 110 1600	HC 110 2500	HC 110 3000	
	Lift height				
h ₁	Height	2100	1850	2100	mm
h ₃	Lift	1600	2500	3000	mm
h ₄	Mast height extended	2100	3055	3550	mm
h ₁₃	Lowered height	90	90	90	mm
y	Wheel base	1335	1335	1335	mm
s/e/l	Fork tine dimensions	21/170/1070	21/170/1070	21/170/1070	mm
l ₁	Overall length	1755	1755	1755	mm
l ₂	Headlength	685	685	685	mm
b ₁	Truck width	722	722	722	mm
b ₅	Outer load fork distance	580	580	580	mm
b ₁₁	Track width, rear	410	410	410	mm
Ast	Working Aisle Width 800x1200 traverse	2175	2175	2175	mm
Ast	Working Aisle Width 800x1200 longit.	2145	2145	2145	mm
	Lift motor, output where s ₃ 10%	1,6	1,6	1,6	kW
	Battery voltage, rated capacity k ₅	12/70	12/100	12/100	V / Ah
	Battery weight	24	38	38	kg



The battery size must be adhered to for the duplex mast, as the battery weight must be present in the truck to act as a counterweight.



3.3 EN norms

Electromagnetic compatibility (EMC)

The manufacturer confirms compliance with the limit values for electromagnetic emission and interference immunity as well as testing of static electricity discharge according to EN 12895 and the references to other standards contained therein.



No changes to electric or electronic components or their arrangement may be made without the written agreement of the manufacturer.

3.4 Conditions of use

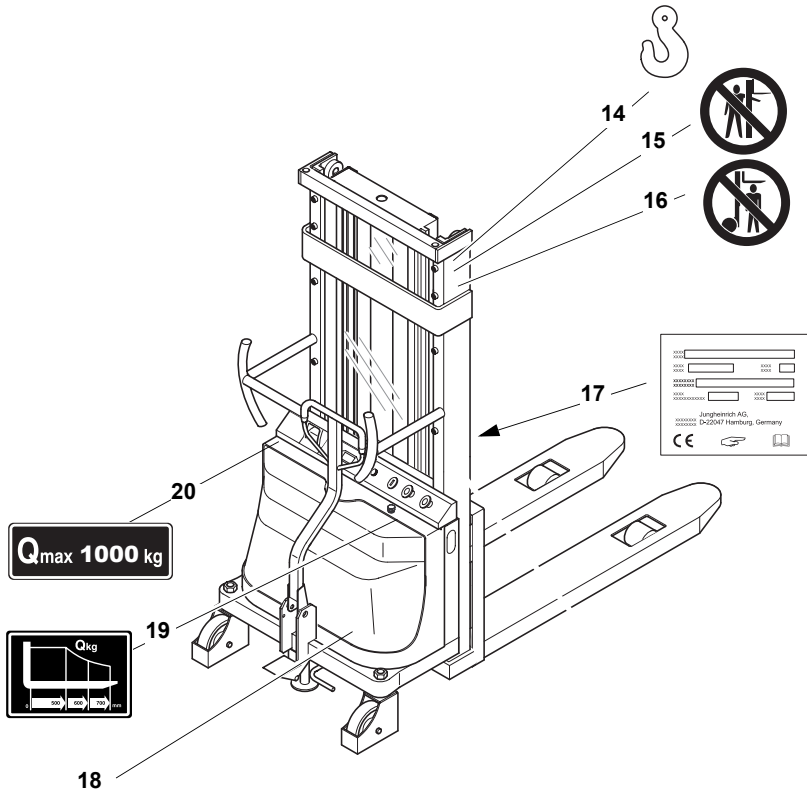
Ambient temperature

- during operation -5 °C to 40 °C



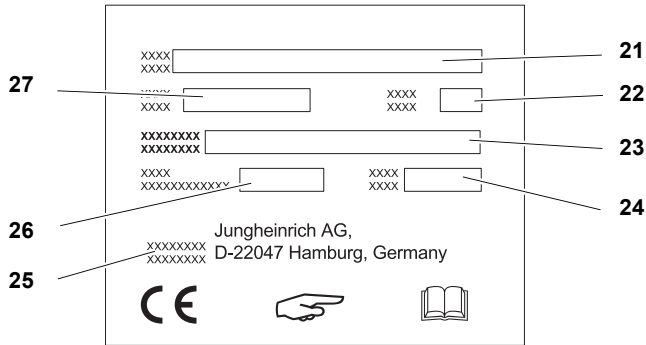
Special equipment and authorisation is required if the truck is to operate constantly below -5 °C to -25 °C or in a cold store or in extreme temperatures or conditions of fluctuating air humidity.

4 Identification points, warning labels and data plates



Item	Description
14	Strap point for crane lifting
15	"Do not reach through the mast" warning
16	"Do not step under the load handler" warning
17	Truck data plate
18	Serial number
19	Residual capacity
20	Capacity

4.1 Truck data plate



Item	Description
21	Model
22	Year of manufacture
23	Serial no.
24	Net weight in kg
25	Manufacturer
26	Rated capacity (kg)
27	Option



For queries regarding the truck or ordering spare parts always quote the truck serial number (23).

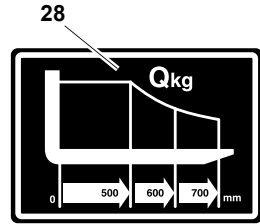
4.2 Capacity



The capacity data with respect to lift height and load centre of gravity distance can be found on the truck's capacity plate (28).

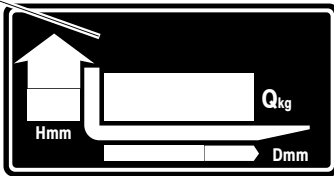
Depending on the mast fitted, the truck will have one of the following two capacity plates (28, 29): (illustrations for reference purposes only)

The capacity plate to the right (28) shows the capacity (Q in kg) for different load centres of gravity (D in mm) in diagram form.



The lower plate (29) gives the capacity (Q in kg) of the truck as a function of the load centre of gravity distance (D in mm) and lift height (H in mm) in tabular form.

29



C Transport and Commissioning

1 Lifting by crane



Only use lifting gear with sufficient capacity (for transport weight see truck data plate).

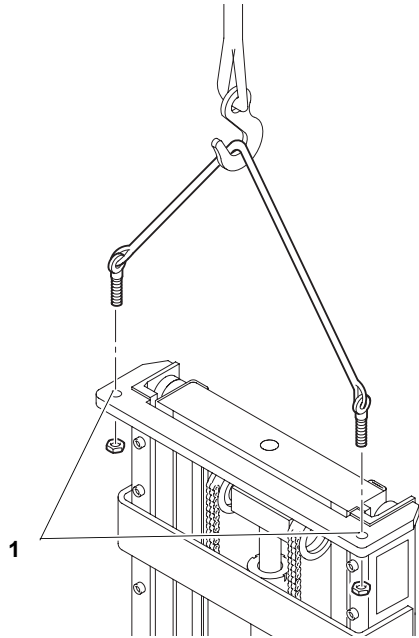


The strap points (1) on the mast are for loading the truck with crane lifting gear.

- Park the truck securely (see Chapter E).
- Secure the lifting slings to the attachment points (1).



Attach the crane slings to the strap points so that the truck cannot slip. Lifting slings should be fastened to the harness in such a way that they do not come into contact with any parts of the truck when it is being raised.



2 Securing the truck during transport

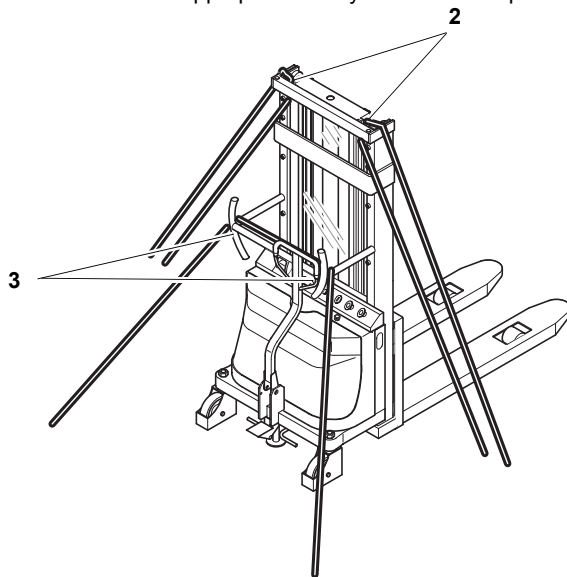


The truck must be securely fastened when transported on a lorry or a trailer. The lorry / trailer must have fastening rings.

- To secure the truck attach the tensioning belt to the strap points (2) and the push handles (3) and attach it to the fastening rings.
- Tighten the tensioning belt with the tensioner.



Loading must be carried out by specially trained staff in accordance with recommendations contained in Guidelines VDI 2700 and VDI 2703. In each case correct measurements must be made and appropriate safety measures adopted.



3 Using the truck for the first time



In order to disconnect the power supply immediately in an emergency, the battery connector must be connected to the truck's Emergency Disconnect. **The truck must not be operated without the emergency disconnect.**

To prepare the truck after delivery or after transport, proceed as follows:

- Make sure the truck's equipment is complete and in a satisfactory condition.
- Install battery (where required). Do not damage battery cable. (see Chapter D).
- Charge the battery (see Chapter D).
- Start up the truck as indicated. (see Chapter E).



When the truck is parked the surface of the tyres will flatten. The flattening will disappear after a short period of operation.

D Battery Maintenance, Charging & Replacement

1 Safety regulations for handling acid batteries

Park the truck securely before carrying out any work on the batteries (see Chapter E).

Maintenance personnel: Batteries may only be charged, serviced or replaced by trained personnel. The present operator manual and the manufacturer's instructions concerning batteries and charging stations must be observed when carrying out the work.

Fire protection: Smoking and naked flames must be avoided when working with batteries. Wherever a truck is parked for charging there shall be no inflammable material or operating fluids capable of creating sparks within 2 metres around the truck. The area must be well ventilated. Fire protection equipment must be provided.

Battery maintenance: The battery cell covers must be kept dry and clean. The terminals and cable shoes must be clean, secure and have a light coating of dielectric grease. Batteries with non insulated terminals must be covered with a non slip insulating mat.

Battery Disposal: Batteries may only be disposed of in accordance with national environmental protection regulations or disposal laws. The manufacturer's disposal instructions must be followed.



Before closing the battery panel make sure that the battery lead cannot be damaged.



Batteries contain an acid solution which is poisonous and corrosive. Therefore, always wear protective clothing and eye protection when carrying out work on batteries. Above all avoid any contact with battery acid.

Nevertheless, should clothing, skin or eyes come in contact with acid the affected parts should be rinsed with plenty of clean water - where the skin or eyes are affected call a doctor immediately. Immediately neutralise any spilled battery acid.



Only use batteries with the specified rating (see chapter B).



Only batteries with a sealed battery container may be used.



The weight and dimensions of the battery have considerable affect on the operational safety of the truck. Battery equipment may only be replaced with the agreement of the manufacturer.

2 Battery types



If the truck is fitted with maintenance-free batteries, do not add distilled water. The cell covers are fixed tight. If you open them, the battery will be damaged. Note the instructions on the battery.



When replacing or installing batteries, ensure that the battery is correctly secured in the battery compartment of the truck.

Depending on the model, the HC110 comes with different battery types.



The battery weight and size will affect the capacity of the truck. The truck's capacity as indicated on the capacity data plate is based on having a battery weight as indicated in the Specifications (see Chapter B).

3 Charging the battery with an on-board charger

To charge the battery, the truck must be dry and parked in closed and properly ventilated rooms.

The charger must not be opened. If damaged, it must be replaced.

The charger mains cable can be accessed from the outside.



The battery panel must never be removed before or during charging. An open panel can result in death by electric shock.



To replace the fuse (2), always disconnect the mains plug (1).

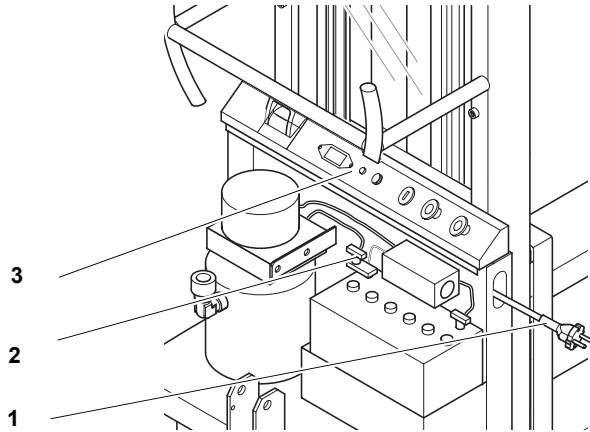


It is advisable to charge the batteries whenever possible (e.g. when the truck is not being used). This spares the batteries and the charger as they are subjected to less depletion. This increases the useful life of the battery. Always insert the mains connection cable back inside the panel through the opening to avoid damaging or shearing the mains connection cable when the truck is in operation.



The on-board charger is used to charge the batteries in accordance with the descending characteristic curve. The charge time is approx. 9-12 hours for a maximum 80% discharged battery.

- Park the truck securely near to a suitable mains socket (see chapter E).
- Pull the mains connector (1) of the charger out of the bracket below the panel and connect it to the mains socket.
- If the battery is discharged the LED flashes (3) green and charging begins.
- When the battery is fully charged, the charger automatically transfers to a discontinuous charge which remains for as long as the mains supply is applied. The LED (3) is lit green. (Up to this time the truck should not be used).
- If the LED (3) goes out during charging, check if the mains supply is still applied.



Mains connection

Mains voltage: 230 V $\pm 10\%$

Mains frequency: 50 Hz $\pm 4\%$

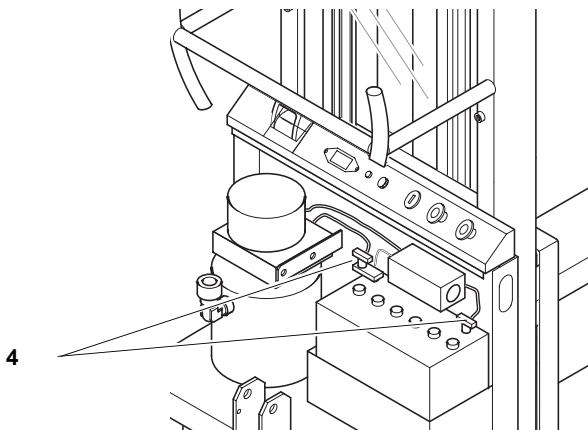
4 Battery removal and installation

- Park the truck securely (see Chapter E).
- Undo the screws and remove the front panel.



Place the battery cable in such a way that it cannot get caught on the battery when the battery is removed.

- Undo the terminal screws (4) and remove the battery cable from the terminals.
- Lift out the battery.



- Installation is the reverse order. When reinstalling the battery, note the proper installation position and make sure the battery is connected correctly.



After installing the battery, check all cables and plug connections for visible signs of damage.

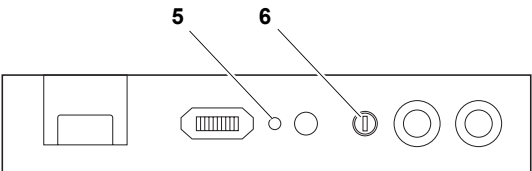


Before starting the truck, the battery panel must be firmly closed. Close the battery panel carefully and slowly. Do not reach between the battery panel and the chassis.

5 Battery Displays

5.1 Charge status display

When the charger has been connected to a mains socket, the LED (5) indicates the battery charge status.



The LED (5) colours represent the following conditions:

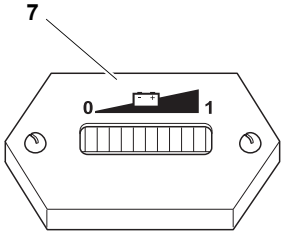
LED	
Flashes green	Battery is being charged
Lit green	Battery fully charged, charge conservation
Flashes red	Battery faulty, charge circuit interrupted, no mains supply
Not lit	Truck faulty

5.2 Battery discharge indicator

When the truck has been released via the key switch (6) the battery discharge indicator (7) displays the charge status.

The battery discharge status is indicated in 10% increments through the 10 bars on the battery discharge indicator (7).

As the battery increasingly discharges, the bars go out from right to left.



E Operation

1 Safety Regulations for the Operation of Forklift Trucks

Driver authorisation: The forklift truck may only be used by suitably trained personnel, who have demonstrated to the proprietor or his representative that they can drive and handle loads and have been authorised to operate the truck by the proprietor or his representative.

Driver's rights, obligations and responsibilities: The driver must be informed of his duties and responsibilities and be instructed in the operation of the truck and shall be familiar with the operator manual. The driver shall be afforded all due rights. Safety shoes must be worn for pedestrian operated trucks.

Unauthorised use of truck: The driver is responsible for the truck during the time it is in use. The driver must prevent unauthorised persons from driving or operating the truck. Do not carry passengers or lift other people.

Damage and faults: The supervisor must be immediately informed of any damage or faults to the forklift truck or attachment. Trucks which are unsafe for operation (e.g. wheel or brake problems) must not be used until they have been rectified.

Repairs: The driver must not carry out any repairs or alterations to the industrial truck without the necessary training and authorisation to do so. The driver must never disable or adjust safety mechanisms or switches.

Hazardous area: A hazardous area is defined as the area in which a person is at risk due to truck movement, lifting operations, the load handler (e.g. forks or attachments) or the load itself. This also includes areas which can be reached by falling loads or lowering operating equipment.



Unauthorised persons must be kept away from the hazardous area. Where there is danger to personnel, a warning must be sounded with sufficient notice. If unauthorised personnel are still within the hazardous area the truck shall be brought to a halt immediately.

Safety devices and warning signs: Safety devices, warning signs and warning instructions shall be strictly observed.

2 Controls and Displays

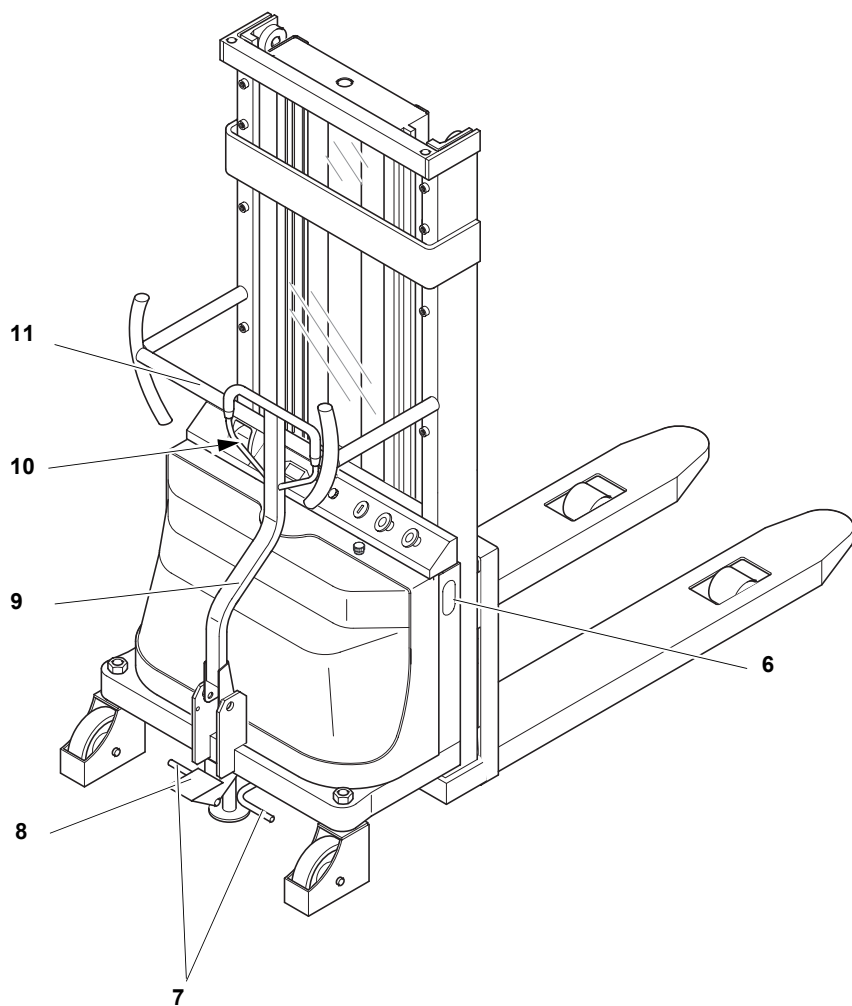
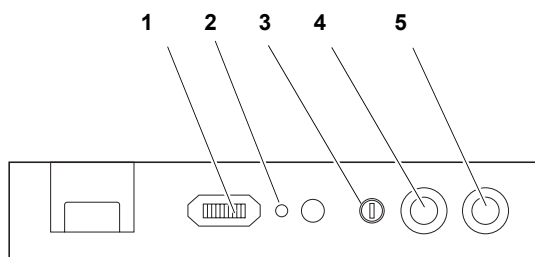
Item	Control / Display		Function
1	Battery discharge indicator	●	Battery charge status.
2	Charger LED status	●	Indicates the charge status (see Chapter D).
3	Key switch	●	Switches control current on and off. Removing the key prevents the truck from being switched on by unauthorised personnel.
4	Load fork raise button	●	Raises the forks.
5	Load fork lower button	●	Lowers the forks.
6	Connection, on-board battery charger	●	Charges the battery by inserting the mains connector into a mains socket.
7	Brake release (parking brake), either side of brake pedal	●	Releases the brake
8	Brake pedal (parking brake)	●	Prevents the truck from rolling away.
9	Tiller	●	Moves and steers the truck.
10	Battery connector (Emergency Disconnect)	●	Disconnects the circuit, all electrical functions are deactivated.
11	Push handles	●	Move the truck forward/backward.

● = Standard equipment

○ = Optional Equipment



¹⁾The truck must not be operated without the Emergency Disconnect (see page C 2).



3 Starting up the truck



Before the truck can be started, operated or a load lifted, the driver must ensure that there is nobody within the hazardous area.

Checks and operations to be performed before starting daily work

- Visually inspect the entire truck (in particular wheels and load handler) for obvious damage.
- Visually inspect the battery attachment and cable connections

Switching on the truck

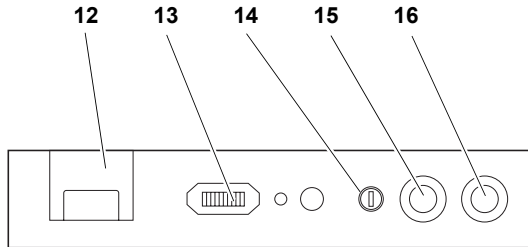
- Make sure the battery is connected (12).
- Check if charging connector has been removed, if necessary terminate charging (see chapter D).
- Insert the key in the key switch (14) and turn it as far right as it will go.



The battery discharge indicator (13) shows the current battery charge status.

- Test lifting (15) and lowering (16) by applying the control lever.
- Test the brakes (see section 4.2)

The truck is now operational.



4 Using the industrial truck

4.1 Safety regulations for truck operation

Travel routes and work areas: Only use lanes and routes specifically designated for truck traffic. Unauthorised third parties must stay away from work areas. Loads must only be stored in places specially designated for this purpose.

Travel conduct: The driver must adapt the travel speed to local conditions. The truck must be driven at slow speed when negotiating bends or narrow passageways, when passing through swing doors and at blind spots. The driver must always observe an adequate braking distance between the forklift truck and the vehicle in front and must be in control of the truck at all times. Abrupt stopping (except in emergencies), rapid U turns and overtaking at dangerous or blind spots are not permitted. It is forbidden to lean out of or reach beyond the working and operating area.

Travel visibility: The driver must look in the direction of travel and must always have a clear view of the route ahead. Loads that affect visibility must be positioned at the rear of the truck. If this is not possible, a second person must walk in front of the truck as a lookout.

Negotiating slopes and inclines: Slopes or inclines may only be negotiated if they are designated traffic routes, are clean and have a non-slip surface and providing they can be safely negotiated in accordance with the technical specifications of the truck. The truck must always be driven with the load unit facing uphill. The industrial truck must not be turned, operated at an angle or parked on inclines or slopes. Inclines must only be negotiated at slow speed, with the driver ready to brake at any moment.

Negotiating lifts and docks: Lifts and docks must only be used if they have sufficient capacity, are suitable for driving on and authorised for truck traffic by the owner. The driver must satisfy himself of the above before entering these areas. The truck must enter lifts with the load in front and must take up a position which does not allow it to come into contact with the walls of the lift shaft.

Persons riding in the lift with the forklift truck must only enter the lift after the truck has come to a halt and must leave the lift before the truck.

Nature of loads to be carried: The operator must make sure that the load is in a satisfactory condition. Only carry loads that are positioned safely and carefully. Use suitable precautions, e.g. a load guard, to prevent parts of the load from tipping or falling down.

Transporting fluids: When transporting fluids the centre of gravity can fluctuate, depending on the position of the truck, and considerably affect its stability. All necessary precautions must therefore be taken, in particular when accelerating, braking and negotiating bends, to avoid sudden movements.

4.2 Travel, steering, braking



Never carry passengers.

Emergency Disconnect

- Disconnect the battery (19).

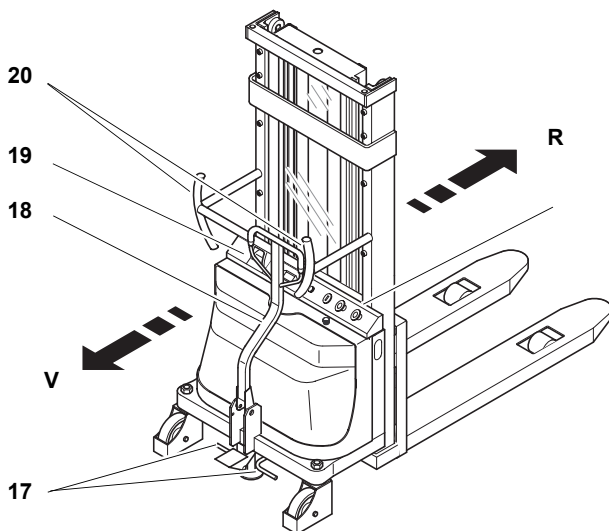
All electrical functions are deactivated.

Traction



Do not drive the truck unless the panels are closed and properly locked.

- Start up the truck (see Section 3).
- Release the parking brake by standing on the brake (17) release mechanism.
- Using the push handles (20) move the truck in the reverse (**R**) direction.
- Push the tiller (18) down and pull the truck in the forward direction (**V**).



Steering

- Move the tiller (18) to the left or right.



On narrow bends the tiller extends outside the truck's geometry.

Brakes



The braking pattern of the truck depends largely on the ground conditions. The driver must take this into account.

The truck can brake in two different ways:

- Manually (by pulling or pushing against the direction of movement)
- Brake pedal (parking brake only)

Travelling on inclines



Loads must always be carried at that end of the truck facing uphill.

4.3 Lifting and depositing loads

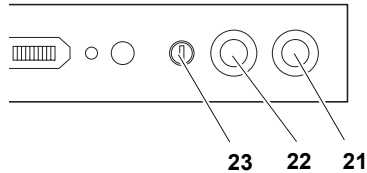


Before lifting a load, the driver must ensure that it is correctly palletised and that the capacity of the truck is not exceeded.

- Enter the truck and the forks as far as possible underneath the load unit.

Lifting

- Press the “Raise Load Forks” button ((22) until the required lifting height has been reached.



Lowering

- Press the “Lower Load Forks” button (21) until the required lifting height has been reached.

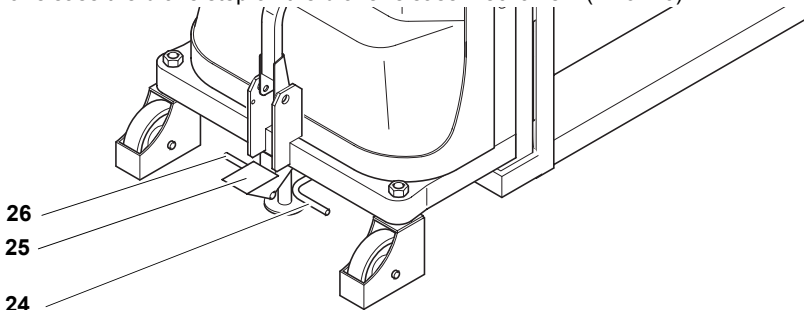
4.4 Parking the truck safely

When you leave the truck it must be securely parked even if you only intend to leave it for a short time.



Do not park the truck on a slope. The forks must always be lowered to the ground.

- Lower the forks.
- Set the key (23) to the vertical position and remove it.
- Apply the brake pedal (26).
- To release the brake step on the brake release mechanism (24 or 26).



4.5 Troubleshooting

This chapter allows the user to identify and rectify basic faults or the effects of incorrect operation. When trying to locate a fault, proceed in the order shown in the table.

Fault	Probable Cause	Action
Truck does not start	<ul style="list-style-type: none">– Battery connector not plugged in– Key switch set to OFF– Battery still being charged– Battery charge too low– Battery not charging– Faulty fuse	<ul style="list-style-type: none">– Check battery plug and plug in if necessary.– Set key switch to "I"– Disconnect the 230 volt connection– Check battery charge, charge battery if necessary– Check charger, check battery terminal connections– Check fuses 2F1 and F1
Load cannot be lifted	<ul style="list-style-type: none">– Truck not operational– Hydraulic oil level too low– Faulty fuse– Load is too heavy– Charge capacity below 40%	<ul style="list-style-type: none">– Carry out all remedial actions listed under "Truck does not start".– Check the hydraulic oil level– Check fuse F1– Note maximum capacity (see data plate)– Charging the battery



If the fault cannot be rectified after carrying out the remedial procedure, notify the manufacturer's service organisation, as any further troubleshooting can only be performed by specially trained and qualified service personnel.

F Industrial Truck Maintenance

1 Operational Safety and Environmental Protection

The servicing and inspection duties contained in this chapter must be performed in accordance with the intervals indicated in the maintenance checklists.



Any modification to the forklift truck assemblies, in particular the safety mechanisms, is prohibited. Do not alter the trucks' operating speeds under any circumstances.



Only original spare parts have been certified by our quality assurance department. To ensure safe and reliable operation of the truck, use only the manufacturer's spare parts. Used parts, oils and fuels must be disposed of in accordance with the relevant environmental protection regulations. For oil changes, contact the manufacturer's specialist department.

Upon completion of inspection and servicing, the tasks contained in the "Recommissioning" section must be performed (see chapter F).

2 Maintenance Safety Regulations

Maintenance personnel: Industrial trucks must only be serviced and maintained by the manufacturer's trained personnel. The manufacturer's service department has field technicians specially trained for these tasks. We therefore recommend a maintenance contract with the manufacturer's local service centre.

Lifting and jacking up: When an industrial truck is to be lifted, the lifting gear must only be secured to the points specially provided for this purpose. When jacking up the truck, take appropriate measures to prevent the truck from slipping or tipping over (e.g. wedges, wooden blocks). You may only work underneath a raised load handler if it is supported by a sufficiently strong chain.

Cleaning: Do not use flammable liquids to clean the industrial truck. Prior to cleaning, implement all necessary safety measures to prevent sparking (e.g. through short circuits). For battery-operated trucks, the battery connector must be removed. Only weak suction or compressed air and non-conductive antistatic brushes may be used for cleaning electric or electronic assemblies.



If the truck is to be cleaned with a water jet or a high-pressure cleaner, all electrical and electronic components must be carefully covered beforehand as moisture can cause malfunctions.

Do not clean with pressurised water.

After cleaning the truck, carry out the activities detailed in the "Recommissioning" section.

Electrical System: Only suitably trained personnel may operate on the truck's electrical system. Before working on the electrical system, take all precautionary measures to avoid electric shocks. For battery-operated trucks, also de-energise the truck by removing the battery connector.

Welding: To avoid damaging electric or electronic components, remove these from the truck before performing welding operations.

Settings: When repairing or replacing hydraulic, electric or electronic components or assemblies, always note the truck-specific settings.

Tyres: The quality of tyres affects the stability and performance of the truck. When replacing factory fitted tyres only used original manufacturer's spare parts, as otherwise the data plate specifications will not be kept. When changing wheels and tyres, ensure that the truck does not slew (e.g. when replacing wheels always left and right simultaneously).

Lift chains: Lift chains wear rapidly if not lubricated. The intervals stated in the service checklist apply to normal duty use. More demanding conditions (dust, temperature) require more regular lubrication. The prescribed chain spray must be used in accordance with the instructions. Applying grease externally will not provide sufficient lubrication.

Hydraulic hoses: The hoses must be replaced every six years. When replacing hydraulic components, also replace the hoses in the hydraulic system.

3 Servicing and Inspection

Thorough and expert servicing is one of the most important requirements for the safe operation of the industrial truck. Failure to perform regular servicing can lead to truck failure and poses a potential hazard to personnel and equipment.



The service intervals stated are based on single shift operation under normal operating conditions. They must be reduced accordingly if the truck is to be used in conditions of extreme dust, temperature fluctuations or multiple shifts.

The following maintenance checklist states the tasks and intervals after which they should be carried out. Maintenance intervals are defined as:

W = Every 50 service hours, at least weekly

A = Every 500 service hours,

B = Every 1000 service hours, or at least annually

C = Every 2000 service hours, or at least annually



W service intervals are to be performed by the customer.

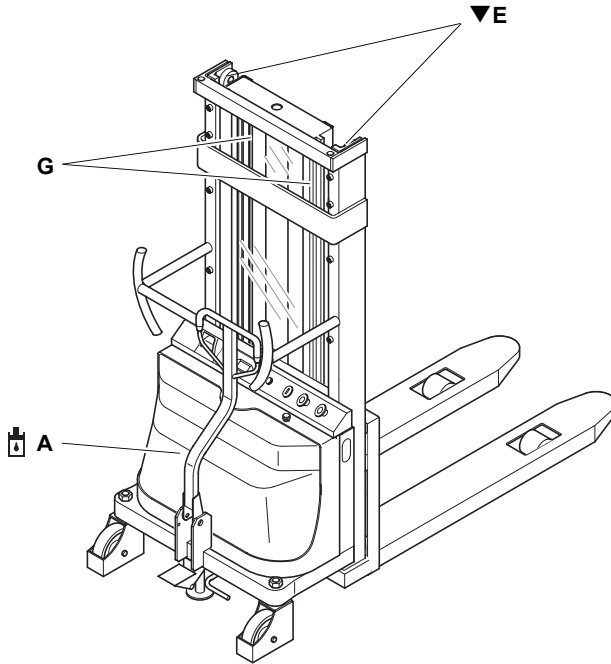
During the run-in period – after approx. 100 service hours – the owner must check the wheel nuts/bolts and re-tighten if necessary.

4 Maintenance checklist

Maintenance Intervals

			Standard = ●	W	A	B	C
			Cold store = *				
Chassis/ Super- structure:	1.1	Check all load bearing components for damage				●	
	1.2	Check screw connections				●	
Wheels:	3.1	Check wheels for wear and damage	●				
	3.2	Check suspension and attachment	*			●	
Steering:	4.1	Check slack				●	
Brake system:	5.1	Test operation and settings	*			●	
	5.2	Test recuperating function				●	
	5.3	Check the brake lining wear					●
Hydraulic System:	6.1	Test operation	*			●	
	6.2	Check unions and connections for leaks and damage	*			●	
	6.3	Check hydraulic cylinder for leaks and damage and make sure it is secure	*			●	
	6.5	Replace hydraulic oil			*		●
	6.6	Test operation of pressure relief valves			*		●
Electrical system:	7.1	Test operation				●	
	7.2	Make sure wire connections are secure and check for damage				●	
	7.3	Check fuse ratings					●
	7.4	Test switches and trip cams and make sure they are secure				●	
	7.5	Check contactors and relays; if necessary replace any worn parts				●	
	7.6	Test all warning devices and safety switches.	*			●	
Battery:	9.1	Check acid density, acid level and cell voltage	*			●	
	9.2	Check terminals are securely attached, and apply grease	*			●	
	9.3	Clean battery connections, make sure they are tight	*			●	
	9.4	Check battery cables for damage, replace if necessary.				●	
Mast:	10.1	Visually inspect rollers, slide pieces and stops	*			●	
	10.2	Check forks and fork carriage for wear and damage	*			●	
	10.3	Check mast attachment				●	
	10.4	Check lift chains and guides for wear, adjust and lubricate.				●	
	10.5	Check lateral slack and ensure mast sections are parallel					●
	10.6	Check protective mechanisms for damage and make sure they are secure	*			●	
Lubri- cation:	11.1	Lubricate truck in accordance with Lubrication Schedule.	*			●	
General measure- ments:	12.1	Check electrical system for frame leakage					●
	12.2	Test lift and lowering speeds					●
	12.3	Test safety devices and cutouts				●	
Demon- stration:	13.1	After carrying out maintenance, present the truck to the supervisor.	*			●	

5 Lubrication Schedule



Contact surfaces



Hydraulic oil filler neck

5.1 Consumables

Handling consumables: Consumables must always be handled correctly. Follow the manufacturer's instructions.



Improper handling is hazardous to health, life and the environment. Consumables must only be stored in appropriate containers. They may be flammable and must therefore not come into contact with hot components or naked flames.

Only use clean containers when filling up with consumables. Do not mix consumables of different grades. The only exception to this is when mixing is expressly stipulated in the Operating Instructions.

Avoid spillage. Spilled liquids must be removed immediately with suitable bonding agents and the bonding agent / consumable mixture must be disposed of in accordance with regulations.

Code	Order no.	Package quantity	Description	Used for
A	50 449 669	5.0 l	HLP-B 46	Hydraulic systems
E	29 201 430	1.0 kg	Grease, DIN 51825	Lubrication
G	29 201 280	0.51 l	Chain spray	Chains

Code	Saponification	Dew point °C	Worked penetr. at 25°C	NLG1 class	Application temperature °C
E	Lithium	185	265 - 295	2	-35 / +120

6 Maintenance Instructions

6.1 Preparing the truck for maintenance and repairs

All necessary safety measures must be taken to avoid accidents when carrying out maintenance and repairs. The following preparations must be made:

- Park the truck securely (see Chapter E).
- Disconnect the battery to prevent the truck from being switched on accidentally

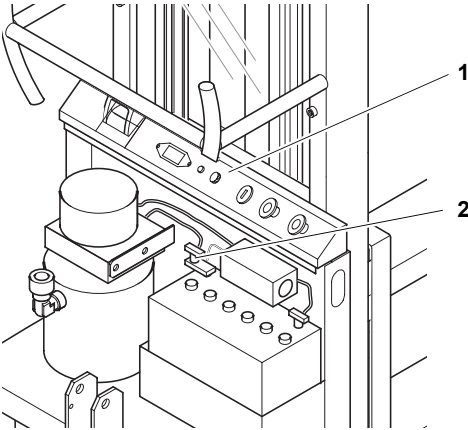


When working under a raised lift truck, secure it to prevent it from tipping or sliding away. When raising the truck also refer to the instructions in the “Transport and Commissioning” section.

When working on the parking brake, prevent the truck from rolling away.

6.2 Checking electrical fuses

- Prepare the truck for maintenance (see Chapter 6.1).
- Remove panel.
- Check all fuse ratings in accordance with the table; replace if necessary.



Item	Description	To protect:	HC
1	F1	Control fuse	8 A
2	2F1	Power fuse	250 A

6.3 Recommissioning

The truck may only be restored to service after cleaning or repair work, once the following operations have been performed.

- Test EMERGENCY DISCONNECT connector.
- Test brakes.
- Lubricate the truck in accordance with the maintenance schedule.

7 Decommissioning the industrial truck

If the industrial truck is to be decommissioned for more than six months, e.g. for operational reasons, it must be parked in a frost-free and dry location and all necessary measures must be taken before, during and after decommissioning as described.



On decommissioning the truck must be jacked up so that all the wheels are clear of the ground. This is the only way of ensuring that the wheels and wheel bearings are not damaged.

If the truck is to be out of service for more than 6 months, further measures must be taken in consultation with the manufacturer's service department.

7.1 Prior to decommissioning:

- Thoroughly clean the truck.
- Check the brakes.
- Check the hydraulic oil level and replenish as necessary (see Chapter F).
- Apply a thin layer of oil or grease to any non-painted mechanical components.
- Lubricate the truck in accordance with the maintenance schedule (see Chapter F).
- Charge the battery (see Chapter D).
- Disconnect the battery, clean it and apply grease to the terminals.



In addition, follow the battery manufacturer's instructions.

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

7.2 During decommissioning:

Every 6 months:

- Charge the battery (see Chapter D).



Battery powered trucks:

The battery must be re-charged at regular intervals, otherwise it will automatically discharge resulting in depletion which in turn will damage the battery.



If the battery undergoes a constant compensation charge it will not need to be charged every 6 months to prevent depletion.

7.3 Returning the truck to operation after decommissioning

- Thoroughly clean the truck.
- Lubricate the truck in accordance with the maintenance schedule (see Chapter F).
- Clean the battery, grease the terminals and connect the battery.
- Charge the battery (see Chapter D).
- Check hydraulic oil for condensed water and replace if necessary.
- Start up the truck (see Chapter E).



Battery powered trucks:

If there are switching problems in the electrical system, apply contact spray to the exposed contacts and remove any oxide layers on the contacts of the operating controls by applying them repeatedly.



Test the brakes immediately as soon as the truck has been commissioned.

8 Safety checks to be performed at regular intervals and following any unusual incidents



Carry out a safety check in accordance with national regulations. Junheinrich recommends checks in accordance with FEM Guideline 4.004. Jungheinrich has a special safety department with trained personnel to carry out such checks.

The truck must be inspected at least annually (refer to national regulations) or after any unusual event by a qualified inspector. The inspector shall assess the condition of the truck from purely a safety viewpoint, without regard to operational or economic circumstances. The inspector shall be sufficiently instructed and experienced to be able to assess the condition of the truck and the effectiveness of the safety mechanisms based on the technical regulations and principles governing the inspection of forklift trucks.

A thorough test of the truck must be undertaken with regard to its technical condition from a safety aspect. The truck must also be examined for damage caused by possible improper use. A test report shall be provided. The test results must be kept for at least the next 2 inspections.

The owner is responsible for ensuring that faults are immediately rectified.



A test plate is attached to the truck as proof that it has passed the safety inspection. This plate indicates the due date for the next inspection.

9 Final de-commissioning, disposal



Final, proper decommissioning or disposal of the truck must be performed in accordance with the regulations of the country of application. In particular, regulations governing the disposal of batteries, fuels and electronic and electrical systems must be observed.