

EP中力

ES10-10WA/ES12-12WA

ES14-14WA/ES16-16WA

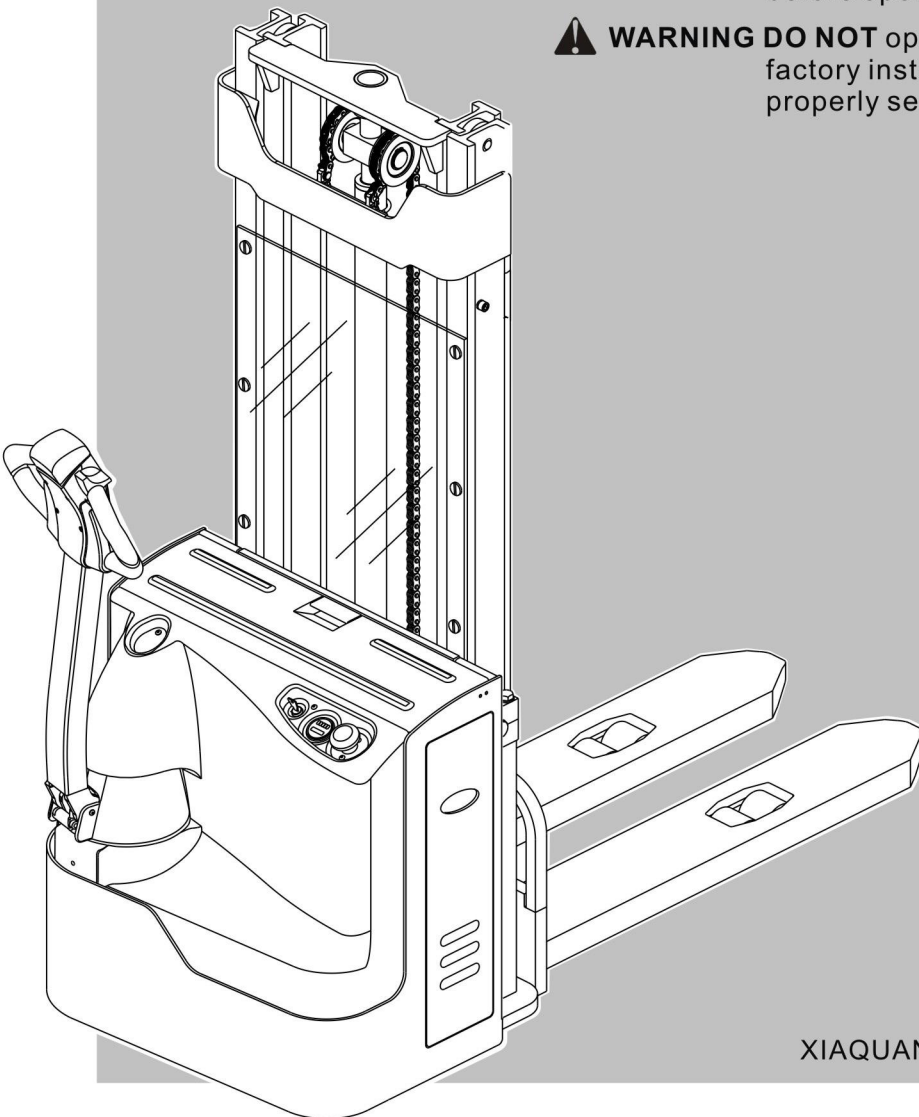
ES20-WA

Electric Pallet Stacker

Operation Manual

⚠ WARNING Read and observe all warnings on this unit before operating it

⚠ WARNING **DO NOT** operate this equipment unless all factory installed guards and shields are properly secured in place



CE CERTIFICATE

EP EQUIPMENT CO.,LTD.
XIAQUAN,DIPU,ANJI,ZHEJIANG CHINA



EP EQUIPMENT CO.,LTD. is one of the world's leading companies manufacture, design material handling equipment and provide related service. With over 100,000m² plant it produces over 100,000 trucks per year, and provides professional, effective and optimized material handling solutions worldwide, until now it has developed three major kinds of business:

- Material handling equipment: Focus on electric forklift and warehouse equipment
- OEM parts: Global parts supply
- Inow industry,online: One stop industrial products supply

Guided by our customer-oriented concept, EP has developed service centers in more than 30 countries around the world, from which customers are able to receive timely local service. Moreover, 95% of warranty parts can be shipped out within 24 hours after been ordered. Through our online after-sales service system, customers can process their warranty claims, order spare parts and consult the operation manuals, maintenance materials and spare parts catalogs.

With business all over the world, EP has thousands of employees and hundreds of agents worldwide to provide our global customers with prompt local service.

Based on the concept of sharing economy , EP also offer rental service for various logistics equipment. Adhering to the idea “Making the leasing of logistic equipment more simple”, EP is devoted to providing customized one-stop leasing solutions for our customers with our high quality, reasonable price and prompt rental service.

EP's mission&vision is “ Let more people apply the electrical material handling equipment to relieve the intensity of labour” and “Let's grow together”.

EP EQUIPMENT CO., LTD
Address: XIAQUAN, DIPU, ANJI,
ZHEJIANG, CHINA
Tel: + 86-0571-28023920
Fax: + 86-0571-28035616
Website: www.ep-ep.com
Email: service@ep-ep.com

Foreword

The present original operating instructions are designed to provide sufficient instruction for the safe operation and maintenance of the truck. Please be sure to read this operator manual carefully if you are operator or are in charge of the truck, before you operate and service the truck. Only in this way can you protect yourself and make the truck play a role as much as possible.

Our trucks are subject to ongoing development, so maybe there are some differences between your product and the description in this manual. And the operator manual details will be different because of customer's special requirements.

If you have any questions ,please keep in touch with the sales department or let the dealer know.

Notes:

1. This manual is used for operation and maintenance , the detail parameters, size and specifications in context is only for reference , the real parameters will depend on sale files.
2. Manual pictures for reference only, the real car shall prevail, and shall not affect the manual use.
3. Manual pictures only sign for one of the models in this series models.

Catalog

Correct use and application	1
Chapter 1 stacker Description	2
1 Application.....	2
2 Assemblies.....	3
3 Standard Version Specifications.....	4
3.1 Performance data for standard stackers.....	4
3.2 Dimensions.....	4
3.3 Conditions of use.....	8
4. Identification points and data plates.....	8
4.1 stacker data plate.....	10
4.2 Capacity chart.....	10
Chapter 2 Operation	11
1 Safety Regulations for the Operation of stacker.....	11
2 Controls and Displays.....	12
3 Starting up the stacker.....	14
4 Industrial stacker operation.....	14
4.1 Safety regulations for stacker operation.....	14
4.2 Travelling, Steering, Braking.....	15
4.3 Collecting and depositing loads.....	17
5 Parking the stacker securely.....	18
6 Display instrument.....	18
6.1 Battery Discharge Indicator.....	18
6.2 Operating hours display.....	18
6.3 Power up test.....	19
7 Troubleshooting.....	19
Chapter 3 Battery Maintenance, Charging & Replacement	20
1 Safety regulations for handling acid batteries.....	20
2 Battery specifications.....	20
3 Exposing the battery.....	21
4 Charging the battery.....	21
5 Battery removal and installation.....	22
Chapter 4 stacker Maintenance	24
1 Operational safety and environmental protection.....	24
2 Maintenance Safety Regulations.....	24
3 Servicing and inspection.....	25
4 Maintenance Checklist.....	26
5 Lubrication Schedule.....	28
5.1 Fuels, coolants and lubricants.....	29
6 Maintenance Instructions.....	30
6.1 Prepare the stacker for maintenance and repairs.....	30

6.2 Removing the front panel.....	30
6.3 Remove the drive panel.....	30
6.4 Replacing the drive wheel.....	31
6.5 Checking the hydraulic oil level.....	31
6.6 Check transmission oil level.....	31
6.7 Flushing the gauze filter, Replacing the gauze filter.....	32
6.8 Checking electrical fuses.....	33
6.9 Recommissioning.....	34
7 Decommissioning the industrial stacker.....	34
7.1 Prior to decommissioning.....	34
7.2 During decommissioning.....	34
7.3 Restoring the stacker to operation after decommissioning.....	35
8 Safety checks to be performed at regular intervals and following any unusual incidents	35
9 Final de-commissioning, disposal.....	36

Correct use and application

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

The stacker described in the present operator manual is an industrial stacker designed for lifting and transporting load units.

It must be used, operated and serviced in accordance with the present instructions. Any other type of use is beyond the scope of application and can result in damage to personnel, the stacker or property. In particular, avoid overloading the stacker with loads which are too heavy or placed on one side. The data plate attached to the stacker or the load diagram are binding for the maximum load capacity. The industrial stacker 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 stacker 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 stacker, is charged with operational duties.

The proprietor must ensure that the stacker 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 proprietor must ensure that all stacker users have read and understood this operator manual.

Failure to comply with the operator manual shall invalidate the warranty. The same applies if improper work is carried out on the stacker 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 supplements the performance of the industrial stacker 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.

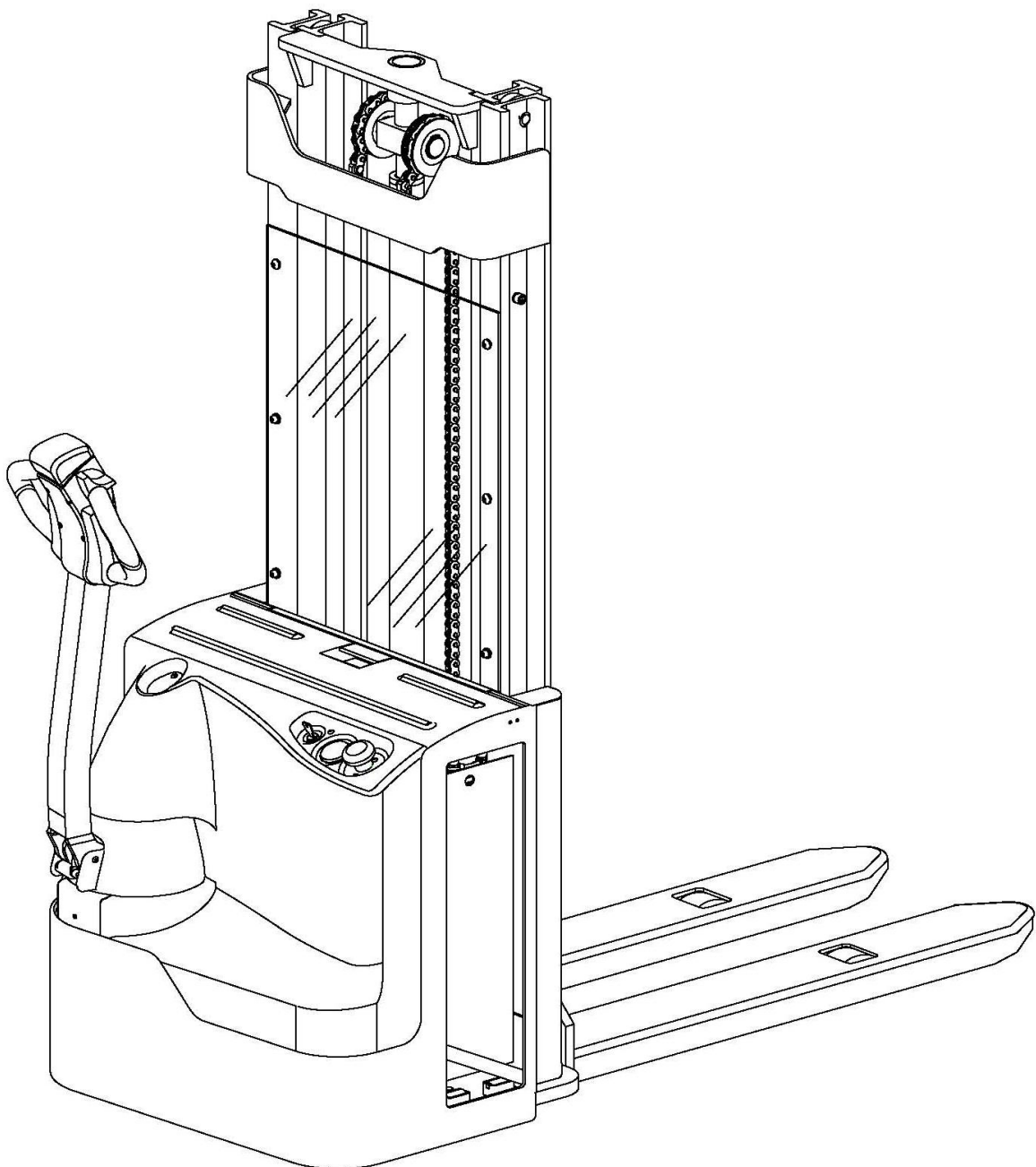
Chapter 1 stacker Description

1 Application

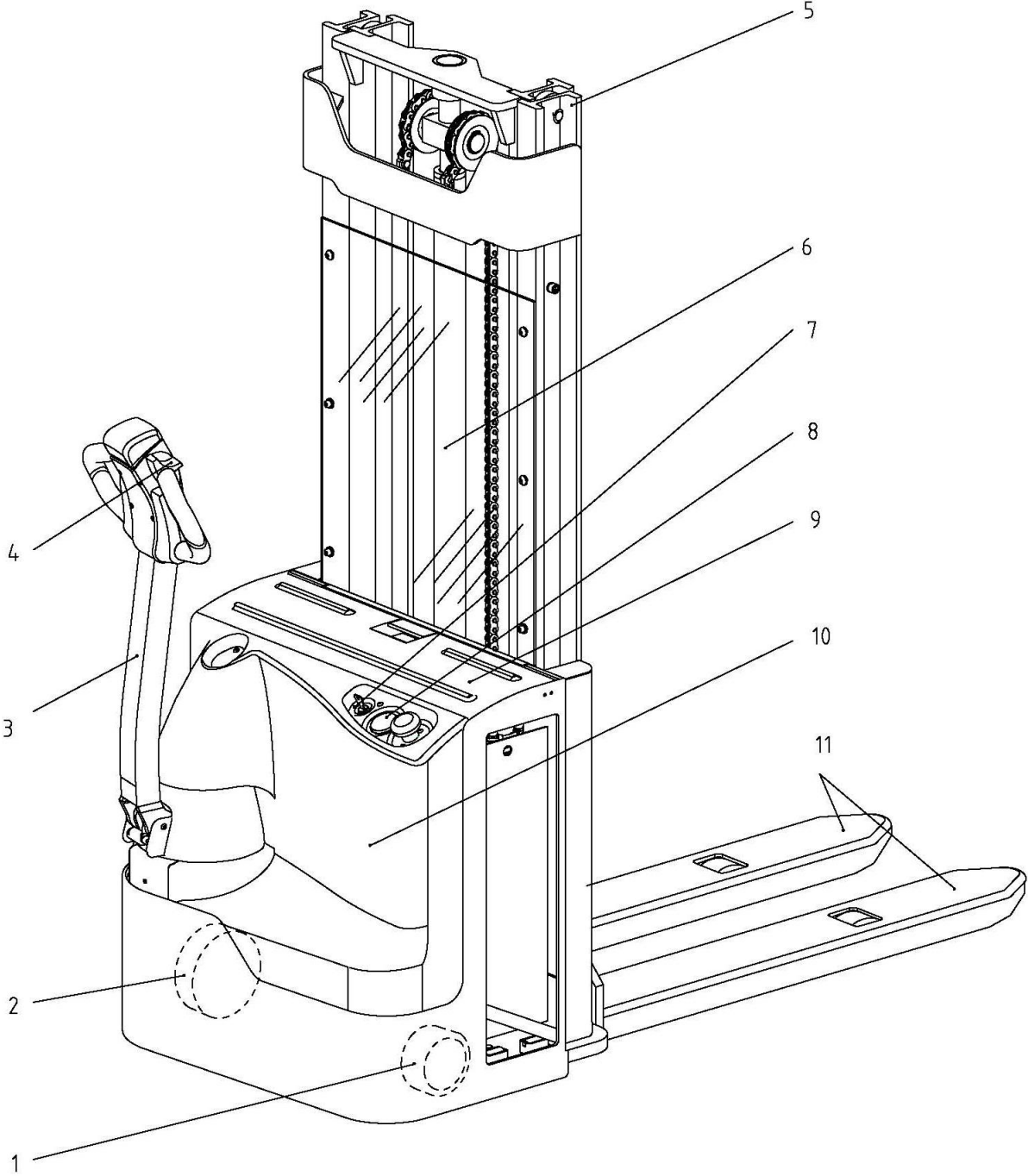
The stacker is a four wheel, tiller guided electric stacker with a steered drive wheel. It is designed for use on level floors to lift and transport palletised goods. Open bottom pallets or roll cages can be lifted.

The capacity can be obtained from the data plate.

The capacity with respect to lift height and load center of gravity is indicated on the capacity plate.



2 Assemblies



Item	Component	Item	Component
1	Caster wheel	7	Key switch
2	Drive wheel	8	Battery display instrument
3	Tiller and tiller arm	9	Battery panel
4	Controller	10	Front panel
5	Mast	11	Lift mechanism
6	Mast guard		

3 Standard Version Specifications

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

3.1 Performance data for standard stackers

Item	Description	ES10-10WA	ES12-12WA	ES14-14WA	ES16-16WA	ES20-WA	Unit	
Q	Rated capacity	1000	1200	1400	1600	2000	kg	
C	Load center distance Standard fork length	600						mm
	Travel speed, laden/ unladen	5/5.5				4.5/5.0	km/h	
	Lifting speed, laden/ unladen	0.10/0.16		0.13/0.16		0.11/0.16	m/s	
	Lowering speed, laden/ unladen	0.19/0.18		0.22/0.13		0.32/0.23 (high-speed)	m/s	
						0.16/0.12 (low-speed)		
	Maximum gradeability, laden/ unladen S2 5 min.	8/16				6/12	%	

3.2 Dimensions

	Description	ES10-10WA	ES12-12WA	ES14-14WA	ES16-16WA	ES20-WA	Unit
h1	Height	1970		2030		2020	mm
h2	Free lift	100					mm
h3	Lift (mast-dependent)	3000					mm
h4	extended mast height (mast-dependent)	3420		3465			mm
h13	Load fork lowered	90				88	mm
h14	Tiller height in min/max travel position	825/1225				715/ 1200	mm
y	Wheelbase	1225		1305		1305	mm
l1	Overall length	1826		1940		1940	mm
l2	Length incl. fork shank	676		787		787	mm
b1	stacker width	800					mm
b5	Distance between	550				600	mm

	forks, outer				
m2	Ground clearance	30			mm
Ast	Aisle width ¹⁾ , 1000×1200 pallet crossways	2333	2465		mm
Ast	Aisle width ¹⁾ , 800×1200 pallet lengthways	2303	2440		mm
Wa	Turning radius in shunt mode	1463	1589		mm
b10	Track width, operator side	538			mm
b11	Track width, Load side	380	360	380	mm
s/e/l	Fork dimension	60×170×1150		60×190×1150	mm
x	Load distance (Raised/Lowered)	688	693		mm

¹⁾ Including safety distance a = 200 mm

ES10-10WA / ES12-12WA

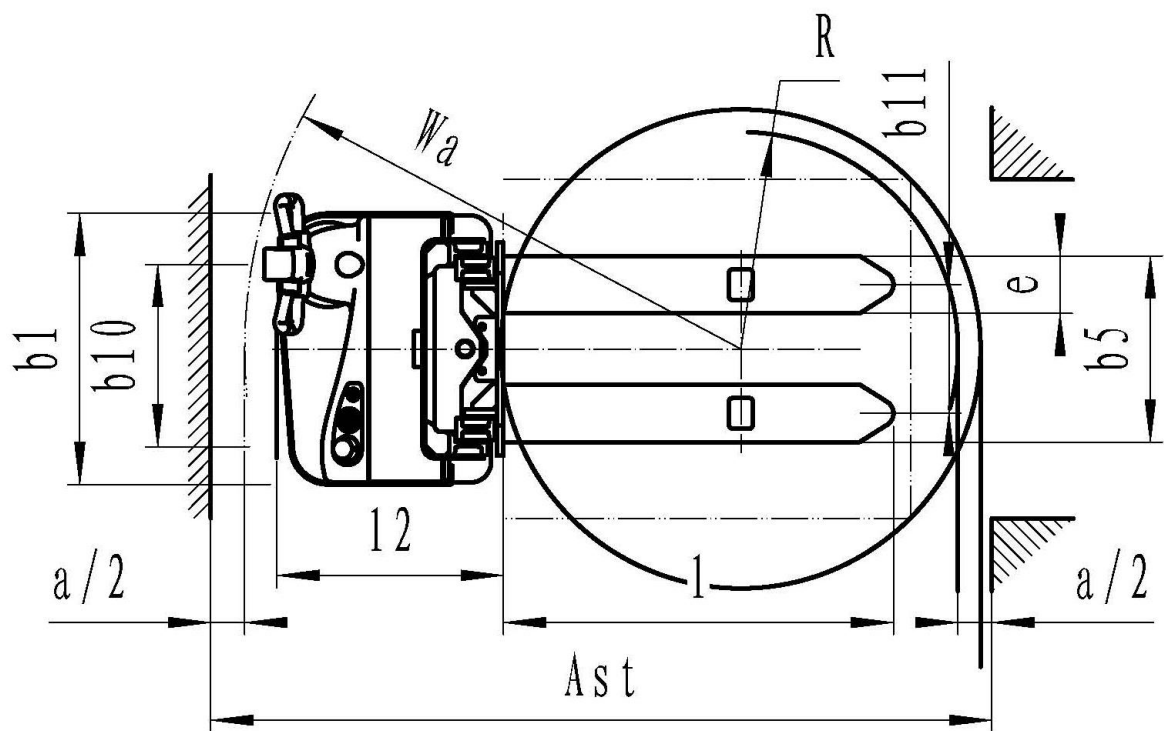
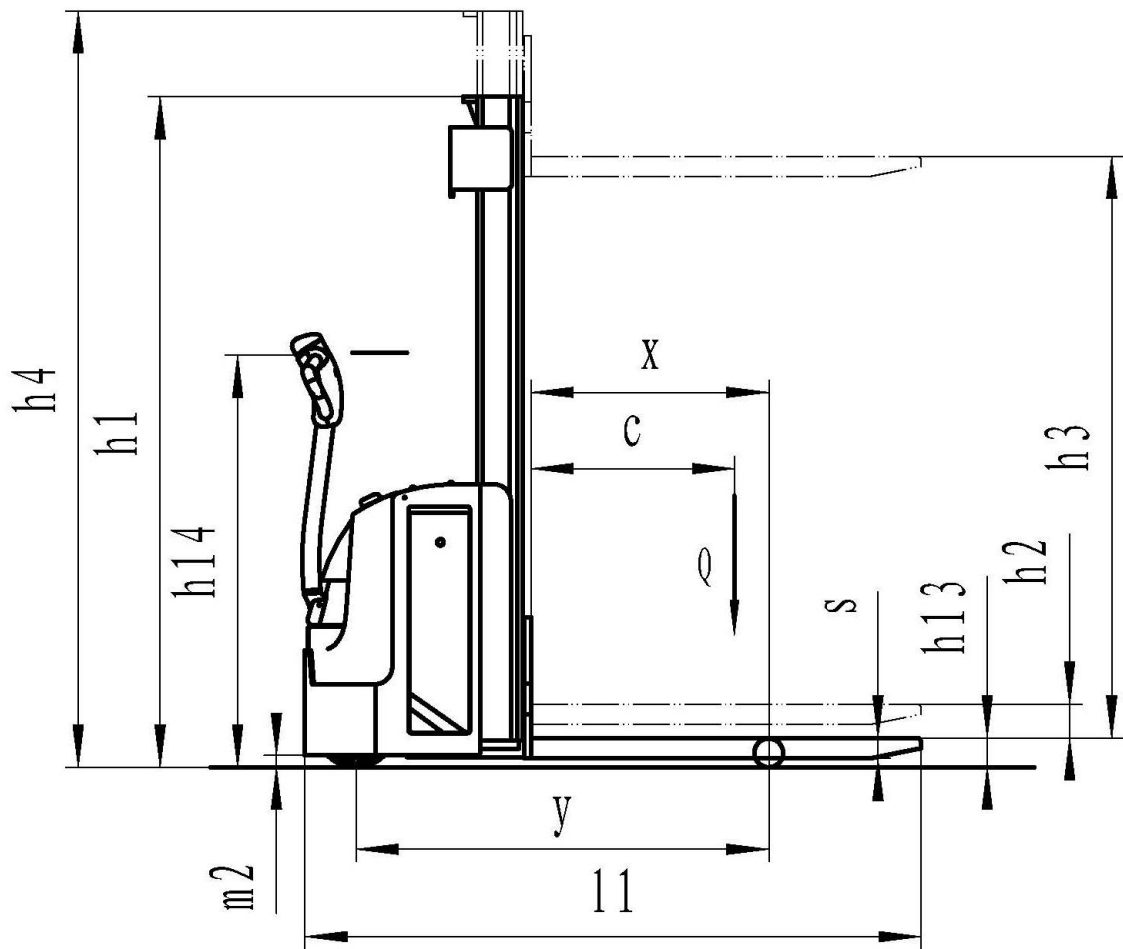
Standard Mast Types (mm)				
Mast types	Close Mast height	Free height	lift height	Extended Mast Height
	h1	h2	h3	h4
Two Stage Mast	1720	100	2430 (2500)	2900
	1820	100	2630 (2700)	3100
	1970	100	2930 (3000)	3400
	2120	100	3230 (3300)	3700
	2270	100	3530 (3600)	4000
	2420	100	3830 (3900)	4300
	2550	100	4090 (4200)	4560
Two Stage Mast (Free Lifting)	1819	1320	2620 (2700)	3119
	1969	1470	2920 (3000)	3419
	2119	1620	3220 (3300)	3719
Three Stage Mast (Free Lifting)	1822	1390	3990 (4000)	4460
	2022	1590	4490 (4500)	4960
	2122	1690	4790 (4800)	5260

ES140-14WA / ES16-16WA

Standard Mast Types (mm)				
Mast types	Close Mast height	Free height	lift height	Extended Mast Height
	h1	h2	h3	h4
Two Stage Mast	1870	100	2650 (2700)	3165
	2020	100	2950 (3000)	3465
	2170	100	3250 (3200)	3765
	2320	100	3550 (3600)	4065
Three Stage Mast (Free Lifting)	1830	1390	3990 (4000)	4470
	2022	1590	4490 (4500)	4970

ES20-WA

Standard Mast Types (mm)				
Mast types	Close Mast height	Free height	lift height	Extended Mast Height
	h1	h2	h3	h4
Two Stage Mast	1870	100	2650 (2700)	3165
	2020	100	2950 (3000)	3465
	2170	100	3250 (3200)	3765
	2320	100	3550 (3600)	4065
Three Stage Mast (Free Lifting)	1830	1390	3990 (4000)	4470
	2022	1590	4490 (4500)	4970



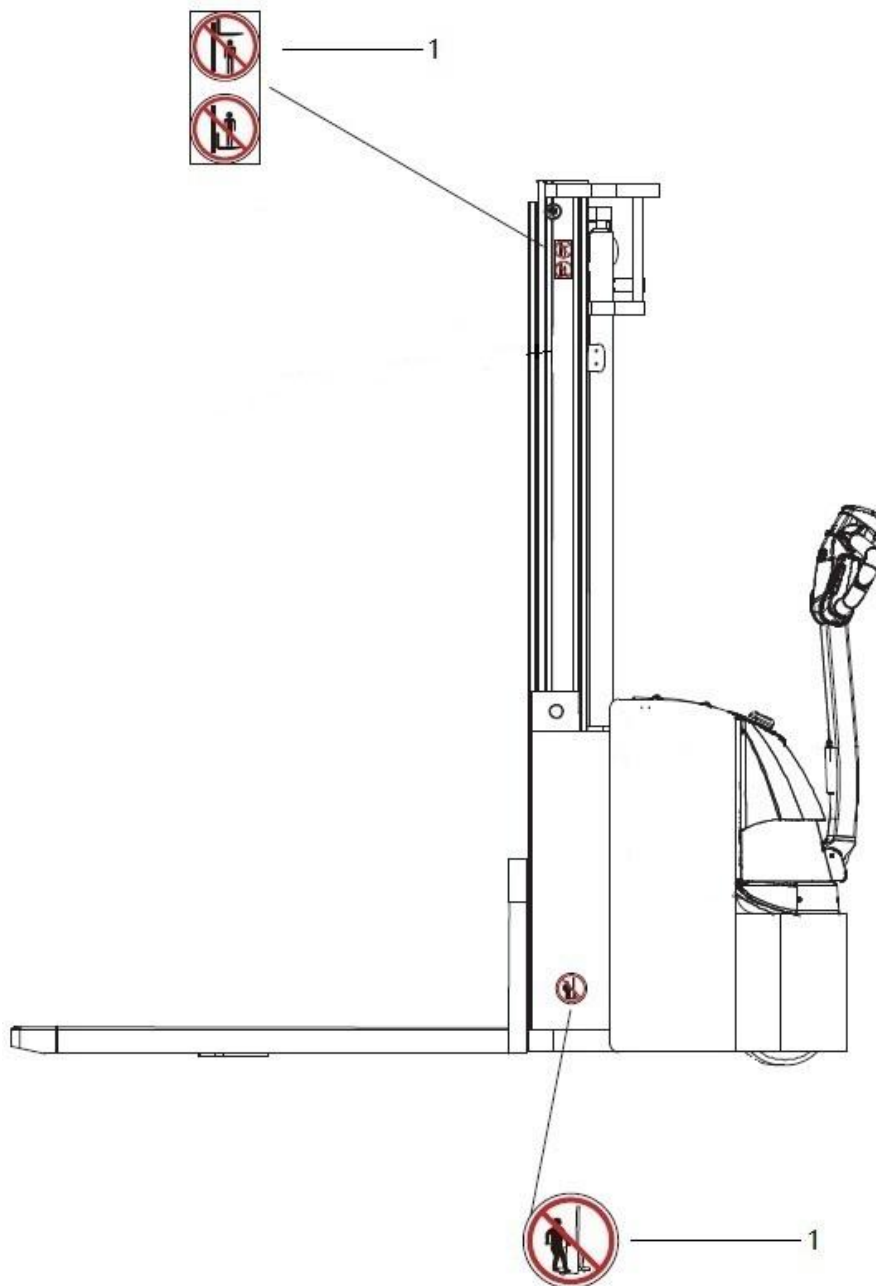
3.3 Conditions of use

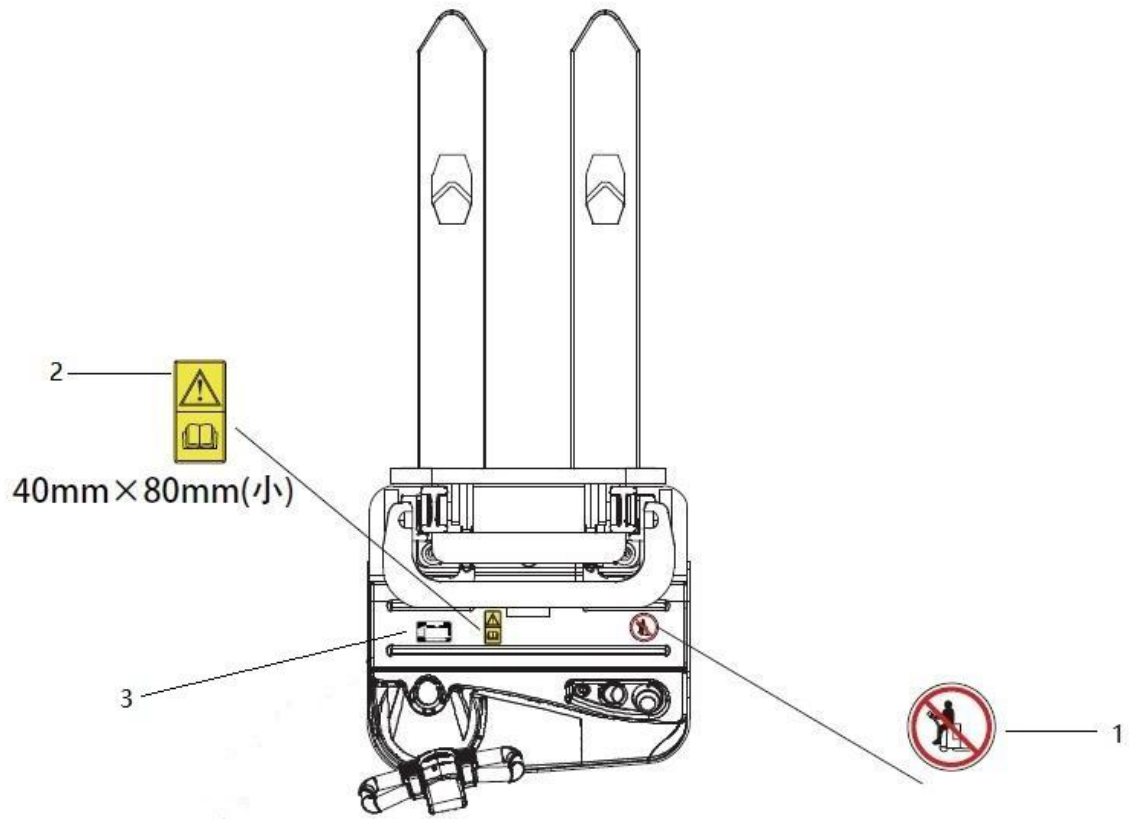
Ambient temperature

- operating at 5 °C to 40 °C

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

4. Identification points and data plates





Item	Description
1	Warning decal
2	Refer to manual decal
3	Truck data plate

4.1 stacker data plate

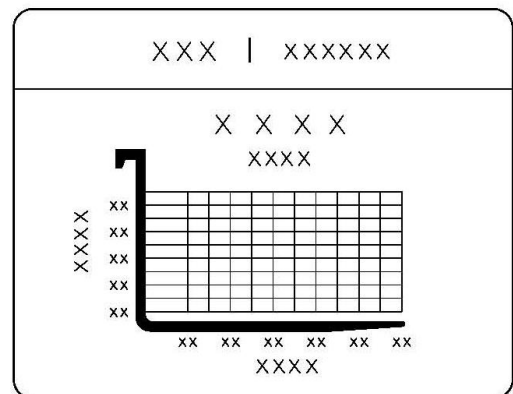
1	[Manufacturer]			
2	PRODUCT NAME			
3	MODEL TYPE			
4	SERIAL NO.		RATED CAPACITY	kg
5	MANUFACTURE DATE		LOAD CENTER	mm
6	UNLADEN MASS WITH BATTERY			kg
7	UNLADEN MASS WITHOUT BATTERY			kg
8	BATTERY VOLTAGE	V	MAX BATTERY WEIGHT	kg
9	RATED DRIVE POWER	kW	MIN BATTERY WEIGHT	kg
		LIFT HEIGHT	LOAD CENTER DISTANCE	CAPACITY
10	MAX CAPACITY	mm	mm	kg
11	MAX LIFT HEIGHT	mm	mm	kg

Item	Description	Item	Description
1	Manufacturer	9	Rated drive power
2	Product name	10	Max capacity
3	Model type	11	Max lift height
4	Serial NO.	12	Rated capacity
5	Manufacture date	13	Load center

For queries regarding the truck or ordering spare parts please quote the truck serial number(4).

4.2 Capacity chart

The chart given above shows the relation between the load center and the weight of loads.



Chapter 2 Operation

1 Safety Regulations for the Operation of stacker

Driver authorization: The stacker 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 stacker 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 stacker and shall be familiar with the operator manual. The driver shall be afforded all due rights. Safety shoes must be worn with pedestrian operated stackers.

Unauthorised Use of stacker: The driver is responsible for the stacker during the time it is in use. He shall prevent unauthorised persons from driving or operating the stacker. It is forbidden to carry passengers or lift personnel.

Damage and Faults: The supervisor must be immediately informed of any damage or faults to the stacker. stackers not safe 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 stacker without the necessary training and authorisation to do so. The driver must never disable or adjust safety mechanisms or switches.

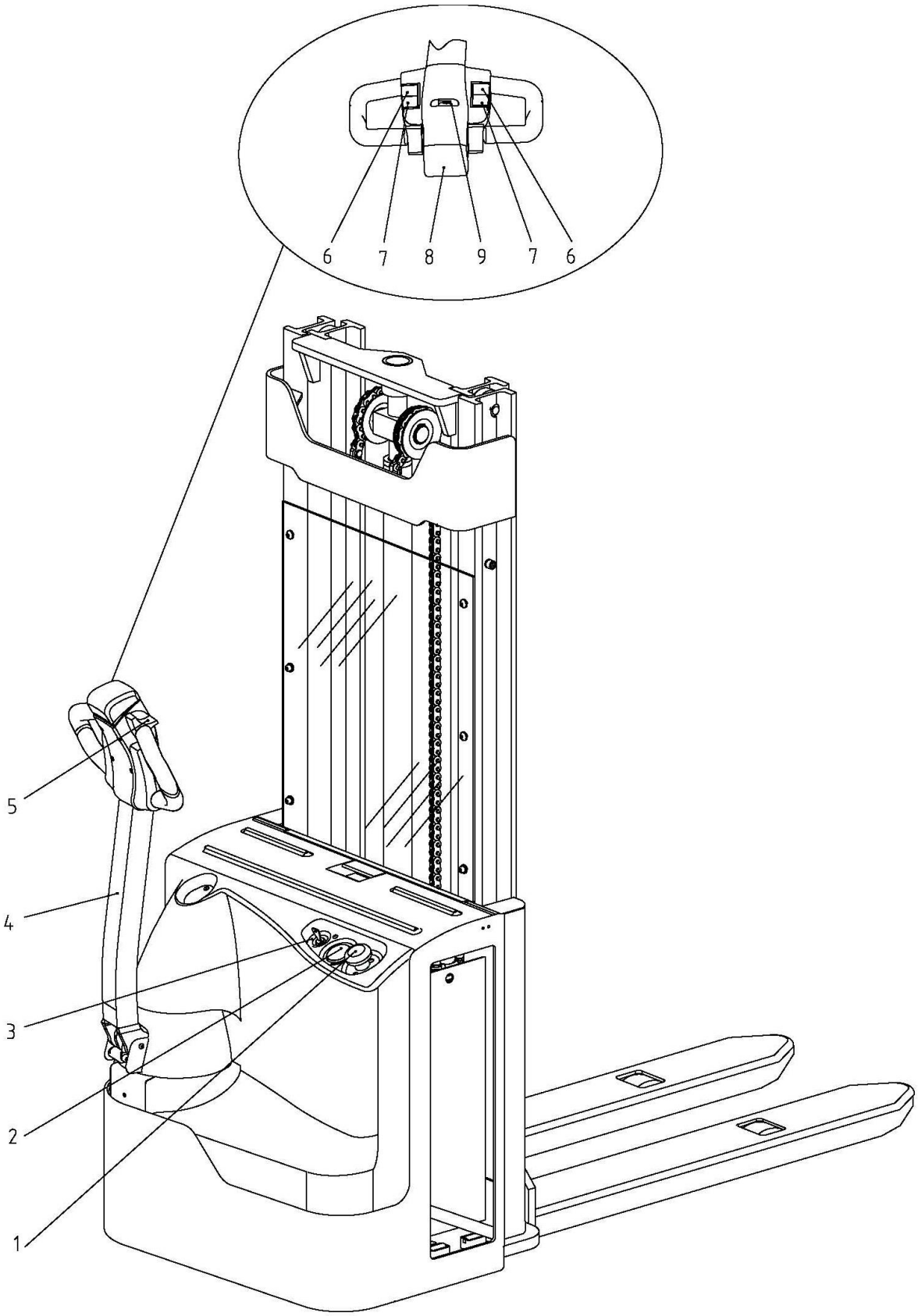
Hazardous area: A hazardous area is defined as the area in which a person is at risk due to stacker movement, lifting operations, the load handler (e.g. forks or attachments) or the load itself. This also includes areas which can be reached by falling loads or lowering operating equipment.

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 stacker 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	Emergency Stop	The circuit is interrupted, all electrical functions are cut out. The stacker automatically brakes.
2	battery display instrument	Operating hours meter. Battery charge status.
3	Switch switch	Switches control current on and off. Removing the key prevents the stacker from being switched on by unauthorised personnel.
4	Tiller	Is used to steer the stacker.
5	Controller	Controls travel direction and speed.
6	Load fork lower switch	Lowers the forks.
7	Load fork raise switch	Raises the forks.
8	Collision safety switch	stacker moves away from the operator and stops.
9	Warning signal(horn) button	Triggers a warning signal.



3 Starting up the stacker

Before the stacker can be commissioned, operated or a load unit 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 stacker (in particular wheels and load handler) for obvious damage.
- Visually inspect the battery attachment and cable connections.

Switching on the stacker

Make sure the battery is connected

Insert the key in the key switch (3), and turn it to the right as far as it will go,

Test the warning signal switch (9).

The stacker is now operational.

The battery charge / discharge indicator (2) shows the available battery capacity.

Test the braking operation of the tiller (4) (see section 4.2).

4 Industrial stacker operation

4.1 Safety regulations for stacker operation

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

Driving conduct: The driver must adapt the travel speed to local conditions. The stacker 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 stacker and the vehicle in front and must be in control of the stacker 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 which affect visibility must be stored at the rear of the stacker. If this is not possible, a second person must walk in front of the stacker as a lookout.

Negotiating slopes and inclines: Negotiating slopes or inclines is only permitted if such roads are clean and have a non-slip surface and providing such journeys are safely undertaken in accordance with the technical specifications for the stacker in question. The stacker must always be driven with the load unit facing uphill. The industrial stacker 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 stacker traffic by the owner . The driver must satisfy himself of the above before entering these areas. The stacker 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 stacker must only enter the lift after the stacker has come to a rest and must leave the lift before the stacker.

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.

4.2 Travelling, Steering, Braking

Never carry passengers.

Emergency Stop

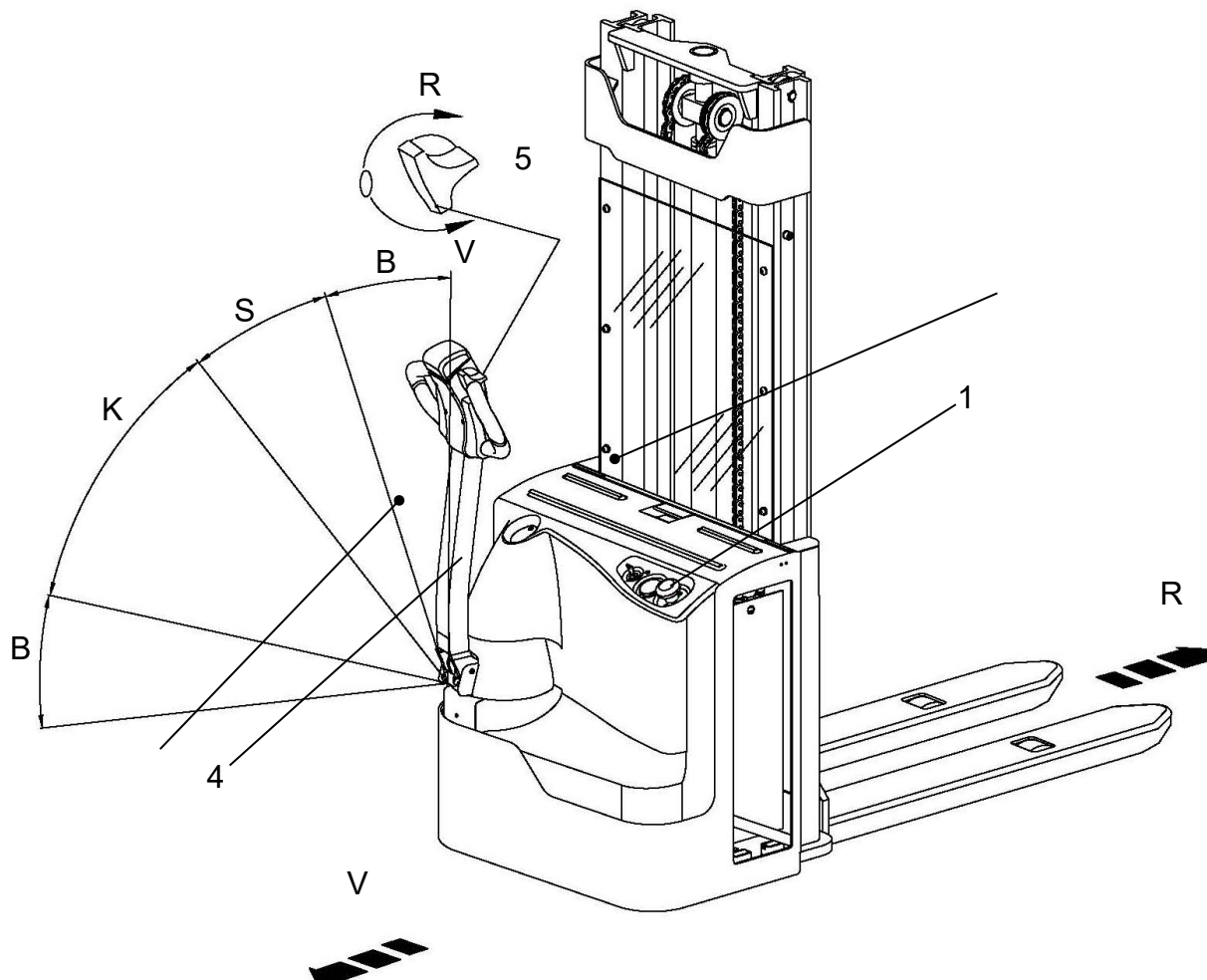
press the Emergency Stop button(1)。

All electrical functions are deactivated.

Automatic braking

Automatic braking occurs when the tiller is released – the tiller automatically sets itself to the upper brake zone (B).

If the tiller moves slowly to the upper brake zone, the cause of this fault must be rectified. If necessary, replace the gas pressure spring.



Travel

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

Driving in low speed

Set the tiller (4) to the travel range (s), and press the travel switch (5) in the desired direction (fwd. or rev.).

The more the tiller rotates, the speed is faster.

Driving in high speed

Set the tiller (4) to the travel range (k), and press the travel switch (5) in the desired direction (fwd. or rev.).

The more the tiller rotates, the speed is faster.

Steering

– Apply the tiller (4) to the left or right.

Braking

The braking pattern of the stacker depends largely on the track conditions. The driver must take this into account when operating the stacker.

Braking with the Service Brake:

- Set the tiller (4) up or down to one of the brake zones (B).

The service brake is the generator brake. Only when this brake fails to achieve the necessary brake force is the mechanical brake applied.

Plugging:

- You can set the travel switch (5) to the opposite direction when traveling.
- The stacker braked regeneratively until it starts to move in the opposite direction.

Braking with the Coasting Brake:

If the travel switch is set to 0, the stacker automatically brakes regeneratively.

Driving on inclines

Loads must always be carried on the end of the stacker facing uphill.

Preventing the stacker from “rolling downhill”:

- With the travel switch set to zero, the brake is automatically applied after a short jerk (the controller detects the stacker is rolling back on the slope). The service brake is released again via the travel switch, which is also used to select the speed and the travel direction.

4.3 Collecting and depositing loads

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

- Drive the stacker with forks as far as possible underneath the load.

With the two-stage Duplex mast (ZZ) a short, center-mounted free lift cylinder initially lifts the load carriage (free lift) without changing the overall height of the stacker.

Lifting

- Press the “Raise Load Forks” switch (7) until the required lifting height has been reached.

Lower

- Press the “Lower Load Forks” switch (6) until the required lifting height has been reached. Avoid fast and sudden depositing of the load.

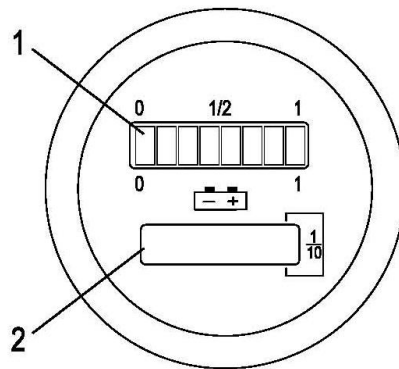
5 Parking the stacker securely

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

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

- Lower the load forks.
- Set the key switch (3) to “0” and remove the key.

6 Display instrument



The LEDs (1) represent battery residual capacity, The LCD (2) displays the operating hours

6.1 Battery Discharge Indicator

When the stacker has been released via the key switch, the battery charge status is displayed.

The colours of the LEDs (1) represent the following conditions:

LED colour		value
Green	Standard battery residual capacity	70-100%
Orange	Standard battery residual capacity	3060%
Flashing Red	Standard battery residual capacity	0-20%

Battery Discharge for 70%, A flashing red show on storage battery charge warning.

Battery Discharge for 80%, Two flashing reds show on battery charge used up warning, Lifting is now inhibited. The battery must be charged.

6.2 Operating hours display

Display range between 0.0 and 99,999.0 hours. Travel and lifting are logged. This is a backlit display.

6.3 Power up test

On power up the display shows:

- the operating hours
- the charge status

Low Voltage Protection

This vehicle has a low-voltage protection function.

When the battery voltage is less than, the vehicle will appear that the driving speed is slow ,but the fork can be lifted.And now the battery needs to be charged.

7 Troubleshooting

This chapter is designed to help the user identify and rectify basic faults or the results of incorrect operation. When locating a fault, proceed in the order shown in the table.

Fault	Possible cause	Action
stacker does not start.	<ul style="list-style-type: none">– Battery connector not connected– Key switch in “0” position– Battery charge too low– Faulty fuse– stacker in charge mode	<ul style="list-style-type: none">– Check the battery connector and connect if necessary.– Set key switch to “I”– Check battery charge, charge battery if Necessary– Test fuses– Interrupt charging
Load can not be lifted	<ul style="list-style-type: none">– Charge capacity below 20 / 40% –– Hydraulic oil level too low– Excessive load	<ul style="list-style-type: none">– Charging the battery– Check the hydraulic oil level– Note maximum capacity (see data plate)

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

Chapter 3 Battery Maintenance, Charging & Replacement

1 Safety regulations for handling acid batteries

Park the stacker securely before carrying out any work on the batteries.

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 stacker is parked for charging there shall be no inflammable material or operating fluids capable of creating sparks within 2 metres around the stacker. 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 insulation 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 cover 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 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 stacker. Battery equipment may only be replaced with the agreement of the manufacturer.

2 Battery specifications

Reading the battery data plate

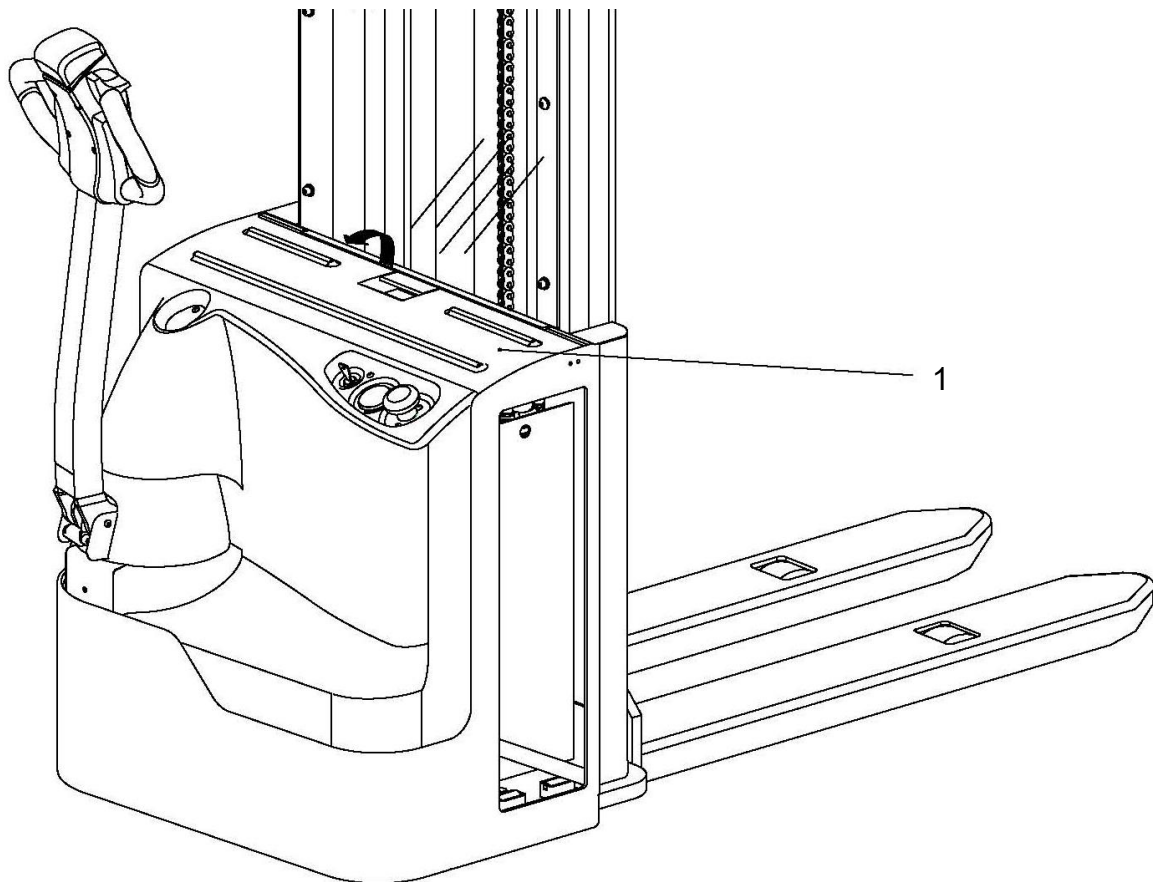
When replacing or installing batteries, ensure that the battery is correctly secured in the

battery compartment of the stacker.

3 Exposing the battery

- Park the stacker securely.
- Lift up the battery panel (1)

When you lift up the battery panel, make sure the panel lock engages.

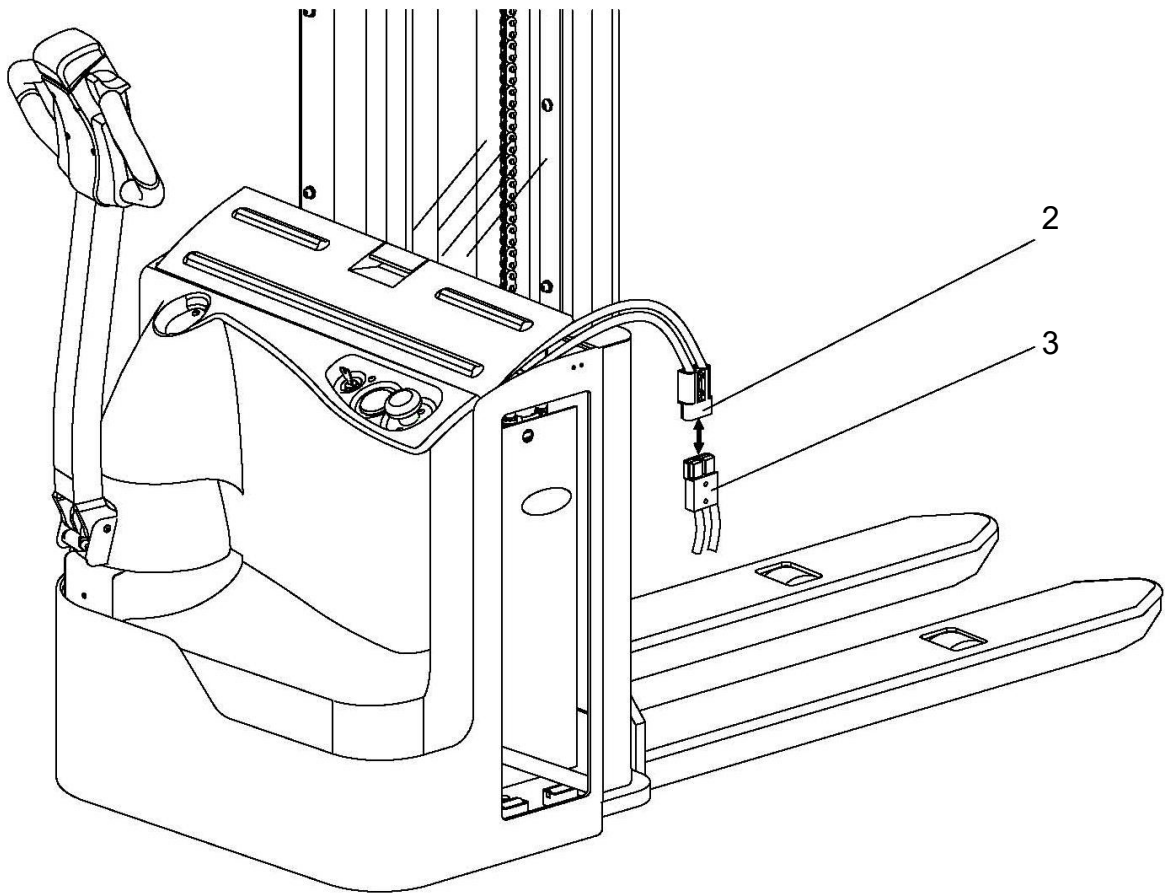


4 Charging the battery

To charge the battery, the stacker must be parked in a closed and properly ventilated room. When charging, the tops of the battery cells must be exposed to provide sufficient ventilation. Do not place any metal objects on the battery. Before charging, check all cables and plug connections for visible signs of damage.

It is essential to follow the safety regulations of the battery and charging station manufacturers.

- Expose the battery (see Section 3).
- Connect the battery plug (3) with the charging lead of the stationary charger (2) and turn on the charger.



5 Battery removal and installation

(1) Undo the spring elements of the battery panel and remove the battery panel.

The stacker must be parked on level ground. To prevent short circuits, batteries with exposed terminals or connectors must be covered with a rubber mat. Place the battery connector or the battery cable in such a way that they will not get caught on the stacker when the battery is removed.

When transporting batteries using a crane, ensure that the crane is of adequate Capacity (the battery weight is indicated on the battery data plate on the battery container). The lifting gear must exert a vertical pull so that the battery container is not compressed. The hooks must be attached to the eyes (4) of the battery in such a way that they cannot fall onto the battery cells when the lifting gear is discharged.

– Attach the lifting gear to the attachment eyes (4) and lift out the battery.

When replacing a battery always use the same battery type. Extra weights must not be removed and must remain in the same position.

– Installation is in the reverse order of operations. When reinstalling the battery, heed the required installation position and make sure the battery is connected correctly.

(2) remove the side panel

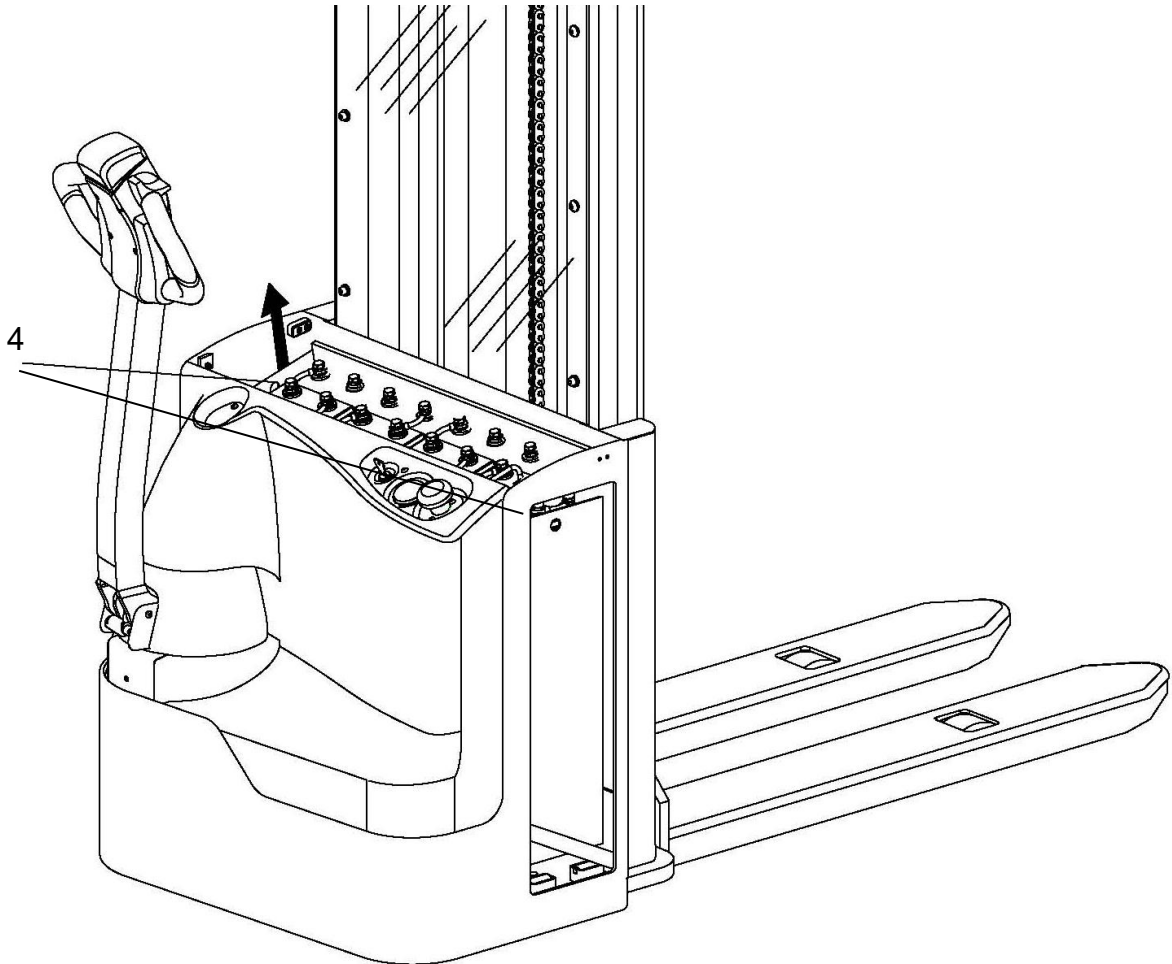
The stacker must be parked on level ground. To prevent short circuits, batteries with exposed terminals or connectors must be covered with a rubber mat. Place the battery connector or the battery cable in such a way that they will not get caught on the stacker when the battery is

removed.

–Remove the battery panel which on the side, then pull out the battery. Installation is in the reverse order of operations.

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

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



Chapter 4 stacker Maintenance

1 Operational safety and environmental protection

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

Any modification to the stacker assemblies, in particular the safety mechanisms, is prohibited. The operational speeds of the stacker must not be changed under any circumstances.

Only original spare parts have been certified by our quality assurance department. To ensure safe and reliable operation of the stacker, 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, carry out the activities listed in the "Recommissioning" section.

2 Maintenance Safety Regulations

Maintenance personnel: Industrial stackers 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 stacker is to be lifted, the lifting gear must only be secured to the points specially provided for this purpose. When jacking up the stacker, take appropriate measures to prevent the stacker 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 stacker. Prior to cleaning, all safety measures required to prevent sparking (e.g. through short circuits) must be taken. For battery-operated stackers, 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 stacker 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 stacker, carry out the activities detailed in the "Recommissioning" section.

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

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

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

Tyres: The quality of tyres affects the stability and performance of the stacker. When replacing factory fitted tyres only use original manufacturer's spare parts, as otherwise the data plate specifications will not be kept.

When changing wheels and tyres, ensure that the stacker 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.

3 Servicing and inspection

Thorough and expert servicing is one of the most important requirements for the safe operation of the industrial stacker. Failure to perform regular servicing can lead to stacker 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 stacker 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 250 operating hours

B = Every 500 operating hours, or at least annually

C = Every 2000 operating hours, or at least annually

W service intervals are to be performed by the customer.

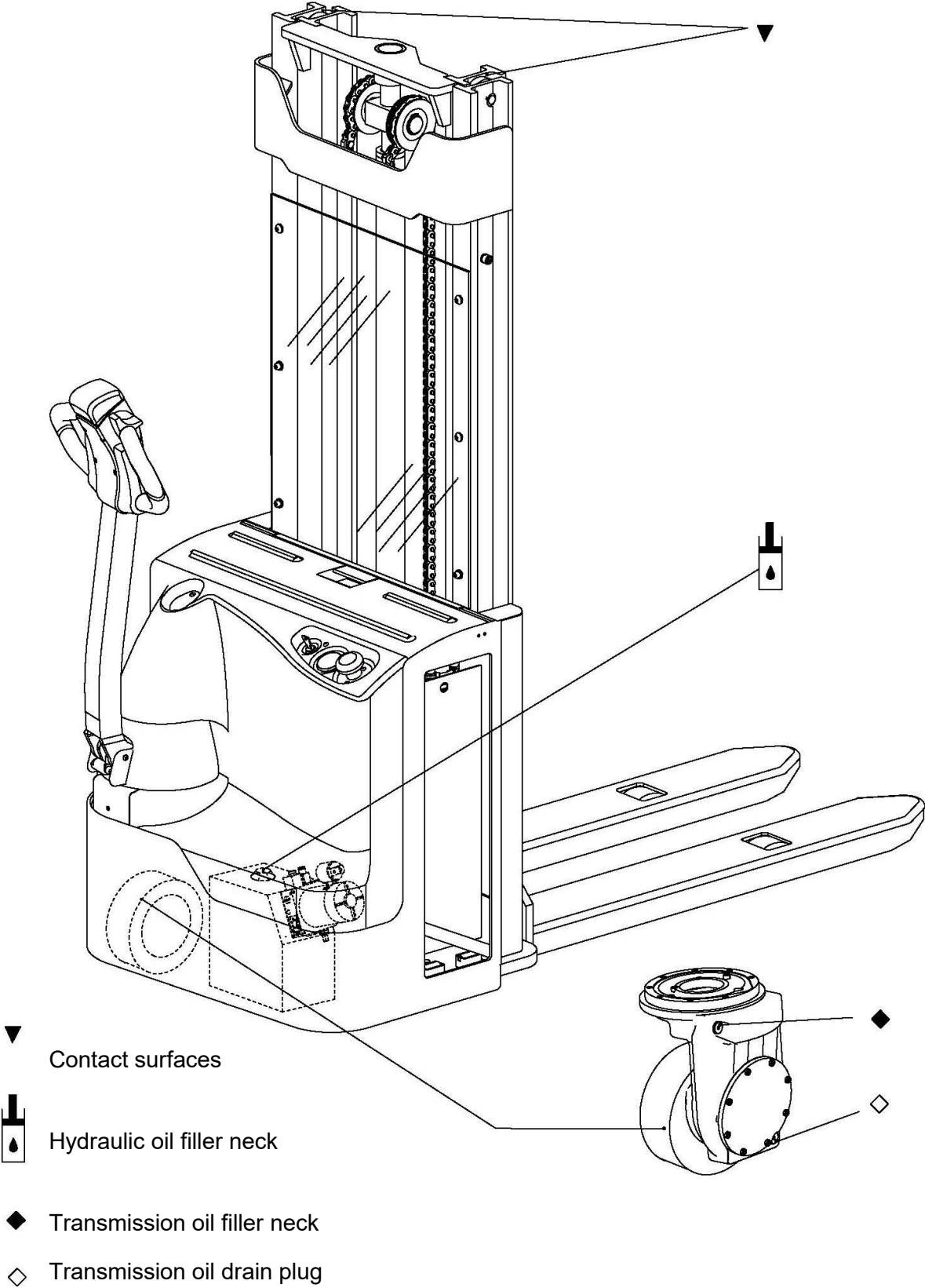
In the run-in period - after approx. 100 service hours - or after repair work, the owner must check the wheel nuts/bolts and re-tighten if necessary.

4 Maintenance Checklist

		Standard = ★ Cold Store = ☆	W	A	B	C
Brake	1.1	Check magnetic brake air gap.			★	
Electrics	2.1	Test instruments, displays and control switches.	★			
	2.2	Test warning and safety device.	☆	★		
	2.3	Check fuse ratings.				★
	2.4	Make sure wire connections are secure and check for damage.			★	
	2.5	Test micro switch setting.	★			
	2.6	Check contactors and relays.			★	
	2.7	Frame leakage test			★	
	2.8	Test cable and motor attachments.			★	
	2.9	Check carbon brush wear, replace if necessary.			★	
Power supply	3.1	Visually inspect battery	☆	★		
	3.2	Check battery cable connections are secure, grease terminals if necessary.	☆		★	
	3.3	Check acid density, acid level and battery voltage.	☆		★	
Travel	4.1	Check motor suspension.			★	
	4.2	Check the transmission for noise and leakage.			★	
	4.3	Replace gear oil if service life exceeded (10,000 hours).				
	4.4	Check travel mechanism, adjust and lubricate if necessary. Check tiller recuperating function.	☆ ★			
	4.5	Check wheels for wear and damage.	☆		★	
	4.6	Check wheel bearings and attachments.			★	
stacker design	5.1	Test the operator's platform and check for damage.			★	
	5.2	Check chassis for damage and screw connections.			★	
	5.3	Check labels.			★	
Hydraulic operation	6.1	Check operation, wear and setting.		★		
	6.2	Check forks for wear and damage.			★	
	6.3	Test hydraulic system.	☆	★		
	6.4	Check that hose and pipe lines and their connections are secure, check for leaks and damage.	☆	★		
	6.5	Check cylinders and piston rods for damage and leaks, and make sure they are secure.	☆		★	

	6.6	Check hydraulic oil level.	☆		★	
	6.7	Replace hydraulic oil filter.			☆	★
	6.8	Replace hydraulic oil.			☆	★
	6.9	Check wheels for wear and damage.			★	
Agreed performance levels	7.1	Lubricate stacker in accordance with Lubrication Schedule.	☆		★	
	7.2	Test run			★	
	7.3	Demonstration after servicing			★	

5 Lubrication Schedule



5.1 Fuels, coolants and lubricants

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	Description	Used for
A	HM46#	Hydraulic system
B	Grease, Polylube GA352P	Lubrication
C	GL-5 85W-90	Transmission

6 Maintenance Instructions

6.1 Prepare the stacker 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 stacker securely (see Chapter 2).
- Disconnect the battery to prevent the stacker from accidentally starting.

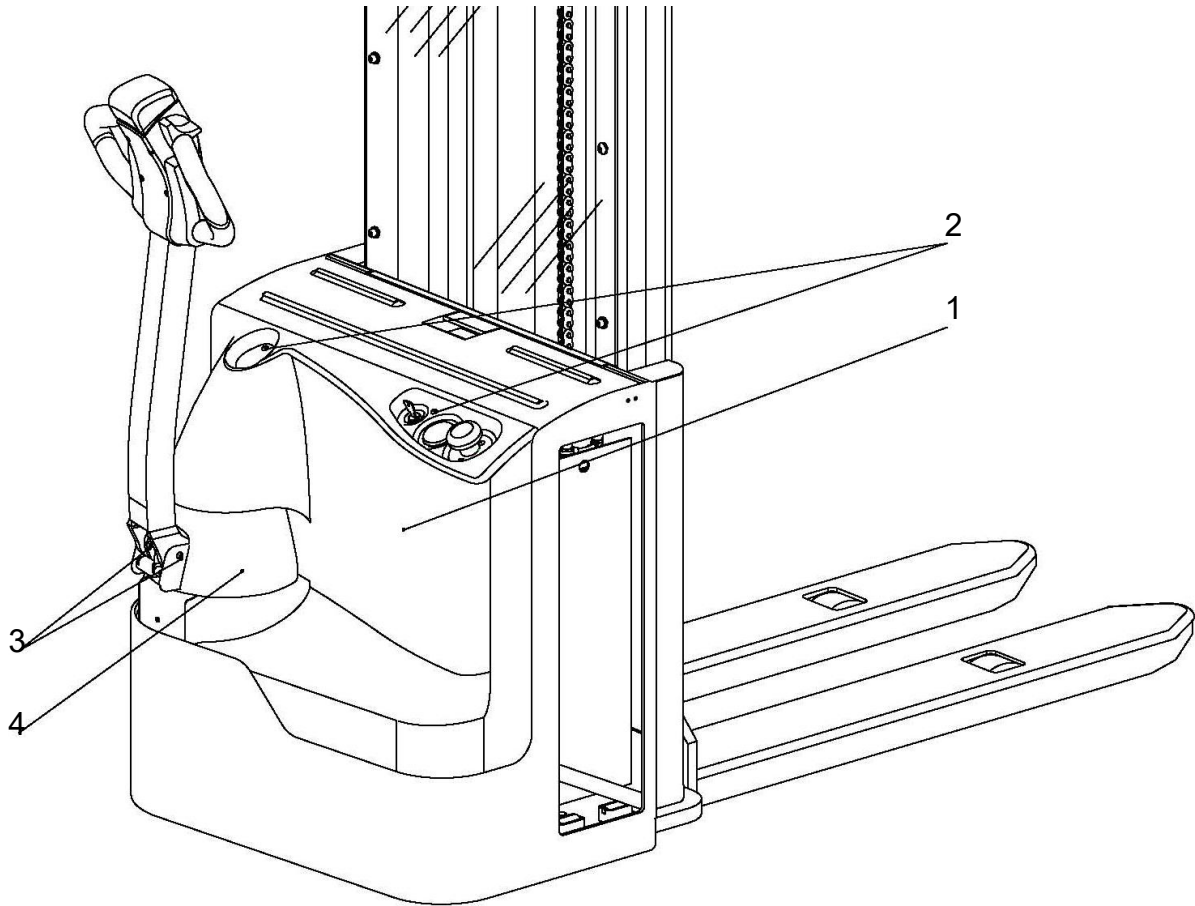
When working under a raised lift stacker, secure it to prevent it from tipping or sliding away.

6.2 Removing the front panel

- Open the battery panel.
- Remove the two screws (2).
- Carefully lift off the front panel (1).

6.3 Remove the drive panel

- Turn the tiller to the left stop.
- Unscrew the screws (3) with the Allen key on the right.
- Turn the tiller to the right stop.
- Unscrew the screws (3) with the Allen key on the left.
- Unscrew the panel (4) and carefully remove it.



6.4 Replacing the drive wheel

The drive wheel must only be replaced by authorised service personnel.

6.5 Checking the hydraulic oil level

- Prepare the stacker for maintenance and repairs (see Chapter 6.1).
- Remove the front panel (see section 6.2).
- Check hydraulic oil level in hydraulic reservoir.

There is oil level display (5) on the hydraulic reservoir surface. The Oil level depends on the lift height.

The oil level must be checked when the load forks are lowered.

- If necessary add hydraulic oil of the correct grade (see Section 5)

Installation is the reverse order.

6.6 Check transmission oil level

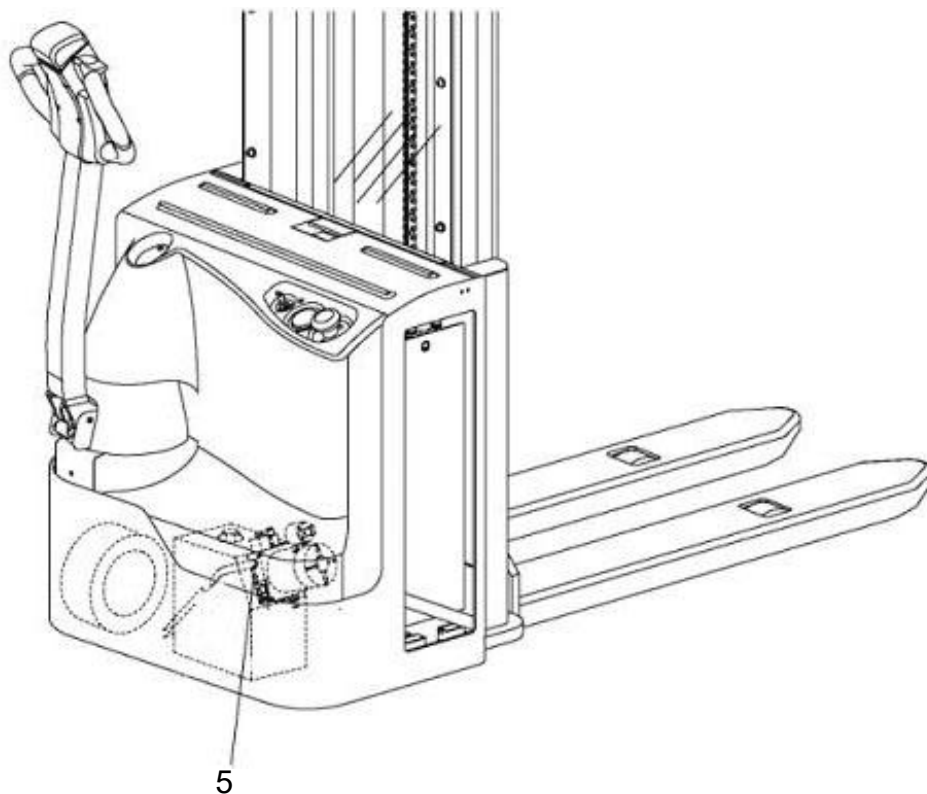
- Prepare the stacker for maintenance and repairs (see Chapter 6.1).
- Remove the front panel (see section 6.2).
- Turn the tiller to the right stop.
- Check the transmission oil level – it should be at the control plug level (see Section 5).
- **Add transmission oil every 800~1000 operating hours, or at least annually.** (see Section 5).

Installation is the reverse order.

6.7 Flushing the gauze filter, Replacing the gauze filter

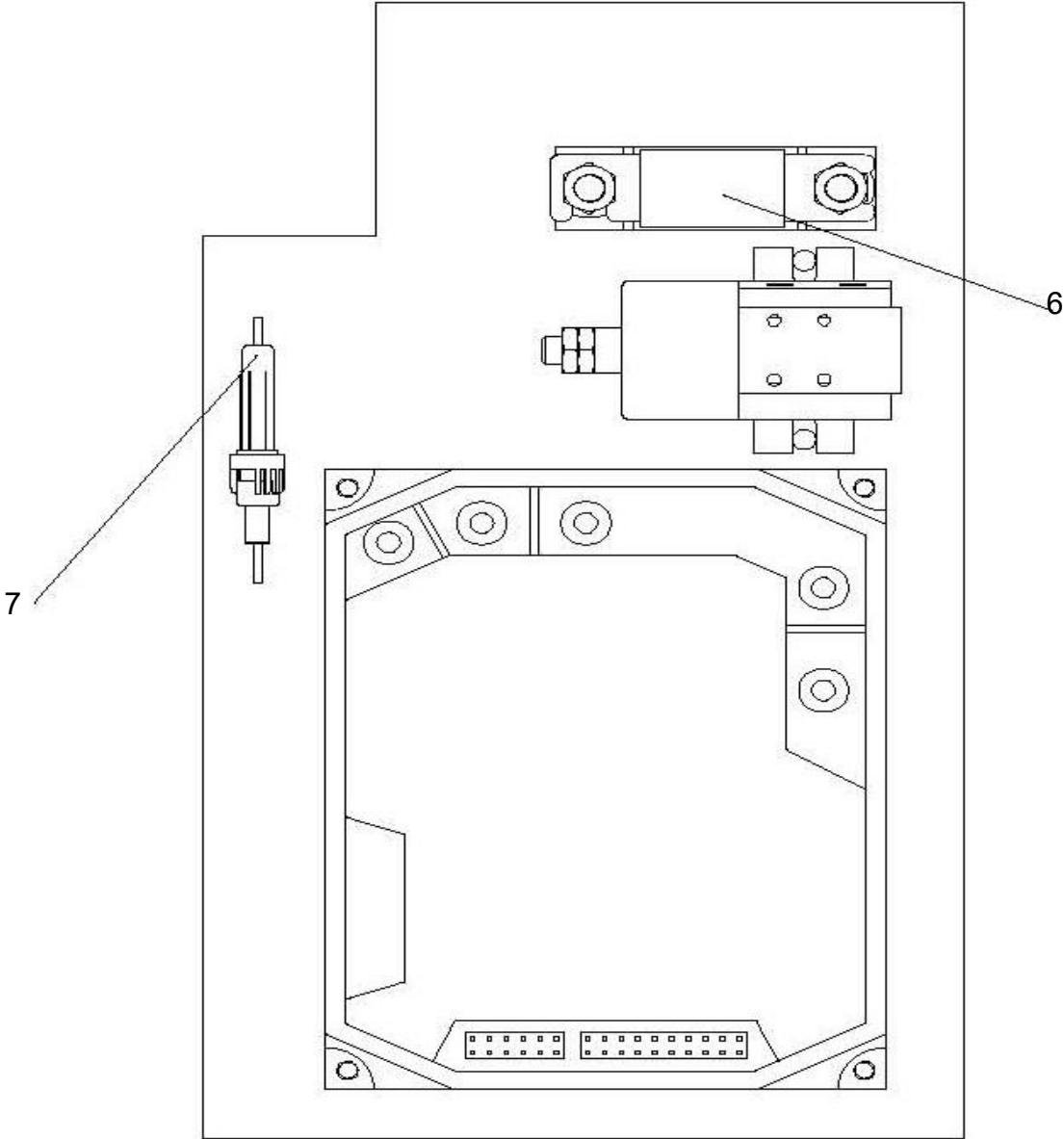
- Prepare the stacker for maintenance and repairs (see Section 6.1).
- Remove the front panel (see Section 6.2).
- Undo the union (5).
- Remove connection and take out the gauze filter
- Insert a clean / new filter

Assembly is the reverse order.



6.8 Checking electrical fuses

- Prepare the stacker for maintenance and repairs (see Section 6.1).
- Dismantle the front panel (see Section 6.3).
- Check rating of all fuses in accordance with table, replace if necessary.



Item	To protect:	Rating
6	Traction / Lift motor	200A
7	Controller	10A

6.9 Recommissioning

The stacker may only be recommissioned after cleaning or repair work, once the following operations have been performed.

- Test horn.
- Test EMERGENCY DISCONNECT switch.
- Test brake.
- Lubricate the stacker in accordance with the maintenance schedule.

7 Decommissioning the industrial stacker

If the industrial stacker is to be decommissioned for more than two 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 stacker 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 stacker 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 stacker.
- Check the brakes.
- Check the hydraulic oil level and replenish as necessary (see Chapter4).
- Apply a thin layer of oil or grease to any non-painted mechanical components.
- Lubricate the stacker in accordance with the maintenance schedule (see Chapter4).
- Charge the battery (see Chapter 3).
- Disconnect the battery, clean it and apply grease to the terminals.

In addition, follow the battery manufacturer's instructions.

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

7.2 During decommissioning

Every 2 months:

- Charge the battery (see Chapter 3).

Battery powered stackers:

The battery must be charged at regular intervals to avoid depletion of the battery through self-discharge. The sulfatisation would destroy the battery.

7.3 Restoring the stacker to operation after decommissioning

- Thoroughly clean the stacker.
- Lubricate the stacker in accordance with the maintenance schedule (see Chapter 4).
- Clean the battery, grease the terminals and connect the battery.
- Charge the battery (see Chapter 3).
- Check transmission oil for condensed water and replace if necessary.
- Check hydraulic oil for condensed water and replace if necessary.
- Start up the stacker (see Chapter 2).

Battery powered stackers:

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.

Perform several brake tests immediately after re-commissioning the stacker.

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

Carry out a safety check in accordance with national regulations. EP has a special safety department with trained personnel to carry out such checks. The stacker 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 stacker 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 stacker and the effectiveness of the safety mechanisms based on the technical regulations and principles governing the inspection of stacker.

A thorough test of the stacker must be undertaken with regard to its technical condition from a safety aspect. The stacker 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 stacker 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 stacker 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.