

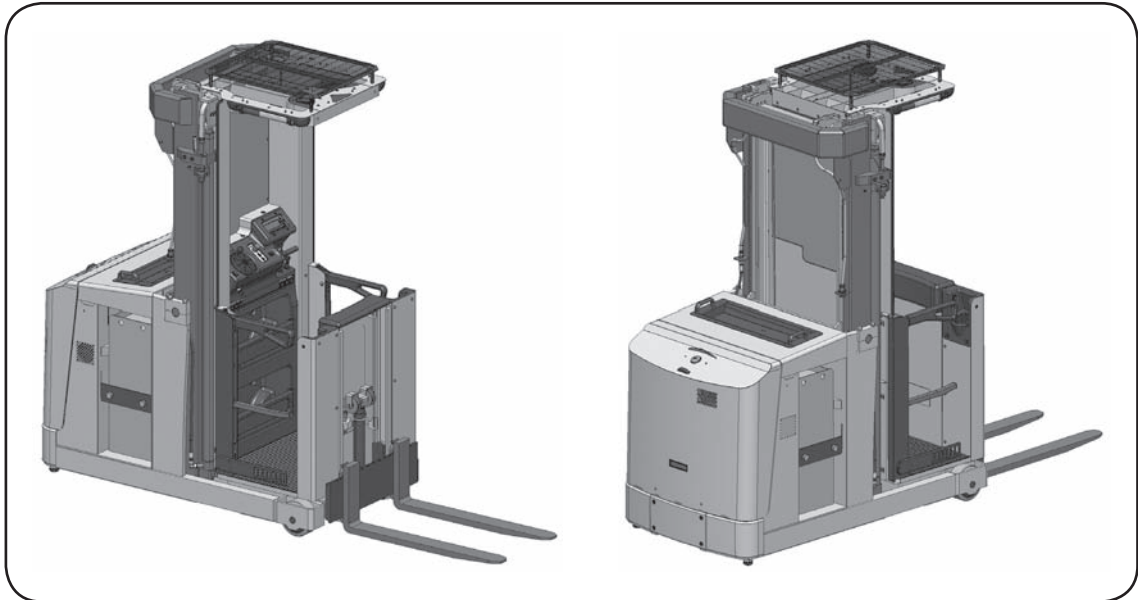
SERVICE REPAIR

MANUAL

Hyster B460 (K1.0M, K1.0H, K1.0H WP) Forklift

HYSTER

Technical information for Hyster customer care centres



This manual is addressed to the skilled technicians of Hyster service network

B460.....

K1.0M
K1.0H



IMPORTANT

This manual contains detailed information about the routine and preventive maintenance, troubleshooting, disassembly/assembly of components, adjustment procedures for the following Hyster models:

K1.0M - K1.0H.

These procedures require specific technical knowledge and they must be carried out only by qualified and trained staff. Please read this manual carefully in order to prevent damage or accidents to people; it must be kept in good conditions so that it is always readable and complete in all its parts.

This manual is an integral part of the use and maintenance manual and it does not replace it.

HYSTER *Product support group*

HOW TO USE THE MANUAL

ENCLOSED MANUALS

Motors (Part no.1641577)
EPS-AC / wire guidance (Part no.1641566)
ETACC (2200 SRM 1058)
Industrial battery (2240 SRM 1)

SECTIONS

This manual is divided in the following sections:

Section1: **Presentation**
Section 2: **Installation and settings**
Section 3: **Diagnostic**
Section 4: **Electric system**
Section 5: **Hydraulic system**
Sezione 6: **Frame mechanics**
Sezione 7: **Mast mechanics**
Sezione 8: **Cab mechanics**
Sezione 9: **Reduction gear**
Sezione 10: **Breaking system**
Sezione 11: **End of aisle slow-down and stop**
Sezione 12: **Ordinary maintenance**

Always refer to the index with the numbered black bands in order to go to the desired section.

SYMBOLS



It indicates the presence of a danger that can cause accidents to people or damage to the truck.



It indicates a danger due to high temperatures.



It indicates notes or important information to be taken into consideration.



It indicates that, in the electronic version of the manual, by clicking on this symbol it is possible to display a filmed sequence.

ASSEMBLY PROCEDURE

For the assembly carry out the disassembly procedure in the reverse order complying with the information and the notes concerning the correct operation of the truck.

GENERAL SAFETY STANDARDS

PERSONAL SAFETY

- Always use the personal protective equipment when it is required.
- Pay attention to the squashing risks due to moving parts, oscillations, not correctly fastened materials when lifting operations are carried out or when the loads are moved.
- Do not wear rings, watches, jewels, unbuttoned or hanging clothes such as scarves, unbuttoned jackets or smocks with open zips that can get entangled in the moving parts.
- Never carry out cleaning, lubrication or maintenance operations when the battery is connected.
- If you use compressed air to clean the parts, wear glasses with lateral guards. The air pressure must not be higher than 1 bar.

SAFETY IN THE WORKPLACE

- Make sure that all working tools are perfectly efficient and ready to use. Keep the working surfaces clean and free from the deposits that settle on the truck parts and cause damage.
- Keep sparks, free flames and cigarettes at a distance from fuels or flammable materials such as the gas of the batteries.
- Make sure that the working area is well ventilated, illuminated, dry and clean. Remove any water puddles or oil spots.
- Make sure that the lifting equipment, devices or machines can bear the load.
- Never use petrol, gas oil or other flammable liquids as detergents: use commercial non-toxic and non-flammable solvents.
- In case the interventions are carried out of the workshop, lay the truck flat and block it. If it is necessary to carry out the work on slopes, block the truck and bring it in a flat area as soon as possible within a certain safety limit.
- Disconnect the batteries and label all controls in order to indicate that an intervention is in progress. Block the truck and any equipment to be lifted.
- Do not carry out any intervention on the truck when the operators are controlling it, except that they are qualified operators and help to carry out the intervention.
- During towing operations use only the prescribed attachment points and make sure that the pins and/or bolts are tightly secured. Lift and move all heavy components by means of a lifting device of proper carrying capacity. Use the proper eyebolts. Make sure that nobody stays near the load to be lifted.
- Do not twist chains or metal ropes.
- Do not use damaged or bent chains or ropes: do not use them during lifting or towing operations. While handling them always wear safety gloves.
- Do not accumulate cloths soaked with grease or oil: they represent a risk of fire. Always put them in a closed metal container.
- The oil must be collected and not be let off in the drain pipes; the industrial oils must be disposed of by specialized companies under the protection of the law in force in every Country.
- When welding operations are carried out, it is necessary to use proper accident-prevention protections: protective glasses, helmet, overalls, shoes. The protective glasses must be worn also by the people who do not carry out the works if they stay near a welding area.

**Thanks very much for your reading,
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Please click here, Then get the complete
manual**

JustClickHere 

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**Have any questions please write to me:
admin@servicemanualperfect.com**

- Before using the batteries, make sure that the cables are connected to the terminals as described: (+) with (+) and (-) with (-).
- Do not short-circuit the terminals.
- The gas emanated during a recharge is highly flammable. During the recharge of the battery leave the battery compartment uncovered in order to use a more efficient ventilation and remove the plugs.
- Do not check the condition of the battery charge by means of "jumpers" obtained by placing metal objects on the terminals.
- Before any intervention check if there are no short-circuit elements.
- Disconnect the batteries before acting on the electric system.
- For the battery chargers and similar equipment, use only auxiliary electric power supply sources in order to avoid any electric shocks.
- A fluid passing through a very small hole can be almost invisible but strong enough to penetrate into the skin; in these cases check the fluid by means of a card or a piece of wood.
- To check the pressure of the plant use the proper devices.
- **BANDS, ROPES AND HANGING ROPES: SUGGESTIONS FOR THE USE**
- Register all used hanging ropes, whose features and data are shown on the identification plate.
- Do not use bands, ropes or hanging ropes, whose identification plate has been lost.
- Always use bands, ropes or hanging ropes of proper dimensions. As far as the hanging ropes are concerned, take into consideration the lifting angle and the unbalance of the load.
- The hooks of the hanging ropes must have a proper size according to the hook of the bridge crane and they must move freely.
- Position the load in the hook mouth.
- Do not place the load on the point of the hook.
- During lifting, do not carry out sudden operations that could tear the ropes and the bands.
- Do not carry out lifting operations with twisted ropes and bands.
- Knots are forbidden. Always protect the ropes and the bands when they are near sharp edges.
- During the movements without load in order to avoid unintentional collisions or hooking, fasten the hooks to the proper seats and lock them.

Use of hanging ropes with unbalanced load

If unbalanced loads must be lifted it is advisable to reduce the carrying capacity of the hanging ropes:

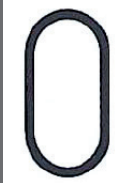



- Slings with 2 arms, consider them as the slings with 1 arm.
- Slings with 3 and 4 arms, consider them as the slings with 2 arms.

Suggestions for maintenance





Check the bands, the ropes and the hanging ropes according to the law in force in order to determine their working conditions. Carry out the replacement in the following cases:

- When the components are deformed, cut or when there are cracks, hollows, notches or abrasions on them.
- When the wear of the components is higher than 10% of the initial dimensions.
- When the sling is overloaded.


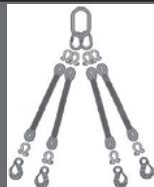


Rope capacity table

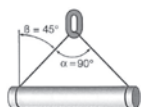
	Colour				
Working capacity (kg)	violet	1000	2000	1400	800
	green	2000	4000	2800	1600
	yellow	3000	6000	4200	2400
	grey	4000	8000	5600	3200
	red	5000	10000	7000	4000
	brown	6000	12000	8400	4800
	blue	8000	16000	11200	6400
	orange	10000	20000	14000	8000
	orange	12000	24000	16800	9600
	orange	15000	30000	21000	12000
	orange	20000	40000	28000	16000
	orange	25000	50000	35000	20000
	orange	30000	60000	42000	24000
Coefficient		1	2	1,4	0,8

Band capacity table

	Colour	Width (mm)				
Working capacity (kg)	black	35	500	1000	700	400
	violet	50	1000	2000	1400	800
	black	50	1500	3000	2100	1200
	green	60	2000	4000	2800	1600
	yellow	75	3000	6000	4200	2400
	grey	120	4000	8000	5600	3200
	red	150	5000	10000	7000	4000
	browm	180	6000	12000	8400	4800
	blue	240	8000	16000	11200	6400
	orange	300	10000	20000	14000	8000
Coefficient			1	2	1,4	0,8

Hanging rope capacity table

	Colour				
Working capacity (kg)	violet	1000	1400	2100	2100
	green	2000	2800	4200	4200
	yellow	3000	3800	6300	6300
	grey	4000	5600	8400	8400
	red	5000	6600	9800	10500
Coefficient		1	1,4	2,1	2,1



Working capacity: the working capacity is calculated with an angle in the centre of 90° .

DRIVING TORQUE OF SCREWS, NUTS AND CONNECTORS



Before the disassembly of the various parts and of the bolts and screws, read carefully the instructions below.

To tighten the screws use the product LOCTITE 270 in order to ensure the safety of the threaded couplings.

If it is not possible to loosen the screws because this product is used, do not add extensions to the tools, but heat the area (maximum 50°C) in order to eliminate the effect of LOCTITE 270.

In the above-mentioned cases use a small quantity of LOCTITE 270 in the assembly phase (30% of the connection surface).

The driving torque with which the threaded couplings are tightened is very important to ensure the safety of the truck connection.

The bolts and nuts and the corresponding driving torques are shown in the tables on this page.

Nominal diameter	DRIVING TORQUE Nm	
	Class 8	Class 10
M 3	4	5.2
M 4	7	9.15
M 5	12.14	14.8
M 6	17.2	20.9
M 8	31.8	38.1
M 10	50.5	60.3
M 12	74.2	88.5
M 14	101.2	120.8
M 16	138.2	164.9
M 18	176.6	203.5
M 20	225.4	259.7
M 22	278.8	321.2
M 24	324.8	374.2
M 27	422.3	486.5
M 30	516.1	594.7

				Preloading N	DRIVING TORQUE Nm					
					Class 5.8		Class 8.8		Class 10.9	
M 4	0.7	7	3	2400	1.92	1.44	3.07	2.3	4.17	3.13
M 5	0.8	8	4	3880	3.88	2.91	6.2	4.65	8.43	6.33
M 6	1	10	5	5490	6.58	4.94	10.5	7.9	14.3	10.8
M 8	1.25	13	6	9990	16	12	25.6	19.2	34.8	26.1
M 8	1	13	6	10700	17.1	12.8	27.4	20.5	37.3	27.9
M 10	1.5	16	8	15825	31.7	23.8	51	38	69	52
M 10	1.25	16	8	16700	33.4	25.1	53	40.1	73	55
M 12	1.75	18	10	23025	55	41.4	88	66	120	90
M 12	1.25	18	10	25150	60	45.3	96	72	130	98
M 14	2	21	12	31400	88	66	140	105	190	145
M 14	1.5	21	12	34125	96	72	155	115	210	155
M 16	2	24	14	42850	135	105	220	165	300	225
M 16	1.5	24	14	45600	145	110	235	175	320	240
M 20	2.5	30	17	66875	270	200	430	320	580	435
M 20	1.5	30	17	74250	295	225	475	355	650	485



= with lubricant

CORRECT METHOD TO APPLY THE FEMALE CONNECTORS

To ensure an optimum connection between the female connectors and the adapters mentioned in this manual, it is necessary to carry out the following procedure, which is different from the one for the assembly of the rigid pipes.

Female connectors without gasket (metal/metal connection)

Screw the nut manually and then tighten 1/4 turn by means of a spanner.

Female connectors with O-RING

Screw the nut manually and then tighten 1/4 turn by means of a spanner.

In any case make sure that the pipe is correctly aligned before tightening the nut to the adapter.

DRIVING TORQUE

ROTARY METRIC FEMALE CONNECTOR			
Thread UNF	External diameter of the pipe	Driving torque Nm	
		Nominal torque	min / max
M 12x1.5	6	20	15 - 25
M 14x1.5	8	38	30 - 45
M 16x1.5	8	45	38 - 52
	10		
M 18x1.5	10	51	43 - 85
	12		
M 20x1.5	12	58	50 - 65
M 22x1.5	14	74	60 - 88
	15		
M 24x1.5	16	74	60 - 88
M 26x1.5	18	105	85 - 125
M 30x2	20	135	115 - 155
	22		
M 36x2	25	166	140 - 192
	28		
M 42x2	30	240	210 - 270
M 45x2	35	290	255 - 325
M 52x2	38	330	280 - 380
	42		

ROTARY METRIC FEMALE CONNECTOR jic 37°			
Thread UNF	Dimension	Driving torque Nm	
		Nominal torque	min / max
7/16-20	-4	15	9 - 21
1/2-20	-5	20	13 - 27
9/16-18	-6	30	18 - 42
3/4-16	-8	50	30 - 70
7/8-14	-10	69	44 - 94
1.1/16-12	-12	98	63 - 133
1.3/16-12	-14	118	73 - 163
1.5/16-12	-16	140	90 - 190
1.5/8-12	-20	210	135 - 285
1.7/8-12	-24	290	200 - 380
2.1/2-12	-32	450	300 - 600

ROTARY FEMALE CONNECTOR BSP		
Thread UNF	Driving torque Nm	
	Nominal torque	max
G1/4	20	15 - 25
G3/8	34	27 - 41
G1/2	60	42 - 76
G5/8	69	44 - 94
G3/4	115	95 - 135
G1	140	115 - 165
G1.1/4	210	140 - 280
G1.1/2	290	215 - 365
G2	400	300 - 500

ROTARY FEMALE CONNECTOR ORFS			
Thread UNF	Dimension	Driving torque Nm	
		Nominal torque	max.
9/16-18	-4	14	16
11/16-16	-6	24	27
13/16-16	-8	43	47
1-14	-10	60	68
1.3/16-12	-12	90	95
1.3/16-12	-14	90	95
1.7/16-12	-16	125	135
1.11/16-12	-20	170	190
2-12	-24	200	225
2-1/2-20	-32	460	490



The values shown in the tables refer to galvanized steel connectors. Different values correspond to connectors of different materials.

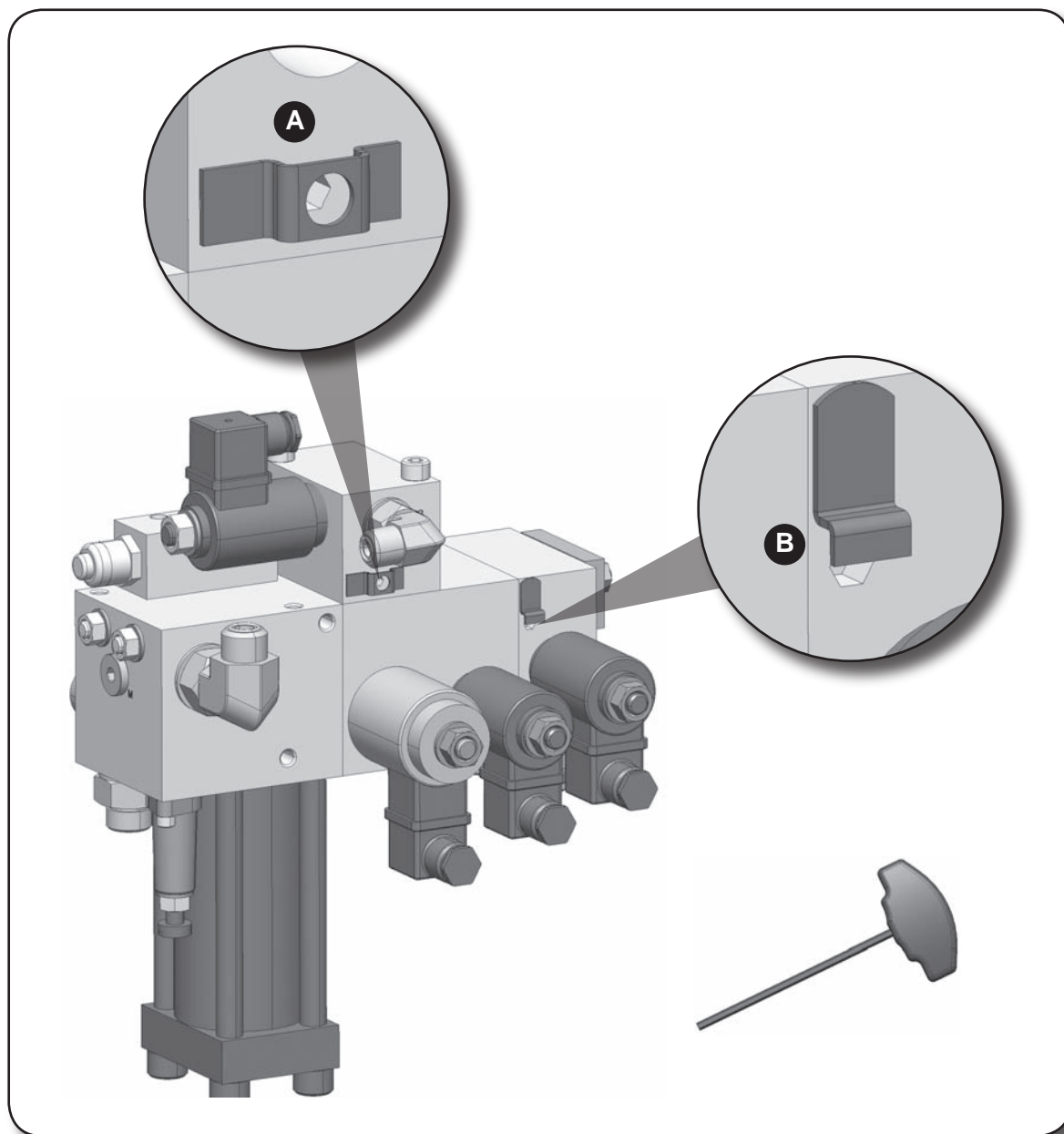
INSTRUCTIONS FOR THE MAINTENANCE OF THE HYDRAULIC SYSTEM

Before proceeding with the maintenance of the hydraulic system, it is necessary to remove any possible residual pressures inside it.

Open valve "A" by using the supplied hexagonal "T" wrench in order to discharge the residual pressure in the fork lifting circuit.

Open valve "B" in order to discharge the residual pressure in the cabin lifting circuit .

At the end of the maintenance operations, close the valves.



INSTRUCTIONS FOR THE INSTALLATION OF HOSES AND CONNECTORS

Visual check of hoses and connectors: if one of the following conditions occurs, the hose must be immediately disconnected and replaced:

- movement of the connector on the hose;
- there are damage, cuts or abrasions on the surface;
- hardening or stiffness of the hose, burned parts or cracks due to heat;
- cracks, damage or corroded parts on the connector;
- leakages from the hose or connector;
- the hose has permanent folds, squashed or twisted parts;
- presence of bubbles, softening and wear of the external surface.

Pre-installation inspection: before installing a hose it is necessary to check the conditions of the pipes. First of all check if the type, the size, the reference code and the length are correct and then make sure that there are no impurities, obstructions, bubbles, external layer peeling-off or other visible defects.

Installation:

Do not twist the hose, otherwise it could break due to pressure.

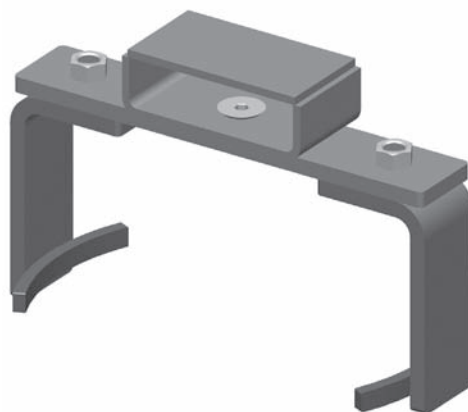
Consider a proper radius of curvature in order to avoid the bending or breaking. If the radius of curvature is lower than the minimum radius of curvature allowed, the life of the hose is considerably reduced.

The pressure can change the length of the hose, up to + 2%. Therefore it is advisable to consider a length which is higher than the required one in order to compensate for such changes.

SPECIAL TOOLS



Drive motor support code 1586992



Pump motor support code 1586747

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PRESENTATION

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TRUCK IDENTIFICATION DATA PLATE 4

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TRUCK PRESENTATION

The range of lift trucks for medium/high level load collection consists of two models, with a nominal load capacity of 1000 kg:

- **K1.0M**
- **K1.0H**

Electrical system

All the motors benefit from the use of three phase AC alternate current technology: traction motor, steering motor and pump motor.

The high battery efficiency is guaranteed by the regenerative nature of the breaking system, energy retrieval during the cab lowering stage with the load on the forks.

The electronic controls Sicos, AC2 Traction, AC2 Pump, EPS AC and Mhyrio communicate via a CAN-Bus system (Controller Area Network Bus).

Hydraulic system

The 12 KW pump motors provides high level performance thanks to the ON/OFF and proportional solenoid valves for the fork/cab lifting/lowering operations with fluid operator movements.

Guidance system

For guidance in the aisle the trucks can be equipped with contrast rollers and photocells that detect the presence of side guide rails, or with aerials for induction guidance thanks to an AC electronic control (wire guidance).

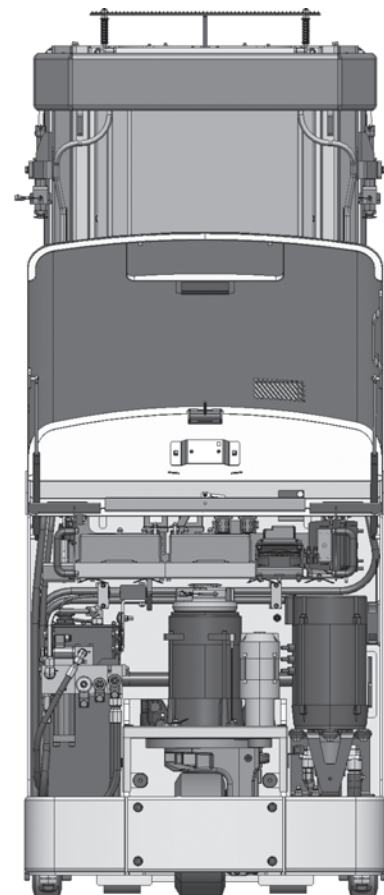
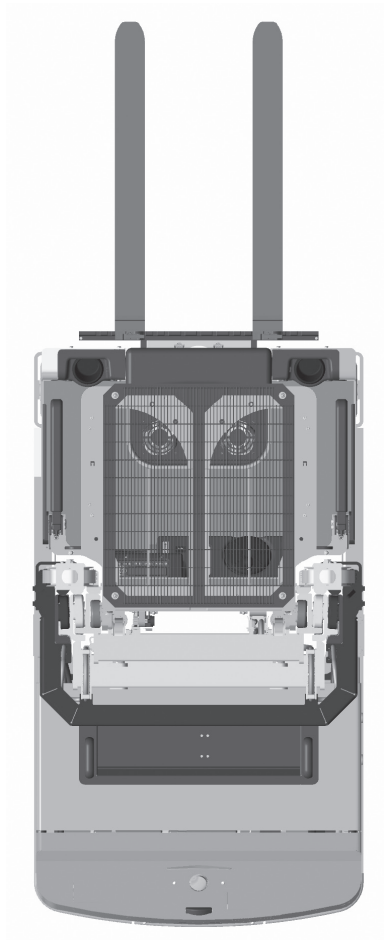
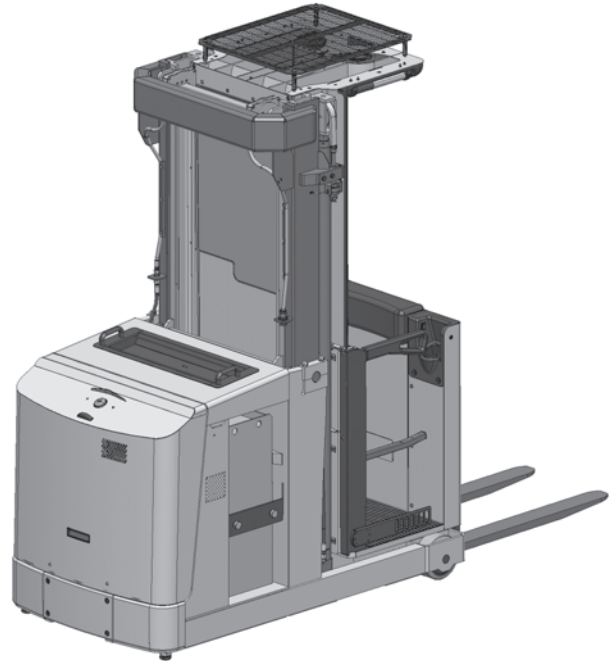
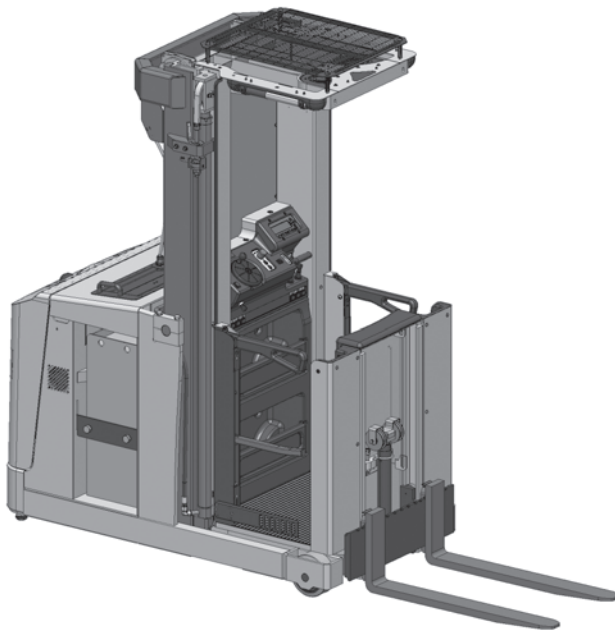
In both cases, the traction wheel performs self-centering once the photocells or the aerials have detected the aisle entrance.

Mast

The masts can be in two or three stages.


The rigidity and stability characteristics of the masts allow the forks to reach heights of over 8 meters.

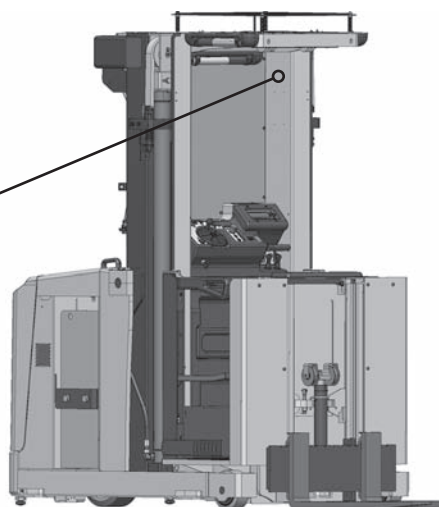
The lifting cylinders are of the single acting hollow rod type, the single-acting solid plunger rod type or the single-acting hollow plunger rod type.

TRUCK VIEWS

TRUCK AND LOAD IDENTIFICATION DATA

TRUCK IDENTIFICATION DATA PLATE

 20060 Masate (MI) - Italy - Via Confalonieri, 2 Tel. +39 02953991 Fax. +39 0295761091			
MODEL MODEL MODELO		MODELLO	
SERIAL NUMBER KUNNRUMMER MATRICOLA		MATRICOLA	
MASSA SENZA BATTERIA MASS WITHOUT BATTERY MASSE OHNE BATTERIE MASSE SANS BATTERIE PESO SIN BATERIA		ANNO DI COSTRUZIONE YEAR OF CONSTRUCTION BAUJAHR ANNÉE DE FABRICATION AÑO DE FABRICACIÓN	MASSA BATTERIA BATTERY MASS BATTERIE GEWICHT POIDS DE LA BATTERIE PESO DE LA BATERIA
BATTERIA BATTERY BATTERIE BATERIA		VOLT	PORTATA NOMINALE NOMINAL CAPACITY NENTRAGFÄHIGKEIT CAPACITÉ NOMINALE CAPACIDAD NOMINAL
PERSONE A BORDO PERSONS ON BOARD PERSONEN A BORD PERSONNES A BORD PERSONAS A BORDO		N°	

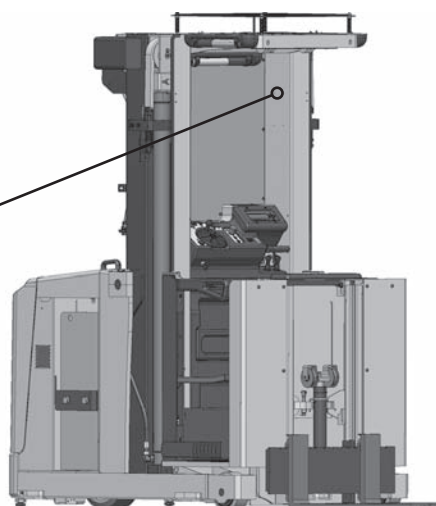


The truck identification data plate is located in the cab.

- Manufacturer's name.
- Model
- Serial number
- Weight without battery
- Year of manufacture
- Max. weight battery
- Min weight battery
- Battery voltage
- Nominal Load capacity
- Persons on board

RESIDUAL LOAD PLATE

MODELLO - MODEL - MODEL MODELE - MODELO			
PORTATE - CARRYING CAPACITIES - TRAGFÄHIGKEITEN - CAPACITÉS - CAPACIDADES			
kg.			mm.
kg.			mm.
kg.			mm.
kg.			mm.
mm.			ALTEZZA DI SOLLEVAMENTO LIFTING HEIGHT HUBHÖHE HAUTEUR DE LEVAGE ALTURA DE ELEVACION
BARICENTRO CARICO LOAD CENTER LASTSCHWERPUNKT BARYCENTRE BARICENTRO CARGA			



The load plate is located in the cab

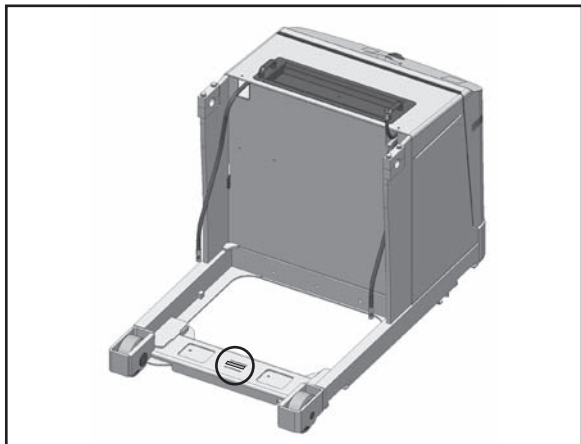
The load plate bears the following data:

- Model
- Lifiable load values up to varying heights up to the maximum load with different distances from the load centre of gravity of the forks.

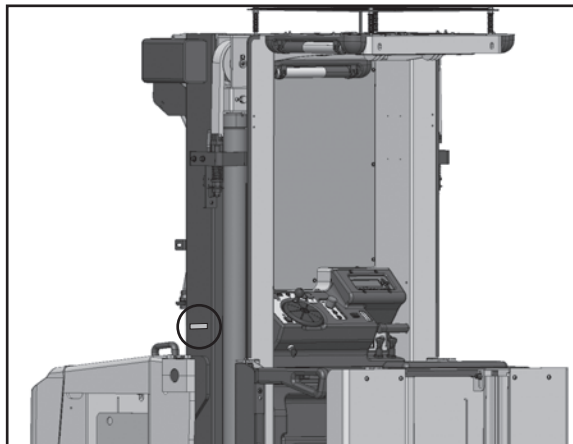


Always refer to the load plate to be sure to lift an admissible load to a suitable height.

TRUCK AND MAST SERIAL NUMBER STAMP

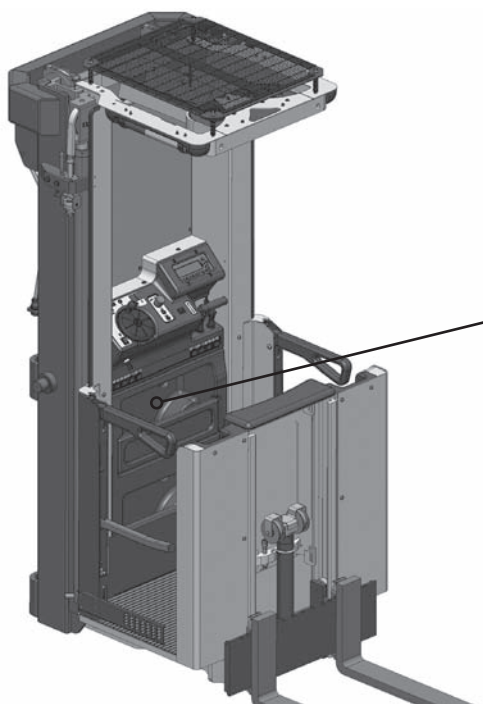


The truck serial number is located beneath the cab under the crossbar of the base carriage.



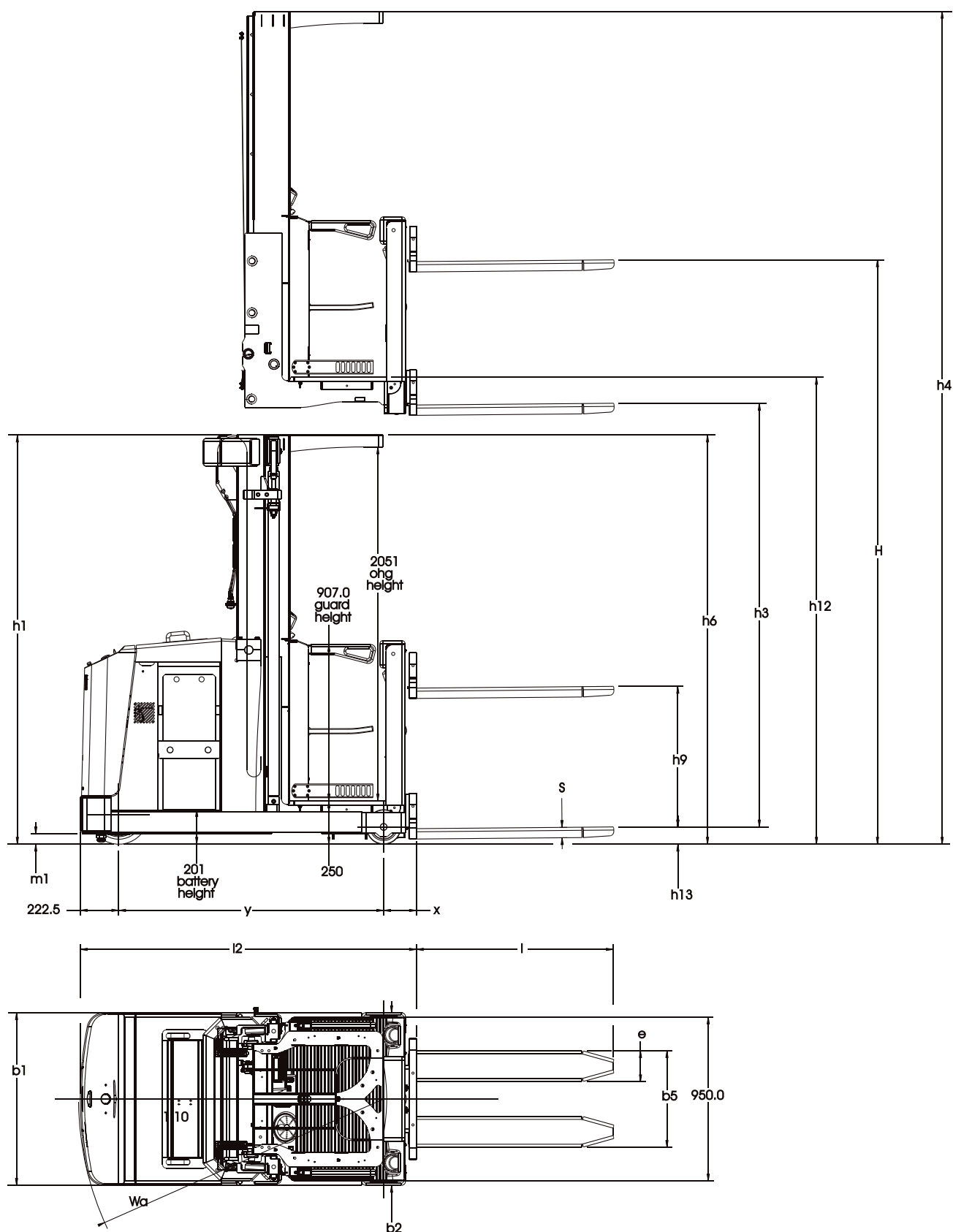
The mast serial number is located on the side of the external mast.

DATA POSITION



The documentation concerning the truck is located in the cab.

GENERAL SPECIFICATIONS



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BEFORE INSTALLATION

Depending on the size of the mast and the kind of transportation (container, truck, etc.), the carriage may be sent:

- **complete in vertical position** (option A)
- **complete in horizontal position with forks dismantled** (option B).

In the second instance one must check in advance that one is equipped with all the tools necessary to bring it to the vertical position (crane hire, forklift truck, belts, etc). Before delivering to the client it is very important to check the suitability of the place where the carriage is to be installed.

WEIGHT TABLES

BASIC CARRIAGE

Wheelbase (y) mm	Width mm	Weight kg
1534,50	1000	1095
1574,50	1100	1130
	1100	1137
1674,50	1200	1180
	1200	1184

CABIN

Width	Weight	
mm	fem forks (kg)	pallet forks (kg)
950	456.40	500.40
1050	474	518
1150	485.60	529.60
1240	496	540