SERVICE REPAIR

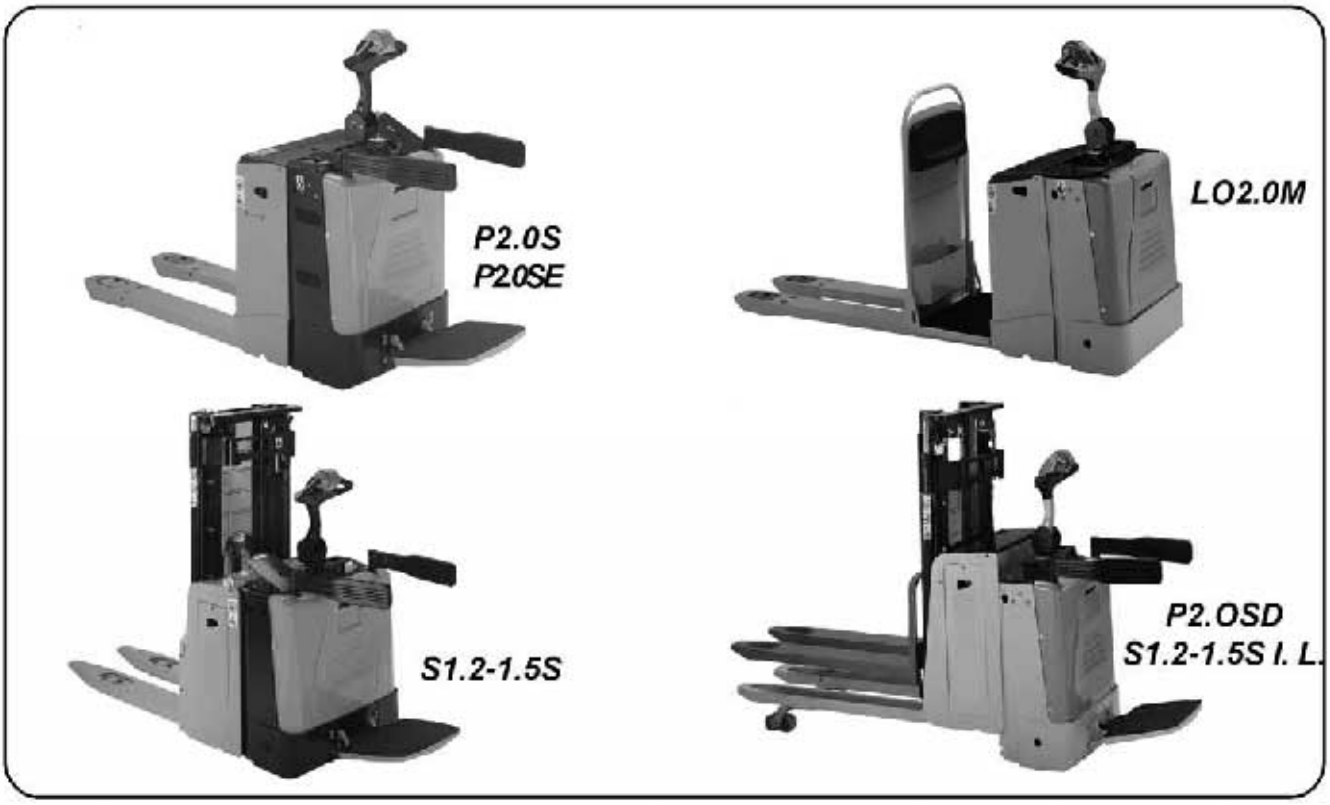
MANUAL

Hyster A978 (P2.0SE) Forklift

HYSTER

PART No. 1567003

Technical information for Hyster customer care centres



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

C439.....	P2.0S
A978.....	P2.0SE
B433.....	P2.OSD
C442.....	S1.2-1.5S
C442.....	S1.2-1.5S I. L.
A939.....	LO2.0M

HYSTER

IMPORTANT

This manual contains detailed information about the routine and preventive maintenance, troubleshooting, disassembly/assembly of components, adjustment procedures for the following Hyster models: P2.0S, P2.0SE, LO2.0M, S1.2-1.5S, P2.0SD.
These procedures require specific technical knwoledge 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

AC drive motor control
DDI Display
Steering motor control
Motors
Reduction gears

SECTIONS

This manual is divided into the following sections:

Section 1: **Introduction**
Section 2: **Installation and settings**
Section 3: **Diagnostics**
Section 4: **Electric system**
Section 5: **Hydraulic system**
Section 6: **Frame mechanics**
Section 7: **Mast-fork mechanics**
Section 8: **Mast mechanics**
Section 9: **Reduction gear**
Section 10: **Braking system**

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

WORDS AND SYMBOLS

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

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.

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.

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.
- 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 higly 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 chek 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.

Band 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**

Rope capacity table

	Colour	Width (mm.)				
Working capacity (kg.)	black	35	500	1000	700	400
	violet	50	1000	2000	1400	800
	black	60	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
	brown	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 of 90° in the centre

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 of 90° in the centre

NOTES:

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 oder 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	3660	3,66	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 tigthen 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 TORQUES

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 10	45	38 - 52
M 18x1,5	10 12	51	43 - 85
M 20x1,5	12	58	50 - 65
M 22x1,5	14 15	74	60 - 88
M 24x1,5	16	74	60 - 88
M 26x1,5	18	105	85 - 125
M 30x2	20 22	135	115 - 155
M 36x2	25 28	166	140 - 192
M 42x2	30	240	210 - 270
M 45x2	35	290	255 - 325
M 52x2	38 42	330	280 - 380

ROTARY 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	460	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 - 78
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 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.

INTRODUCTION

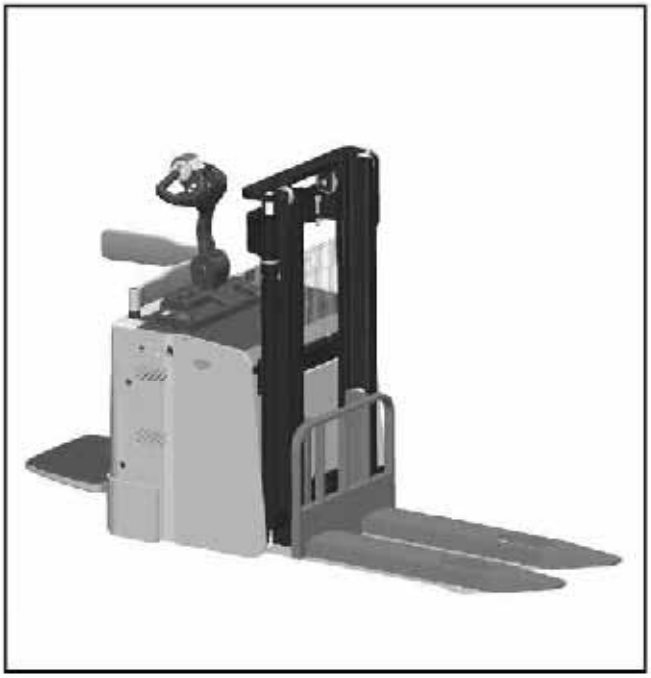
1.00 PRESENTATION OF THE VARIOUS MODELS

VIEWS OF THE TRUCKS

P2.0S - P2.0SE

LO2.0M

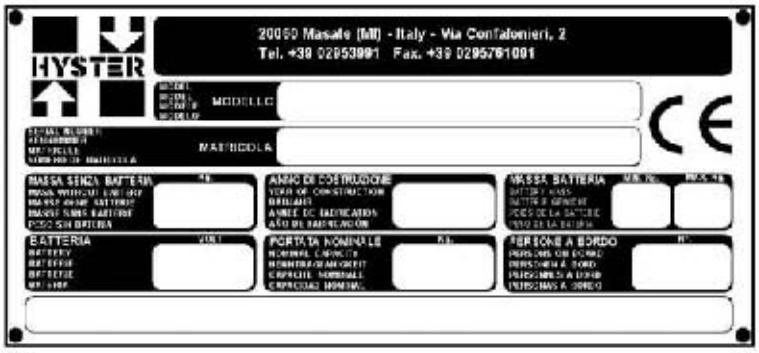
P2.0SD



S1.2S - S1.5S - S1.2S IL - S1.5S IL

2.00 IDENTIFICATION DATA AND RESIDUAL CAPACITY

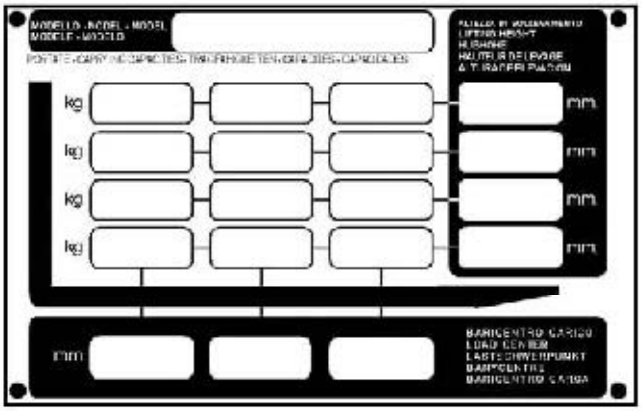
IDENTIFICATION DATA PLATE



The identification plate provides the following data:

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

RESIDUAL CAPACITY PLATE

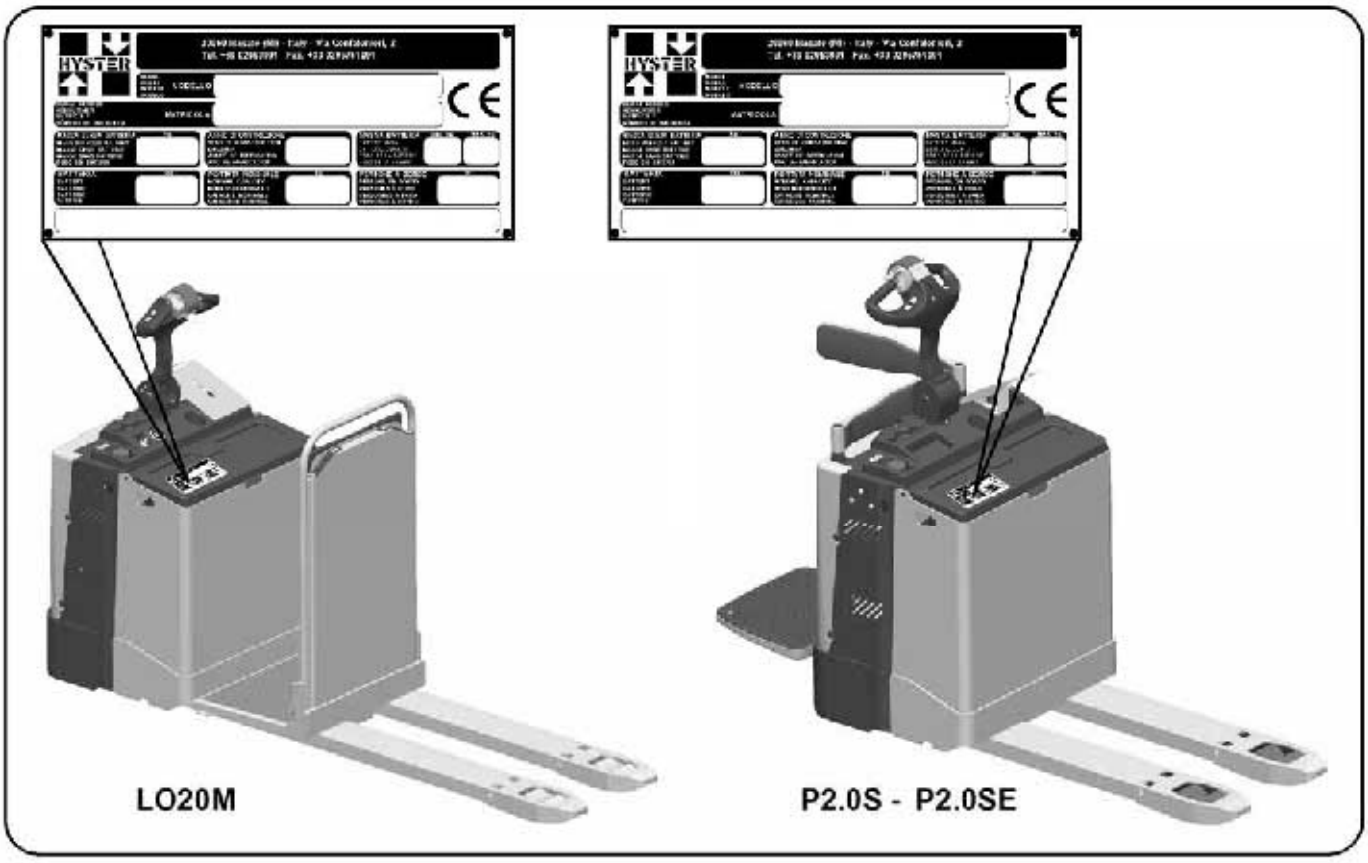


The residual capacity plate provides the following data:

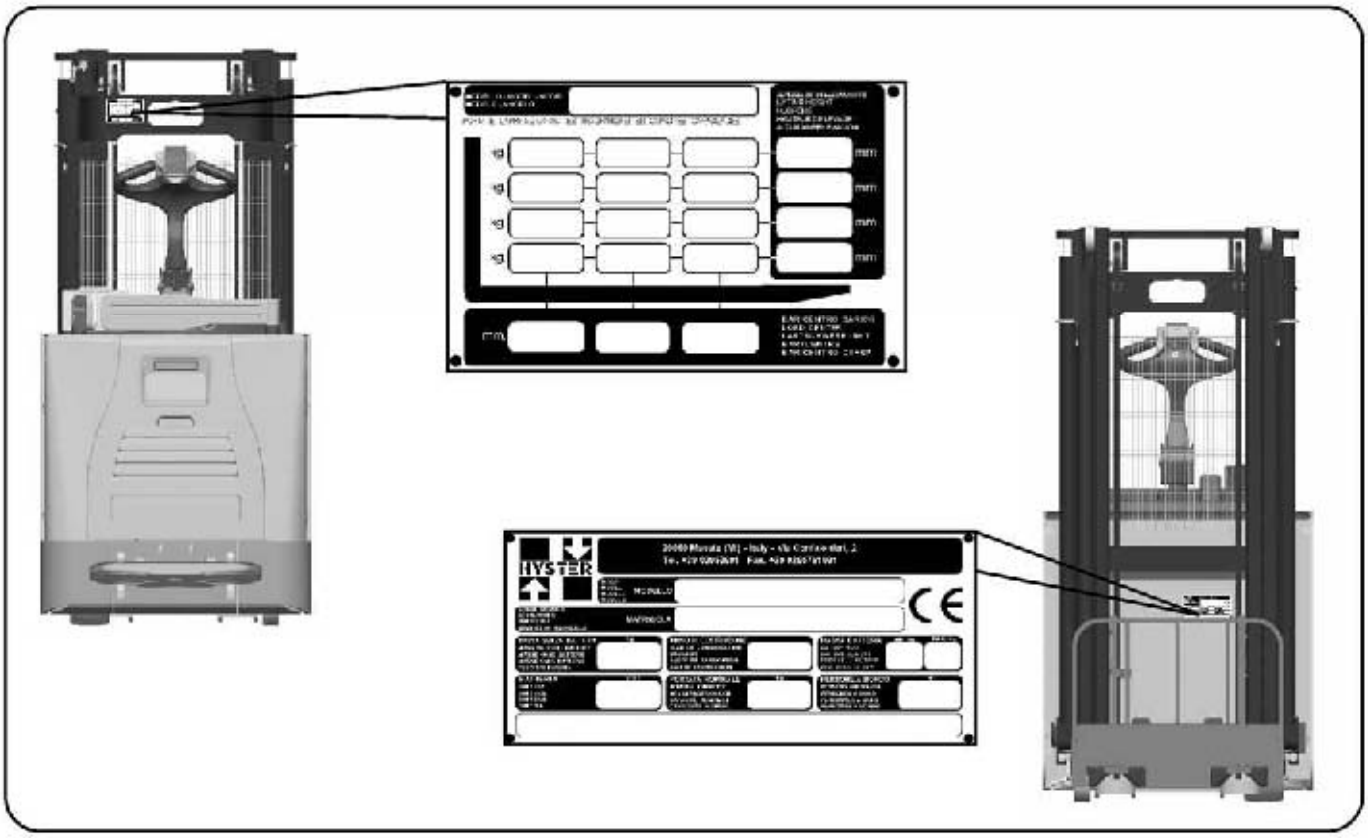
- Model
- Values of load which may be lifted to various heights up to the maximum height and with different distances between the centre of gravity of the load and the forks.

Always refer to the carrying capacity plate to ensure that the load is lifted to the suitable height.

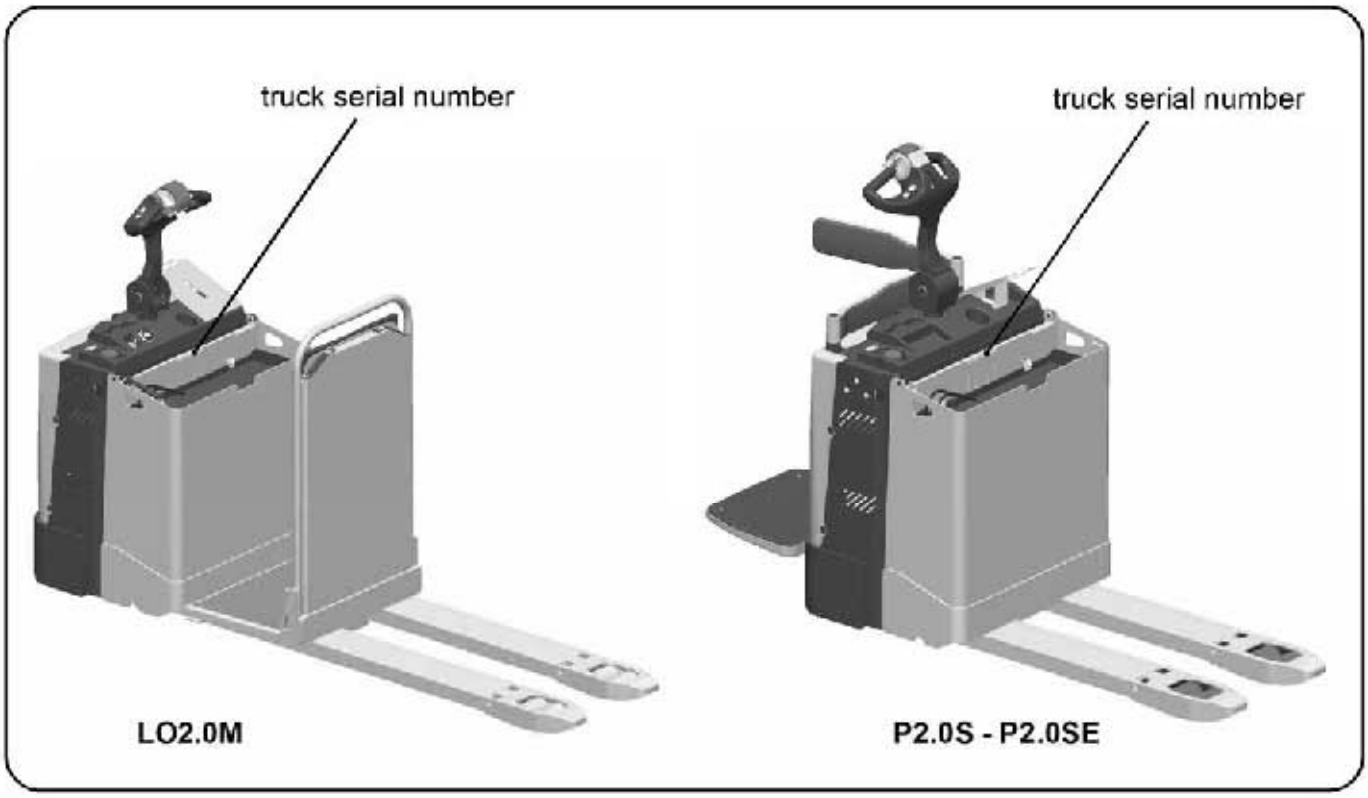
3.00 PLATE POSITIONING
MOD. *LO2.0M - P2.0S - P2.0SE*



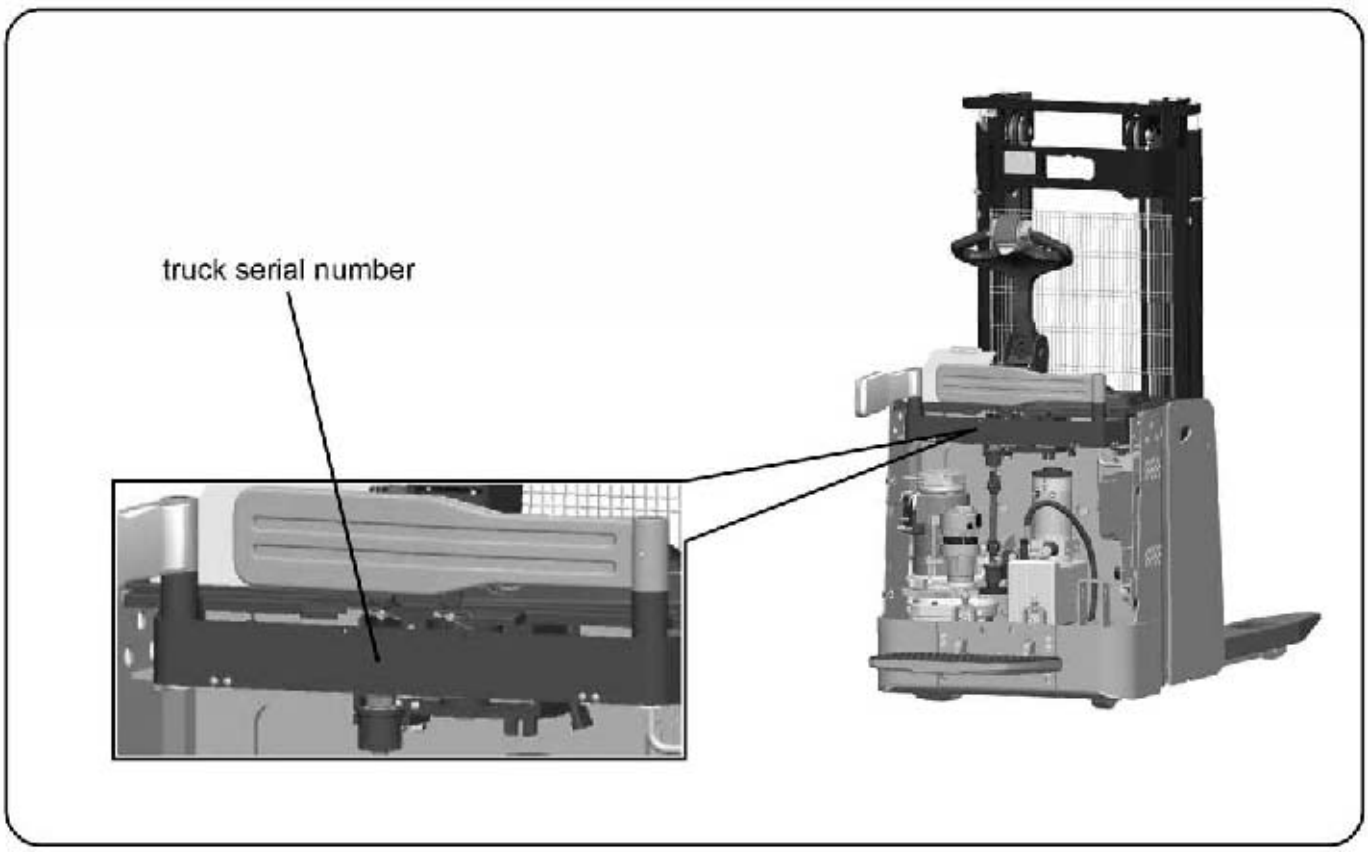
3.01 PLATE POSITIONING
MOD. *P2.0SD - S1.2S - S1.5S - S1.2 IL - S1.5 IL*



4.00 STAMPING OF THE TRUCK SERIAL NUMBER
MOD. *LO2.0M - P2.0S - P2.0SE*

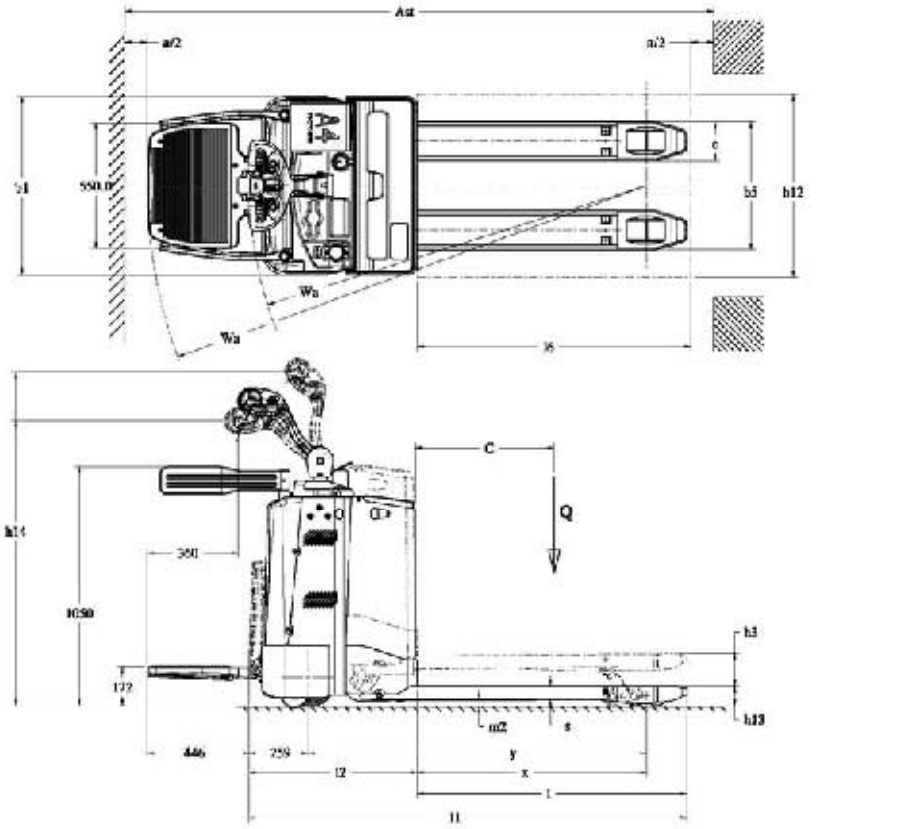


4.01 STAMPING OF THE TRUCK SERIAL NUMBER
MOD. *P2.0SD - S1.2S - S1.5S - S1.2 IL - S1.5 IL*

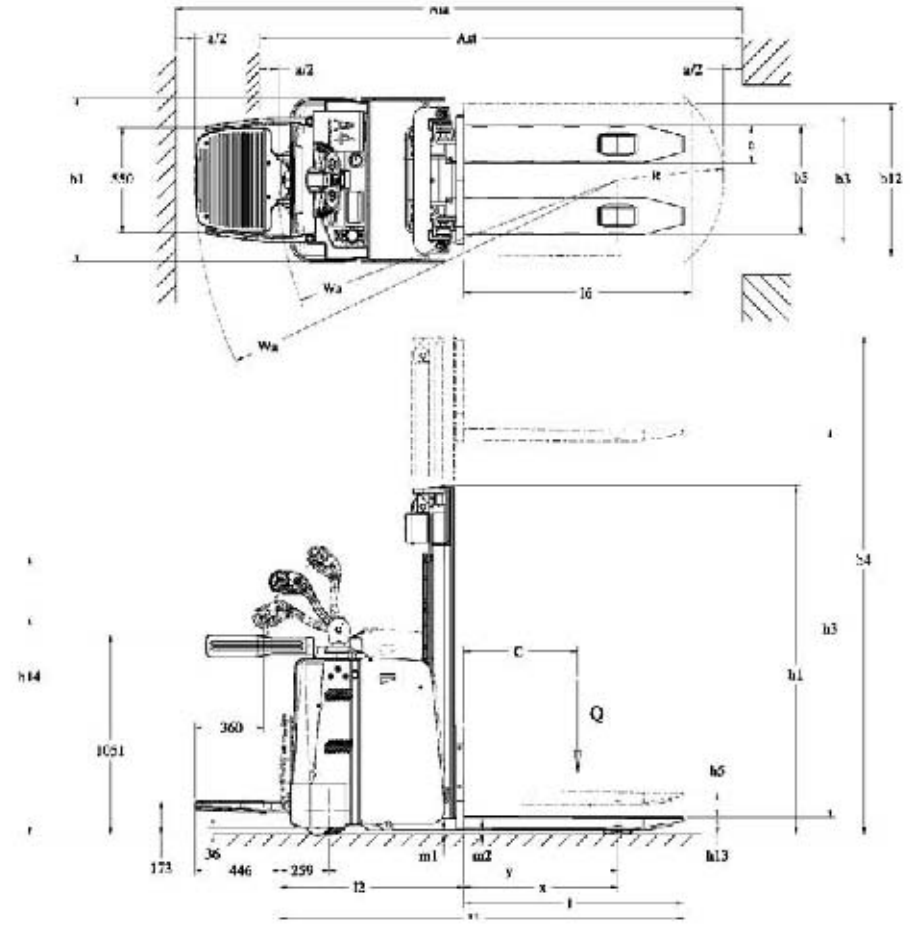


5.00 CONFIGURATION
MOD. *P2.0S - P2.0SD*

P2.0S



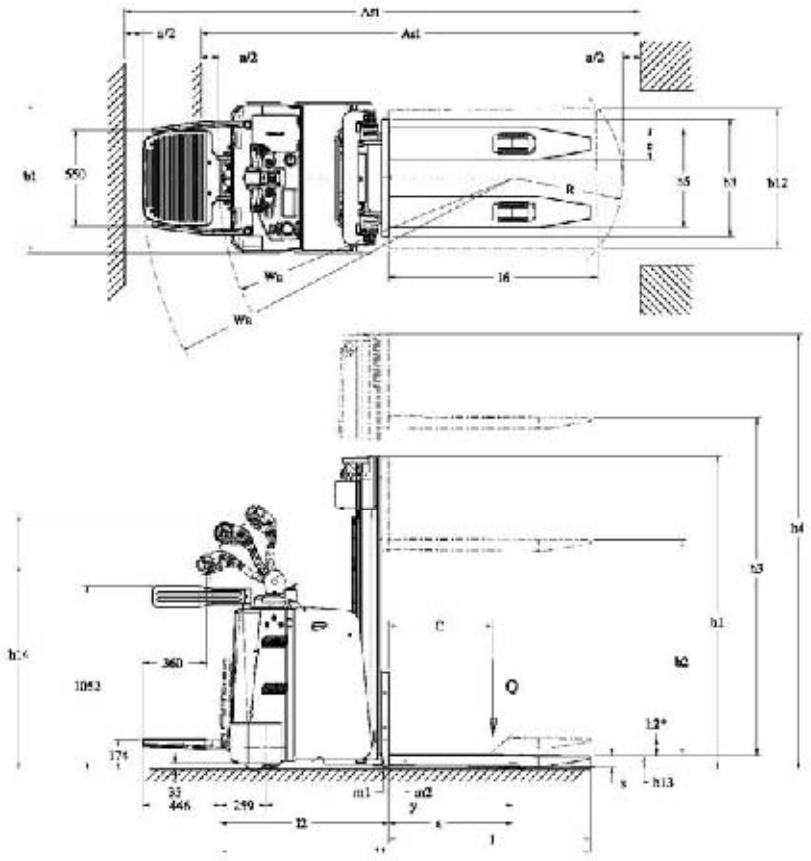
P2.0SD



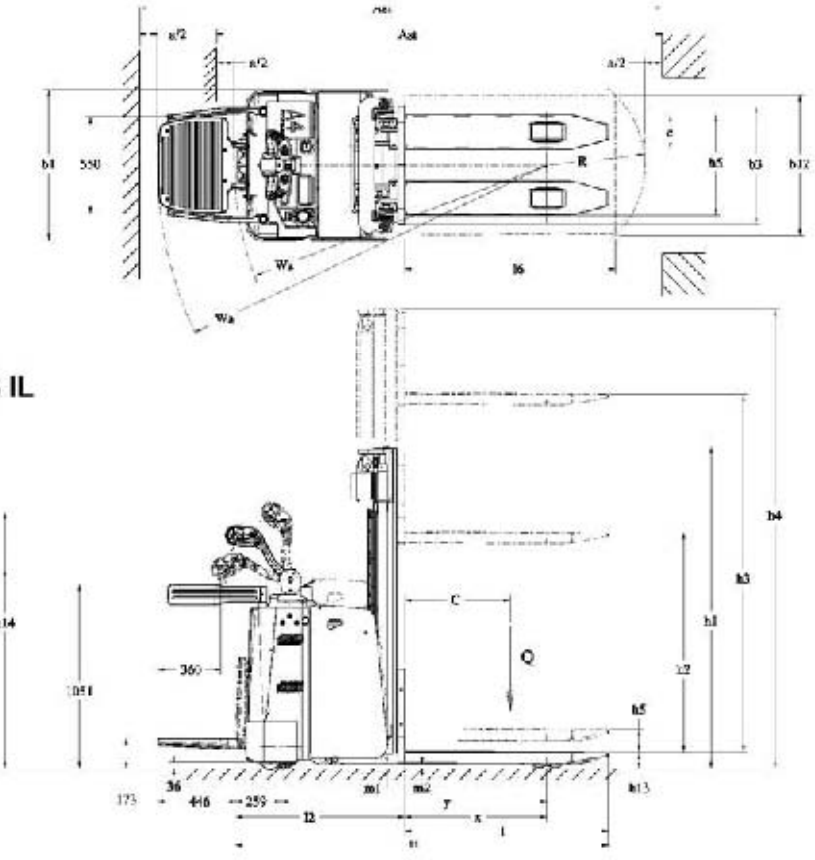
		GENERAL SPECIFICATION		P2.0S	P2.0SD
FEATURES	1.1	manufacturer		Hyster	Hyster
	1.2	model		P2.0S	P2.0SD
	1.3	power: battery, diesel, GPL, electric mains		battery	battery
	1.4	operation: tiller, pedestrian, stand on, seated		pedestrian (stand on)	pedestrian (stand on)
	1.5	load capacity	Q (t)	2.0	1 + 1
	1.6	load centre	c (mm)	600	600
	1.8	load distance from the load wheel axle	x (mm)	1004	992
	1.9	wheelbase	y (mm)	1465 / 1525 / 1575	1702
WHEIGHT	2.1	actual weight (without battery)	kg	950 (1000)	(1100) 1050
	2.2	axle loading ladencarico per asse a carico	kg	1150 (1200) / 1600	(1150) 1100 / 1950
	2.3	axle loading unladen	kg	(750) 800 / 200	(800) 750 / 300
Ruedas y neumáticos	3.1	tyres: rubber, polyurethane, vulkollan		Vulkollan / Vulkollan	Vulkollan / Vulkollan
	3.2	tyre size front		ø 254 x 90	ø 254 x 90
	3.3	tyre size rear		ø 85 x 94	ø 85 x 74
	3.4	additional wheels (dimensions)		ø 125 x 50	ø 125 x 50
	3.5	wheels: number, (x = drive wheel)		1x + 2 / 4	1x + 1 / 4
	3.6	truck width front	b 10 (mm)	526	484
	3.7	tryck width rear	b 11 (mm)	390	375
DIMENSIONS	4.2	lowered mast height	h1 (mm)		1560
	4.3	free lift	h2 (mm)		100
	4.4	lift height	h3 (mm)	130	1650
	4.5	height with mast extended	h4 (mm)		2325
	4.6	outrigger lifting	h5 (mm)		130
	4.9	height of tiller arm in working position min/max	h14 (mm)	1220 / 1460	1220 / 1460
	4.15	lowered height	h13 (mm)	85	90
	4.19	overall length (pedestrain)	l1 (mm)	1922 / 1962 / 2012	2129
	4.19	overall length (stand on)	l1 (mm)	2368 / 2408 / 2456	2575
	4.20	Length to front face of forks (pedestrian)	l2 (mm)	739 / 779 / 829	968
	4.20	Length to front face of forks (stand on)	l2 (mm)	1165 / 1225 / 1275	1415
	4.21	overall width	b1/b2 (mm)	780	760
	4.22	fork dimensions	s/e/l (mm)	55 / 170 / 1183	55 / 195 / 1160
	4.23	fork carriage DIN 15173, Class A, B		-	-
	4.24	fork carriage width	b3 (mm)		675
	4.25	outside fork width	b5 (mm)	560	570
	4.31	ground clearance, beneath the mast	m1 (mm)		30
	4.32	ground clearance, centre of wheelbase	m2 (mm)	30	30
	4.33	aisle width for pallet 1000x1200 wide (stand on)	Ast (mm)	2388 / 2428 / 2476	3206
		aisle width for pallet 1000x1200 wide (pedestrian)	Ast (mm)	1939 / 1979 / 2029	2770
	4.34	aisle width for pallet 1000x1200 long (stand on)	Ast (mm)	2585 / 2625 / 2676	3059
		aisle width for pallet 1000x1200 long (pedestrian)	Ast (mm)	2139 / 2179 / 2229	2821
	4.35	turning radius (stand on)	Wa (mm)	2190 / 2230 / 2280	2408
		turning radius (pedestrian, tiller in vertical position, snail function)	Wa (mm)	1743 / 1783 / 1833	1970
PERFORMANCE	5.1	traverse speed, laden/unladen (pedestrian) (2)	km/h	6 / 6	6 / 6
	5.1	traverse speed, laden/unladen (stand on) (2)	km/h	10 / 10,5	8 / 8.5
	5.2	lifting speed, laden/unladen	m/s	0.03 / 0.04	0.16 / 0.22
	5.3	lowering speed, laden/unladen	m/s	0.05 / 0.04	0.3 / 0.28
	5.7	gradeability, laden/unladen	%	10 / 20	8 / 10
	5.8	max. gradeability, laden/unladen	%	10 / 20	8 / 10
	5.10	service brake		electromagnetic	electromagnetic
POWER UNIT	6.1	drive motor, rating S2 60 min.	kW	4.0	4.0
	6.2	lifting motor, rating S3 15%	kW	2.0	2.0
	6.3	battery to DIN 43531/35/36 A,B,C, no		no	no
				24/210	
	6.4	battery voltage/capacity (5 hour rate)	V/Ah	24/250 / 24/400 / 24/500	24/300
				24/300	
				215	
	6.5	battery weigth	kg	215 / 330 / 400	260
				260	
	6.6	consumption according to VDI cycle	kWh/h	/	/
OTHERS	8.1	drive control		Mosfet ~ AC	Mosfet ~ AC
	8.4	average noise level at operator's ear	dB (A)	< 70	< 70

(1) Truck provided with electric power steering, 400Ah (300 Ah per MD) battery compartment and fork dimensions b5=560, L=1183
(2) Drive, the speed can vary according to the lifting height
( ) Value or text concerning "Biga" or "Bob" versions

5.01 CONFIGURATION
MOD. *S1.2S - S1.5S - S1.2S IL - S1.5S IL*



S1.2S - S1.5S

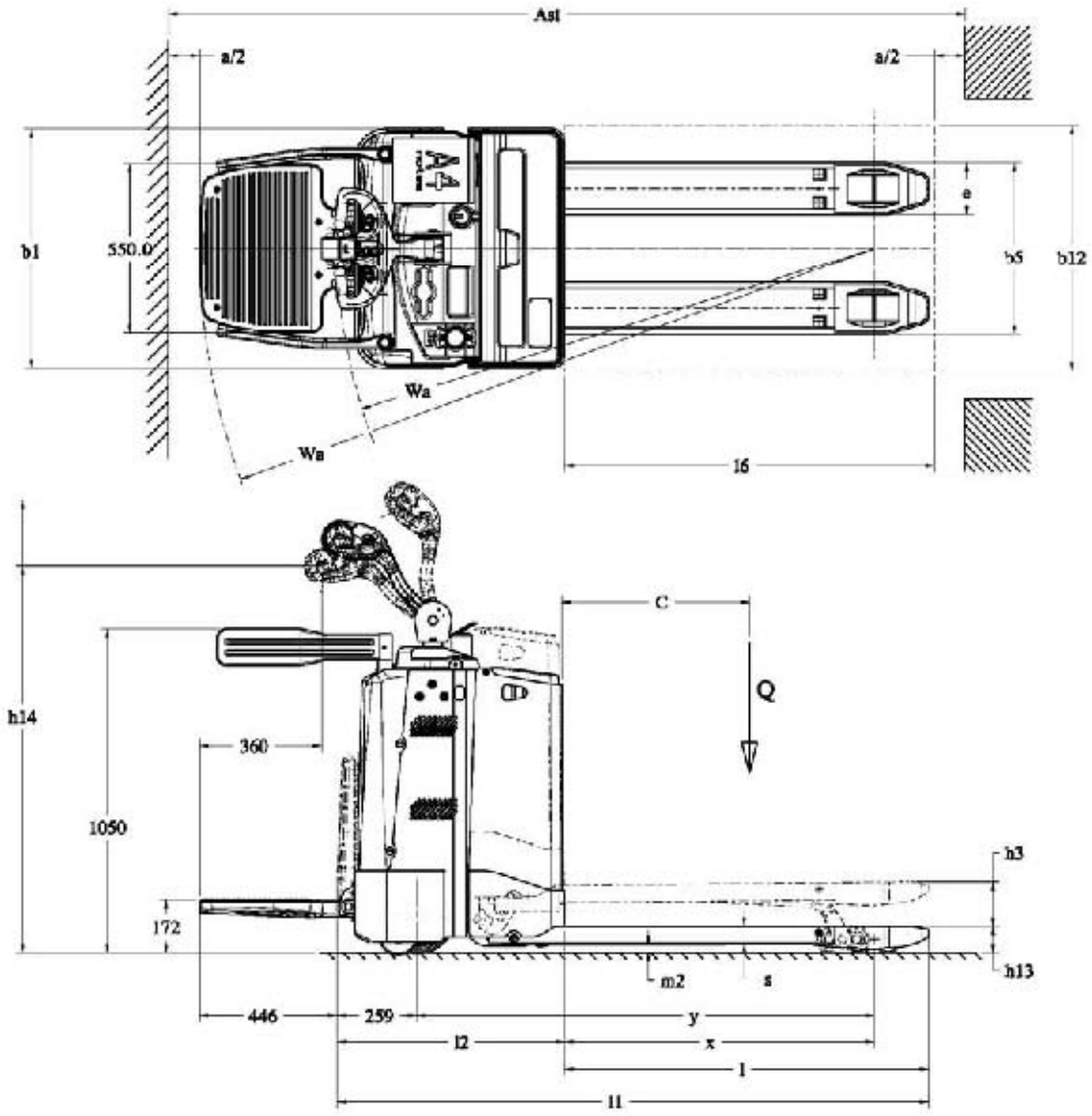


S1.2S IL - S1.5S IL

		GENERAL SPECIFICATIONS		S1.2S	S1.5S	S1.2S IL	S1.5S IL
Characteristics	1.1	Manufacturer		Hyster	Hyster	Hyster	Hyster
	1.2	Model		S1.2S [1]	S1.5S [2]	S1.2S IL [1]	S1.5S IL [2]
	1.3	Power: battery, diesel, LPG, electric mains		Battery	Battery	Battery	Battery
	1.4	Operation: manual, pedestrian, stand on, seated		pedestrian (stand on)	pedestrian (stand on)	pedestrian (stand on)	pedestrian (stand on)
	1.5	Load capacity	Q (t)	1.25	1.5	1.25	1.5
	1.6	Load centre	c (mm)	600	600	600	600
	1.8	Load distance	x (mm)	713	701	811	811
	1.9	Wheelbase	y (mm)	1423	1423	1520	1520
Weights	2.1	Unladen weight (battery included) [3]	kg	1398	1570	1393	1570
	2.2	Axle loading laden, front/rear [3]	kg	950 / 1092	1142 / 1928	958 / 1705	1142 / 1928
	2.3	Axle loading unladen, front/rear [3]	kg	926 / 472	1012 / 558	926 / 472	1012 / 558
Wheels and tyres	3.1	Tyres: rubber, polyurethane, vulkollan, front/rear		Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan
	3.2	Tyre size - front		ø 254 x 90	ø 254 x 90	ø 254 x 90	ø 254 x 90
	3.3	Tyre size - rear		ø 85 x 74	ø 85 x 74	ø 85 x 74	ø 85 x 74
	3.4	Additional wheels: (dimensions)		ø 125 x 50	ø 125 x 50	ø 125 x 50	ø 125 x 50
	3.5	Wheels - number front/rear (x = driven)		1x + 1 / 4	1x + 1 / 4	1x + 1 / 4	1x + 1 / 4
	3.6	Track width - front	b 10 (mm)	564	564	564	564
	3.7	Track width - rear	b 11 (mm)	395	395	395	395
Dimensions	4.2	Height of mast, lowered	h1 (mm)	see mast table	see mast table	see mast table	see mast table
	4.3	Free lift	h2 (mm)	see mast table	see mast table	see mast table	see mast table
	4.4	Lift height	h3 (mm)	see mast table	see mast table	see mast table	see mast table
	4.5	Height of mast extended	h4 (mm)	see mast table	see mast table	see mast table	see mast table
	4.6	Outrigger lift	h5 (mm)	see mast table	see mast table	see mast table	see mast table
	4.9	Height of tiller arm in working position: min/max	h14 (mm)	1220 / 1460	1220 / 1460	1220 / 1460	1220 / 1460
	4.15	Lowered height	h13 (mm)	90	90	90	90
	4.19	Overall length (pedestrian)	l1 (mm)	2128	2141	2129	2141
	4.19	Overall length (stand on)	l1 (mm)	2575	2587	2575	2587
	4.20	Length to front face of forks (pedestrian)	l2 (mm)	969	981	969	981
	4.20	Length to front face of forks (stand on)	l2 (mm)	1415	1427	1415	1427
	4.21	Overall width	b1/b2 (mm)	980	980	980	980
	4.22	Fork dimensions	s/e/l (mm)	65 / 180 / 1150	65 / 180 / 1150	55 / 195 / 1150	65 / 195 / 1150
	4.23	Fork carriage DIN 15173, Class A, B		-	-	-	-
	4.24	Fork carriage width	b3 (mm)	875	875	875	875
	4.25	Outside fork width	b5 (mm)	560	560	570	570
	4.31	Ground clearance beneath mast, laden	m1 (mm)	30	30	30	30
	4.32	Ground clearance, centre of wheelbase	m2 (mm)	20	20	30	30
	4.33	Aisle width for pallets 1000x1200 wide (stand on)	Ast (mm)	2894	3012	3385	3073
		Aisle width for pallets 1000x1200 wide (pedestrian)	Ast (mm)	2555	2573	2817	2835
	4.34	Aisle width for pallets 1000x1200 long (stand on)	Ast (mm)	2959	2977	2884	2912
		Aisle width for pallets 1000x1200 long (pedestrian)	Ast (mm)	2520	2538	2546	2474
	4.35	Turning radius (stand on)	Wa (mm)	2128	2128	2228	2228
		Turning radius (pedestrian, tiller in vertical position, snail function)	Wa (mm)	1690	1690	1788	1788
Performance	5.1	Travel speed laden/unladen (pedestrian) [4]	km/h	6 / 6	6 / 6	6 / 6	6 / 6
	5.1	Travel speed laden/unladen (stand on) [4]	km/h	6 / 6	6 / 6.5	6 / 6.5	6 / 6.5
	5.2	Lift speed, laden/unladen	m/s	0.16 / 0.22	0.16 / 0.22	0.16 / 0.22	0.16 / 0.22
	5.3	Lowering speed, laden/unladen	m/s	0.3 / 0.29	0.3 / 0.29	0.3 / 0.29	0.3 / 0.29
	5.7	Gradeability, laden/unladen	%	8 / 10	8 / 10	8 / 10	8 / 10
	5.8	Max gradeability, laden/unladen	%	8 / 10	8 / 10	8 / 10	8 / 10
	5.10	Service brake		electromagnetic	electromagnetic	electromagnetic	electromagnetic
Power unit	6.1	Drive motor rating (S2 60 min)	kW	2.2	4.0	4.0	4.0
	6.2	Lift motor rating (S3 15%)	kW	3.0	3.0	3.0	3.0
	6.3	Battery to DIN 43531/35/36 A,B,C, no		no	no	no	no
	6.4	Battery voltage/capacity (5 hour rate)	Ah	24/350	24/350	24/350	24/350
	6.5	Battery weight	kg	300	300	300	300
	5.6	Consumption according to VDI cycle	kWh/h	/	/	/	/
Other	8.1	Drive control		Mosfet ~ AC	Mosfet ~ AC	Mosfet ~ AC	Mosfet ~ AC
	8.4	Average noise level at the operator's ear	dB (A)	< 70	< 70	< 70	< 70

[1] The values refer to a truck with two stage HiV mast, h3 = 2.966
[2] The values refer to a truck with three stage FFL mast, h3 = 4.628
[3] The values refer to the truck with the above-mentioned mast and battery as in line 6.4
[4] Drive, the speed can vary according to the lifting speed

5.02 CONFIGURATION
MOD. *P2.0SE*



		GENERAL SPECIFICATION		P2.0SE	
FEATURES	1.2	model		P2.0SE	
	1.3	power: battery, diesel, GPL, petrol, electric mains		Battery	
	1.4	operation: tiller, pedestrian, stand on, seated		pedestrian / on board	
	1.5	load capacity	Q (t)	2.0	
	1.6	load centre	c (mm)	600	
	1.8	load distance from the load wheel axle	x (mm)	1012	
	1.9	wheelbase (step)	y (mm)	1419	1491
WEIGHT	2.1	actual weight (without battery)	kg	750	
	2.2	axle loading ladencarico per asse a carico	kg	1050/1700	
	2.3	axle loading unladen	kg	550/200	
WHEELS AND TYRES	3.1	tyres: rubber, polyurethane, vulkollan		Vulkollan / Vulkollan	
	3.2	tyre size front		ø 230 x 75	
	3.3	tyre size rear		ø 85 x 94	
	3.4	additional wheels (dimensions)		ø 125 x 50	
	3.5	wheels: number, (x = drive wheel)		1x+2/4	
	3.6	track width front	b 10 (mm)	480	
	3.7	tracj width rear	b 11 (mm)	390	
DIMENSIONS	4.4	lifting	h3 (mm)	130	
	4.9	tiller height in working position	h14 (mm)	1220 / 1460	
	4.15	lowered fork height	h13 (mm)	85	
	4.19	overall length (pedestrian)	l1 (mm)	1850	1922
	4.19	overall length (stand on)	l1 (mm)	2296	2368
	4.20	length to front face of forks (pedestrian)	l2 (mm)	658	730
	4.20	length to front face of forks (stand on)	l2 (mm)	1104	1176
	4.21	overall width	b1/b2 (mm)	716	
	4.22	fork dimensions	s/e/l (mm)	170/55/1191	
	4.25	outside fork width	b5 (mm)	560	
	4.32	ground clearance, centre of wheelbase	m2 (mm)	30	
	4.33	aisle width for pallet 1000 x 1200 wide (pedestrian)	Ast (mm)	1858	1930
	4.33	aisle width for pallet 1000 x 1200 wide (on board)	Ast (mm)	2308	2380
	4.34	aisle width for pallet 800 x 1200 long (pedestrian)	Ast (mm)	2058	2130
	4.34	aisle width for pallet 800x1200 long (stand on)	Ast (mm)	2508	2580
	4.35	turning radius (pedestrian)	Wa (mm)	1670	1742
	4.35	turning radius (on board)	Wa (mm)	2120	2192
PERFORMANCE	5.1	traverse speed (pedestrian)	km/h	6 / 6	
	5.1	traverse speed (on board)	km/h	7,4 / 7,5	
	5.2	lifting speed	m/s	0.03 / 0.04	
	5.3	lowering speed	m/s	0.05 / 0.04	
	5.7	gradeability	%	10 / 20	
	5.8	max. gradeability	%	10 / 20	
	5.10	service brake		electromagnetic	
POWER UNIT	6.1	drive motor	kW	2	
	6.2	lifting motor	kW	1.0	2.0
	6.3	battery BS, DIN 43531/35/36 A,B,C, no		no	no
	6.4	battery voltage /capacity	V/Ah	24/210	24/315
	6.5	battery weight (+/- 5%)	kg	215	330
	6.6	consumtion according to VDI cycle	kWh/h	/	
OTHERS	8.1	drive control		Mosfet ~ AC	
	8.4	average noise level at the operator's ear	dB (A)	< 70	
		Vibrations	m/sec2	3,20	

5.03 CONFIGURATION
MOD. *LO2.0M*

LO2.0M