

Edition 2008B

General information and technical data

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Edition 2008B

1 General information and technical data

1.1 Introduction

This manual describes the service procedures for ATLET's low lifters, pickers and stackers in the T truck series. Use the manual for quick and correct service of respective truck models.

The manual describes models manufactured from November 1991.

You may find contradictions in the manual compared to the models supplied due to optional designs, product development, and the like.



Warning!

If the truck is to be rebuilt after delivery or supplemented in such a way that safety may be affected, ATLET AB or its authorised representative should be contacted.

The electrical system must never be rewired in any form after delivery without written authorisation from ATLET AB, since this may change the measured and applicable EMC.

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In the event of inconsistent information in the Swedish and translated editions, it is the Swedish edition that applies.

Modifications and updates will be distributed via ATLET AB Service Manual Change.

1.2 General information TP /TL /TS

The trucks have been developed with the driver's working environment in focus and in accordance with a completely new customer-orientated concept.

TP is built according to a module system, where the chassis module is the same for all alternatives.

The steering modules are the steering wheel or steering arm. The driver module has two alternatives, either fixed or driver-lifting.

The load carrying module is available in two versions, low lifters or fork lifters.

TL and TS are available in two versions, with or without driver platform.

New time-saving solutions reduce the time required for servicing. The drive motor, hydraulic motor and other service points are easily accessible. A large number of common parts ensure a high degree of service.

1.3 How to use the manual

The manual is arranged according to the same principles as ATLET's spare part catalogues, i.e. a system consists of 12 sections, where sections 4 -12 contain information limited to a specific part of the truck, e.g. Master (section 6) and Hydraulic system (section 8). Sections 1 - 3 in this manual contain more comprehensive information regarding technical data, general service instructions and tools. The main principle for extra accessories is to place them under the respective sections. Otherwise they are placed under section 12 "Miscellaneous". For this reason section 12 does not always contain any information in the Service Manual.

For specific problems or information about procedures, look in the main index for the correct section.

1.3.1 History

This service manual covers all variants in the T truck series manufactured since 1991. Note that there may be parallel sections applicable for T trucks of different dates of manufacture and variants. See the table below.

Table 1.1

Date	Chassis no.	Event	Truck type
1991		Trucks manufactured before this event are not described in this service manual.	T

1.3.2 Symbol key



Warning!

Used with risk of personal injury.



Important!

Used with the risk of damage to the machine.



Note!

Used for general observation.

1.4 Tips before next step

1.4.1 Lifting points

Figures 1.1 – 1.3 show where the permitted lifting points are placed on the truck. Lifting points A are marked with a decal representing a lifting hook.

When lifting with TS that have free view masts, the lifting holes in the outer mast should be used (point B).

On machines with other mast types the lifting strap is attached round the upper mast strut (point C).

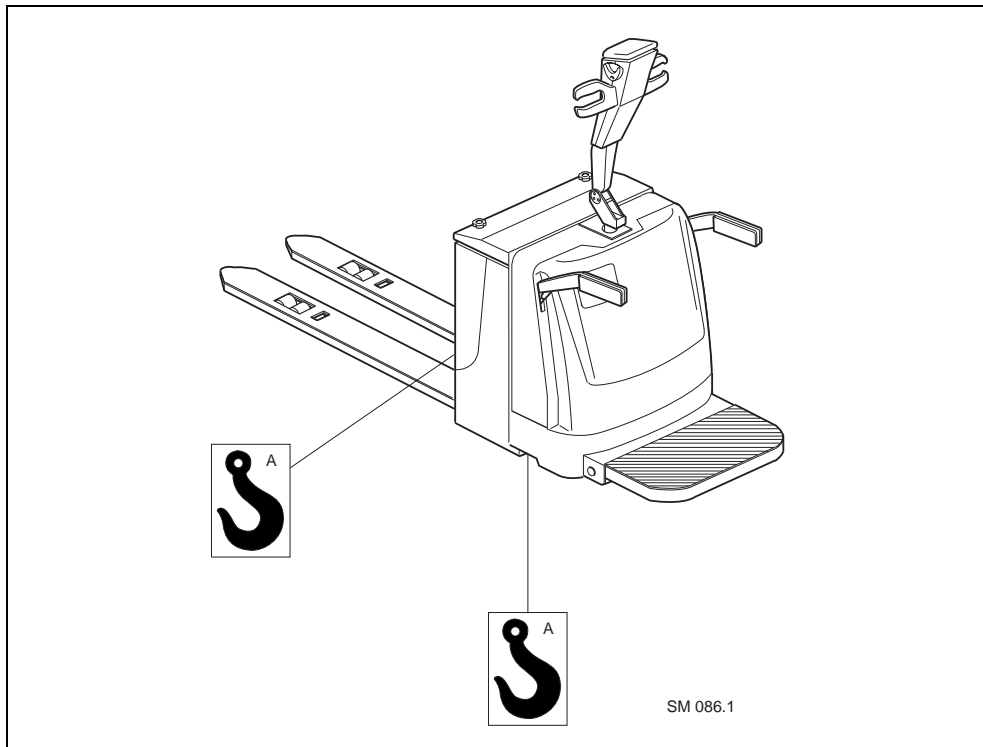


Figure 1.1 TL

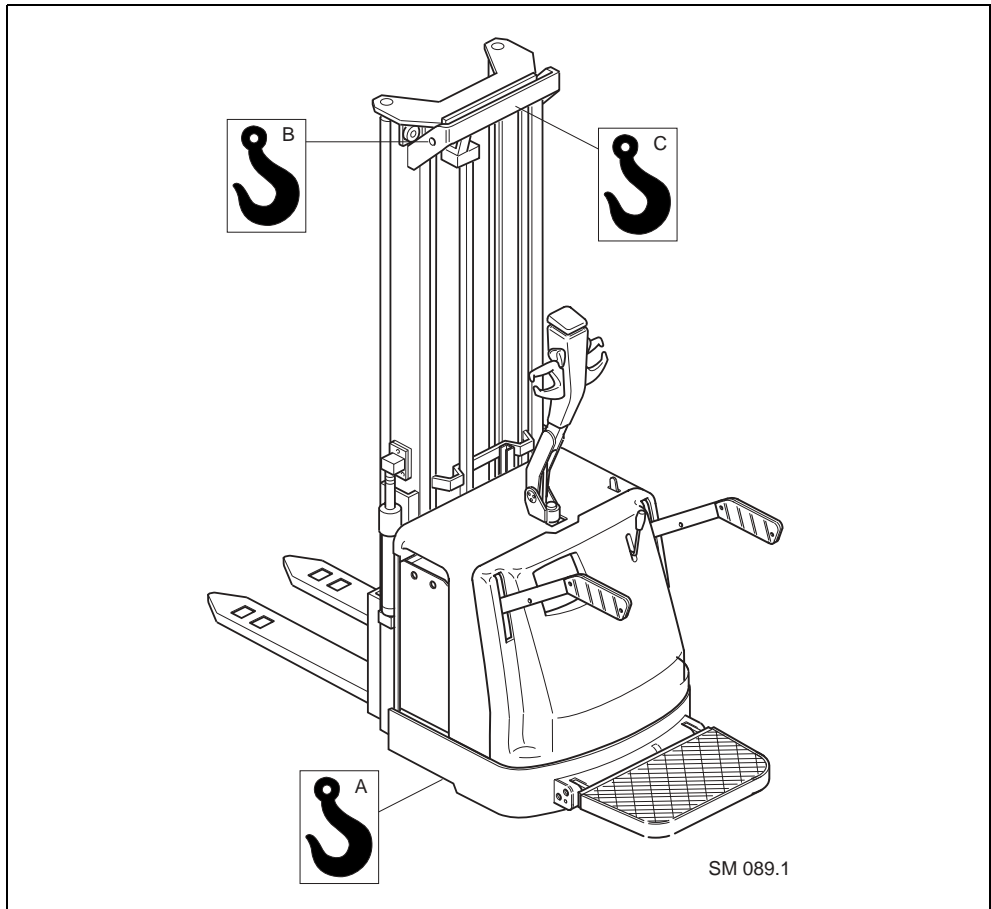


Figure 1.2 TS

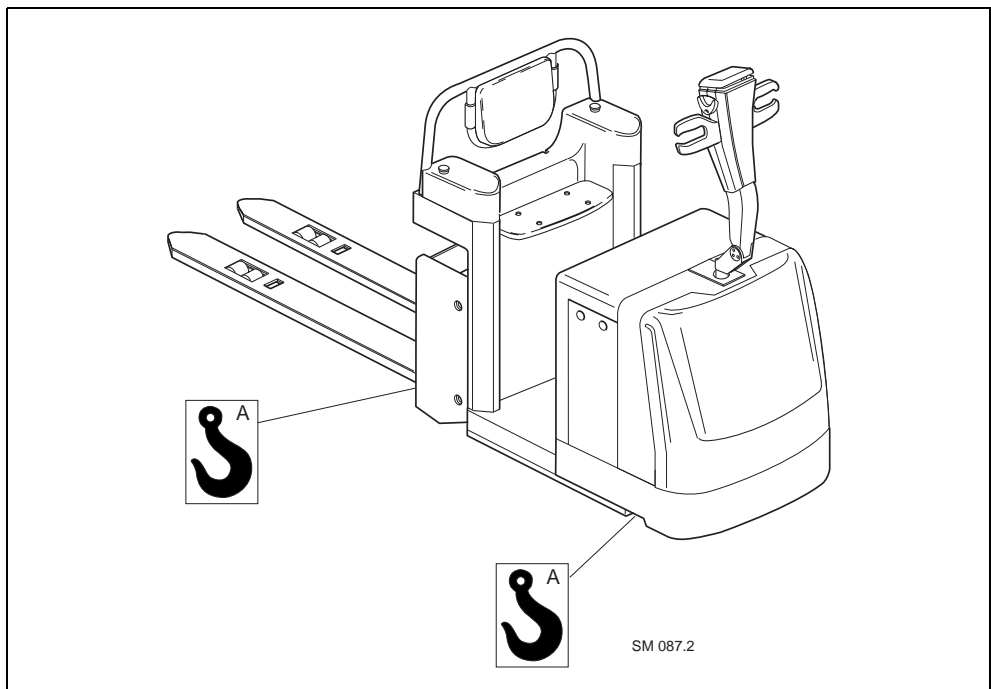


Figure 1.3 TP

1.4.2 General safety risks when working on fork trucks

Extreme importance must be placed on precautionary measures to avoid accidents during all work on the vehicle.

A general rule is to always implement preventive measures that are adapted to the type of vehicle to be worked on. The general rules below must always be observed:

- Smoking or naked flames are strictly forbidden as there is a risk of explosion in the vicinity of batteries and while working on gas equipped vehicles.
- The battery should always be protected during grinding work.
- The fire regulations for the building should also be observed.

The drive wheel should always be lifted up free from the floor during service work to prevent the vehicle from moving. The vehicle must not rest solely on the jack, but must be secured by some form of blocking.

- To prevent injuries caused by crushing, the battery plug should always be pulled out when working around the mast, reach carriage and power pack on electric Reach Trucks. The mast, reach carriage and power pack can be actuated due to an electrical fault or a mistake while working. Pull out the plug and wait 3 minutes before starting work on the electrical system. The battery plug may only be connected while trouble shooting, and when the greatest of care is exercised, (with the truck raised).



Warning!

Standing on the reach carriage between the mast and battery partition with the current connected to the truck can result in fatal injury!

When working on and around the mast and power pack, they must be locked by using the mast lock, wooden blocks or some other appropriate means.

No other persons should be in the vicinity of the truck when it is test run in conjunction with repair work, in view of the risk of accidents or near-accidents from the truck making an unexpected manoeuvre.

When working on the gas equipment on gas driven vehicles the gas system should be emptied first, if possible, by shutting the main tap and running the motor or equipment until the system is empty and stops.

Escaping gas is heavier than air and has a tendency to collect in cavities, and can be ignited by sparks or a naked flame. The machine should therefore be ventilated with compressed air before service work is begun. Ventilation should also be carried out after repairs before the motor or another unit is started, since sparks from the starter or relays can cause explosions.

The system should not be pressurised, e.g. the pump motor shutoff and the forks down, when dismantling parts of the hydraulic system.

1.4.3 Environmentally hazardous waste – environment

Atlet AB takes care of the environment. Waste material in conjunction with repairs, maintenance, cleaning, or scrapping, should be collected and disposed of in an

environment-friendly way and in accordance with the directives of respective countries. Such work must only be carried out in areas intended for this purpose.

Environmentally hazardous waste, such as oil filters, batteries, hydraulic hoses and electronics, can have a negative effect on the environment, or health, if handled incorrectly. Recyclable material should be taken care of by specialised authorities.

1.4.4 Handling

- Make sure that you have all the essential tools close at hand before starting work.
- Check colour codes and for damage to cables and connections before the cabling or other electrical components are disconnected. When complex, complete components are repaired and need to be dismantled ensure that you have good control of the different component parts so that confusion is avoided.
- When repairing or maintaining sensitive components (e.g. electrical and hydraulic components), make sure that you use clean tools and work on a clean work surface.
- Dismantle, inspect and adjust components in accordance with the description under respective sections for detailed information.
- Every time gaskets and O-rings etc. are removed, make sure that you replace them with new ones.
- Always use ATLET's original spare parts.
- Use the screws and bolts specified in the spare parts catalogue. Tighten according to instructions. In those cases where the tightening torque is not stated, refer to the table of standard tightening torque.

1.4.5 Trouble shooting

When you suspect a faulty component, do not replace it immediately. First check the surrounding equipment and carry out complete trouble shooting routines. Make sure you know the reason for the fault before replacing a component.

1.5 Type designations TL/TP/TS

Table 1.2

	Type	Description
Truck type:	TL	TLL, TLP
	TP	TPL, TPF, TPD, TPC
	TS	TSL, TSP
Available combinations:	TLL	Low lifter
	TLP	Fixed platform, low lifting forks
	TPL	Fixed platform, low lifting forks
	TPF	Fixed platform, fork lift
	TPD	Driver-lifting platform, low lifting forks
	TPC	Driver-lifting platform, fork lift
	TSL	Stacker
	TSP	Stacker with platform
Load capacity:	TL	2000 kg
	TP	2000 kg (can vary depending on forks)
	TS	1200 kg, 1400 kg, 1500 kg
Frame types: S = Narrow gauge B = Broad gauge T = Telescopic frame DT = Double telescopic frame F = Free lift V = Free view H = Straddle lift	TPF/TPC	Fork lift: I = Initial lift
	TS 120	ST
	TS 140	ST, STFV, STFV-H, SDTFV, SDTFV-H, BTFV, BDTFV
	TS 140*	BDTFV, BT, BTFV, BTV, SDTFV, SDTFV-H, ST, STFV, STFV-H, ST-H, STV, STV-H
Battery types:		DIN cells or BS cells
Battery capacity:	TL:	Max 300 Ah
	TP:	Max 480 Ah
	TS:	Max 270 Ah

* TS from machine no.: 3001

1.5.1 Type plate TL

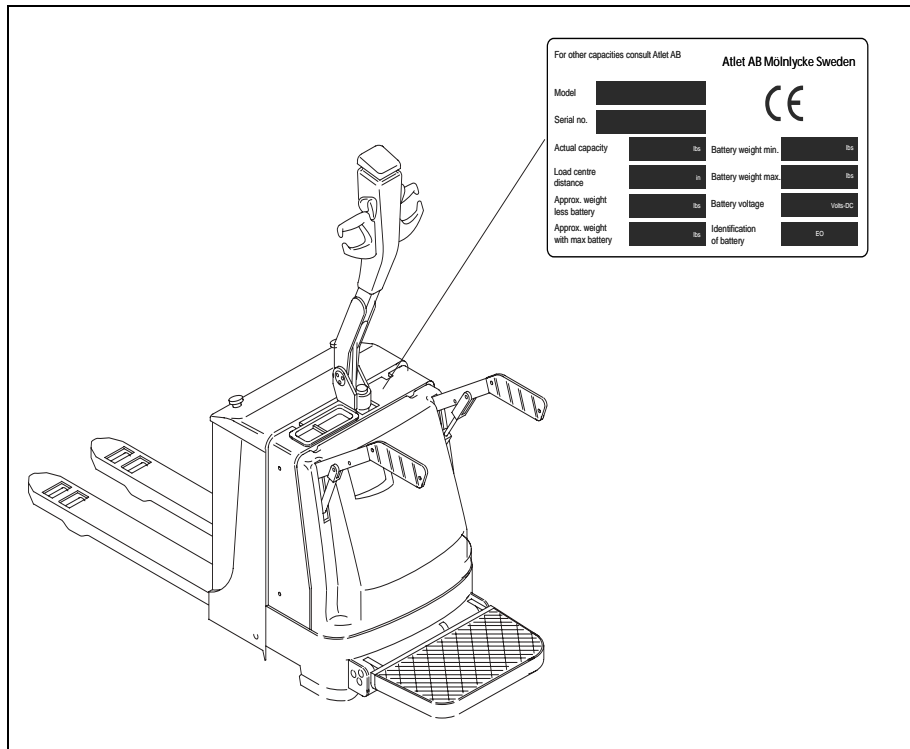


Bild 1.4 Example of type plate, TL

1.5.2 Type plate TP

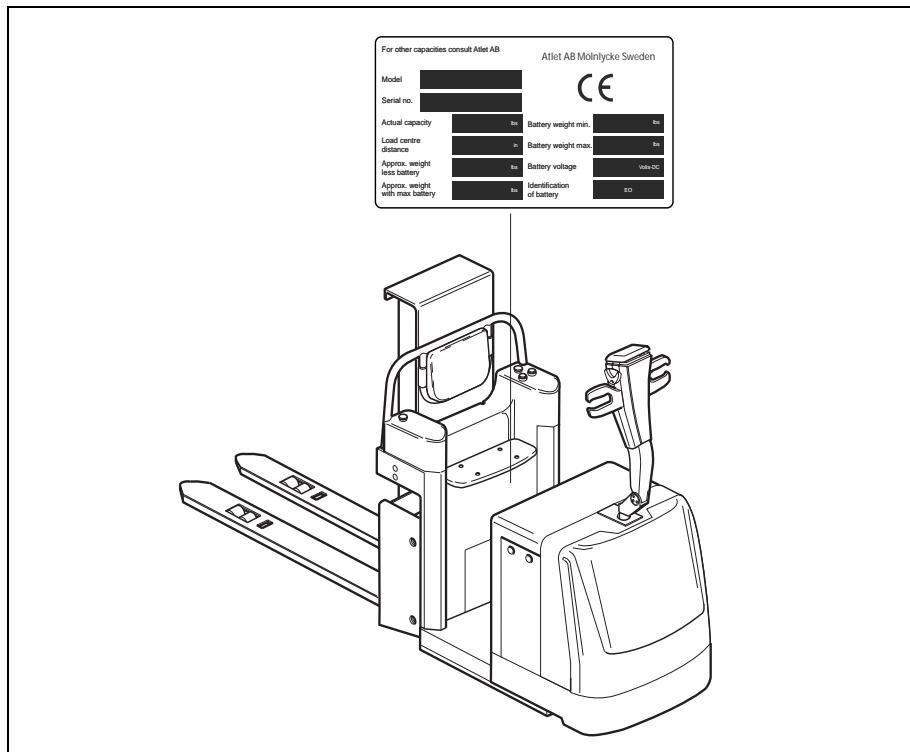


Bild 1.5 Example of type plate, TP

1.5.3 Type plate TS (-2006w36)

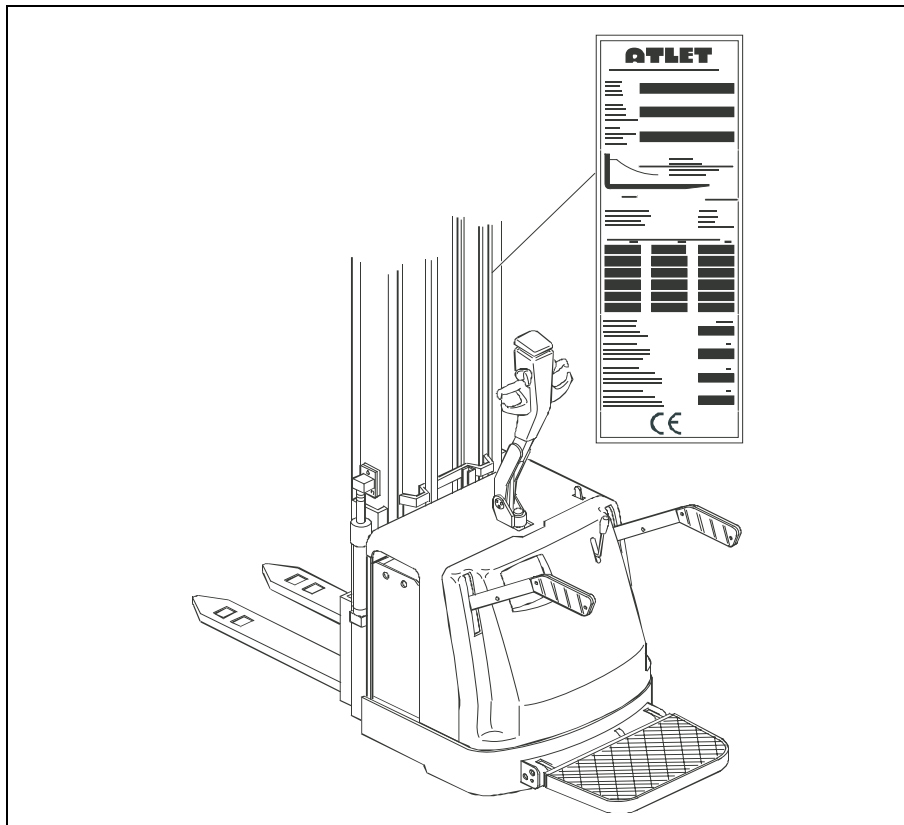


Bild 1.6 Example of type plate, TS (-2006w36)

1.5.4 Type plate TS (2006w37-)

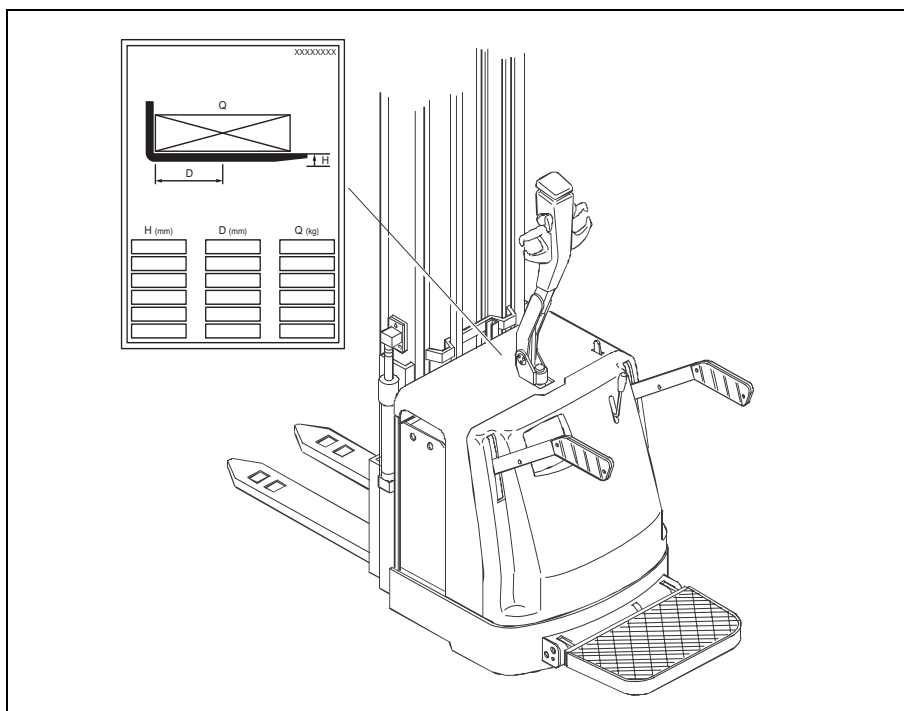


Bild 1.7 Example of type plate, TS (2006w37-)

**Note!**

In cases where the machine plate has been lost or become illegible, it must be renewed immediately. In order to identify the machine's serial number, there is a plate located on each main component such as drive motor, gearbox, hydraulic unit, TMC etc. For some machines there is even a plate attached inside the battery compartment, or serial number punched on the side of the mast.

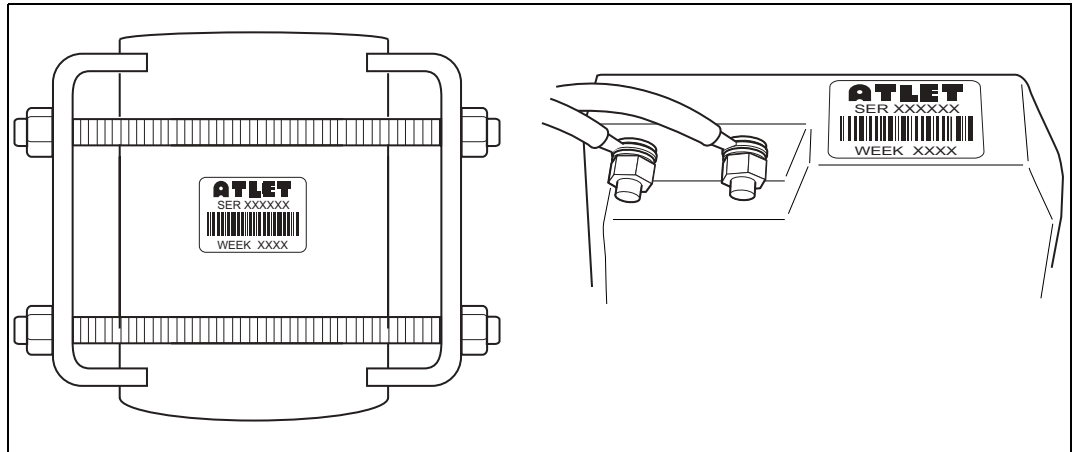


Figure 1.8 Example of plate with serial number.

1.6 Dimensions and weights

Table 1.3

Model	Standard lifting height H4 mm	Weight with/ without battery
TPL/TPD	230	
TPF/TPC	950	

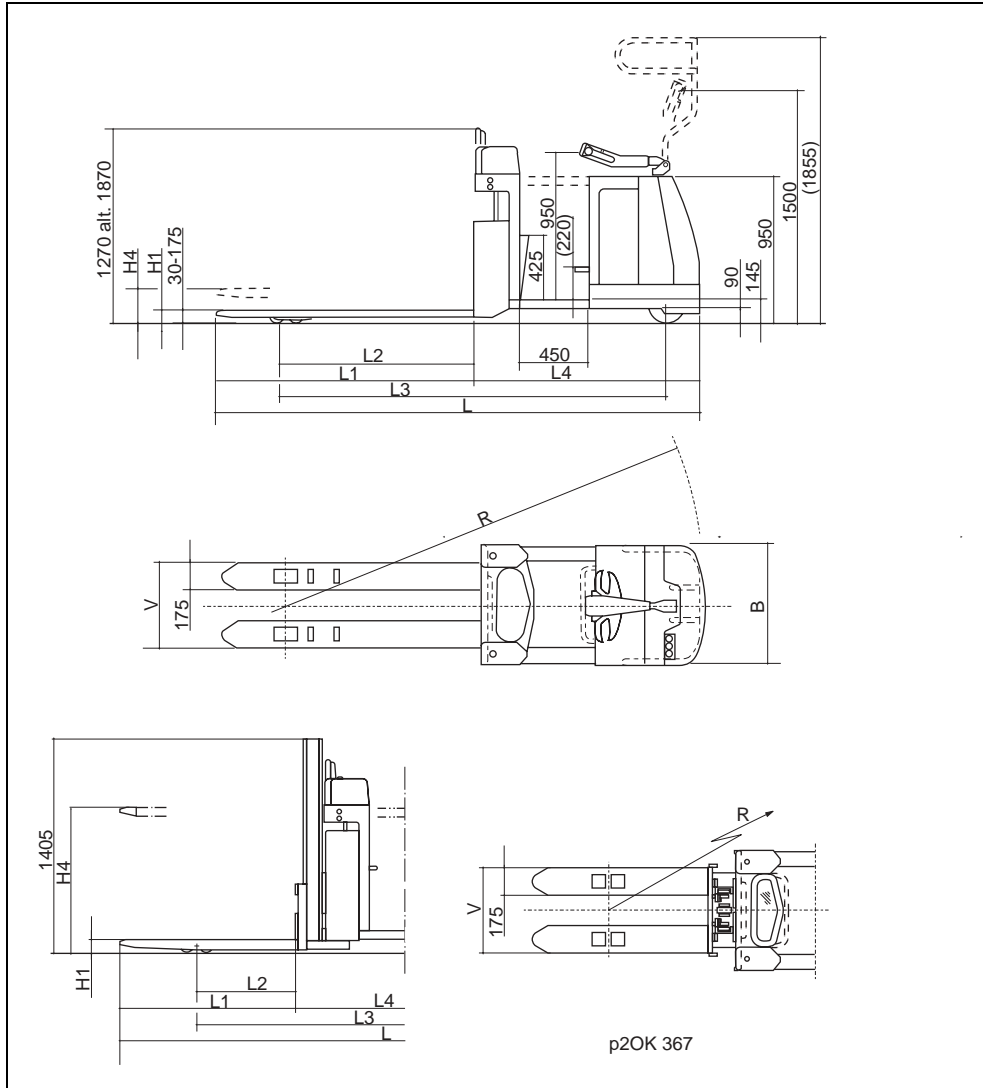


Figure 1.9 TP

Table 1.4

Model	Standard lifting height H4 mm	Weight with/without battery kg
TLL20	200	620 / 400
TLL20S	210	670 / 450
TLP20	200	640 / 420
TLP20S	210	690 / 470

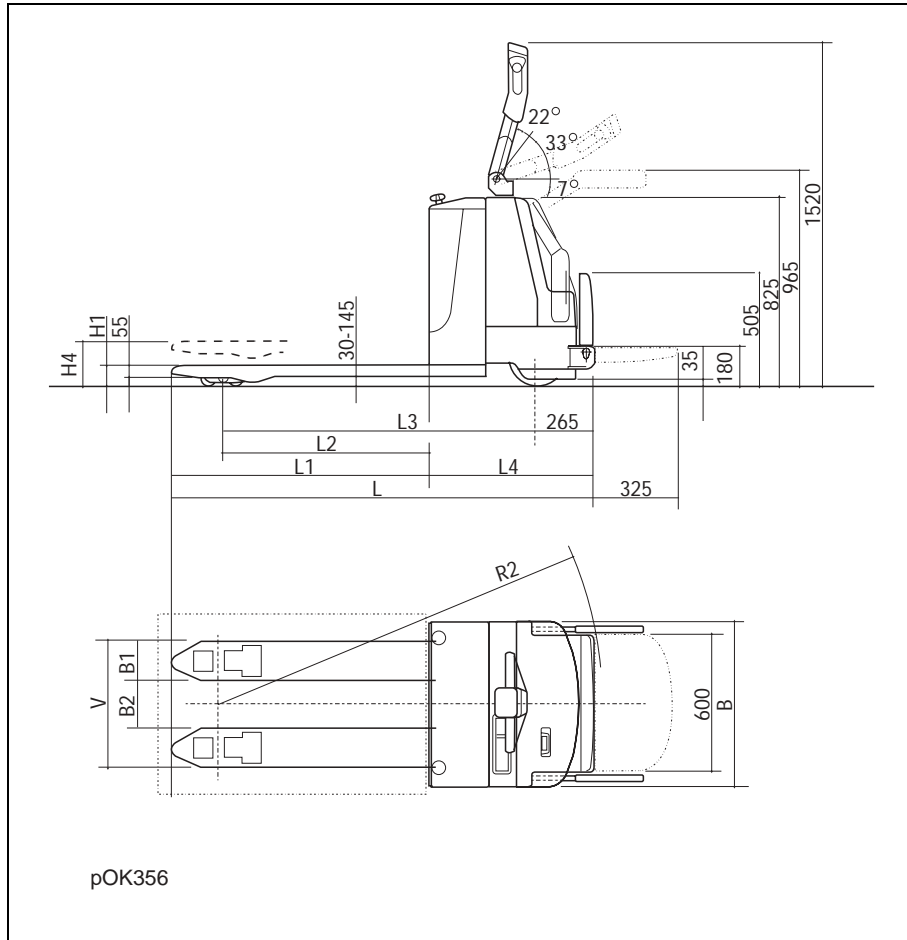


Figure 1.10 TL

Table 1.5 Dimension TS

Frame type	TS 140 H4 mm	TS 120 H4 mm
Telescopic (T)	1600-4200	1600-3450
Telescopic Free View (TFV)	1600-4200	-
Double Telescopic Free View (DTFV)	3600-4800	-

Table 1.6 Service weight TS

Frame type	TS 140 weight with/ without battery	TS 120 weight with/ without battery
Telescopic (T)	1120 / 850 kg	1020 / 750 kg
TFV/DTFV	1230 / 960 kg	-

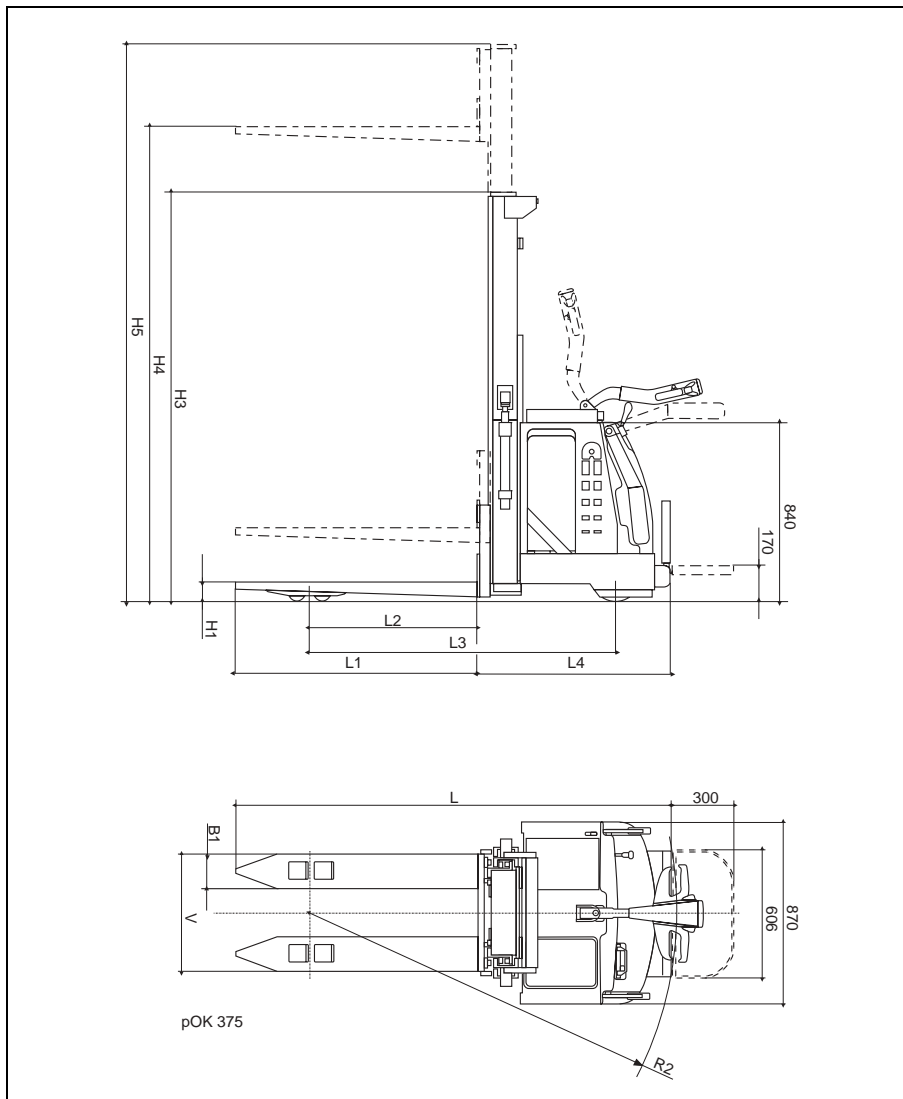


Figure 1.11 TS

1.7 Component specification

1.7.1 Drive motor

Table 1.7

	TL	TP	TS
Output (kW)	1,1/2-2*	2	1,1/2-2*
Speed (rpm)	1500/2200	2200	1500/2200

- *) TLL from machine no. 3001
 TLP from machine no. 7001
 TP from machine no. 12001
 TS from machine no. 2001

1.7.2 Electric brake

(See also section 5, Electric brake)

Table 1.8

	TL		TP		TS
Braking torque (Nm)	16	32	22/10	32	16
Stage	1	1	2	1	1

1.7.3 Gearbox

(See also section 5, Gearbox)

Table 1.9

	TL	TP	TS
Gear ratio	15:1/11:1	15:1/11:1	15:1
Oil volume (l)	1,8	1,8	1,8

1.7.4 Hydraulic unit (motor and pump)

(See also section 8, Hydraulic unit)

Table 1.10

	TL	TP	TS
Manufacture	HPI	Smith/Hesselman	Hesselman
Output (kW)	1,2	1,2/3,25	3,25
Max pressure (MPa)	21	21/21	21

1.7.5 Control system for motor

Table 1.11

	TL 1.1 kW		TL 2 kW		TP		TS 1.1 kW		TS 2 kW	
Manufacture	Sevcon	Curtis*	Sevcon	Curtis*	Sevcon	Curtis*	Sevcon	Curtis*	Sevcon	Curtis*
Type	MOS 90A	Sepex 1243	MOS 90B	Sepex 1243	MOS 90B	Sepex 1243	MOS 90A	Sepex 1243	MOS 90B	Sepex 1243
Voltage (V)	24	24	24	24	24	24	24	24	24	24

*) TLL from machine no. 3001
 TLP from machine no. 7001
 TP from machine no. 12001
 TS from machine no. 2001

1.7.6 Battery

Table 1.12

	TL	TP	TS
Voltage (V)	24	24	24
Capacity range (Max Ah)	300	480	270

1.7.7 Fuses

Table 1.13

	TL 1.1 kW	TL 2 kW	TP	TS 1.1 kW	TS 2 kW
Control fuses (A)	8 (2 pcs)	8 (2 pcs)	3 (1 pcs) 7.5 (2 pcs)	3 (1 pcs) 7.5 (1 pcs)	3 (1 pcs) 7.5 (1 pcs)
Pump motor fuse 1 pcs (A)	63	63	63 / 250	250	250
Drive motor fuse 1 pcs (A)	100	160	160	100	160

1.8 Tightening torque

1.8.1 Tightening torque standard

Table 1.14

DIM	Tensile grade			
	4,6	8,8	10,9	12,9
	Nm	Nm	Nm	Nm
M4	1,1	2,9	4,0	4,9
M5	2,2	5,7	8,1	9,7
M6	3,7	9,8	14	17
M8	8,9	24	33	40
M10	17	47	65	79
M12	30	81	114	136
M14	48	128	181	217
M16	74	197	277	333
M18	103	275	386	463
M20	144	385	541	649



Important!

The tightening torque in the table above are standard values. In some cases a specific tightening torque is specified in respective sections. If no tightening torque is specified in the service instructions, the values shown in the table above apply.

Table 1.15

Tightening torque: Pipe thread / metric thread:			
Metric fine thread	Whitworth pipe thread	MA (Nm) with ring	MA (Nm) with elastic
M10 x 1	G 1/8"	25	10
M12 x 1.5		30	20
M14 x 1.5	G 1/4"	50	30
M16 x 1.5	G 3/8"	80	35
M18 x 1.5		90	40
M20 x 1.5	G 1/2"	130	50

Table 1.15

Tightening torque: Pipe thread / metric thread:			
Metric fine thread	Whitworth pipe thread	MA (Nm) with ring	MA (Nm) with elastic
M22 x 1.5		150	60
M26 x 1.5		250	70
M27 x 1.5	G 3/4"	250	80
M27 x 2		250	90
	G 1"	350	140
M33 x 2		400	140
M42 x 2	G 1 1/4"	600	240
M48 x 2	G 1 1/2"	800	300

Connect pipes and hoses in accordance with the hydraulic diagram. Pay attention to the connection designations. Do not use force; avoid building-in tensions in pipes, etc.


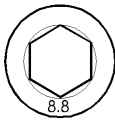
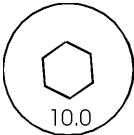
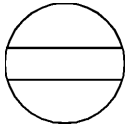
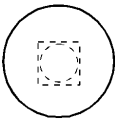
1.8.2 Conversion table

Table 1.16

Newton metres (Nm)	Kilopond metre (kpm)	Pound force inch (lbg x in)	Pound force foot (lbf x ft)
1	0.10	8.85	0.74
9.81	1	86.80	7.23
0.11	0.01	1	0.08
1.36	0.14	12	1

1.8.3 Tensile grade, screws

Table 1.17

Figure	Screw type	Designation	Tensile grade
	M6S	Hexagon screw	8,8 10,9
	MC6S	Hexagon hole screw	8,8 10,9
	MF6S	Hexagon hole screw, countersunk	10,9
	MCS	Slotted screw	4,6
	MVBF	Oval head countersunk screw	4,6

Marking with the manufacturer's trademark, including the tensile grade, is compulsory for screws with a thread diameter from 5 mm and in tensile grades according to the table above. Marking only takes place when the shape of the product permits.

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