372 804 25 11 - 01/03

Operating instructions

Linde pallet stackers

L 14 - L14AP / L 16 - L16AP

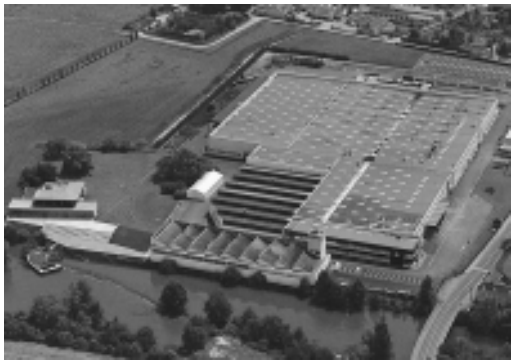
372 804 25 11

09/01 ⇨

Linde - Your Partner

Linde AG Linde Material Handling Division

Werk II, Aschaffenburg-Nilkheim



Fenwick-Linde, Châtellerault

Lansing Linde Ltd., Basingstoke

Werk I, Aschaffenburg

Werk III, Kahl am Main

Linde Heavy Truck Division Ltd., Merthyr Tydfil

Linde, an enterprise operating worldwide in the investment and service sector, is one of the large industrial enterprises in the EC with its three business segments and six divisions.

The Linde Material Handling division is a leading manufacturer of industrial trucks and hydraulics. It includes eight manufacturing plants in the Federal Republic of Germany, France and Great Britain, as well as subsidiaries and branches in all economically important countries.

Linde industrial trucks enjoy a worldwide reputation - thanks to their high quality in engineering, performance and service.

Your

Linde lift trucks offer the best in economy, safety and driving convenience. However, preserving the qualities of the truck for a long and profitable service life, and making full use of their benefits in operation, relies mainly on the operator.

This Operating Instructions manual tells you all you must know about starting, running, servicing and maintaining your Linde lift truck.

Follow the instructions for operating the lift truck and carry out the maintenance and care prescribed in the maintenance plan regularly and on time.

To keep your warranty valid and to ensure safety, all maintenance should only be carried out by qualified persons authorised by Linde.

Approved applications

Linde trucks are designed for transporting and lifting loads stated on the load capacity plate within a temperature range of 40°C down to -9°C standard, or -30°C as an option.

In particular, we refer to the attached booklet (VDMA or BITA for UK market) concerning the safe operation and accident prevention for fork lift trucks, to the safety guidelines for gas vehicles and the regulations for use of the truck on public roads.

The booklet for users of industrial and rough terrain trucks (VDMA or BITA for UK market) must be followed under all circumstances by the operator and service personnel.

The user, and not Linde, is responsible for any accidents arising from applications not authorised by the manufacturer.

Should you want to use the fork lift truck for applications not covered in these instructions, please contact your local Linde representative.

No modifications or conversions may be made, or additional equipment fitted to your fork lift truck, without prior permission of the manufacturer.

For attachments: the operating instructions supplied by the attachment manufacturer are applicable.

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Technical note

These operating instructions or excerpts thereof may only be copied, translated or transmitted to third parties after prior written approval by the manufacturer.

Linde pursues a policy of continuous improvement in design and manufacture of its products. The illustations and thenical details referring to design, fittings and engineering of lift trucks are subject to change or modification as a result of technological progress by Linde.

Linde is therefore unable to consider any claims based on the specification, illustrations and descriptions contained in this Operating Instructions manual.

Please submit all enquiries concerning Linde fork truck orders for spare parts to your local Linde representative, making sure to give the correct delivery address.

For repairs use only original Linde spare parts. Only in this way can it be guaranteed that your Linde fork lift truck maintains its original technical standard.

When ordering spare parts, please specify the part number and state the following truck data.

Lift Truck Type _____

Manufacturer's Serial No./Year built _____

Delivery Date _____
Please also specify the production number of the mast, when ordering mast parts.

Mast No.: _____
Mast Lift Height: _____ mm

When taking over the fork lift truck, transfer the data from the type plates into this Operating Instructions manual. This information can be found on the type plates on the truck. We recommend that you transfer this information to this manual for ease of future reference.

Truck take over

Every Linde lift truck undergoes careful inspection before leaving the factory in order to make sure that it will be in good condition and fully equipped as ordered when delivered.

Your local Linde representative is under obligation to re-inspect the truck before delivery and to hand it over in full working order.

In orders to avoid later complaints and inconvenience to customers, you are requested to ascertain that the truck is in satisfactory condition and fully equipped at the time of delivery and to acknowledge the correct installation of the truck in the manufacturers certificate of conformity.

The following technical documents belong to each fork lift truck:

1 Operating Instructions manual

1 EC Certificate of conformity
The manufacturer certifies that the industrial truck conforms to EC guidelines for machines.

1 Spare Parts Catalogue

1 Booklet for users of industrial and rough terrain trucks (VDMA or BITA for UK market)

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Risk of danger and preventive measures when using trucks

Danger	Measure	Check X done - not applicable	Comments
Truck equipment not conform with the workstation	Check	◯	
Poor training and inexperience of the truck driver	Training of the truck driver (driver seated and standing up) Train the walkalong driver	◯ ◯	
Used by unauthorized persons	Access to authorized persons by key only	◯	
Truck not in working condition	Periodic check and repair	◯	
Poor visibility due to the load	Change the driving position	◯	
Polluted atmosphere	Due to diesel exhaust fumes Due to LPG exhaust fumes	◯ ◯	
Inappropriate work (not in accordance with the regulations)	Become familiar with the instructions Written instructions to the truck driver Refer to the Instructions and the VDMA book	◯ ◯ ◯	
When filling with fuel a) Diesel fuel b) LPG	 Refer to the Instructions and the VDMA book Refer to the Instructions and the VDMA book	 ◯ ◯	
When charging traction batteries	Refer to the Instructions and the VDMA book	◯	

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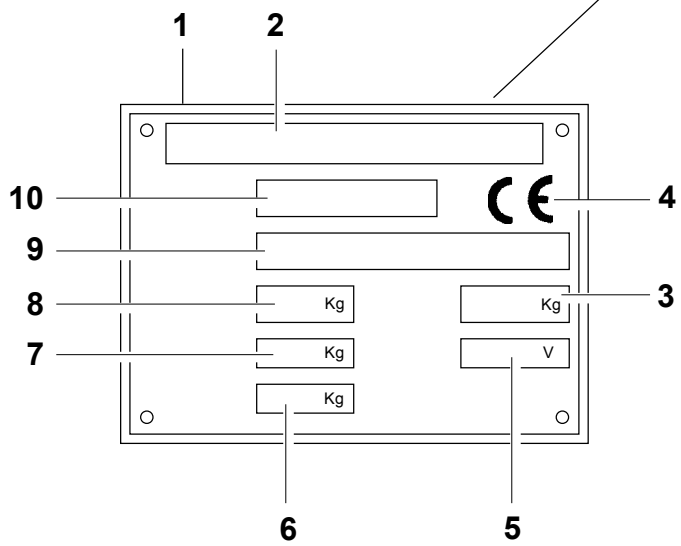
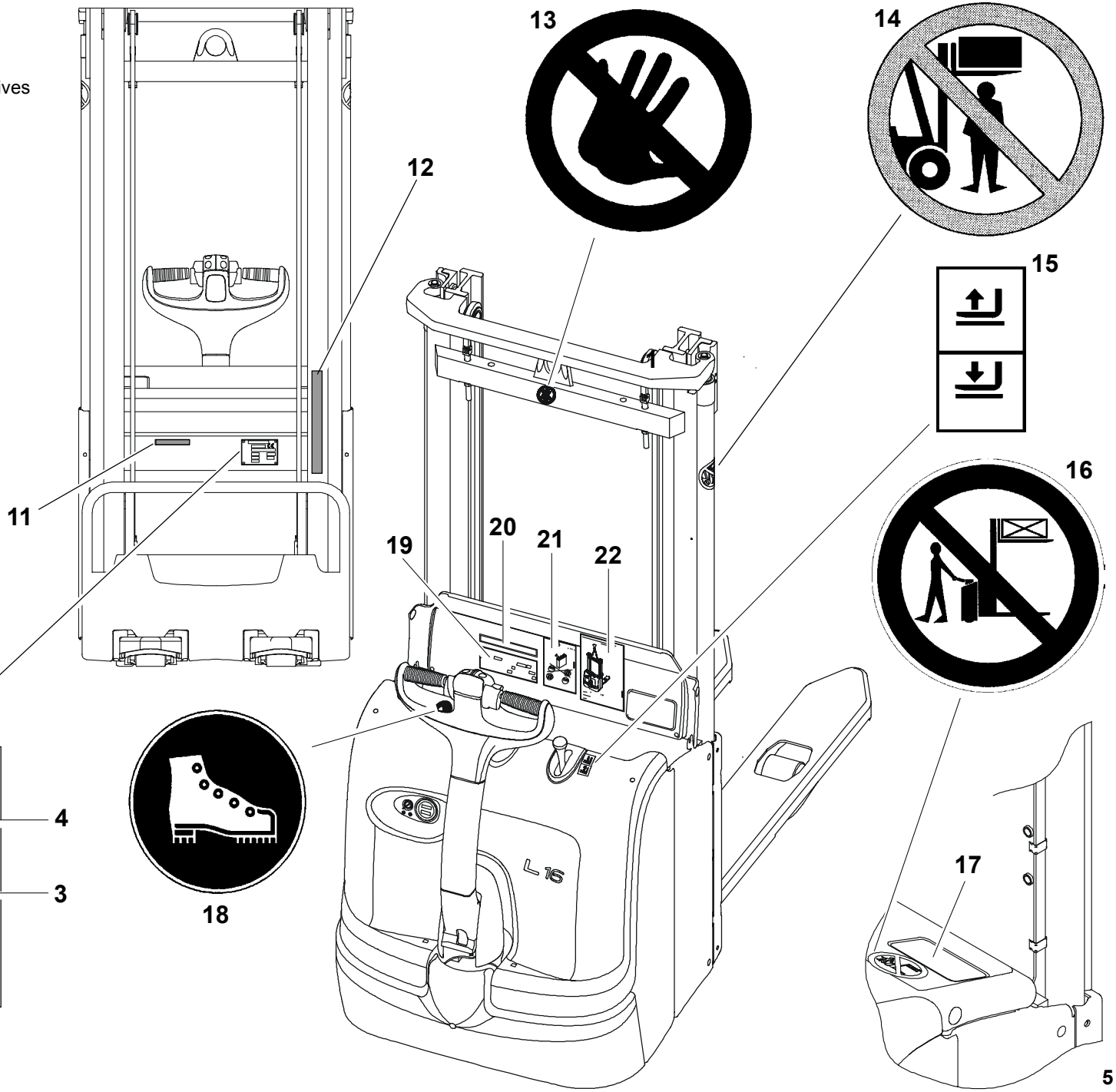
Plates and labels

1. Identification plate
2. Manufacturer
3. ECsymbol
   (The symbol certifies that all relevant EC directives and applicable guidelines are fulfilled)
4. Unladen weight
5. Battery voltage
6. Minimum battery weight
7. Maximum battery weight
8. Nominal truck capacity
9. Serial number / year
10. Model
11. Serial number (engraved)
12. Mast number (engraved)
13. Mast safety labels
14. Mast safety labels
15. Raising/lowering label
16. Rolling safety label
17. Capacity plate
18. Compulsory safety shoes label
19. Charger label
20. Gel / non-gel battery
21. Battery safety label
22. Truck slinging label





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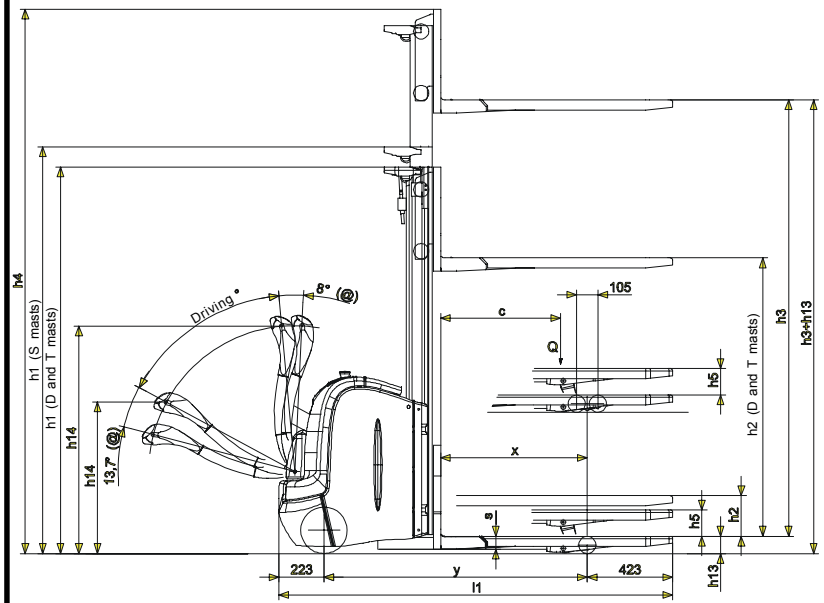

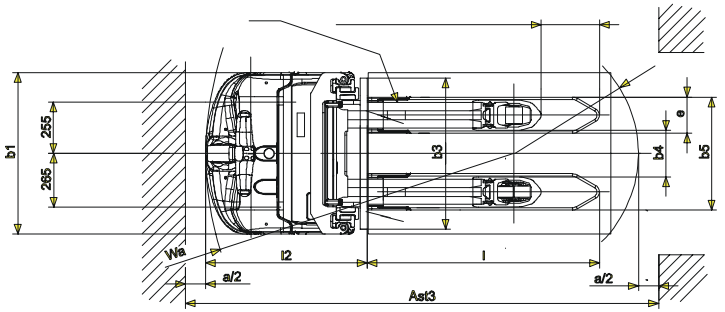

NOTE:
(@): Cut-off angle and brake
Safety free space: a = 200 mm

Valid table for masts 1400kg (L14).
For masts 1600kg (L16) subtract 80mm from h3; h3+h13; h4 (except T masts)

Type of mast		Standard							Duplex							Triplex	
Truck		1924 S	2424 S	2924 S	3324 S	3824 S	4224 S	4724 S	1924 D	2424 D	2924 D	3324 D	3824 D	4224 D		4266 T	4716 T
h3	mm	1924	2424	2924	3324	3824	4224	4724	1924	2424	2924	3324	3824	4224		4266	4716
h3+h13	mm	2010	2510	3010	3410	3910	4310	4810	2010	2510	3010	3410	3910	4310		4352	4802
h1	mm	1490	1740	1990	2190	2440	2640	2890	1415	1665	1915	2115	2365	2565		1915	2065
h4	mm	2460	2960	3460	3860	4360	4760	5260	2460	2960	3460	3860	4360	4760		4802	5252
h2	mm	150	150	150	150	150	150	150	/	/	/	/	/	/		/	/
h2	mm	/	/	/	/	/	/	/	879	1129	1379	1579	1829	2029		1379	1529

SEPTEMBER
2001

Technical sheet L14 / L16 pedestrian pallet stacker

Characteristics	1.1	Manufacturer		LINDE	LINDE	LINDE	LINDE
	1.2	Model designation		**L 14**	**L 16**	**L 14 I**	**L 16 I**
	1.3	Power unit: battery, diesel, petrol, LP gas, mains power		Battery	Battery	Battery	Battery
	1.4	Operation: manual, pedestrian, stand-on, seated, order picker		Pedestrian	Pedestrian	Pedestrian	Pedestrian
	1.5	Load capacity	Q (kg)	1400	1600	1400(2000)[1]	1600(2000)[1]
	1.6	Load centre	c (mm)	600	600	600	600
	1.8	Axle centre to load face	x (mm)	727	727	648/726[2]	648/726[2]
	1.9	Wheelbase	y (mm)	1304 [3]	1304 [3]	1225/1303 [2][3]	1225/1303 [2][3]
Weights	2.1	Service weight	kg	1050 [4]	1050 [4]	1050 [4]	1050 [4]
	2.2	Axle load with load, front (drive)/rear (load)	kg	850/1600 [5]	860/1790 [5]	850/1600 [5]	860/1790 [5]
	2.3	Axle load without load, front (drive)/rear (load)	kg	735/315 [5]	735/315 [5]	735/315 [5]	735/315 [5]
Wheels and tyres	3.1	Tyres, front (drive)/rear (load) C = cushion rubber, P = polyurethene		C+P/P	C+P/P	C+P/P	C+P/P
	3.2	Tyre size, front (drive)	mm	230/90	230/90	230/90	230/90
	3.3	Tyre size, rear (load)	mm	85X85(85X60) [6]	85X85(85X60) [6]	85X85(85X60) [6]	85X85(85X60) [6]
	3.4	Auxiliary wheels (dimensions)	mm	150X150	150X150	150X150	150X150
	3.5	Wheels: number front (drive)/rear (load)		1X+1/2(1X+1/4)[6]	1X+1/2(1X+1/4)[6]	1X+1/2(1X+1/4)[6]	1X+1/2(1X+1/4)[6]
	3.6	Track width, front (drive)	mm	520	520	520	520
	3.7	Track width, rear (load)	mm	380 [7]	380 [7]	380 [7]	380 [7]
Dimensions	4.2	Height of mast, lowered	h_1 (mm)	1990 [8][9]	1990 [8][9]	1990 [8][9]	1990 [8][9]
	4.3	Free lift	h_2 (mm)	150 [8]	150 [8]	150 [8]	150 [8]
	4.4	Lift	h_3 (mm)	2924 [8]	2844 [8]	2924 [8]	2844 [8]
	4.5	Height of mast, extended	h_4 (mm)	3460 [8]	3380 [8]	3460 [8]	3380 [8]
	4.6	Initial lift height	h_5 (mm)			125	125
	4.9	Height of tiller arm in operasting position, minimum/maximum		750/1126	750/1126	750/1126	750/1126
	4.15	Fork height, lowered	h_{13} (mm)	86	86	86	86
	4.19	Overall length	l_1 (mm)	1950 [3]	1950 [3]	1949 [3]	1949 [3]
	4.20	Length to fork face	l_2 (mm)	800 [3]	800 [3]	800 [3]	800 [3]
	4.21	Overall width	b_1/b_2 (mm)	800	800	800	800
	4.22	Fork dimensions	s/e/l (mm)	71/180/1150	71/180/1150	71/180/1150	71/180/1149
	4.24	Fork carriage width	b_3 (mm)	780	780	780	780
	4.25	Fork spread, minimum/maximum	b_5 (mm)	560/680	560/680	560/680	560/680 560/680
	4.26	Min./max. load bearing arms	b_4 (mm)	255/375 [7]	255/375 [7]	255/375 [7]	255/375 [7]
	4.32	Ground clearance, centre of wheelbase	m_2 (mm)	30	30	145/20	145/20
	4.33	Aisle width with pallet 1 000 x 1 200 across forks	Ast (mm)	-	-	-	-
	4.34	Aisle width with pallet 800 x 1 200 along forks	Ast (mm)	2346 [3]	2346 [3]	2330/2346 [3]	2330/2346 [3]
	4.35	Turning radius	Wa (mm)	1527 [3]	1527 [3]	1448/1526 [3]	1448/1526 [3]
Performance	5.1	Travel speed with/without load	km/h	5,6/6,0 [11][4]	5,6/6,0 [11][4]	5,6/6,0 [11][4]	5,6/6,0 [11][4]
	5.2	Lifting speed, with/without load	m/s	0,16/0,25(0,40)[11][12]	0,14/0,22(0,37)[11][12]	0,16/0,25(0,40)[11][12]	0,14/0,22(0,37)[11][12]
	5.3	Lower speed, with/without load	m/s	0,45/0,45 [12]	0,40/0,35 [12]	0,45/0,45 [12]	0,40/0,35 [12]
	5.7	Climbing ability with/without load, 30 minute rating	%	-	-	-	-
	5.8	Maximum climbing ability with/without load, 5 minute rating	%	9/10	8/10	9 [7]/ 24 [14]	8 [7]/ 24 [14]
	5.10	Service brake		Electro-mag/elec	Electro-mag/elec	Electro-mag/elec	Electro-mag/elec
Drive	6.1	Drive motor, 60 minute rating	kW	1,2	1,2	1,2	1,2
	6.2	Lift motor, at 15 % rating	kW	3	3	3/(0,8) [13]	3/(0,8) [13]
	6.3	Battery according to DIN 43531/35/36 A, B, C, no		DIN 43535B	DIN 43535B	DIN 43535B	DIN 43535B
	6.4	Battery voltage/rated capacity (5h)	V/Ah	24/240	24/240	24/240	24/240
	6.5	Battery weight (± 5%)	kg	200	200	200	200
	6.6	Power consumption according to VDI cycle	kWh	-	-	-	-
Misc.	8.1	Type of drive control		Electronic (LDC)	Electronic (LDC)	Electronic (LDC)	Electronic (LDC)
	8.4	Noise level at operator's ear	dB(A)	<65	<65	<65	<65

1) As an aside:Transpallet capacity on load bearing arms (option L.I.)
2) High position/low position load-bearing arms
3) For long chassis 3 PzS: add 75mm to sides
4) Truck provided with a battery line 6.5
5) Weight obtained according to line 2.1
6) As an aside: truck equipped with option boggies
7) Truck equipped with carriage line 4.25
8) Standard mast type 2924S (L14), 2844S (L16). Other types: see other table
9) This side takes into account the free lift line 4.3
11) As an aside: loaded speed with booster (only with LSL)
12) Valid speeds only for S mast and LSL distribution
13) As an aside: initial lift elevation motor
14) With raised load-bearing arms. As an aside: with transpallet line 1.5

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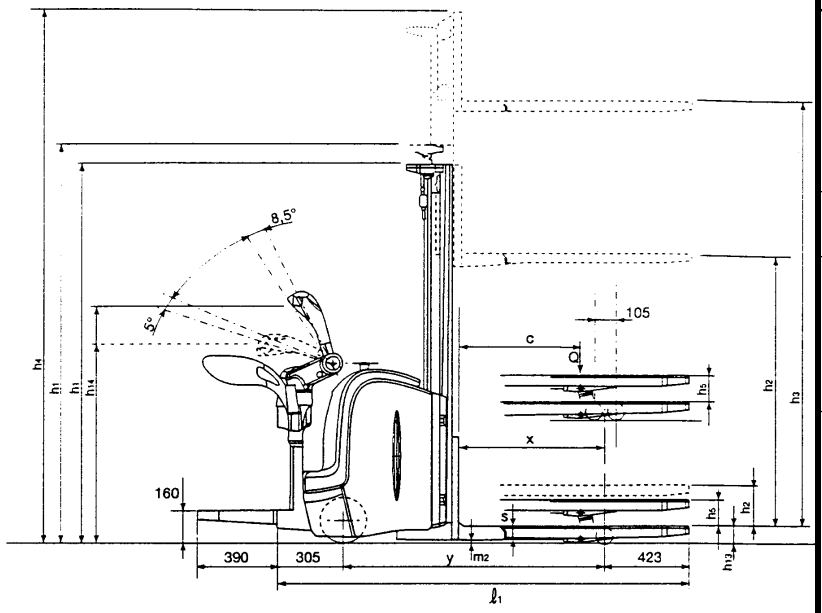

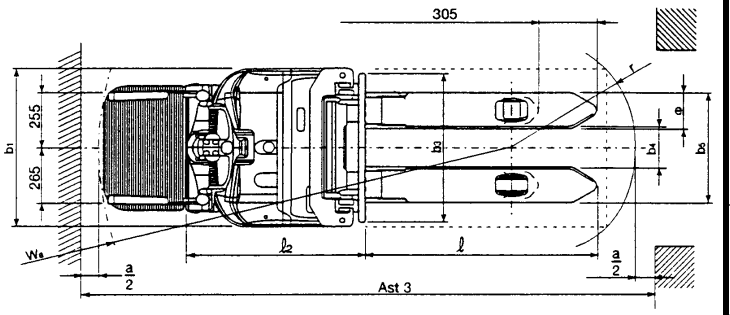

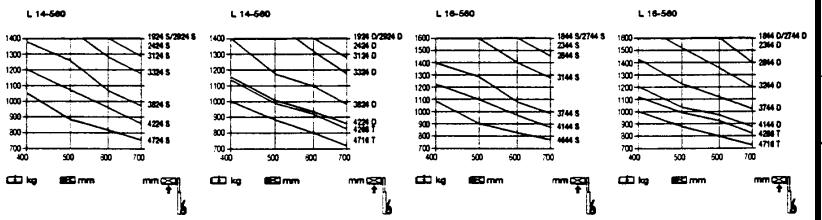

SEPTEMBER

2001

Technical sheet L14 / L16 AP
pedestrian pallet stacker with stand-on platform

Characteristics	1.1	Manufacturer		LINDE	LINDE	LINDE	LINDE
	1.2	Model designation		**L 14 AP**	**L 16 AP**	**L 14 API**	**L 16 API**
	1.3	Power unit: battery, diesel, petrol, LP gas, mains power		Battery	Battery	Battery	Battery
	1.4	Operation: manual, pedestrian, stand-on, seated, order picker		Pedestrian	Pedestrian	Pedestrian	Pedestrian
	1.5	Load capacity	Q (kg)	1400	1600	1400(2000)[1)]	1600(2000)[1)]
	1.6	Load centre	c (mm)	600	600	600	600
	1.8	Axle centre to load face	x (mm)	726	726	648/726[2)]	648/726[2)]
	1.9	Wheelbase	y (mm)	1303 [3)]	1303 [3)]	1225/1303 [2)3)]	1225/1303 [2)3)]
Weights	2.1	Service weight	kg	1240 [4)]	1240 [4)]	1230 [4)]	1230 [4)]
	2.2	Axle load with load, front (drive)/rear (load)	kg	[5)]	[5)]	[5)]	[5)]
	2.3	Axle load without load, front (drive)/rear (load)	kg	[5)]	[5)]	[5)]	[5)]
Wheels	3.1	Tyres, front (drive)/rear (load) C = cushion rubber, P = polyurethene		C+P/P	C+P/P	C+P/P	C+P/P
	3.2	Tyre size, front (drive)	mm	230/90	230/90	230/90	230/90
	3.3	Tyre size, rear (load)	mm	85X85(85X60) [6)]	85X85(85X60) [6)]	85X85(85X60) [6)]	85X85(85X60) [6)]
	3.4	Auxiliary wheels (dimensions)	mm	2 X Ø140 X L50	2 X Ø140 X L50	2 X Ø140 X L50	2 X Ø140 X L50
	3.5	Wheels: number front (drive)/rear (load)		1X+2/2(1X+1/4)[6)]	1X+2/2(1X+1/4)[6)]	1X+2/2(1X+1/4)[6)]	1X+2/2(1X+1/4)[6)]
	3.6	Track width, front (drive)	mm	520	520	520	520
	3.7	Track width, rear (load)	mm	380 [7)]	380 [7)]	380 [7)]	380 [7)]
Dimensions	4.2	Height of mast, lowered	h_1 (mm)	1990 [8)9)]	1990 [8)9)]	1990 [8)9)]	1990 [8)9)]
	4.3	Free lift	h_2 (mm)	150 [8)]	150 [8)]	150 [8)]	150 [8)]
	4.4	Lift	h_3 (mm)	2924 [8)]	2844 [8)]	2924 [8)]	2844 [8)]
	4.5	Height of mast, extended	h_4 (mm)	3460 [8)]	3380 [8)]	3460 [8)]	3380 [8)]
	4.6	Initial lift height	h_5 (mm)			125	125
	4.9	Height of tiller arm in operasting position, minimum/maximum		1095/1217	1095/1217	1095/1217	1095/1217
	4.15	Fork height, lowered	h_{13} (mm)	86	86	86	86
	4.19	Overall length	l_1 (mm)	2031 (2421) [3)15)]	2031 (2421) [3)15)]	2031 (2421) [3)15)]	2031 (2421) [3)15)]
	4.20	Length to fork face	l_2 (mm)	882 (1272) [3)15)]	882 (1272) [3)15)]	882 (1272) [3)15)]	882 (1272) [3)15)]
	4.21	Overall width	b_1/b_2 (mm)	800	800	800	800
	4.22	Fork dimensions	s/e/l (mm)	71/180/1150	71/180/1150	71/180/1150	71/180/1149
	4.24	Fork carriage width	b_3 (mm)	780	780	780	780
	4.25	Fork spread, minimum/maximum	b_5 (mm)	560/680	560/680	560/680	560/680
	4.26	Min./max. load bearing arms	b_4 (mm)	255/375 [7)]	255/375 [7)]	255/375 [7)]	255/375 [7)]
	4.32	Ground clearance, centre of wheelbase	m_2 (mm)	30	30	145/20	145/20
	4.33	Aisle width with pallet 1 000 x 1 200 across forks	Ast (mm)	-	-	-	-
	4.34	Aisle width with pallet 800 x 1 200 along forks	Ast (mm)	2457 (2827) [3)15)]	2457 (2827) [3)15)]	2457 (2827) [3)15)]	2457 (2827) [3)15)]
	4.35	Turning radius [3)15)]	Wa (mm)	1638 (2008) [3)15)]	1638 (2008) [3)15)]	1560(1930)/1638(2038)	1560(1930)/1638(2038)
Performances	5.1	Travel speed with/without load	km/h	7 / 9 [10) 4)]	6,5 / 9 [10) 4)]	7 / 9 [10) 4)]	6,5 / 9 [10) 4)]
	5.2	Lifting speed, with/without load	m/s	0,16/0,25(0,40)[10)11)]	0,14/0,22(0,37)[10)11)]	0,16/0,25(0,40)[10)11)]	0,14/0,22(0,37)[10)11)]
	5.3	Lower speed, with/without load	m/s	0,45/0,45 [11)]	0,40/0,35 [11)]	0,45/0,45 [11)]	0,40/0,35 [11)]
	5.8	Maximum climbing ability with/without load, 5 minute rating	%	9/10	8/10	9 (7)/ 24 [13)]	8 (7)/ 24 [13)]
	5.10	Service brake		Electro-mag/elec	Electro-mag/elec	Electro-mag/elec	Electro-mag/elec
Drive	6.1	Drive motor, 60 minute rating	kW	1,5	1,5	1,5	1,5
	6.2	Lift motor, at 15 % rating	kW	3	3	3/(0,8) [12)]	3/(0,8) [12)]
	6.3	Battery according to DIN 43531/35/36 A, B, C, no		DIN 43535B	DIN 43535B	DIN 43535B	DIN 43535B
	6.4	Battery voltage/rated capacity (5h)	V/Ah	24/240	24/240	24/240	24/240
	6.5	Battery weight (± 5%)	kg	200	200	200	200
	6.6	Power consumption according to VDI cycle	kWh	-	-	-	-
Misc.	8.1	Type of drive control		Electronic (LDC)	Electronic (LDC)	Electronic (LDC)	Electronic (LDC)
	8.4	Noise level at operator's ear	dB(A)	<65	<65	<65	<65

1) As an aside:Transpallet capacity on load bearing arms (option L.I.)
2) High position/low position load-bearing arms
3) For long chassis 3 PzS: add 75mm to sides
4) Truck provided with a battery line 6.5
5) Weight obtained according to line 2.1
6) As an aside: truck equipped with option boggies
7) Truck equipped with carriage line 4.25
8) Standard mast type 2924S (L14), 2844S (L16). Other types: see table below.
9) This side takes into account the free lift line 4.3
10) As an aside: loaded speed with booster (only with LLC)
11) Valid speeds only for S mast and LLC distribution
12) As an aside: initial lift elevation motor
13) With raised load-bearing arms. As an aside: with transpallet line 1.5
15) Lowered platform

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Introduction

The type 372 L14 - L16 pedestrian operated pallet stacker trucks are specially designed for preparation of orders in reduced spaces.

Various options are available:
- Pedestrian operation, or stand-on operation, equipped with a retractable platform (AP) which allows the operator to work safely over long distances without tiring.
- Without or with initial lift (I), enabling the transportation of loads up to 2000 kg, and facilitating the loading of trucks and wagons.
- With lift control lever mounted on the chassis, or with proportional lift control (LLC) mounted on the tiller arm head, which offers precision and smoothness of load bearing form arm movements.

The four point configuration and central tiller arm, associated with LES electrical steering, make these pallet stackers very manoeuvrable while transporting loads.

Drive and transmission

These pallet stackers are powered by a 1.2kW (L14-L16) or 1.5kW (L14AP - L16AP) traction motor mounted vertically on the gearbox. The gearbox ratio varies according to the version.
Power is supplied by a 24 volt lead battery, varying from 240 Ah to 360 Ah.
The traction motor is controlled by the digital control system, which gives optimum utilisation of battery energy.

Mast and hydraulics

The trucks are available with different hydraulic systems:
- Pallet stackers without initial lift are equipped with a 3 kW motor, and pump unit with either a single pump, or a double pump, which offers high lifting speed when unladen.
- Pallet stackers with initial lift are equipped with a 3 kW motor, and pump unit with either a single pump, or a double pump, which offers high lifting speed when unladen. An independent 0.8 kW motor operates initial lift.

Lift control is carried out, depending on model, by either a lever mounted on the chassis, or by a proportional control switch located on the tiller arm head (LLC).

The masts are industrial type with high visibility.
– Lift heights with standard masts up to 4716 mm
– Three types of lifts available (S: standard, D: duplex with free lift, T: triplex with free lift). Mast are equipped with side lift jacks and central free lift jack.
On models with initial lift, two additional jacks allow lifting the load bearing arms.

Steering

The (LES) electrical steering offers steering precision and reduced manoeuvring effort.

The steering employs an electrical gear motor, which positions the gearbox. The steering motor is controlled by an electronic drive unit, which monitors both the tiller arm position, and the drive wheel orientation.

Braking

The trucks have three independent braking systems.

Powerful and progressive electro-magnetic brake operating on the drive motor shaft when the tiller is in the horizontal or vertical position.

Automatic electric braking actuated when the traction butterfly lever is fully released.

Controlled electric braking by selection of the opposiste direction of travel.

Operating controls

The operating controls for traction, lift/lower, reverse and automatic braking, together with horn are all groped on the tiller arm head.

Driving platform

The foldaway driving platform with side guards enable these pallet stackers to be used either in pedestrian mode or stand-on operation.

Integrated charger*

The fully automatic charger is equipped with an automatic cut-out. Charging is controlled by a microprocessor. It is provided for recharging batteries from 150 to 300 Ah:
- Single-phase supply 220 V, 50 Hz (1)
- Load current 30A maximum

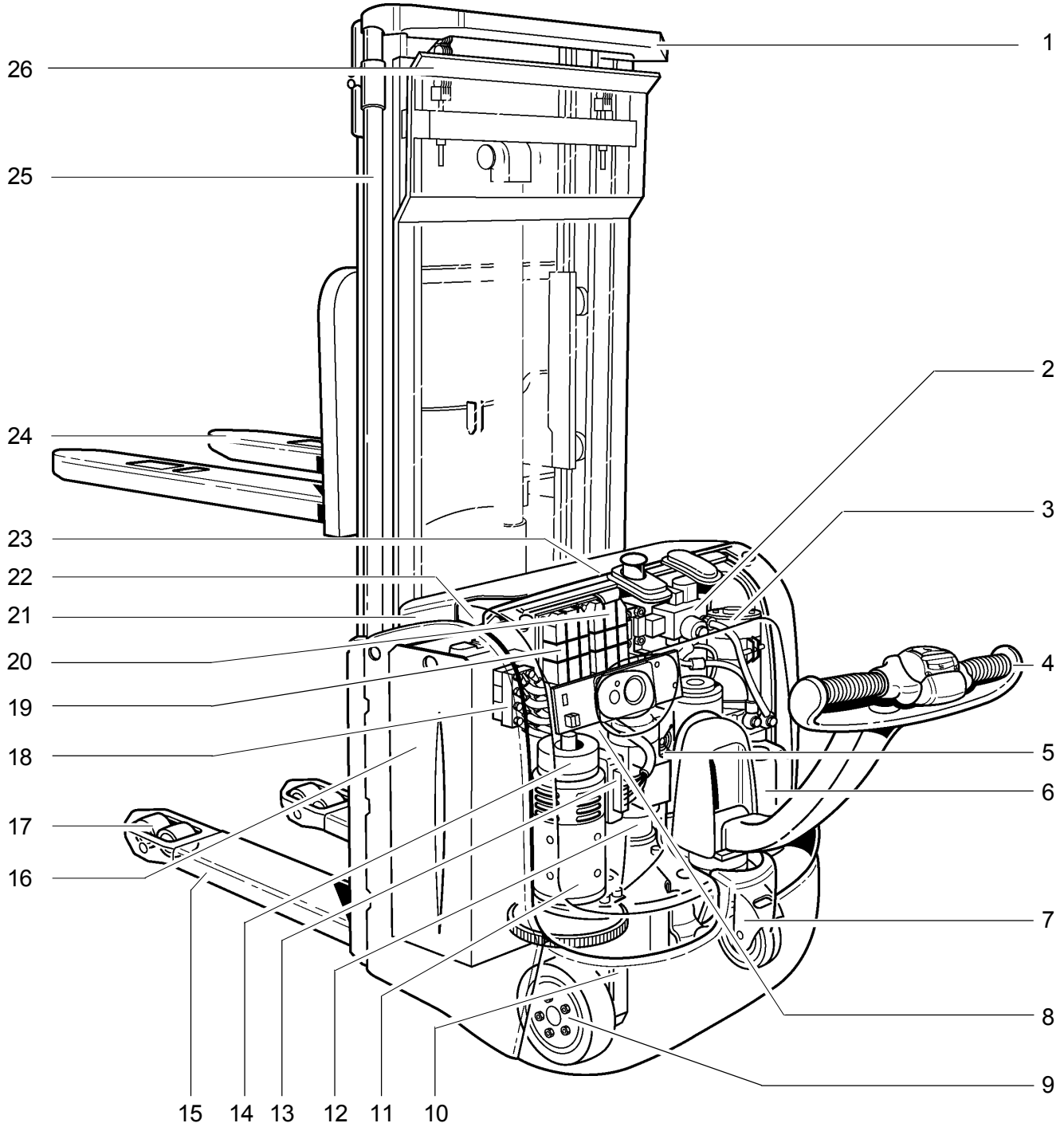
(1): Other voltages and frequencies are available.

NOTE: For gelled electrolyte batteries, a specific charger is required.

* Optional equipment for the trucks, battery with vertical outlet version.

General view L 14 - L 16

1. Mast
2. Proportional distribution valve
3. Motor pump unit
4. Tiller arm
5. Integrated charger
6. Hydraulic tank
7. Stabiliser wheel
8. Horn
9. Drive wheel
10. Gearbox
11. Traction motor
12. Steering motor
13. LES steering controller (Linde Electric Steering)
14. Electromagnetic brake
15. Load bearing arms
16. Battery
17. Load wheels
18. Control unit
19. LDC controller (Linde Digital Control)
20. LLC controller (Linde Lifting Control)
21. Battery cover
22. Front cover
23. Battery connector
24. Forks
25. Lift jacks
26. Mast protection screen



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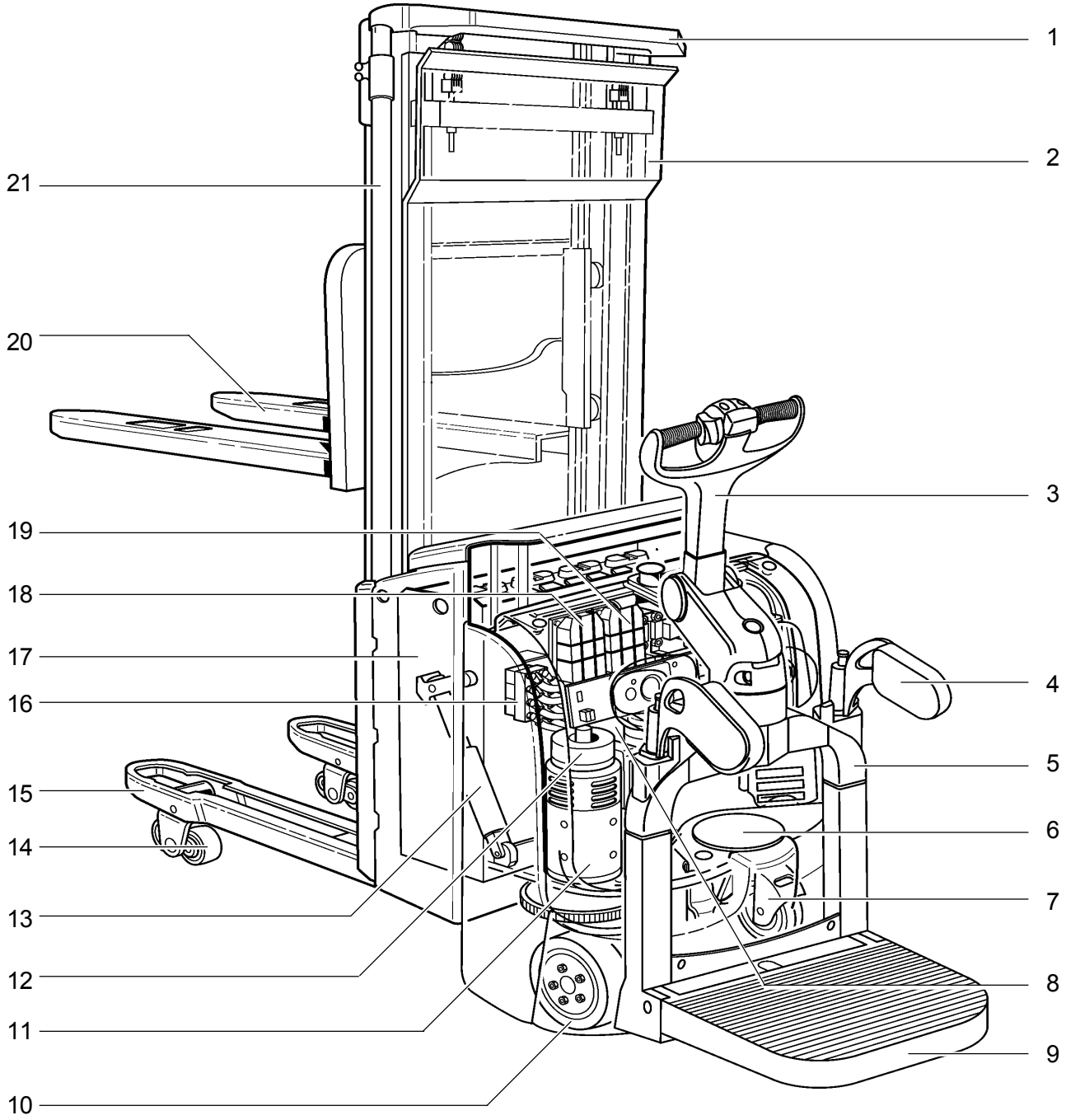
General view L14 AP - L16 AP

1. Mast
2. Mast protection screen
3. Articulated tiller arm
4. Side guards
5. Foldaway platform unit
6. Cover
7. Stabiliser wheel
8. Horn
9. Retractable driver platform
10. Drive wheel
11. Traction motor
12. Electromagnetic brake
13. Initial lift jacks
14. Load wheels
15. Load bearing arms
16. Control unit
17. Battery
18. LDC controller (Linde Digital Control)
19. LLC controller (Linde Lifting Control)
20. Forks
21. Lift jacks



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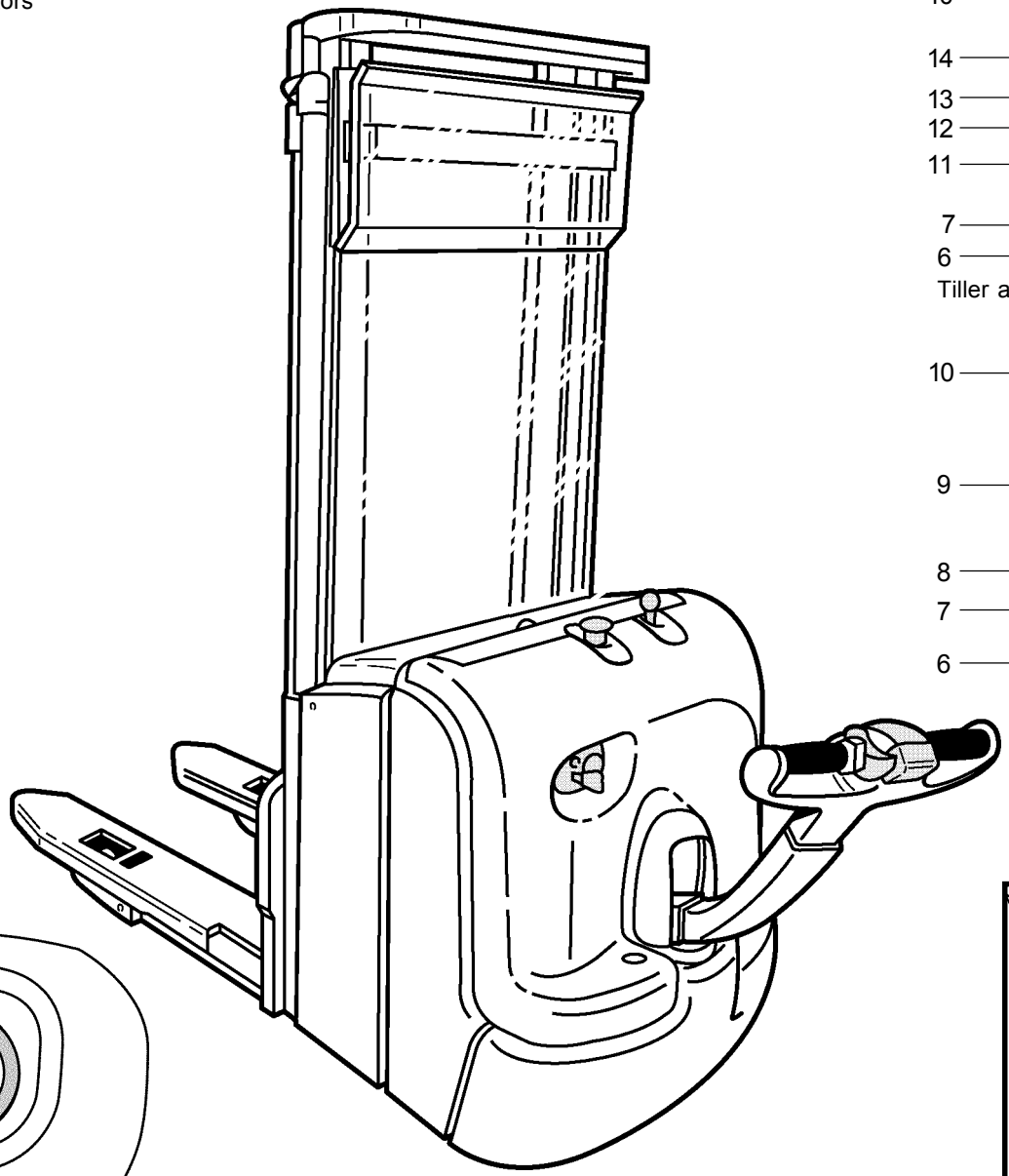
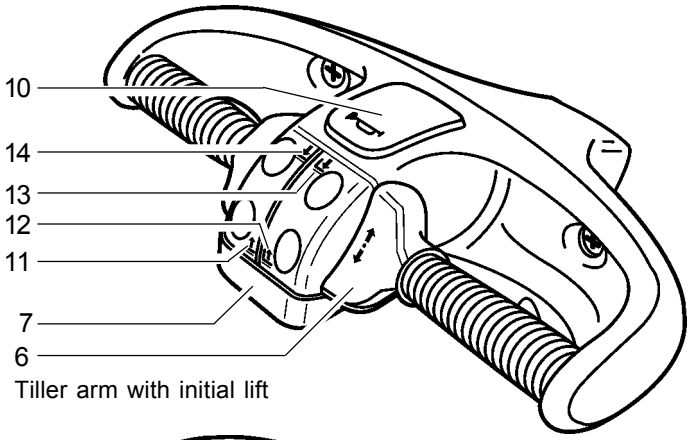
L14 - L16 lift controls with lever operation

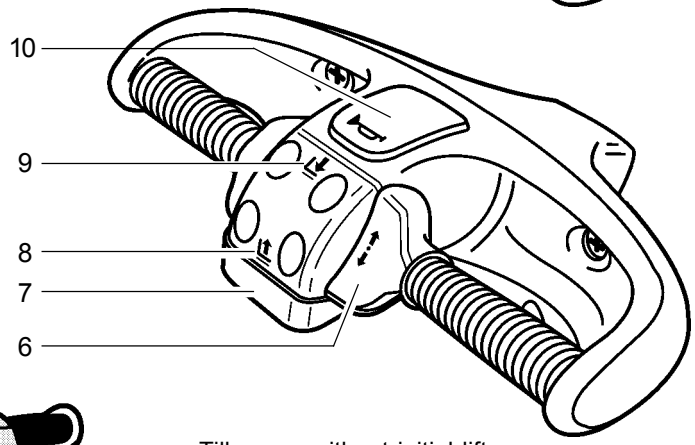
1. Keyswitch
2. Hour meter/ discharge indicator
3. Incorporated charger indicators*
4. Lift control lever
5. Emergency isolator
6. Butterfly lever
7. Safety reversing swtich
8. Fork lifting control
9. Fork lowering control
10. Horn control
11. Initial lift control
12. Fork lifting control
13. Fork lowering control
14. Initial descent control

* Optional equipment

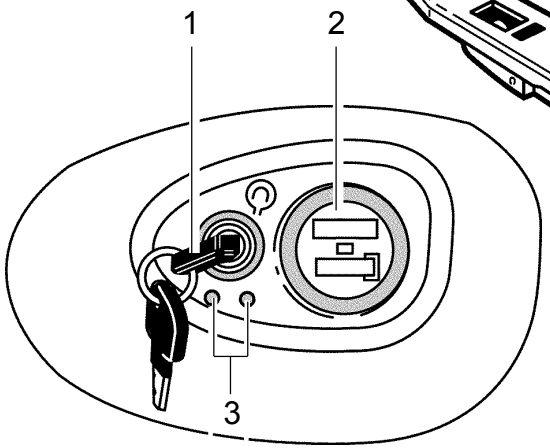


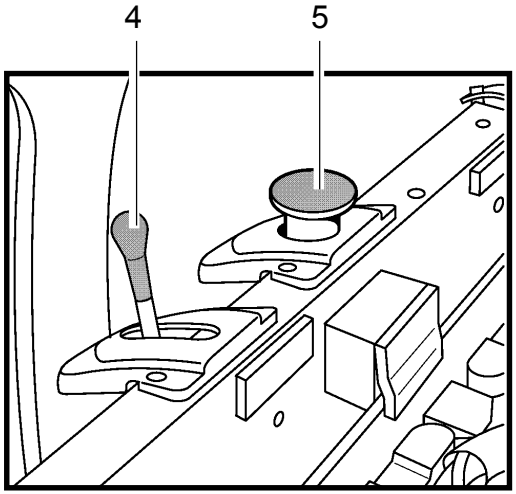


Tiller arm with initial lift



Tiller arm without initial lift





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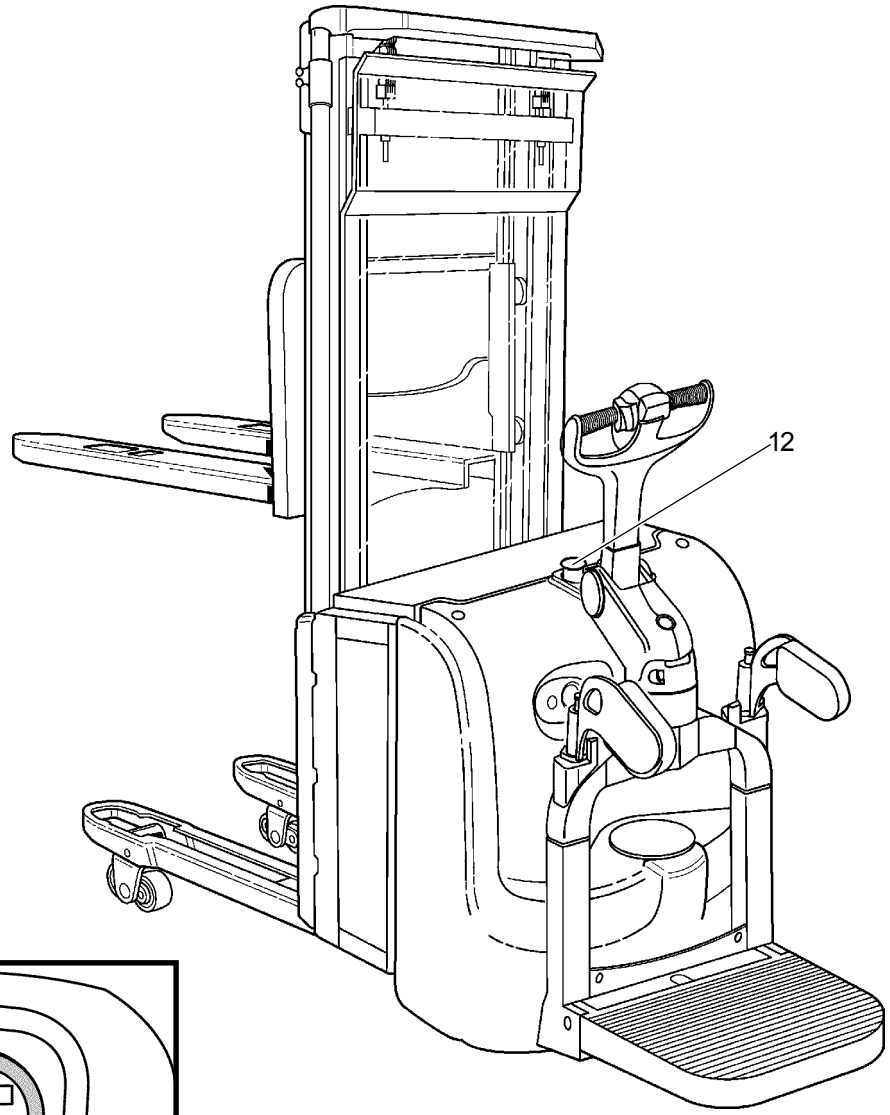
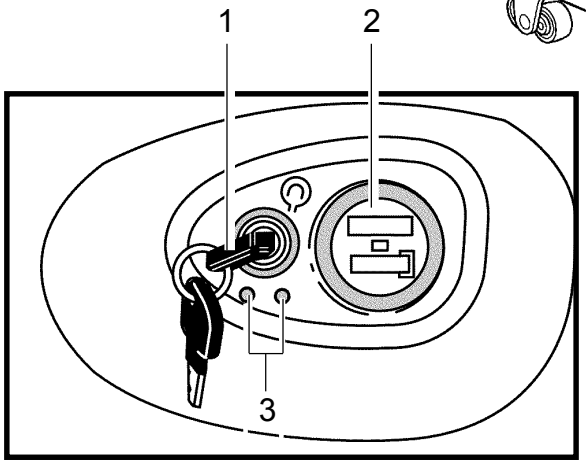
L14-L16 / L14AP-L16AP proportional lift controls (LLC)

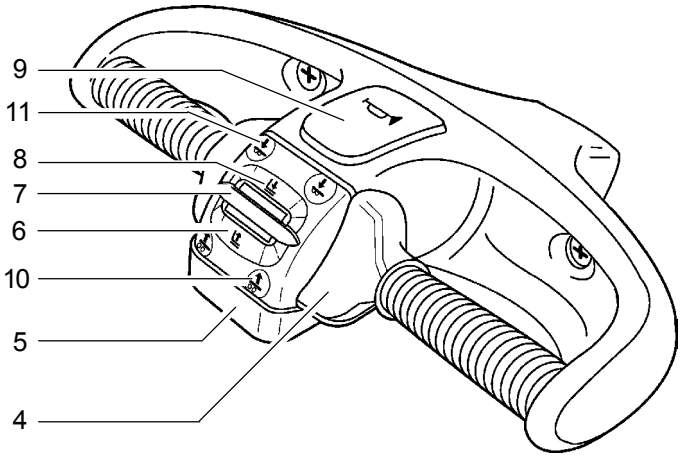
1. Keyswitch
2. Hour meter/ discharge indicator
3. Incorporated charger indicators*
4. Butterfly lever
5. Safety reversing switch
6. Lifting label
7. Proportional lift control
8. Lowering label
9. Horn control
10. Initial lift control
11. Initial descent control
12. Emergency isolator

* Optional equipment

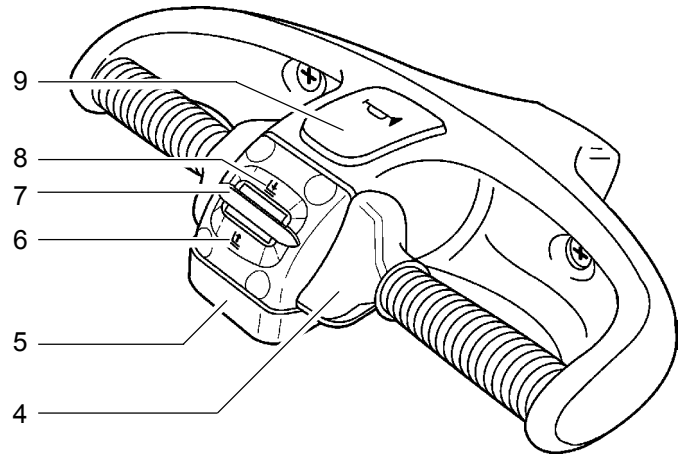




Proportional control tiller arm with initial lift



Proportional control tiller arm without initial lift



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Combined hour meter/ battery discharge indicator

A single casing houses the battery discharge indicator (9) and the hour meter (5).
The face of the device is made of high-resistant macrolon.

Hour meter operation

- This indicates the operational time of the truck in hours.
- The counter increments after an autotest procedure when the tiller arm is in the driving position.
- During counting, the egg-timer symbol (8) flashes slowly.
- The LCD indicator (5) displays the hours (6) and tenths of an hour (7). When the battery is connected to the truck, it shows the hours stored in memory.

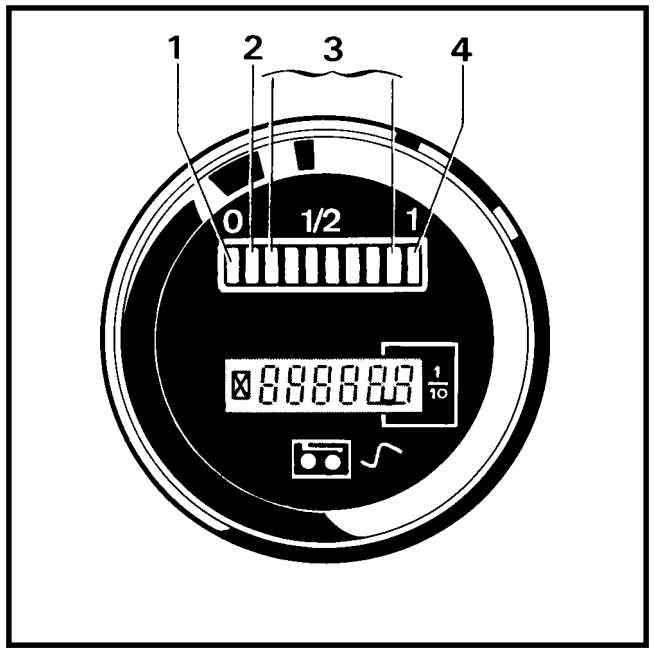
☞ NOTE
On starting the hour meter, the counter lights up during the autotest of the discharge indicator diodes.
When the battery is disconnected, the hours are stored in memory. If the hour meter has to be replaced, record the number of service hours of the defective meter in the place provided for this purpose next to the meter and in the maintenance logbook.

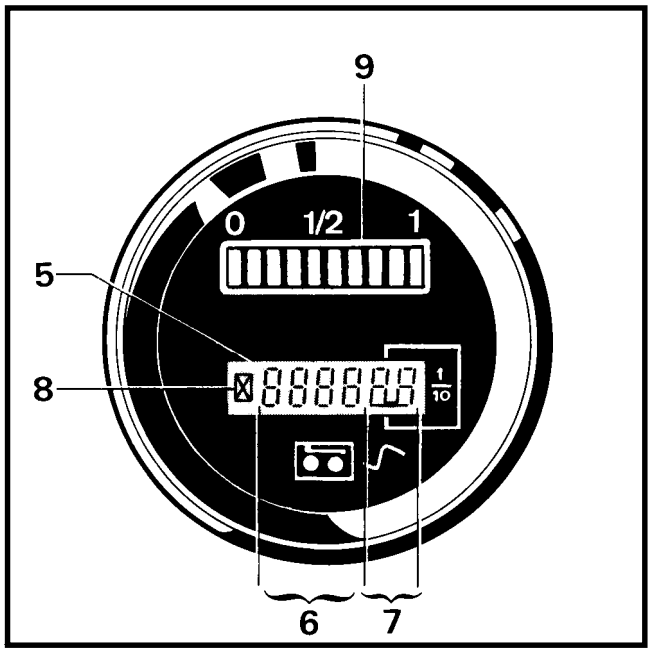
Battery discharge meter operation

- On starting the truck, the LED diodes (9) of the indicator light up one after the other, from left to right to carry out a autotest of proper operation.
- After the autotest, the LED diode indicators (0) display the state of charge of the battery.
- With battery is fully charged, the green diode (4) lights up.
- During discharge, the green and orange diodes (3) light up in succession (from right to left and one at a time).
- When the red diode (2) lights up and flashes, the battery is around 70 % discharged.
- When the red diodes (1) and (2) flash alternately, the battery is 80 % discharged; when this threshold is reached, the limiter stops the lifting motor from working.
- The battery must then be recharged to reset the truck.

NOTE:
Behind the casing a potentiometer allows the cut-out threshold to be adjusted for special use. The normal position is with the arrow on the letter N. If a special setting proves necessary for your requirements, contact your local representative.

☞ NOTE
For gelled electrolyte batteries, a specific setting is required.





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Prior to any work with or on the fork lift truck all responsible staff, particularly the truck operators and servicing personnel, must be instructed by qualified instructors, in the normal and proper use with the safety guidelines supplied with these operating instructions.

The employer must ensure that the operator has understood all safety information.

Please observe the guidelines and safety rules therein, for example:

- Information on the operation of industrial trucks
- Rules for roadways and work areas
- Rights, duties and safety rules for the operator
- Operation in special areas
- Information related to starting, driving and braking
- Service and repair information
- Recurrent inspections, accident prevention check
- Disposal of greases, oil and batteries
- Any other risks

The operator (owner) or responsible person must ensure that the above guidelines and safety rules are observed.

During training the operator must fully acquaint themselves with:

- special features of the lift truck
- additional attachments
- special operating conditions

Practice driving, control and steering operations with truck unladen until they are completely understood.

Only then can stacking and destacking operations commence.

DANGER: If modifications are made to the drive or braking parameters, then it is imperative that operators are informed of such changes so that they are able to familiarise themselves with the new operating characteristics before taking the truck into service.

With normal and proper use the stability of the fork lift truck is assured.

Safety information

The warning precautions DANGER, WARNING, CAUTION and NOTE in this manual are provided to indicate special dangers or unusual information requiring special identification:

DANGER: Indicates hazards that may result in bodily injury or death and/or severe product damage.

WARNING: Indicates hazards that may result in bodily injury and/or severe product damage.

CAUTION: Indicates hazards that may result in damage to or destruction of the product.

NOTE: Identifies technical information requiring special attention because the connection may not even be obvious to skilled personnel.

Handling lubricants

Always handle lubricants safely and as specified by the manufacturer.

Only store lubricants in approved containers at specified storage locations. As they could be inflammable, do not let them come in contact with hot objects or naked flames.

Clean the area surrounding the part in question before lubrication, filter renewal or repairs in the hydraulic system.

Only use clean containers when replenishing fuels and lubricants.

Follow the manufacturer's safety and disposal instructions when using lubricants and cleaning compounds.

Avoid spilling lubricants. Remove any spillage immediately with a suitable binding agent and dispose of as specified.

Always dispose of used or contaminated lubricants as specified. Follow laws and regulations.

Dispose of used parts, filters etc., in an environmentally friendly manner.

CAUTION
Accidental penetration of hydraulic fluid under the skin is dangerous. See a doctor immediately if injured.

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Report of Thorough Examination

The accident prevention rules in some countries require that the fork lift truck must be checked periodically for proper operation by trained personnel.

In the UK, the specific requirements of LOLER 1998 and PUWER 1998, state that lift truck users are required by law to ensure that their lift trucks are thoroughly examined periodically by a competent person, and that supporting records are available for inspection. Non compliance with these requirements may result in legislative action.

Please contact your local Linde representative.

Advice for initial use

Your new truck may be used immediately; however, we recommend you avoid over-intensive use of the truck during the first 50 hours of operation.

During the first hours of service, or whenever a wheel is changed, check the tightness of the wheel nuts over several days, before starting work, until they are seated firmly.

☞ REMARK
The torque for diametrically tightening the nuts is given in the maintenance section.

Checks before initial operation

- Check direction controls
- Check lift and lower controls
- Check indicator operation
- Check braking
- Check emergency isolator
- Check operation of horn
- Check the steering operation
- Check level and gravity of battery electrolyte
- Check battery connection
- Check hydraulic oil level
- Check gearbox oil level
- Check for any oil leaks
- Check the tightness of wheels

NOTE:
The last 4 operations are described in the maintenance section.

Daily checks before use

IMPORTANT
Before daily operation, it is imperative to check the function of the truck and in particular of the safety components.
- Check the Forward/Reverse and raise/lower controls
- Check the steering operation
- Check braking
- Check emergency isolator
- Check operation of horn
- Check condition of battery charging
- Check battery lock

☞ NOTE
These checks are described in the following pages.

DANGER
Immediately inform the supervisor if anything abnormal occurs. Stop using the truck.

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Check the Forward/Reverse and raise/lower controls

- Check these controls are working properly; see Operation chapter

Check the safety braking

- Operate the truck, then move the tiller arm in the zones (1) and (2); the truck must stop.
- In these two zones, the truck is braked by the electromagnetic brake and the motor supply is cut-off.

☞NOTE
To release the electromagnetic brake in zone (2), the tiller arm must raised off of the rubber stop.
By releasing the tiller arm whilst travelling, it is automatically moved to braking position (1).

Check automatic braking

- Operate the truck.
- Release the accelerator butterfly lever (3). The automatic electric brake is applied

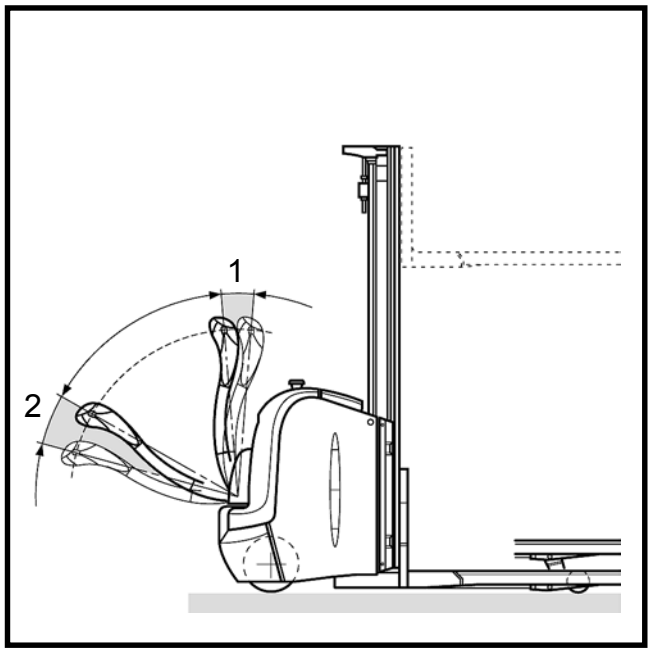
WARNING
Do not drive the truck with defective braking equipment.
Call your local representative if you discover any problem with the braking system.

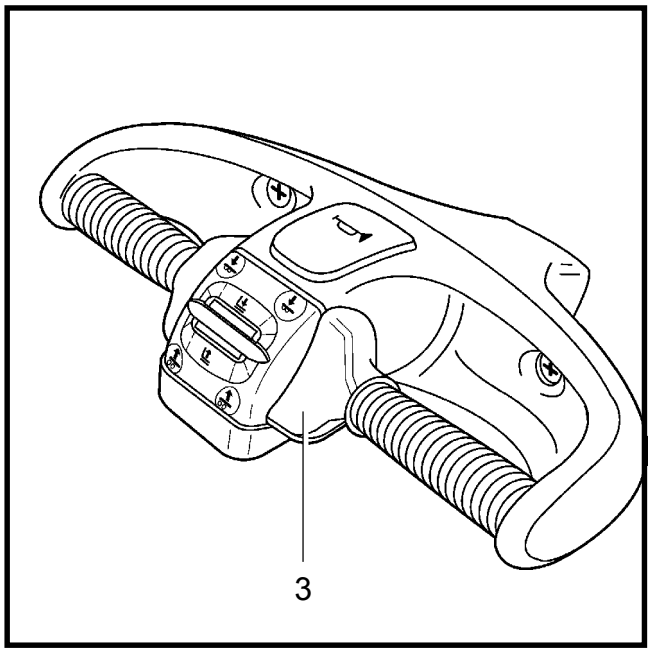
Check parking brake

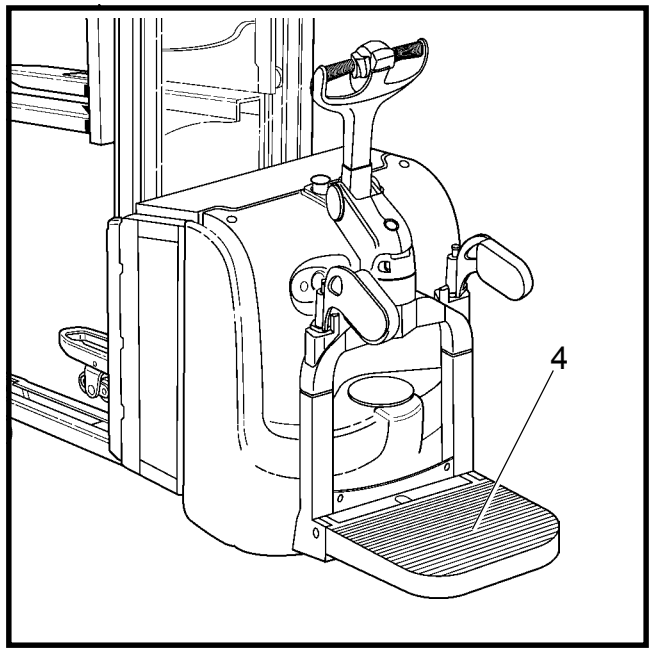
Should the operator step from the platform (4), or release the tiller arm, then the parking brake will apply.

☞ NOTE
The presence detection is integrated within the platform.

WARNING
Do not drive the truck with defective braking equipment.
Call your local representative if you discover any problem with the braking system.







Check emergency isolator

- Depress the emergency isolator (5).

The electric supply to the truck will be cut off. The electric controls and motors are disconnected.
The electromagnetic brake is applied.

- Pull the emergency isolator (5) to resume work.

The truck is operational again.

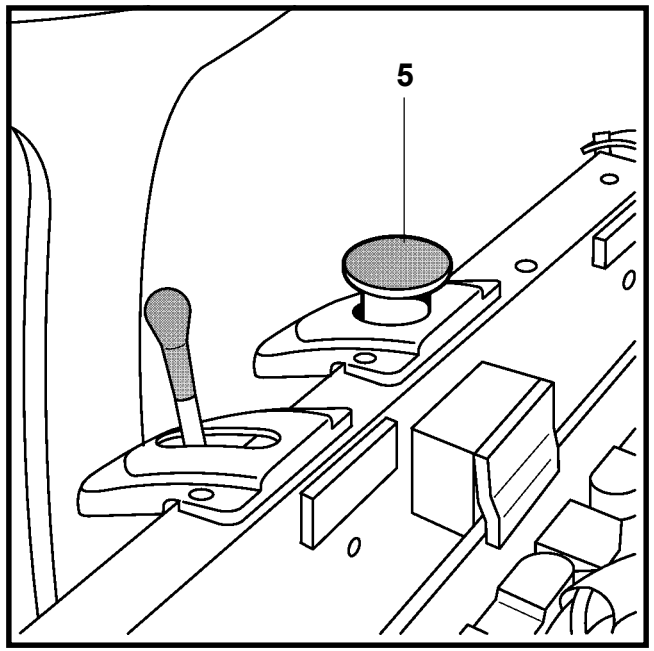
Check operation of safety reversing switch

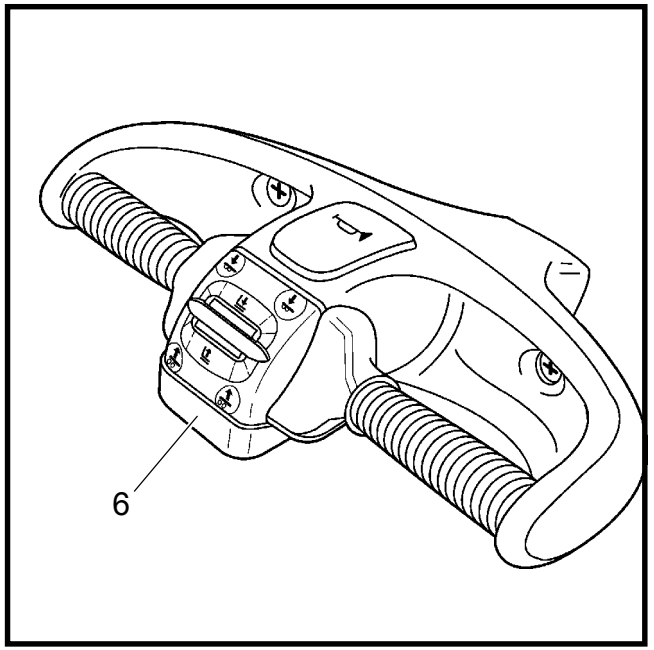
- Operate the truck at slow speed, with forks leading.
- Press the switch (6). The truck must stop immediately and then travel in the opposite direction at low speed.

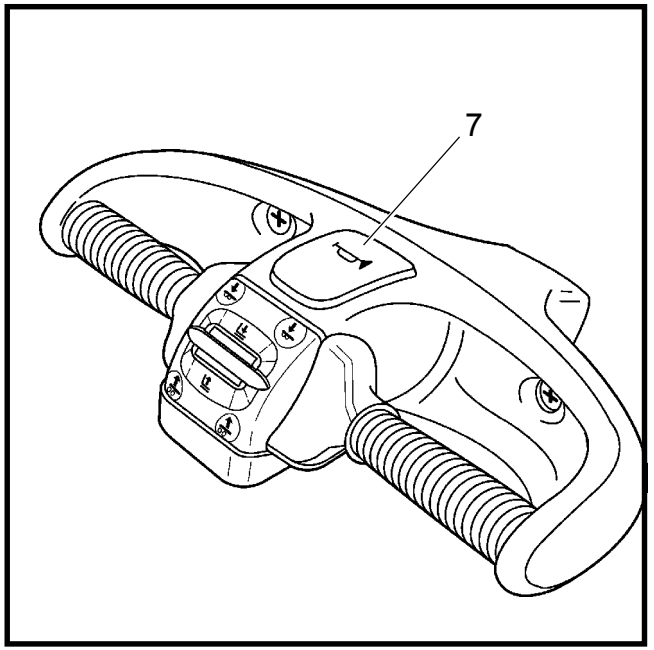
☞NOTE:
The safety reversing switch is not active on trucks with lowered platforms.

Check operation of horn

Press the horn button (7) located on the tiller arm head.
The horn sounds.







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Daily checks and commissioning checks

DANGER
Charge and maintain the battery in accordance with the instructions supplied with the battery (and with the charger in the case of an external charger).

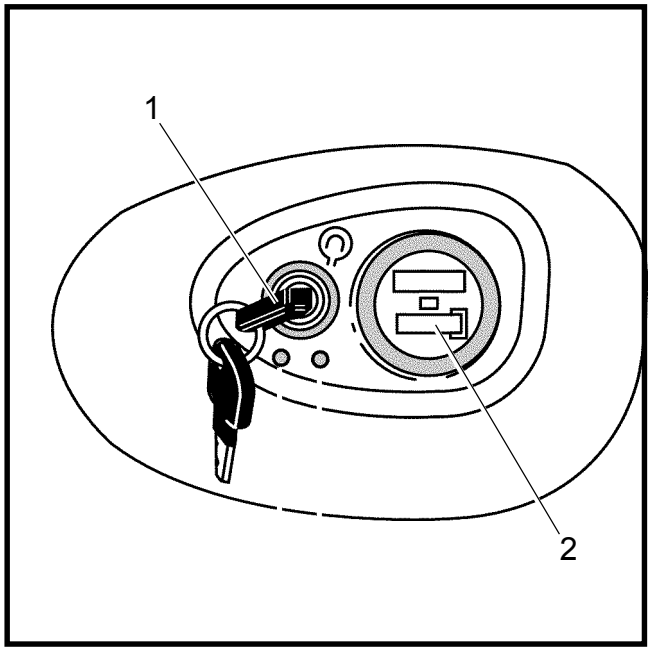
The electrolyte contains sulphuric acid which is a dangerous substance. Wear gloves and goggles when working on the battery. If any electrolyte is splashed onto the skin or into the eyes, wash immediately with clean water and then consult a doctor if necessary. Charging batteries releases hydrogen which can produce an explosive mixture. Do not cause sparks, do not smoke, do not bring any flame near a battery on charge or recently charged. To prevent the accumulation of hydrogen keep the battery cover open during charging. Charge the battery in a well-ventilated place. Do not place any metal object on the battery as this may cause a short-circuit.

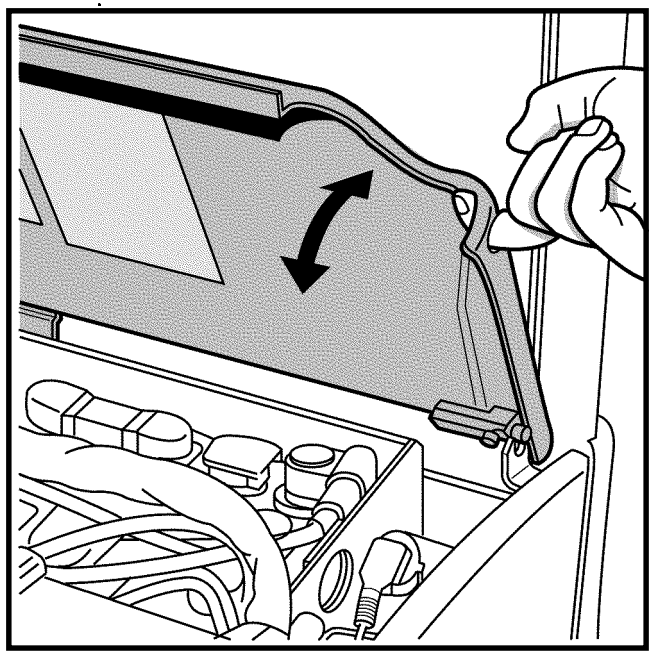
Check the battery state of charge

- Before starting the shift, check battery is properly charged.
- Connect the battery connector.
- Release the emergency isolator.
- Turn the keyswitch (1) on.
- Check the battery state of charge on the indicator (2), (refer to the chapter on discharge indicator)

Opening the battery cover

- Stop the truck, lower the forks fully.
- Turn the keyswitch off and remove the key.
- Depress the emergency isolator.
- Raise the cover fully by using the opening on the side of the cover.





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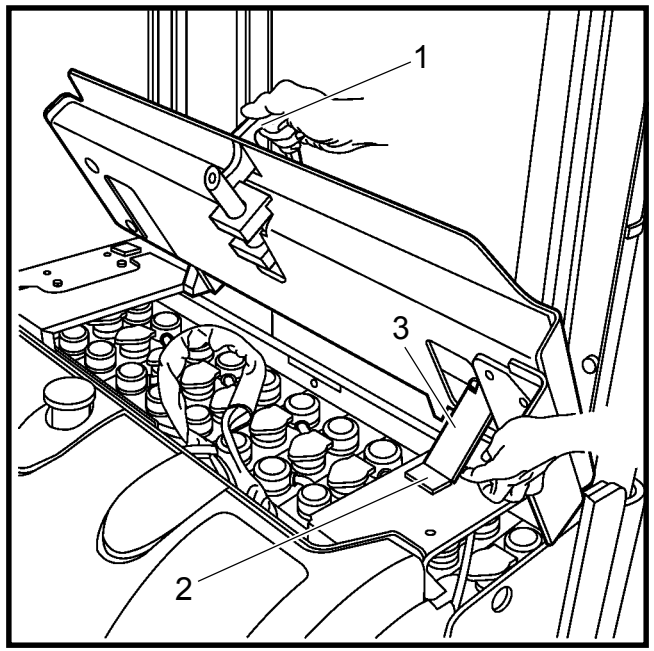
Opening the battery cover (roll on, roll off)

- Stop the truck, lower the forks fully.
- Turn the keyswitch off and remove the key.
- Depress the emergency isolator.
- Unlock the battery cover by pulling the grip (1) towards the mast.
- Raise the cover fully until the stay (3) locates on lug (2).

Closing the battery cover

- To close it, pull the battery cover backwards
- Raise the stay (3) to disengage it from the lug (2)
- Slowly close the cover
- Release the catch
- Lower the cover until the lock engages in locked position.

CAUTION
Always check that the battery cover is properly closed, which ensures the battery is locked in the compartment.



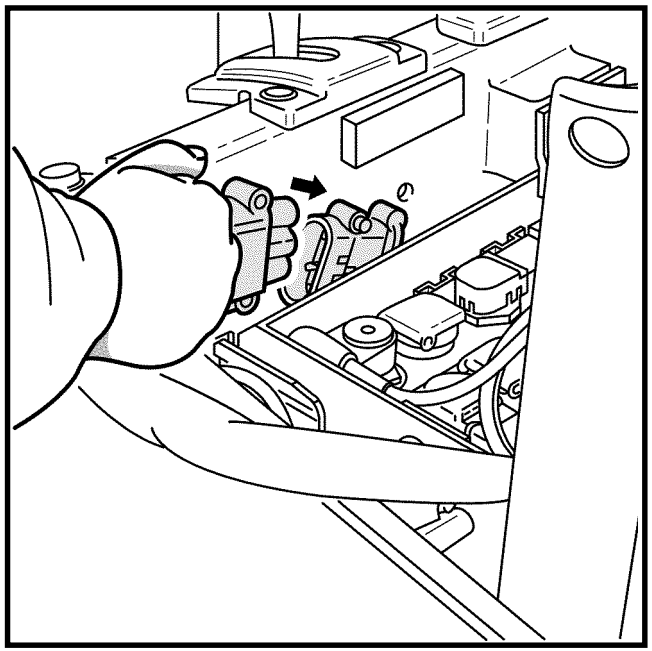
Connecting/disconnecting the battery

To disconnect

- Stop truck, turn the keyswitch off, depress the emergency isolator and remove the key.
- Open the battery cover
- Pull on battery grip to disconnect

To re-connect

- Check polarity + and -
- Press the two half connectors one inside the other.
- Replace the cables and the connector between the battery housing and the chassis.
- Release the emergency isolator.



CAUTION
Never connect or disconnect the connector if there is a current in the circuit; this creates a high risk of arc and destruction of the contacts.
Regularly check the state of the connector contacts, replace them if there are signs of arc and carbonisation.
Follow the polarity signs + and - , always connect + with + and - with - . Do not reverse the connectors.
Each half of the connector has a polarisation finger; check these are present and in good condition. They prevent any risk of reversal.

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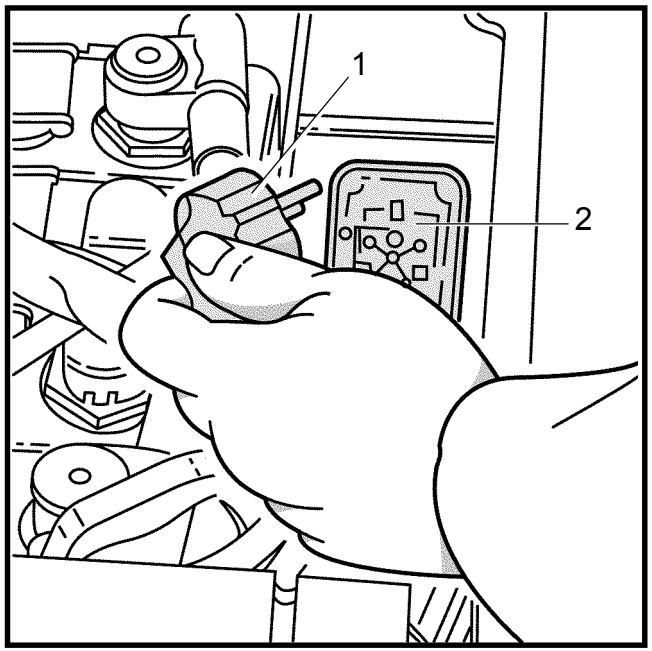
Charging the battery with the integrated charger

Daily, if the truck is engaged normally or every two days in case of light use, the battery should be recharged after the shift is complete.

- Stop the truck at an electrical outlet (220 V - 10/16 A).
- Lower the forks, switch off, remove key.
- Open the battery compartment cover to allow proper ventilation.
- Remove the plug (1) from holder (2), unroll the wire and connect to the mains supply.
- The charger starts automatically, the green light (4) flashes, the red light (3) lights up then extinguishes and the charge fan starts.
- At the end of normal charging, the green light remains lit up and the fan stops.
- An equalisation charging starts automatically 15 minutes later; the green light remains lit up, the fan operates.
- If the charger remains connected to the mains supply, it restarts a charge cycle every 48 hours: the green light blinks.



CAUTION
Do not disconnect the battery when charging (green light blinking)

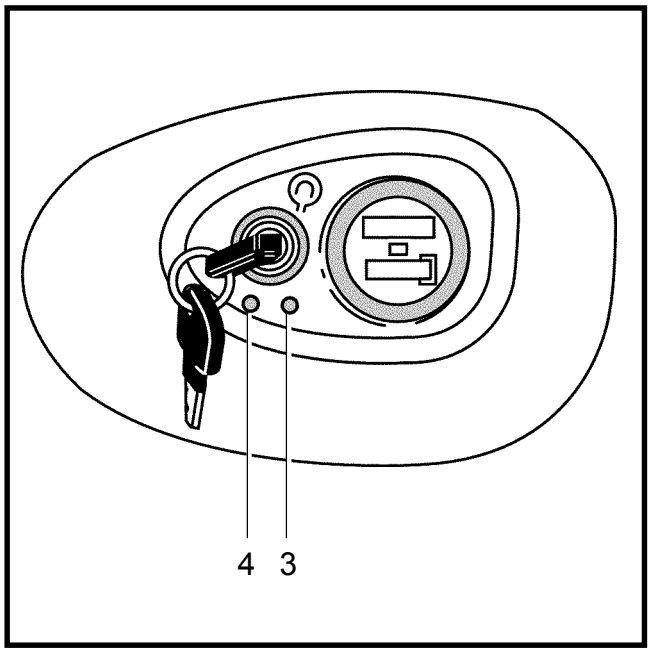
Faults during charging

In case of defect during the charging, the red light (3) lights up and the charger stops.
To restart a charging cycle after the detection of a fault:

- Disconnect the mains power supply
- Disconnect the battery for minimum 1 minute
- Reconnect the battery then the mains power supply.

If the fault persists, please contact your local representative.

* Only for trucks equipped with a battery with vertical outlet.



Replacing the mains power supply cord

- Arrange the cord in the compartment between the battery compartment and the chassis.
- Press the mains supply plug (1) into the red safety holder (2) located in the battery compartment.
- Close the cover.

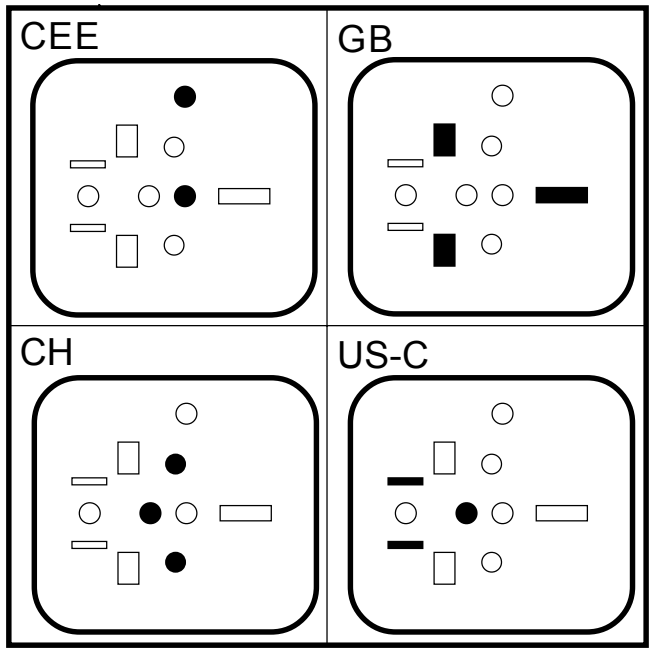
IMPORTANT
The truck will not function unless the plug is correctly replaced in the support (2).

Electric characteristics of the charger

Mains supply 220V 50Hz*. Nominal battery voltage 24V
Max. output 720 W – Max. current 30 A.
Recharge time: 12 h for 240 Ah
* Other voltages/frequencies according to the local mains power supply

Special case of gelled batteries

A special charger is compulsory to charge gelled electrolyte batteries.



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Recharging the battery with an external charger

- After the shift, take the truck to the charging area.
- Stop truck, lower the forks, switch off and remove key (1).
- Disconnect battery connector, (See chapter on connecting/ disconnecting the connector).
- Open battery compartment cover
- Connect the battery connector to the charger output connector.
- Switch the charger on, in accordance with the charger's specific instructions.
- After the charger has been switched off when charging is finished, disconnect from the charger and reconnect the battery.
- Close the cover. Check the charge state on the indicator (2) after switching on. The truck is ready for use.

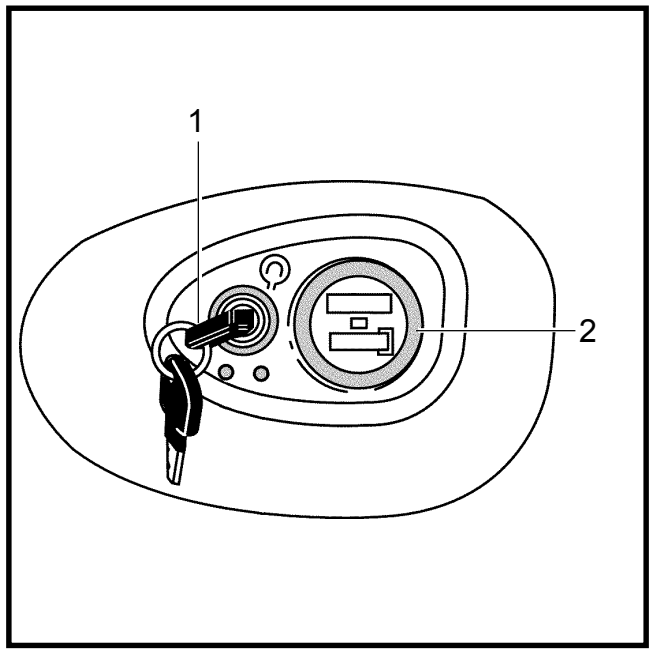
CAUTION
To avoid any sparking, always connect the battery connector before starting the charger, and disconnect it after the charger has stopped.

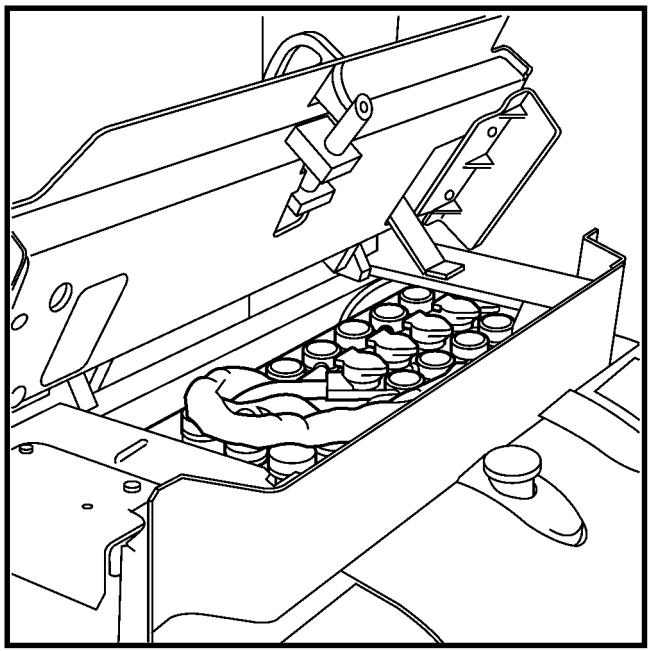
- Make sure the charger is compatible with the truck battery in terms of voltage and charge current (see charger instructions).
- When charger and battery connectors are being connected, ensure you follow the + and – polarities (do not reverse the connectors).
- The connectors have has a polarisation finger to prevent reversal of connectors, check regularly that they are present and in good condition.

Checking the condition of cables, terminals and battery contact

- Check the cable insulation is not damaged and there is no trace of heating at the connectors.
- Check that the + and - output terminals are not sulphated (presence of white salt).
- Check the condition of battery connectors and existence of polarisation finger.

WARNING
The points indicated above could cause serious malfunctions, request our local network to remedy them as soon as possible.





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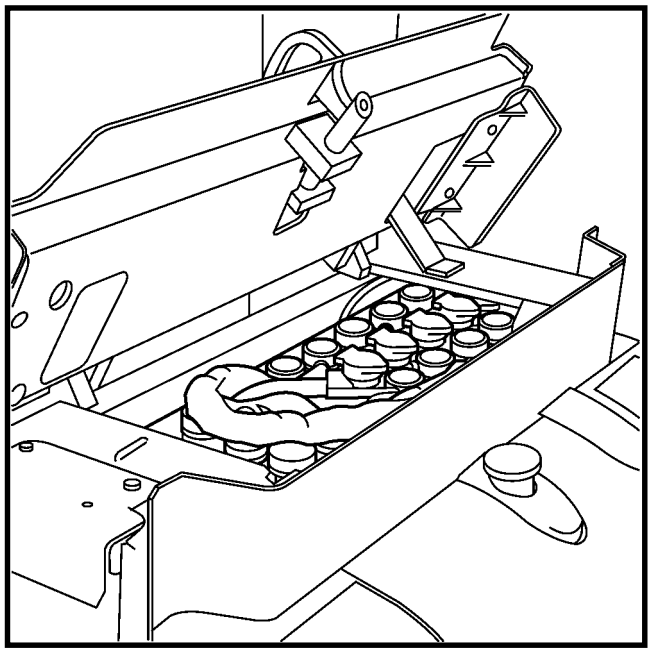
The procedures described below concern liquid electrolyte lead batteries.
For gelled electrolyte batteries, called "no-maintenance" batteries, see manufacturer's instructions.

WARNING
Avoid any contact with the acid. Do not create a short-circuit. See recommendations in daily checks section.

Checking level of electrolyte

- This check, and the top-up if necessary must be done weekly, after recharging the battery.
- Switch off the truck, open the cover and disconnect the battery.
- Check the level, it should be at the bottom of the stopper, a little above the splashguard.
- Add distilled water to top up the level of cells.
- Then close the stoppers.



CAUTION
Top up only with distilled water.
Never top up before charging (risk of overflow).
Never overfill the cells.

For further information, see instructions provided with battery.

Checking the electrolyte specific gravity

- The specific gravity measurement precisely reflects the state of charge of each cell making up the battery. This measurement can be done before or after charging.
- Minimum specific gravity, battery 80% discharged; 1.14
- Maximum specific gravity, battery 100% charged; 1.29 to 1.32 (depending on brand)
- We recommend a reading every 1 or 2 weeks. Note down the values read in your battery monitoring logbook.
- As described previously, remove the cover of the stopper of each cell.
- Carefully record the specific gravity of each cell with the hydrometer.
- Close the stoppers after measurement.

NOTE: If the cell voltage varies or is too low for some cells, call your local representative. Any discharge below the 1.14 threshold will be very detrimental to the life of the battery.

For further information, see battery instructions.

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Removing/replacing the battery

CAUTION
The battery is a heavy, fragile component, which must be handled with care.

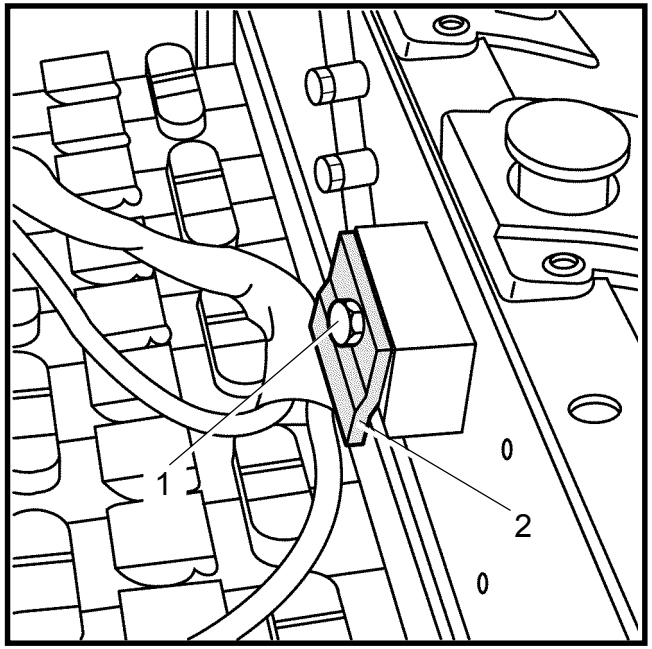
CAUTION
When lowering the forks, ensure feet are well clear.

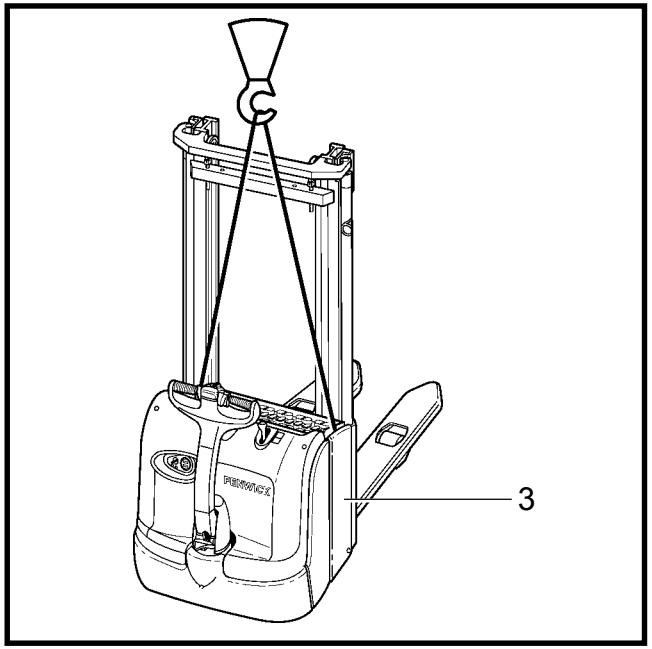
CAUTION
When operating the battery locking system, ensure hands are kept well clear of moving parts.

Battery changing, hoist method

- Lower the forks completely
- Open the battery cover
- Disconnect the battery connector
- Remove the battery cover by pulling it to the top
- Remove screw (1) and remove the battery retaining plate (2).
- To avoid jamming the cables, move the power cables and the power cord from the integrated charger to outside the case.
- Fix the hook slings to the battery case (3).
- Carefully withdraw the battery.
- To replace the battery, reverse the removal procedure.

CAUTION
After replacing the battery, ensure that the battery retaining plate (2) is replaced.





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Battery changing, roll-on, roll-off method

We recommend, to assist battery handling, that you use a changing frame or wheeled trolley when removing the battery.

- Place the changing frame (3) or the wheeled trolley (2) adjacent to the battery compartment
- Open the battery cover (1)
- Disconnect the battery connector
- Place the connector onto the top of the battery
- Pull the battery onto the changing frame or wheeled trolley and lock it in position.
- To replace the battery, reverse the removal procedure.
- Close the battery cover (1)

WARNING
L14 - L16 at side outlet:
Before reversing with the appliance, make sure that the battery is in place and that the battery lock is locked properly.

Roll-on, roll-off battery, choosing the opening side of the battery compartment

It is possible to remove the battery from its compartment from either the left or right hand side.

- Reverse the securing plates (4) on the chassis and cover.
- Reverse the position of the cover support (5) on the cover

WARNING
Always ensure that the securing plates (4) are in place on the truck.

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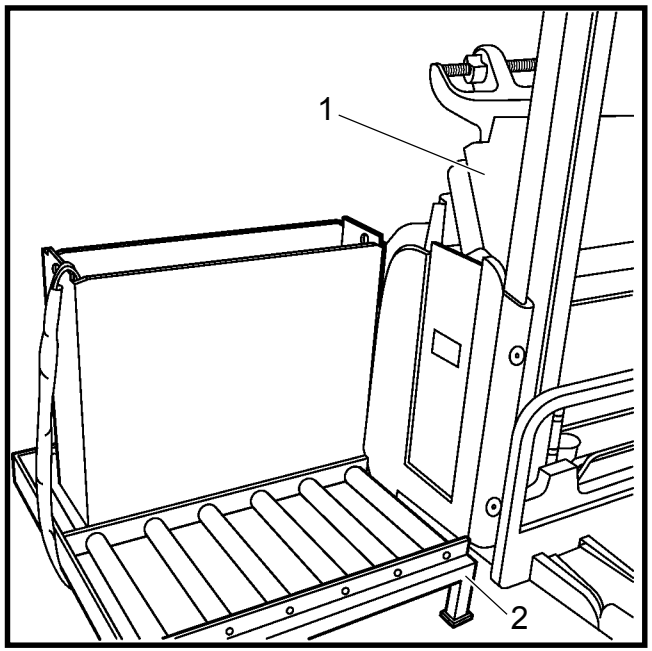
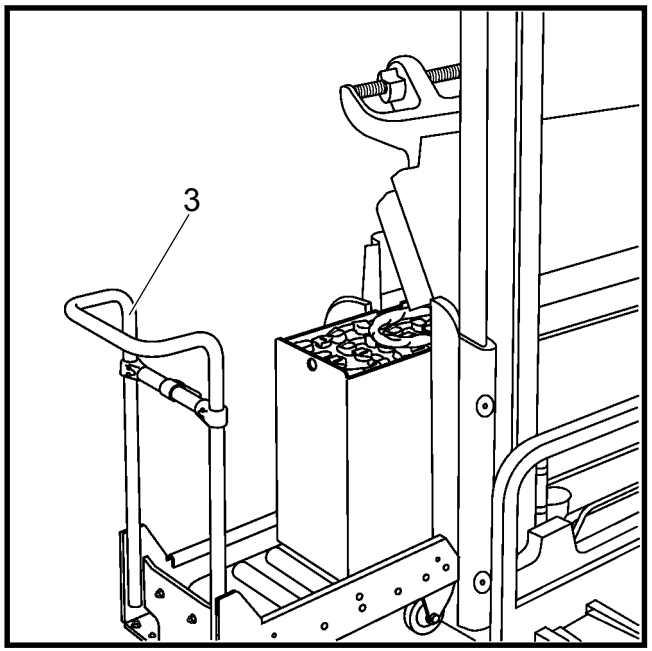
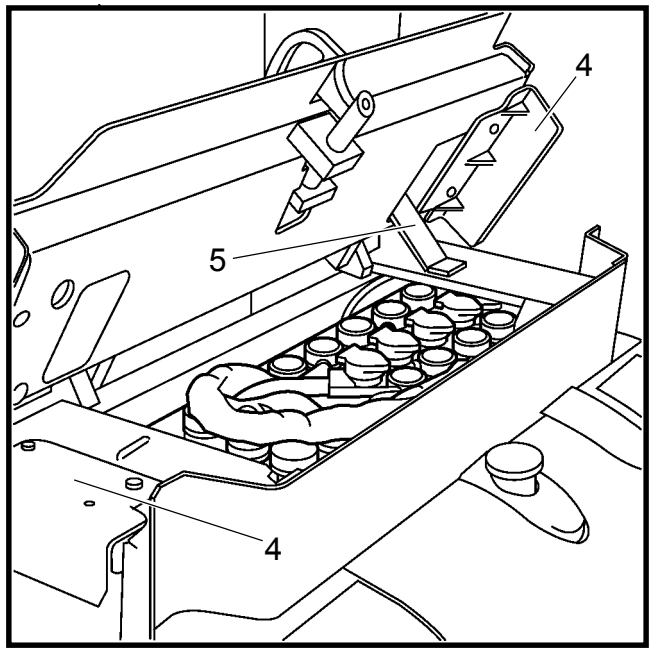






Instructions for use

The L 14 / L 16 without or without initial lift, are designed for use indoors in non-hazardous atmospheres; the ambient temperature must be between -10°C and + 40°C and the air humidity less than 95%.
NOTE: For lower temperature, a cold store option is available.
The pallet stackers without initial lift can negotiate ramps and slight angles; pallet stackers with initial lift have greater clearances.
These trucks must preferably be used on flat flooring.
The floor must be able to withstand a load of 53daN/mm^2
The L14 can handle loads up to 1400 kg maximum, the L16 up to 1600 Kg. The L14-1L16 provided with an initial lift can transport 2000 Kg on the forks. Loads must be homogeneous and of a max. recommended height of 2 m.
For uses other than those described above, please see your local representative.

CAUTION
Always adapt your driving to the condition of the surface you are driving on (irregular surfaces, etc.), to particularly hazardous working areas and to the load.

CAUTION
Since the pallet truck braking torque is proportional to the transported load, always raise the forks by a few centimetres before starting.

CAUTION
Always turn the keyswitch off, and remove the key before leaving the truck.

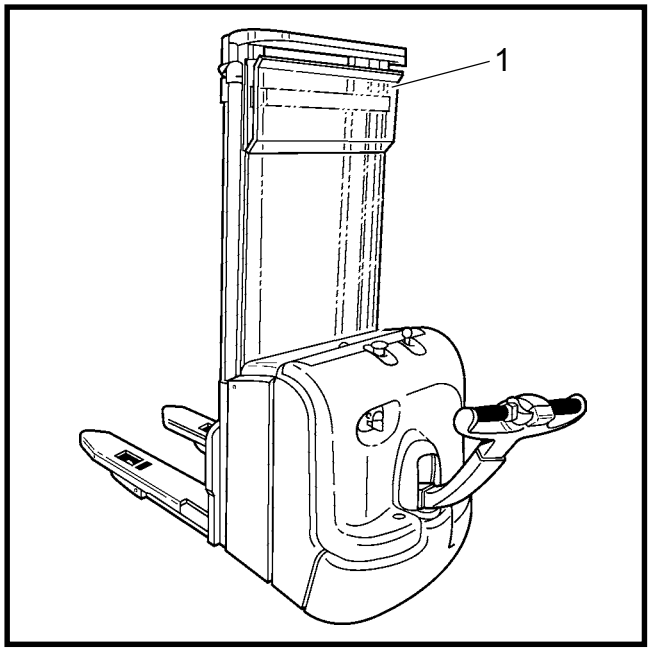
CAUTION
The platform of this pallet stacker is designed to protect the driver's feet. This protection can only be effective if the driver is wearing safety shoes.

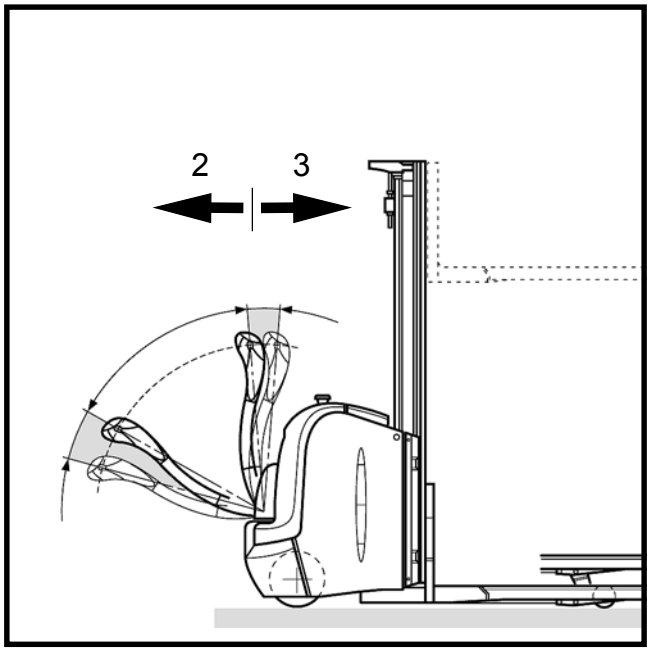
WARNING
Always keep your hands on the controls, and never bring your hands close to moving parts and components unless you have disconnected the battery.

CAUTION
The mast protective screen (1) must always be in placed and well secured.

Defining the travel direction

On a pallet stacker the conventional directions are:
- Forward travel < (2) - Forks trailing
- Reverse travel > (3) - Forks leading





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Startup

- Connect the battery connector
- Release the emergency isolator
- Turn the key switch (1) fully clockwise.
- The discharge indicator illuminates and the hour meter (2) operates.
- The brake is automatically released
- Raise the forks to a few centimetres above the ground.

REMARK
Always adapt your travel speed to the dangers and to the load.
Only use your pallet stacker on correct surfaces.

CAUTION
Driving on slopes greater than 10% is forbidden, due to braking and stability.

Steering

- Move the tiller arm to the operating position (3).

REMARK
In the zones (1 and 2), the electromagnetic brake is activated and it is not possible to steer the truck.

Forward travel

- Gradually and gently with the thumb, press on the lower part of the butterfly lever – butterflies rotate in the direction (4).

The truck accelerates in proportion to the pressure exerted on the butterfly lever.

Reverse travel

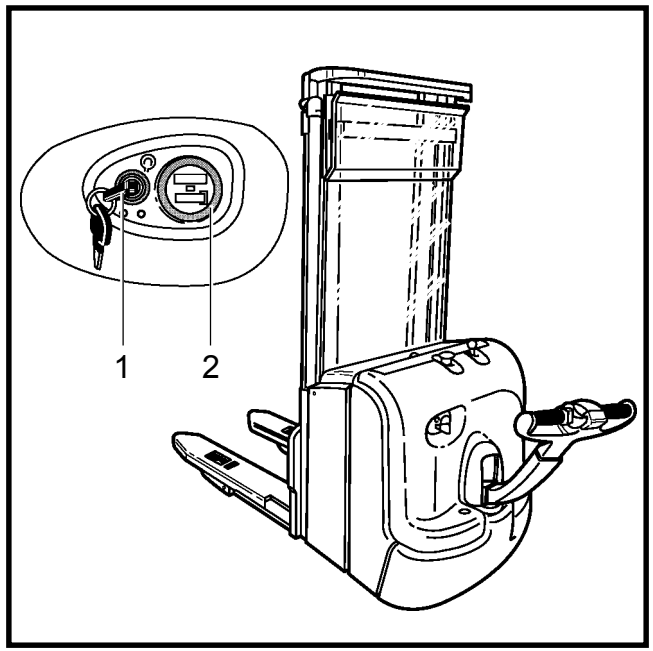
- Gradually and gently with the thumb, press on the upper part of the butterfly lever – butterflies rotate in the direction (5).

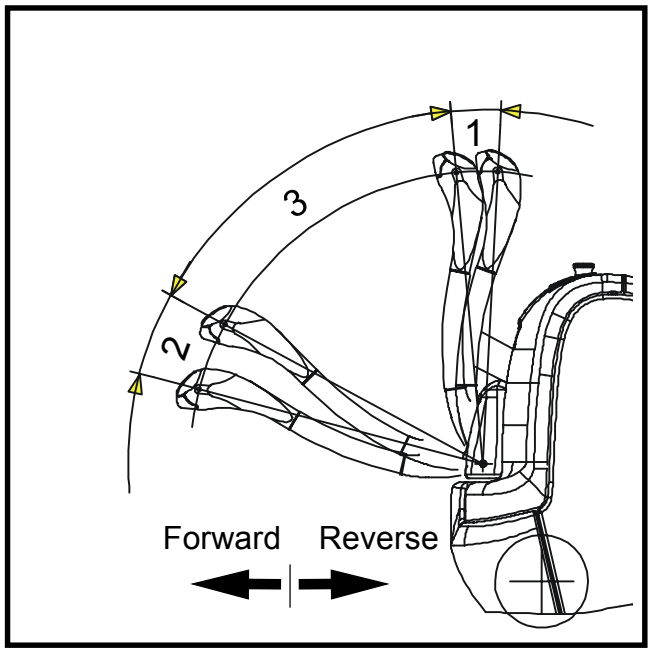
The truck accelerates in reverse direction in proportion to the pressure exerted on the butterfly lever.

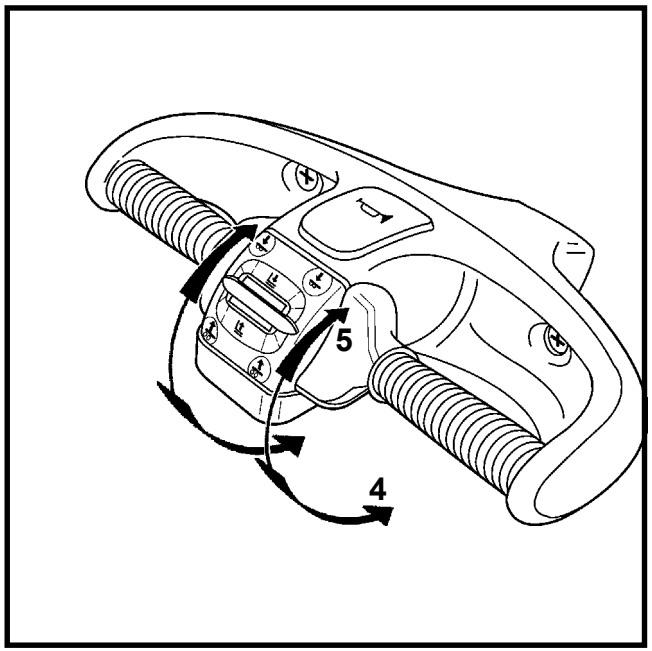
Changing the direction of travel

- Release the butterfly lever and actuate it in the opposite direction.

The reversal of direction of travel may be carried out while the truck is moving.
If so, the truck is first electrically braked until it stops, then it starts again in the opposite direction.







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Steering

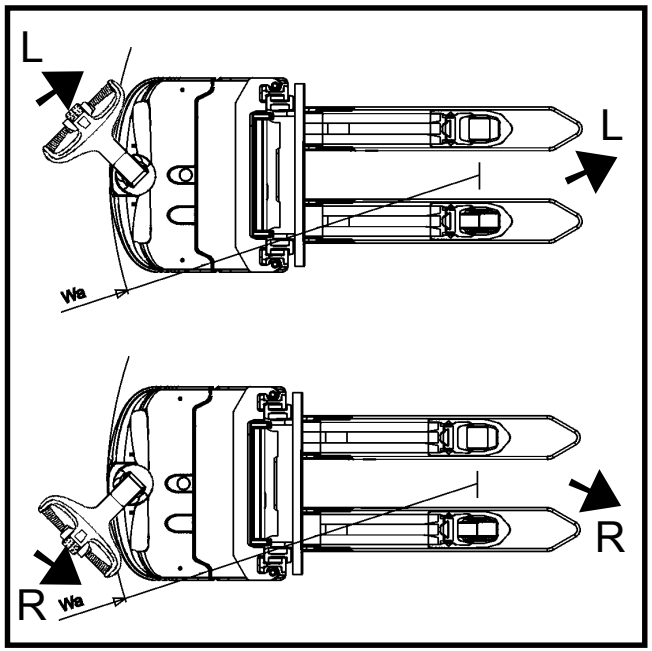
In straight line, the tiller arm is central.
- Turn the tiller arm in the clockwise direction, the truck turns to the left in forward direction.
- Turn the tiller arm in the anti-clockwise direction, the truck turns to the right in forward direction.

CAUTION
When engaged in a tight turn, slow the truck down. A tight turn undertaken too fast can cause the truck to overturn.

The electrically assisted steering allows the driver to guide the truck with precision and with little effort.
- Drive the truck, turn the tiller arm and ensure that the transmission of steering movements are correct and simultaneous.

Steering angle .....180°

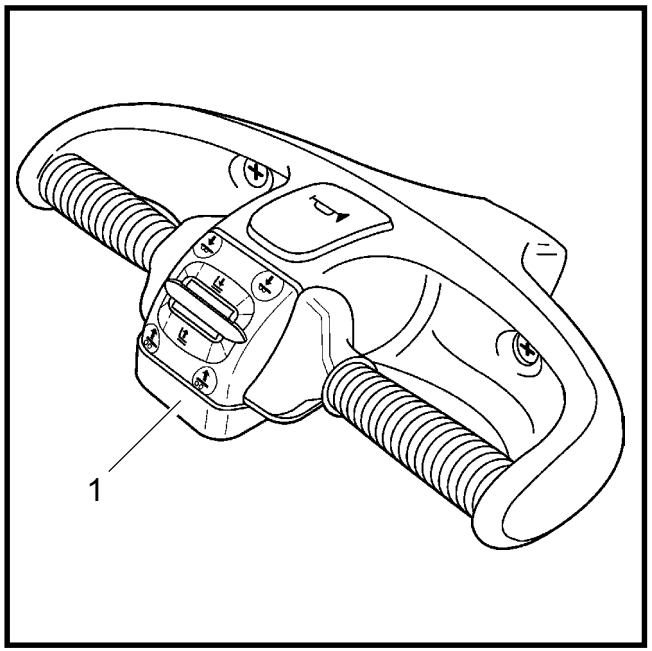
The steering radius (Wa) depends on the length of the chassis. (see technical data).



Safety reversing switch

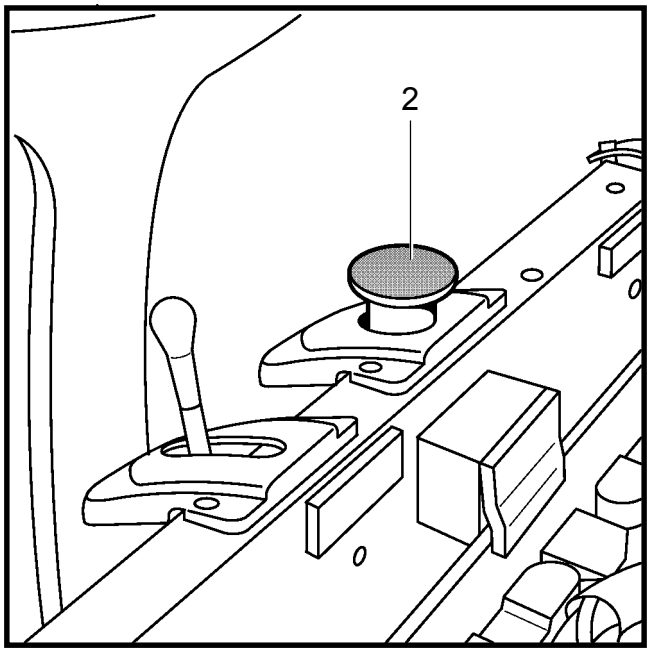
To protect the driver from the risk of being trapped between an obstacle and the truck, a safety reversing switch (1) is located on the tillerarm head

If the switch is actuated, the truck stops immediately and proceeds in the forks leading direction at low speed.



Emergency isolator

- For normal operation, release the isolator (2).
- If there is any danger, press the isolator (2) to open the electrical circuit and shut down the truck.



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Operating the truck on slopes

REMARK
Do not misuse the truck on slopes. This is particularly wearing on the traction motor, brakes and battery.

Take care when approaching slopes.
- Never move onto a slope where the incline is greater than the maximum practicable ramp specified for the truck (see technical data sheet).
- Check that the ground is clean and has a non-skid surface and that the path is clear.

Ascending slopes

When transporting a load, slopes must be ascended in the reverse direction.

When empty, the truck can ascend a slope in the forward direction.

Descending slopes

When transporting a load, slopes must be ascended in the forward direction.

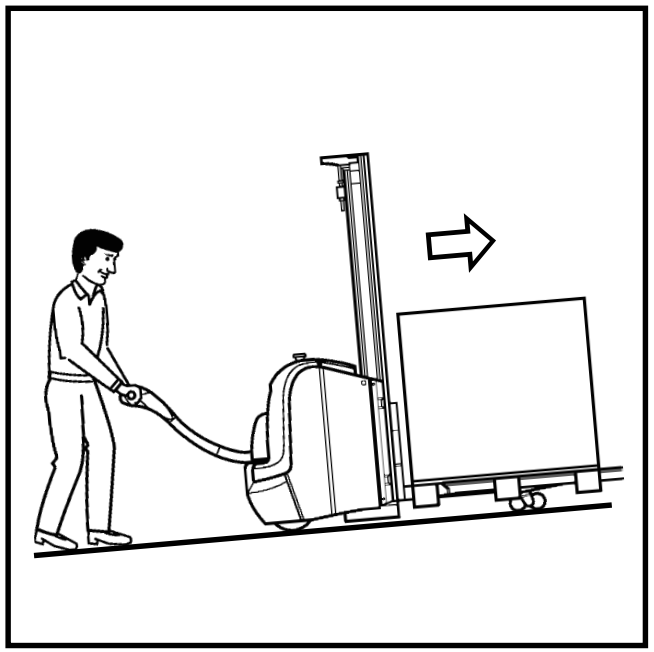
When empty, the truck must descend a slope in the forward direction.

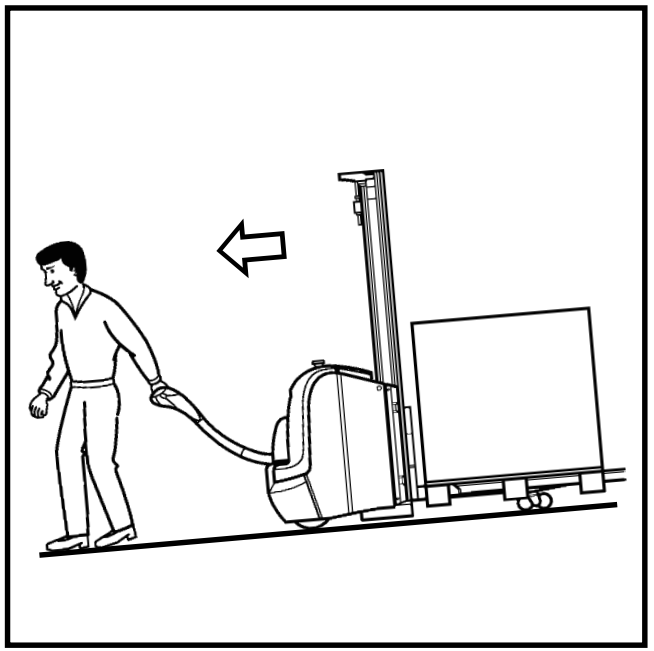
DANGER
Always descend slopes at very low speed and brake very progressively.

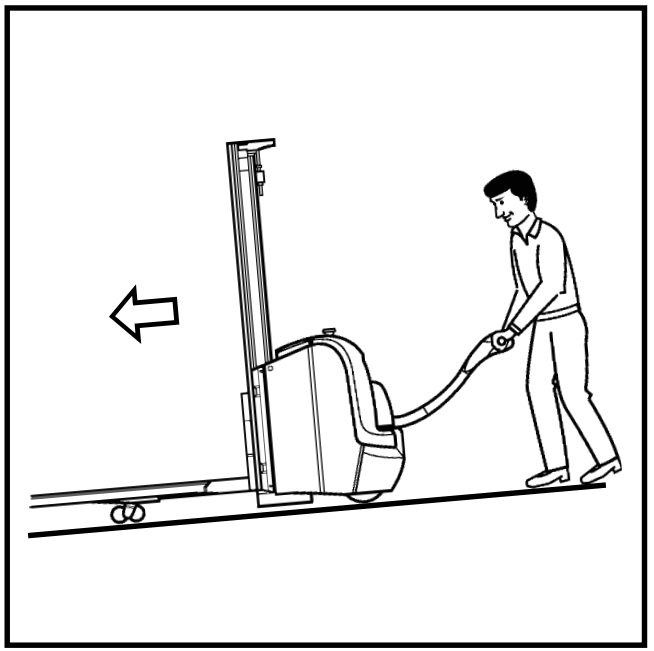
DANGER
Never park the truck on a ramp. U-turns and cutting across are prohibited on slopes.

Starting on a slope

For starting on a slope, activate the butterfly lever in the desired direction, with the tiller arm is in position 2 (truck braked).
Move the tiller arm to the operating position.







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Instructions for use

The L 14 AP / L 16 AP without or without Initial Lift, are designed for use indoors in non-hazardous atmospheres; the ambient temperature must be between -10°C and + 40°C and the air humidity less than 95%.
NOTE: For lower temperature, a cold store option is offered.
The pallet stackers without initial lift can negotiate ramps and slight angles; pallet stackers with initial lift have greater clearances.
These trucks must preferably be used on flat flooring.
The floor must be able to withstand a load of 53daN/mm^2
The L14 AP can handle loads up to 1400 kg maximum, the L16 AP up to 1600 Kg. The L14AP-1L16AP provided with an initial lift can transport 2000 Kg on the forks. Loads must be homogeneous and of a max. recommended height of 2 m.
For uses other than those described above, please see your local representative.

CAUTION
Always adapt your driving to the condition of the surface you are driving on (irregular surfaces, etc.), to particularly hazardous working areas and to the load.

CAUTION
Since the pallet truck braking torque is proportional to the transported load, always raise the forks by a few centimetres before starting.

CAUTION
Always turn the keyswitch off, and remove the key before leaving the truck.

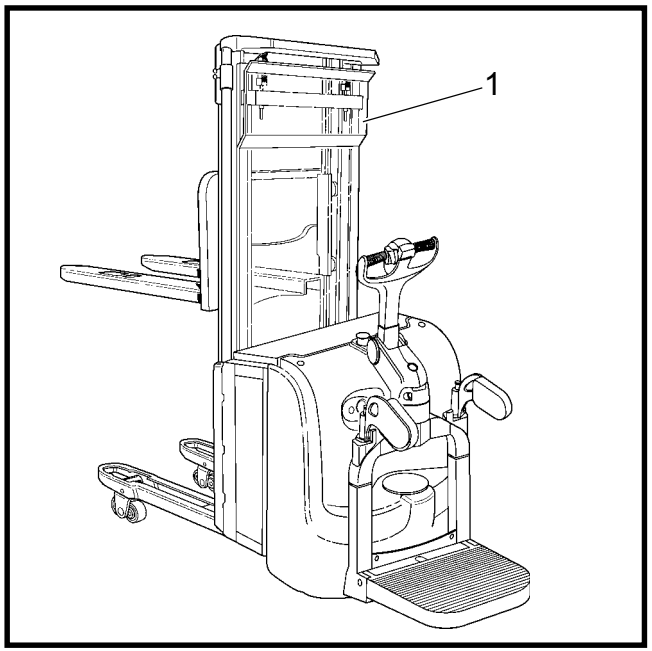
CAUTION
The platform of this pallet stacker is designed to protect the driver's feet. This protection can only be effective if the driver is wearing safety shoes.

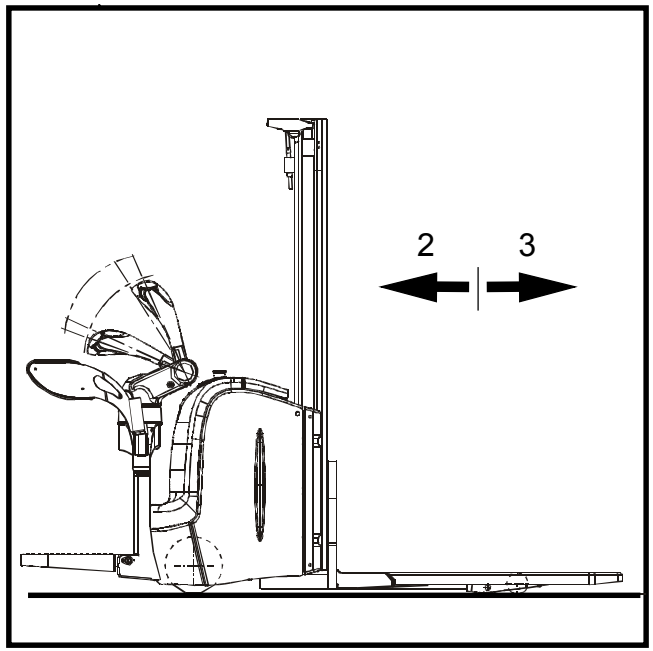
CAUTION
Always keep your hands on the controls, and never bring your hands close to moving parts and components unless you have disconnected the battery.

CAUTION
The mast protective screen (1) must always be in placed and well secured.

Defining the travel direction

On a pallet stacker (ride-on version) the conventional directions are:
- Forward travel < (3) - Forks leading
- Reverse travel > (2) - Forks trailing





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Startup

- Connect the battery connector
- Stand on the driving platform

WARNING
Always open the side guards before starting.

- Release the emergency isolator (4)
- Turn the key switch (5) fully clockwise.
- The discharge indicator illuminates and the hour meter (6) operates
- The parking brake is automatically released when you move the tiller arm to the operating position (3).
- Raise the forks to a few centimetres above the ground.

REMARK
Always adapt your travel speed to the dangers and to the load.
Only use your pallet stacker on correct surfaces.

CAUTION
Driving on slopes greater than 10% is forbidden, due to braking and stability.

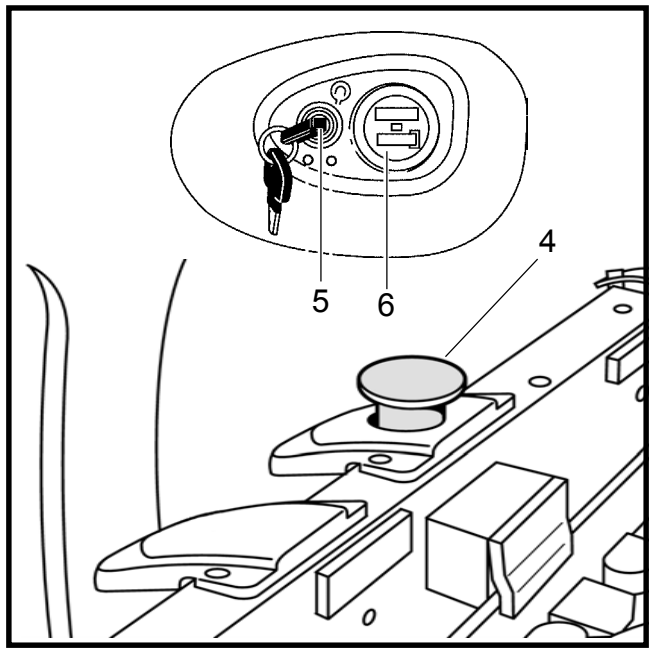
Pedestrian mode steering

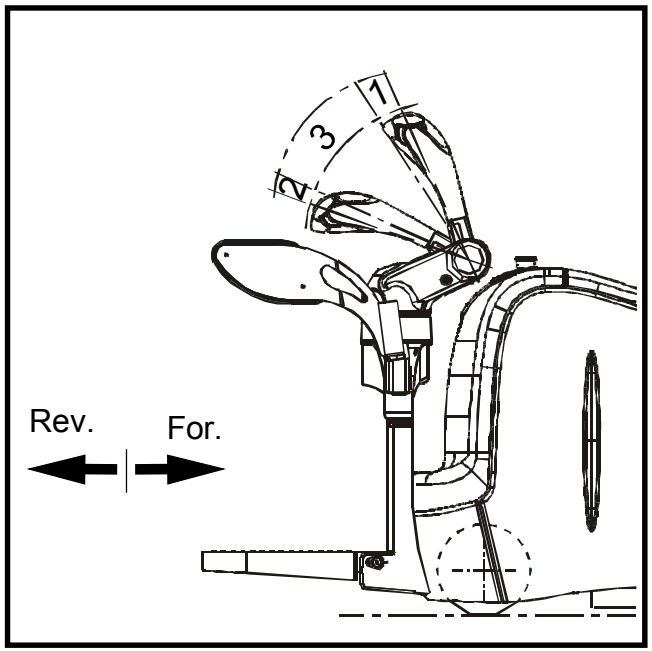
In confined spaces, you can use this pallet stacker with in pedestrian mode to facilitate the manoeuvres.

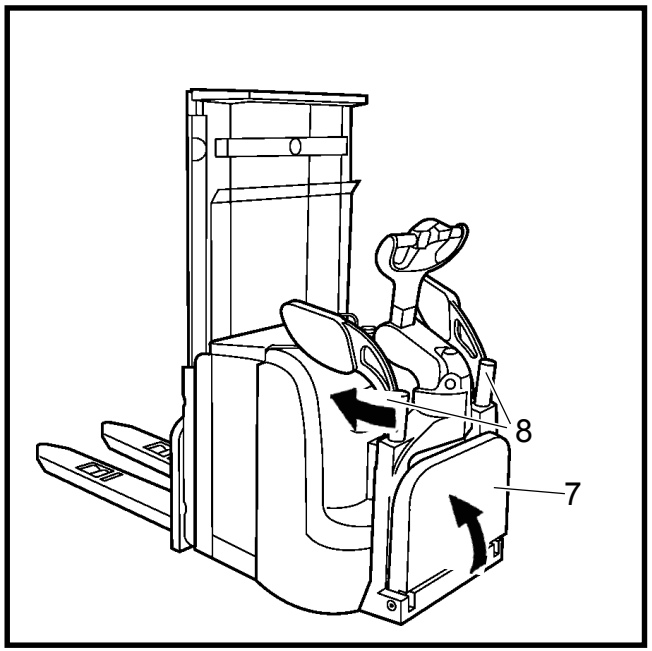
- Raise the stand-on platform (7)
- Fold the side guards (8) in, and lock into position.
- Move the tiller arm to the operating position (3)

In the zones (1 and 2), the electromagnetic brake is activated and it is not possible to steer the truck.

NOTES:
- Pedestrian mode is only possible only when the stand-on platform is raised and the side guards are folded back.
- The safety reversing button is activated
- The max. speed in pedestrian mode is reduced to 6 km/h.







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Ride-on steering

- Lower the stand-on platform
- Open the side guards and lock into position.
- Stand on the platform
- Move the tiller arm to the operating position (3).

In the zones (1 and 2), the electromagnetic brake is activated and it is not possible to steer the truck.

NOTA
When the lateral protections are shut, the speed of the truck is limited to 6 Km/h.

Forward travel

- Gradually and gently with the thumb, press on the upper part of the butterfly lever – butterflies rotate in the direction (5).

The truck accelerates in forward direction in proportion to the pressure exerted on the butterfly lever.

Reverse travel

- Gradually and gently with the thumb, press on the lower part of the butterfly lever – butterflies rotate in the direction (4).

The truck accelerates in reverse direction in proportion to the pressure exerted on the butterfly valve.

Changing the direction of travel

- Release the butterfly lever and actuate it in the opposite direction.

The reversal of direction of travel may be carried out while the truck is moving.
If so, the truck is first electrically braked until it stops, then it starts again in the opposite direction.

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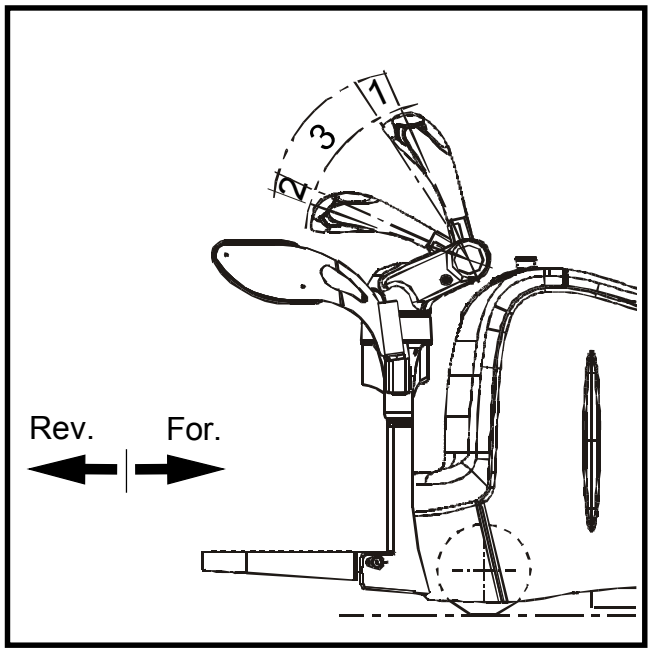
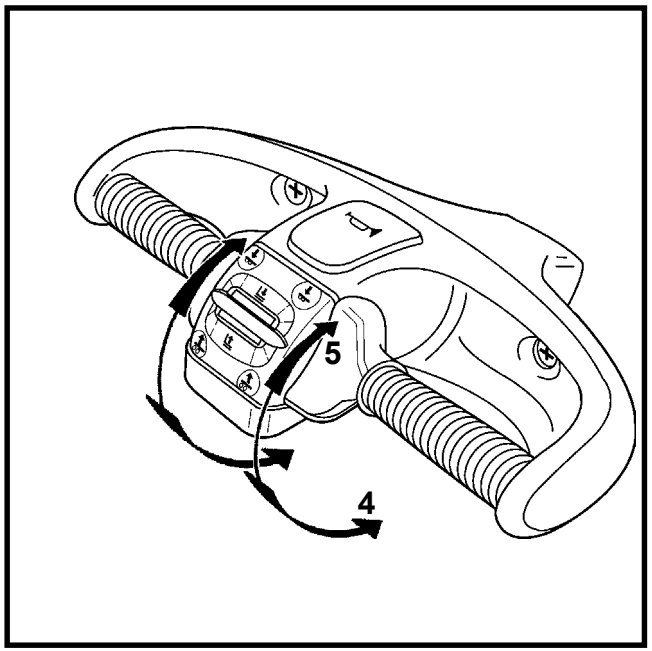




Steering

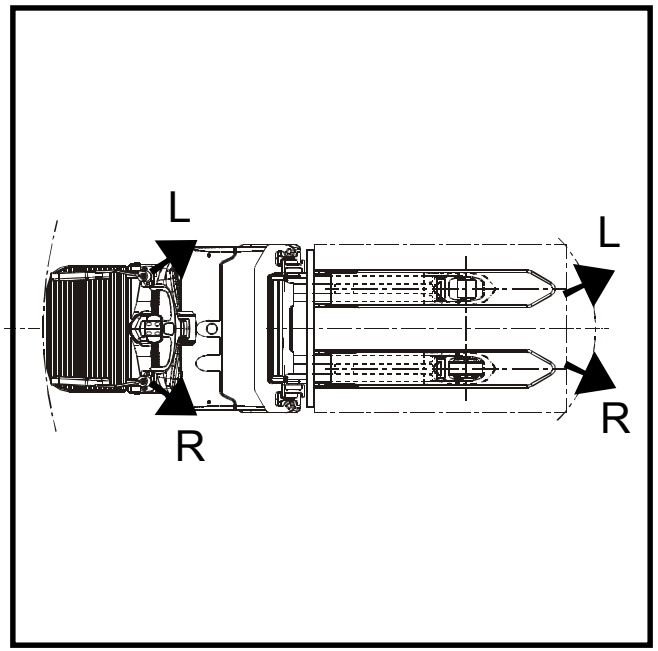
In straight line, the tiller arm is central.
- Turn the tiller arm in the clockwise direction, the truck turns to the left in forward direction.
- Turn the tiller arm in the anti-clockwise direction, the truck turns to the right in forward direction.

CAUTION
When engaged in a tight turn, slow the truck down. A tight turn undertaken too fast can cause the truck to overturn.

The electrically assisted steering allows the operator to guide the truck with precision and with little effort.
- Drive the truck, turn the tiller arm and ensure that the transmission of steering movements are correct and simultaneous.

Steering angle .....180°

The steering radius (Wa) depends on the length of the chassis. (see technical data).

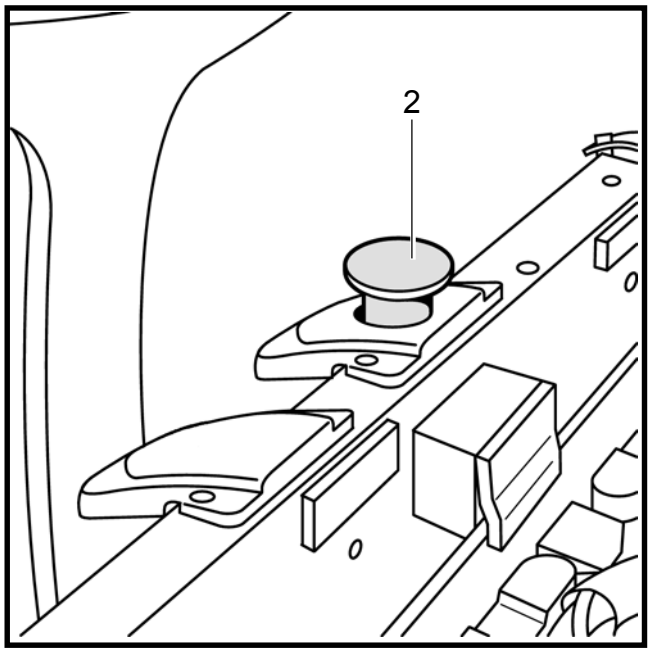


Safety when turning: speed limitation

The L14AP/L16AP are provided with a safety feature that automatically reduces the travel speed when negotiating corners.

Emergency isolator

- For normal operation, release the isolator (2).
- If there is any danger, press the isolator (2) to open the electrical circuit and shut down the truck.



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Operating the truck on slopes

REMARK
Do not misuse the truck on slopes. This is particularly wearing on the traction motor, brakes and battery.

Take care when approaching slopes.
- Never move onto a slope where the incline is greater than the maximum practicable ramp specified for the truck (see technical data sheet).
- Check that the ground is clean and has a non-skid surface and that the path is clear.

Ascending slopes

When transporting a load, slopes must be ascended in the reverse direction.

When empty, the truck can ascend a slope in the forward direction.

Descending slopes

When transporting a load, slopes must be ascended in the forward direction.

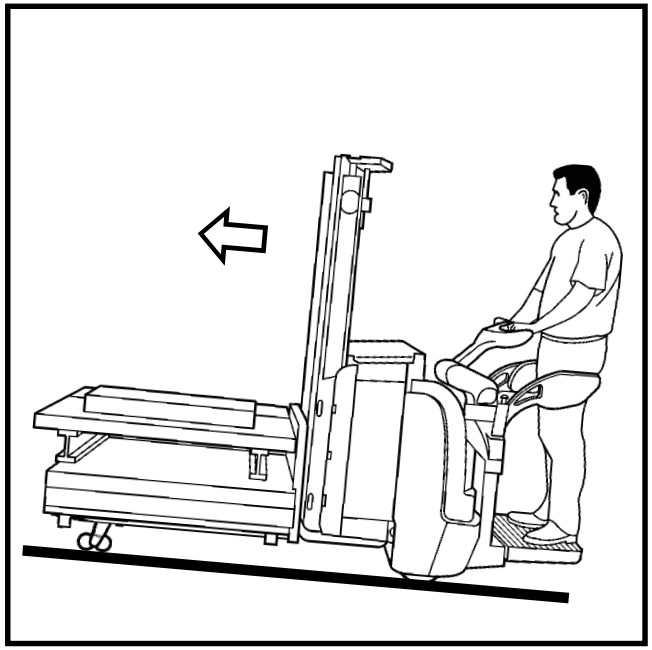
When empty, the truck must descend a slope in forward travel.

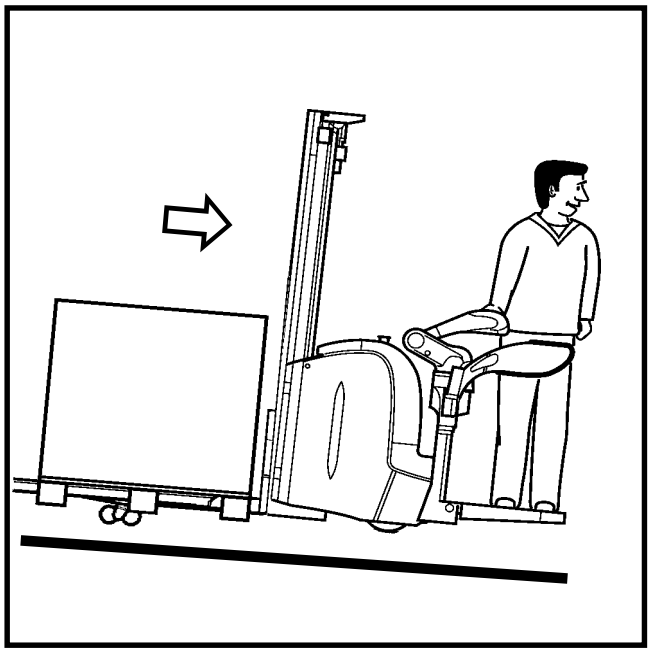
DANGER
Always descend slopes at very low speed and brake very progressively.

DANGER
Never park the truck on a ramp. U-turns and cutting across are prohibited on slopes.

Starting on a slope

For starting on a slope, activate the butterfly lever in the desired direction, with the tiller arm is in position 2 (truck braked).
Move the tiller arm to the operating position.





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Electromagnetic braking

L14 / L16
To actuate the electromagnetic brake, either move the tiller arm into braking position (2) or release the tiller arm. The tiller arm is then pulled up by a gas spring into braking position (1).

L14AP / L16AP
To actuate the electromagnetic brake, either the tiller arm must contact the rubber stop in braking position (2) or release the tiller arm. The tiller arm is then pulled up by a spring into braking position (1).

Movement of the stand-on platform instantly actuates the electromagnetic brake.

Braking by reversing the direction of travel

Counter-current braking can be obtained by reversing the direction of travel:
- Operate the butterfly lever (3) in the opposite direction until the truck stops.
- Then release the butterfly lever

Parking brake

- The parking brake is applied automatically when the operator releases the tiller arm, it is pulled up automatically in braking position (1).

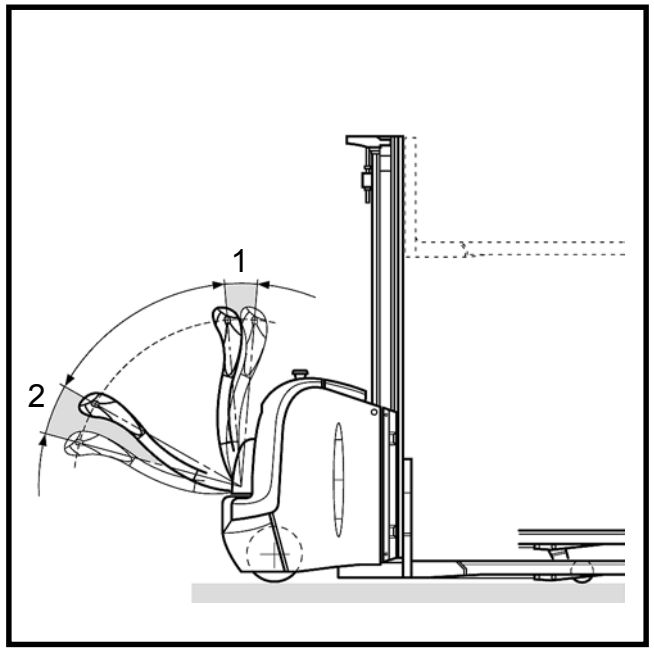
L.B.C. (Linde Brake Control) automatic braking

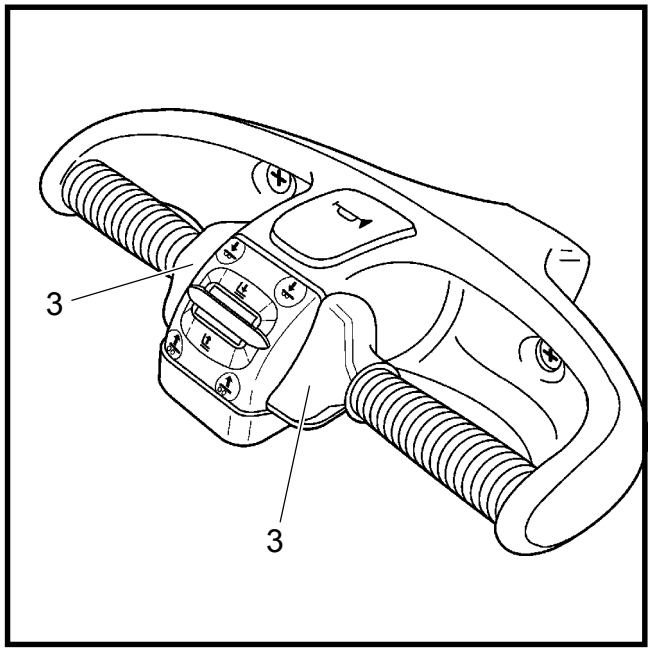
- When the butterfly lever (3) is released, the counter-current braking is triggered automatically until the truck stops.

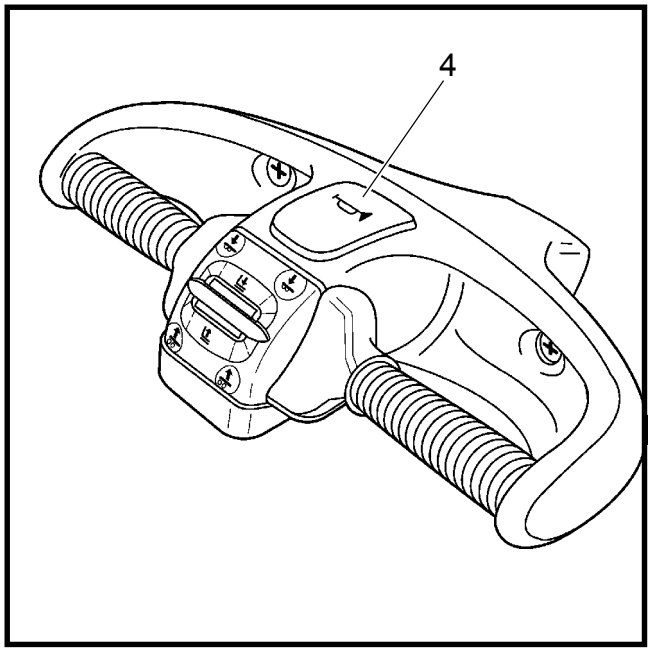
Horn control

The horn must be used at points of poor visibility or at crossings.

- Press on the button (4) on the head of the tiller arm.







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Use of the mast

CAUTION
Use the mast and accessories only for work for which they are designed. The driver must receive instructions about how the lift system works.

CAUTION
Never bring your hands close to the lifting system.

DANGER
The mast protective screen must always be in place, fixed properly to offer good visibility.

Option: high lifting speed

An optional configuration of two pumps, allows for higher unladen lifting speeds, thus optimising the handling time.

Tiller arm lifting control

Lifting the fork carriage:

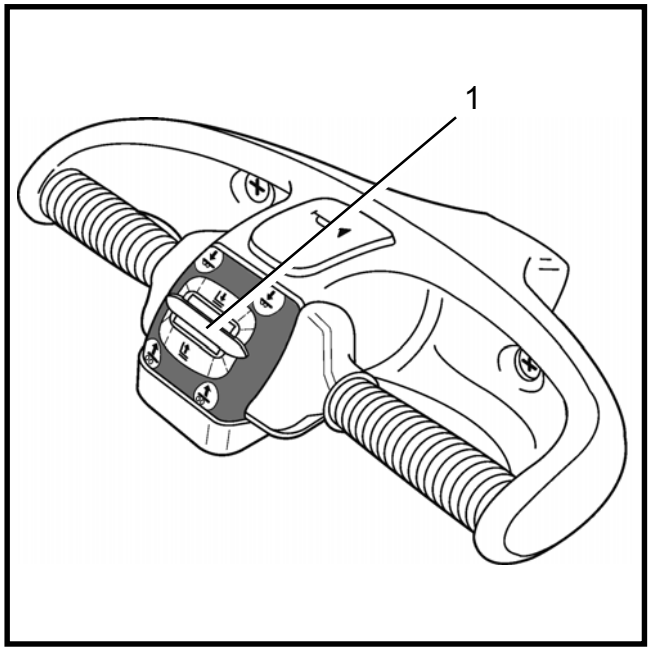
- With the thumb, gradually pull the switch (1) to the bottom.

Lowering the fork carriage:

- With the thumb, gradually push the switch (1) to the top.

When the switch (1) is released, the carriage stops at the desired height.

NOTE:
Lift and lower speed is determined by the position of switch (1). The switch automatically returns to the neutral position when released.



CAUTION
Always operate the switch (1) gently and smoothly.

Initial lift controls

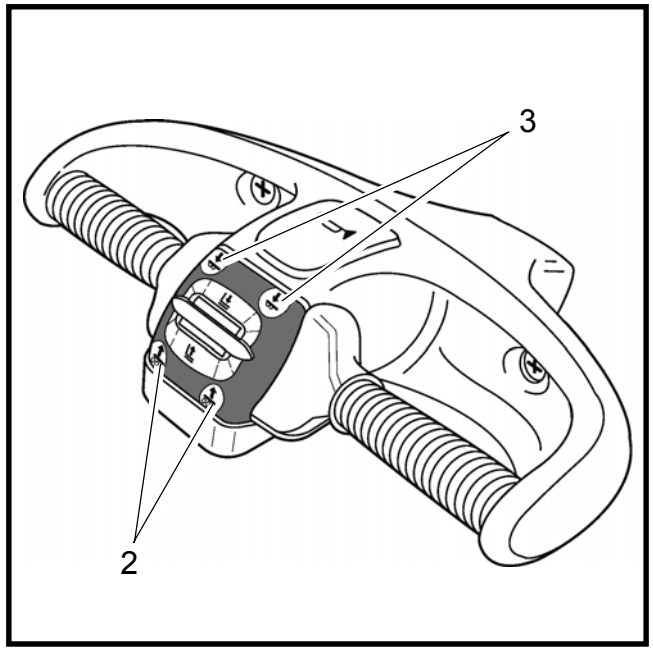
Raising the pallet legs:

- Activate the control switch (2)

Lowering the pallet legs:

- Activate the control switch (3)

REMARKS
High lifting automatically causes the pallet legs to lower. Initial lift is unavailble when the forks are raised above 1.50 m above ground.



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Automatic lower slowdown*

A detector (4) automatically slows lower.

- Lower the forks completely, the forks will be slowed down automatically.*

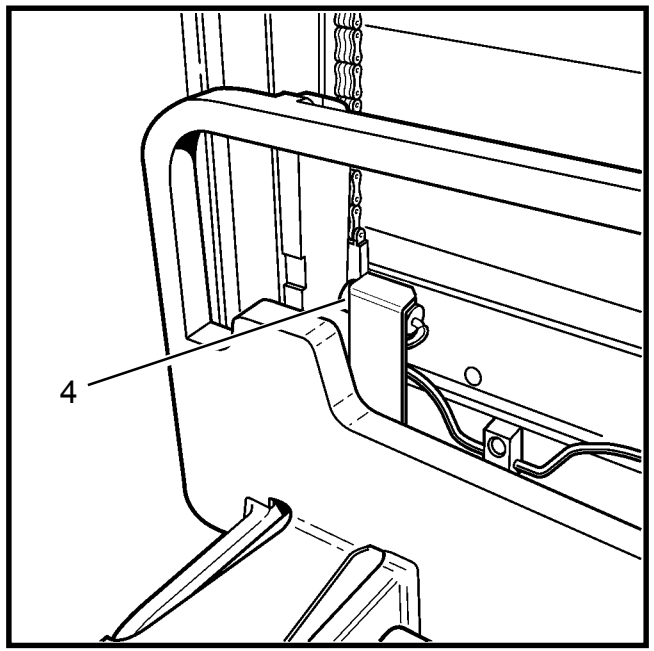
* Option

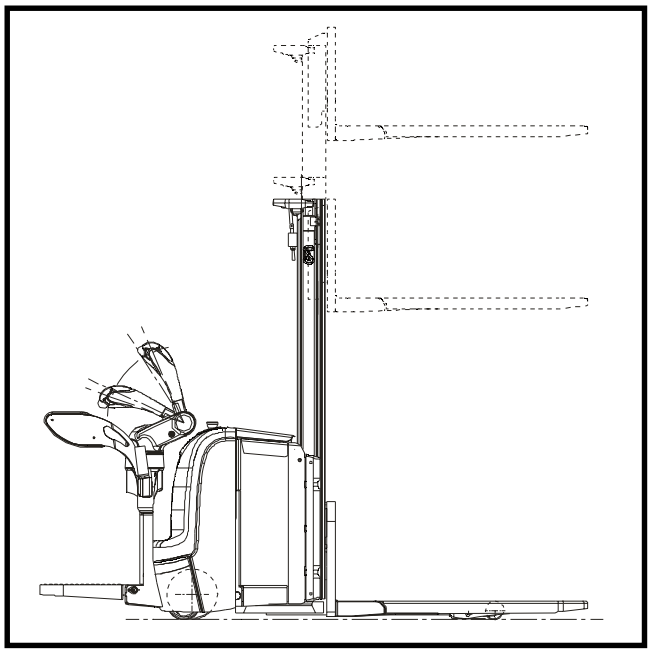
Speed limit with raised forks

The pallet stacker is fitted with a detector that limits the traction speed when the forks reaches a height of about 1.5 m from the ground (according to the configuration of the truck).

Speed limit for L14AP-L16 AP

Travel speed is reduced when transporting loads heavier than 1400 Kg.





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Chassis mounted lifting lever

Lifting the fork carriage:

- Pull the lever (2) in direction (3).

Lowering the fork carriage:

- Push the lever (2) in direction (1).

NOTE
Lift and lower speed is determined by how far the lever is moved.

CAUTION
Always operate the lever (1) gently and without jerks.

Tiller arm lift controls

Lifting the fork carriage:

- Push switch (4) on the tiller arm head.

Lowering the fork carriage:

- Push switch (5) on the tiller arm head.

NOTE:
Lift and lower speeds are not proportional to pressure applied to the switches.
For safety reasons, lowering speed controlled by the tiller arm head switch is less than that obtained by the action of the chassis mounted control lever.

Initial lift controls

Raising the pallet legs:

- Operate control switch (6)

Lowering the pallet legs:

- Operate control switch (7)

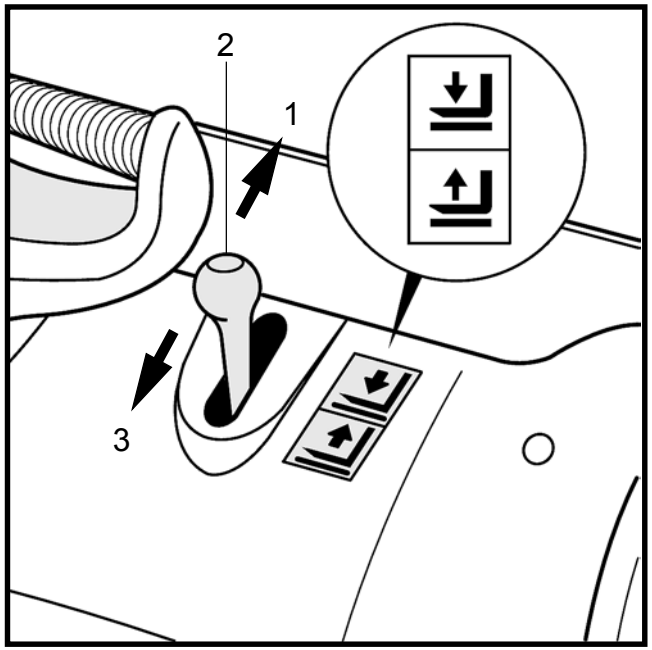
REMARKS
High lifting automatically causes the pallet legs to lower.
Initial lift is unavailble when the forks are raised above 1.50 m above ground.

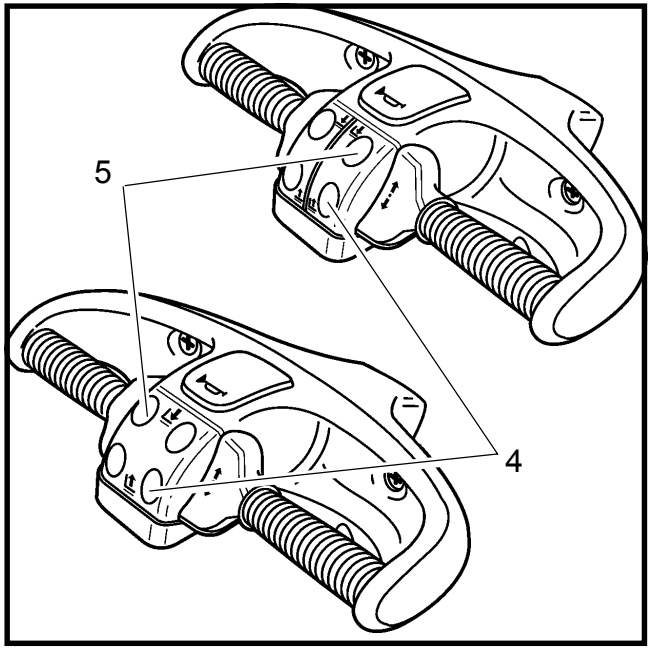
Control of attachments

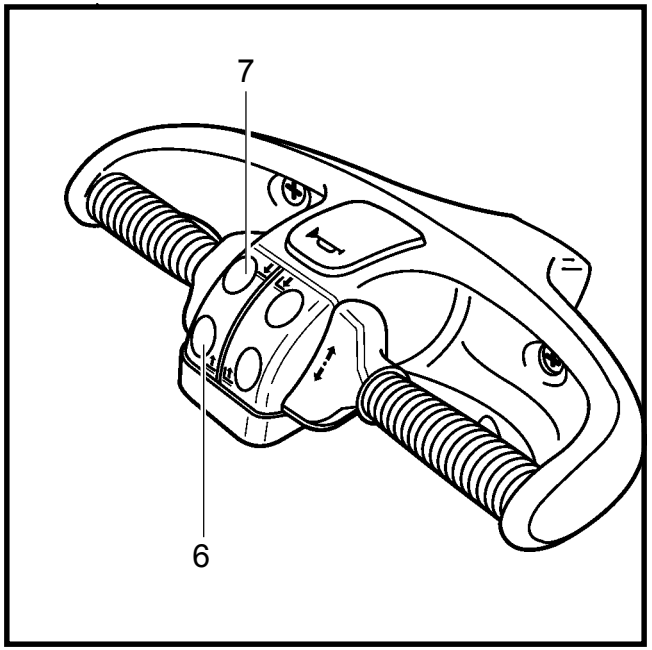
In special cases, the truck can also be equipped with special attachments, which is controlled by an additional lever or switch. Observe the working pressure for this equipment.

REMARK
For each attachment, fix a load capacity table and the corresponding operating symbol next to the operating lever/ switch.

CAUTION
It is compulsory to have all accessories not provided with the truck, approved prior to use to assure their compatibility with the truck.







CAUTION
Before picking up a load, be sure that its weight does not exceed the safe working load of the truck. Note the nominal safe working load indicated on the plate (1) of the truck.

The indicated values include the compact and homogeneous loads. They must not be exceeded, if they are exceeded, then the stability of the truck, and integrity of the mast and chassisare no longer guaranteed.

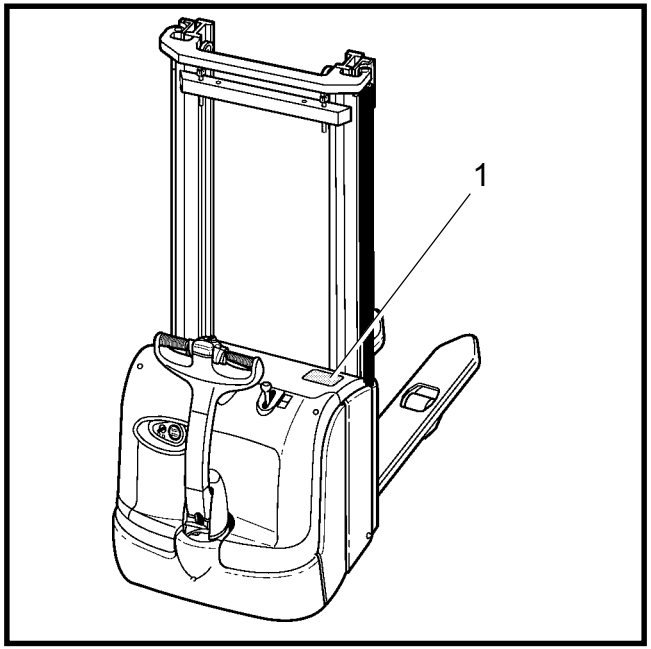
The distance from the centre of gravity of the load to the back of the fork and the lifting height determine the maximum liftable load.

Capacity L14-L16 without initial lift

L14: 1400 kg
L16: 1600 kg.

Capacity L14-L16 with initial lift

L14: 1400 kg
L16: 1600 kg
As a pallet truck: 2000 Kg.



Reading the load diagram L14 - L16

Example with a L16 with initial lift equipped with a standard mast of 3744 mm:

Maximum capacity of mast: 1600 kg.
Maximum elevation height: 3744 mm.
Maximum capacity of initial lift: 2000 kg.

Use of the mast

Refer to the bottom half of the load capacity diagram.

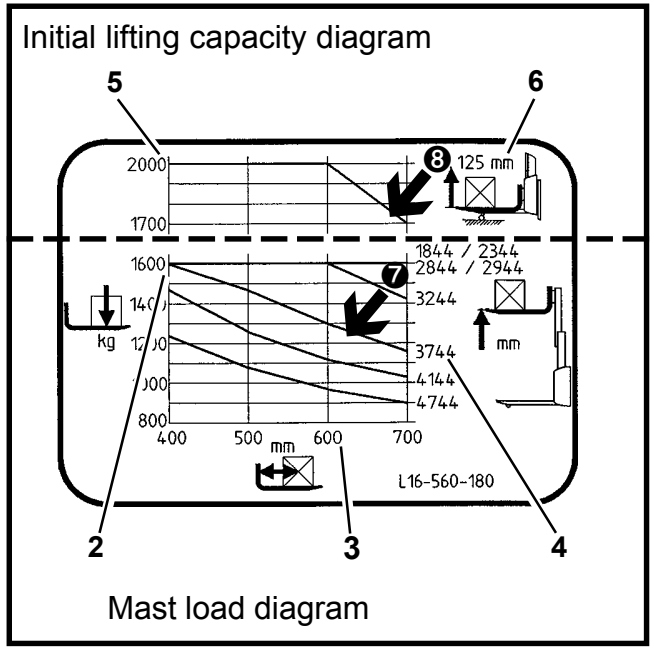
- Follow the appropriate mast curve (arrow ❼) to determine the load value and the position on the fork.

2 - Maxi. lifting load in kg
3 - Distance from the centre of gravity of the load to the back of the fork in mm.
4 - Maximum elevation heights in mm

Use of the initial lift

Refer to the top half of the load capacity diagram.

- Follow the initial lifting curve (arrow ❽) to determine the load value and the position on the pallet legs.

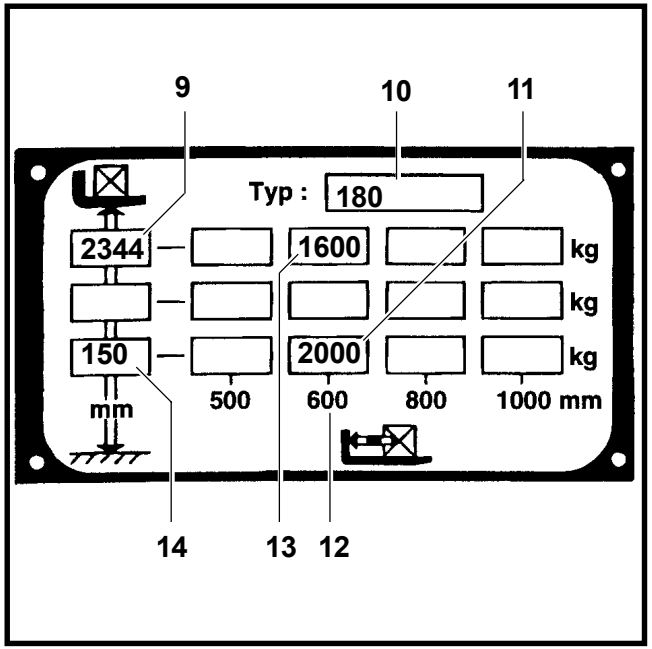


5 - Max. load on the fork arms in kg.
6 - Maximum height of initial lift.

Reading the load diagram L14AP - L16AP

Example with a L16AP with initial lift equipped with a standard mast of 2344 mm:

9- Maximum elevation height: 2344mm
10-Elevating mast type
11-Maximum capacity on the fork arms: 2000kg
12 - Distance from the back of the fork to the centre of gravity of the load: 600mm
13-Maximum capacity on the fork: 1600 kg
14-Maximum elevating height of pallet legs



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Picking up a load on the ground (L14-L16 without initial lift)

- Approach the load carefully.
- Lower the fork legs until they can easily enter the pallet.
- Insert the forks under the load.
- If the load is shorter than the forks, position the truck so that the far end of the load is a few centimetres beyond the end of the fork arms, to avoid snagging the load behind the one to be picked up.
- Lift the load a few centimetres off the ground.
- Withdraw the truck from the racking or adjoining loads slowly and in a straight line.
- Lower the forks so that the load is a few centimetres from the ground.

Picking up a load on the ground (L14-L16 with initial lift)

- Use the initial lift to raise a load of up to 2 tonnes a few centimetres above the ground.

Transporting a load

- It is preferable to transport a load in the forward direction for reasons of visibility.
- When transporting a load on a steep slope always ascend or descend with the load on the uphill side, do not cut across and do not perform U-turns.
- Reverse motion is used only for putting down the load, at very low speed because of reduced visibility.
- Do not drive with an unstable load.
- Ask someone to guide you if you cannot see very well.
- Take care when passing through areas with low headroom: low frame, scaffolding, pipes etc.

CAUTION
Transport of persons is strictly prohibited.

DANGER
Never drive with the load raised. Always lower the fork arm before starting.

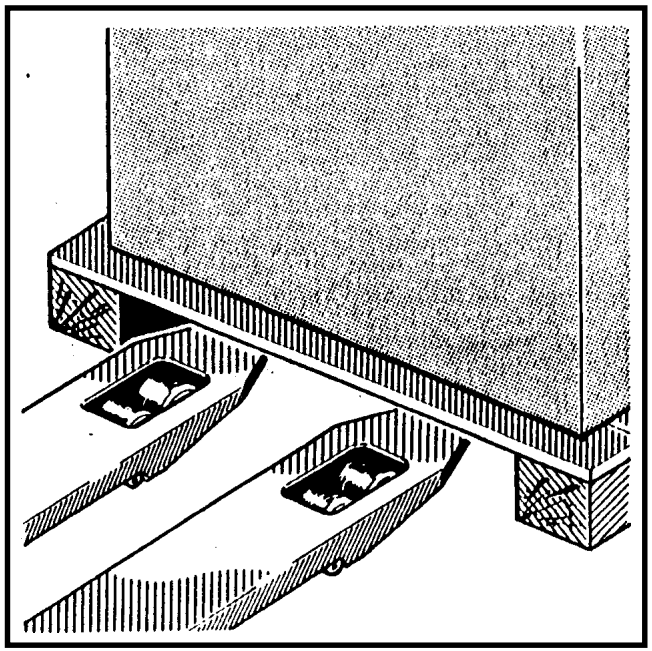
DANGER
Always slow down when approaching a turn and on wet floors.

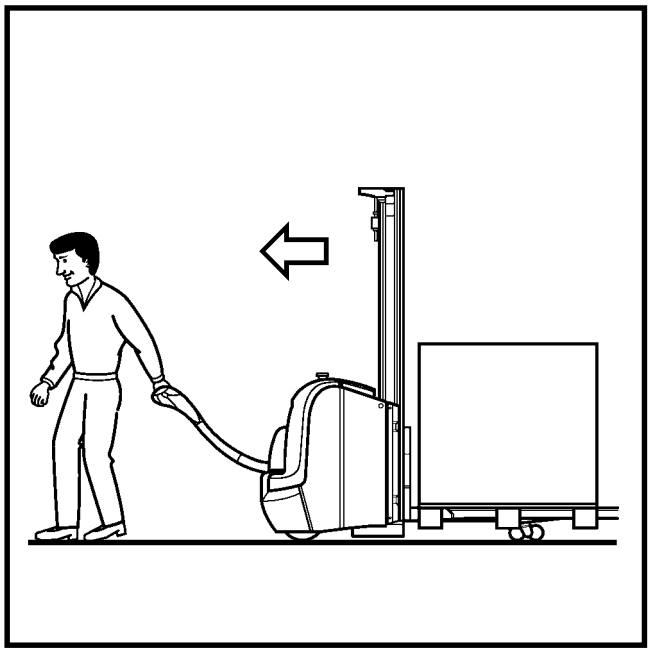
Putting down the load on the ground

- Move the truck carefully to the required place.
- Manoeuvre the load carefully into the area where it is to be put down.
- Lower the load until the pallet legs are free.
- Withdraw the truck in a straight line.
- Raise the forks by a few centimetres.

CAUTION
Take care not to touch any nearby loads, or loads behind the load being placed.

DANGER
There must be no one under or in the vacinity of a raised load.





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Stacking a load

- Move the truck carefully to the required place.
- Raise the forks clearly above the level where the load will be positioned.
- Move forwards carefully as close as possible to the shelf.
- Lower the load until the forks are free.
- Withdraw the truck in a straight line.
- Lower the forks to just above the ground.

DANGER
There must be no one under or in the vacinity of a raised load.

Picking up a load at a height

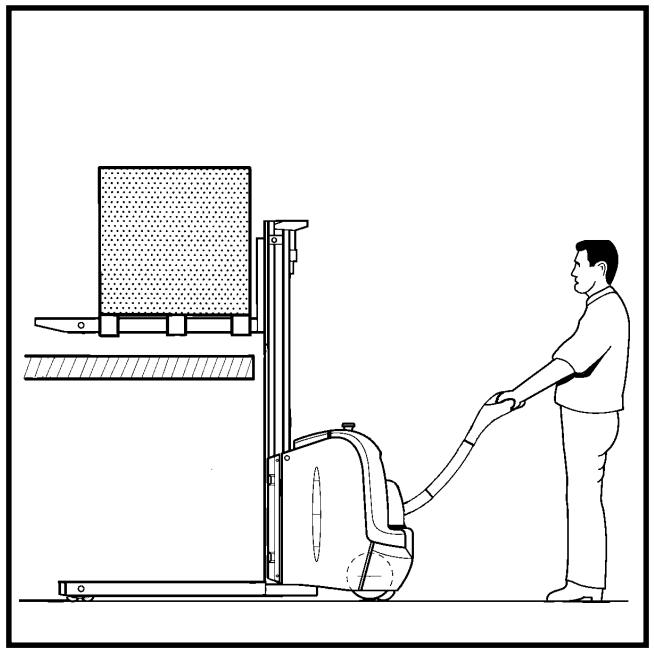
- Move the truck carefully to the required place.
- Raise the forks with the main lift to the required pallet height; the initial lift remains in low position.
- Move the forks forwards under the pallet carefully.
- Raise the forks until the pallet is raised from the shelf.
- Withdraw the pallet slowly.
- Lower the load to just above the ground.

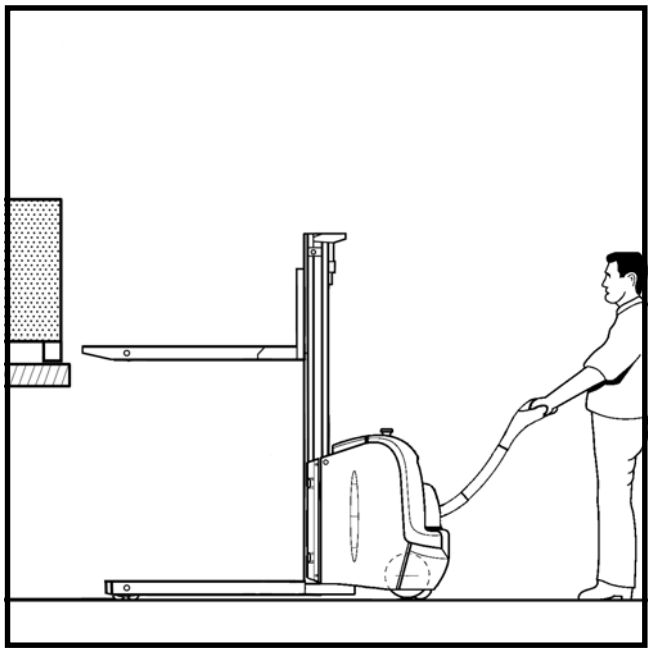
CAUTION
When pickiing up a load at height, do not use the initial lift control in order to preserve maximum stability and to avoid any risk of overloading the truck.

Before leaving the truck

CAUTION
Always park the truck on a level floor and away from pedestrian walkways.

- Lower the pallet legs fully.
- Turn off the key switch and remove the key.
- In the case of a prolonged stop, disconnect the battery.





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Picking up a load on the ground (L14AP-L16AP without initial lift)

- Approach the load carefully.
- Lower the pallet legs until they can easily enter the pallet.
- Insert the forks under the load.
- If the load is shorter than the forks, position the truck so that the far end of the load is a few centimetres beyond the end of the fork arms, to avoid snagging the load behind the one to be picked up.
- Lift the load a few centimetres off the ground.
- Withdraw the truck from the racking or adjoining loads slowly and in a straight line.
- Lower the forks so that the load is a few centimetres from the ground.

Picking up a load on the ground (L14AP-L16AP with initial lift)

- Use the initial lift to raise a load of up to 2 tonnes a few centimetres above the ground.

Transporting a load

- Proceed as normal with fork in forward motion.
- If the load is bulky and prevents visibility, proceed in reverse direction and at reduced speed.
- When transporting a load on a steep slope always ascend or descend with the load on the uphill side, do not cut across and do not perform U-turns.
- Do not drive with an unstable load.
- Ask someone to guide you if you cannot see very well.
- Take care when passing through areas with low headroom: low frame, scaffolding, pipes…

CAUTION
Transport of persons is strictly prohibited.

DANGER
Never drive with the load raised. Always lower the fork arm before starting.

DANGER
Always slow down when approaching a turn and on wet floors.

DANGER
Do not lean or allow any part of your body to hang outside the driving platform.

Putting down the load on the ground

- Move the truck carefully to the required place.
- Manoeuvre the load carefully into the area where it is to be put down.
- Lower the load until the pallet legs are free.
- Withdraw the truck in a straight line.
- Raise the forks by a few centimetres.

CAUTION
Take care not to touch any nearby loads, or loads behind the load being placed.

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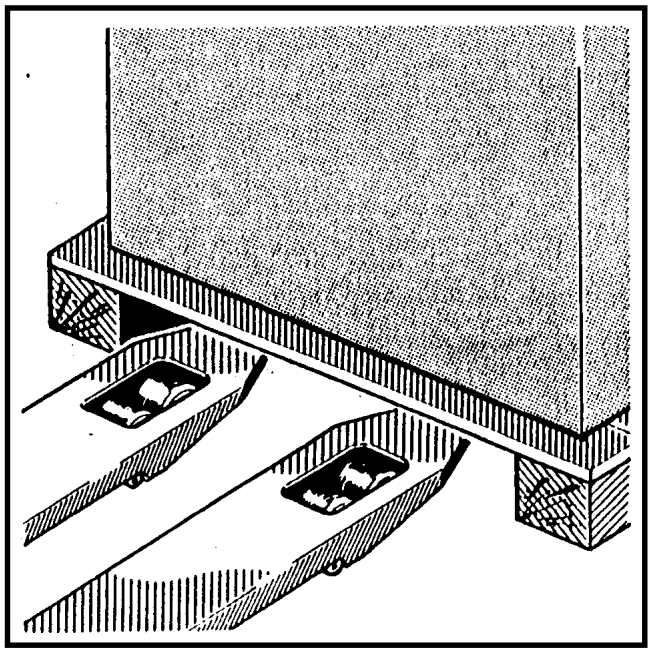
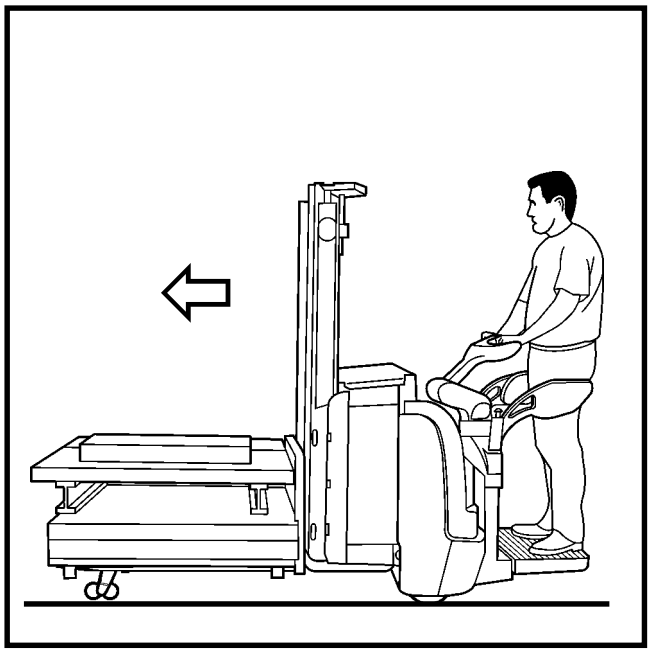
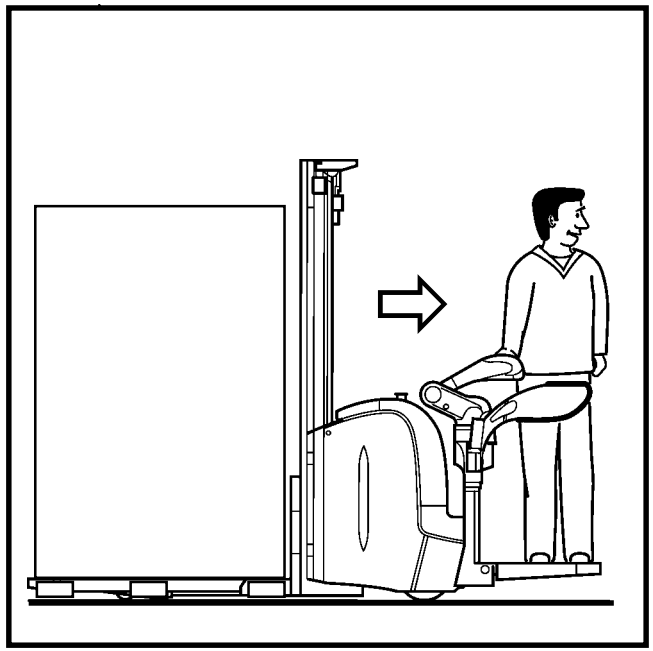
There must be no one under or in the vacinity of a raised load.







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Stacking a load

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- Lower the load until the forks are free.
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DANGER
There must be no one under or in the vacinity of a raised load.

Picking up a load at a height

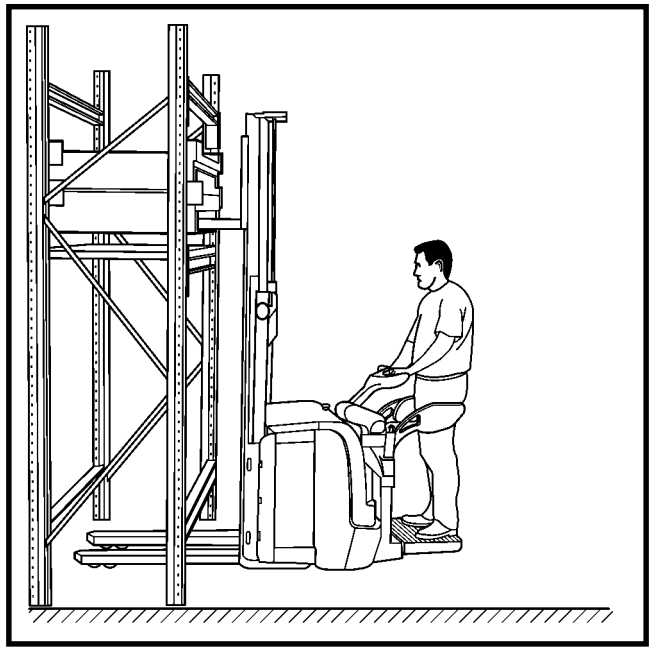
- Move the truck carefully to the required place.
- Raise the forks with the main lift to the required pallet height; the initial lift remains in low position.
- Move the forks forwards under the pallet carefully.
- Raise the forks until the pallet is raised from the shelf.
- Withdraw the pallet slowly.
- Lower the load to just above the ground.

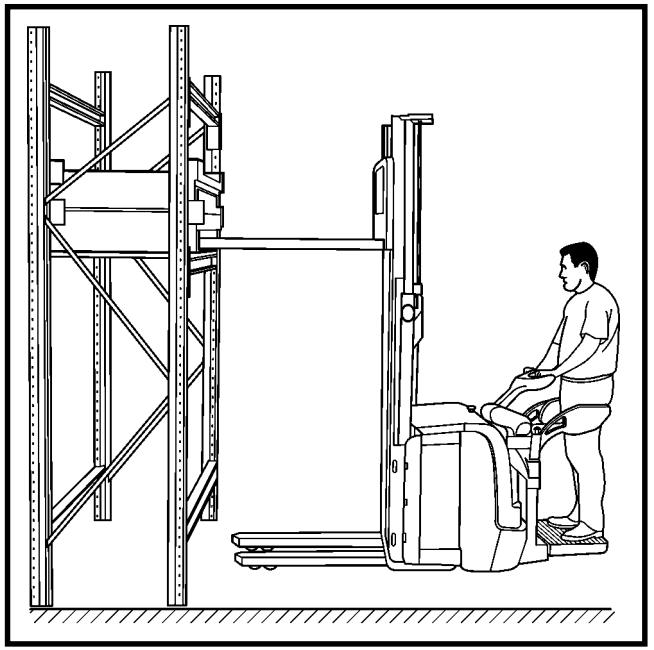
CAUTION
When pickiing up a load at height, do not use the initial lift control in order to preserve maximum stability and to avoid any risk of overloading the truck.

Before leaving the truck

CAUTION
Always park the truck on a level floor and away from pedestrian walkways.

- Lower the pallet legs fully.
- Turn off the key switch and remove the key.
- In the case of a prolonged stop, disconnect the battery.





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Slinging the truck

CAUTION
Only use slings (1) and crane with a sufficient capacity. Protect all the parts that come into contact with the lifting equipment. Fasten the lifting equipment as illustrated below.

Weight of truck (with battery): see technical data.

DANGER
When lifting the truck, nobody should be under or close to the truck
Never raise the truck with the lifting jack

Jacking the truck

For some maintenance work the truck has to be raised.

- Use a jack with sufficient capacity.
- To lift the front of the truck, place the jack under the chassis marked with locations (3); wedge with wooden beam for safety reasons.
- For working on the mast, the jack must be placed under the battery tray (4).
- For maintenance of load wheels, the jack must be placed under the pallet legs at the places indicated (5).

WARNING
Always wedge and block the truck securely after it has been lifted.

Towing

- If there is an electrical fault the truck cannot be towed, because the steering is not active and the electromagnetic brake is locked.
- The truck can be moved only with the drive wheel raised and with care.

Removing the mast

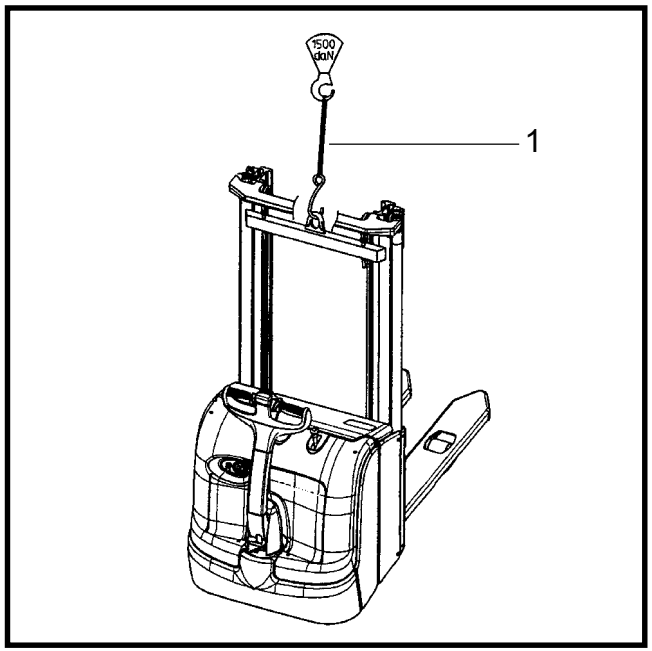
DANGER
Hooks the slings into the ring (2).

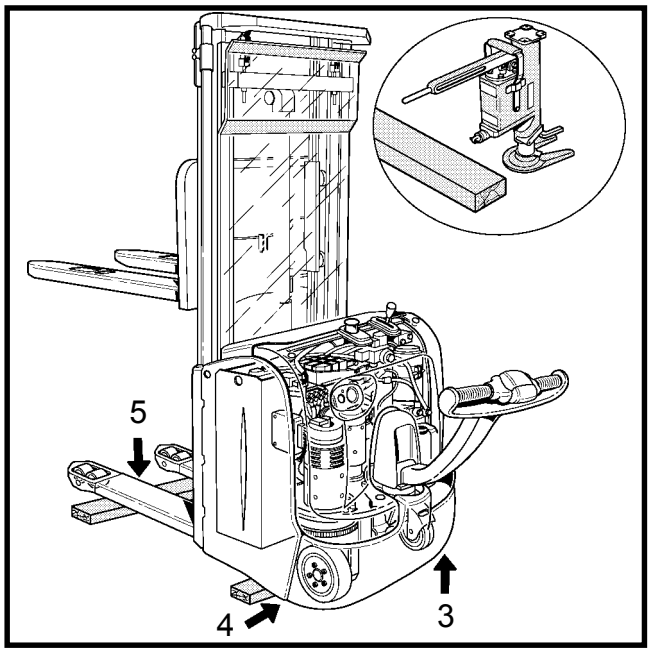
This work is done exclusively with the help of the system personnel.

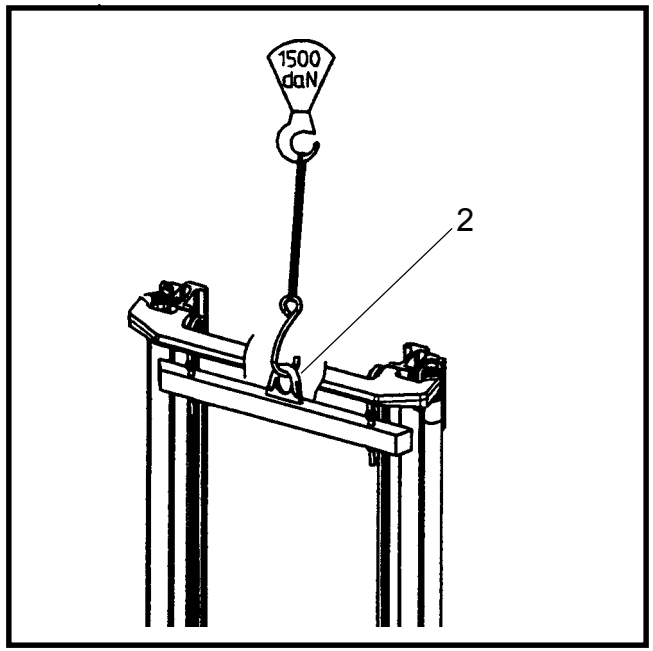
Transporting and storing the truck

If the truck is transported, check that it is correctly chocked and protected from inclement weather.
If the truck is not to be used for a long time:

- Remove the battery and charge it at least once a month.
- Remove any loads, and lower the mast fully.
- Raise the truck on blocks to prevent deformation of the tyres.







General remarks

Your truck will remain serviceable only if the maintenance and inspection tasks described in this manual are carried out regularly.
Maintenance must be carried out only by qualified and approved personnel.
Maintenance can be handled by the Linde network under a service agreement. If you wish to carry out this work yourself, we recommend that you have the first three services carried out by your local representative in the presence of your maintenance personnel, in order to train them.

CAUTION
For all maintenance work, park the truck on a level floor, in an area set aside for this purpose, chock the wheels, remove the key from the key switch and disconnect the battery.

After any maintenance work, test the truck to ensure that it is operating correctly.

Modifying your truck, fitting accessories or structural modifications are prohibited without the prior agreement of the manufacturer.

REMARK
In the case of difficult working conditions:
extreme ambient temperatures, cold or hot and dusty environments, maintenance periods are reduced.
Carefully clean the external parts concerned before carrying out lubrication, replacing the filter or working on the hydraulic system.
Use appropriate containers for lubricants.

CAUTION
Conform to the regulations governing the use of maintenance products.

CAUTION
Use only lubricants that conform to the specifications.
See table of recommended lubricants.

Work on the lifting mast

CAUTION
When doing any work on the forward part of the truck with the mast raised, do not start until a safety device has been fitted to prevent the mast from accidentally lowering.

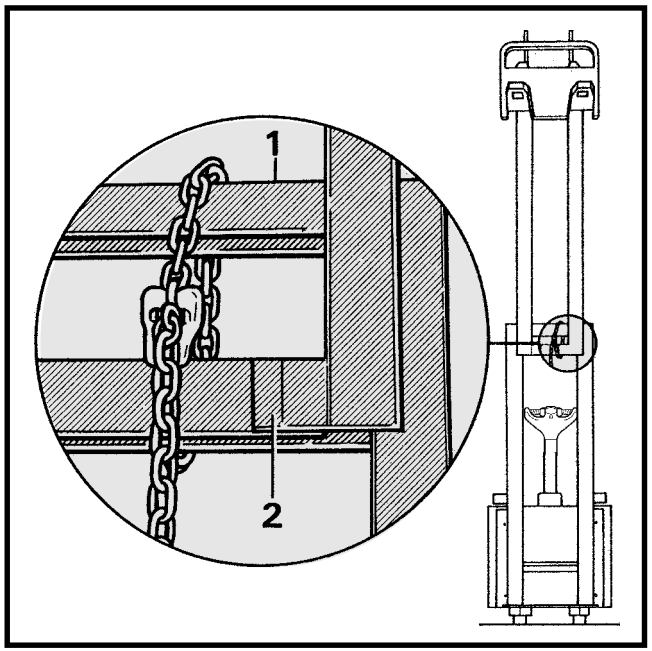
Standard lifting mast

OPERATION
When the internal upright is raised, the chain guide pulley is also raised such that the fork carriage rises twice as fast 1.

Safety device for the standard lifting mast

CAUTION
Choose a chain with SWL higher than the weight of the mast.

- Raise the mast.
- Close the chain after passing it above the fixed cross member (1) and below the inside cross member (2).
- Lower the inside member until the safety chain is pulled tight.



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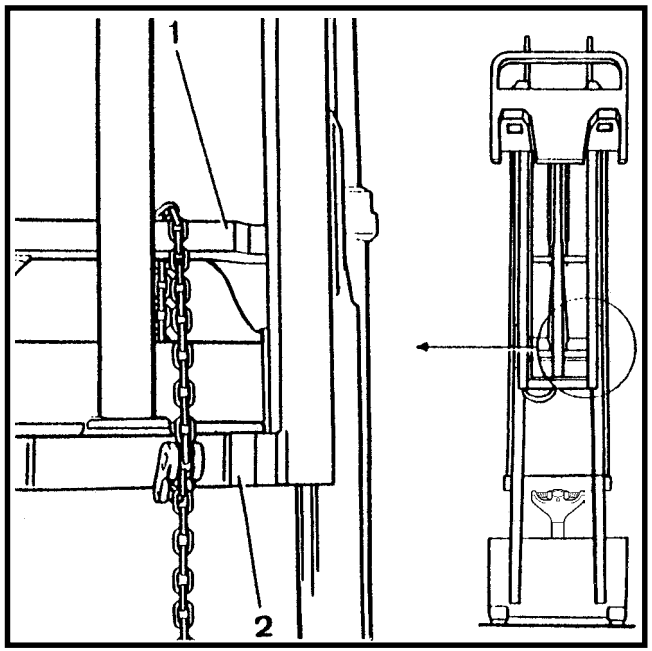
Duplex lifting mast

REMARK
The advantage of this mast is the possibility to use it in places with low ceilings such as, wagons, boats etc. allowing maximum use of its free lift capacity.

OPERATION
The fork carriage is raised up to the free lift by means of a guide pulley on the chain of the central jack. It moves at twice the speed of the jack.
Then the inside member, along with the fork carriage are raised by the two side jacks.The central jack is raised with inside member.

Safety device for the Duplex lifting mast

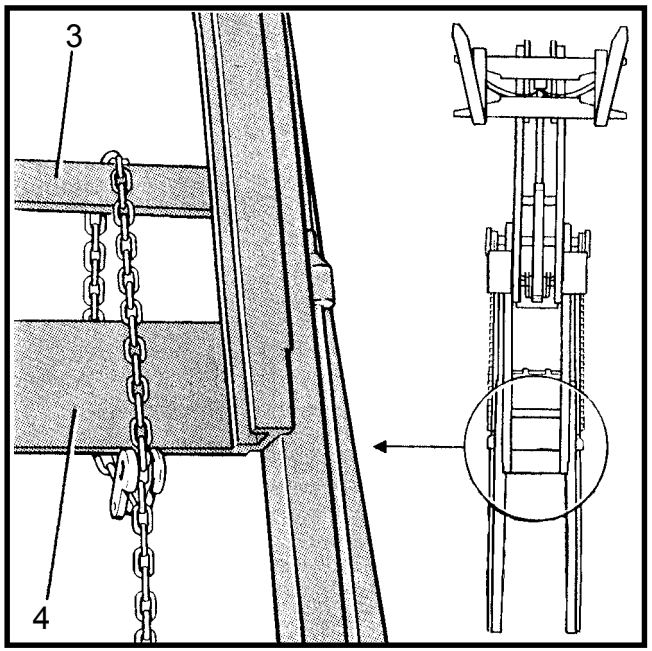
CAUTION
Choose a chain with a SWL higher than the weight of the mast.



- Raise the mast.
- Close the chain after passing it above the fixed cross member (1) and the inside cross member (2).
- Lower the mast until the safety chain is pulled tight.
- Lower the fork carriage onto it's stop.

Triplex lifting mast

OPERATION
The fork carriage is raised up to the free lift by means of a guide pulley from the chain of the central jack.
Then the two external jacks raise the intermediate mast. Due to the chain return, the inside mast is raised at the same time.
The central jack is laid in the mobile inside mast.



Safety device for the Triplex lifting mast

DANGER
Chose a chain a SWL suitable for each type of mast. Conform to the authorised maximum elevation.

- Raise the mast.
- Close the chain after passing it above the fixed cross member (3) and below the inside central mast (4).
- Lower the mast until the safety chain is pulled tight.
- Lower the fork carriage up to the low stop.

Checks and maintenance work after the first 50 hours of service*

- Check the braking system
- Check the tightness of wheels
- Check the state of the wheels
- Check hydraulic oil level
- Check tightness of hydraulic circuits
- Clean the hydraulic filter
- Replace the LSL distributor filter
- Check level and gravity of battery electrolyte
- Check the condition and fixing of cables and electrical connections
- Check the condition and adjustment of chains
- Check mechanical fixings of frame and lifting system.
- Grease the turntable bearing of the motor unit
- Overall lubrication
- Check battery charger

* REMARK
Consult the following pages to find the description of the work.

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Operation / Period	Before first use	Daily checks	After first 50 hours	As required	Every 500 h or every 6 months
Checks before initial operation (see page 14)	●				
Daily checks before use (see page 14)		●			
Check the braking system			●		
Check the tightness of wheels			●		
Check the state of the wheels			●		
Check hydraulic oil level			●		
Check that hydraulic circuits are leak proof			●		
Clean the hydraulic filter			●		
Replace the LSL distributor filter			●		
Check level and gravity of battery electrolyte			●		
Check the condition and fixing of cables and electrical connections			●		
Check the mechanical fixings and the frame			●		
Check the condition of the mast and chains			●		
Overall lubrication			●		
Grease the turntable bearing of the motor unit			●		
Check battery charger			●		
Truck operation tests			●		
Cleaning the truck				●	
Stabilising wheel height adjustment				●	
Fuse check				●	
Battery and battery compartment cleaning				●	
Cleaning and lubricating chains					●
Check the condition and fixings of mast protections					●
Check the condition and fixing of wheels					●
Blowing shafts of micro switches of guard rails (L14AP – L16AP)					●
Check lubrication condition and spring of the battery cover handle (lateral)					●
Check lateral stop fixings of the battery compartment					●
Checking level of electrolyte and water supplement					●
Checking the electrolyte gravity					●
Check the condition of cables, terminals and battery contact					●

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Operation / Period	Every 500 h or every 6 months	Every 1000 h or every year	Every 2000 h or every 2 years	
Grease the turntable bearing of the motor unit				
Cleaning the steering ring gear pinion	●			
Check hydraulic oil level.				
Check that hydraulic circuits are leak proof	●			
Check the condition and fixing of cables and electrical connections	●			
Check the condition and fixing of the mast and chains	●			
Check the length of chains	●			
Lubricating the mast	●			
Cleaning variator panel	●			
Check contact wear	●			
Check and replace if necessary traction motor brush	●			
Check and replace if necessary steering motor brush	●			
Adjustment of electromagnetic brake	●			
Check and adjustment of guide shoes of the initial lift	●			
Check articulations	●			
Check hydraulic oil level of gear reducer	●			
Truck operation tests	●			
Check and replace if necessary pump motor brush		●		
Replace the filter of the distributor block LLC		●		
Cleaning and replacement of hydraulic filter and breather vent		●		
Check the mechanical parts		●		
Truck operation tests		●		
Replace the hydraulic oil			●	
Replace the oil of gear reducer			●	
Truck operation tests			●	

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Cleaning the truck

Disconnect the battery before cleaning. Use steam jet or highly degreasing cleaning products only with great care, since they dilute the grease of bearings with lifetime lubrication. Given that subsequent greasing is not an option, these cleaning methods cause deterioration of the bearings.

CAUTION
When using cleaning equipment, do not expose the electrical circuits, motors and insulating panels to direct jets; protect them before cleaning.
When using compressed air, first remove stubborn dirt with a cold detergent.
Before lubricating, clean the oil filler openings and their surroundings, as well as grease nipples, with particular care.
Dry the truck after cleaning.

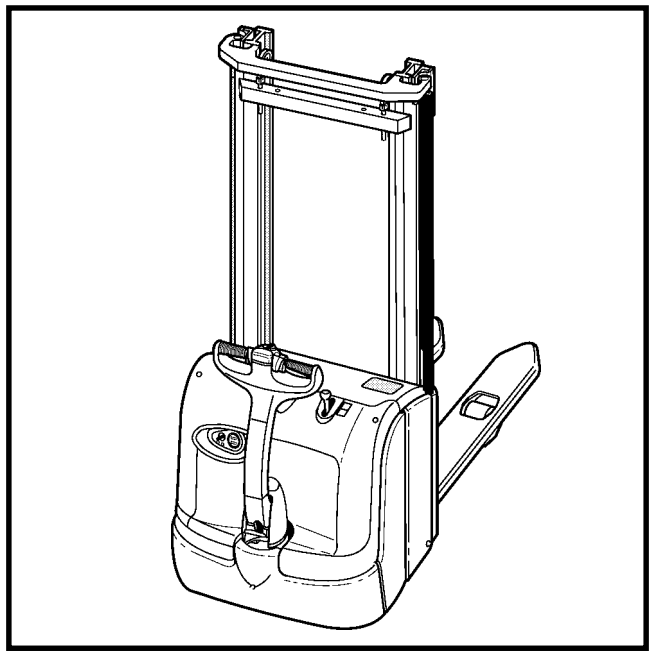
If despite all precautions, water has penetrated into the motors, the truck must be put into operation to avoid the formation of rust (drying with its own heat). The motors may also be dried with compressed air.

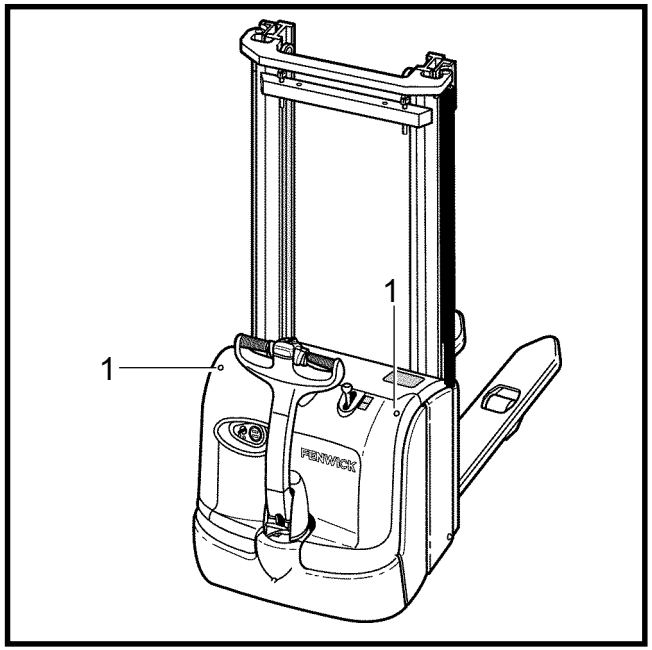
REMARK
If a truck is cleaned frequently, it must also be greased more often.

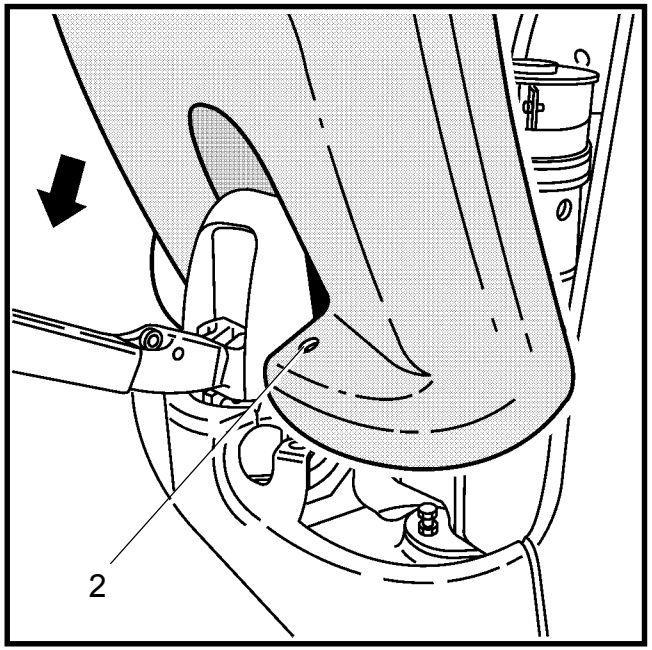
Opening the front cover (L14 - L16 without platform)

- Unscrew the 2 cover maintenance screws (1).
- Tilt the cover backwards
- Remove the cover and place it on the ground.
- To close, place the lower lock plugs (2) in the holes on the chassis or on the power cord box.
- Screw back the 2 cover screws (1).

CAUTION
Before any work on the truck:
- Press on the emergency isolator
- Disconnect the battery.







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Releasing the flexible access cover for the tiller arm articulation (L14 - L16 without platform)

- Removing the front cover
- Take out the flexible tiller arm articulation cover by pulling it up.
- Access the steering column equipment (tiller arm spindle, microswitch of tiller arm base, drive cam…) by turning the tiller arm to the left or right.

Opening the front cover (L14 - L16 with platform)

On the platform version, the tiller arm must be turned backwards to remove the front cover.

- Pull out the central screw (1)
- Turn the tiller arm backwards.
- To draw out and close the front cover, proceed in the same manner as with an L14-L16 without platform.

CAUTION
Before any work on the truck:
- Press on the emergency isolator
- Disconnect the battery.

CAUTION
Before using the truck, ensure that the central screw (1) is tightened properly and that the tiller arm is well locked in steering position.

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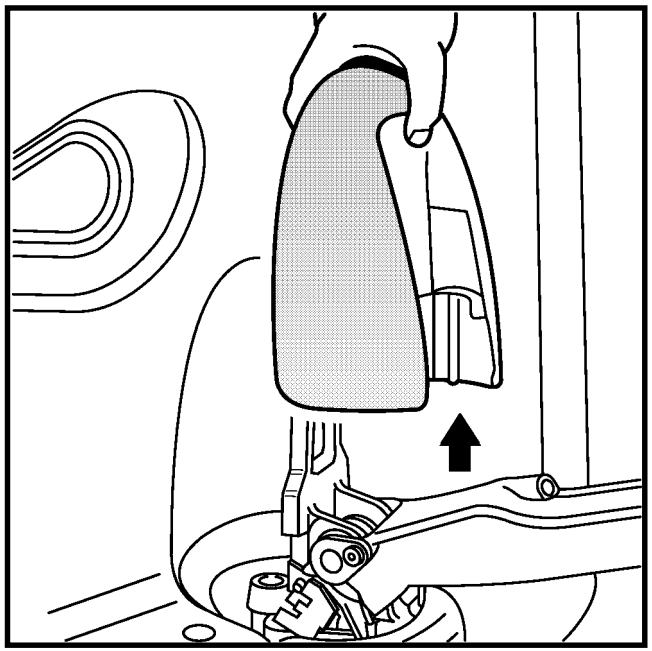
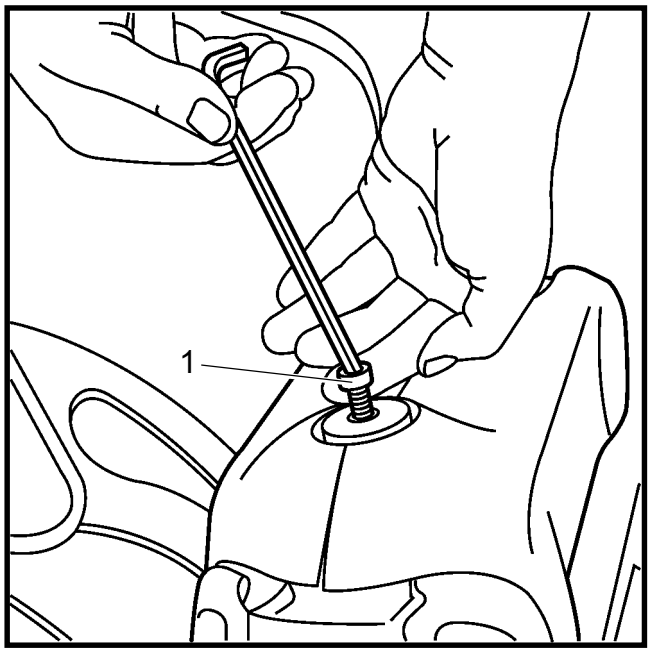
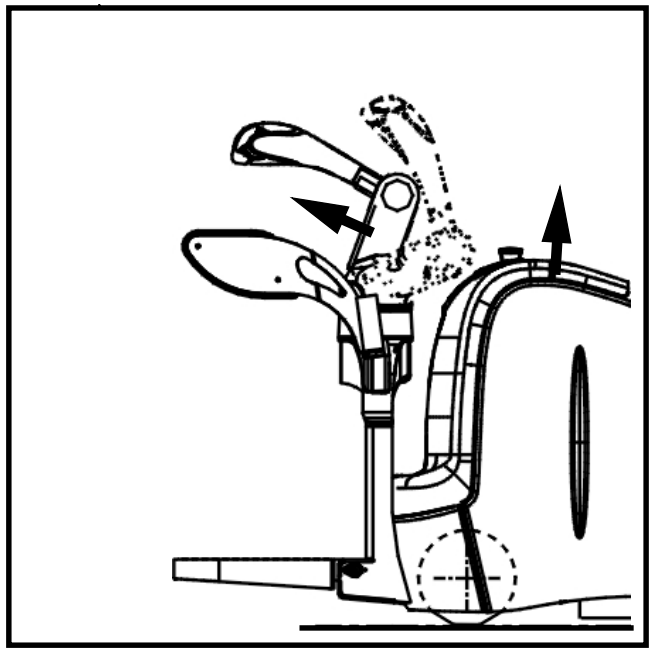






Adjust the height of the stabiliser wheel

To compensate for wear of the motor wheel, the height of the stabiliser wheel is adjustable.
To adjust this height:
- Remove the front cover
- Loosen the stabiliser block screw (1)
- Loosen the nut (2) and adjust the screw (3) to compensate for tyre wear.
- Tighten to lower the stabiliser, or loosen screw to raise the stabiliser.

After the adjustment, tighten the block the screw (1) and the nut (2).

Fuses

- Remove the motor cover to gain access to the fuses.
- The 7.5 A fuse (15 A fuse in cold store version) protects the control circuits.
- The 150 A fuse protects the circuit of the traction motor of the L14-L16 without platform.
- A 225 A fuse protects the circuit of the traction motor of the L14-L16 with platform.
- The 175 A fuse protects the circuit of the lift pump motor.
- The 100 A fuse protects the circuit of the initial lift pump motor.
- The 30 A fuse protects the circuit of the steering motor.

Clean the battery and battery compartment

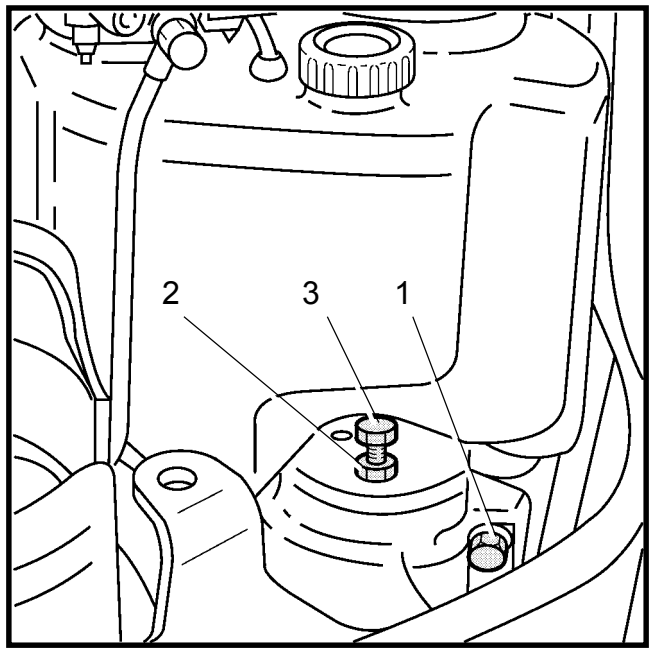
CAUTION
For this delicate operation, acid-resistant clothes, glasses and gloves must be worn.

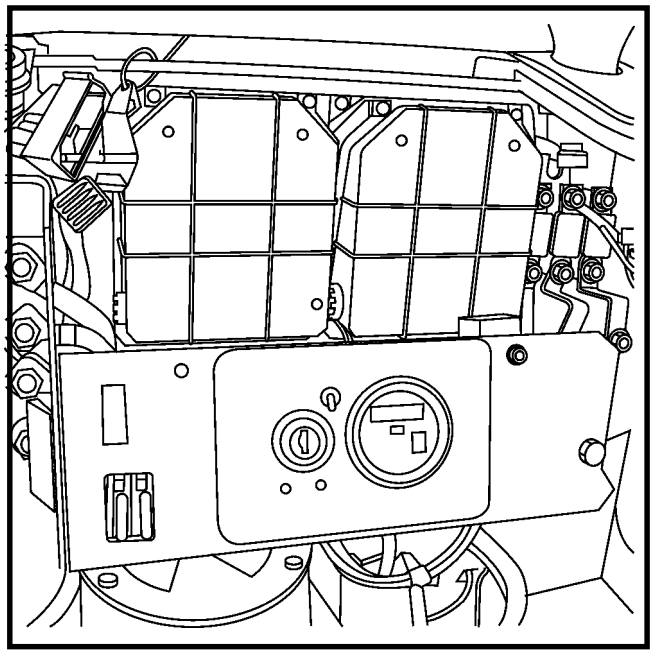
Follow the precautions mentioned in the preceding sections. Do not dispose of cleaning water polluted by acid in the drains.
For further information, see battery instructions.

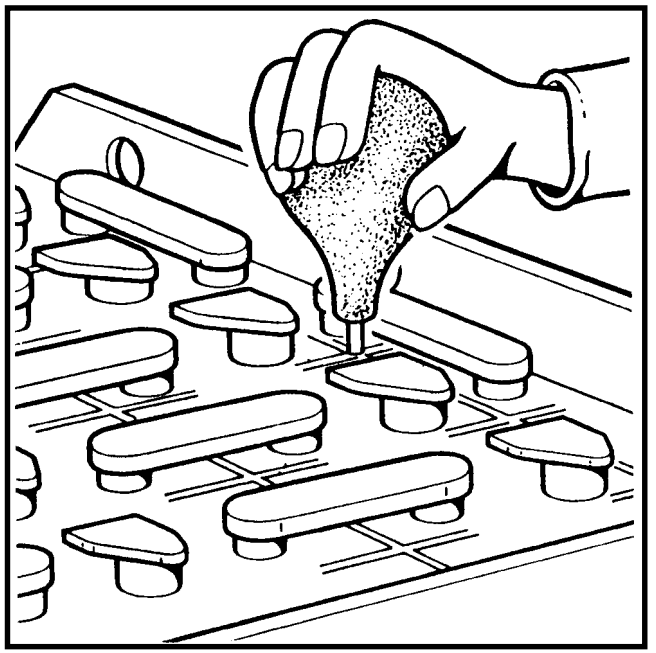
Battery in sealed case

- Verify there is no electrolyte at the bottom of the case, by connecting the suction syringe provided with the battery to the plastic plunger tube.
- Pump out any electrolyte that has spilled between cells.
- Clean the top of the elements with a wet rag.

CAUTION
If there is heavy sulphating, or major electrolyte overflow, call your local representative as soon as possible.







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Check the condition and fixing of the mast and chains

DANGER: The examination and adjustment of lift chains should only be carried out by certified personnel who have received the relevant training. DO NOT adjust or make an assessment of chain condition unless you have been certified to do so. Please contact your local Linde representative.

Adjustment of mast chains

NOTE: When the truck is being used, chains are subject to elongation and consequently have to be regularly adjusted.

DANGER: The examination and adjustment of lift chains should only be carried out by certified personnel who have received the relevant training. DO NOT adjust or make an assessment of chain condition unless you have been certified to do so. Please contact your local Linde representative.

Clean and lubricate chains

REMARK
If the lift chain is too choked, clean it.
- Place a container below the lifting device.
- Clean with a product derived from paraffin (petrol, gas-oil, etc.). Follow the safety instructions of the manufacturer.
- If you use a steam jet; do not put additives.
- Dry the chain and articulations immediately with the compressed air. During this operation, manipulate the chain several times.
- Grease the chain immediately with a special chain aerosol lubricant.

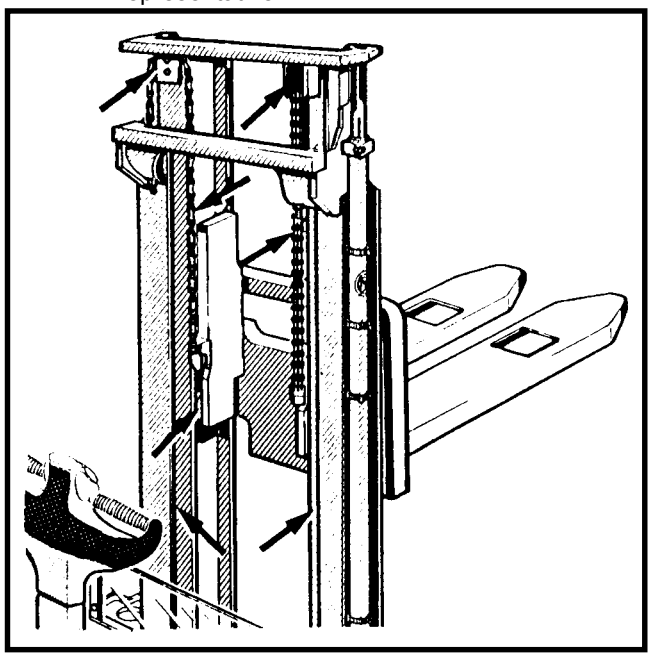
CAUTION
Chains are safety items, using cold detergents, chemical products, acid or chlorine products can destroy them.

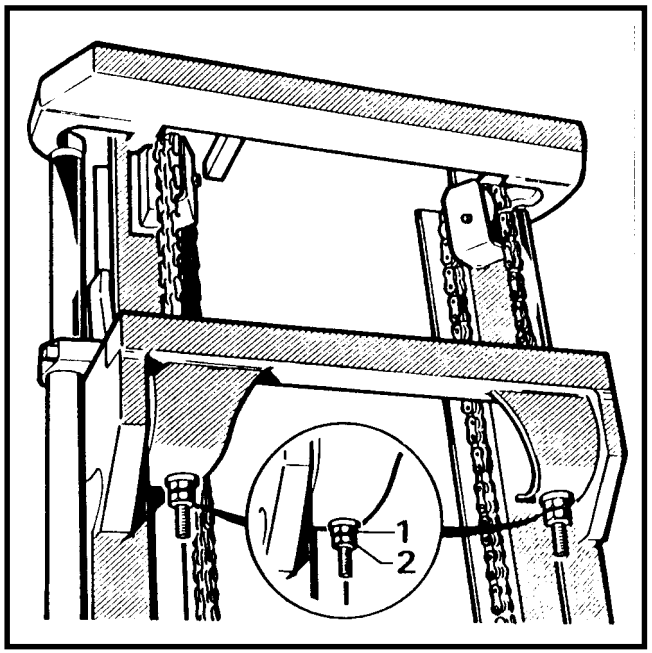
REMARK
It is forbidden to use cleaning equipment with pressurised liquid.

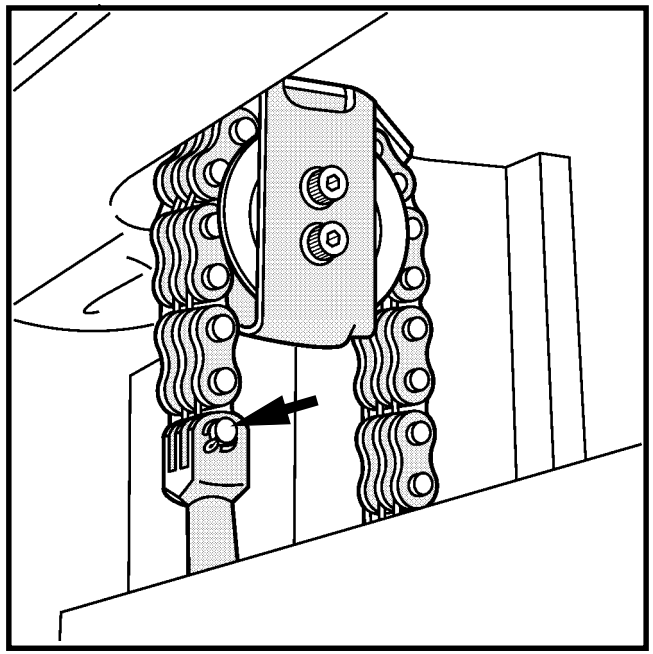
Lubricate the mast

- Coat the guide surfaces, the guide pulleys and the chains with the special aerosol lubricant.

REMARK
For trucks used in the foodstuffs industry, use a dry lubricant instead of the aerosol.







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Check the condition and fixings of mast protections

It is important to check the condition of the mast protection screens as well as the tightening of their fixings.

CAUTION
Never approach parts and moving components without lowering the mast and disconnecting the battery.

Check and adjustment of guide shoes of the initial lift

To preserve operation of the lifting system (initial lift versions), it is important that the lateral shoes (3) make good contact with the guides (4).

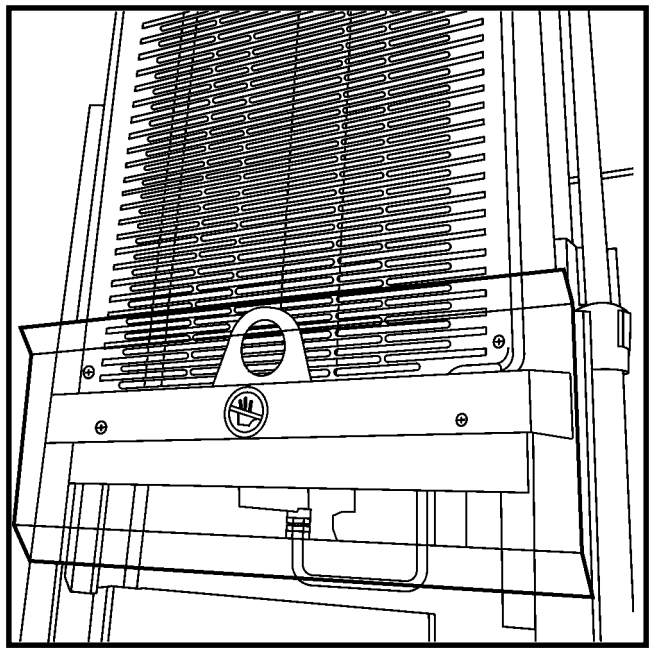
To make an adjustment if necessary, you must:
- Raise the battery cover
- Loosen the lock-nut (2).
- Adjust screw (1) to force the shoe (3) onto the guide (4)
- After adjustment, lubricate the guides (4) over their full length with chain spray.

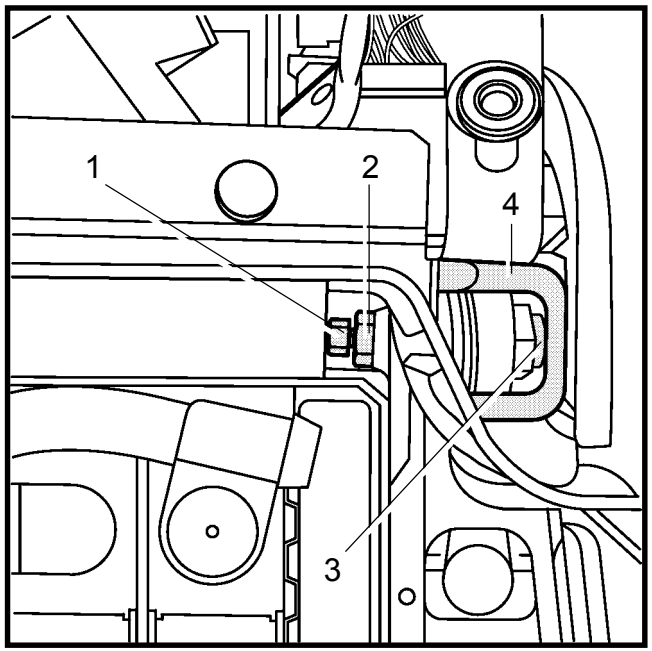
Thickness of shoes min. 1 mm

Check articulations

- Check and grease the variuos articulation points.
- Use aerosol oil or lubricant

NOTE:
For trucks with greased operating mechanism option, the articulation pins are provided with lubrication nipples for a more effective lubrication.
Use the lubricant indicated in the lubricants table.





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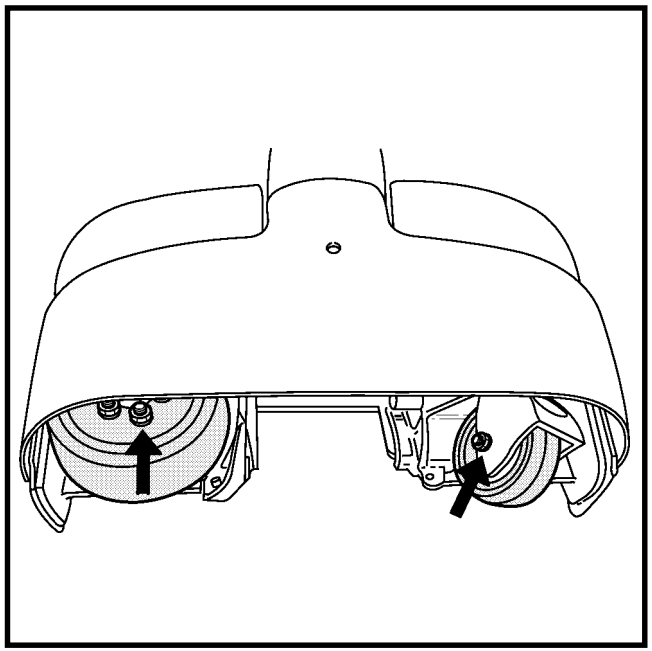
Check the security of the wheels

- Raise the truck until the wheels are clear of the ground.
- Check the tightness of the main wheel nuts
  - Motor wheel: 80 Nm
  - Stabiliser wheel: 110 Nm
  - Castor wheels: 75 Nm

Check the condition of wheels

- Raise the truck until the wheels are clear of the ground.
- Check that the wheels rotate freely and remove all potential obstacles from them.
- Change worn or damaged wheels.

CAUTION
Any wires tangled in the wheel hubs and bearings must be removed; otherwise, there is a risk of rapid deterioration of the wheels.

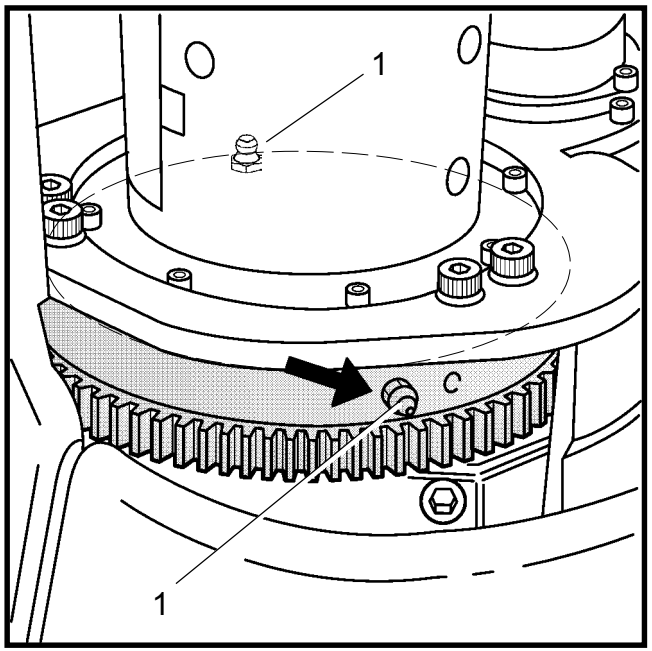


Grease the motor turntable bearing

REMARK
For greasing, use only grease that conforms with that listed in the lubricant tables.

- Open the motor cover for access to the grease nipples
- Clean the grease nipples (1)
- Inject grease into each nipple until clean grease comes out of the bearing race.
- Lubricate in many positions of the slew ring

DANGER
Disconnect the truck power supply before any action on the motor unit



Clean the steering ring pinion gear

- Remove the motor cover
- Check that the pinion and the toothed ring are not clogged with impurities.
- If necessary, clean them with solvent, then dry them with compressed air.
- Then lubricate the pinion and wheel with silicon from an aerosol.

CAUTION
Do not lubricate with any other product, as this will create a risk of dust accumulation.

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Clean the side guard position microswitches (L14 AP – L16AP)

To avoid any clogging of the side guard position microswitches (1), it is desirable to blow the seats with compressed air.

CAUTION
Always wear protective glasses when working with compressed air.

Check condition of spring and lubrication of battery cover lock handle (roll-on, roll-off)

For trucks equipped with roll-on, roll-off batteries,, the battery cover lock must always be well greased. The retraction spring (2) and the locking pin (3) must also be in good condition. The battery security depends on it.

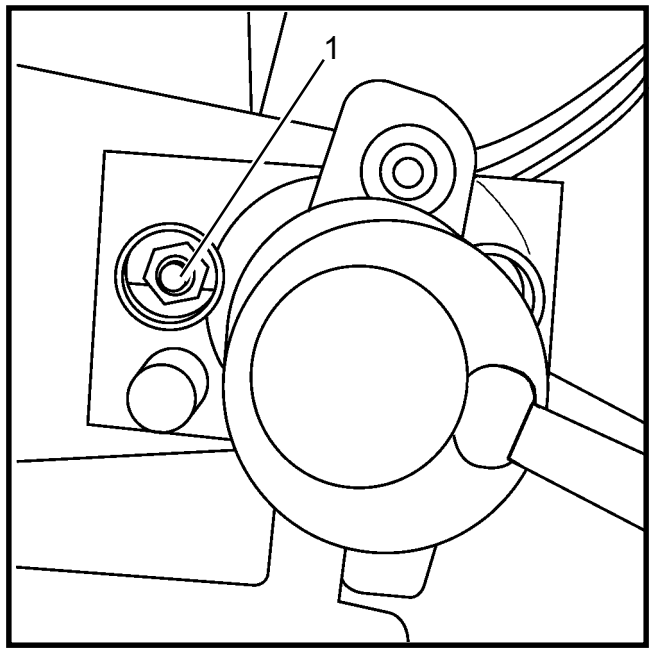
- For this lubrication point, use the lithium soap based grease.

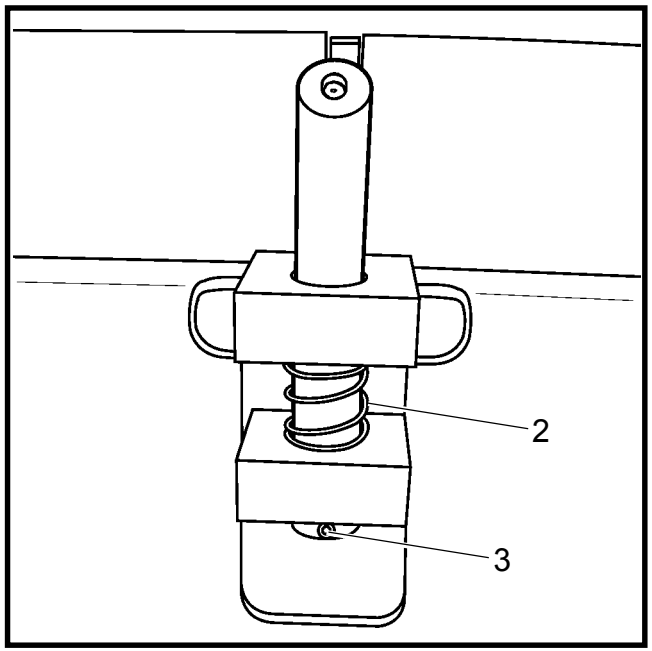
Check the lateral stop fixings of the battery compartment.

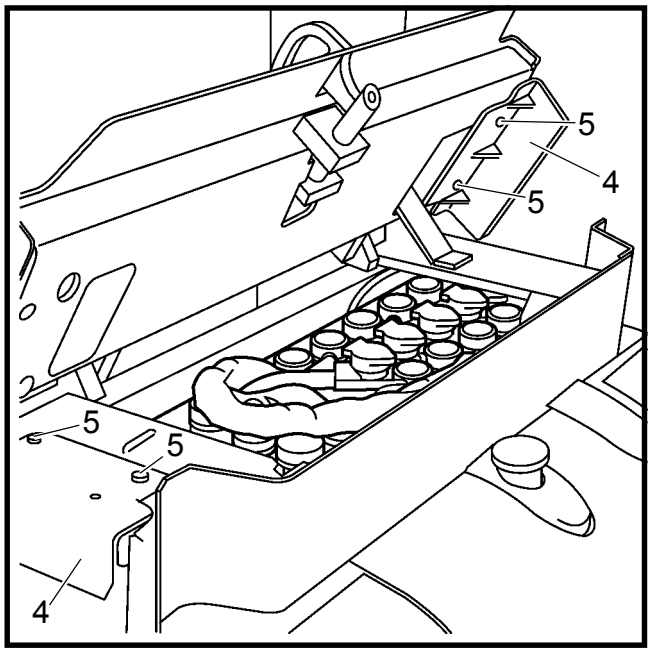
The battery security depends on the proper fixing of the battery compartment lateral stops (4); one on the chassis and the other on the battery cover.

REMINDER
These stops can be reversed depending on the desired changing side of the battery.

- Use an Allen key to check the fixing screws (5) are tight.
- Every reassembly must be carried out with the screws (5) inserted with Loctite.
- In case of oxidation of these screws (5), replace them immediately.







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The operations described below concern liquid electrolyte lead batteries.
For gelled electrolyte batteries, called «no-maintenance» batteries, see manufacturer's instructions.

CAUTION
Avoid any contact with the acid. Do not create a short-circuit. See recommendations in daily checks section.

Check the electrolyte level

- This check and the top-up if necessary must be done weekly, after recharging the battery.
- Switch off the truck, open the cover and disconnect the battery.
- Check the level, it should be at the bottom of the stopper, a little above the splashguard.
- Add distilled water to top up the level of cells.
- Then close the stoppers.

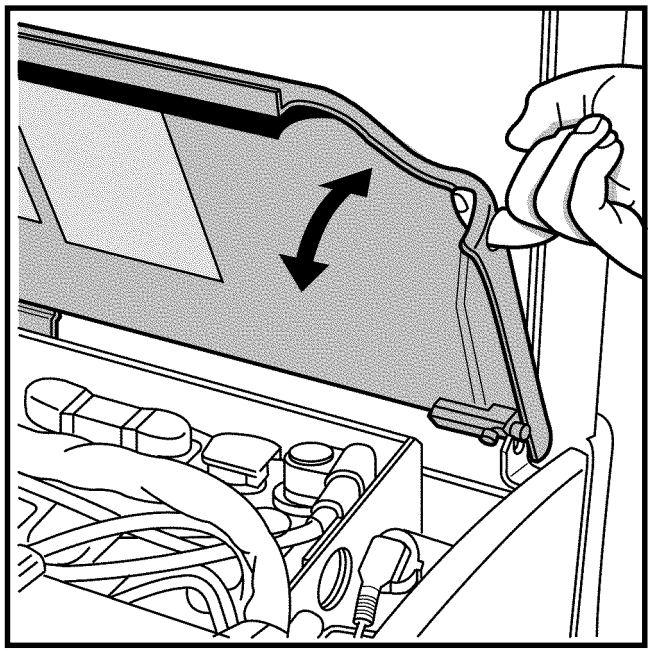
CAUTION
Top up only with distilled water.
Never top up before charging (risk of overflow).
Never overfill the cells.
For further information, see instructions provided with battery.

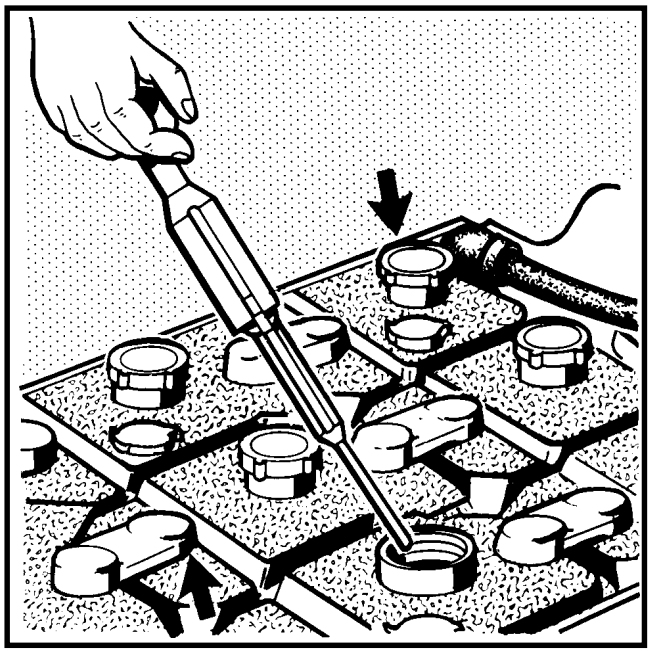
Check the battery specific gravity

- The s.g. measurement precisely reflects the charge state of each cell making up the battery. This measurement can be done before or after charging.
- Minimum gravity, battery 80% discharged; 1.14
- Maximum gravity, battery 100% charged; 1.29 to 1.32 (depending on brand)
- We recommend a reading every 1 or 2 weeks. Note down the values read in your battery monitoring logbook.
- As described above, raise the cover of the stopper of each cell.
- Carefully record the specific gravity of each cell with the hydrometer.
- Close the various stoppers after measurement.

NOTE: If the cell density varies or is too low for some cells, call your local representative. Any discharge below the 1.14 threshold will be very detrimental to the life of the battery.

For further information, see battery instructions.





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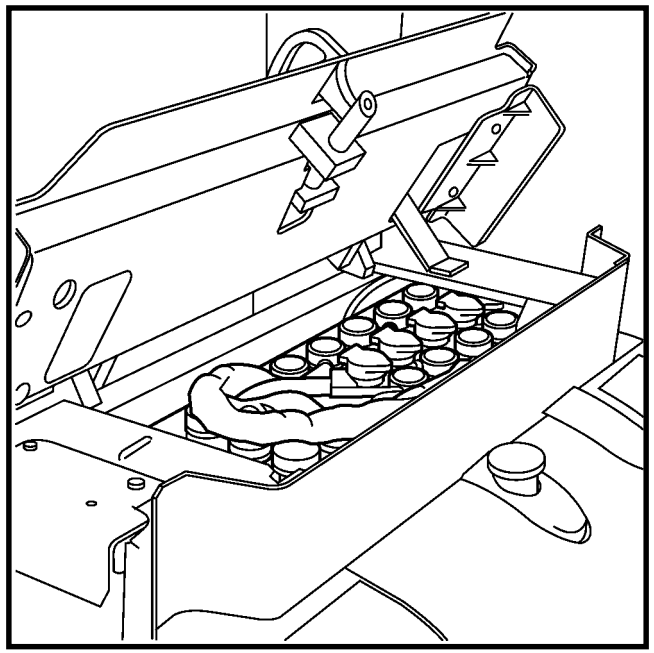
Check the condition of cables, terminals and battery connector

- Check the cable insulation are not damaged and there is no trace of heating at the connections.
- Check that the + and - output terminals are not sulphated (presence of white salt).
- Check the condition of the connector contacts, and the existence of the safety pin.

CAUTION
The points indicated above could cause serious malfunctions; request our local network to remedy them as soon as possible.

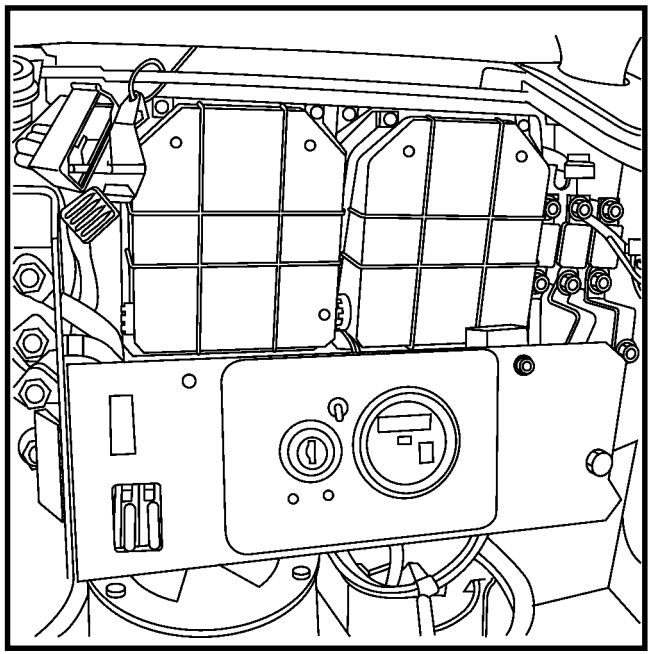


Clean the control unit and check the electrical connections

- Disconnect the battery connector
- Remove the front cover
- Clean the conrol unit with compressed air.
- Check for correct routing of cables.
- If necessary, tighten the motor and contactor circuit terminals.

REMARK
Protect the control unit against humidity. Adjustments and repairs must be carried out by our local representative.

CAUTION
Before working on the control unit, first disconnect the battery.



Clean and check contactor wear

- Disconnect the battery connector
- Clean the contacts with compressed air; check the mechanism.
- Replace contacts showing high wear or high traces of burning.

Always replace the full set of contacts

REMARK
We advise you to have this operation carried out by your local representative.

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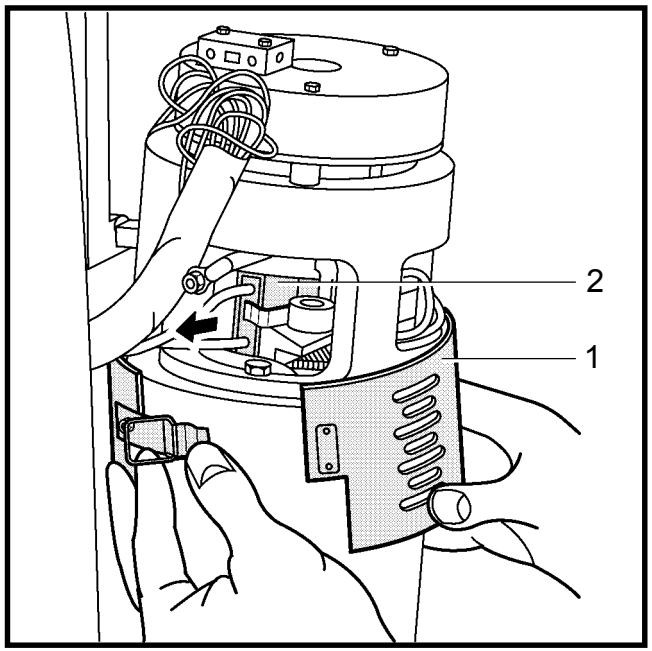
Check, and if necessary replace the traction motor brushes

- Disconnect the battery connector
- Open the motor cover
- Remove the protection cover (1)
- Clean the motor with compressed air
- Check there are no traces of overheating in the brush connections
- Check the tightness of the connections
- Check the brushes slide properly in their holders by slightly pulling the springs.
- Raise the springs, take the brushes out of their holders (2) and measure their length
- Replace them if necessary
- Check that the commutator is not broken and shows no traces of arcing

REMARK
Always replace the full set of brushes
We advise you to have this operation carried out by your local representative.



Dimensions L14 - L16:

Traction motor:	1.2 kW	new:	30 mm
		min.:	15 mm

Dimensions L14 AP - L16 AP:

Traction motor:	1.5 kW	new:	26 mm
		min.:	15 mm

CAUTION
In the event of a problem, please contact your local representative

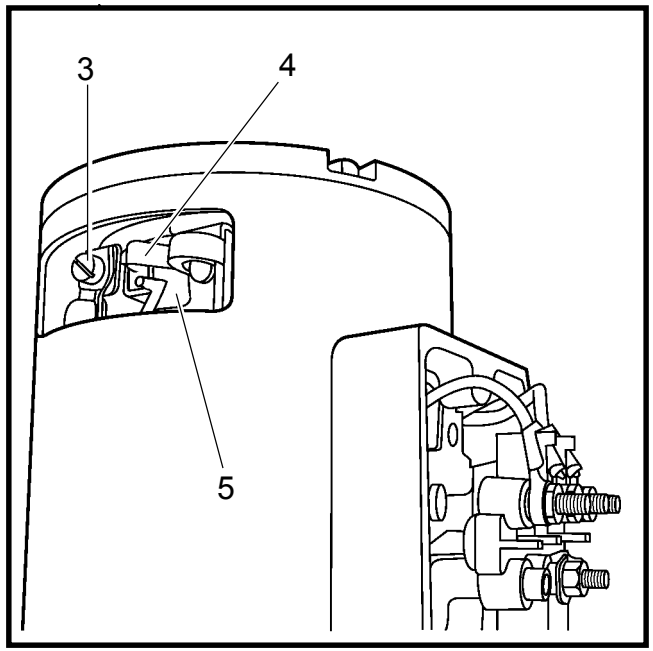
Check, and if necessary replace the steering motor brushes

- Disconnect the battery connector
- Open the motor cover
- Remove the protection cover
- Clean the motor with compressed air
- Check there are no traces of overheating in the brush connections (3)
- Check the tightness of the connections
- Check the brushes slide properly in their holders by slightly pulling the springs
- Raise the springs (4), take the brushes out of their guide (5) and measure their length
- Replace them if necessary
- Check that the commutator is not broken and shows no traces of arcing

REMARK
Always replace the full set of brushes
We advise you to have this operation carried out by your local representative.

Dimensions:

Steering motor: 0.18 kW		new:	22 mm
		min.:	11 mm



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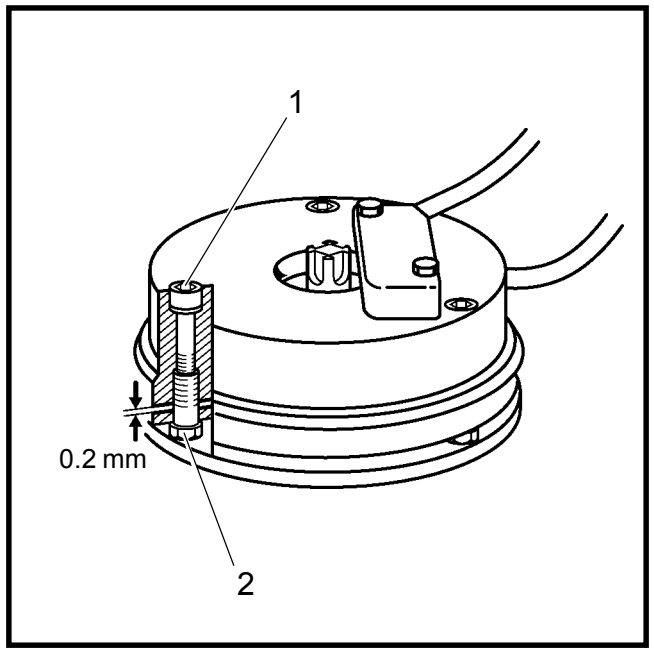
Adjust the electromagnetic brake

IMPORTANT
The mechanical braking force is factory set.

- The brake must be checked in the “brake on” position with no load on the forks, i.e. with the keyswitch turned off.
- Check the air gap of the brake with a set of feeler gauges. The original air gap is 0.2 mm, the max. air gap after partial wear of the disk is 0.5 mm; thereafter there is a risk of incomplete brake release and of overheating.
- If the air gap is close to the maximum value of 0.5 mm, it must be adjusted.
- Disconnect the brake power supply
- Loosen the 3 fixing screws (1)
- Turn the 3 hollow screws (2) to adjust the air gap to the original value of 0.2 mm
- Tighten the 3 fixing screws (1)
- Check the air gap at 3 points 120° apart
- Ensure the air gap is even all around the brake
- Operate the brake by pressing on the presence zone and check that the brake releases fully.

We advise you to have this operation carried out by your local representative.

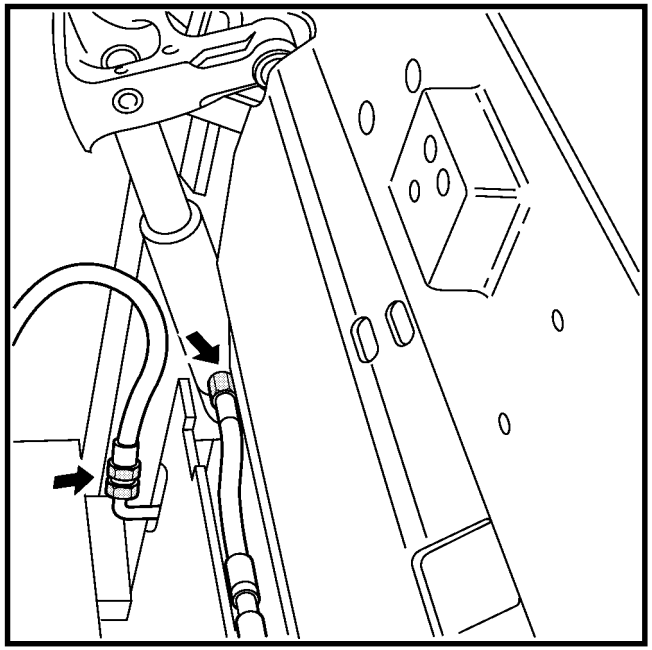


REMARK
We advise you to have this operation carried out by your local representative.

Check the hydraulic circuit for leaks

- Inspect the hydraulic circuit: pipes, hoses and connections from the motor pump to the lift jacks
- Tighten the connections if required
- Check that the lift jacks are not leaking
- Check that the hoses are correctly fixed and have not become chaffed.

If you notice any leaks, consult your local representative.

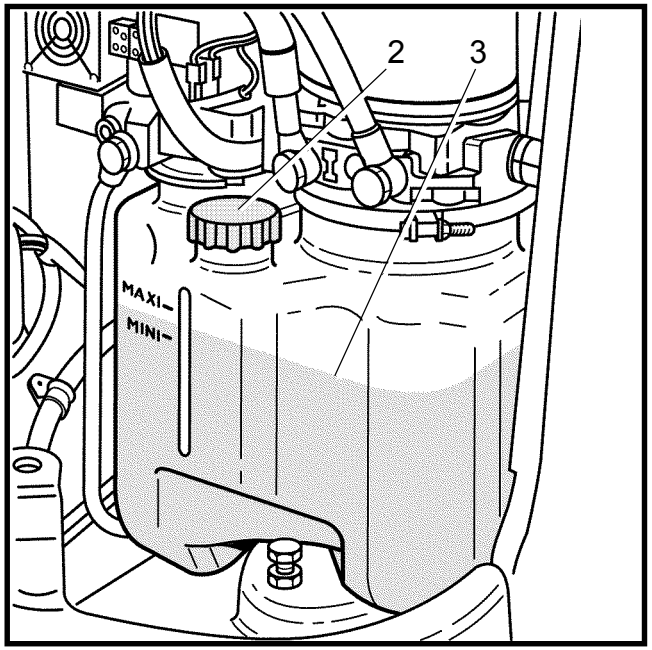


Check the hydraulic oil level

An electric gauge in the tank detects the lifting height of the fork arms at around 1.5 m from the ground (according to the truck configuration) and orders the lowering of the fork arms.

- Lower the forks and pallet legs (with initial lift) fully.
- Press on the emergency isolator
- Remove the front cover
- The oil level (3) should be between the min. and max. level markings of the tank for a proper use of the truck functions.
- Top up the level if necessary, after unscrewing the filler cap (2).
- Replace the filler cap at the end of the operation.

CAUTION
Use only hydraulic oil in accordance with the specifications (see table of lubricants)



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Check the gearbox oil level

- Remove the motor cover
- Rotate the wheel, to gain access to the filler plug (1).
- Unscrew the filler plug (1), the oil must be flush with the bottom of the hole.
- If necessary, top up to the correct level.
- Refit the filler plug.
- Check that there are no traces of leakage.

DANGER
Disconnect the truck power supply before any action on the motor unit

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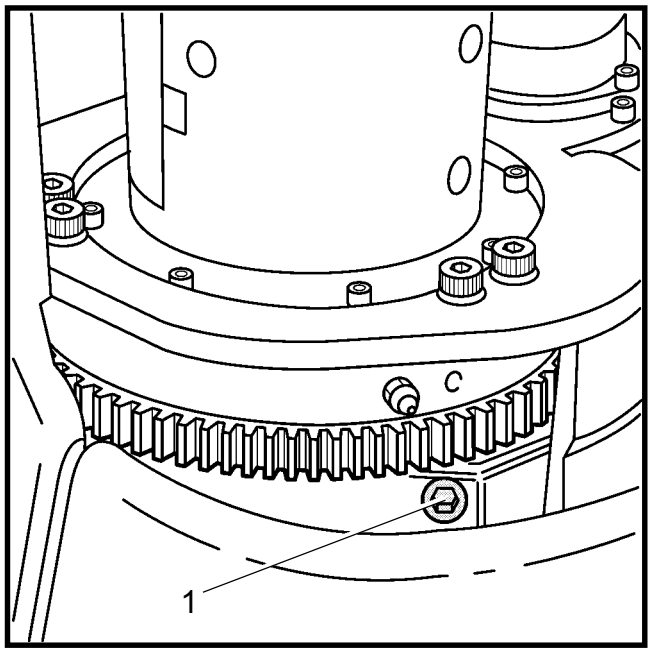
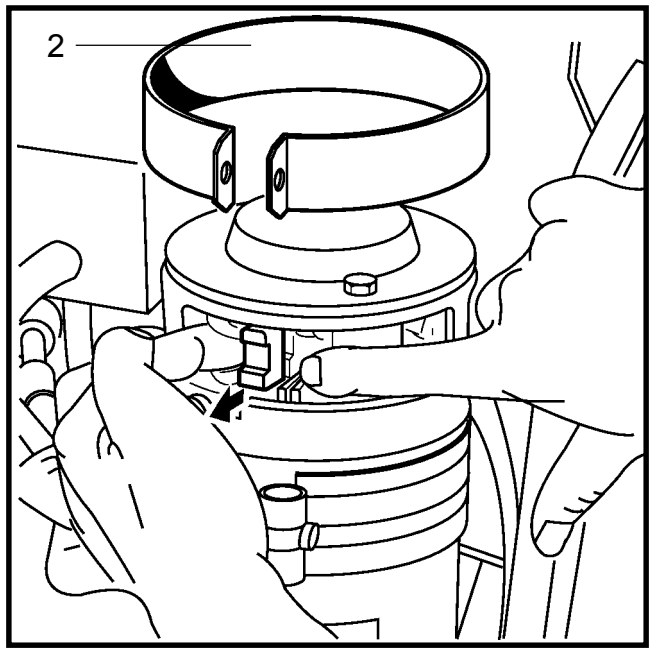


Check, and if necessary replace the main pump motor brushes

- Disconnect the battery
- Remove the brush cover band (2)
- Clean the motor with compressed air
- Check there are no traces of overheating in the brush connections
- Check the tightness of the connections
- Check the brushes slide properly in their holders by slightly pulling the springs
- Raise the springs, take the brushes out of their holders and measure their length
- Replace them if necessary
- Check that the commutator is not broken and shows no traces of arcing

REMARK
Always replace the full set of brushes
Dimensions:
Pump motor: 3.0 kW new: 22.5 mm
min.: 14 mm
We advise you to have this operation carried out by your local representative.



NOTE: The initial lift motor is maintenance-free.
It cannot be dismantled

Clean the hydraulic filter

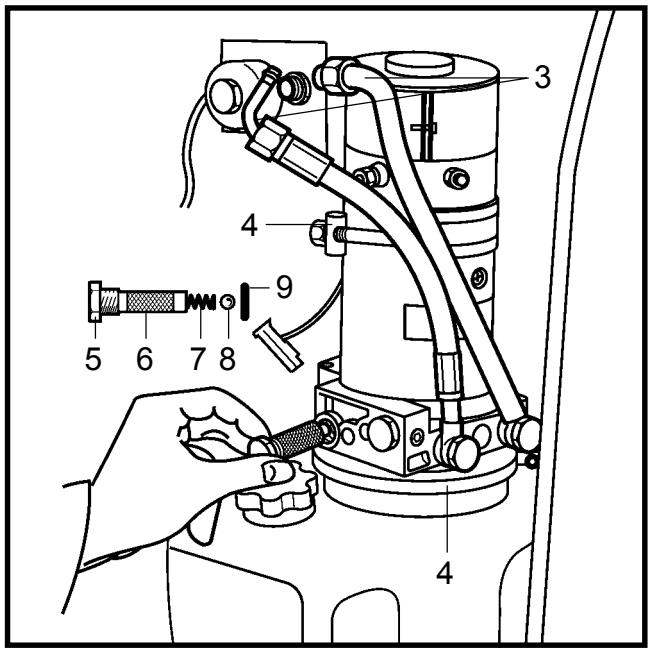
- Lower the forks and pallet legs fully.
- Disconnect the motor supply cables
- Disconnect the hoses (3) at the valve block LLC.
- Looses the two hose clamps (4)
- Rotate the assembly to access the connection (5)
- Unscrew the connection (5)
- Remove the filter unit
- Clean or replace the filter element (6)

CAUTION
When disassembling, take care not to lose spring (7) and ball (8) of the non-return valve associated with the filter.

- Check that the seal (9) is in good condition

After this operation, check the oil level.

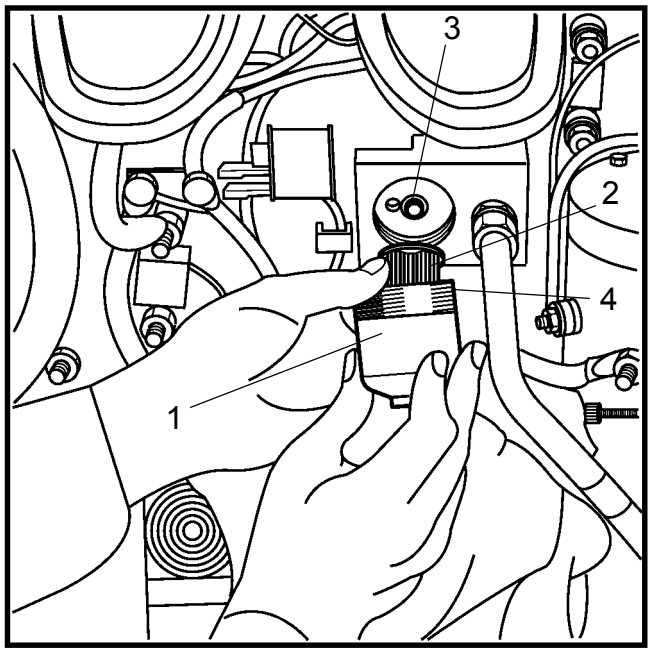
REMARK
We recommend that you have this work carried out by your local representative.



Replace the LLC valve block filter cartridge

- Lower the forks and pallet legs fully.
- Unscrew the housing (1)
- Replace the metallic filter cartridge (2), protecting peripheral components from possible oil splashes
- Thoroughly clean inside the housing (1)
- Replace the O-ring (4) in the housing and the gasket at the bottom of the filter (3)
- Screw the cartridge / housing assembly back onto the block to a torque of 25 Nm.
- Raise and lower the forks several times and purge the hydraulic system at the bleed screws located on the lift jacks.
- Lower the forks and pallet legs fully.
- Check the hydraulic oil level, and top up if necessary.

REMARK
We advise you to have this operation carried out by your local representative.



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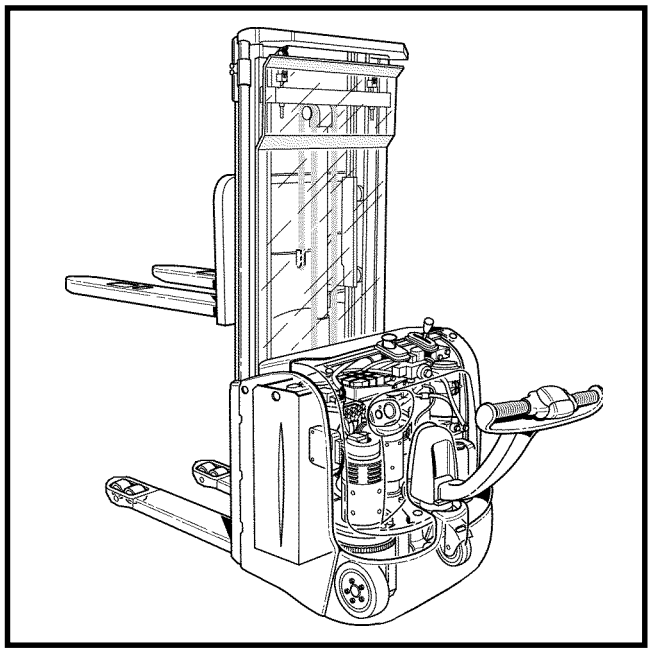
Check the security of components

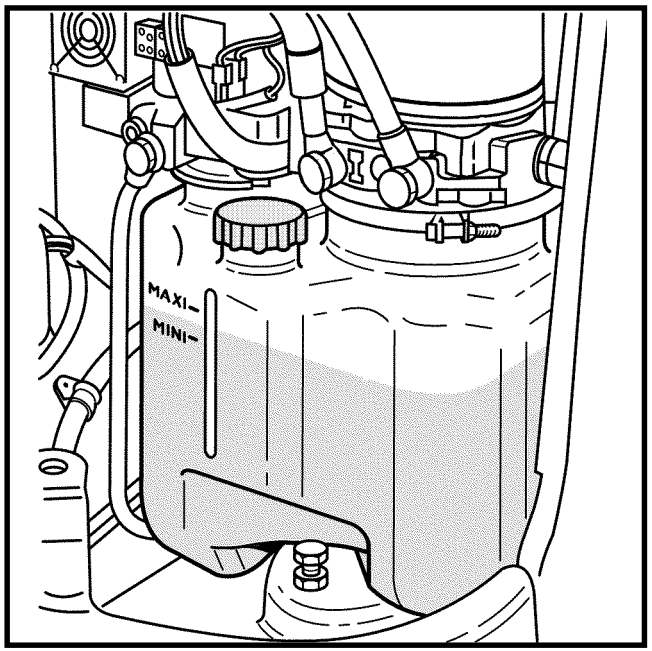
- Check the sub-assemblies are properly attached: motor/ gearbox, load wheels, motor wheels and stabiliser wheels.
- Check the tightness of the various screws and nuts
- Check that the forks are in good condition
- Replace defective parts
- Retouch paintwork if necessary



Replace the hydraulic oil

- Unscrew the hydraulic hoses
- Switch off the power supply
- Remove the pump unit
- Remove the collar of the lift motor
- Remove the four screws of the initial lift motor (in black)
- Remove the tank
- Empty the oil
- Clean the two fitters

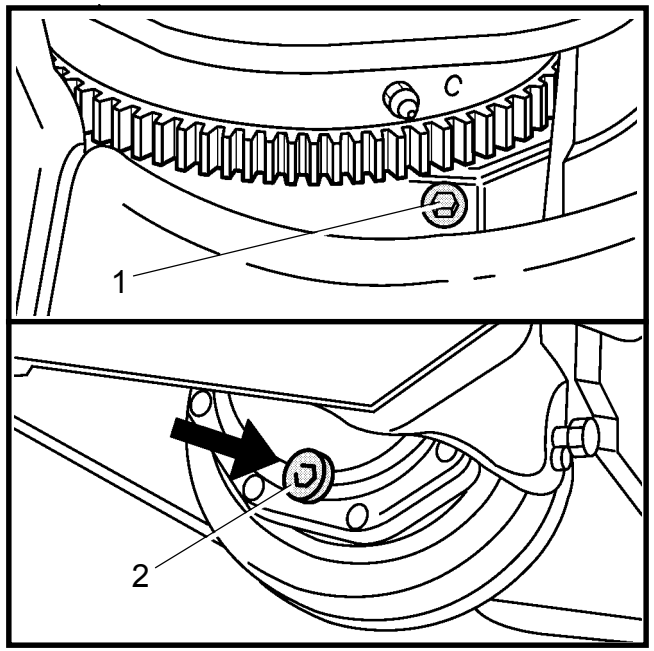
FILLING
- Re-fix the motor-driven pump unit, taking care to replace joint correctly.
- Replace the pump unit on the chassis
- Connect up the hoses and power supply
- Unscrew the filling stopper
- Fill the tank through hole
- Rescrew the stopper.
- Raise and lower the forks several times and purge the hydraulic system at the bleed screws located on the lift jacks.



Replace the gearbox oil

REMARK
Before this ope ration, run the truck to heat up the geabox oil.
- Switch off truck power supply
- Remove the front cover
- Raise the truck
- Position the gearbox, using the tiller arm, until the drain plug (2) and level plug (1) are accessible
- Place a receptacle under the gearbox.
- Unscrew the level plug (1)
- Unscrew the magnetic drain plug (2)
- Clean and replace the magnetic drain plug, after replacing the oil seal.

FILLING
- Fill through the level hole (1) as far as its lower edge.
- Screw back the level plug (1)



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Assembly	Ingredients/lubricants	Capacities/Setting values
Hydraulic system	Hydraulic oil	6.8 l
Hydraulic system	Filter element	Efficiency: 150 µ
Hydraulic system (lifting)	Max. pressure	220 bars (end of opening)
Hydraulic system (initial lifting)	Max. pressure	235 bars (end of opening)
LLCDistributor	Filter element	Efficiency: 20 µ
Reduction gear	Reduction gear oil	1.3 litres
Motor wheel		Thread torque: 80 Nm
Stabiliser wheel		Thread torque: 110 Nm
Ground wheels		Thread torque: 75 Nm
Traction motor	Fuses	Rating 150 A Quantity: 1
Steering motor	Fuses	Rating 30 A Quantity: 1
Lifting pump motor	Fuses	Rating 175 A Quantity: 1
Initial lift pump motor	Fuses	Rating 100 A Quantity: 1
Control bank	Fuses	Control 7.5 A Quantity: 1
Control bank (cold store)	Fuses	Control 15 A Quantity: 1
Integrated charger	Fuses	Secondary 25 A Quantity: 2
Traction motor 1.2 KW (L14-L16)	Brushes	New 30 mm, min 15 mm
Traction motor 1.5 KW (L14AP-L16AP)	Brushes	New 26 mm, min 15 mm
Steering motor 0.18 KW	Brushes	New 22 mm, min 11 mm
Pump motor (lifting) 3.0 KW	Brushes	New 22.5 mm, min 14 mm
Pump motor (initial lifting) 0.8 KW	Brushes	New 27 mm, min 8 mm
Battery	Distilled water	As required
Articulations	Lithium soap grease	As required

Hydraulic oil

ISO VG 46 H-L or H-LP (DIN 51524). Manufacturer reference in 5-litre cans = 8101521
For cold store = 8101489 (25-litre cans)

Reduction gear oil

SAE 80 W 90, API, GL5, MIL.L 21DSC. Manufacturer reference in 5-litre cans = 8100560

Multi-purpose grease

Lithium soap grease, extreme pressure with anti-wear additive – Standard DIN 51825 - KPF 2K - 30, KPF 2K - 20, KPF 2N - 30.
Manufacturer reference: Cartridge 7.337.475 140

Aerosol bomb for chains

Manufacturer reference: 7326300602
For cold store: 7326300615

Grease for steering ring and pinion

Aerosol silicon grease (600 ml)
Reference: FM 8 107 219

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Hydraulic diagram L14 - L16 / L14AP - L16AP (LLC proportional control + Initial lift)

1 Lower fork solenoid valve
2 LLC distribution block
3 Emergency lowering valve
4 Proportional solenoid valve
5 Elevation jacks
6 Initial lift jacks
7 Initial lift solenoid valve
8 Lower initial lift retarder
9 Non-return valve
10 Initial lift pump (1 cm3 / tr)
11 Initial lift motor pump unit
12 Main pressure limiter for the high lift circuit (235 bars)
13 Breather (integrated in filling stopper)
14 Tank
15 Discharge strainer 450 µ
16 Intake strainer 450 µ
17 Electric gauge
18 High lift motor pump unit (4 cm3 / tr)
19 Main pressure limiter for the high lift circuit (220 bars)
20 Initial lift pump (4 cm3 / tr)
21 Non-return valve + 150 µ pressure filter assembly
22 LSL 20 µ filter distributor
23 Option: Quick high lift motor pump unit (double-pump 4 + 4 cm3)

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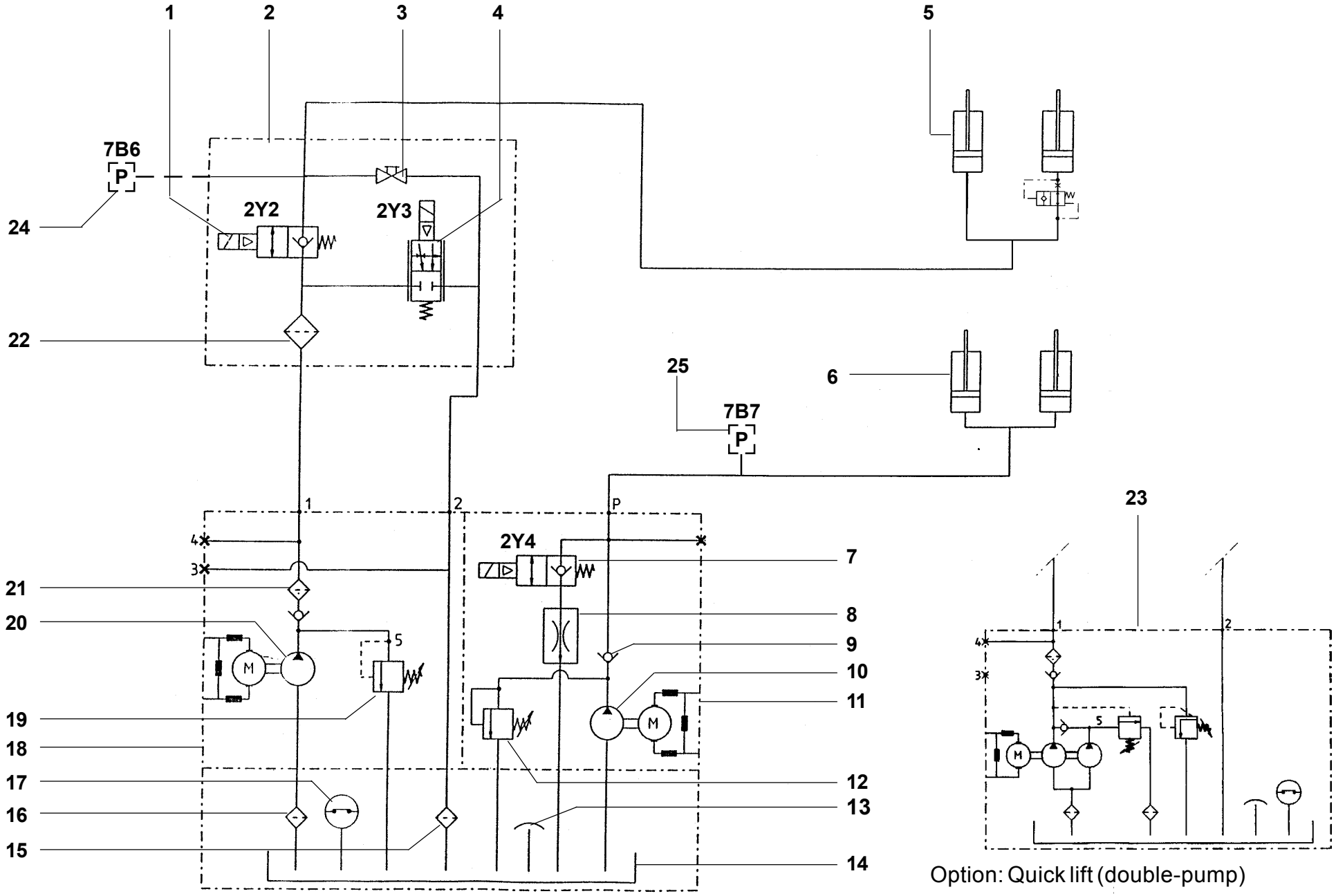
Hydraulic diagram L14 - L16 / L14AP - L16AP (LLC proportional control + Initial lift)



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Hydraulic diagram L14 - L16 (lever distributor + initial lift)

1 Lower retarder
2 Raising fork arm solenoid valve 2Y1
3 Lowering fork arm solenoid valve 2Y2
4 Elevation jacks
5 Safety parachute
6 Initial lift jacks
7 Initial lift solenoid valve 2Y4
8 Lower initial lift retarder
9 Non-return valve
10 Initial lift pump (1 cm3 / tr)
11 Initial lift motor pump unit
12 Main pressure limiter for the high lift circuit (235 bars)
13 Discharge strainer 450 µ
14 Breather (integrated in filling stopper)
15 Hydraulic tank
16 Intake strainer 450 µ
17 Electric gauge
18 Main pressure limiter for the high lift circuit (220 bars)
19 High lift motor pump unit (4 cm3 / tr)
20 Initial lift pump (4 cm3 / tr)
21 Non-return valve + 150 µ pressure filter assembly
22 Non-return valve distributor
23 Conventional distribution block
24 Lever-controlled hydraulic distributor

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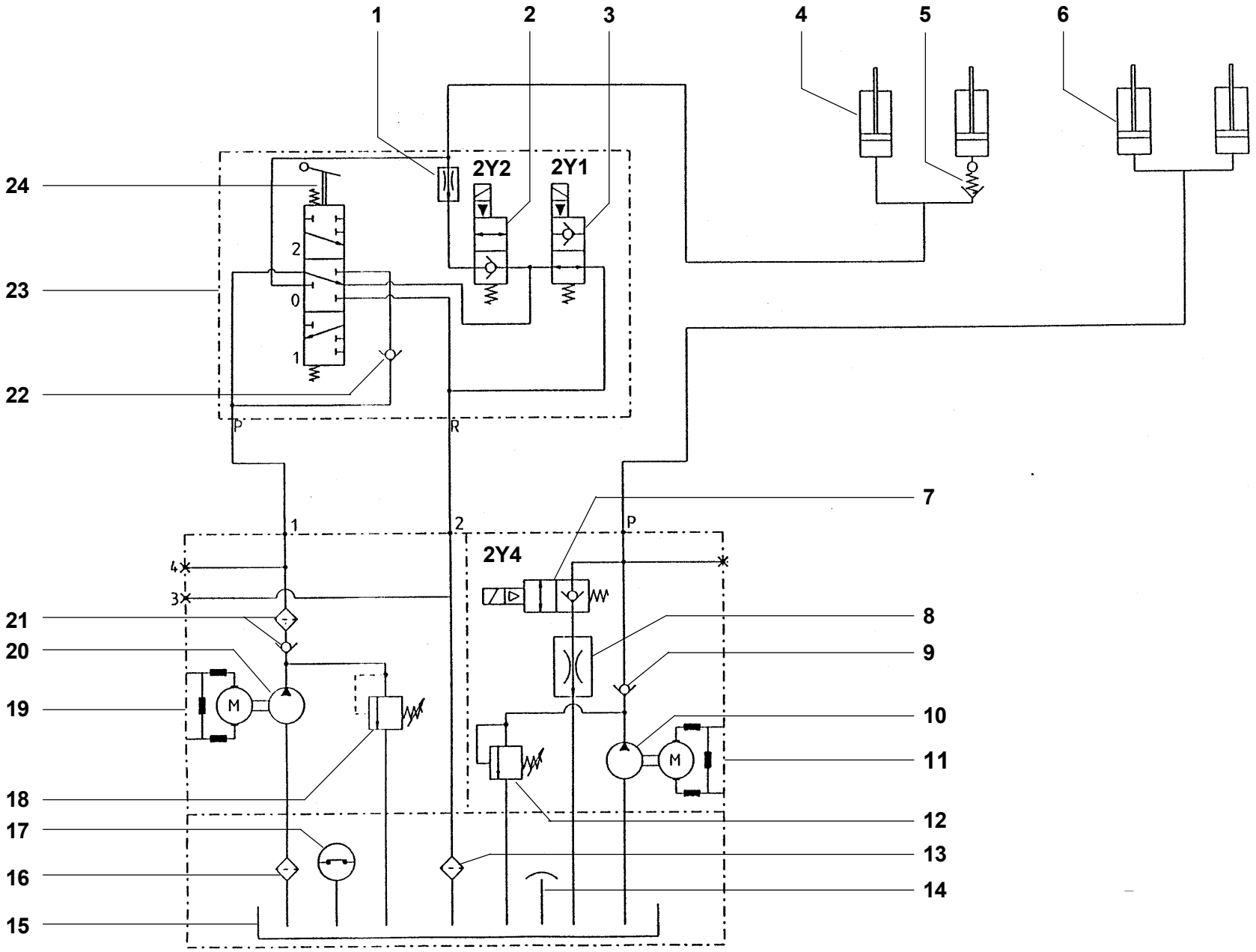
Hydraulic diagram L14 - L16 (lever distributor + initial lift)



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Electrical diagram L14-L16 (LLC proportional control)

Rep.	Name	Position
1A1	Traction variator (LDC)	11-15,28-48
2A3	Elevation control (LLC)	3 - 5, 51-68
3A1	Steering control (LES)	5-10,15-27
1B1	Acceleration potentiometer	40-42
1B2	Motor direction of rotation and speed detector	45-47
2B1	Height detector fork arm (option)	63-65
2B4	Lifting potentiometer	54-59
3B2	Handlebar potentiometer	17-22
3B3	Steering wheel potentiometer	17-23
1F1	150A traction motor fuse	14
1F3	7.5 A control fuse (*)	17
2F1	175A fuse for motor pump	4
3F1	30 A steering motor fuse	10
9F1	Cold store fuse	17
G1	Battery	2
G2	Integrated battery charger (option)	1,2
4H1	Horn	50
6H1	Led green charge indicator	5
6H2	Led orange charge indicator	6
1K11	Forward traction contactor	13,16,32
1K12	Reverse traction contactor	13,16,34
2K11	Motor pump unit contactor	4-7, 66
3K1	Steering contactor	10,17
9K1	Cold store relay	17-19
1M1	Traction motor	14
2M1	Pump motor	4
3M1	Steering motor	7

Rep.	Name	Position
6P2	Hour meter, battery discharge limiter indicator	68-73
S1	Ignition key	17
1S3	Lift jack reverse safety microswitch	39
1S4	Lift jack base microswitch	25
1S8	Charger safety microswitch	21
1S21	Variator startup microswitch (handle)	34
1S22	Variator startup microswitch (handle)	36
2S13	Electric gauge	48
4S1	Horn control microswitch	47
7S1	Emergency stop switch	2
X1	Battery connector	
1X1	Traction variator connector	
1X2	Traction motor speed sensor connector	
1X3	Lifting jack connector	
1X4	LDC programming box connector	
1X5	Lifting jack connector	
1X11	Fork arm height detection connector at 1.5 m	
1X13	Encoding connector	
2X1	LLC elevation control connector	
2X2	Fork arm height detection connector at 0.3 m	
2X4	Connector for programming box on LLC	
2X5	Lifting jack LT side control connector	
2X13	LLC encoding connector	
3X1	Steering logical circuit connector	
3X2	Steering potentiometer connector (set value)	
3X3	Steering potentiometer connector (position)	
3X4	Connector for programming box on LES	
3X5	Steering contactor connector	
6X1	Hour meter load limiter indicator connector	
7X3	Brake release interface connector / high cut-off	
7X6	Electromagnetic brake connector	
9X3	Connector for cold store resistance	
9X10	Connector for cold store relay	

Rep.	Name	Position
Y1	Electromagnetic brake	30
2Y2	Lower fork solenoid valve	60
2Y3	Proportional solenoid valve for fork arm raise	64
Z1	Anti-interference circuit	
Z2	Anti-interference diode	
7Z1	Brake anti-interference circuit	28
R1CF	Cold store resistance (option)	
R2CF	Cold store resistance (option)	
R3CF	Cold store resistance (option)	

* 15 A in cold store version

Code	Colour	Code	Colour
BK	Black	GN	Green
WH	White	VT	Violet
BU	Blue	RD	Red
OG	Orange	YE	Yellow
BN	Brown	GY	Grey

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Electrical diagram L14-L16 (LLC proportional control)

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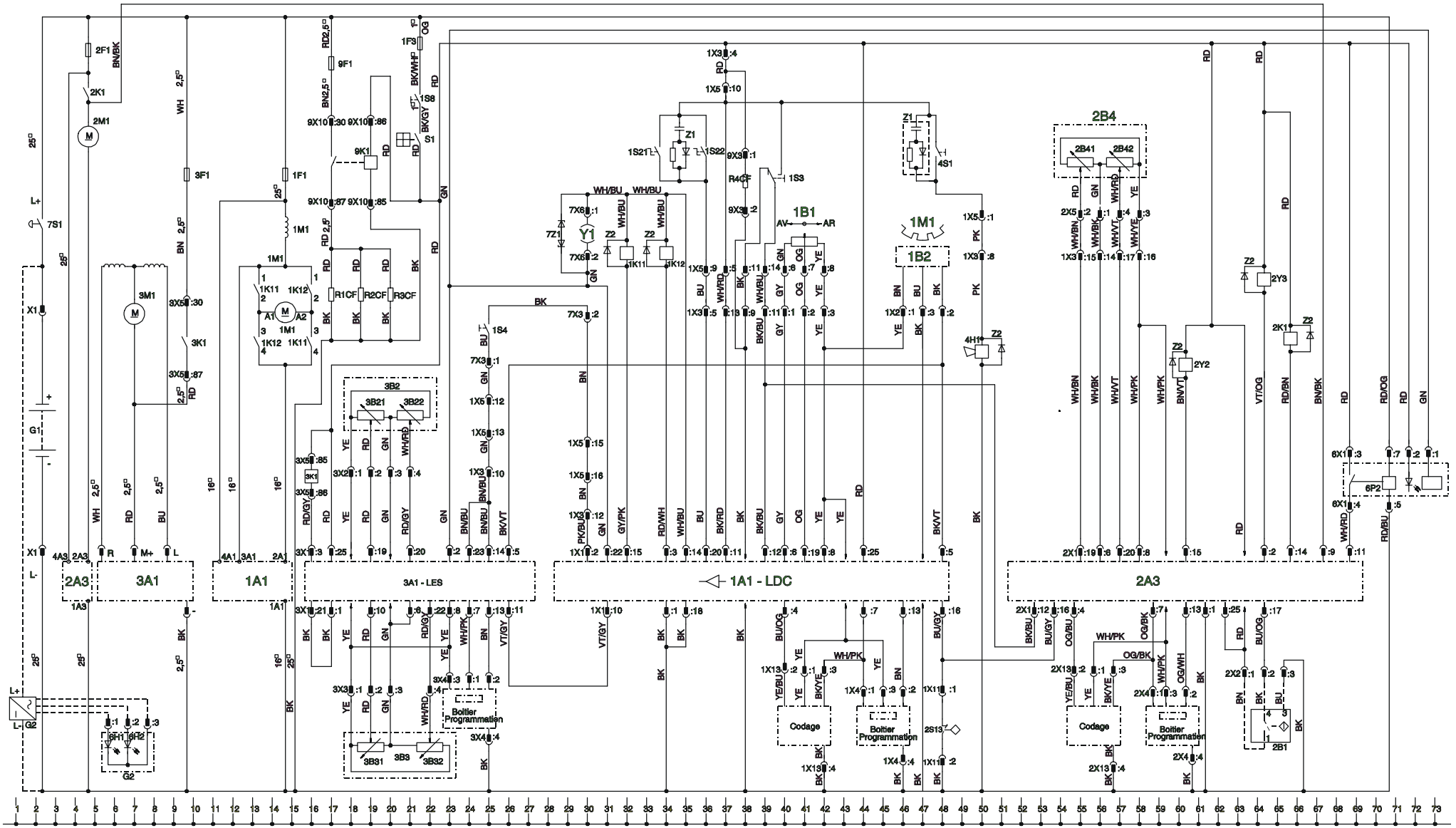

Electrical diagram L14 - L16 (lever distributor)

Rep.	Name	Position
1A1	Traction variator (LDC)	11-15, 28-47
3A1	Steering control (LES)	17-27
1B1	Acceleration potentiometer	40-42
1B2	Motor direction of rotation and speed detector	44-46
3B2	Handlebar potentiometer	19-24
3B3	Steering wheel potentiometer	19-24
1F1	150A traction motor fuse	14,15
1F3	7.5 A control fuse (*)	17
2F1	175 A pump motor fuse	4
3F1	30 A steering motor fuse	9,10
G1	Battery	2,3
G2	Integrated battery charger (option)	1,2
4H1	Horn	48
6H1	Led green charge indicator	5,6
6H2	Led orange charge indicator	6,7
1K11	Forward traction contactor	13-16,31
1K12	Reverse traction contactor	13-16,33
2K1	Pump contactor	4,61,62
3K1	Steering contactor	9,10,17
1M1	Traction motor	14,15
2M1	Pump motor	4
3M1	Steering motor	7
6P2	Hour meter, battery discharge limiter indicator	61-66

Rep.	Name	Position
S1	Ignition key	17
1S3	Lift jack reverse safety microswitch	39
1S4	Lift jack base microswitch	29
1S8	Charger safety microswitch	17
1S21	Variator startup microswitch (handle)	34
1S22	Variator startup microswitch (handle)	36
2S6	Lower forks control microswitch	52-55
2S7	Raise forks control microswitch	49-52
2S12	Raise forks lever control microswitch	61,62
2S13	Electric gauge	46
4S1	Horn control microswitch	48-49
7S1	Emergency stop switch	2,3
X1	Battery connector	2,3
1X1	Traction variator connector	28-46
1X2	Traction motor speed sensor connector	44-46
1X3	Lifting jack connector	22-53
1X4	LDC programming box connector	41-44
1X5	Lifting jack connector	21-53
1X11	Fork arm height detection connector at 1.5 m	46
3X1	Steering logical circuit connector	17-27
3X2	Steering potentiometer connector (set value)	19-23
3X3	Steering potentiometer connector (position)	19-23
3X4	Connector for programming box on LES	25-27
3X5	Steering contactor connector	9,10,17
6X1	Hour meter load limiter indicator connector	61-66
7X3	Brake release interface connector / high cut-off	29
7X6	Electromagnetic brake connector	29

Rep.	Name	Position
Y1	Electromagnetic brake	29
2Y1	Lower forks solenoid valve	50,51
2Y2	Raise forks solenoid valve	53,54
Z1	Anti-interference circuit	
Z2	Anti-interference diode	
R1CF	Cold store resistance (option)	16
R2CF	Cold store resistance (option)	17

* 15 A in cold store version

Code	Colour	Code	Colour
BK	Black	GN	Green
WH	White	VT	Violet
BU	Blue	RD	Red
OG	Orange	YE	Yellow
BN	Brown	GY	Grey

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Electrical diagram L14 - L16 (lever distributor)

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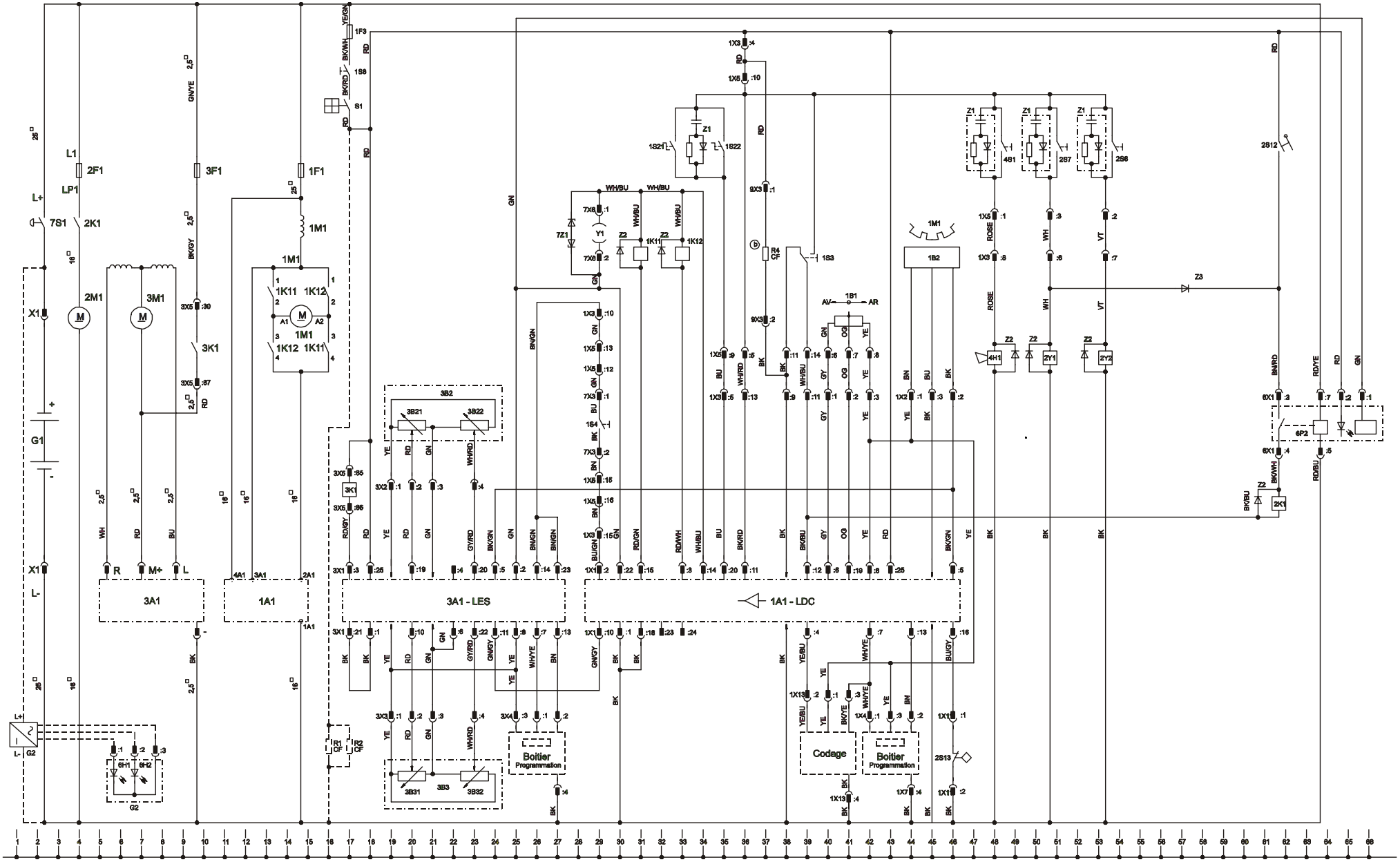

Electrical diagram L14 I-L 16 I (LLC proportional control + initial lift)

Rep.	Name	Position
1A1	Traction variator (LDC)	11-15,28-48
2A3	Elevation control (LLC)	3 - 5, 51-68
3A1	Steering control (LES)	5-10,15-27
1B1	Acceleration potentiometer	40 -42
1B2	Motor direction of rotation and speed detector	44-46
2B1	Height detector fork arm (option)	63-65
2B4	Lifting potentiometer	53-58
3B2	Handlebar potentiometer	17-23
3B3	Steering wheel potentiometer	17-23
1F1	150A traction motor fuse	14
1F3	7.5 A control fuse (*)	17
2F11	175 A pump motor fuse	4
2F12	L.I. 100 A pump motor fuse	7
3F1	30 A steering motor fuse	10
G1	Battery	2
G2	Integrated battery charger (option)	1,2
4H1	Horn	50
6H1	Led green charge indicator	5
6H2	Led orange charge indicator	6
1K11	Forward traction contactor	13-16,32
1K12	Reverse traction contactor	13-16,34
2K11	Motor pump unit contactor	4-7, 66
3K1	Steering contactor	10,17
1M1	Traction motor	14
2M11	Pump motor	4
2M12	Initial lift pump motor	7
3M1	Steering motor	7

Rep.	Name	Position
6P2	Hour meter, battery discharge limiter indicator	64-72
S1	Ignition key	17
1S3	Lift jack reverse safety microswitch	39
1S4	Lift jack base microswitch	25
1S8	Charger safety microswitch	21
1S21	Variator startup microswitch (handle)	34
1S22	Variator startup microswitch (handle)	36
2S8	Initial lift microswitch	50
2S9	Initial descent microswitch	52
2S10	Initial lift high cut-off microswitch	67
2S13	Electric gauge	48
4S1	Horn control microswitch	47
7S1	Emergency stop switch	2
X1	Battery connector	
1X1	Traction variator connector	
1X2	Traction motor speed sensor connector	
1X3	Lifting jack connector	
1X4	LDC programming box connector	
1X5	Lifting jack connector	
1X11	Fork arm height detection connector at 1.5 m	
1X13	Encoding connector	
2X1	LLC elevation control connector	
2X2	Fork arm height detection connector at 0.3 m	
2X3	Plate side LT control connector	
2X4	Connector for programming box on LLC	
2X5	Lifting jack LT side control connector	
2X13	LLC encoding connector	
3X1	Steering logical circuit connector	
3X2	Steering potentiometer connector (set value)	
3X3	Steering potentiometer connector (position)	
3X4	Connector for programming box on LES	
3X5	Steering contactor connector	
6X1	Hour meter load limiter indicator connector	
7X3	Brake release interface connector / high cut-off	
7X6	Electromagnetic brake connector	

Rep.	Name	Position
Y1	Electromagnetic brake	30
2Y2	Lower fork solenoid valve	60
2Y3	Proportional solenoid valve for fork arm raise	64
2Y4	Initial lift lower forks solenoid valve	61
Z1	Anti-interference circuit	
Z2	Anti-interference diode	
7Z1	Brake anti-interference circuit	28
R1CF	Cold store resistance (option)	
R2CF	Cold store resistance (option)	
R3CF	Cold store resistance (option)	

* 15 A in cold store version

Code	Colour	Code	Colour
BK	Black	GN	Green
WH	White	VT	Violet
BU	Blue	RD	Red
OG	Orange	YE	Yellow
BN	Brown	GY	Grey

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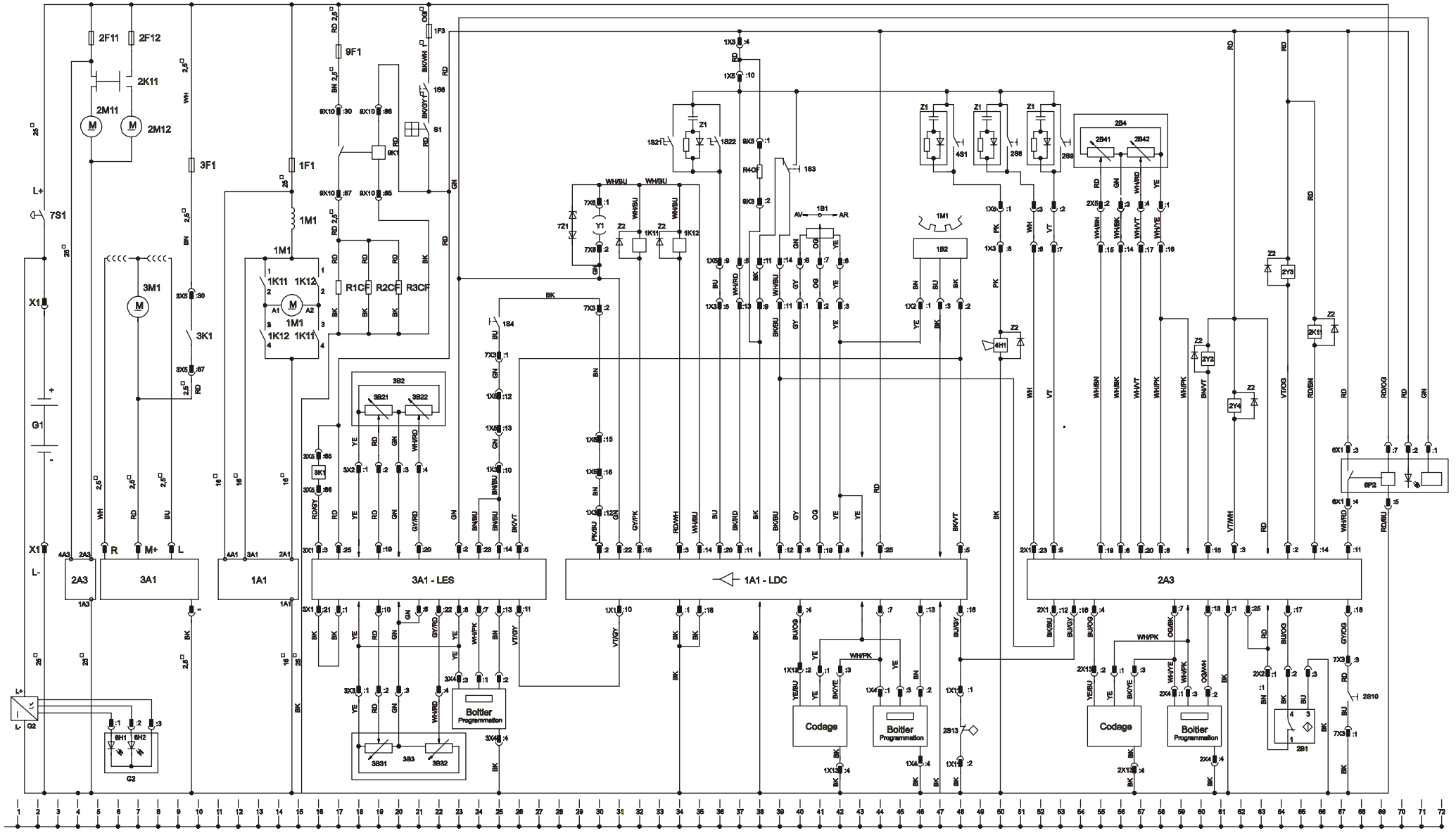
Electrical diagram L14 I-L 16 I (LLC proportional control + initial lift)



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Electrical diagram L14 I-L 16 I (LLC lever distributor + initial lift)

Rep.	Name	Position
1A1	Traction variator (LDC)	11-15,28-47
2A1	Elevation control box	50-60
3A1	Steering control (LES)	17-27
1B1	Acceleration potentiometer	40-42
1B2	Motor direction of rotation and speed detector	44-46
2B1	Fork arm height detector (option)	52-55
3B2	Handlebar potentiometer	19-24
3B3	Steering wheel potentiometer	19-24
1F1	150A traction motor fuse	14,15
1F3	7.5 A control fuse (*)	17
2F11	175 A pump motor fuse	4
2F12	L.I. 100 A pump motor fuse	7
3F1	30 A steering motor fuse	9,10
G1	Battery	2,3
G2	Integrated battery charger (option)	1,2
4H1	Horn	48
6H1	Led green charge indicator	5,6
6H2	Led orange charge indicator	6,7
1K11	Forward traction contactor	13-16,31
1K12	Reverse traction contactor	13-16,33
2K11	Pump contactor	4,63,64
2K12	Initial lift pump contactor	7,61,62
3K1	Steering contactor	9,10,17
1M1	Traction motor	14,15
2M11	Pump motor	4
2M12	Initial lift pump motor	7
3M1	Steering motor	7

Rep.	Name	Position
6P2	Hour meter, battery discharge limiter indicator	63-68
S1	Ignition key	17
1S3	Lift jack reverse safety microswitch	39
1S4	Lift jack base microswitch	29
1S8	Charger safety microswitch	17
1S21	Variator startup microswitch (handle)	34
1S22	Variator startup microswitch (handle)	36
2S6	Lower forks control microswitch	55-57
2S7	Raise forks control microswitch	53-54
2S8	Initial lift microswitch	47-49
2S9	Initial descent microswitch	50-52
2S12	Manual elevation control microswitch	61
2S13	Electric gauge	46
4S1	Horn control microswitch	48-49
7S1	Emergency stop switch	2,3
X1	Battery connector	2,3
1X1	Traction variator connector	28-46
1X2	Traction motor speed sensor connector	44-46
1X3	Lifting jack connector	22-53
1X4	LDC programming box connector	41-44
1X5	Lifting jack connector	21-53
1X11	Fork arm height detection connector at 1.5 m	46
2X1	LSL elevation control connector	50-60
2X2	Fork arm height detection connector at 0.3 m	52-55
2X3	Plate side initial lift control connector	53-55
2X5	Lift jack side initial lift control connector	53-55
3X1	Steering logical circuit connector	17-27
3X2	Steering potentiometer connector (set value)	19-23
3X3	Steering potentiometer connector (position)	19-23

Rep.	Name	Position
3X4	Connector for programming box on LES	25-27
3X5	Steering contactor connector	9,10,17
6X1	Hour meter load limiter indicator connector	63-68
7X3	Brake release interface connector / high cut-off	29
7X6	Electromagnetic brake connector	29
Y1	Electromagnetic brake	29
2Y2	Lower fork solenoid valve	57
2Y1	Raise fork arms proportional solenoid valve	58
2Y4	Initial lift lower forks solenoid valve	55,56
Z1	Anti-interference circuit	
Z2	Anti-interference diode	
R1CF	Cold store resistance (option)	15
R2CF	Cold store resistance (option)	16
R3CF	Cold store resistance (option)	17

* 15 A in cold store version

Code	Colour	Code	Colour
BK	Black	GN	Green
WH	White	VT	Violet
BU	Blue	RD	Red
OG	Orange	YE	Yellow
BN	Brown	GY	Grey

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Electrical diagram L14 I-L 16 I (LLC lever distributor + initial lift)

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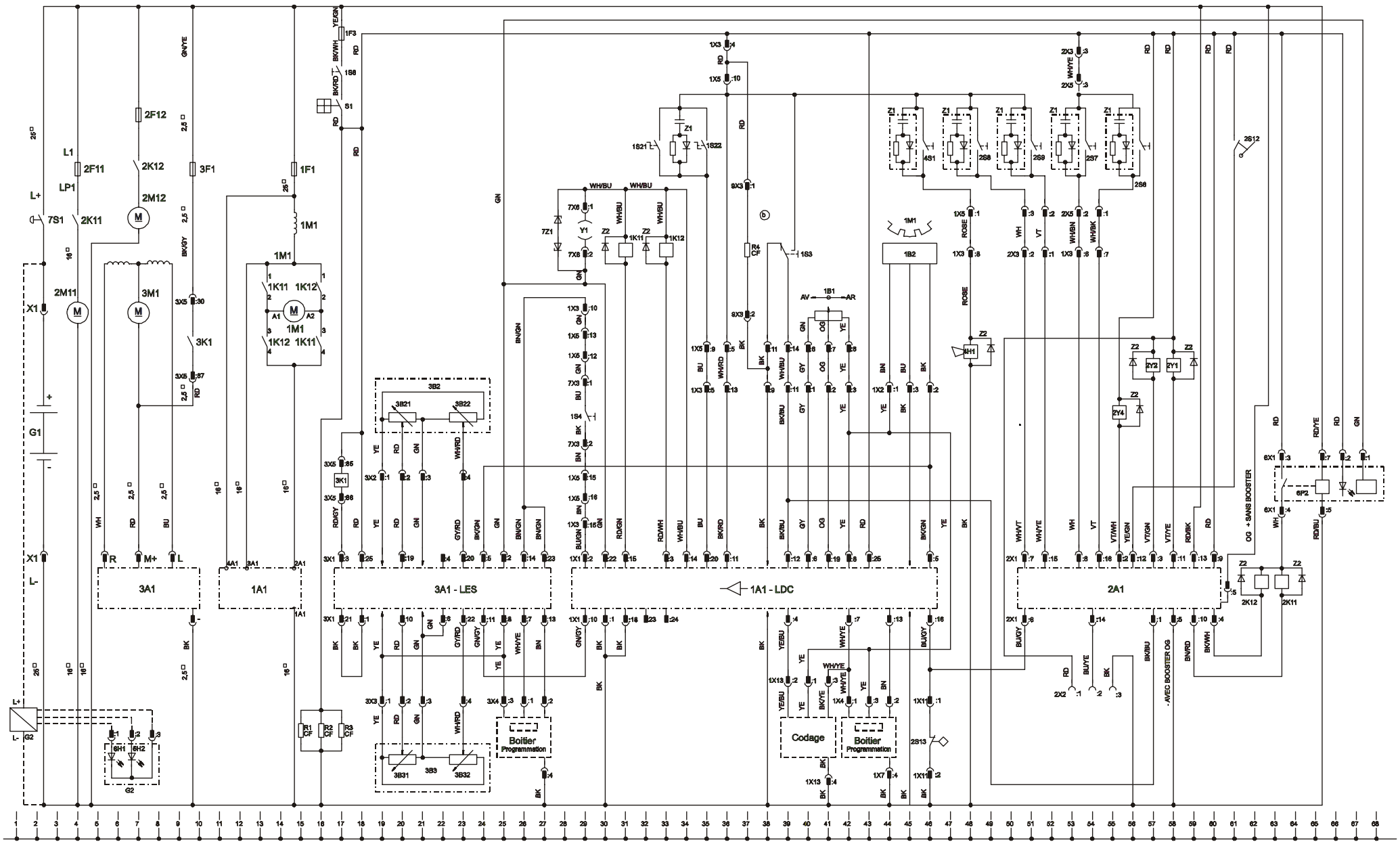

Electrical diagram L14 AP-L 16 AP (LLC proportional control without initial lift)

Rep.	Name	Position
1A1	Traction variator (LDC)	11-14,29-50
2A3	Elevation control (LLC)	3 - 5, 53-71
3A1	Steering control (LES)	14-29
1B1	Acceleration potentiometer	40-43
1B2/1B5	Motor direction of rotation and speed detector	46-49,43-45
2B1	Fork arm height detector (option)	65-68
2B4	Lifting potentiometer	55-61
3B2	Handlebar potentiometer	19-24
3B3	Steering wheel potentiometer	19-24
7B6	LT pressure circuit sensor	47
1F1	150A traction motor fuse	14
1F3	7.5 A control fuse (*)	23
2F1	175A fuse for motor pump	4
3F1	30 A steering motor fuse	9
9F1	15A cold store fuse	17
G1	Battery	2
G2	Integrated battery charger (option)	1-2
4H1	Horn	51
6H1	Led green charge indicator	5
6H2	Led orange charge indicator	7
1K1	Platform relay	24,28
1K11	Forward traction contactor	13-16,33
1K12	Reverse traction contactor	13-16,35
2K1	Motor pump unit contactor	3-7, 68
3K1	Steering contactor	10,17
9K1	Cold store relay	17,19
1M1	Traction motor	14
2M1	Pump motor	4
3M1	Steering motor	7
6P2	Hour meter, battery discharge limiter indicator	70-75

Rep.	Name	Position
S1	Ignition key	23
1S3	Lift jack reverse safety microswitch	39
1S4/1S4A	Lift jack base microswitch	30
1S8	Charger safety microswitch	23
1S21	Variator startup microswitch (handle)	34
1S22	Variator startup microswitch (handle)	36
1S8	Charger safety microswitch	23
1S9	Operator microswitch (platform)	26
1S15	Low position platform microswitch	24
1S16	Right guide rail microswitch	28
1S17	Left guide rail microswitch	32
2S13	Electric gauge	48
4S1	Horn control microswitch	49
7S1	Emergency stop switch	2
X1	Battery connector	
1X1	Traction variator connector	
1X2/1X2A	Traction motor speed sensor connector	
1X3	Lifting jack connector	
1X3-1	Lift jack plate link connector	
1X4	LDC programming box connector	
1X5	Lifting jack connector	
1X9	Conductor connector (platform)	
1X11	Fork arm height detection connector at 1.5 m	
1X13/2X13/3X13	Encoding connector	
1X19	Right/left guide rail connector	
1X20	Platform position connector	
1X23	Platform relay connector	
2X1	LLC elevation control connector	
2X2	Fork arm height detection connector at 0.3 m	
2X3	Plate side initial lift control connector	
2X4	Connector for programming box on LLC	
2X5	Lifting jack LT side control connector	
2X13	LLC encoding connector	
3X1	Steering logical circuit connector	
3X2	Steering potentiometer connector (set value)	
3X3	Steering potentiometer connector (position)	
3X4	Connector for programming box on LES	
3X5	Steering contactor connector	
6X1	Hour meter load limiter indicator connector	

Rep.	Name	Position
7X3	Brake release interface connector / high cut-off	
7X6	Electromagnetic brake connector	
9X3	Connector for cold store resistance	
9X10	Connector for cold store relay	
Y1	Electromagnetic brake	30
2Y2	Lower fork solenoid valve	60
2Y3	Raise fork arms proportional solenoid valve	64
Z1	Anti-interference circuit	
Z2	Anti-interference diode	
7Z1	Brake anti-interference circuit	28
R1CF	Cold store resistance (truck)	17
R2CF	Cold store resistance (truck)	19
R3CF	Cold store resistance (truck)	21
R4CF	Cold store resistance (truck)	37

* 15 A in cold store version

Code	Colour	Code	Colour
BK	Black	GN	Green
WH	White	VT	Violet
BU	Blue	RD	Red
OG	Orange	YE	Yellow
BN	Brown	GY	Grey

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Electrical diagram L14 AP-L 16 AP (LLC proportional control without initial lift)

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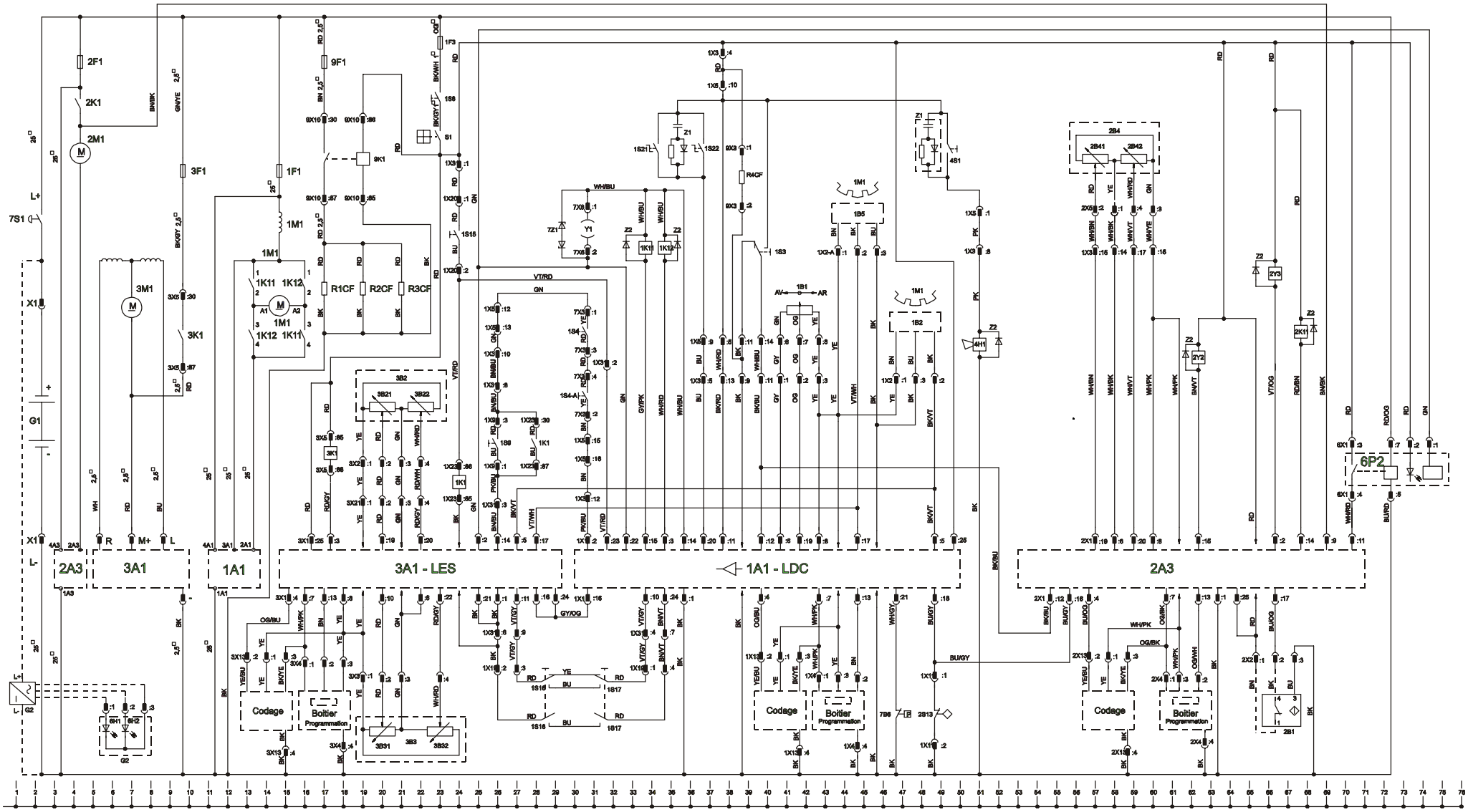

Electrical diagram L14 API-L 16 API (LLC proportional control with initial lift)

Rep.	Name	Position
1A1	Traction variator (LDC)	11-14,29-50
2A3	Elevation control (LLC)	3 - 5, 53-71
3A1	Steering control (LES)	14-29
1B1	Acceleration potentiometer	40-43
1B2/1B5	Motor direction of rotation and speed detector	46-49,43-45
2B1	Fork arm height detector (option)	65-68
2B4	Lifting potentiometer	55-61
3B2	Handlebar potentiometer	19-24
3B3	Steering wheel potentiometer	19-24
7B6/7B7	Circuit pressure sensor LT/LI	47
1F1	150A traction motor fuse	14
1F3	7.5 A control fuse (*)	23
2F11	175A fuse for motor pump	4
2F12	100A initial lift fuse for motor pump unit	7
3F1	30 A steering motor fuse	9
9F1	15A cold store fuse	17
G1	Battery	2
G2	Integrated battery charger (option)	1-2
4H1	Horn	51
6H1	Led green charge indicator	5
6H2	Led orange charge indicator	7
1K1	Platform relay	24,28
1K11	Forward traction contactor	13-16,33
1K12	Reverse traction contactor	13-16,35
2K11	LI or LT motor pump unit contactor	3-7, 68
3K1	Steering contactor	10,17
9K1	Cold store relay	17,19
1M1	Traction motor	14
2M11	LT pump motor	4
2M12	LI pump motor	7
3M1	Steering motor	7

Rep.	Name	Position
6P2	Hour meter, battery discharge limiter indicator	70-75
S1	Ignition key	23
1S3	Lift jack reverse safety microswitch	39
1S4/1S4A	Lift jack base microswitch	30
1S8	Charger safety microswitch	23
1S21	Variator startup microswitch (handle)	34
1S22	Variator startup microswitch (handle)	36
1S8	Charger safety microswitch	23
1S9	Operator microswitch (platform)	26
1S15	Low position platform microswitch	24
1S16	Right guide rail microswitch	28
1S17	Left guide rail microswitch	32
2S8	Initial lift control microswitch	51
2S9	Lower initial lift control microswitch	54
2S13	Electric gauge	8
4S1	Horn control microswitch	49
7S1	Emergency stop switch	2
X1	Battery connector	
1X1	Traction variator connector	
1X2/1X2A	Traction motor speed sensor connector	
1X3	Lifting jack connector	
1X3-1	Lift jack plate link connector	
1X4	LDC programming box connector	
1X5	Lifting jack connector	
1X9	Conductor connector (platform)	
1X11	Fork arm height detection connector at 1.5 m	
1X13/2X13/3X13	Encoding connector	
1X19	Right/left guide rail connector	
1X20	Platform position connector	
1X23	Platform relay connector	
2X1	LLC elevation control connector	
2X2	Fork arm height detection connector at 0.3 m	
2X3	Plate side initial lift control connector	
2X4	Connector for programming box on LLC	
2X5	Lifting jack LT side control connector	
2X13	LLC encoding connector	
3X1	Steering logical circuit connector	
3X2	Steering potentiometer connector (set value)	
3X3	Steering potentiometer connector (position)	

Rep.	Name	Position
3X4	Connector for programming box on LES	
3X5	Steering contactor connector	
6X1	Hour meter load limiter indicator connector	
7X3	Brake release interface connector / high cut-off	
7X6	Electromagnetic brake connector	
9X3	Connector for cold store resistance	
9X10	Connector for cold store relay	
Y1	Electromagnetic brake	30
2Y2	Lower fork solenoid valve	62
2Y3	Raise fork arms proportional solenoid valve	66
2Y4	Initial lift solenoid valve	
Z1	Anti-interference circuit	
Z2	Anti-interference diode	
7Z1	Brake anti-interference circuit	28
R1CF	Cold store resistance (truck)	17
R2CF	Cold store resistance (truck)	19
R3CF	Cold store resistance (truck)	21
R4CF	Cold store resistance (truck)	37

* 15 A in cold store version

Code	Colour	Code	Colour
BK	Black	GN	Green
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Electrical diagram L14 API-L 16 API (LLC proportional control with initial lift)

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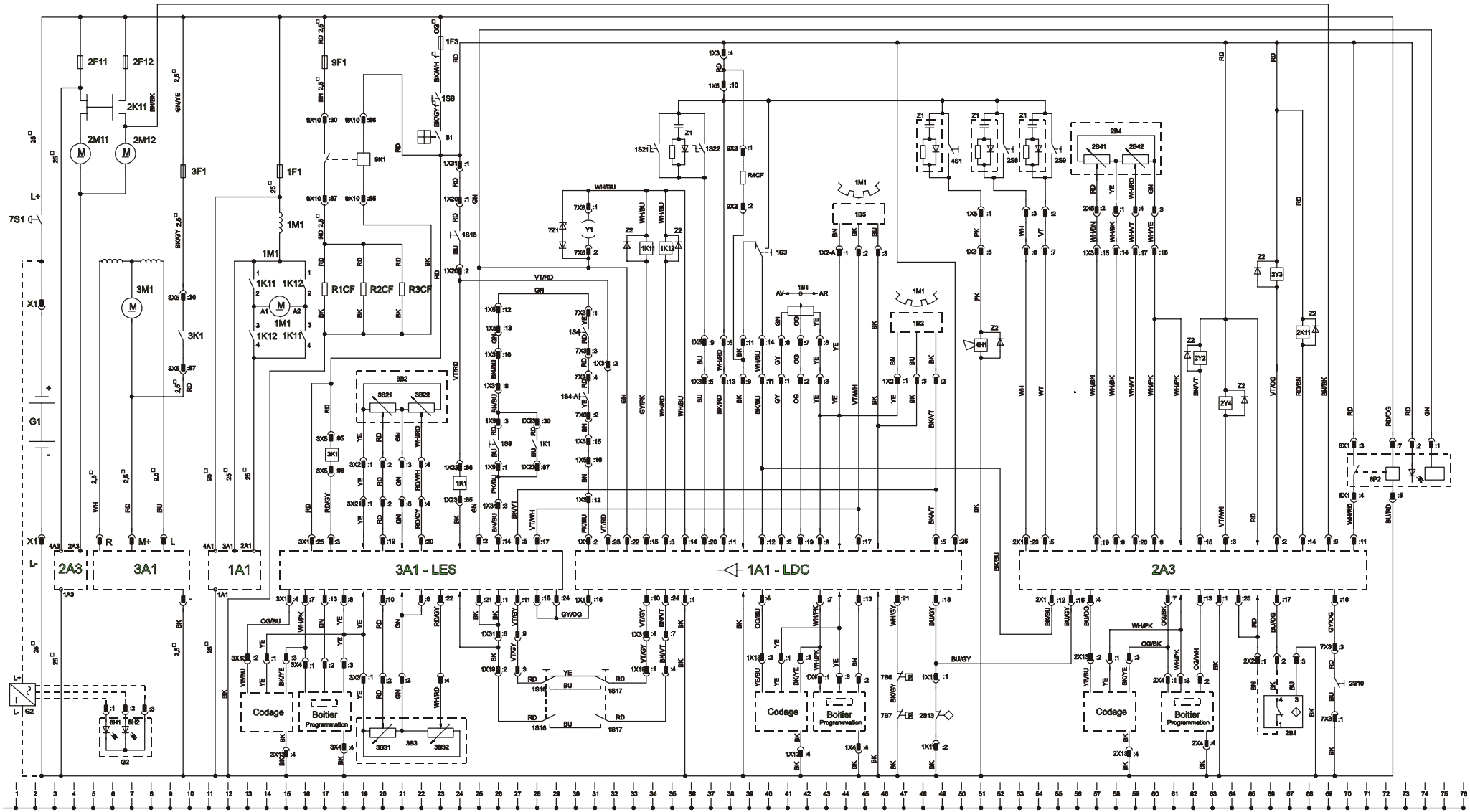

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