11. Troubleshooting and alarms

Troubleshooting

Symptom	Fault	Action
Truck does not move	Battery connector is unplugged.	Plug in the battery connector.
	Battery is empty.	Recharge the battery.
	Incorrect start (Alarm 79).	Release the tiller arm and recycle the key switch.
	Emergency stop button is activated.	Release the emergency stop button.
	Key switch is faulty.	Replace the switch. **Contact maintenance personnel.**
	Drive motor fuse has blown.	Check the connections and cables and replace the fuse. **Contact maintenance personnel.**
	Control circuit fuse has blown.	Check the connections and cables and replace the fuse. **Contact maintenance personnel.**
	Accelerator is faulty.	**Contact maintenance personnel.**
Lift pump does not run	Pump motor fuse has blown.	Check the connections and cables and replace the fuse. **Contact maintenance personnel.**
	Load handling switch is faulty.	Replace the switch. **Contact maintenance personnel**.
	Control unit is faulty.	**Contact maintenance personnel**.
Lifting functions improperly	Overload.	Reduce the load.
	Battery is empty.	Recharge the battery.
	Not enough oil in tank.	Add oil.
	Oil leak.	Check the joints and seals. **Contact maintenance personnel.**
	Pump is faulty.	**Contact maintenance personnel.**
	Dirt or wear in valves.	**Contact maintenance personnel.**
Battery does not charge	Charger is incorrectly connected.	Check the connection.
	Charger fuse has blown or main voltage is missing.	Check the connections and cables and replace the fuse. **Contact maintenance personnel**
	Battery cell's water level or specific gravity is low.	Check the cell voltages and specific gravity. Add water and/or acid when necessary. See section "Recharging the Battery" in chapter 7.

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4.9	Height of tiller arm in travel position (min./max.)	h14 [mm]	892/1371	892/1371	894/1374
4.15	Fork height, fully lowered	h13 [mm]	85	85(92)	85(92)
4.19	Overall length	l1 [mm]	1833	1816(1920)	1939(2044)
4.20	Powerhead length (to fork face)	l2 [mm]	683	666(770)	789(894)
4.21	Chassis (overall width)	b1/b2 [mm]	800	800	800
4.22	Fork dimensions (thickness/ width/ length)	s/e/l [mm]	64/165/1150	65/165(175)/1150	65/165(175)/1150
4.24	Forkcarriage width	b3 [mm]	566	684	684
4.25	Outside width over forks	b5 [mm]	540	550(560)	550(560)
4.32	Ground clearance, centre of wheelbase (forks lowered)	m2 [mm]	20	20	20
4.33	Working aisle width (Ast3), pallet 1000x1200 mm, load lengthwise	Ast3 [mm]	2104	2094(2194)	2210(2314)
4.33	Working aisle width (Ast), pallet 1000x1200 mm, load lengthwise	Ast [mm]	2340	2282(2492)	2398(2612)
4.34	Working aisle width (Ast3), pallet 800x1200 mm, load lengthwise	Ast3 [mm]	2104	2094(2194)	2210(2314)
4.34	Working aisle width (Ast), pallet 800x1200 mm, load lengthwise	Ast [mm]	2266	2220(2406)	2336(2526)
4.35	Turning radius (forks lowered)	Wa [mm]	1492	1324(1723)	1440(1843)
	PERFORMANCE				
5.1	Travel speed, laden / unladen	[km/h]	6,0/6,0 ***	6,0/6,0 ***	6,0/6,0 ***
5.2	Lifting speed, laden / unladen	[m/s]	0,10/0,15	0,13/0,21	0,15/0,24
5.3	Lowering speed, laden / unladen	[m/s]	0,25/0,21	0,26/0,21	0,24/0,24
5.8	Maximum gradeability, laden / unladen	[%]	8/15	8/15	8/15
5.10	Service brake	[s]	Magn.brake	Magn. brake	Magn. brake
	MOTORS				
6.1	Drive motor S2 60 min	[kW]	0,6	0,6	0,8
6.2	Lift motor S3 kW/%	[kW/%]	1,5 / 10	2,2 / 10	3,0 / 15
6.4	Battery voltage / capacity (5hr. rating)	[V/Ah]	24 / 160, 230	24 / 160, 230	24 / 270, 345
6.5	Battery weight	[kg]	153-200	153-200	230-275
	MISCELLANEOUS				
8.1	Speed control type		Stepless	Stepless	Stepless
8.4 **	Sound level at the driver's ear according to EN 12 053:2001 and EN ISO 4871, work sequence LpA	[dB (A)]	72	68	62
	Sound level at the driver's ear	[dB (A)]	73/78/0	69/74/0	66/66/0

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8. Maintenance

Only adequately trained truck operators and servicemen are allowed to carry out the daily and weekly check-up. The terms of the warranty prescribe appropriate maintenance of the truck. All spare parts must be original ones.

Safety instructions for maintenance

- Keep the service area clean. Oil, grease, and water make the floor slippery.
- Remove all rings, watches and other metal jewellery. If a metal object gets into contact with an electrically conductive part, a short-circuit or burn may result.
- Switch off the truck's power before opening the cover of the motor or the electrical system.
- Release the hydraulic pressure before opening the system.
- Dismount the seat for the duration of service work (applies only to sit-on trucks).
- Do not use your hands to check for oil leaks.
- Remember that the surfaces of the hydraulic system and the motors may be hot.
- Only use clean oil in the hydraulic system.
- When welding, always disconnect the battery and the electronic devices. Remove paint from a 10 cm radius from the welding point to avoid creating toxic gases during welding.
- The truck must always be supported on jacks if someone needs to work underneath it.

WARNING! *Do not make any alterations or repairs that can weaken the truck's structure or endanger safety.*

Daily checks

- Check the truck externally to see that there are no oil leaks.
- Check all wheels for damage or wear.
- Check the battery fluid in each battery cell. Top up with battery water if needed. The fluid surface should be about 15 mm above the plates. (Does not apply to maintenance-free batteries.)
- Check the gearbox for leaks. Also check the hydraulic pipes, hoses and connectors. No leaks or damage should be found.
- Switch on the power and test the operation of the lifting hydraulics by raising and lowering the forks.
- Check the operation of the accelerator and steering by driving slowly forward and backward.
- Check also the operation of the other electrical functions.
- Check that the batteries are charged and locked in place.
- Check the operation of the horn.
- Check that the emergency stop operates properly.
- Check that the safety button works.
- Check that the operating brake and the parking brake functions properly.
- Check the fastenings of the lifting chain (does not apply to pallet trucks).

Weekly maintenance

- Check and clean the battery cable fastenings.
- Ensure that the air holes of the battery cell plugs are not plugged up (does not apply to maintenance-free batteries).
- Clean the batteries with a dry rag.
- Check that the hydraulic system has no leaks.
- Check the hydraulic oil level in the oil tank. Add if necessary.
- Check that all the screws, nuts, and pipe connections are tight.
- Check that the fastening bolts of the driving wheel are tight.
- Check that the machine plates and labels are fastened securely and are fully legible.

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5. Driving instructions

Daily checks before operation

Carry out the daily maintenance check before using the truck. Neglecting daily maintenance may decrease the safety and reliability of the truck. Notify the site supervisor immediately if you notice an error or deficiency during the check.

- Check the truck externally to see that there are no oil leaks.
- Check all wheels for damage or wear.
- Check the battery fluid in each battery cell. Top up with battery water if needed. The fluid surface should be about 15 mm above the plates. (Does not apply to maintenance-free batteries.)
- Check the gearbox for leaks. Also check the hydraulic pipes, hoses, and connectors. No leaks or damage should be found.
- Switch on the power and test the operation of the lifting hydraulics by raising and lowering the forks.
- Check the operation of the accelerator and steering by driving slowly forward and backward.
- Also check the operation of the other electrical functions.
- Check that the batteries are charged and locked in place.
- Check the operation of the horn.
- Check that the emergency stop operates properly.
- Check that the safety button works.
- Make sure that the tiller arm returns to the up position and the parking brake functions properly.
- Check the fastenings of the lifting chain (does not apply to pallet trucks).

Before you start

- Make sure that the daily maintenance has been carried out.

Using the PIN code entry device (optional)

To be able to drive the truck, you need to activate it with the PIN code entry device. It can have up to 200 user codes and one master code.

NOTE *It is recommended to program one general code to the unit, so that, in the event of emergency, the truck can be activated and moved also by persons who do not have a PIN code of their own.*

To activate the truck, enter your PIN code and press **Enter** (4). The green indicator light (1) is lit.



NOTE *If you enter a wrong code three times, the keypad will be locked for 30 seconds.*

After use, switch off the power by pressing **Shutdown** (3). When the **Driver Present** mode is activated, the power can also be switched off automatically after a certain time if there is no driver input. This is a precaution to prevent unauthorised use.

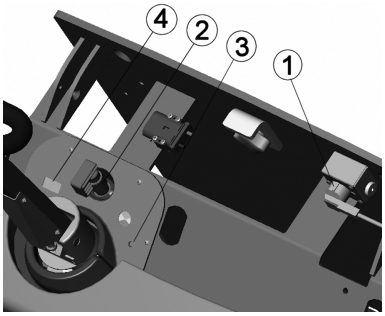
The PIN code entry device has two indicator lights. When you switch on the power from the main switch, the red light (2) will briefly illuminate. In normal operation they signal the following:

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4. Operating devices

Control panel

Connector of the inbuilt charger (1) (optional)



The battery can be charged using an inbuilt charger. See section "Battery charging with an inbuilt charger" in chapter 7, "Batteries". After charging, the charger connector must be connected to its own socket outlet, otherwise the truck cannot be used.

Main switch (key + emergency stop) (2)

The main switch connects the truck's electrical equipment to the battery circuit.

- The power is on when the switch is pulled up.
- The power is off when the switch is pushed down (power can still be connected to certain electronic devices).

NOTE *The switch also functions as an emergency stop. In the event of an emergency, the truck can be completely disconnected from the power source by unplugging the battery connector. The key can be removed only by pushing it down and then turning it counterclockwise.*

NOTE *Before carrying out electrical welding on the truck, disconnect the battery.*

"Power on" indicator light (3)

The green light indicates that the power is on. It also indicates possible faults in the truck. If the light blinks in a series of four flashes, the battery charge status is low, and you cannot raise the fork. If it blinks in any other way, contact the maintenance department.

Truck display (4)

The device displays level of battery charge, indication of operational hours and system alarm codes. It always functions when some of the electric devices are on.

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10. Transportation and storage

Transportation

Lifting the truck.



The truck can only be lifted from a marked position. Make sure that the capacity of the lifting device is sufficient.

NOTE *If the truck has more than one lifting position, all of the positions must be used during lifting the truck.*

Towing the truck. The truck can only be towed with its drive wheel raised from the floor.

Storage

If the truck is not used for a lengthy period of time, it should be stored in a cool (above 0°C) and dry place on an even surface. Before storage, complete the following:

- Charge the battery well, and recharge it every 2 or 3 months to prevent damage during storage. At the same time, check the fluid level and add more if necessary.
- Change the hydraulic oil if the machine is not used for more than a year.
- If the machine is not used for more than a week, support the truck in such a way that the load exerted on the drive wheel becomes lighter.

Returning the truck to operation. If the truck has been stored for several months, it must undergo maintenance as per 600 operational hours. Otherwise normal daily maintenance and inspection are sufficient.

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6. Load handling

Only transport a load when it has been loaded safely.

- Always drive the truck with its forks lowered.
- When the load is raised, steer and brake carefully.
- If the truck has side stabilizers, use them when loading and unloading. Raise them when driving.
- Do not let anyone, under any circumstances, walk or stand under the forks.
- Never place any part of your body between the mast structures or any moving parts of the truck.
- When carrying a load larger than the outlines of the truck, take into account the extra space it requires.
- Only handle undamaged loads.
- Place the load correctly.
- When driving the truck on slopes and ramps,
  - observe extreme caution.
  - Keep the forks and load down.
  - Drive straight with the load pointing uphill.
  - Drive at a low speed and anticipate other traffic.
- Do not overload.

Lifting capacity

The lifting capacity of the truck is printed on the capacity plate. Obey the maximum values for load weight and load center information in the different loading situations. Take into account the effect of any attachments on the lifting capacity.

WARNING! *Do not exceed the truck's maximum loading capacity under any circumstances, because there is always a risk of overturning.*

Pallet handling (pallet trucks)

To load:

- Drive towards the pallet with the forks lowered.
- Move forward until the forks are completely under the pallet.
- Raise the pallet so that it is clearly above the floor level.

To unload:

- Stop the truck.
- Lower the forks so that they disengage.
- Reverse from the unloading location.

Two-pallet handling (double stackers)

To load:

- Drive towards the first pallet with the forks and fork arms lowered.
- Move forward until the forks are completely under the pallet.
- Raise the pallet so that it is clearly above the second pallet.
- Drive towards the second pallet with the fork arms lowered.
- Move forward until the fork arms are completely under the pallet.
- Raise the pallet so that it is clearly above the floor level.

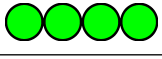
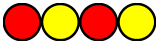
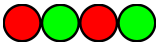
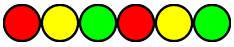
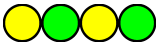
To unload:

- Stop the truck.
- Lower the fork arms so that they disengage.

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Alarms

In addition to the charging phase, the three-colour indicator light of the integrated charger also indicates possible faults related to charging. In the event of an alarm, the battery charger stops charging automatically.

Condition	Alarm type	Description (Action)
Flashing GREEN 	Timeout	The duration of the main charging time exceeds the given maximum. Verify the battery capacity.
Flashing RED-YELLOW 	Battery current	Loss of output current control (failure of the control logic). Replace the charger.
Flashing RED-GREEN 	Battery voltage	Loss of output voltage control (failure of the control logic). Replace the charger.
Flashing RED-YELLOW-GREEN 	Thermal	The charger is overheated. Verify the fan operation.
Flashing YELLOW-GREEN 	Selection	An unavailable configuration has been selected. Verify the selector's position.

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