

D Battery Maintenance, Charging & Replacement

1 Safety regulations for handling acid batteries

Park the truck securely before carrying out any work on the batteries (see Chapter E).

Maintenance personnel: Batteries may only be charged, serviced or replaced by trained personnel. The present operator manual and the manufacturer's instructions concerning batteries and charging stations must be observed when carrying out the work.

Fire protection: Smoking and naked flames must be avoided when working with batteries. Wherever a truck is parked for charging there shall be no inflammable material or operating fluids capable of creating sparks within 2 metres around the truck. The area must be well ventilated. Fire protection equipment must be provided.

Battery maintenance: The battery cell covers must be kept dry and clean. The terminals and cable shoes must be clean, secure and have a light coating of dielectric grease. Batteries with non insulated terminals must be covered with a non slip insulating mat.

Battery Disposal: Batteries may only be disposed of in accordance with national environmental protection regulations or disposal laws. The manufacturer's disposal instructions must be followed.



Before closing the battery door make sure that the battery lead cannot be damaged.



Batteries contain an acid solution which is poisonous and corrosive. Therefore, always wear protective clothing and eye protection when carrying out work on batteries. Above all avoid any contact with battery acid.

Nevertheless, should clothing, skin or eyes come in contact with acid the affected parts should be rinsed with plenty of clean water - where the skin or eyes are affected call a doctor immediately. Immediately neutralise any spilled battery acid.



Only batteries with a sealed battery container may be used.



The weight and dimensions of the battery have considerable effect on the operational safety of the truck. Battery equipment may only be replaced with the agreement of the manufacturer.

2 Battery types

The truck will be equipped with different battery types, depending on the application. The following table shows which combinations can be included as standard:

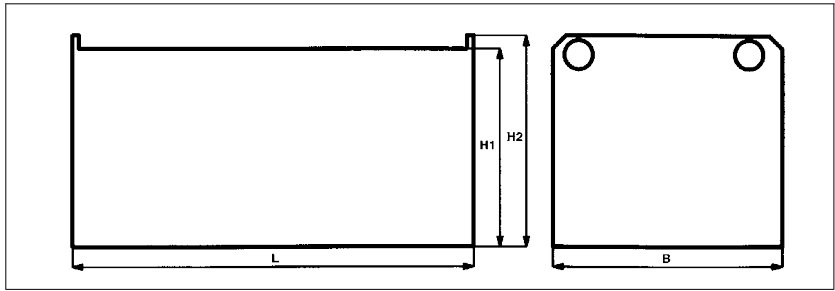
EFG 213	48 V - 4PzS 460 Ah battery
EFG 215	48 V - 4PzS 460 Ah battery
EFG 216k	48 V - 5PzS - 575 Ah battery
EFG 216	48 V - 6PzS 690 Ah battery
EFG 218k	48 V - 5PzS - 575 Ah battery
EFG 218	48 V - 6PzS 690 Ah battery
EFG 220	48 V - 6PzS - 690 Ah battery
EFG 316k	48 V - 5PzS - 575 Ah battery
EFG 316	48 V - 6PzS 690 Ah battery
EFG 318k	48 V - 5PzS - 575 Ah battery
EFG 318	48 V - 6PzS 690 Ah battery
EFG 320	48 V - 6PzS 690 Ah battery

The battery weights are indicated on the battery data plate.



When replacing/installing the battery make sure the battery is securely located in the battery compartment of the truck.

48 volt drive battery						similar to DIN 43531
Truck	Dimension inch (mm)				Rated weight (-5/+8%) in (kg)	
	L max.	W max.	H1 +/- 2 mm	H2 +/- 2 mm		
EFG 213/215	830	522	612	627	715	400 - 480 Ah
EFG 216k/ 218k/ 316k/318k	830	630	612	627	855	500 - 630 Ah
EFG 216/ 218/220/ 316/318/320	830	738	612	627	1025	600 - 720 Ah



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3 Battery removal and installation



To prevent short circuits, batteries with exposed terminals or connectors must be covered with a rubber mat. When replacing a battery with a crane, make sure the crane has sufficient capacity (see battery weight on the battery data plate on the container).

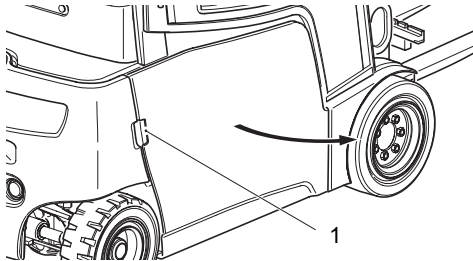
The battery plug and socket may only be withdrawn or connected when the main switch and the charging equipment are switched off.



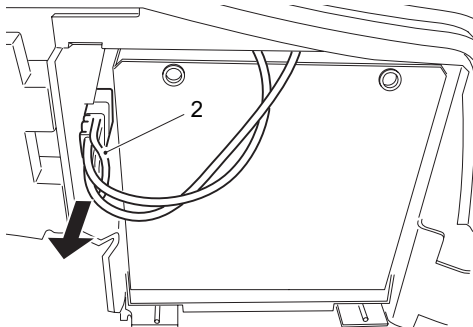
Park the truck securely, see "Parking the Truck Securely" in Chapter E.

3.1 Removal and installation using a multi-adapter (O)

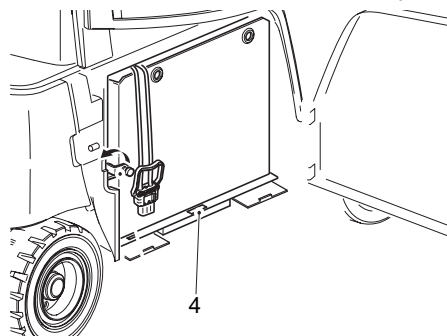
- Open the battery door (1) as far as the stop.



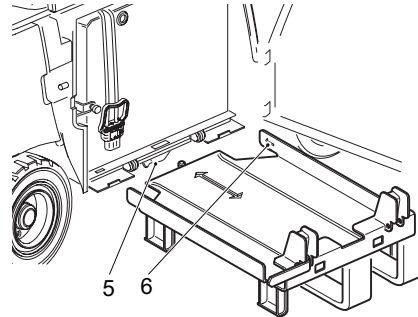
- Disconnect the battery.



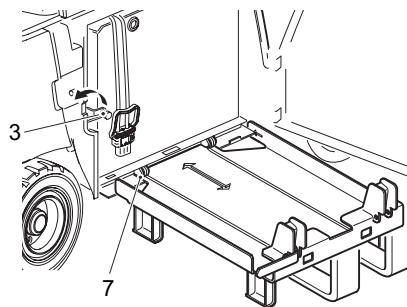
On trucks with a long battery lead fit the battery connector to the battery connector bracket (4).



- Push the lift truck with the multi-adapter as far as the stop (5) underneath the battery.
- Set the multi-adapter to the straight-ahead position using the alignment (6).



- Raise the lift truck until the multi-adapter is up to the height stop (7).
- Prevent the lift truck from rolling away.
- Undo the battery lock (3).

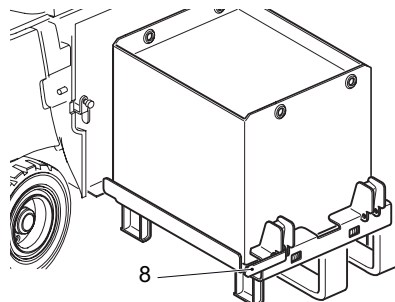


- Remove the battery.



The battery must engage fully with the safety catch (8).

- Lower the lift truck slightly to move it.
- Bring the battery to the charging station for charging.



Battery assembly is the reverse order.



Insert the battery in the battery compartment and at the same time undo the safety catch (8) with your foot.



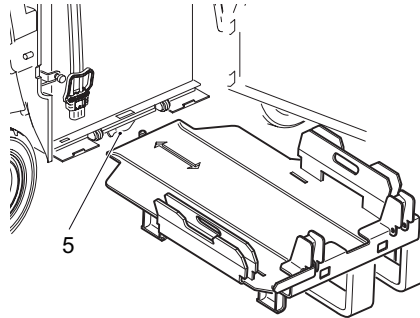
After inserting the battery close the battery lock and then lower the lift truck.

3.2 Removal and installation using a worktable for crane loading (○)

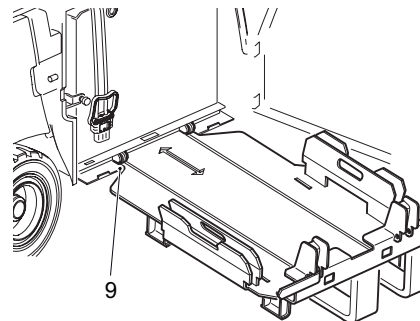
- Open the battery door as far as the stop.
- Disconnect the battery connector.

→ See “Removal and installation using a multi-adapter” (○)

- Push the lift truck with the worktable as far as the stop (5) underneath the battery.



- Raise the lift truck and worktable up to the height stop (9).

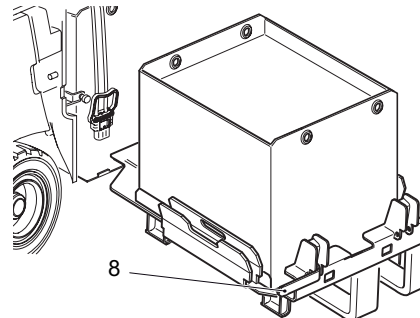


- Undo the battery lock.

- Remove the battery.

→ The battery must engage fully with the safety catch (8).

- Strap the crane lifting harness to the battery container. The hooks must be fitted in such a way that when the crane lifting harness is slackened, they do not fall onto the battery cells.
- Undo the safety catch (8) and lift out the battery for transporting to the charger station.



Battery assembly is the reverse order.

→ Insert the battery in the battery compartment and at the same time undo the safety catch (8) with your foot.

→ After inserting the battery close the battery lock and then lower the lift truck.

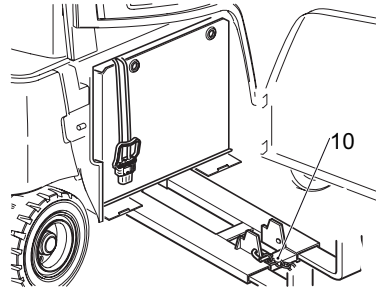
3.3 Removal and installation using a fork shoe (○)

- Open the battery door as far as the stop.
- Disconnect the battery connector.
- Undo the battery lock.

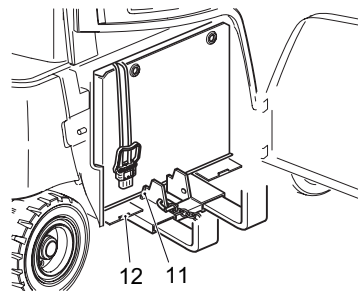


See “Removal and installation using a multi-adapter” (○)

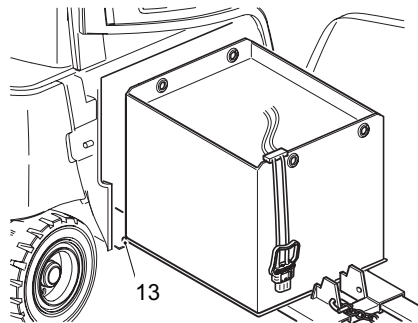
- Place the fork shoe onto the forks of a second lift truck with a minimum 1000 kg capacity and secure it to the fork carriage with a chain (10).
- Tilt the mast forward.



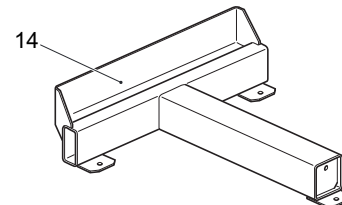
- Move the fork shoe up to the stop (11) underneath the battery.
- Raise the fork carriage until the battery is resting on the forks.
- Pull out the battery as far as the stop (12) on the truck chassis.



- Raise the fork carriage.
- Tilt the mast back fully and bring the battery to the charging station to be charged.



- Place the battery carefully onto the charging station (14).



Installation is the reverse order of removal. Make sure the rollers (13) on the battery are inserted into the guides in the battery compartment.

3.4 Removal and assembly for maintenance

- Open the battery door as far as the stop.
- Disconnect the battery connector.
- Undo the battery lock.



See “Removal and installation using a multi-adapter” (○)

- Place a standard hand pallet truck (800 mm fork length) under the battery.



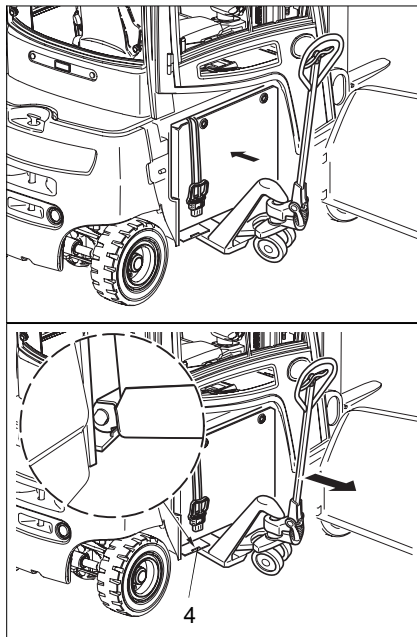
If the forks are longer they must be inserted 950 mm underneath the battery, measured from the fork tip. This must be indicated on the forks before removing the battery.

- Raise the battery with the hand pallet truck until the battery is resting on the forks and is not in contact with the chassis.
- Remove the battery for maintenance.



The battery is guided on rollers. Remove the rollers as far as the stop (4).

Installation is the reverse order of removal.



4 Charging the battery



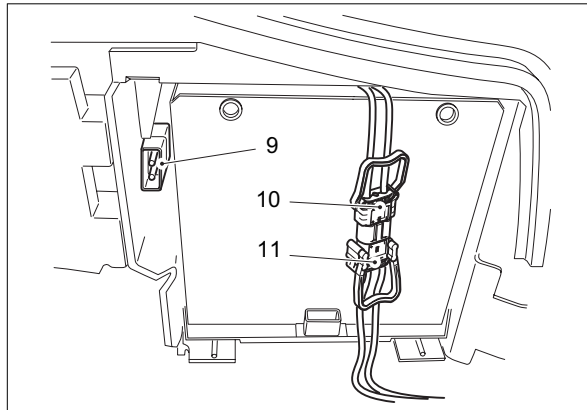
Only connect and disconnect the battery and charger when the charger is switched off.

To charge the battery, the truck must be dry and parked in closed and properly ventilated rooms. The battery door must remain at least 200 mm open to ensure adequate ventilation. Do not place any metal objects on the battery.

Before charging, check all cables and plug connections for visible signs of damage. All safety instructions as provided by the battery supplier and battery charger supplier must be strictly observed.

4.1 Charging the battery with a stationary charger

- Disconnect the battery connector (10) from the truck connector (9).
- Connect the battery connector (10) with the charging lead (11) of the stationary charger and turn on the charger.



4.2 Charging the battery with an on-board charger



The on-board charger consisting of a battery charger and battery controller must not be opened. If damaged, it must be replaced.

The charger must only be used for batteries supplied by Jungheinrich or other approved batteries provided it has been adapted by the manufacturer's service department. Batteries must never be swapped from truck to truck.

Mains connection

The mains lead may vary depending on the size of the on-board charger.

On-board charger with 65 Ah: 16 A; 230 V; 3 pin

On-board charger with 130 Ah: 16 A; 400 V; 5 pin



Only use mains leads with a maximum length of 30 m. If a cable reel is being used, it must be fully rolled up.

Only use original manufacturer's mains leads.

Insulation safety, acid and caustic ratings must comply with the manufacturer's mains lead.

Charging

- Open the battery door.
- Connect the on-board charger to the local mains socket using the mains cable.
- Charging begins automatically.
- When the truck is switched on the charging status and the residual capacity are shown on the display.

Battery charger LED displays

Green LED	Meaning
Flashing	Charging
Lit	Charging complete

Red LED	Meaning
Flashing	Error

Battery controller LED displays

White LED	Meaning
Flashing	Radio network activated

Blue LED	Meaning
Lit	Electrolyte level too low (measured after each charge)

Yellow LED	Meaning
Flashing rolling	Charging
Lit	Charge status

Red LED	Meaning
Flashing	Error

→ For display messages see “Pictograms and Display” in chapter E.

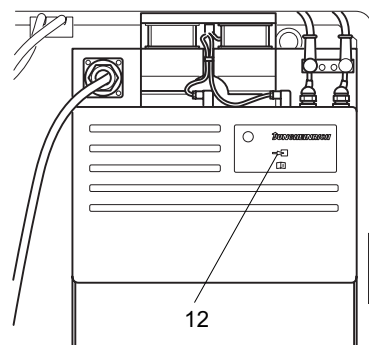
Float charge:

The float charge starts automatically when charging is complete.

Partial charging:

The charger is designed to automatically adapt to partially charged batteries. This keeps battery wear to a minimum.

→ If you need to interrupt a charge, press button (12). Remove the mains connector only when the green LED goes out. Charging recommences when the mains lead is connected back to the mains socket.



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