CROWN



Service Manual

Wartungshandbuch
Manuel de maintenance

WP2000 Series

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ZAPI SEM Zero Traction Controller

DANGER

Jack up the truck before carrying out repair work or troubleshooting the electrical system.

General

The programmable ZAPI SEM Zero impulse controller provides effective control over the driving behaviour of the truck.

The truck is powered by a separate excited motor (SEM). This version has two variables for governing the motor output: field and armature current.

Precautionary Measures

- Do not attach the controller to a battery with a different rated voltage to that of the controller (24 - 36 VDC).
  A higher battery voltage may destroy the MOSFETs, while a lower power supply will result in system failure.
- Only operate the controller with special traction batteries. Do not connect to a rectifier or mains components.
- When commissioning jack up the truck to prevent it from starting suddenly if there is a wiring error.
- When the key switch has been turned off the filter capacitors in the controller remain charged for a few minutes. If work is performed on the controller during this time it must be disconnected from the battery (disconnect battery). Finally, to discharge the capacitors short-circuit the positive and negative terminals of the power part together over a resistance (10 - 100 Ohm, min. 5 W) for a few seconds.

Operational Features

Speed Control

Stepless, handset programmable speed control in both directions.

Reduced Speed Ranges

Two reduced speed ranges are available: slow travel (via a toggle switch HSS in the multitask handle) and the special travel zone (depending on the multitask handle position, activated by a microswitch ORS integrated within the multitask handle).

Downhill Speed Control

When travelling downhill the controller monitors the motor anchor speed via the drive signal from the traction potentiometer. When the set speed is exceeded, electrical braking with energy retention is introduced.

Regenerative Braking

Three forms of regenerative braking are available:

- Release braking (travel switch or multitask handle return to neutral)
- Inversion braking (travel switch set in opposite direction)
- Braking by reducing speed on a slope: the controller constantly regulates the engine speed according to the set value prescribed by the travel switch. Braking is automatically activated when the set value is exceeded.

Anti - Roll Down Function

This function prevents the truck from accidentally rolling down a slope. When the key switch is on the controller monitors the engine speed. If it detects a turning movement without a travel command, braking is automatically activated.

If the truck automatically starts to move on a slope, it therefore brakes after a short period. When the truck stops braking is released causing the truck to move again, followed by further braking. If the brake is not applied the truck will therefore move down the slope very slowly.

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Battery

General

The condition of the battery considerably affects the output and behaviour of the truck. Proper maintenance enhances the performance and service life of the battery.

Only service the battery in accordance with the manufacturer's instructions.

The respective manufacturer's maintenance manual is provided with all batteries supplied by Crown.

Operation

During discharge the battery connector is connected to the truck circuit. During charging, it is connected to the charger.

Make sure that the battery connector is not disconnected when the truck is in use and that there is a fixed connection between the connector halves during truck operation and when the battery is being charged. A poor connection will cause the contacts to burn and damage the operation and charging capacity of the battery.

Reading the Electrolyte Level

Check the electrolyte level on the surface of the battery fluid before adding destilled water.

The electrolyte density is the most reliable indicator of the battery's condition. When checking it, make sure that sufficient electrolyte is suctionned into the glass tube so that the floating body can swim freely when the acid tester is held vertically.

To compensate for loss of electrolyte use destilled water only. Replenish at regular intervals irrespective of the ambient temperature (see maintenance schedule in Section M1.2).

The battery plates must be covered. Never overfill the battery as wet and dirty cell lids lead to leak current and can thus reduce battery power. Overfilling can also lead to corrosion of the battery terminals and damage to the battery housing.

Excessive loss of electrolyte indicates a faulty battery, e.g. due to over-charging, total discharge, leak current from individual battery cells etc.

Replacing the Battery

WARNING

Only use batteries which comply with the dimension, weight and capacity requirements for this truck.

- *An incorrect tbattery can damage the truck.*
- *Incorrect weight and dimensions alter the truck centre of gravity. This can result in accidents and will invalidate the warranty.*

To replace the battery use either a battery trolley or a crane with sufficient capacity.

Removing the Battery

- Apply the handbrake.
  The multitask handle is vertical.
- Switch off the truck and remove the key.
- Open the battery compartment lid (see Fig. M1461).
- Remove the battery connection and put the battery cable in a safe place.
- Securely fit the appropriate lifting equipment.
- Using an appropriate lifting mechanism lift the battery out of the truck and rest it securely.
- Install the charged battery in the reverse order.



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