Event Messages

This display units shows a four-digit event message for every event. Trucks that only use one luminous display (e.g. LED) show the event through a flashing code (see "Display System").
Each event message is also stored in the master logbook. The master logbook describes the event in more detail through the sub index behind the event message (**FEXX**).

Event numbering display

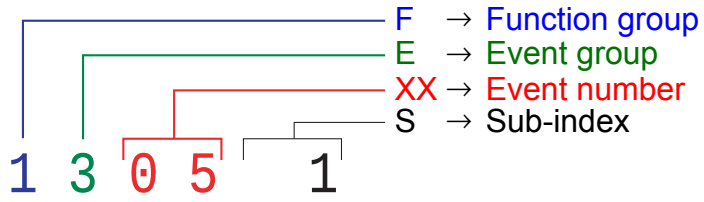
F E XX S

F → Function group; **E** → Event group
XX → Event number **S** → Sub index

The first two characters "**F**, **E**" refer to the category. The middle two digits "**XX**" refer to the event. From these two digits the range:

- 1 to 50 describes standard events (uniform basic events) which can occur in any function group.
- 51 to 99 describes specific events.

The event is described in further detail through the last characters "**S**" (single digit / multi-digit).
This process ensures that a unique number is assigned to each event. Example:



Sub-division of function group "F"

0	System: Overlapping functions that cannot be assigned to any other function group) Example: seat switch / deadman switch or master controller
1	Travel
2	Hydraulics (load handling)
3	Steering and travel
4	Displays/controls, interface
5	Charger (either on-board or external charger)
6	Reserved
7	Reserved
8	Reserved
9	Special functions Example: ISM

Sub-division of event group “E”

0	Fault reset or no fault
1	General fault / additional functions Example: Logic error, e.g. both directions selected simultaneously
2	Current (input interface, device-internal, output interface)
3	Voltage (input interface, device-internal, output interface)
4	Temperature
5	Hardware Example: Output transformer short circuit, EEPROM not responding, …
6	Software (internal software, application software, data record / parameters) Example: EEPROM data error
7	Additional modules
8	CAN monitoring
9	External fault Example: ISM

Display system

The system distinguishes between:

- event messages caused by operator errors.
- event messages caused by truck errors.

For operator errors there are three versions that can be displayed in the truck depending on the display unit options.

- Event number display (e.g. CANDIS)
- Pictogram display
- Text message display

For truck errors the event number and possibly a fault graphic icon (e.g. service key) will also be displayed.

Trucks that only use one luminous display (e.g. LED) use the following flashing code:

- Each character of the four-digit event number is shown with a 2 Hz / 0.5 sec frequency (flashing).

➔ The figure “zero” is displayed by flashing ten times.

- After each character of the four-digit event message there is a pause (LED off) of one second.
- After the complete four-digit event message a 3 second pause (LED off) is set.

Description / cause / action and effects

The following table lists the event message with a description / cause / action and effect.
Each event group (**E**) with the corresponding event number (**XX**) can be combined with different function groups (**F**), hence in the following table **the placeholder "F" is used for the first character "F" of the four-digit event number**.
It also shows the operating status when the event occurred:

Operating status	Explanation
Bootloader	Occurs during / directly after truck power up (basic initialisation of components, possible change to flash mode). Example: Checking the RAM / ROM (memory check)
System start	Occurs during installation of operating software of individual components. Example: correct hardware installed, ...
Self test	Occurs during the self-test of each component, as coordinated by the master → The main contactor is then closed
Operation	Occurs during operation
System end	Occurs during truck power-down (correct powering down of components, …)
Undefined	Can occur at any time

“Event messages” table

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	01	1	System start	Supply via unexpected key switch input	Evaluation of three key switch inputs. Possible encodings are 1, 2 or 4, otherwise the event message is triggered.	- Check key switch input connection against the wiring diagram; - Replace controller;
_	1	02	1	Self test	Contact closed instead of open	On power-up the capacitor voltage should be one volt (1 V) below the battery voltage.	- Test the main contactor output of the controller; - Check wire connection; - Replace contactor;
_	1		2	Self test	Contact open instead of closed	When the main contactor has switched on the capacitor voltage should be the same as the battery voltage (within 500 msec.), otherwise the event message is produced.	- Test the main contactor output of the controller; - Check wire connection; - Replace contactor;
_	1		3	Self test	Main contactor permanently on	respectively for t = 100 msec.: U_capacitor >= U_key - 3 V, if a) Monitoring processor tries to open the main contactor and if a) Control processor tries to open the main contactor	- Replace controller;
_	1		4	Self test Operation	Main contactor feedback input implausible	Feedback signal from main contactor status implausible with main contactor control (error activated after limit time)	- Test the main contactor output of the controller; - Check wire connection; - Replace contactor;
_	1	03	1	Self test	Output transformer faulty (phase U)	The semi-jumpers 1, 2 and 3 are controlled in turned for 50 msec at 25% PWM (pulse width modulation) when the output transformer is closed (“Output transformer deactivated” signal). The event message is issued if at the end of the 50 msec period of the respective phase the following applies: $V_{Phase\_X} < (V_{capacitor} / 2) - 25\%$	- Replace controller;
			2	Self test	Output transformer faulty (phase V)		
			3	Self test	Output transformer faulty (phase W)		

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	04	1	Self test	Output transformer faulty (phase U)	Semi-jumpers 1, 2 and 3 are controlled in turn for 50 msec at 25% PWM (pulse width modulation). The event message is issued if at the end of the 50 msec period of the respective phase the following applies: $V_{Phase\_X} > (V_{capacitor} / 4)$ 25% or $V_{Phase\_X} < (V_{capacitor} / 4)$ - 25%	- Replace controller;
			2	Self test	Output transformer faulty (phase V)		
			3	Self test	Output transformer faulty (phase W)		
_	1	04	4	Operation	Error bit set for power stage ID	"Error, power stage ID : The power card of the power stage can only obtain faulty information (ID) about the identity and hence suitability of the card for the intended powering of the operating system when the error bit is set"	- Replace controller;
_	1	05	1	Self test	Motor cutout	Semi-jumpers 1, 2 and 3 are controlled in turn for 50 msec at 25% PWM (pulse width modulation). The event message is issued if at the end of the 50 msec period of at least one of the two non-controlled phases the following applies: $V_{Phase} > (V_{capacitor} / 4)$ 25% or $V_{Phase} < (V_{capacitor} / 4)$ - 25%	- Check motor connection wire (wire breakage); - Replace motor;
_	1	05	2	Self test	"Combi controller behaviour for non-controlled power stages" logic implausible	Semi-jumpers 1, 2 and 3 of a combi controller power part are controlled in turn for 50 msec at 25% PWM (pulse width modulation). The event message is issued if at the end of the 50 msec period of at least one of the semi-jumpers of the other power part the following applies: $V_{Phase\_X} > (V_{capacitor} / 2) + 15\%$ or $V_{Phase\_X} < (V_{capacitor} / 2) - 15\%$	- Switch the truck off and on again; - Check the motor connections; - Check for a short between two power stages or motors; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	06	1	Operation	Safety switch inputs implausible	The safety switch consists of a NC and a NO contact. When the button is pressed both contacts connect simultaneously. As a result, only the 0/1 and 1/0 combinations should occur. During operation combinations 0/0 and 1/1 (500 msec.) trigger the event message. For a valid combination (0/1 or 1/0, 500 msec) the event message and the truck response are reset. For an implausible condition the seat switch is considered to be open (-> the truck brakes with the coasting ramp).	- Check safety switch wire connection; - Check safety switch; - Replace safety switch; ➔ Safety switches can include: - Deadman (foot switch), - Seat switch, - Tiller switch.
_	1	06	2	Operation	Deadman switch inputs implausible	During operation combinations 0/0 and 1/1 trigger the event message. The event message can only be reset by resetting the truck. The activation limit is 2000 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	06	3	Operation	Slack chain safety device inputs implausible	During operation combinations 0/0 and 1/1 trigger the event message. For a valid combination (0/1 or 1/0), the event and the truck response are reset. The activation limit is 1000 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	06	4	Operation	Cabin gate inputs implausible	During operation combinations 0/0 and 1/1 trigger the event message. For a valid combination (0/1 or 1/0), the event and the truck response are reset. The activation limit is 2000 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	06	5	Operation	Optional cabin gate inputs implausible	During operation combinations 0/0 and 1/1 trigger the event message. For a valid combination (0/1 or 1/0), the event and the truck response are reset. The activation limit is 2000 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	06	6	Operation	Sideshift index inputs implausible	During operation combinations 0/0 and 1/1 trigger the event message after a traverse path of more than 30mm. For a valid combination (0/1 or 1/0), the event and the truck response are reset. The activation limit is 0 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	06	7	Operation	Aisle recognition right inputs implausible	During operation combinations 0/1 and 1/0 trigger the event message after the truck has travelled more than 100mm. The event message can only be reset by resetting the truck. The activation limit is 100 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	06	8	Operation	Aisle recognition left inputs implausible	During operation combinations 0/1 and 1/0 trigger the event message after the truck has travelled more than 100mm. The event message can only be reset by resetting the truck. The activation limit is 100 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	06	9	Operation	Load handling inputs: no signal	During operation combinations 0/0 and 1/1 trigger the event message. The event message can only be reset by resetting the truck. The activation limit is 2000 msec.	- Check wiring with multimeter; - Test sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	06	10	Operation	Load sensing inputs: no signal	If the weight display > 300 kg the load sensors must be applied. The event message can only be reset by resetting the truck. The activation limit is 2000 msec.	- Check wiring with multimeter; - Test sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	06	11	Operation	Logic test: signal at working platform raised inputs improbable	During operation combinations 0/0 and 1/1 trigger the event message. The event message can only be reset by resetting the truck. The activation limit is 2000 msec.	- Check wiring with multimeter; - Test sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	06	12	Operation	Logic test: signal at left/right gate lock inputs improbable	During operation combinations 0/1 and 1/0 trigger the event message. The activation limit is 2000 msec.	- Check wiring with multimeter; - Test sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	06	13	Operation	Logic test: No signal for gate lock despite gate lock being applied	During operation no feedback triggers the message when applied. The activation limit is 2000 msec.	- Check wiring with multimeter; - Test sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	06	14	Operation	Logic test: Signal for gate lock present despite gate lock not being applied	During operation a feedback triggers the message without being applied. The activation limit is 2000 msec.	- Check wiring with multimeter; - Test sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	06	15	Operation	Logic test: No signal for gate lock despite the lift mechanism being above the set height	During operation no feedback triggers the message when lift mechanism is above the set height. The activation limit is 2000 msec.	- Check wiring with multimeter; - Test sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	07	1	Operation	Operator protection switch inputs implausible	The body protection switch consists of a NC and a NO contact. When the button is pressed both contacts connect simultaneously. As a result, only the 0/1 and 1/0 combinations should occur. During operation combinations 0/0 and 1/1 (500 msec.) trigger the event message. For a valid combination (0/1 or 1/0, 500 msec) the event message and the truck response are reset.	- Check wire connections; - Check operator protection switch; - Replace operator protection switch;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	07	2	Operation	Acknowledge button inputs implausible	During operation combinations 0/0 and 1/1 (500 msec.) trigger the event message. For a valid combination (0/1 or 1/0, 500msecs) the event and the truck response are reset.	- Check wire connections; - Check button; - Replace button;
_	1	08	1	Operation	Touch mode switch inputs implausible	The touch mode button consists of a NC and a NO contact. When the button is pressed both contacts connect simultaneously. As a result, only the 0/1 and 1/0 combinations should occur. During operation combinations 0/0 and 1/1 (500 msec.) trigger the event message. For a valid combination (0/1 or 1/0, 500 msec) the event message and the truck response are reset.	- Check wire connection; - Check touch mode button; - Replace touch mode button;
_	1	08	2	Operation	"Crawl speed redundant inputs" logic implausible	During operation combinations 0/0 and 1/1 (500 msec.) trigger the event message. For a valid combination (0/1 or 1/0, for 500 msec.) the event and truck response are reset. The status is assessed as an actuated status (adjustable crawl speed active)	- Check wire connections; - Check crawl speed button; - Replace crawl speed button;
_	1	08	3	Operation	“Stop" button redundant inputs” logic improbable	The "Stop" button consists of an NC and an NO contact. When the button is pressed both contacts switch simultaneously. As a result, only the 0/1 and 1/0 combinations should occur. During operation the combinations 0/0 and 1/1 (500 msec) trigger the event message. For a valid combination (0/1 or 1/0, 500 msec) the event message and the truck's response are reset.	- Check parameter reading (side pedestrian mode activated?); - Check wire connections; - Press "Stop" button; - Replace "Stop" button;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	09	1	Operation	Weigher button inputs implausible	The weigher button consists of a NC and a NO contact. When the button is pressed both contacts connect simultaneously. As a result, only the 0/1 and 1/0 combinations should occur. During operation combinations 0/0 and 1/1 (500 msec.) trigger the event message. For a valid combination (0/1 or 1/0, 500 msec) the event message and the truck response are reset.	- Check wire connection; - Check weigher button; - Replace weigher button;
_	1	10	1	Operation	Lift/lower digital setpoints are invalid	During operation the combination 1/1 for both buttons pressed simultaneously for 500 msec triggers the following event message. For a valid combination (0/0, 0/1 or 1/0 [button not pressed / only one button pressed]; 500 msec) the event message and the truck response are reset.	- Check wire connection; - Check button; - Replace button;
_	1	10	2	Operation	Lift/lower analog setpoints are invalid	During operation the limits for 1/1 [both buttons pressed simultaneously] for 500 msec have been exceeded. For a valid combination (0/0, 0/1 or 1/0 [button not pressed / only one button pressed]; 500 msec) the event message and the truck response are reset.	- Check wire connection; - Check button; - Replace button;
_	1	11	1	Operation	Braking setpoint and release contact implausible	The event message is triggered if the following applies for T = 250msec: $V_{brake\ pedal}$ < 12.5% and Logic signal release contact = 1	- Check wire connection; - Check pedal power supply; - Replace pedal; - Replace signal-evaluating controller;
_	1	11	2	Operation	Braking setpoint and release contact implausible	The event message is triggered if the following applies for T = 250msec: $V_{brake\ pedal}$ > 25% and Logic signal release contact = 0	- Check wire connection; - Check pedal power supply; - Replace pedal; - Replace signal-evaluating controller;
_	1	11	3	Operation	Braking setpoint and full brake contact implausible	The event message is triggered if the following applies for T = 250msec: $V_{brake\ pedal}$ < 65% and Logic signal full brake contact = 1	- Check wire connection; - Check pedal power supply; - Replace pedal; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	11	4	Operation	Braking setpoint and full brake contact implausible	The event message is triggered if the following applies for T = 250msec: $V_{brake\ pedal}$ > 80% and Logic signal full brake contact = 0	- Check wire connection; - Check pedal power supply; - Replace pedal; - Replace signal-evaluating controller;
_	1	11	5	Operation	Combination "brake setpoint" against brake pressure invalid (movement without brake pressure)	for T = 250 msec.: ($V_{brake\ pedal}$ > 80%) and brake pressure < 40 bar	- Check brake fluid level; - Check proximity sensor; - Check pressure sensors;
_	1	11	6	Operation	Combination "brake setpoint" against brake pressure invalid (brake pressure without movement)	for T = 250 msec.: ($V_{brake\ pedal}$ < 20%) (>TV)) and brake pressure > 20 bar	- Check brake fluid level; - Check proximity sensor; - Check pressure sensors;
_	1	12	1	Operation	Travel setpoint and release contact invalid	The event message is triggered if the following applies for T = 250msec: $V_{accelerator\ pedal}$ < 12.5% and Logic signal release contact = 1	- Check wire connection; - Check accelerator pedal/tiller arm power supply; - Replace accelerator pedal / tiller arm; - Replace signal-evaluating controller;
_	1	12	2	Operation	Travel setpoint and release contact invalid	The event message is triggered if the following applies for T = 250msec: $V_{accelerator\ pedal}$ > 25 % and Logic signal release contact = 0	- Check wire connection; - Check accelerator pedal/tiller arm power supply; - Replace accelerator pedal / tiller arm; - Replace signal-evaluating controller;
_	1	12	3	Operation	Total voltage "Travel1 setpoint" to "Travel2 setpoint" invalid	for T = 250msec: (V_accelerator pedal1 +V_accelerator pedal2 > 5.5V or V_accelerator pedal1 +V_accelerator pedal2 < 4.5V)	- Check wire connection; - Check accelerator pedal/tiller arm power supply; - Replace accelerator pedal / tiller arm; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	13	1	Operation	Travel direction 1 and travel direction 2 invalid	During operation the combination 1/1 [both travel direction switch / button / twin pedal pressed] for 500 msec triggers the following event message. For a valid combination (0/0, 0/1 or 1/0 [travel direction switch/button/twin pedal not pressed or only one travel direction switch/button/twin pedal pressed]; 500 msec) the event message and the truck response are reset.	- Check wire connection; - Check travel direction switch/button/twin pedal; - Check travel direction switch/button/twin pedal; - Replace signal-evaluating controller;
_	1	14	1	Self test	Motor speed signal implausible	Logic test: after a short period of motor control, the speed sensor does not supply any signals	- Rectify mechanical blockage of drive system; - Check speed sensor power supply; - Check wire connection; - Replace speed sensor; - Replace signal-evaluating controller;
_	1	15	1	Operation	Motor powers without setpoint	Motor powered for 500 msec without setpoint. Logic: implausible status in controller	- Check motor connections; - Check motor model, replace if necessary;
_	1	15	2	Operation	Motor powers without setpoint	Convergence problem in monitor for the motor speed Logic: implausible status in monitor	- Check motor connections; - Check motor model, replace if necessary;
_	1	16	1	Operation	Irregular speed signal	Jump from n_motor > 10% to n_motor < 1% and for T = 80 msec. the following applies: n_motor < 1%	- Check speed sensor power supply; - Check wire connection; - Replace speed sensor; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	16	2	Operation	Irregular speed signal (large jump in evaluated speed signal)	Incrementer damaged The AC-3 Power Control (U8) has identified the sensor bearing as being damaged. The AC-3 Power Control (U8) monitors sensor to ensure the impulse wires are single-channel, and to check for sudden changes in the pulse rate and for constant power supply. Sensor is damaged (broken wire, short circuit, incorrect pulses); Operating system wrongly flags a fault; AC-3 Power Control component (sensor bearing control) is faulty Jump from n_Motor> 10 % to n_Motor< 1 % and For T = 80 msec.: n_motor< 1%	- Check incrementer signals with multimeter; - Check speed sensor power supply; - Check wire connection; - Replace speed sensor; - Replace signal-evaluating controller;
						No signals from incremental transmitter 1B5.	- Manually move the shuttle to the channel start, remove any blockage (use recovery vehicle); - Reduce load on shuttle; - Drive: check setpoint specification, motor controller 9U19 and drive motor including carbon brushes and incremental transmitter 1B5; - Check wire connection; - If the shuttle is overloaded, increase the travel speed;
_	1	17	1	Operation	A speed sensor channel does not pulse	Both speed sensor tracks are counted. When the first deviation limit is reached the system waits for a feasible signal from the suspected broken track. When the second limit is reached the event message is generated.	- Check speed sensor incrementer channels; - Replace speed sensor; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	17	2	Operation	A speed sensor channel does not pulse	Incrementer damaged The AC-3 Power Control (U8) has identified the sensor bearing as being damaged. The AC-3 Power Control (U8) monitors sensor to ensure the impulse wires are single-channel, and to check for sudden changes in the pulse rate and for constant power supply. Sensor is damaged (broken wire, short circuit, incorrect pulses); Operating system wrongly flags a fault; AC-3 Power Control component (sensor bearing control) is faulty Both sensor tracks are counted. When the first deviation limit is reached the system waits for a feasible signal from the suspected broken track. When the second limit is reached the event is generated.	- Check incrementer signals with multimeter; - Check speed sensor power supply; - Check wire connection; - Replace speed sensor; - Replace signal-evaluating controller;
_	1	17	3	Operation	No speed signal from the travel impulse sensor although travel sensor indicates greater than 0.5 km/h.	The counts for both incrementers are compared. If the travel incrementer supplies a speed signal of > 0.05 km/h and the travel pulse contact controller incrementer a speed signal of 0 km/h, the event is triggered. The activation limit is 100 msec.	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	4	Operation	No speed signal from travel sensor although travel impulse sensor indicates greater than 0.5 km/h.	The counts for both incrementers are compared. If the travel incrementer supplies a speed signal of 0 km/h and the travel pulse contact controller incrementer a speed signal of > 0.05 km/h, the event is triggered. The activation limit is 100 msec.	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	5	Operation	Deviation of more than 0.25 km/h between travel impulse sensor and travel sensor	The counts for both incrementers are compared. If the speed signals of both incrementers differ by more than 0.025 km/h, the event is triggered. The activation limit is 100 msec.	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	17	6	Operation	Directions obtained from travel sensor and travel impulse sensor are contradictory	The counts for both incrementers are compared. If the speed of both incrementers > 0.01 km/h and the directions of the speed signals for both incrementers are contradictory, the event is triggered. The activation limit is 100 msec.	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	7	Operation	One incremental track height measurement of the proportional lift pulses, the other does not	Both sensor tracks are counted. When the first deviation limit is reached the system waits for a feasible signal from the suspected broken track. When the second limit is reached the event is generated.	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	8	Operation	One incremental track height measurement of the free lift pulses, the other does not	Both sensor tracks are counted. When the first deviation limit is reached the system waits for a feasible signal from the suspected broken track. When the second limit is reached the event is generated.	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	9	Operation	One incremental track height measurement of the auxiliary lift pulses, the other does not	Both sensor tracks are counted. When the first deviation limit is reached the system waits for a feasible signal from the suspected broken track. When the second limit is reached the event is generated.	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	10	Operation	Main lift does not lower despite the hydraulic motor turning	The counts for both incrementers are compared. If the lift controller incrementer supplies a speed signal, but the lift height measurement incrementer does not supply a signal after one second, the event is triggered. The activation limit is 20 msec.	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	11	Operation	Main lift lowers despite the hydraulic motor not turning	The counts for both incrementers are compared. If the lift height measurement incrementer supplies a speed signal, but the lift controller incrementer does not supply a signal after one second, the event is triggered. The activation limit is 20 msec.	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	17	12	Operation	Excessive deviation between lift speed and pump speed	The counts for both incrementers are compared. If the incrementers for the lift control and lift height measurement are not synchronised within three seconds, the event is triggered. The activation limit is 100 msec.	- Check the hydraulic system for leaks; - Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	13	Operation	Proportional lift incrementer 1: One channel defective	Channel A or channel B are defective on the incrementer	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	14	Operation	Proportional lift incrementer 2: One channel defective	Channel A or channel B are defective on the incrementer	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	15	Operation	Free lift incrementer 1: One channel defective	Channel A or channel B are defective on the incrementer	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	16	Operation	Free lift incrementer 2: One channel defective	Channel A or channel B are defective on the incrementer	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	17	Operation	Aux. lift incrementer 1: One channel defective	Channel A or channel B are defective on the incrementer	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	18	Operation	Logic test: Main lift does not lower despite pump rotating	The counts for both incrementers are compared. If the lift controller incrementer supplies a speed signal, but the lift height measurement incrementer does not supply a signal after one second, the event is triggered. The activation limit is 20 msec.	- Check incrementer signals with multimeter; - Check wiring with multimeter; - Replace speed sensor;
_	1	17	19	Operation	LH load wheel sensor incrementer deviation	Incorrect counting detected between ChA and ChB.	- Check sensor / magnet assembly; - Replace sensor;
_	1	17	20	Operation	RH load wheel sensor incrementer deviation	Incorrect counting detected between ChA and ChB.	- Check sensor / magnet assembly; - Replace sensor;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	17	21	Operation	LH load wheel sensor excessive deviation from reading to drive wheel	Incorrect counting detected between LH load wheel sensor and drive wheel incrementer.	- Check sensor / magnet assembly; - Check tyre quality; - Replace sensor;
_	1	17	22	Operation	RH load wheel sensor excessive deviation from reading to drive wheel	Incorrect counting detected between RH load wheel sensor and drive wheel incrementer.	- Check sensor / magnet assembly; - Check tyre quality; - Replace sensor;
_	1	17	23	Operation	Three channel incrementer comparison with sensor bearing incrementer	The sensor bearing and three channel incrementer are synchronised with respect to each other every 120 mm. The error is generated if the sensor bearing deviates from the three channel sensor by >= 5 mm.	- Test the electrical function of the sensor bearing - Test the mechanical function of the sensor bearing
_	1	18	1	Undefined	Speed sensor in load wheel sensor damaged	This event message is not currently used.	- Check speed sensor power supply; - Check wire connection; - Replace speed sensor; - Replace signal-evaluating controller;
_	1	19	1	Operation	Cabin position implausible	For T >= limit time: detection of a status change of the lower limit platform sensor from the zero position to the "platform raised" position during travel	- Check wiring from controller to platform lower limit sensor; - Check / replace lower limit sensor; - Check lift motor power cables; - Replace the signal-generating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	20	1	Operation	Drive wheel slip excessive	Excessive slip / drive has probably been tipped The AC-3 Power Control (U8) has detected excessive deviation (slip) between the phase current frequency and the speed. The activation limit is 20 msec. More torque is required from / placed on the motor than it can provide / accept; Field current is reduced excessively; Error accompanying sensor bearing control or output stage protection; Operating system does not allow enough slip for the driven motor; AC-3 Power Control component is damaged	- Check motor connection wire (wire breakage); - Check motor model, replace if necessary; - Check motor and replace if necessary;
_	1	21	1	Self test	Output stage faulty	The lift actuator jumper is controlled for max. 40 msec at 100 % PWM (pulse width modulation). The event message is triggered if the pump voltage drops within this time below 10% of the capacitor voltage: $V_{pump} > V_{capacitor} / 10$.	- Check motor connection wire (wire breakage); - Check motor model, replace if necessary; - Replace controller;
_	1	22	1		“Digital signal” logic/signal shape implausible	This event message is triggered if the signal shape or modulation of a digital signal is implausible.	- Replace tiller head;
_	1	23	1	Operation	Brake response switch signal implausible (in idle)	The event message is triggered if after the brake applies the feedback switch does not report this status (after 1 sec.).	- Remove physical blockage from the brake; - Check wire connection; - Check switch and replace if necessary; - Replace signal-evaluating controller;
_	1	23	2	Operation	Brake response switch signal implausible (in idle)	The event message is triggered if after the brake is released the feedback switch does not report this status (after 300 msec.).	- Remove physical blockage from the brake; - Check wire connection; - Check switch and replace if necessary; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	23	3	Operation	Brake response switch signal implausible (speed > 1km/h)	This event message is triggered if the response switch signals applied status during travel.	- Remove physical blockage from the brake; - Check wire connection; - Check switch and replace if necessary; - Replace signal-evaluating controller;
_	1	23	4	Operation	Failsafe brake does not hold (on a ramp)	This event message is triggered if for T > 250 msec the transmission reports an actual speed of > 20 rpm when the brake is applied.	- Check brake wear, replace wear parts / brake if necessary. - Measure current through the magnetic coil (you should not be able to measure any current when the brake is applied). - Replace signal-issuing controller;
_	1	23	5	System start	Failsafe brake does not hold (during system start)		- Check brake wear, replace wear parts / brake if necessary. - Measure current through the magnetic coil (you should not be able to measure any current when the brake is applied). Replace signal-issuing controller;
_	1	23	6	Operation	Left load wheel brake not controlled but feedback signal present	Left load wheel brake not controlled but feedback signal is still present The activation limit is 1000 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	23	7	Operation	Left load wheel brake controlled although feedback signal missing	Left load wheel brake controlled but feedback signal is not present The activation limit is 1000 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	23	8	Operation	Right load wheel brake not controlled but feedback signal present	Right load wheel brake not controlled but feedback signal is still present The activation limit is 1000 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	23	9	Operation	Right load wheel brake controlled although feedback signal missing	Right load wheel brake controlled but feedback signal is not present. The activation limit is 1000 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	23	10	System start	Hydraulic failsafe brake cannot be released (pressure > 3 bar for energised brake)	for 500 msec.: brake energised and pressure on emergency stop mechanism > 3 bar	- Listen to check if emergency stop mechanism switches: - If so, check the pressure sensor and replace if necessary; - If not, check the relay and replace if necessary;
_	1	23	11	Operation	Manual parking brake feedback contacts implausible	If the combinations 0/0 and 1/1 appear for longer than the limit time, a message is activated.	- Check brake wear, replace wear parts / brake if necessary; - Check wire connection; - Check switch and replace if necessary; - Replace signal-evaluating controller;
_	1	24	1	Operation	Lift height signal implausible	**The lift height sensor sequence is implausible. This event message is triggered if the following applies for T => 500 msec:** **Sequence of 2 lift height signals is implausible,** e.g. Top lift height signal without Bottom lift height signal	**- Check wire connection;** **- Check sensor and replace if necessary;** **- Replace signal-evaluating controller;**
_	1	24	2	Operation	“Stacking height redundant inputs” logic implausible	For t = 100 msec. the NC and NO contacts have the same condition	- Check wire connection; - Check sensor and replace if necessary; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	24	3	Operation	“Free lift sensor redundant inputs” logic implausible	For t = 250 msec. the NC and NO contacts have the same condition When the event occurs, the master assumes that the truck is in the mast lift stage.	- Check wire connection; - Check sensor and replace if necessary;
_	1	24	4	Operation	Lifting stroke greater than 2x free lift, however mast lift has not been detected	Integrated lift stroke is greater than 2x the set free lift height, however sensor indicates free lift. When the event occurs, the master assumes that the truck is in the mast lift stage.	- Check wire connection; - Check sensor and replace if necessary;
_	1	24	5	Operation	“Lift limit switch redundant inputs” logic implausible	For t = 100 msec. the NC and NO contacts have the same condition	- Check wire connection; - Check sensor and replace if necessary; - Replace signal-evaluating controller;
_	1	24	6	Operation	“Initial lowering limit redundant inputs” logic implausible	For t = 100 msec. the NC and NO contacts have the same condition	- Check wire connection; - Check sensor and replace if necessary; - Replace signal-evaluating controller;
_	1	24	7	Operation	Logic: lift system limit switch faulty.	No positive signal at 7B38.1 - 7B38.4 during lifting or lowering.	- Try not to use the lift system as the lift limit is deactivated. The lift mechanism could move too far and get damaged; - If absolutely necessary, lower the lift mechanism manually. Note that lowering must end as soon as the shuttle can move freely underneath the pallets. - Check lift limit switch 7B38.1-7B38.4, check signal return to inputs R3-R6 of main controller 8U37; - Check wire connection;
_	1	24	8	Operation	Lift stroke greater than 1.5x free lift, however mast lift has not been detected	Integrated lift stroke is greater than 1.5x the set free lift height, however sensor indicates free lift. When the event occurs, the master assumes that the truck is in the mast lift stage. Event is reset when mast lift is detected.	- Free lift sensor check (position, contamination) - Set free lift height check - Pump drive check (pump worn?)

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	25	1	Operation	Signal on load sensing inputs is implausible	During operation combinations 0/0 and 1/1 trigger the event message. The event message can only be reset by resetting the truck. The activation limit is 2000 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	25	2	Operation	No load sensing signal when weight > 300 kg	Plausibility test: If the weight display > 300 kg the load sensors must be applied. The event message can only be reset by resetting the truck. The activation limit is 2000 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	1	Operation	Feedback from a main contactor contact or the emergency stop relay although the Emergency Disconnect switch is not activated.	Feedback from a main contactor contact or the emergency stop relay although the Emergency Disconnect switch is not activated. The event message can only be reset by resetting the truck. The activation limit is 100 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	2	Operation	Feedback from the Emergency Disconnect switch at channel 1 of the Safe computer although the Emergency Disconnect switch has not been activated	Feedback from the Emergency Disconnect switch at channel 1 of the Safe computer although the Emergency Disconnect switch has not been activated. The event message can only be reset by resetting the truck. The activation limit is 100 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	3	Operation	Feedback from the main contactor level 1 control at channel 1 of the Safe computer although contactor level 1 has not been activated.	Feedback from the main contactor level 1 control at channel 1 of the Safe computer although contactor level 1 has not been activated. The event message can only be reset by resetting the truck. The activation limit is 100 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	26	4	Operation	Feedback from the main contactor level 2 control at channel 1 of the Safe computer although contactor level 1 has not been activated.	Feedback from the main contactor level 2 control at channel 1 of the Safe computer although contactor level 1 has not been activated. The event message can only be reset by resetting the truck. The activation limit is 100 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	5	Operation	Feedback from the Emergency Disconnect switch at channel 2 of the Safe computer although the Emergency Disconnect switch has not been activated	Feedback from the Emergency Disconnect switch at channel 2 of the Safe computer although the Emergency Disconnect switch has not been activated. The event message can only be reset by resetting the truck. The activation limit is 100 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	6	Operation	Feedback from the main contactor level 1 control at channel 2 of the Safe computer although contactor level 1 has not been activated.	Feedback from the main contactor level 1 control at channel 2 of the Safe computer although contactor level 1 has not been activated. The event message can only be reset by resetting the truck. The activation limit is 200 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	7	Operation	No feedback from the Emergency Disconnect switch at channel 1/2 of the Safe computer although the Emergency Disconnect switch has been activated	No feedback from the Emergency Disconnect switch at channel 1/2 of the Safe computer, although activated The event message can only be reset by resetting the truck. The activation limit is 200 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	8	Operation	No feedback from relay K1 despite Safe computer activation	No feedback from relay K1 although the Safe computer has been activated. The event message can only be reset by resetting the truck. The activation limit is 200 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	26	9	Operation	No feedback from relay K2 despite Safe computer activation	No feedback from relay K2 although the Safe computer has been activated. The event message can only be reset by resetting the truck. The activation limit is 200 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	10	Operation	No feedback from relay K3 despite Safe computer activation	No feedback from relay K3 although the Safe computer has been activated. The event message can only be reset by resetting the truck. The activation limit is 200 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	11	Operation	No feedback from relay K4 despite Safe computer activation	No feedback from relay K4 although the Safe computer has been activated. The event message can only be reset by resetting the truck. The activation limit is 200 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	12	Operation	No feedback from main contactor 1 despite "main contactor 1" signal activation	No feedback from main contactor 1 although the Safe computer has been activated. The event message can only be reset by resetting the truck. The activation limit is 200 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	13	Operation	No feedback from main contactor 2 despite "main contactor 2" signal activation	No feedback from main contactor 2 although the Safe computer has been activated. The event message can only be reset by resetting the truck. The activation limit is 200 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	14	System start	Test routine for emergency stop circuit by the Safe computer has failed	Power up test for emergency stop circuit by the Safe computer has failed The event message can only be reset by resetting the truck. The activation limit is 20 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	26	15	Operation	Different input statuses between the two Safe computers	Redundant controllers of the Safe computer have detected different input statuses. The event message can only be reset by resetting the truck. The activation limit is 100 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	26	16	Operation	Comparison of channel A / channel B of external Emergency Disconnect of APM + PLC for diversity	The error is triggered for the combination 1/0 or 0/1. Activation limit 100 ms.	- Check information in the truck display - Assess wiring
_	1	26	17	Operation	Monitoring of APM+ Emergency Stop cancel request and the power supply.	The Emergency Stop request is withdrawn via the CanBus, however there is no corresponding Emergency Disconnect feedback.	- Check information in the truck display - Assess wiring
_	1	26	18	Operation	Monitoring of APM+ Emergency Stop cancel request and the power supply.	The Emergency Stop request is set via the CanBus, however there is no corresponding Emergency Disconnect feedback.	- Check information in the truck display - Assess wiring
_	1	27	1	Operation	Main Lift lowers without activation signal	Main Lift stage has lost height without request. The event message appears as soon as the lift height lowers by more than 50 mm without request.	- Check mast mechanics; - Check mast hydraulics;
_	1	28	1	Operation	Main lift: free lift has lowered before proportional lift	The free lift stage has moved hydraulically although the proportional lift stage was not fully retracted.	- Check mast mechanics; - Check mast hydraulics;
_	1	28	2	Operation	Main lift: proportional lift has lowered before free lift	The proportional lift stage has moved hydraulically although the free lift stage was not fully retracted.	- Check mast mechanics; - Check mast hydraulics;
_	1	29	1	Operation	Main lift: Permissible lowering speed exceeded	The permissible lowering speed has been exceeded.	- Check mast mechanics; - Check mast hydraulics;
_	1	29	2	Operation	Aux. lift: Permissible lowering speed exceeded	The permissible lowering speed has been exceeded.	- Compare actual speed with data sheet values; - if it is too high, adjust to data sheet value;
_	1	29	3	Operation	Sideshift: Permissible speed exceeded	The permissible speed has been exceeded.	- Compare actual speed with data sheet values; - if it is too high, adjust to data sheet value;
_	1	29	4	Operation	Rotate: Permissible speed exceeded	The permissible speed has been exceeded.	- Compare actual speed with data sheet values; - if it is too high, adjust to data sheet value;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	30	1	Operation	Main lift does not reach pre-tension moment in prescribed time	The pre-tension moment could not be established in the set time.	- Check the pre-tension moment and adjust if necessary; - Check mast mechanics; - Check mast hydraulics;
_	1	30	2	Operation	Aux. lift does not reach pre-tension moment in prescribed time	The pre-tension moment could not be established in the set time.	- Check the pre-tension moment and adjust if necessary; - Check mast mechanics; - Check mast hydraulics;
_	1	30	3	Operation	Pallet clamp does not reach the closed limit position in prescribed time	The pallet clamp closed limit position could not be reached in the set time.	- Check the hydraulic setpoint and adjust if necessary; - Check the pallet clamp mechanisms for sluggishness;
_	1	30	4	Operation	Pallet clamp does not reach the open limit position in prescribed time	The pallet clamp open limit position could not be reached in the set time.	- Check the hydraulic setpoint and adjust if necessary; - Check the pallet clamp mechanisms for sluggishness;
_	1	31	1	System start	Emergency stop circuit power-up test: Emergency Stop switch activated, but CAN-BUS not OK	CAN-BUS status damaged during booting. The event message can only be reset by an Emergency Stop reset. The activation limit is 1000 msec.	- Check wiring with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	31	2	System start	Emergency stop circuit power-up test: no activation of any pulse contact controllers	No pulse contact controller has reported charge circuit activation. The charging of the pulse contact controllers must be finished within 10 seconds. The activation limit is 1000 msec.	- Check the charging voltage on the controllers; - Check wiring;
_	1	31	3	System start	Emergency stop circuit power-up test: no lift controller activation	The hydraulic controller has not reported charge circuit activation. The charging of the pulse contact controllers must be finished within 10 seconds. The activation limit is 1000 msec.	- Check the charging voltage on the controllers; - Check wiring;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	31	4	System start	Emergency stop circuit power-up test: no traction controller activation	The traction controller has not reported load circuit activation. The charging of the pulse contact controllers must be finished within 10 seconds. The activation limit is 1000 msec.	- Check the charging voltage on the controllers; - Check wiring;
_	1	31	5	System start	Emergency stop circuit power-up test: no steering controller activation	The steering controller has not reported load circuit activation. The charging of the pulse contact controllers must be finished within 10 seconds. The activation limit is 1000 msec.	- Check the charging voltage on the controllers; - Check wiring;
_	1	31	6	System start	Emergency stop circuit power-up test: no release of main contactor level 2	Feedback contact of second main contactor level not closed within 10 seconds. The activation limit is 1000 msec.	- Check the charging voltage on the controllers; - Check wiring;
_	1	31	7	System start	Emergency stop circuit power-up test: non-defined EMERGENCY STOP error	Other non-separated event message in main contactor circuit. This event message does not occur in normal operation. The activation limit is 1000 msec.	➔ The event message should not occur. Otherwise contact troubleshooting specialists;
_	1	32	1	System start	power circuit activated during charging	**Charge** The AC-3 Power Control (U8) has been activated while its internal capacitors were charging. The main contactor was opened during active control. Power circuit activated during charging. The activation limit is 20 msec. The main contactor was disconnected during active control; The control system was activated before the main contactor was closed and the internal capacitors were charged; Installation of the AC-3 Power Control component is damaged; AC-3 Power Control component (voltage measurement) is damaged;	- Check power cables (main current connections, integrated charging circuit wiring,...); - Check main current fuses and replace if necessary; - Replace AC-3 Power Control interface card;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	32	2	Self test	Capacitor pre-charge cannot be switched off	The capacitor voltage should reduce by at least 1 V within 750 msec. of the pre-charge circuit being switched off.	- Replace controller;
_	1	32	3	Self test	Capacitor pre-charge (output stage pre-charge) not complete	The condition (V-key - V-cap.) < limit voltage is not met within a fixed time after activating the pre-charge circuit.	- Check battery voltage / key switch voltage; - Check controller power connections for shorts; - Replace component;
_	1	33	1	Operation	Ground system track 1 left actual value sensor system: invalid channel A / channel B value relationship	Switch status of ground sensors unequal. The activation limit is 20 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	33	2	Operation	Ground system track 2 left actual value sensor system: invalid channel A / channel B value relationship	Switch status of ground sensors unequal. The activation limit is 20 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	33	3	Operation	Ground system track 3 left actual value sensor system: invalid channel A / channel B value relationship	Switch status of ground sensors unequal. The activation limit is 20 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	33	4	Operation	Ground system track 1 right actual value sensor system: invalid channel A / channel B value relationship	Switch status of ground sensors unequal. The activation limit is 20 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	33	5	Operation	Ground system track 2 right actual value sensor system: invalid channel A / channel B value relationship	Switch status of ground sensors unequal. The activation limit is 20 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	33	6	Operation	Ground system track 3 right actual value sensor system: invalid channel A / channel B value relationship	Switch status of ground sensors unequal. The activation limit is 20 msec.	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	1	34	1	Operation	Brake force governor: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	34	3	Operation	Traverse sensor system: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	34	5	Operation	Rotate sensor system: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	34	7	Operation	Left hand support mushroom: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	34	9	Operation	Right hand support mushroom: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace sensor;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	34	11	Operation	Steering actual value sensor systems: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace actual value sensor;
_	1	34	13	Operation	Steering setpoint device: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace setpoint sensor;
_	1	34	15	Operation	Steering setpoint device optional: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace setpoint sensor;
_	1	34	21	Operation	Hydraulic setpoint device: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace setpoint sensor;
_	1	34	23	Operation	Travel setpoint device: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace setpoint sensor;
_	1	34	25	Operation	Hydraulic setpoint device optional: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace setpoint sensor;
_	1	34	27	Operation	Travel setpoint device optional: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace setpoint sensor;
_	1	34	29	Operation	Accelerator pedal setpoint device: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	34	31	Operation	Brake pedal setpoint device: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	1	34	33	Operation	Pedestrian right travel setpoint device: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	34	35	Operation	Pedestrian left travel setpoint device: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	34	37	Operation	Pedestrian right steer setpoint device: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	34	39	Operation	Pedestrian left steer setpoint device: invalid channel A / channel B value relationship	Analog sensor value relationship deviates by more than 2.5°. The activation limit is 100 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	35	1	System start	Brake force governor: referencing failed	Referencing could not be completed after the truck has been switched on. The activation limit is 100 msec.	- Check referencing; - Teach-in the function if necessary via Judit;
_	1	35	7	System start	Left hand support mushroom: referencing failed	Referencing could not be completed after the truck has been switched on. The activation limit is 100 msec.	- Check referencing; - Teach-in the function if necessary via Judit;
_	1	35	9	System start	Right hand support mushroom: referencing failed	Referencing could not be completed after the truck has been switched on. The activation limit is 100 msec.	- Check referencing; - Teach-in the function if necessary via Judit;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	35	25		Main lift proportional lift stage: referencing failed	Referencing could not be completed after the truck has been switched on. The activation limit is 100 msec.	- Check referencing; - Teach-in the function if necessary via Judit;
_	1	35	27		Main lift free lift stage: referencing failed	Referencing could not be completed after the truck has been switched on. The activation limit is 100 msec.	- Check referencing; - Teach-in the function if necessary via Judit;
_	1	35	29		Aux. lift: referencing failed	Referencing could not be completed after the truck has been switched on. The activation limit is 100 msec.	- Check referencing; - Teach-in the function if necessary via Judit;
_	1	36	1	Operation	Brake force governor: value range calculated during TeachIn implausible	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	7	Operation	Left hand support mushroom: value range calculated during TeachIn implausible	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	9	Operation	Right hand support mushroom: value range calculated during TeachIn implausible	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	13	Operation	Steering wheel sensor Teach-In: captured range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	15	Operation	Optional steering wheel: Sensor Teach-in: captured range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	21	Operation	Hydraulic control lever: Teach-in value range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	23	Operation	Travel control lever: Teach-in value range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	36	25	Operation	Optional hydraulic control lever: Teach-in value range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	27	Operation	Optional travel control lever: Teach-in value range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	29	Operation	Accelerator pedal: Teach-in value range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	31	Operation	Brake pedal: Teach-in value range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	33	Operation	Right pedestrian travel control lever: Teach-in value range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	35	Operation	Left pedestrian travel control lever: Teach-in value range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	37	Operation	Right pedestrian steer control lever: Teach-in value range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	36	39	Operation	Left pedestrian steer control lever: Teach-in value range too small	The teach-in process could not be completed. The activation limit is 100 msec.	- Teach-in the function via Judit;
_	1	37	1	Operation	Brake force governor: brake force governor position implausible with respect to index switch trip point	Deviation between index switch and angle sensor position. The activation limit is 100 msec.	- Index switch assignment invalid. - Check the setting of the index switch (clean activation through index metal) and adjust if necessary. - Replace index switch;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	37	4	Operation	Traverse sensor system: traverse position / index switch difference	Deviation between index switch and angle sensor position. The activation limit is 100 msec.	- Index switch assignment invalid. - Check the setting of the index switch (clean activation through index metal) and adjust if necessary. - Replace index switch;
_	1	37	25	Operation	No index switch reference side	Main lift, proportional lift stage: Deviation between index switch and lift height position. The activation limit is 100 msec.	- Index switch assignment invalid; - Check the setting of the index switch (activates cleanly through index metal) and adjust if necessary; - Replace index switch;
						No negative flank on 7B38.1 - 7B38.4 after set time	- Manually move the shuttle back or recover if necessary (use recovery vehicle); - Attention: If the limit switch 7B38.1-7BB38.4 is welded, note that manual lowering must terminate as soon as the shuttle can move freely under the pallets, as the lift limit is deactivated. The lift mechanism could move too far and get damaged; - Check fuse 2F19; - Check lift motor and motor carbon brushes 7M6, 7M7; - Check control contactors K8 - K11 and 2K10; - Check limit switch 7B38.1-7BB38.4; - Check wire connection;
_	1	37	26	Operation	Main lift, proportional lift stage: difference between index switch / lift height reference side	Deviation between index switch and lift height position. The activation limit is 100 msec.	- Index switch assignment invalid. - Check the setting of the index switch (clean activation through index metal) and adjust if necessary. - Replace index switch;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	37	27	Operation	Main lift free lift stage: no index switch reference side	Deviation between index switch and lift height position. The activation limit is 100 msec.	- Index switch assignment invalid. - Check the setting of the index switch (clean activation through index metal) and adjust if necessary. - Replace index switch;
_	1	37	28	Operation	Main lift free lift stage: difference between index switch / lift height reference side	Deviation between index switch and lift height position. The activation limit is 100 msec.	- Index switch assignment invalid. - Check the setting of the index switch (clean activation through index metal) and adjust if necessary. - Replace index switch;
_	1	37	29	Operation	Aux. lift: no index switch reference side	Deviation between index switch and lift height position. The activation limit is 100 msec.	- Index switch assignment invalid. - Check the setting of the index switch (clean activation through index metal) and adjust if necessary. - Replace index switch;
_	1	37	30	Operation	Aux. lift: difference between index switch / lift height reference side	Deviation between index switch and lift height position. The activation limit is 100 msec.	- Index switch assignment invalid. - Check the setting of the index switch (clean activation through index metal) and adjust if necessary. - Replace index switch;
_	1	38	1	Operation	Signals from left "extended position" and "retracted" collectors supplied simultaneously	Both messages supplied simultaneously. The activation limit is 20 msec.	- Check the feedback switch. - Replace the feedback switch;
_	1	38	2	Operation	Signals from right "extended position" and "retracted" collectors supplied simultaneously	Both messages supplied simultaneously. The activation limit is 20 msec.	- Check the feedback switch. - Replace the feedback switch;
_	1	39	1	Operation	Collector: Time monitoring timeout.	Nominal position could not be reached within the set time. The activation limit is 20 msec.	- Check the mechanics run smoothly;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	40	1	Operation	Tolerance field violated although lift height is positioned	Set tolerance window for Rack Height Select abandoned.	- Check Rack Height Select setpoint setting;
_	1	40	2	Operation	Lift request although target lift height exceeded	An invalid program condition has been detected. Detailed information shown in the event log book. The activation limit is 20 msec.	- Save the detailed information from the event log book in Judit via print screen function and send it to development department via VK-B.
_	1	40	3	Operation	Lower request although below target lift height	An invalid program condition has been detected. Detailed information shown in the event log book. The activation limit is 20 msec.	- Save the detailed information from the event log book in Judit via print screen function and send it to development department via VK-B.
_	1	41	1		Load wheel sensor system: Channel A of the left sensor not counting	Channel A of the left sensor on the load wheel sensor system not supplying pulses. The activation limit is 20 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	41	2		Load wheel sensor system: Channel B of the left sensor not counting	Channel B of the left sensor on the load wheel sensor system not supplying pulses. The activation limit is 20 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	41	3		Load wheel sensor system: Channel A of the right sensor not counting	Channel A of the right sensor on the load wheel sensor system not supplying pulses. The activation limit is 20 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	41	4		Load wheel sensor system: Channel B of the right sensor not counting	Channel B of the right sensor on the load wheel sensor system not supplying pulses. The activation limit is 20 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	41	5		Load wheel sensor system: None of the sensors counting	None of the channels of the load wheel sensors (= 4 off) are supplying pulses. The activation limit is 20 msec.	- Measure sensor signals with multimeter; - Replace sensor;
_	1	41	6		Load wheel sensor system: Distance calculation via load wheel sensor system implausible	Distance calculation via load wheel sensor system supplies invalid readings in relation to drive wheel sensor system. The activation limit is 20 msec.	- Measure sensor signals with multimeter; - Replace sensor;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	42	1	Operation	Truck deceleration too low	When the truck begins to brake, the maximum brake time is calculated based on the current travel speed. As soon as this time is exceeded, the event message is triggered.	- Check CAN-Bus; - Check truck speed values for plausibility; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	1	42	2		Truck deceleration too great	When the truck begins to brake, the minimum permissible brake time is calculated based on the current travel speed. If this time is not attained, the event message is triggered.	- Check CAN-Bus; - Check truck speed values are correct; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	1	42	3	Operation	Actual speed does not follow rated speed	for T = 100 msec.: Actual speed > restricted maximum speed from monitoring function and actual speed does not approach maximum speed	- Inquire about software update; - Replace signal-issuing controller;
_	1	42	4	Operation	Truck deceleration too low	Travel speed > minimum speed and brake ramp < limit for 500 msec.	- Switch the truck off and on again; - Check brake system; - Inquire about software update;
_	1	42	5	Operation	Brake moment implausible	Required brake moment > 10% max. brake moment and drive system reports motor operation (> 0Nm)	- Switch the truck off and on again; - Inquire about software update;
_	1	42	6		Truck deceleration too low	During braking the actual deceleration is calculated on the basis of the change in travel speed (drive wheel). If this is below 4.5% for more than 1 second the monitor function applies. As for 1.142.1, but for adjustment work in the factory. Hence no error response, just a display.	- Check inversion brake settings through brake log; set deceleration values to data sheet values;
_	1	43	1	Operation	Current actual value prop. level without activation (prop output 1...8)	For T = 80 msec.: Actual value > lower limit without activation	- Check valve coil cable connection; - Check valve coil (resistance measurement) and replace if necessary; - Check outputs for short circuits and rectify if necessary; - Replace signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	43	2	Operation	Switch valve active switch condition without activation	Valve actual condition (switch condition) of a blocked hydraulic function is not zero	- Check valve coil cable connection; - Check valve coil (resistance measurement) and replace if necessary; - Check outputs for short circuits and rectify if necessary; - Replace signal-issuing controller;
_	1	44	1	Operation	Membrane key test contact implausible	Keypad test contact (loop over connector 1-n) interrupted for > 100 msec.	- Replace keypad; - Replace control unit;
_	1	44	2	Self test	“Membrane redundant inputs” logic implausible during self test	During the self test a short was detected between the two contacts of at least one key.	- Replace keypad; - Replace control unit;
_	1	44	3	Operation	“Membrane key redundant inputs” logic implausible during operation	During operation an invalid condition was detected on at least one key for >100 msec.	- Replace keypad; - Replace control unit;
_	1	45	1	Operation	Brake fluid switch reports lack of fluid	Brake fluid switch indicates a lack of brake fluid for >2s.	- Check brake fluid level; - Check the brake system for leaks; - Check switch, wires to MFC brakes
_	1	46	1		"Redundant values for load wheel system wire guidance sensors" implausible	Deviation recorded from guide wire by systems A and B differs by more than 50 mm for distances longer than 0.5 m.	- Check distance signals of both sub-systems over several points along the guide wire; - If the sub-systems deviated, calibrate and teach the guide wire sensors;
_	1	46	2		"Redundant values for cornering drive direction system wire guidance sensors" implausible	Deviation recorded from guide wire by systems A and B differs by more than 50 mm for distances longer than 0.5 m.	- Check distance signals of both sub-systems over several points along the guide wire; - If the sub-systems deviated, calibrate and teach the guide wire sensors;
_	1	46	3		"Redundant values for drive wheel system wire guidance sensors" implausible	Deviation recorded from guide wire by systems A and B differs by more than 50 mm for distances longer than 0.5 m.	- Check distance signals of both sub-systems over several points along the guide wire; - If the sub-systems deviated, calibrate and teach the guide wire sensors;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	47	1	Operation	"Active safety functions monitoring" logic improbable	For T >= limit time the anticipated safety functions are not activated.	- Switch the truck off and on again, do not apply any travel setpoint devices when the system starts up; - Switch the truck off and on again with the deadman button applied / not applied; - Replace signal-evaluating controller;
_	1	48	1	Operation	Maximum lift time exceeded	For T >= limit time uninterrupted control of hydraulic unit	- Do not apply hydraulic setpoint device; - Switch the truck off and on again, do not apply any hydraulic setpoint devices;
_	1	49	1	Operation	"Manifold sensor feedback input" to nominal condition implausible	For T > limit time after lowering has stopped, the manifold sensor indicates that lowering is activated	- Check wire connection; - Check connected consumers (valves, …) and replace if necessary; - Check outputs via JUDIT; - Replace controller;
_	1	49	2	Operation	"Manifold sensor feedback input" to nominal condition implausible	The number of side changes from the manifold sensor deviates too far from the expected value from the lowering setpoint.	- Check wire connection; - Check connected consumers (valves, …) and replace if necessary; - Check outputs via JUDIT; - Replace controller;
_	1	51	1		Steering specific: Setpoint control logic: "Speed for steer angle setpoint redundant inputs" too high.	This event message is not currently used.	- Check steer sensor power supply; - Check channels A / B for short circuits or interruption; - Check wire connection; - Replace the angle sensor; - Replace signal-evaluating controller;
_	1	52	1		Steering specific: Setpoint control logic: "Steer angle setpoint redundant inputs rotary direction" implausible	This event message is not currently used.	

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	53	1		Steering specific: Setpoint control logic: "No. impulses for steer angle setpoint redundant inputs" not the same	This event message is not currently used.	
_	1	54	1	Operation	Setpoint control 1 implausible	Steering: “Calculated steer angle setpoint 1” setpoint control logic in control and/or monitor processor implausible (readings differ); The setpoint directly from the sensor differs between the control processor and the monitoring processor by more than 500 digits 5 times in a row (50 msec).	- Check steer sensor power supply; - Check channels A / B for short circuits or interruption; - Check wire connection; - Replace the angle sensor; - Replace signal-evaluating controller;
_	1	54	2	Operation	Steering specific: "Calculated steer angle setpoint" monitoring logic implausible (Sine cosine implausible)	The setpoint abandons the permissible unit circuit for T > limit time by more than the permissible limit.	- Check angle sensor (steering wheel/tiller) power supply; - Check channels A / B for short circuits or interruption; - Check wire connection; - Replace the angle sensor; - Replace signal-evaluating controller;
_	1	55	1	Operation	Steering specific: “Calculated steer angle actual value2” actual value control logic in control and/ or monitor processor differs	The calculated actual value2 differs between the control processor and the monitoring processor by more than 500digits 5 times in a row (50 msec).	- Switch the truck off and on again; - Check angle sensor (steering wheel/tiller) power supply; - Check channels A / B for short circuits or interruption; - Check wire connection; - Replace the angle sensor; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	56	1	Operation	Setpoint control 2 implausible	Steering: “Calculated steer angle setpoint 2” setpoint control logic in control and/or monitor processor differs, The calculated setpoint differs between the control processor and the monitoring processor by more than 500 digits 5 times in a row (50 msec).	- Switch the truck off and on again; - Check angle sensor (steering wheel/tiller) power supply; - Check channels A / B for short circuits or interruption; - Check wire connection; - Replace the angle sensor; - Replace signal-evaluating controller;
_	1	57	1		Actual value control implausible	This event message is not currently used. Steering: Actual value control logic: "No. of pulses from absolute sensor" vs. "No. of pulses from sensor bearing" are implausible.	
_	1	58	1	Operation	Actual value control implausible	Steering: “Calculated steer angle actual value” logic actual value control in control and/or monitor processor implausible (readings differ); The actual value direct from the sensor differs between the control processor and the monitoring processor by more than 500 digits 5 times in a row (50 msec).	- Check steer sensor power supply; - Check channels A / B for short circuits or interruption; - Check wire connection; - Replace the angle sensor; - Replace signal-evaluating controller;
_	1	58	2	Operation	Actual value control implausible	Steering: “Calculated steer angle actual value” actual value control logic in control and/or monitor processor implausible (sine, cosine unfeasible); Actual value abandons the standard circuit more than 30times. (30 * 0.125 msec.)	- Check steer sensor power supply; - Check channels A / B for short circuits or interruption; - Check wire connection; - Replace the angle sensor; - Replace signal-evaluating controller;
_	1	59	1	Self test	Steering specific: Actual value control logic: "Segment width of segment 1" out of range	The first segment was not found during referencing.	- Check segment position sensor; - Check segment disk; - Check chain tension or gearwheel wear; - Check/replace centre pivot plate suspension; - Replace actuating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	59	2	Operation	Determine angle position, calculated crank length implausible	Crank length excessive during teach-in. The activation limit is 20 msec.	- Check angle sensor wiring and signals; - Check index switch wiring and signals; - Check index switch setting; - Re-teach the function via Judit;
_	1	59	3	Operation	Steer crank tolerance setting too high	Crank tolerance violated during teach-in. The activation limit is 20 msec.	- Check angle sensor wiring and signals; - Check index switch wiring and signals; - Check index switch setting; - Re-teach the function via Judit;
_	1	59	4	System start	Side position crossed over during referencing	Steer referencing turned too far when searching for a side or approaching a position. The activation limit is 20 msec.	- Check angle sensor wiring and signals; - Check index switch wiring and signals; - Check index switch setting; - Re-teach the function via Judit;
_	1	59	5	System start	Position of steer angle sensor implausible during referencing	Steer referencing: Angle sensor actual value does not match the 0° switch. The steering must be “re-taught”. The activation limit is 20 msec.	- Check angle sensor wiring and signals; - Check index switch wiring and signals; - Check index switch setting; - Re-teach the function via Judit;
_	1	59	6	Operation	Side position crossed over during steering teach-in	Steer teach-in turned too far when searching for a side or approaching a position. The activation limit is 20 msec.	- Check angle sensor wiring and signals; - Check index switch wiring and signals; - Check index switch setting; - Re-teach the function via Judit;
_	1	59	7	Operation	Expected crank side not found	No crank side during teach-in; The activation limit is 20 msec.	- Check angle sensor wiring and signals; - Check index switch wiring and signals; - Check index switch setting; - Re-teach the function via Judit;
_	1	59	8	Operation	Error detected during steer crank monitoring	Crank error during operation. The activation limit is 100 msec.	- Check angle sensor wiring and signals; - Check index switch wiring and signals; - Check index switch setting; - Re-teach the function via Judit;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	59	9	System start	Wrong crank side during referencing. Re-reference steering.	Crank error during referencing. The activation limit is 20msec.	- Check segment position sensor - Check segment disk - Check chain tension or gearwheel wear - Check/replace centre pivot plate suspension - Replace actuating controller - W&S: - Check angle sensor wiring and signals; - Check index switch wiring and signals; - Check index switch setting; - Re-teach steering via Judit.
_	1	59	10	Operation	Wrong crank side during steering teach-in.	Crank error during steering teach-in. The steering must be “re-taught”. The activation limit is 20 msec.	- Check angle sensor wiring and signals; - Check index switch wiring and signals; - Check index switch setting; - Re-teach the function via Judit;
_	1	59	11	Self test	Steering specific: Actual value control logic: "Segment width of segment 2" out of range	The second segment was not found during referencing.	- Check segment position sensor - Check segment disk - Check chain tension or gearwheel wear - Check/replace centre pivot plate suspension - Replace actuating controller
_	1	60	1		Actual value control implausible	This event message is not currently used. Steering: "Absolute sensor segment width" actual value monitoring logic differs from sensor bearing	
_	1	61	1	Self test	Timeout during referencing	Referencing run was not completed within T=5s after the start of the self test	- Only occurs as a result of other errors;
_	1	62	1		Unexpected engine rotation direction	This event message is not currently used. Steering: Unexpected engine rotation direction	

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	63	1	Operation	Steering controller overvoltage (brake applies)	This event message is triggered when the following applies: $V_{capacitor}$ > limit voltage (reduce overvoltage through failsafe brake).	- Switch the truck off and on again; - Check battery cable connection; - Check battery electrolyte level; - Check charger; - For a new battery wait for five charge cycles; - Replace signal-evaluating controller;
_	1	64	1	Self test	Relay brake closed instead of open	At the start of the self-test the brake relay is closed instead of open.	- Check wire connection; - Replace signal-issuing controller;
_	1	64	2	Self test	Relay brake open instead of closed	The brake relay does not close during the self-test.	- Check wire connection; - Replace signal-issuing controller;
_	1	64	3	Self test	Relay brake closed instead of open	At the end of the self-test the brake relay is closed instead of open.	- Replace signal-issuing controller;
_	1	64	4	Operation	Pulsed braked for emergency stop.	implausible pulsed brake pattern during emergency stop	- Test feedback contact on brake, if necessary adjust or replace feedback contact; - Measure current through the magnetic coil (you should not be able to measure any current when the brake is applied). - Replace signal-issuing controller;
_	1	65	1	Self test	Control and monitor processors damaged	Communication between control and monitor processors implausible (CRC checksum in initialisation telegram implausible)	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - If the event message persists (permanently), replace the signal-issuing controller;
_	1	65	2	Operation	Control and monitor processors damaged	Communication between control and monitor processors implausible (CRC checksum in cyclical telegram implausible)	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - If the event message persists (permanently), replace the signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	65	3	Self test Operation	Control and monitor processors damaged	Communication between control and monitor processors implausible (UART register status message)	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - If the event message persists (permanently), replace the signal-issuing controller;
_	1	65	4	Operation	Control and monitor processors damaged	Communication between control and monitor processors implausible (UART telegram “Start Monitoring” timeout)	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - If the event message persists (permanently), replace the signal-issuing controller;
_	1	65	5	Self test	Control and monitor processors damaged	Communication between control and monitor processors implausible (UART telegram “Initialisation” timeout)	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - If the event message persists (permanently), replace the signal-issuing controller;
_	1	65	6	Operation	Control and monitor processors damaged	Communication between control and monitor processors implausible (UART pulse flank change timeout)	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - If the event message persists (permanently), replace the signal-issuing controller;
_	1	65	7	Operation	Control and monitor processors damaged	Communication between control and monitor processors implausible (UART telegram cyclical timeout)	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - If the event message persists (permanently), replace the signal-issuing controller;
_	1	65	8	Operation	Control and monitor processors damaged	Communication between control and monitor processors implausible (UART pulse start timeout)	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - If the event message persists (permanently), replace the signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	65	9	Operation	Control and monitor processors damaged	Communication between control and monitor processors implausible (flank change direction implausible)	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - If the event message persists (permanently), replace the signal-issuing controller;
_	1	65	10	Self test Operation	Control and monitor processors damaged	Communication between control and monitor processors implausible (1st process error in UART telegram)	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - If the event message persists (permanently), replace the signal-issuing controller;
_	1	65	11	Self test Operation	Control and monitor processors damaged	Communication between control and monitor processors implausible (2nd process error in UART telegram)	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - If the event message persists (permanently), replace the signal-issuing controller;
_	1	66	1	Operation	Teach-in interrupted	Teach-in of truck in idle not recognised or Teach sequence not kept	- Switch the truck off and on again; - Set default values for steering parameters. - Set default values for Teach parameters. - Jack up the truck so that the steered wheel is clear of the ground. Carry out teach-in; do not interrupt the process! - Replace signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	66	2	Operation	Teach-in interrupted	Motor (actual value) could not be determined in the allocated time (timeout while motor turning).	- Rectify mechanical blockage of drive system; - Switch the truck off and on again; - Check motor wire connections; - Set default values for steering parameters. - Set default values for Teach parameters. - Jack up the truck so that the steered wheel is clear of the ground. Carry out teach-in; do not interrupt the process! - Check actual value sensor on steered wheel; - Replace signal-issuing controller; - Replace steer motor;
_	1	66	3	Operation	Teach-in interrupted	No rotary movement on actual value sensor and / or from steered wheel	- Rectify mechanical blockage of drive system; - Switch the truck off and on again; - Check motor wire connections; - Set default values for steering parameters. - Set default values for Teach parameters. - Jack up the truck so that the steered wheel is clear of the ground. Carry out teach-in; do not interrupt the process! - Check actual value sensor on steered wheel; - Replace signal-issuing controller; - Replace steer motor;
_	1	66	4	Operation	Teach-in interrupted	The straight-ahead position of the steered wheel (no zero position) could not be approached	- Finish the teach-in, then switch the truck off and on again; - Set default values for steering parameters. - Set default values for Teach parameters. - Jack up the truck so that the steered wheel is clear of the ground. Carry out teach-in; do not interrupt the process! - Replace signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	67	1	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Integral over rated / actual difference too great.	- Check wheel freedom of movement on the ground. - Check if truck is overloaded; - Check battery voltage, charge battery if necessary; - Check steering chain and chain tension; - Check steering bolster mechanics; - Check actual value sensor attachment; - Test steer motor; - Check tyres, replace wheel if necessary.
_	1	67	2	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Rated ROTATION DIRECTION_NONE; The permissible angle deviation is again out of range. (angle difference < XX°).	- Check wheel freedom of movement on the ground; - Check if truck is overloaded; - Check battery voltage, charge battery if necessary; - Check steering chain and chain tension; - Check steering bolster mechanics; - Check actual value sensor attachment; - Test steer motor; - Check tyres, replace wheel if necessary.
_	1	67	3	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Rated ROTATION DIRECTION_NONE; In the small difference° < angle difference < large difference range the wheel must follow with at least minimum rotational speed.	- Check wheel freedom of movement on the ground; - Check if truck is overloaded; - Check battery voltage, charge battery if necessary; - Check steering chain and chain tension; - Check steering bolster mechanics; - Check actual value sensor attachment; - Test steer motor; - Check tyres, replace wheel if necessary.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	67	4	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Rated ROTATION DIRECTION_NONE; Where the angle difference > significant the wheel should follow at a slow rotational speed.	- Check wheel freedom of movement on the ground; - Check if truck is overloaded; - Check battery voltage, charge battery if necessary; - Check steering chain and chain tension; - Check steering bolster mechanics; - Check actual value sensor attachment; - Test steer motor; - Check tyres, replace wheel if necessary.
_	1	67	5	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Rate-ROTATION DIRECTION_LEFT or Rated ROTATION DIRECTION_RIGHT; Rated/actual rotation direction opposite; Angle difference > small difference; Angle difference is not reduced.	- None: refer to truck overload, steered wheel is discharged (steering can swing up);
_	1	67	6	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Rate-ROTATION DIRECTION_LEFT or Rated ROTATION DIRECTION_RIGHT; Rated/actual rotational direction same; Wheel advances (by more than XX°).	- None: refer to truck overload, steered wheel is discharged (steering can swing up);
_	1	67	7	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Rate-ROTATION DIRECTION_LEFT or Rated ROTATION DIRECTION_RIGHT; Rated/actual rotational direction same; In the small difference° < angle difference > large difference range the wheel must follow with at least minimum rotational speed.	- Check wheel freedom of movement on the ground; - Check if truck is overloaded; - Check battery voltage, charge battery if necessary; - Check steering chain and chain tension; - Check steering bolster mechanics; - Check actual value sensor attachment; - Test steer motor; - Check tyres, replace wheel if necessary.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	67	8	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Rate-ROTATION DIRECTION_LEFT or Rated ROTATION DIRECTION_RIGHT; Rated/actual rotational direction same; Where the angle difference > significant the wheel should follow at a slow rotational speed.	- Check wheel freedom of movement on the ground; - Check if truck is overloaded; - Check battery voltage, charge battery if necessary; - Check steering chain and chain tension; - Check steering bolster mechanics; - Check actual value sensor attachment; - Test steer motor; - Check tyres, replace wheel if necessary.
_	1	67	9	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Internal status, control status machine implausible	- Switch the truck off and on again;
_	1	67	10	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: STATUS_STEERING_TYRE_DISCHARGED; Setpoint has changed by more than XX° without the control processor changing status.	- Switch the truck off and on again;
_	1	67	11	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Rate-ROTATION DIRECTION_LEFT or Rated ROTATION DIRECTION_RIGHT; If the rated-actual difference > small difference, the system checks whether a current pulse (> YY A) is flowing in the right direction within a particular time (XX ms). If this is not the case and the actual-rated difference rises to > medium difference, an event is triggered.	- Switch the truck off and on again; - Replace signal-issuing controller;
_	1	67	12	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Rate-ROTATION DIRECTION_LEFT or Rated ROTATION DIRECTION_RIGHT; If the sub index 11 rule is met (current pulse recognised) and the rated-actual difference continues to rise, the current must not flow in the wrong direction for more than a certain time (XX ms).	- Switch the truck off and on again; - Replace signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	67	13	Operation	The steered wheel does not follow the setpoint	Internal monitoring rule violation: Specified-actual difference too large. Rated-actual difference > maximum rated-actual difference On many trucks (e.g. EJC) the maximum difference is prescribed by the mechanical stops. If the current rated-actual difference is more than the maximum rated-actual difference plus a value “X”, the event message is triggered	- Switch the truck off and on again; - Check wheel freedom of movement on the ground; - Check steering bolster mechanics; - Check actual value sensor attachment; - Test steer motor;
_	1	67	14		The steered wheel does not follow the setpoint	Internal monitoring rule violation: Sudden steer angle actual value change	-
_	1	67	15		The steered wheel does not follow the setpoint	Internal monitoring rule violation: Change to the actual value despite small change / no change to the setpoint	-
_	1	67	16	Operation	Steering specific: Internal monitoring rule violation	Difference between truck nominal steer angle control processor and monitoring processor > 5° for 30ms	- Replace signal-evaluating controller;
_	1	67	17	Operation	Steering specific: Internal monitoring rule violation	Difference between travel mode button control processor and monitoring processor for 30ms	- Replace signal-evaluating controller;
_	1	67	18	Operation	Steering specific: Internal monitoring rule violation	Difference between actual travel mode control processor and monitoring processor for 30ms	- Replace signal-evaluating controller;
_	1	67	19	Operation	Steering specific: Internal monitoring rule violation	Difference between potential travel mode control processor and monitoring processor for 30ms	- Replace signal-evaluating controller;
_	1	67	20	Operation	Steering specific: Internal monitoring rule violation	Difference between actual steering mode control processor and monitoring processor for 30ms	- Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	68	1	Self test Operation	No feedback from regenerative braking	Event message not acknowledged by master within 90 msec.	- Switch the truck off and on again; - Check wire connection; - Check interference (radio, static charge); - Check CAN-Bus;
_	1	69	1	Self test	Error during self-test phase (component has identified fault)	Steering not requested within 10 s after power up for self test	- Look for and replace faulty controller during self-test. - Inquire about software update;
_	1	69	2	Self test	Error during self-test phase (component has identified fault)	Steering set to RUNNING although the steering self-test was faulty	- Inquire about software update;
_	1	70	1	Operation	Horizontal tilt mechanism inputs implausible	MULTI-PILOT: The horizontal-tilt button consists of a NC and a NO contact. When the button is pressed both contacts connect simultaneously. As a result, only the 0/1 and 1/0 combinations should occur. During operation combinations 0/0 and 1/1 (500 msec.) trigger the event message. For a valid combination (0/1 or 1/0, 500 msec) the event message and the truck response are reset.	- Check horizontal tilt parameters; - Check the wire connection between the MULTI-PILOT and the horizontal tilt button; - Check the horizontal tilt button; - Replace the horizontal tilt button; - Replace the MULTI-PILOT;
_	1	71	1	Operation	Centre-shift inputs implausible	MULTI-PILOT: The centre-shift button consists of a NC and a NO contact. When the button is pressed both contacts connect simultaneously. As a result, only the 0/1 and 1/0 combinations should occur. During operation combinations 0/0 and 1/1 (500 msec.) trigger the event message. For a valid combination (0/1 or 1/0, 500 msec) the event message and the truck response are reset.	- Check the centre-shift parameters; - Check the wire connection between the MULTI-PILOT and the centre-shift button; - Check the centre-shift button; - Replace the centre-shift button; - Replace the MULTI-PILOT;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	72	1	Operation	Steering specific: “Redundant inputs” logic improbable (180°/360° steering mode change)	During operation combinations 0/0 and 1/1 (for 500 msec.) trigger the event message. The system also changes to 360° mode.	- Check the steering selector parameters; - Check the wire connection between the Multipilot and the steering selector button; - Check the steering selector button; - Replace the steering selector button; - Replace the Multipilot;
					Multipilot specific: “Redundant inputs” logic improbable (180°/360° steering mode change)	During operation combinations 0/0 and 1/1 (for 500 msec.) trigger the event message. For a valid combination (0/1 or 1/0, for 500msec.) the event and the truck response are reset.	
_	1	76	1	Undefined	Brake signal implausible	Tiller head: The signal shape or modulation of the brake digital signal is implausible.	- Replace tiller head;
_	1	77	1	Undefined	Analog / digital control implausible	Tiller head: Wrong analog / digital transmitter connected to tiller arm.	- Replace tiller head;
_	1	77	2	Undefined	Smart Sensor is implausible	Tiller head: Wrong smart sensor connected to the tiller arm.	- Replace tiller head;
_	1	80	1…32	Self test	Error occurred during self-test phase	Master: Slave does not respond 1 second after the request for a self-test (self-test request not answered). Sub index matches the CANopen-ID.	- Check the component shown in the sub index; - Check CAN-Bus; - Replace the component shown in the sub index;
_	1	81	1…32	Self test	Error occurred during self-test phase	Master: Slave reports fault during self-test (component has identified fault). Sub index matches the CANopen-ID. This is a consequential event and always occurs in conjunction with an event of the tested component (note the sub index).	- Process the events of the component shown in the sub index in the sequential order (read the logbook).

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	90	1	Operation	ISM sensor 1 voltage implausible	ISM: Invalid voltage at optional sensor 1 (stage 4 only). The sensor voltage is out of range (0.5 V – 9.5 V).	- Check ISM sensor 1 parameter settings (parameter #11-17); - Check wire connection to ISM sensor 1; - Check ISM sensor 1 and replace if necessary; - Replace signal-evaluating controller;
_	1	90	2	Operation	ISM sensor 2 voltage implausible	ISM: Invalid voltage at optional sensor 2 (stage 4 only). The sensor voltage is out of range (0.5 V – 9.5 V).	- Check ISM sensor 2 parameter settings (parameter #20-26); - Check wire connection to ISM sensor 2; - Check ISM sensor 2 and replace if necessary; - Replace signal-evaluating controller;
_	1	90	3	Operation	ISM sensor 3 voltage implausible	ISM: Invalid voltage at optional sensor 3 (stage 4 only). The sensor voltage is out of range (0.5 V – 9.5 V).	- Check ISM sensor 3 parameter settings (parameter #29-35); - Check wire connection to ISM sensor 3; - Check ISM sensor 3 and replace if necessary; - Replace signal-evaluating controller;
_	1	91	1	Operation	ISM access module / ISM data recorder damaged	ISM: Communication between access module and data recorder interrupted	- Check wire connection between ISM access module and ISM data recorder; - Replace ISM data recorder; - Replace ISM access module;
_	1	91	2	Operation	ISM radio module damaged	ISM: Faulty radio module	- Check wire connections to ISM radio module; - Visually inspect the antenna and replace if necessary; - Replace ISM radio module; - Replace ISM data recorder;
_	1	91	3	Operation	ISM radio channel number implausible	ISM: “Radio channel” parameter set to 0.	- Check radio channel parameter settings (set “radio channel” parameter to 1);

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	91	4	Operation	No ISM radio transmission output	ISM: Transmission output too low	- Visually inspect the antenna and replace if necessary; - Check ISM transmission output parameter settings (set “radio transmission output” parameter to 31); - Check receiver; - Replace ISM radio module;
_	1	91	5	Operation	ISM access module damaged	ISM: Faulty access module	- Check wire connections; - If lock number is invalid replace ISM access module;
_	1	91	6	Operation	ISM data recorder damaged	ISM: Data recorder faulty	- Check wire connections; - Replace ISM data recorder;
_	1	93	1	Undefined	Charger: precharge timeout	Charger: “Pre-charge” phase (P1) Maximum charge time (limit) in the “pre-charge” phase exceeded (pre-charging of fully discharged battery)	- Check battery voltage / test for faulty cell; - Check electrolyte level; - Check wire connections; - Check electrolyte level sensor on battery controller and replace if necessary; - Check charge characteristic against battery data plate and adjust as required; - Check fuse in charging cable, replace charging cable if required; - Replace charger;
_	1	93	2	Undefined	Charger: Main charge I time exceeded	Charger: “Main charge I (constant)” charge phase (P2) Maximum charge time (limit) in “Main charge I (constant)” charge phase exceeded.	- Check battery voltage / test for faulty cell; - Check electrolyte level; - Check wire connections; - Check electrolyte level sensor on battery controller and replace if necessary; - Check charge characteristic against battery data plate and adjust as required; - Check fuse in charging cable, replace charging cable if required; - Replace charger;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	93	3	Undefined	Charger: Main charge V time exceeded	Charger: “Main charge V (constant)” charge phase (P3) Maximum charge time (limit) in “Main charge V (constant)” charge phase exceeded.	- Check battery voltage / test for faulty cell; - Check electrolyte level; - Check wire connections; - Check electrolyte level sensor on battery controller and replace if necessary; - Check charge characteristic against battery data plate and adjust as required; - Check fuse in charging cable, replace charging cable if required; - Replace charger;
_	1	93	4	Undefined	Charger: recharge timeout	Charger: “trickle-charge” phase (P4a) The trickle charge phase specifications have not been achieved.	- Check battery voltage / test for faulty cell; - Check electrolyte level; - Check wire connections; - Check electrolyte level sensor on battery controller and replace if necessary; - Check charge characteristic against battery data plate and adjust as required; - Check fuse in charging cable, replace charging cable if required; - Replace charger;
_	1	93	5	Undefined	Specific battery management: battery disconnected from charger during charging	No current flow during charging	- None: This is an operator error
_	1	94	1	Operation	Charger: charge characteristic undefined	Charger: Set charge characteristic is not available.	- Check charge characteristic against battery data plate and adjust as required; - Replace battery controller;
_	1	94	2	Undefined	Charger: change to safety characteristic curve	Charger: if the charger could not charge a characteristic curve from the battery controller, it changes to a safety characteristic curve.	- Check charge characteristic against battery data plate and adjust as required; - Replace battery controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	94	3	Undefined	Charger: charge at rated temperature	Charger: if the charge could not receive a battery temperature from the battery controller, the rated temperature is used	- Check temperature gauge on battery controller (between battery cells); - Replace battery controller;
_	1	95	1	Undefined	Charger: Internal error	Charger: Internal error	- Check fuse in charging cable, replace charging cable if required; - Replace charger;
_	1	96	1	Undefined	Charger: communication error in radio network	Charger: communication error in radio network Permanent loss of radio connection	- Inquire about software update; - Check fuse in charging cable, replace charging cable if required; - Replace battery controller; - Replace charger;
_	1	96	2	Undefined	Charger: communication error in radio network	Charger: communication error in radio network Routing error in radio network	- Inquire about software update; - Check fuse in charging cable, replace charging cable if required; - Replace battery controller; - Replace charger;
_	1	96	3	Undefined	Charger: communication error in radio network	Charger: communication error in radio network buffer overflow in radio network	- Inquire about software update; - Check fuse in charging cable, replace charging cable if required; - Replace battery controller; - Replace charger;
_	1	96	4…n	Undefined	Charger: communication error in radio network	Charger: communication error in radio network	- Inquire about software update; - Check fuse in charging cable, replace charging cable if required; - Replace battery controller; - Replace charger;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	1	97	1	Undefined	Charger: maximum charge factor exceeded	Charger: this event message is triggered if the rated capacity is exceeded by a factor of 1.1 (only for pre-, main and trickle charges). Not for recovery charge).	- Check charge characteristic against battery data plate and adjust as required; - Re-start charging; - Inquire about software update; - Check fuse in charging cable, replace charging cable if required; - Replace charger;
_	1	98	1	Operation	Battery useful life expired	The battery capacity has been reduced to 80% of a new battery.	- Replace battery as required;
_	2	01	1	Self test	Current reading for I=0A implausible	Current reading for I = 0 A (mean current) implausible: $V_{current\ sensor\_U} < V_{0A\_should\ be}$ - 10% or $V_{current\ sensor\_U} > V_{0A\_should\ be}$ + 10%	- Replace component;
_	2	01	2	Self test	Current reading for I=0A implausible	Current reading for I = 0 A (mean current) implausible: $V_{current\ sensor\_V} < V_{0A\_should\ be}$ - 10% or $V_{current\ sensor\_V} > V_{0A\_should\ be}$ + 10%	- Replace component;
_	2	01	3	Self test	Current reading for I=0A implausible	Current reading for I = 0 A (mean current) implausible: $V_{current\ sensor\_W} < V_{0A\_should\ be}$ - 10% or $V_{current\ sensor\_W} > V_{0A\_should\ be}$ + 10%	- Replace component;
_	2	01	4	Operation	Current measurement faulty	Converter signals damaged The AC-3 Power Control (U8) monitors the phase current measurement signals (converter). If a sufficiently high current is measured when the components are de-energised and non-active, an error is detected. Internal pulse controller current measurement faulty The activation limit is 20 msec.	- Switch the truck off and on again; - Replace AC-3 Power Control (U8);
_	2	01	5	Self test	Implausible current measurement for I=0A (mean current) (current prop.)	(V_current sensor_prop < V_0A_rated - 5%) or (V_current sensor_prop > V_0A_rated + 5%)	- Replace component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	2	02	1	Operation	“Power connection output” current signal too high	This event message is triggered when for T = 4 msec the following applies: (i_{phase_V} or i_{phase_V} or i_{phase_W}) > I_{rated_peak} + 20%	- Check motor connection cable (short circuit); - Check speed sensor, replace if necessary; - Check motor and replace if necessary; - Replace component;
_	2	02	2	Operation	“Power connection output” current signal too high	for T = 0.5msec: (i_phase_U or i_phase_V or i_phase_W) > 800A	- Check motor connection cable (short circuit); - Check speed sensor and replace if necessary; - Check motor and replace if necessary; - Replace component;
_	2	02	4	Operation	“Power connection output” current signal too high	Phase current too great The AC-3 Power Control (U8) has measured an excessive phase current; the error threshold is 25% above the maximum phase current limit set by the controller. This depends on the frequency and temperature and can be adjusted via a parameter. Internal overcurrent measurement from pulse controller faulty. The activation limit is 20 msec. The control system has been incorrectly set with regard to the subordinate current controllers; Power outputs of the AC-3 Power Control components have been shorted (either to the power supply or among each other); The phase current limit parameter has been adjusted during operation; AC-3 Power Control component (current measurement) is faulty	- Check power circuit wiring (short circuit); - Replace AC-3 Power Control interface card;
_	2	02	5	Operation	Short circuit steer motor to 0 V or power supply	For 100 msec. the steer current of the control and monitoring processors is different (self-measured current |I-steer| < 4A ; measured current of other processor |I-steer|> 22A)	- Line control steer motor/controller A1/A2

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	2	03	1…12	Operation	Current actual value prop. level not achieved (prop output 1...12)	for T >= control deviation limit time > limit	- Check wire connection to brake coil / valve coil; - Check brake coil / valve coil (resistance measurement), replace if necessary; - Check outputs for short circuits and rectify if necessary; - Replace signal-issuing controller;
_	2	04	1	Operation	Insufficient current through speed sensor	This event message is triggered if for T = 200 msec the following applies: i_{min} < 7 mA.	- Check wire connection; - Check speed sensor, replace if necessary; - Replace signal-evaluating controller;
_	2	04	4	Operation	Incrementer supply, broken wire	Incrementer supply, broken wire activation limit for longer than limit time.	- Check speed sensor power supply; - Check wire connection; - Replace speed sensor; - Replace signal-evaluating controller;
_	2	04	5	Operation	Additional incrementer supply, broken wire	Incrementer supply, broken wire activation limit for longer than limit time.	- Check speed sensor power supply; - Check wire connection; - Replace speed sensor; - Replace signal-evaluating controller;
_	2	04	6		Additional incrementer supply, broken wire	Incrementer supply, broken wire activation limit for longer than limit time.	-
_	2	04	7		Additional incrementer supply, broken wire	Incrementer supply, broken wire activation limit for longer than limit time.	-
_	2	04	8	Operation	Warning Incrementer supply, broken wire	Warning Incrementer supply, broken wire An emergency stop follows when the controller power stage is activated. The activation limit is 20 msec.	- Check speed sensor power supply; - Check wire connection; - Replace speed sensor; - Replace signal-evaluating controller;
_	2	05	1	Operation	Excessive current through speed sensor	This event message is triggered if for T = 200 msec the following applies: $U_{speed\ sensor\ supply}$ < 7 V.	- Check wire connection; - Check speed sensor, replace if necessary; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	2	06	4	Operation	Phase wire breakage, truck stationary	Phase wire breakage Each time the control system is activated AC-3 Power Control (U8) checks all phases for any disconnection of the current flow to the motor (wire breakage). Phase wire breakage when truck stationary. The activation limit is 20 msec. Broken wire or loosen screws in motor supply lines; •Motor damage; •The control system has been incorrectly set with regard to the subordinate current controllers; •AC-3 Power Control component (current transformer) is damaged;	- Check motor wire connections; - Check motor and replace if necessary; - Replace AC-3 Power Control interface card
_	2	06	5	Operation	Phase wire breakage, truck moving	Phase wire breakage Each time the control system is activated AC-3 Power Control (U8) checks all phases for any disconnection of the current flow to the motor (wire breakage). Phase wire breakage while truck moving (speed). The activation limit is 20 msec. Broken wire or loosen screws in motor supply lines; •Motor damage; •The control system has been incorrectly set with regard to the subordinate current controllers; •AC-3 Power Control component (current transformer) is damaged;	- Check motor wire connections; - Check motor and replace if necessary; - Replace AC-3 Power Control interface card
_	2	07	1	Operation	Warning No activation for internal driver supply 1 from safety computer.	Warning Driver supply 1 interrupted. An emergency stop follows when the controller power stage is activated. The activation limit is 20 msec.	- Check wiring between safe and power controller;
_	2	07	2	Operation	Warning No activation for internal driver supply 2 from safety computer.	Warning Driver supply 2 interrupted. An emergency stop follows when the controller power stage is activated. The activation limit is 20 msec.	- Check wiring between safe and power controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	2	07	3	Operation	No activation for internal driver supply from safety computer.	Internal driver supply 1 or 2 interrupted. The activation limit is 20 msec.	- Check wiring between safe and power controller;
_	2	08	1	Operation	Load wheel brake current too low	The safety function should be activated if for a brake setpoint (standardised pedal value affected by teach-in values) > 80% of the maximum current value does not exceed 2.0 A in the load wheel brake drivers for 200 msec.	- Switch the truck off and on again; - Check battery cable connection; - Check the brakes' electrical system; - Inquire about software update; - Replace signal-issuing controller;
_	2	09	1	Operation	Discharge current exceeds manufacturer's limit 1	I > current limit1 for t > time limit1	- Allow the battery to cool
_	2	09	2	Operation	Discharge current exceeds manufacturer's limit 5	I > current limit5 for t > time limit5	- Allow the battery to cool
_	2	10	1	Operation	Discharge current exceeds manufacturer's limit 2	I > current limit2 for t > time limit2	- Allow the battery to cool
_	2	11	1	Operation	Discharge current exceeds manufacturer's limit 3	I > current limit3 for t > time limit3	- Allow the battery to cool
_	2	12	1	Operation	Charge current exceeds manufacturer's limit 4	Charge / regenerate: I > current limit4 for t > time limit4	- Check charger
_	2	50	1	Operation	Front windscreen wiper output implausible	Interface: When the front windscreen wiper is switched on the following is checked in second pulses: Current < 200 mA, otherwise the event message is triggered	- Check wire connection; - Check sensor wiper motor and replace if necessary; - Replace signal-issuing controller;
_	2	50	2	Operation	Rear windscreen wiper output implausible	Interface: When the rear windscreen wiper is switched on the following is checked in second pulses: Current < 200 mA, otherwise the event message is triggered	- Check wire connection; - Check sensor wiper motor and replace if necessary; - Replace signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	2	50	3	Operation	Windscreen washing system output implausible	Interface: When the windscreen washing system is switched on the following is checked in second pulses: Current > 5 A, otherwise the event message is triggered Broken wire detected (OpenLoad detection) when system switched off -> error message after system switched on	- Check wire connection; - Check windscreen washing system pump and replace if necessary; - Replace signal-issuing controller;
_	2	50	4	Operation	Front left work lights output implausible	Interface: When the front left work lights are switched on the following is checked in second pulses: Current < 400 mA, otherwise the event message is triggered	- Check wire connection; - Check work lights and replace if necessary; - Replace signal-issuing controller;
_	2	50	5	Operation	Front right work lights output implausible	Interface: When the front right work lights are switched on the following is checked in second pulses: Current < 400 mA, otherwise the event message is triggered	- Check wire connection; - Check work lights and replace if necessary; - Replace signal-issuing controller;
_	2	50	6	Operation	Rear left work lights output implausible	Interface: When the rear left work lights are switched on the following is checked in second pulses: Current < 400 mA, otherwise the event message is triggered	- Check wire connection; - Check work lights and replace if necessary; - Replace signal-issuing controller;
_	2	50	7	Operation	Rear right work lights output implausible	Interface: When the rear right work lights are switched on the following is checked in second pulses: Current < 400 mA, otherwise the event message is triggered	- Check wire connection; - Check work lights and replace if necessary; - Replace signal-issuing controller;
_	2	50	8	Operation	Left indicator output implausible	Interface: This event message is triggered when the ramp has reached 100 % PWM (pulse width modulation): actual current < limit current (VFG E box)	- Check wire connection; - Check work lights and replace if necessary; - Replace signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	2	50	9	Operation	Right indicator output implausible	Interface: This event message is triggered when the ramp has reached 100 % PWM (pulse width modulation): actual current < limit current (VFG E box)	- Check wire connection; - Check work lights and replace if necessary; - Replace signal-issuing controller;
_	2	90	1	Undefined	Charger: battery current excessive	Charger: battery current excessive This event message is triggered if for T = 5 msec the following applies: I_{bat} > 800 A	- Check wire connections (battery, truck components,…) for short circuits;
_	3	01	1	System start	Key switch input low voltage	This event message is triggered if for T = 100 msec. (system start): $V_{key\ switch}$ < rated voltage - 30%	- Check battery voltage, charge battery if necessary; - Check the control current fuse and replace if necessary; - Check main fuse and replace if necessary; - Check key switch / ISM / CANCODE and replace if necessary; - Check “key switch discharge” contactor and replace if necessary; - Check controller cable connection; - Check the components supplied by the key switch (control and power circuits); - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	02	1	Operation	Key switch input low voltage	This event message is triggered if for T = 100 msec. (operation): $V_{key\ switch}$ < rated voltage - 50% Specifically for system trucks: internal power supply interrupted The AC-3 Power Control (U8) monitors the internal supply voltages for deviations. In the event of an error the AC-3 Power Control component (current transformer) is damaged.	- Switch the truck off and on again; - Check battery voltage, charge battery if necessary; - Check the control current fuse and replace if necessary; - Check main fuse and replace if necessary; - Check key switch / ISM / CANCODE and replace if necessary; - Check “key switch discharge” contactor and replace if necessary; - Check controller cable connection; - Check the components supplied by the key switch (control and power circuits); - Replace signal-evaluating controller;
_	3	02	2	Operation	“Key switch input” voltage signal too small from hardware	A digital signal generated outside the processor shows the status "key switch low voltage" and automatically disables the power stages. Activation limit, timing and truck response therefore depend on the switch and must not be changed through the software.	- Switch truck off and on again; - Check battery voltage, charge battery if necessary - Check control current fuse and replace if necessary; - Check main fuse and replace if necessary; - Check key switch / ISM / CANCODE and replace if necessary; - Check “key switch discharge” contactor and replace if necessary; - Check controller cable connection; - Check the components supplied by the key switch (control and power circuits); - Replace signal-evaluating controller;
_	3	03	1	Operation	Key switch input high voltage	This event message is triggered if for T = 100 msec the following applies: $V_{key\ switch}$ > rated voltage + 30%	- Switch the truck off and on again; - Check battery cable connection; - Check battery electrolyte level; - Check charger; - For a new battery wait for five charge cycles; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	04	1	Self test	Power connection input (+) low voltage	This event message is triggered if for T = 5 msec the following applies: $V_{capacitor} < V_{rated\ voltage}$ - 40% Specifically for system trucks: Low voltage The AC-3 Power Control (U8) has measured a battery voltage of less than 50% of the rated voltage when the control system was activated. Battery is discharged or incorrect rated voltage The main contactor was disconnected during active control (motor operation); The control system was activated before the main contactor was closed and the internal capacitors were charged; Installation of the AC-3 Power Control component is damaged; AC-3 Power Control component (voltage measurement) is damaged;	- Switch the truck off and on again; - Check the battery's rated voltage; - Check battery cable connections (transfer resistance, ...); - Check controller cable connections (right connections, transfer resistance, ...); - Check battery voltage, charge battery if necessary; - Check main fuse / power fuses and replace if necessary; - Disconnect the battery. Disconnect the component power positive terminal / fuses. Connect the components in turn. Connect the battery; - Check the consumers behind the main contactor are using current; - Check the main current wires (except for motor supply wires); - Replace signal-evaluating controller;
_	3	04	2	Self test	Power connection input (+) low voltage	This event message is triggered if the following applies for T = 3 sec after the component self-test: $V_{capacitor} < V_{rated\ voltage}$ - 33%	- Check battery voltage, charge battery if necessary; - Check main fuse / power fuses and replace if necessary; - Disconnect the battery. Disconnect the component power positive terminal / fuses. Connect the components in turn. Connect the battery; - Check the consumers behind the main contactor are using current; - Check the main current wires (except for motor supply wires); - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	05	1	Operation	Power connection input (+) low voltage	This event message is triggered if for T = 100 msec the following applies: $V_{capacitor} < V_{rated\ voltage}$ -30%	- Check main fuse and replace if necessary; - Check main contactor and replace if necessary; - Check battery electrolyte level; - Check the main current wires (except for motor supply wires); - Replace signal-evaluating controller;
_	3	05	2	Operation	Power connection input (+) low voltage	This event message is triggered if for T = 100 msec the following applies: $V_{capacitor} < V_{rated\ voltage}$ -16% in addition, regenerative braking and lifting are inhibited.	- Check main fuse and replace if necessary; - Check main contactor and replace if necessary; - Check battery electrolyte level; - Check the main current wires (except for motor supply wires); - Replace signal-evaluating controller;
_	3	06	1	Operation	Power connection input (+) high voltage	This event message is triggered if for T = 200 msec the following applies: $V_{capacitor} > V_{rated\ voltage}$ + 30% Specifically for system trucks: Overvoltage The AC-3 Power Control (U8) has measured a battery voltage of greater than 125% of the rated voltage when the control system was activated. Battery is overloaded or incorrect rated voltage; The main contactor was disconnected during active control (regenerative operation); Installation of the AC-3 Power Control component is faulty; AC-3 Power Control component (voltage measurement) is faulty;	- Switch the truck off and on again; - Check the battery's rated voltage; - Check battery cable connections (transfer resistance, ...); - Check controller cable connections (right connections, transfer resistance, ...); - Check battery electrolyte level; - Check charger; - For a new battery wait for five charge cycles; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	07	1	Self test	“Phase U output” signal implausible	Semi-jumpers 1, 2 and 3 are not controlled. This event message is triggered if the following applies for 20 msec: $V_{Phase\_X} > (V_{capacitor} / 2) + 25\%$ or $V_{Phase\_X} < (V_{capacitor} / 2) - 25\%$	- Disconnect motor connections. - Measure the phase voltages (U, V, W) against the potential $V_{bat(-)}$; if the phase voltages (U, V, W) are not half the battery voltage, and instead: • $V_{bat(+)}$ potential is -> check the motor is connected to $V_{bat(+)}$. • $V_{bat(-)}$ potential is -> check the motor is connected to $V_{bat(-)}$. - Replace controller;
			2	Self test	“Phase V output” signal implausible		
			3	Self test	“Phase W output” signal implausible		
_	3	08	1	Self test	“Power connection output” signal implausible	The branch is not controlled (lift actuator of a twin controller). This event message is triggered if the following applies for 20 msec: $V_{power\ loss} < V_{capacitor}$ -20%	- Check motor connection wire (wire breakage); - Check motor and replace if necessary; - Replace signal-issuing controller;
_	3	09	1	Operation	Emergency Disconnect detected during operation	Signal from Emergency Disconnect auxiliary contact changes during operation to "Emergency Disconnect" (disable power stage during operation)	- Switch truck off and on again; - Check battery voltage, charge battery if necessary - Check control current fuse and replace if necessary; - Check main fuse and replace if necessary; - Check key switch / ISM / CANCODE and replace if necessary; - Check “key switch discharge” contactor and replace if necessary; - Check controller cable connection; - Check the components supplied by the key switch (control and power circuits); - Replace signal-evaluating controller;
_	3	10	1	Operation	“Accelerator pedal input” signal implausible	The event message is triggered if the following applies for T = 250 msec: $V_{accelerator\ pedal} > 92.5\%$ or $V_{accelerator\ pedal} < 7.5\%$	- Check wire connection; - Check accelerator pedal power supply; - Replace accelerator pedal; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	11	1	Operation	“Hydraulic function 1 input” setpoint implausible	This event message is triggered if for T = 250 msec the following applies: Reading of $V_{hydraulic\ function\_1}$ > 90% or Reading of $V_{hydraulic\ function\_1}$ < 10%.	- Check wire connection; - Check hydraulic setpoint device power supply; - Replace hydraulic setpoint device; - Replace control;
_	3	12	1	Operation	“Hydraulic function 2 input” setpoint implausible	This event message is triggered if for T = 250 msec the following applies: Reading of $V_{hydraulic\ function\_2}$ > 90% or Reading of $V_{hydraulic\ function\_2}$ < 10%.	- Check wire connection; - Check hydraulic setpoint device power supply; - Replace hydraulic setpoint device; - Replace control;
_	3	13	1	Operation	“Hydraulic function 3 input” setpoint implausible	This event message is triggered if for T = 250 msec the following applies: Reading of $V_{hydraulic\ function\_3}$ > 90% or Reading of $V_{hydraulic\ function\_3}$ < 10%.	- Check wire connection; - Check hydraulic setpoint device power supply; - Replace hydraulic setpoint device; - Replace control;
_	3	14	1	Operation	“Hydraulic function 4 input” setpoint implausible	This event message is triggered if for T = 250 msec the following applies: Reading of $V_{hydraulic\ function\_4}$ > 90% or Reading of $V_{hydraulic\ function\_4}$ < 10%.	- Check wire connection; - Check hydraulic setpoint device power supply; - Replace hydraulic setpoint device; - Replace control;
_	3	15	1	Operation	“Hydraulic function 5 input” setpoint implausible	This event message is triggered if for T = 250 msec the following applies: Reading of $V_{hydraulic\ function\_5}$ > 90% or Reading of $V_{hydraulic\ function\_5}$ < 10%.	- Check wire connection; - Check hydraulic setpoint device power supply; - Replace hydraulic setpoint device; - Replace control;
_	3	16	1	Operation	“Hydraulic function 6 input” setpoint implausible	This event message is triggered if for T = 250 msec the following applies: Reading of $V_{hydraulic\ function\_6}$ > 90% or Reading of $V_{hydraulic\ function\_6}$ < 10%.	- Check wire connection; - Check hydraulic setpoint device power supply; - Replace hydraulic setpoint device; - Replace control;
_	3	17	1	Operation	“Motor temperature input” actual value implausible	This event message is triggered if for T = 250 msec the following applies: $V_{temperature\ sensor}$ > upper limit voltage or $V_{temperature\ sensor}$ < lower limit voltage.	- Check wire connection; - Check wire connection polarity; - Check temperature sensor; - If possible replace the temperature sensor, otherwise replace the motor; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	17	2	Operation	“Motor temperature input” actual value implausible	This event message is triggered if for T = 5 sec the following applies: $V_{temperature\ sensor}$ > upper limit voltage or $V_{temperature\ sensor}$ < lower limit voltage.	- Check wire connection; - Check wire connection polarity; - Check temperature sensor; - If possible replace the temperature sensor, otherwise replace the motor; - Replace signal-evaluating controller;
_	3	18	1	Operation	"Controller temperature 1 internal actual value" voltage signal implausible	This event message is triggered if for T = 250 msec the following applies: $V_{temperature\ sensor}$ > upper limit voltage or $V_{temperature\ sensor}$ < lower limit voltage.	- Replace controller;
_	3	18	2	Operation	"Controller temperature 2 internal actual value" voltage signal implausible (truck stop)	This event message is triggered if for T = 250 msec. (when truck is stationary): $V_{temperature\ sensor}$ > upper limit voltage or $V_{temperature\ sensor}$ < lower limit voltage	- Replace controller;
_	3	19	1	Operation	“Safety height input” actual value implausible	This event message is not currently used.	- Check wire connection; - Check sensor and replace if necessary; - Replace signal-evaluating controller;
_	3	20	1	System start operation	“Pressure sensor input” actual value implausible	This event message is not currently used.	- Check wire connection; - Check sensor and replace if necessary; - Replace signal-evaluating controller;
_	3	20	2	System start	Pressure sensor implausible (pressure reading does not match truck's status)	Pressure sensor implausible (pressure reading does not match truck's status); pressure reading of emergency stop device > limit [bar]	- Check sensor and replace if necessary;
_	3	21	1	Operation	“Steer angle sensor 1 input” actual value implausible;	This event message is triggered if for T = 90 msec the following applies: $V_{sensor\ supply}$ > 12.66 V or $V_{sensor\ supply}$ < 11.34 V.	- Check wire connection; - Check steer angle sensor 1 and replace if necessary; - Replace signal-evaluating controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	22	1		“Steer angle sensor 2 input” actual value implausible;	This event message is not currently used.	- Check wire connection; - Check steer angle sensor 2 and replace if necessary; - Replace signal-evaluating controller;
_	3	24	1	Operation	“Brake pedal input” signal implausible	This event message is triggered if for T = 250 msec the following applies: $V_{brake\ pedal}$ > 92.5% or $V_{brake\ pedal}$ < 7.5%.	- Check wire connection; - Brake pedal power supply; - Replace brake pedal; - Replace signal-evaluating controller;
_	3	25	1	Operation	“Hydraulic oil temperature actual value input” voltage signal implausible	for T = 250msec: (V_temperature sensor > upper limit voltage) or (V_temperature sensor < lower limit voltage)	- Check wire connection; - Check wire connection polarity; - Check temperature sensor; - Re-measure the hydraulic oil temperature; - Replace signal-evaluating controller;
_	3	30	1	Operation	Internal power supply out of range (1.9 V)	This event message is triggered if for T = 50 msec the following applies: $V_{1.9V}$ > 1.9 V + 5% or $V_{1.9V}$ < 1.9 V - 5%.	- Replace controller;
_	3	30	2	Operation	Internal power supply out of range (3.0 volts)	This event message is triggered if for T = 50 msec the following applies: V_{3V} > 3 V + 5% or V_{3V} < 3 V - 5%.	- Replace controller;
_	3	30	3	Operation	Internal power supply out of range (3.3 volts)	This event message is triggered if for T = 50 msec the following applies: $V_{3.3V}$ > 3.3 V + 5% or $V_{3.3V}$ < 3.3 V - 5%.	- Replace controller;
_	3	30	4	Operation	Internal power supply out of range (5.0 volts)	This event message is triggered if for T = 50 msec the following applies: V_{5V} > 5 V + 6% or V_{5V} < 5 V - 6 %.	- Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	30	5	Operation	Internal power supply out of range (12.0 V)	This event message is triggered if for T = 250 msec the following applies: V_{12V} > 12 V + 20% or V_{12V} < 12 V - 20%.	- Check connected sensor system and replace if necessary. Switch off the truck. Disconnect the sensor system. Switch the truck on again. Reconnect the sensor system components in turn until the event message appears; - Replace signal-issuing controller;
_	3	30	6	Operation	Internal power supply out of range (14.0 V)	This event message is triggered if for T = 250 msec the following applies: V_{14V} > 14 V + 20% or V_{14V} < 14 V - 20%.	- Replace controller;
_	3	30	7	Operation	Internal power supply out of range (24.0 V)	This event message is triggered if for T = 250 msec the following applies: V_{24V} > 24 V + 20% or V_{24V} < 24 V -20%	- Check fuses from DC / DC converter and replace if necessary; - Check from DC/DC transformer wire connections; - Check DC / DC converter and replace if necessary; - Replace controller;
_	3	30	8	Operation	Internal power supply out of range (10.0 V)	This event message is triggered if for T = 250 msec the following applies: V_{10V} > 10 V + 20% or $V_{10\ V}$ < 10 V - 20%.	- Replace controller;
_	3	30	9	Operation	Internal power supply out of range (2.54 V)	for T=250msec: (U_2_54V > 2.54 V + 20%) or (U_2_54V < 2.54 V - 20%)	- Replace controller;
_	3	31	1	Operation	Power connection input (+) low voltage	Hysteresis: "On" for T => 100 msec: $V_{batt\ reading}$ < V_{rated} - 20% "Off" for T => 100 msec: $V_{batt\ reading}$ > V_{rated} - 17%	- Check battery voltage, charge battery if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	32	1	Operation	“Sideshift position input” actual value implausible	This event message is triggered if for T = 250 msec the following applies: V_{sensor} > 92.5% or V_{sensor} < 7.5%	- Check wire connection; - Check sideshift position sensor power supply; - Replace sideshift position sensor; - Replace signal-evaluating controller;
_	3	33	1	System start	“Speed reduction input” signal implausible	This event message is triggered if for T = 250 msec the following applies: V_{sensor} > 92.5% or V_{sensor} < 7.5%	- Check wire connection; - Check speed reduction sensor power supply; - Replace speed reduction sensor; - Replace signal-evaluating controller;
_	3	34	1	Operation	Brake force governor: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	2	Operation	Brake force governor: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	3	Operation	Traverse sensor: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	4	Operation	Traverse sensor: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	34	5	Operation	Rotate sensor: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	6	Operation	Rotate sensor: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	7	Operation	Left hand support mushroom: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	8	Operation	Left hand support mushroom: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	9	Operation	Right hand support mushroom: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	10	Operation	Right hand support mushroom: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	34	11	Operation	Steering actual value sensor: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	12	Operation	Steering actual value sensor: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	13	Operation	Steering setpoint device: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	14	Operation	Steering setpoint device: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	15	Operation	Steering setpoint device optional: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	16	Operation	Steering setpoint device optional: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	34	21	Operation	Hydraulic setpoint device: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	22	Operation	Hydraulic setpoint device: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	23	Operation	Travel setpoint device: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	24	Operation	Travel setpoint device: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	25	Operation	Hydraulic setpoint device optional: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	26	Operation	Hydraulic setpoint device optional: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	34	27	Operation	Travel setpoint device optional: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	28	Operation	Travel setpoint device optional: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	34	29	Operation	Accelerator pedal setpoint device: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	3	34	30	Operation	Accelerator pedal setpoint device: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	3	34	31	Operation	Brake pedal setpoint device: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	3	34	32	Operation	Brake pedal setpoint device: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	34	33	Operation	Pedestrian right travel setpoint device: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	3	34	34	Operation	Pedestrian right travel setpoint device: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	3	34	35	Operation	Pedestrian left travel setpoint device: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	3	34	36	Operation	Pedestrian left travel setpoint device: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	3	34	37	Operation	Pedestrian right steer setpoint device: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	3	34	38	Operation	Pedestrian right steer setpoint device: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	34	39	Operation	Pedestrian left steer setpoint device: channel A wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	3	34	40	Operation	Pedestrian left steer setpoint device: channel B wire breakage	>4.7 volts measured on the analog input; the activation level is 100 msec	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	3	35	1	Operation	Brake force governor: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	2	Operation	Brake force governor: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	3	Operation	Traverse sensor: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	4	Operation	Traverse sensor: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	35	5	Operation	Rotate sensor: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	6	Operation	Rotate sensor: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	7	Operation	Left hand support mushroom: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	8	Operation	Left hand support mushroom: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	9	Operation	Right hand support mushroom: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	10	Operation	Right hand support mushroom: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	35	11	Operation	Steering actual value sensor: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	12	Operation	Steering actual value sensor: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	13	Operation	Steering setpoint device: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	14	Operation	Steering setpoint device: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	15	Operation	Steering setpoint device optional: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	16	Operation	Steering setpoint device optional: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	35	21	Operation	Hydraulic setpoint device: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	22	Operation	Hydraulic setpoint device: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	23	Operation	Travel setpoint device: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	24	Operation	Travel setpoint device: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	25	Operation	Hydraulic setpoint device optional: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	26	Operation	Hydraulic setpoint device optional: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	35	27	Operation	Travel setpoint device optional: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	28	Operation	Travel setpoint device optional: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	29	Operation	Travel setpoint device: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	30	Operation	Travel setpoint device: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	31	Operation	Brake setpoint device: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	32	Operation	Brake setpoint device: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	35	33	Operation	Pedestrian right travel setpoint device: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	34	Operation	Pedestrian right travel setpoint device: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	35	Operation	Pedestrian left travel setpoint device: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	36	Operation	Pedestrian left travel setpoint device: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	37	Operation	Pedestrian right steer setpoint device: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	38	Operation	Pedestrian right steer setpoint device: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	35	39	Operation	Pedestrian left steer setpoint device: channel A short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	35	40	Operation	Pedestrian left steer setpoint device: channel B short circuit	<0.3 volts measured on the analog input; the activation level is 100 msec	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	36	1	Operation	“Tilt sensor actual value input” voltage signal implausible	for T = 250 msec.: (V_Sensor > 92.5%) or (V_Sensor < 7.5%)	- Check sensor; - Check connectors and wires; - Replace sensor
_	3	37	2	Operation	Internal power supply jxp-A (drive compartment), system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	3	Operation	Internal power supply jxp-Interface IDS, system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	4	Operation	Internal power supply jxp-L, system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	6	Operation	Internal power supply jxp-Interface DPI, system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	7	Operation	Internal power supply jxp-Interface MIO, system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	37	12	Operation	Internal power supply jxp-WGA LD, system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	13	Operation	Internal power supply jxp-WGA KAR, system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	14	Operation	Internal power supply jxp-WGA DD, system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	15	Operation	Internal power supply jxp-DK out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	21	Operation	Internal power supply jxp-E1, system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	22	Operation	Internal power supply jxp-E2, system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	23	Operation	Internal power supply jxp-E1 optional (drive compartment), system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	24	Operation	Internal power supply jxp-E2 optional (charger), system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	25	Operation	Internal power supply jxp-E1 optional (operator position), system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	26	Operation	Internal power supply jxp-E3, system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	37	31	Operation	Internal power supply jxp-E1 (external controller), system A out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	34	Operation	Internal power supply jxp-A (drive compartment), system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	35	Operation	Internal power supply jxp-Interface IDS, system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	36	Operation	Internal power supply jxp-L, system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	38	Operation	Internal power supply jxp-Interface DPI, system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	39	Operation	Internal power supply jxp-Interface MIO, system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	44	Operation	Internal power supply jxp-WGA LD, system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	45	Operation	Internal power supply jxp-WGA KAR, system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	46	Operation	Internal power supply jxp-WGA DD, system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	53	Operation	Internal power supply jxp-E1, system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	37	54	Operation	Internal power supply jxp-E2, system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	55	Operation	Internal power supply jxp-E1 optional (drive compartment), system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	56	Operation	Internal power supply jxp-E2 optional (charger), system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	57	Operation	Internal power supply jxp-E1 optional (operator position), system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	58	Operation	Internal power supply jxp-E3, system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	37	63	Operation	Internal power supply jxp-E1 (external controller), system B out of range	Internal power supply in CANopen Slave out of range	- Check component power supply; - Exchange component
_	3	38	1	Operation	Internal power supply jxp-Panel, system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	2	Operation	Power supply sensor system jxp-A (drive compartment), system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	3	Operation	Power supply sensor system jxp-Interface IDS, system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	38	4	Operation	Power supply sensor system jxp-L, system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	6	Operation	Power supply sensor system jxp-Interface DPI, system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	7	Operation	Power supply sensor system jxp-Interface MIO, system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	21	Operation	Internal power supply jxp-E1, system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	22	Operation	Power supply sensor system jxp-E2, system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	23	Operation	Power supply sensor system jxp-E1 optional (drive compartment), system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	24	Operation	Power supply sensor system jxp-E2 optional (charger), system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	38	25	Operation	Power supply sensor system jxp-E1 optional (operator position), system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	26	Operation	Power supply sensor system jxp-E3, system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	31	Operation	Power supply sensor system jxp-E1 (external controller), system A out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	33	Operation	Power supply sensor system jxp-Panel, system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	34	Operation	Power supply sensor system jxp-A (drive compartment), system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	35	Operation	Power supply sensor system jxp-Interface IDS, system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	36	Operation	Power supply sensor system jxp-L, system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	38	38	Operation	Power supply sensor system jxp-Interface DPI, system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	39	Operation	Power supply sensor system jxp-Interface MIO, system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	53	Operation	Power supply sensor system jxp-E1, system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	54	Operation	Power supply sensor system jxp-E2, system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	55	Operation	Power supply sensor system jxp-E1 optional (drive compartment), system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	56	Operation	Power supply sensor system jxp-E2 optional (charger), system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	57	Operation	Power supply sensor system jxp-E1 optional (operator position), system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	38	58	Operation	Power supply sensor system jxp-E3, system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	38	63	Operation	Power supply sensor system jxp-E1 (external controller), system B out of range	Sensor system 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected sensor system for permissible current consumption; - Replace component;
_	3	39	2	Operation	Power supply line driver jxp-A (drive compartment), system A out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	3	Operation	Power supply line driver jxp-Interface IDS, system A out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	4	Operation	Power supply line driver jxp-L, system A out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	6	Operation	Power supply line driver jxp-Interface DPI, system A out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	7	Operation	Power supply line driver jxp-Interface MIO, system A out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	39	34	Operation	Power supply line driver jxp-A (drive compartment), system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	35	Operation	Power supply line driver jxp-Interface IDS, system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	36	Operation	Power supply line driver jxp-L, system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	38	Operation	Power supply line driver jxp-Interface DPI, system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	39	Operation	Power supply line driver jxp-Interface MIO, system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	53	Operation	Power supply line driver jxp-E1, system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	54	Operation	Power supply line driver jxp-E2, system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	39	55	Operation	Power supply line driver jxp-E1 optional (drive compartment), system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	56	Operation	Power supply line driver jxp-E2 optional (charger), system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	57	Operation	Power supply line driver jxp-E1 optional (operator position), system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	58	Operation	Power supply line driver jxp-E3, system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	39	63	Operation	Power supply line driver jxp-E1 (external controller), system B out of range	Line driver 1 24 volt supply in CANopen slave less than 14 V	- Measure voltage output without load; - Check connected actuating system for permissible current consumption; - Replace component;
_	3	40	1	Operation	Lilon battery considerable low voltage	SOC battery 10% for >30 sec	- Charge the battery
_	3	41	1	Operation	Lilon battery critical low voltage	SOC battery 5% for >30 sec	- Charge the battery
_	3	42	1	Operation	Lilon battery excessive low voltage	SOC battery 2.5% for >30 sec	- Test energy recovery - Check charger - Switch on and operate truck
_	3	43	1	Operation	Lilon battery full discharge	Vcell <3.2V AND charger not detected for >30 sec	- Charge the battery

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	43	2	Operation	Lilon battery full discharge	SOC battery (internal) = 0% AND charger not detected for >30 sec	- Charge the battery
_	3	44	1	Operation	Low voltage Lilon battery faulty	Operating function: Cancode switched on AND cell voltage below 3 V for more than 100ms OR Cancode switched off AND no charger detected AND cell voltage below 3 V for more than 100ms SF5: Charger detected AND cell voltage below 3 V for more than 100ms OR a charge current greater than 1 A AND cell voltage below 3 V for more than 100ms	- Dispose of battery
_	3	45	1	Operation	Lilon battery overvoltage	Vcell >4.2 V for 100 msec	- Reduce energy recovery (i.e. smaller travel program) - Check charger
_	3	46	1		Lilon battery overvoltage charge limit	Vcell >4.12483 V or SOC battery >95% when charging for >10 sec	- Check charger
_	3	51	1	Operation	Water in oil sensor defective	“Water in hydraulic oil”sensor reports error status	- Check wiring with multimeter; - Check sensor system with multimeter; - Check computer component inputs; - Repair faulty components and replace if necessary;
_	3	70	2…n	Operation	Tiller head sensor: analog signal too high	Tiller head sensor: Analog signal limit exceeded.	- Re-teach the tiller head sensor; - Replace tiller head;
_	3	71	2…n	Operation	Tiller head sensor: Analog signal too low	Tiller head sensor: Level below analog signal limit.	- Re-teach the tiller head sensor; - Replace tiller head;
_	3	72	2…n	Operation	Tiller head sensor: Analog signal implausible	Tiller head sensor: Angle deviation from calibration table too great.	- Re-teach the tiller head sensor; - Replace tiller head;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	80	1	Operation	“Travel direction input” signal implausible	Redundancy test failed, broken wire or teach-in values faulty. Error remains until the unit is switched off or reset.	- Check wire connection; - Check travel direction switch power supply; - Re-teach the control / MULTI-PILOT; - If applicable replace the direction switch; - Replace control / MULTI-PILOT;
_	3	81	1	Operation	MULTI-PILOT specific: “Horn button input” voltage signal implausible	for T = 250 msec.: (Reading V_horn button > 90%) or (Reading V_horn button < 10%)	- Check wire connection; - Check horn button power supply; - Replace horn button setpoint device;
_	3	91	1	Undefined	“Battery measurement input” signal on charger too low	Charger: “Battery measurement input” voltage signal on charger too low. This event message is triggered if the following applies for T = 4 sec: V_{cell} < 1.2 volts per cell	- Charge the battery; - Check electrolyte level; - Check battery cell voltage, replace if necessary; - Measure battery voltage on charger; - Measure battery voltage on the battery; - Check charging lead (fuses, ...) and replace if necessary; - Replace battery;
_	3	91	1	Self test / operation	“Battery measurement input” signal on charger too low	Charger: “Battery measurement input” voltage signal on charger too low. This event message is triggered if the following applies for T = 4 sec: V_{cell} < 1.2 volts per cell	- Charge the battery; - Check electrolyte level; - Check battery cell voltage, replace if necessary; - Measure battery voltage on charger; - Measure battery voltage on the battery; - Check charging lead (fuses, ...) and replace if necessary; - Replace battery;
_						Battery measurement input voltage below 1.0V	- Manually move the shuttle to the channel start - Charge batteries and replace if necessary - Check fuse 1F9 - Check voltage divider R10 - Check contactors K1 and K5 - Check wire connection.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	91	2	Undefined	“Battery measurement input” signal on battery controller too low	Battery controller: “Battery measurement input” voltage signal on battery controller too low. The event message is triggered if the following applies for T = 250msec: V_{bat} < 18 V	- Charge the battery; - Check electrolyte level; - Check battery cell voltage, replace if necessary; - Measure battery voltage on charger; - Measure battery voltage on the battery; - Check wire on battery controller; - Check charging lead (fuses, ...) and replace if necessary; - Replace battery;
	3	92	1	Self test / operation	“Battery measurement input” signal on charger too high	Charger: “Battery measurement input” voltage signal on charger too high. This event message is triggered if for T = 2 sec the following applies: V_{cell} > 3 V per cell	- The rated voltages of the battery and charger do not match -> use a suitable charger to charge the battery;
_						Battery measurement input voltage above 8.0V	- Manually move the shuttle to the channel start - Charge batteries and replace if necessary - Check fuse 1F9 - Check voltage divider R10 - Check contactors K1 and K5 - Check wire connection
_	3	92	2	Undefined	“Battery measurement input” signal on battery controller too high	Battery controller: “Battery measurement input” voltage signal on battery controller too high. The event message is triggered if the following applies for T = 250msec: V_{bat} > 117 V	- Measure voltage on battery controller; - Replace battery controller;
_	3	93	1	Undefined	“Battery temperature actual value” signal implausible	Battery controller: “Battery temperature actual value” voltage signal implausible. This event message is triggered if for T = 250 msec the following applies: $V_{temperature\ gauge}$ < -45 °C or $V_{temperature\ gauge}$ > 125 °C	- Check temperature gauge on battery controller (between battery cells); - Replace battery controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	3	94	1	Undefined	“Battery semi-voltage” signal implausible	Battery controller: “Battery semi-voltage” signal implausible. The prompt is issued after T = 250 msec: This event message is triggered if the following applies for T = 2 sec: Voltage over half the cells should be half the battery voltage. If there is a deviation of more than ± 1.5 V between the two halves, the event message is triggered.	- Check the measuring lead of the battery controller is connected to the right cell (GND, $V_{bat/2}$,V_{bat}) - Measure the cell voltage of each battery cell; - Check battery controller cable connection;
_	3	95	1	Operation	Battery full discharge voltage limit exceeded	Battery controller: Battery full discharge voltage limit exceeded. The event message is triggered if the discharge voltage is too low before the battery capacity is zero.	- Check charge characteristic against battery data plate and adjust as required; - Charge the battery; ➔ If the error is not repeated after the battery has been charged, point out to the customer that the battery was fully discharged. - Measure the cell voltage of each battery cell; - Measure the voltage on the connector cables of the battery controller; compare the reading with that measured by the battery controller and if necessary replace the battery controller;
_	3	96	1	Undefined	Mains error low voltage	Mains voltage <= 0.9*rated voltage for longer than 60 sec	- The charger may continue charging with a low current. The charge time may be extended. This event message is designed for information purposes in case the charge times are not maintained.
_	3	97	1	Undefined	Mains error overvoltage	Mains voltage >= 1.15*rated voltage for longer than 60 sec	- The charger continues charging. It finally switches off at 275 V (for the 230 volt model of the ELH2430 family). This event message is designed for information purposes in case the charge times are not maintained.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	4	01	1…n	Operation	Significant over-temperature for components	“Internal components” temperature range exceeded (significantly) Hysteresis: "On" when temperature > contact temperature; "Off" when temperature < contact temperature - 2°C The event message remains if the area is abandoned for higher temperatures.	- Allow the controllers to cool; - Check ventilation inputs and outputs, clean if necessary; - Check assembly on heat dissipater (heat conductivity);
_	4	02	1…n	Operation	Component temperature over-exceeded	“Internal components” temperature range exceeded (too far) Hysteresis: "On" when temperature > lower temperature limit; "Off" when temperature < lower temperature limit - 2°C The event message remains if the area is abandoned for higher temperatures. Specifically for system trucks: Heat sink temperature out of range The AC-3 Power Control (U8) has recorded a heat sink temperature of greater than 90 °C or less than –25 °C ; Fans no longer working or air flow through heat sink restricted; AC-3 Power Control overcharged; Ambient temperature is very high and AC-3 Power Control is overcharged; AC-3 Power Control component (temperature measurement) is faulty	- Allow the controllers to cool; - Check ventilation inputs and outputs, clean if necessary; - Check the air flow through the heat sinks and clean if necessary; - Check assembly on heat dissipater (heat conductivity); - Test fans and replace if necessary; - Replace signal-evaluating controller;
_	4	03	1…n	Operation	Critical over-temperature for components	“Internal components” temperature range exceeded (critically) Hysteresis: "On" when temperature > upper temperature limit; "Off" when temperature < upper temperature limit - 2°C	- Allow the controllers to cool; - Check ventilation inputs and outputs, clean if necessary; - Check assembly on heat dissipater (heat conductivity); - Test fans and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	4	04	1…n	Operation	Significant motor over-temperature	Motor temperature range exceeded (significantly) Hysteresis: "On" when temperature > contact temperature; "Off" when temperature < contact temperature - 5°C The event message remains if the area is abandoned for higher temperatures.	- Allow the motor to cool down; - Check ventilation inputs and outputs, clean if necessary; - Check fan controller parameters; - Check brakes can move freely;
_	4	05	1…n	Operation	Motor temperature over-exceeded	Motor temperature range exceeded (too far) Hysteresis: "On" when temperature > lower temperature limit; "Off" when temperature < lower temperature limit - 5°C The event message remains if the area is abandoned for higher temperatures. Specifically for system trucks: Motor temperature out of range The AC-3 Power Control (U8) has recorded a motor temperature of greater than 125 °C or less than –25 °C ; The motor has been overloaded or motor cooling not working sufficiently; motor ambient temperature is very high and motor is overloaded; Motor (temperature sensor) damaged; AC-3 Power Control component (temperature measurement) is faulty;	- Allow the motor to cool down; - Check ventilation inputs and outputs, clean if necessary; - Check fan controller parameters; - Check brakes can move freely; - Check temperature measurement wiring (controller to motor); - Check motor temperature sensor; - Replace motor;
_	4	06	1…n	Operation	Critical motor over-temperature	Motor temperature range exceeded (critical) Hysteresis: "On" when temperature > upper temperature limit; "Off" when temperature < upper temperature limit - 5 °C	- Allow the motor to cool down; - Check ventilation inputs and outputs, clean if necessary; - Check fan controller parameters; - Check brakes can move freely; - Test fans and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	4	07	1…n	Latent	“Internal components” temperature range not achieved (significantly)	Hysteresis: "On" when temp < limit temperature; "Off" when temp > limit temperature + hysteresis value	- Measure the temperature where the component is installed; compare the temperature measured with the temperature measured by the component and if necessary replace the component.
_	4	08	1	Undefined	Significant battery over-temperature	PZS battery: Hysteresis: "On" when temp > 45°C.; "Off" when temp < 43°C PZV battery: Hysteresis: "On" when temp > 40°C.; "Off" when temp < 38°C Lilon battery: Hysteresis: "On" when temp > 40°C.; "Off" when temp < 38°C	- Measure the temperature of the - battery controller thermal sensor in position. - Compare the temperature reading with the temperature - measured by the battery controller, and if necessary - replace the battery controller; - Allow the battery to cool;
_	4	09	1	Undefined	Battery temperature over-exceeded	PZS battery: Hysteresis: "On" when temp > 55°C.; "Off" when temp < 53°C PZV battery: Hysteresis: "On" when temp > 45°C.; "Off" when temp < 43°C Lilon battery: Hysteresis: "On" when temp >60°C.; "Off" when temp <50°C for travel / energy recovery Lilon battery: Hysteresis: "On" when temp > 45°C.; "Off" when temp < 43°C during charging	- Measure the temperature of the - battery controller thermal sensor in position. - Compare the temperature reading with the temperature - measured by the battery controller, and if necessary - replace the battery controller; - Allow the battery to cool;
_	4	10	1	Undefined	Critical battery over-temperature	“Battery” temperature range exceeded (critically) This event message is not currently used.	
_	4	11	1	Operation	“Hydraulic oil” temperature range exceeded (significantly)	Hysteresis: "On" when temp > application temperature; "Off" when temp < application temperature - 5 K (if the range is abandoned for a higher temperature: event remains)	- Allow the hydraulic system to cool down; - Check ventilation inputs and outputs, clean if necessary; - Check fan controller parameters; - Check mast can move freely;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	4	12	1	Operation	“Hydraulic oil” temperature range exceeded (significantly)	Hysteresis: "On" when temp > upper limit temperature; "Off" when temp < lower limit temperature - 5 K (if the range is abandoned for a higher temperature: event remains)	- Allow the hydraulic system to cool down; - Check ventilation inputs and outputs, clean if necessary; - Check fan controller parameters; - Check mast can move freely;
_	4	13	1	Operation	“Battery” temperature range not reached	Lilon battery: Safety function Activation criterion: if charger is detected AND cell temperature below -10°C for 1 second OR Activation criterion: If charge current > 1 A AND cell temperature below -10°C for 1 second Operating function: Activation criterion: On: temp. < -10° C; Off: temp. >-9° C for 1 second during travel and energy recovery Activation criterion: On: temp. < 5° C; Off: temp. >6° C for 1 second during charging	- Use the battery in a warmer environment
_	4	14	1...n	Operation	“Internal components” temperature range not achieved (too great)	Hysteresis: "On" when temp < limit temperature; "Off" when temp > limit temperature + hysteresis value	- Measure the temperature of the component in position. Compare the temperature measured with the temperature measured by the component and if necessary replace the component.
_	4	15	1...n	Operation	“Internal components” temperature range not achieved (critically)	Hysteresis: "On" when temp < limit temperature; "Off" when temp > limit temperature + hysteresis value	- Measure the temperature of the component in position. Compare the temperature measured with the temperature measured by the component and if necessary replace the component.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	5	01	1	Operation	Output transformer driver connection activated	“Output transformer driver connection” hardware signal activated (main jumper); External interruption of MOSFET driver connection activated. Specifically for system trucks: Output transformer has cut out Hardware output transformer protection of the AC-3 Power Control component (U8) has applied and de-energised the output transformer (Tristate). Power outputs of the AC-3 Power Control components have been shorted (either to the power supply or among each other); AC-3 Power Control component (power stage or power stage contactor) is damaged;	- Switch the truck off and on again; - Check motor connection cable (short circuit); - Check speed sensor, replace if necessary; - Check motor and replace if necessary; - Replace component (for W&S line: replace AC-3 Power Control interface card);
_	5	01	2	Operation	Output transformer driver connection activated	“Output transformer driver connection” hardware signal activated (lift actuator of a combination controller); External interruption of MOSFET driver connection activated.	- Switch the truck off and on again; - Check motor connection cable (short circuit); - Check speed sensor, replace if necessary; - Check motor and replace if necessary; - Replace component;
_	5	01	3	Operation	Driver circuit proportional output activated	"Driver circuit proportional output" hardware signal activated (proportional output); External interruption of MOSFET driver connection activated.	- Check wire connection to brake coil / valve coil; - Check brake coil / valve coil (resistance measurement), replace if necessary; - Check outputs for short circuits and rectify if necessary; - Replace signal-issuing controller;
_	5	01	4	Operation	“Comparator switch” hardware signal triggered (steer motor shorted)	HW comparator switch triggered and the current reading is less than 10A (for t = 200 msec.)	- Line control steer motor/controller A1/A2 - Replace steer motor - Replace controller
_	5	02	1	Operation	Internal processor control implausible	This event message is triggered if for T < 10 msec the "external watchdog" hardware signal is implausible (processed too quickly).	- Switch the truck off and on again; - Replace component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	5	02	2	Operation	Internal processor control implausible	This event message is triggered if for T > 100 msec the "external watchdog" hardware signal is implausible (processed too slowly).	- Switch the truck off and on again; - Replace component;
_	5	02	3	Self test	"External watchdog" hardware signal improbable (not output stage disable)	When the external watchdog runs out the output transformers / basic outputs are not switched off. "External watchdog" hardware signal implausible Signal permanently displayed / output transformer not deactivated.	- Switch the truck off and on again; - Replace component;
_	5	02	4	Operation	Internal processor control implausible	This event message is triggered if the "external watchdog" does not start within 10 msec.	- Switch the truck off and on again; - Replace component;
_	5	02	5	Operation	Internal processor control implausible	This event message is triggered if the initial activation of the external watchdog was not successful.	- Switch the truck off and on again; - Replace component;
_	5	03	1…n	System start operation	EEProm does not respond	This event message is triggered if the EEPROM has not responded forty times in succession.	- Clear logbook; - Set truck type; - Set hourmeter; - Set factory parameters; - Set default parameters; - Replace controller;
_	5	04	1…n	Operation	“Driver connection digital output” damaged	This event message is triggered if for T = 100 msec the following applies: Output driver status register has reported a fault. Sub index matches the output number Status = 1: - No load Status = 2: - Battery (+) short circuit or overtemperature Status = 3: - Battery (-) short circuit.	- Check wire connection; - Check connected consumers (brake magnet, valves, …) and replace if necessary; - Check outputs via JUDIT; - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	5	05	1	Operation	“Overvoltage” signal triggered	This event message is triggered when the “overvoltage” hardware signal is triggered. External interruption of voltage control activated.	- Check main fuse; - Check main contactor / Emergency Disconnect switch; - Check battery cable connection; - Check the battery and charge if necessary; - Check electrolyte level; - Set brake ramp parameters; - Check charger settings; - Replace controller;
_	5	06	1	Undefined	Reset by monitoring component	Hardware reset activated by watchdog.	- Switch the truck off and on again; - Check CAN-Bus; - Replace controller;
_	5	07	1	Undefined	Internal error	I2C bus error (device-internal communication bus) Node ID from logbook corresponds to actuating component.	- Replace component;
_	5	07	2	Undefined	Internal error	SPI bus error (device-internal communication bus) Node ID from logbook corresponds to actuating component.	- Replace component;
_	5	07	3	Undefined	Internal error	Serial interface error (UART error) Node ID from logbook corresponds to actuating component.	- Replace component;
_	5	07	4	Undefined	Internal error	Error in analog/digital transformer (ADC error) Node ID from logbook corresponds to actuating component.	- Replace component;
_	5	07	5	Undefined	Internal error	Error in timer module (RTC error) Node ID from logbook corresponds to actuating component.	- Replace component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	5	07	6	Undefined	Internal error	Faulty radio module Node ID from logbook corresponds to actuating component.	- Replace component;
_	5	07	7	Undefined	ROM or flash error	Flash error -> radio module faulty Node ID from logbook corresponds to actuating component.	- Repeat flash process; - Replace component;
_	5	07	8	Undefined	Improbable readings for analog/digital converter	Analog/digital converter error	- Replace component;
_	5	08	1	Undefined	Fan not working correctly	No speed signal from fan present when the fan is modulated (fan does not rotate?) Or Fan current implausible	- Check fan wire connection; - Check fan freedom of movement; - Replace fan; - Replace signal-issuing controller;
_	5	09	1	System start	Co-processor does not communicate	For t = 2 sec.: processor not triggered by co-processor	- Switch the truck off and on again; - Replace component;
_	5	24	1	Self test	Error bit set in jxp component panel	Interface for evaluating controls in control panel reports fault. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	2	Self test	Error bit set in jxp component A (drive compartment)	Interface in drive compartment reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	3	Self test	Error bit set in jxp component Interface IDS	Drive compartment interface reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	4	Self test	Error bit set in jxp component L (operator position / load handling)	Interface in operator position / load handler reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	6	Self test	Error bit set in jxp component Interface DPI	Drive compartment interface (DPI) reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	5	24	7	Self test	Error bit set in jxp component Interface Mio	Interface in operator position / load handler (MIO) reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	9	Self test	Error bit set in jxp component Drive1	Drive1 interface reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	10	Self test	Error bit set in jxp component Drive2	Drive2 interface reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	11	Self test	Error bit set in jxp component Drive3	Drive3 interface reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	12	Self test	Error bit set in jxp component wire guidance load direction sensor	Wire guidance load direction sensor reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	13	Self test	Error bit set in jxp component KAR antenna	Wire guidance cornering drive direction sensor reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	14	Self test	Error bit set in jxp component wire guidance drive direction sensor	Wire guidance drive direction sensor reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	15	Self test	Error bit set in jxp component Interface DK	Interface DK reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	20	Self test	Error bit set in jxp component HPS left (RFID reader)	RFID reader left reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	21	Self test	Error bit set in jxp component E1	Interface 1 optional type 1 reports error. The activation threshold is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	22	Self test	Error bit set in jxp component E2	Interface 1 optional type 2 reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	5	24	23	Self test	Error bit set in jxp component option E1 (drive compartment)	Interface 2 optional type 1 reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	24	Self test	Error bit set in jxp component option E2 (charger)	Interface 2 optional type 2 reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	25	Self test	Error bit set in jxp component option E1 (cabin)	Interface 3 optional type1 reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	26	Self test	Error bit set in jxp component E3	Interface 1 optional type3 reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	31	Self test	Error bit set in jxp component E1 external controller	Interface for external control optional type 1 reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	52	Self test	Error bit set in jxp component HPS right (RFID reader)	RFID reader right reports error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	24	64	Self test	Error of slave set in Safe computers	A CANopen slave in the network reports an error. The activation limit is 20 msec.	- Contact Technical Support; - Replace components if necessary;
_	5	51	1	Operation	“Steer motor status” signal damaged	Steering: The control electronics of the ISKRA steer motor has identified an internal error. The steering controller is informed of the status of the ISKRA steer motor via a separate wire (>16 V = fault).	- Allow the motor to cool down as it may be overheated; - Check motor fuses and replace if necessary; - If the motor fuses trip again, check the motor and replace if necessary. Then replace the motor fuses;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	5	51	2	Operation	“Steer motor status” signal not ready	Steering: The “ready” status has not been identified T = 2 sec. after power up of the steering controller (during initialization) (flank 24 V to 0 V). The steering controller is informed of the status of the ISKRA steer motor via a separate wire (0 V = ready).	- Allow the motor to cool down as it may be overheated; - Check motor fuses and replace if necessary; - If the motor fuses trip again, check the motor and replace if necessary. Then replace the motor fuses;
_	5	60	1	Operation	Transponder: faulty reading or incorrectly programmed transponder	Transponder data analysis: The last transponder reading did not contain the expected data. The activation limit is 20 msec.	- Check transponder data; - Re-teach the transponder via JUDIT if necessary; - Replace the transponder if necessary;
_	5	60	2	Operation	Transponder: position number in aisle is greater than the maximum number of transponders in the aisle	Transponder data analysis: The number of transponders configured in the aisle type has been exceeded. The activation limit is 20 msec.	- Check transponder data; - Re-teach the transponder via JUDIT if necessary; - Replace the transponder if necessary;
_	5	60	3	Operation	Transponder: transponder has the wrong transponder type	Transponder data analysis: A transponder of the wrong type has been read. The activation limit is 20 msec.	- Check transponder data; - Re-teach the transponder via JUDIT if necessary; - Replace the transponder if necessary;
_	5	60	4	Operation	Transponder: transponder has the wrong aisle type	Transponder data analysis: The last transponder reading contained a wrong aisle type. The activation limit is 20 msec.	- Check transponder data; - Re-teach the transponder via JUDIT if necessary; - Replace the transponder if necessary;
_	5	60	5	Operation	Transponder: transponder has the wrong aisle number	Transponder data analysis: The last transponder reading contained a wrong aisle number. The activation limit is 20 msec.	- Check transponder data; - Re-teach the transponder via JUDIT if necessary; - Replace the transponder if necessary;
_	5	60	6	Operation	Transponder: Sequence of transponders in aisle is incorrect	The last transponder reading contained a wrong transponder sequence. The activation limit is 20 msec.	- Check transponder data; - Re-teach the transponder via JUDIT if necessary; - Replace the transponder if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	5	60	7		Transponder: a transponder was missing	An expected transponder was not found.	- Check the transponder routing; - Check the signal strength of the readers via transponders;
_	5	60	8		Transponder: faulty transponder data reading	The last transponder reading contained faulty transponder data. The activation limit is 20 msec.	- Check the signal strength of the readers via transponders;
_	5	60	9		Transponder: transponder data invalid	The last transponder contains invalid transponder data. The activation limit is 20 msec.	- Check the transponder data content and re-program if necessary.
_	5	60	10		Transponder: multiple transponder data readings implausible	Multiple transponder data readings do not match The activation limit is 20 msec.	- Check the signal strength of the readers via transponders;
_	5	60	11		Transponder: left and right RFID readers have received data	Left and right RFID readers detect a transponder. The activation limit is 20 msec.	- Check the transponder routing;
_	5	60	12		Transponder analysis: aisle active without transponder information	The aisle status is active without having detected an entry direction via transponders. The activation limit is 20 msec.	- Check the transponder routing; - Check the signal strength of the readers via transponders;
_	5	60	13		Transponder analysis: apron field distance exceeded without detecting a transponder	The 'Apron_distance_without_transponder' parameter is shorter than the distance detected. The activation limit is 20 msec.	- Check the transponder routing; - Check the signal strength of the readers via transponders;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	5	61	1	Operation	Warehouse navigation: Expected reflex marker not found	Reflex marker not identified in the expected area. The activation limit is 20 msec.	- Manually move the shuttle to the channel start - Repeat travel command at channel start - Check rail hole sensors 7B33.1, 7B33.2 for contamination, incorrect settings and faults - Check incremental transmitter 1B5 - Check wire connection - Check drive chain - Check position of rail holes, they should lie directly opposite each other - Check rail holes and travel channel for contamination - Check the shuttle in a different travel channel
_						Signal change expected at 7B33.1 Signals of 7B33.1 and 7B33.2 differ No signals from incremental transmitter 1B5	
_	5	61	2		Warehouse navigation: reflex marker read in unexpected position	Reflex marker detected in unexpected position. The activation limit is 20 msec.	- Check the transponder routing; - Check the arrangement of the reflex markers;
_	5	61	3		Warehouse navigation: deviation from marker position to aisle position excessive	Tolerance window not met for marker position. The activation limit is 20 msec.	- Check the transponder routing; - Check the arrangement of the reflex markers;
_	5	61	4		Horizontal positioning: distance between markers smaller than tolerance	Minimum marker distance in mm: (2 * marker tolerance) + marker width; if the distance between two markers is less than the above minimum distance, the error message appears after a job is entered. Remedy: reduce the 'marker tolerance' parameter or set up the warehouse so that the distance between the markers is greater.	- Check the transponder routing; - Check the arrangement of the reflex markers;
_	5	61	5		Horizontal positioning: positioned within tolerance, but no marker	If the 'positioning tolerance' parameter is less than half the 'marker width' parameter, the truck must be positioned exactly on a marker. The error can occur if for example the laser scanner attachment is loose or if positions are stored wrongly during teach-in or during commissioning.	- Check parameter setting;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	5	61	6		Horizontal positioning: adjustment stop value at limit, positioning not possible	The 'correction stop load direction / drive direction' value is restricted to 50 mm. When this has been reach, exact positioning is not possible. Check the 'HP/LN default settings - stopping distance, positioning distance and braking distance' setting	- Check parameter setting;
_	6	01	1	System start	Software has been reset	Software has been reset (internal error).	- Switch the truck off and on again; - Check CAN-Bus; - Inquire about software update; - Replace controller;
_	6	02	1	Undefined	Accessing non-existent memory cell	Internal software error (Processor-internal interruption activated; activation mechanism is processor-dependent).	- Switch the truck off and on again; - Inquire about software update; - Replace controller;
_	6	02	2	Undefined	Invalid operation performed	Internal software error (illegal operation / invalid processor op. code).	- Switch the truck off and on again; - Inquire about software update; - Replace controller;
_	6	03	1	Operation	Main loop seldom processed or not at all	The main loop has not run for T= 100msec	- Switch the truck off and on again; - Check CAN-Bus; - Check CAN-Bus load; - Replace controller;
_	6	04	1	Operation	Undefined interruption activated	Processor-internal event. A non-defined interruption has occurred	- Switch the truck off and on again; - Check CAN-Bus; - Check CAN-Bus load; - Replace controller;
_	6	06	1	Undefined	Component initialisation invalid	Checksum invalid in EEPROM area: 0x0000 - 0x000F For details see EEPROM layout document	- Set truck type; - Switch the truck off and on again; - Set hourmeter; - Set factory parameters; - Set default parameters; - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	07	1	Undefined	“Component information" data EEPROM range invalid	Checksum invalid in EEPROM area: 0x0010 - 0x001F (TS-E data --> Sub 1) 0x0060 - 0x006F (hourmeter 2 --> Sub 2) 0x0070 - 0x007F (hourmeter 3 --> Sub 3) 0x0080 - 0x008F (hourmeter 4 --> Sub 4) For details see EEPROM layout document	- Replace controller;
_	6	07	2	Undefined			- Set hourmeter; - Replace controller;
_	6	07	3	Undefined			- Set hourmeter; - Replace controller;
_	6	07	4	Undefined			- Set hourmeter; - Replace controller;
_	6	08	1	Undefined	“Truck information data” EEPROM range invalid	Checksum invalid in EEPROM area: 0x0020 - 0x002F For details see EEPROM layout document	- Set truck serial number; - Set truck name; - Replace controller;
_	6	08	2	System start	Safety data record not loaded in Safe computer	Safety data record not loaded in Safe computer or not correct. The activation limit is 20 msec.	- Load safety data record into Safe.
_	6	08	3	System start	Serial number in safety data record does not match the dongle	Serial number in safety data record does not match the truck dongle. Invalid safety data record installed for this truck or electronic serial number of dongle invalid. The activation threshold is 20 msec.	- Load the respective safety data record into Safe.
_	6	08	4		**Cross-check of redundant Safe computers does not match**	**The results of processing the program cycles in the two Safe computers do not match. The activation limit is 20 msec.**	-
_	6	08	5	System start	**The Adjustment_Load direction_Load direction parameter deviates from the service parameter setting in the Safe.**	**The parameter settings in the truck do not match the service parameters in the Safe. The activation limit is 20 msec.**	**- Ensure the service parameters are the same in the Master and the Safe.**

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	08	6	System start	The Adjustment_Drive direction_load direction parameter deviates from the service parameter setting in the Safe.	The parameter settings in the truck do not match the service parameters in the Safe. The activation limit is 20 msec.	- Ensure the service parameters are the same in the Master and the Safe.
_	6	08	7	System start	The Adjustment_Load direction_drive direction parameter deviates from the service parameter setting in the Safe.	The parameter settings in the truck do not match the service parameters in the Safe. The activation limit is 20 msec.	- Ensure the service parameters are the same in the Master and the Safe.
_	6	08	8	System start	The Adjustment_Drive direction_drive direction parameter deviates from the service parameter setting in the Safe.	The parameter settings in the truck do not match the service parameters in the Safe. The activation limit is 20 msec.	- Ensure the service parameters are the same in the Master and the Safe.
_	6	08	9	System start	The Adjustment_Steer angle_drive direction parameter deviates from the service parameter setting in the Safe.	The parameter settings in the truck do not match the service parameters in the Safe. The activation limit is 20 msec.	- Ensure the service parameters are the same in the Master and the Safe.
_	6	08	10	System start	The Adjustment_Steer angle_load direction parameter deviates from the service parameter setting in the Safe.	The parameter settings in the truck do not match the service parameters in the Safe. The activation limit is 20 msec.	- Ensure the service parameters are the same in the Master and the Safe.
_	6	08	11	System start	The Adjustment_Steer angle transmission parameter deviates from the service parameter setting in the Safe.	The parameter settings in the truck do not match the service parameters in the Safe. The activation limit is 20 msec.	- Ensure the service parameters are the same in the Master and the Safe.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	08	12	System start	The Offset_angle_index parameter deviates from the service parameter setting in the Safe.	The parameter settings in the truck do not match the service parameters in the Safe. The activation limit is 20 msec.	- Ensure the service parameters are the same in the Master and the Safe.
_	6	08	13	System start	Service safety parameter invalid	- Non-permissible change to non-volatile memory of service safety parameter - Non-permissible change to working copy of service safety parameter - Non-permissible value with regard to service safety parameter value range - Non-permissible default value (with regard to service safety parameter value range) - Timeout in communication with parameter setting tool (Judit)	- Reset service safety parameter - Replace controller
_	6	08	14	System start	Discrepancy between parameter and service safety parameter : Accelerator pedal zero position	Difference between teach-in value for accelerator pedal zero position between master and safety computer	- Check master teach-in value - Check safety computer teach-in value
_	6	08	15	System start	Discrepancy between parameter and service safety parameter : Accelerator pedal 2 zero position	Difference between teach-in value for accelerator pedal 2 zero position between master and safety computer	- Check master teach-in value - Check safety computer teach-in value
_	6	08	16	System start	Safety computer : safety parameter invalid	- Non-permissible change to non-volatile memory of safety parameter - Non-permissible change to working copy of safety parameter	- Reset safety parameter - Replace controller
_	6	09	1	Undefined	“Logbook administration” EEPROM range invalid	Checksum invalid in EEPROM areas: 0x0040 - 0x004F (logbook administration) For details see EEPROM layout document	- Clear logbook, - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	09	2	Undefined	“Logbook entries” EEPROM range invalid	Checksum invalid in EEPROM areas: 0x0400 - 0x0BFF - (logbook entries) For details see EEPROM layout document	- Clear logbook, - Replace controller;
_	6	10	1	Undefined	“Hourmeter” EEPROM range invalid	Checksum invalid in EEPROM area: 0x0050 - 0x005F For details see EEPROM layout document	- Set hourmeter; - Replace controller;
_	6	11	1…32	Undefined	“Calibration data” EEPROM range invalid	Checksum invalid in EEPROM area: 0x0100 - 0x01FF For details see EEPROM layout document	- Replace controller;
_	6	12	1	System start, Undefined	“Parameters / teach-in values 1” EEPROM range invalid	Checksum invalid in EEPROM area: The subindex records faulty parameter/teach-in group (1 - 6) in the EEPROM area.	- Repeat teach-in, e.g. accelerator pedal, brake pedal, load sensor system, steering, MULTI-PILOT, … ; - Set factory parameters; - Set default parameters; - Replace controller;
_	6	12	2	System start, Undefined	“Parameters / teach-in values 2” EEPROM range invalid	Checksum invalid in EEPROM area: The subindex records faulty parameter/teach-in group (1 - 6) in the EEPROM area.	- Repeat teach-in, e.g. accelerator pedal, brake pedal, load sensor system, steering, MULTI-PILOT, … ; - Set factory parameters; - Set default parameters; - Replace controller;
_	6	12	3	System start, Undefined	“Parameters / teach-in values 3” EEPROM range invalid	Checksum invalid in EEPROM area: The subindex records faulty parameter/teach-in group (1 - 6) in the EEPROM area.	- Repeat teach-in, e.g. accelerator pedal, brake pedal, load sensor system, steering, MULTI-PILOT, … ; - Set factory parameters; - Set default parameters; - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	12	4	System start, Undefined	“Parameters / teach-in values 4” EEPROM range invalid	Checksum invalid in EEPROM area: The subindex records faulty parameter/teach-in group (1 - 6) in the EEPROM area.	- Repeat teach-in, e.g. accelerator pedal, brake pedal, load sensor system, steering, MULTI-PILOT, … ; - Set factory parameters; - Set default parameters; - Replace controller;
_	6	12	5	System start, Undefined	“Parameters / teach-in values 5” EEPROM range invalid	Checksum invalid in EEPROM area: The subindex records faulty parameter/teach-in group (1 - 6) in the EEPROM area.	- Repeat teach-in, e.g. accelerator pedal, brake pedal, load sensor system, steering, MULTI-PILOT, … ; - Set factory parameters; - Set default parameters; - Replace controller;
_	6	12	6	System start, Undefined	“Parameters / teach-in values 6” EEPROM range invalid	Checksum invalid in EEPROM area: The subindex records faulty parameter/teach-in group (1 - 6) in the EEPROM area.	- Repeat teach-in, e.g. accelerator pedal, brake pedal, load sensor system, steering, MULTI-PILOT, … ; - Set factory parameters; - Set default parameters; - Replace controller;
_	6	12	10	System start	Invalid parameter ID number transferred or parameter with the supplied ID number already set up	ID of the parameter file to be created invalid or already allocated. The activation limit is 20 msec.	- Contact Technical Support; - replace master component if necessary;
_	6	12	11	System start	No pointer issued to data variable	Pointer for parameter file data sink invalid. The activation limit is 20 msec.	- Contact Technical Support; - replace master component if necessary;
_	6	12	12	System start	Excessive data variable transmitted	Size of data not the same as data source. The activation limit is 20 msec.	- Event message can occur when the software version is changed, if new parameters need to be initialised. - Switch the truck off and on again to enable the initialisation.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	12	13	System start	Data from data source cannot be read	Memory for parameter information could not be read. The activation limit is 20 msec.	- Contact Technical Support; - replace master component if necessary;
_	6	12	14	System start	Memory for data copy not responding	Data sink cannot be written to. The activation limit is 20 msec.	- Contact Technical Support; - replace master component if necessary;
_	6	12	15	System start	Faulty parameter file checksum	Parameter file checksum invalid. The activation limit is 20 msec.	- Contact Technical Support; - replace master component if necessary;
_	6	12	30	System start	Invalid parameters for Max or Min Brake Force Position	Brake force governor: The settings for the brake force governor are implausible, i.e. BFGmax less than 0 or BFGmax greater than BFGmin. "BFGmin" must be greater than zero but less than "BFGmax".The activation limit is 20 msec.	- Check function settings; - Re-teach the brake force governor via Judit;
_	6	12	31	System start	Brake force governor: Basic values for position setpoint calculation invalid.	Brake force governor: The calculated speed values for the brake force governor are implausible. The minimum speed must be less than the maximum speed. The activation limit is 20 msec.	- Check function settings; - Re-teach the brake force governor via Judit;
_	6	12	32...n	System start	“Parameter / taught values" EEPROM range data invalid	Checksum invalid in EEPROM area: The subindex records the EEPROM address area of the faulty parameter/teach-in group (assignment is subindex * 16 = starting address in the EEPROM).	- repeat teach-in, e.g. accelerator pedal, brake pedal, load sensor system, steering, MULTI-PILOT, … ; - Set factory parameters; - Set default parameters; - Replace controller;
_	6	13	1	System start	Traverse distance reference missing from EEPROM	Specifically for the reach truck: Traverse distance reference missing from EEPROM	- Extend mast bracket forward and back; - Check wire connection; - Check the reference sensor and replace if necessary; - Replace controller;
_	6	14	1…n	System start	Calibrated reading out of range	The calibrated reading of an analog signal is out of range	- Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	15	1	System start	EEPROM layout does not match current software.	Material number: Software is not the same as the material number stored in the EEPROM. Or Actual version or number for a saved parameter group does not match the nominal version or number	- Set truck type; - Switch the truck off and on again; - Set hourmeter; - Set factory parameters; - Set default parameters; - Replace controller;
_	6	16	1	Operation	Software error	Number of interruptions implausible (internal software error); triggered in interrupt routine	- Switch the truck off and on again; - Check CAN-Bus; - Check CAN-Bus load; - Inquire about software update; - Replace controller;
_	6	16	2	Operation	Software error	Number of interruptions implausible (internal software error); triggered in idle	- Switch the truck off and on again; - Check CAN-Bus; - Check CAN-Bus load; - Inquire about software update; - Replace controller;
_	6	17	1…n	System start	Software version incompatible	The software version of another component is not compatible with the current version.	- Switch the truck off and on again; - Check software version compatibility on all components; - Inquire about software update;
_	6	17	65…68		Software version incompatible	The software version of another component is not compatible with the current version.	- Switch the truck off and on again; - Check software version compatibility on all components; - Inquire about software update;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	18	4	Self test	parameters set to default after error	**One or more parameters set to default values.** The AC-3 Power Control (U8) operating system has calculated invalid parameter combinations and set one or more parameters to the default specified in the program. The activation limit is 20 msec. The master has specifically set one or more parameters to default values. An operating system has been installed on the AC-3 Power Control component with a different AC-3 Power Control ID than before; The operating system is faulty and contains default settings that are out of the permissible setting range for parameters; Parameter memory is faulty, the correct value of a parameter could not be calculated and has therefore been set to default; AC-3 Power Control component (parameter memory) is faulty; This message is not necessarily an error, but it should at least be reported to the master.	- When updating the operating system: New parameters are set to default when the truck is switched off and on again, event message is reset after the truck is switched on; - Check the operating system and install the correct one if necessary; - Replace the AC-3 Power Control (U8);
_	6	19	1	Operation	Invalid parameter combination	An invalid combination of several parameters has been set	- Check the parameter setting via JUDIT and adjust if necessary;
_	6	19	2		Warehouse navigation: Incorrect type selection	Warehouse navigation parameter setting: type specification undefined. The activation limit is 20 msec.	- Set parameters to valid setting;
_	6	19	3		Warehouse navigation: Aisle length incorrect	Warehouse navigation parameter setting: The aisle length obtained from rack structure parameters does not match the measured aisle length. The activation limit is 20 msec.	- Set parameters to valid setting;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	19	4		Warehouse navigation: warehouse structure parameters faulty	Warehouse navigation parameter setting: Warehouse structure parameters implausible. The activation limit is 20 msec.	- Set parameters to valid setting;
_	6	19	5	Operation	Invalid parameter combination	The parameter combination Aux. Lift extend and lift cutout option is invalid	- Check the parameter setting via JUDIT and adjust if necessary;
_	6	19	6	System start	Invalid parameter combination	If the software part number changes the drive motor parameter= 0	- Set motor parameters;
_	6	19	7	System start	Invalid parameter combination	Load wheel brake parameter and load wheel brake inspection do not match	- Change brake parameter; - Check brakes;
_	6	20	1	Operation	Too many events indicated at the same time	this message is issued if more than 64 events are issued at the same time	- Minimise events (<64) - Replace controller
_	6	21	1	Bootloader Operation	RAM checksum invalid	RAM checksum invalid (internal error)	- Replace controller;
_	**6**	**22**	**1**	**Operation**	**Software error**	**Internal software error (stack limit infringement (overrun))**	**- Switch the truck off and on again; - Inquire about software update; - Replace controller;**
_	6	22	2	Operation	Software error	Internal software error (stack limit infringement (underflow))	- Switch the truck off and on again; - Inquire about software update; - Replace controller;
_	6	22	3	Operation	HEAP memory used up	dynamic data memory fully used up	- Reset event via emergency stop reset; - Replace controller - If this error occurs permanently contact Technical Support;
_	6	22	4	Operation	Unknown fatal processor error	Controller program detects unknown error (EMCY)	- Reset event via emergency stop reset; - Replace controller - If this error occurs permanently contact Technical Support;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	23	1	Operation	Brake force governor: misc. error	An unknown error occurred on the brake force governor The activation limit is 100 msec.	→ Misc. error as the function is being carried out. - Check function and contact Technical Support if necessary;
_	6	23	7	Operation	Left hand support mushroom: misc. error	An unknown error occurred on the left support mushroom. The activation limit is 100 msec.	→ Misc. error as the function is being carried out. - Check function and contact Technical Support if necessary;
_	6	23	9	Operation	Right hand support mushroom: misc. error	An unknown error occurred on the right support mushroom. The activation limit is 100 msec.	→ Misc. error as the function is being carried out. - Check function and contact Technical Support if necessary;
_	6	24	1	Undefined	“Discharge indictor" data EEPROM range invalid	Checksum invalid in EEPROM area: 0x00A0 - 0x00AF For details see EEPROM layout document	- Switch the truck off and on again; - Replace controller;
_	6	25	1	Undefined	“Mac address battery controller" data EEPROM range invalid	Checksum invalid in EEPROM area: 0x00B0 - 0x00BF For details see EEPROM layout document	- Switch the truck off and on again; - Replace controller;
_	6	25	2	Undefined	“Mac address charger" data EEPROM range invalid	Checksum invalid in EEPROM area: 0x00C0 - 0x00CF For details see EEPROM layout document	- Switch the truck off and on again; - Replace controller;
_	6	26	0...63	System start	Code number position "sub index" is incorrect.	Code for this truck is invalid. The sub index shows the position number of the wrong code. The activation limit is 20 msec.	- Wrong code entered. - Check the code via JUDIT and adjust if necessary;
_	6	27	1	System start	The truck parameter setting does not match the safety data record	The parameter settings in the truck do not match the approved parameters in the safety data record. The activation limit is 20 msec.	- Safety data records in the two safe systems do not match. - Load safety data records via JUDIT.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	28	1	Operation	Entry in logbook if time is changed – old time	The event logbook records the time and date settings before the change. The activation limit is 20 msec.	→ The event message is used to document a change in time. No action required.
_	6	28	2	Operation	Entry in logbook when time is adjusted – new time	The event logbook records the time and date settings in the truck. The activation limit is 20 msec.	→ The event message is used to document a change in time. No action required.
_	6	29	1	System start Operation	Parameter does not match the wire harness encoding	A parameter was set that does not match the wire harness encoding (digital input status)	- Check the parameter setting and adjust if necessary; - Check signal on encoding input;
_	6	29	2	Operation	"Personal protection switch function" parameter does not match the wire harness encoding	"Personal protection switch function" on rider truck not set as brake switch, with no further option to operate as service brake. Truck type is encoded via wire harness.	- Set "personal protection switch function" parameter 0x218A to "brake switch until stationary" or "brake switch while personal protection switch applied";
_	6	29	3	System start Operation	Parameter does not match the wire harness encoding	A parameter was set that does not match the wire harness encoding (digital output status)	- Check the parameter setting and adjust if necessary; - Check signal on encoding input; - Check if coupling unit connection for truck type is not the same as "ERD series 2 basic model";
_	6	30	1	System start	Brake force governor: Potentiometer not taught	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	3	System start	Traverse sensor: Potentiometer not taught	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	5	System start	Rotate sensor: Potentiometer not taught	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	7	System start	Left hand support mushroom: Potentiometer not taught	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	9	System start	Right hand support mushroom: Potentiometer not taught	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	30	11	System start	Steering actual value sensor: Potentiometer not taught	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	13	System start	Steering setpoint device: Potentiometer not taught	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	15	System start	Steering setpoint device optional: Potentiometer not taught, carry out teach-in	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	21	System start	Hydraulic setpoint device: Potentiometer not taught	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	23	System start	Travel setpoint device: Potentiometer not taught	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	25	System start	Hydraulic setpoint device optional: Potentiometer not taught, carry out teach-in	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	27	System start	Travel setpoint device optional: Potentiometer not taught, carry out teach-in	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	29	System start	Accelerator pedal setpoint device optional: Potentiometer not taught, carry out teach-in	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	31	System start	Brake pedal setpoint device optional: Potentiometer not taught, carry out teach-in	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	30	33	System start	Pedestrian right travel setpoint device: Potentiometer not taught, carry out teach-in	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	35	System start	Pedestrian left travel setpoint device: Potentiometer not taught, carry out teach-in	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	37	System start	Pedestrian right travel setpoint device: Potentiometer not taught, carry out teach-in	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	30	39	System start	Pedestrian left travel setpoint device: Potentiometer not taught, carry out teach-in	Analog sensor not taught. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	1	System start	Brake force governor: Brake geometry not taught	Mechanical stops of brake force governor not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	2	System start	Brake force governor: Deceleration levels not set	Deceleration levels of brake force governor not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	3	System start	Traverse sensor: Geometry not taught	Mechanical stops of "traverse" sensor not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	4	System start	Traverse sensor: index switch not taught	Position of sideshifter index switch not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	31	5	System start	Rotate sensor: Geometry not taught,	Mechanical stops of "rotate" sensor not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	7	System start	Left hand support mushroom: Geometry not taught	Mechanical stops of left support mushroom not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	9	System start	Right hand support mushroom: Geometry not taught	Mechanical stops of right support mushroom not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	31	System start	Proportional lift: Geometry not taught	Mechanical stops of proportional lift not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	33	System start	Free lift: Geometry not taught	Mechanical stops of free lift not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	35	System start	Aux. lift: Geometry not taught	Mechanical stops of auxiliary lift not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	37	System start	Fork positioner: Geometry not taught	Mechanical stops of fork positioner not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	38	System start	Optional fork positioner: Geometry not taught	Mechanical stops of optional fork positioner not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	39	System start	Sideshifter: Geometry not taught	Mechanical stops of sideshifter not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	31	40	System start	Left current collector: Geometry not taught	Mechanical stops of left current collector not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	31	41	System start	Right current collector: Geometry not taught	Mechanical stops of right current collector not set. Commissioning not performed. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	33	1	System start	Brake force governor: deviation from switched-off position	Switched-on position deviates from switched-off position by more than 20° (angle sensor). The activation limit is 100 msec.	- Carry out a reference run: - Re-teach the brake force governor via Judit;
_	6	33	3	System start	Traverse sensor: deviation from switched-off position	Switched-on position deviates from switched-off position by more than 20° (angle sensor). The activation limit is 100 msec.	- Carry out a reference run: - Re-teach the traverse sensor via JUDIT;
_	6	33	5	System start	Rotate sensor: deviation from switched-off position	Switched-on position deviates from switched-off position by more than 20° (angle sensor). The activation limit is 100 msec.	- Carry out a reference run: - Re-teach the rotate sensor via JUDIT;
_	6	33	7	System start	Left hand support mushroom: deviation from switched-off position	Switched-on position deviates from switched-off position by more than 20° (angle sensor). The activation limit is 100 msec.	- Carry out a reference run: - Re-teach the left support mushroom via JUDIT;
_	6	33	9	System start	Right hand support mushroom: deviation from switched-off position	Switched-on position deviates from switched-off position by more than 20° (angle sensor). The activation limit is 100 msec.	- Carry out a reference run: - Re-teach the right support mushroom via JUDIT;
_	6	35	5	Operation	Rotate: below minimum position	The set position has been abandoned. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	35	6	Operation	Rotate: above maximum position	The set position has been abandoned. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	35	31	Operation	Proportional lift: below minimum position	The set position has been abandoned. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	35	32	Operation	Proportional lift: above maximum position	The set position has been abandoned. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	35	33	Operation	Free lift: below minimum position	The set position has been abandoned. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	35	34	Operation	Free lift: above maximum position	The set position has been abandoned. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	35	35	Operation	Aux. lift: below minimum position	The set position has been abandoned. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	35	36	Operation	Aux. lift: above maximum position	The set position has been abandoned. The activation limit is 100 msec.	- Carry out teach-in via JUDIT;
_	6	36	1	Operation	Parameter does not match the attached	For 300 ms one or more pedestrian mode setpoint devices are detected which do not match the expansion stage set for the respective option.	- Check the parameter setting and adjust if necessary; - Check wire connections from existing buttons to controller;
_	6	37	1	Operation	Safety functions muted	Event issued by changing the service safety parameter	- Switch truck off and on again;
_	6	44	1	System start	Hydraulic lever capacitive switch not taught	Hydraulic lever capacitive switch not taught. The activation limit is 20 msec.	- Carry out teach-in via JUDIT;
_	6	44	2	System start	Travel lever capacitive switch not taught	Travel lever capacitive switch not taught. The activation limit is 20 msec.	- Carry out teach-in via JUDIT;
_	6	45	1…n		Minimum requirements for software version not met.	The software version for this component is too old for the truck version. The activation limit is 20 msec.	- Update the operating system of the component to the required version.
_	6	45	65-68		Minimum requirements for software version not met.	The software version for this component is too old for the truck version. The activation limit is 20 msec.	- Update the operating system of the component to the required version.
_	6	46	1		Information message: truck software changed	The truck software has been changed	- Update the operating system of the component to the required version.
_	6	51	1	System start	“Steer table” data record invalid	This event message is not currently used.	

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	52	1	System start	“Teach in steer angle actual value” data record invalid	Steering: “Teach in steer angle actual value” data record invalid No validity ID in the EEprom.	- Switch the truck off and on again; - Set default values for steering parameters. - Set default values for Teach parameters. - Jack up the truck so that the steered wheel is clear of the ground. Carry out teach-in; do not interrupt the process! - Replace signal-issuing controller;
_	6	52	2	System start	“Teach in steer angle actual value” data record invalid	Steering: “Teach in steer angle actual value” data record invalid Different values in EEprom	- Switch the truck off and on again; - Set default values for steering parameters. - Set default values for Teach parameters. - Jack up the truck so that the steered wheel is clear of the ground. Carry out teach-in; do not interrupt the process! - Replace signal-issuing controller;
_	6	52	3		Steering actual value sensor: captured range too small	Steering actual value sensor: The captured range for the sensor teach-in is too small	- Check sensor wiring and test operation; - Replace sensor;
_	6	52	4		Steering actual value sensor: No value change during Teach-in despite pulse controller turning	Steering actual value sensor: No value change during Teach-in despite pulse controller turning	- Check sensor wiring and test operation; - Replace sensor;
_	6	52	5		Steer referencing: Overall timeout of 20 sec. exceeded	Steer referencing: Overall timeout of 20 sec. exceeded	- Check sensor wiring and test operation; - Replace sensor;
_	6	52	6		Steering Teach-in: Overall timeout of 20 sec. exceeded	Steering Teach-in: Overall timeout of 20 sec. exceeded	- Check sensor wiring and test operation; - Replace sensor;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	53	1	System start	“Teach in steer angle setpoint” data record invalid	Steering: “Teach in steer angle setpoint” data record invalid No validity ID in the EEprom.	- Switch the truck off and on again; - Set default values for steering parameters. - Set default values for Teach parameters. - Jack up the truck so that the steered wheel is clear of the ground. Carry out teach-in; do not interrupt the process! - Replace signal-issuing controller;
_	6	53	2	System start	“Teach in steer angle setpoint” data record invalid	Steering: “Teach in steer angle setpoint” data record invalid Different values in EEprom	- Switch the truck off and on again; - Set default values for steering parameters. - Set default values for Teach parameters. - Jack up the truck so that the steered wheel is clear of the ground. Carry out teach-in; do not interrupt the process! - Replace signal-issuing controller;
_	6	53	3	Operation	“Teach in steer angle setpoint” data record invalid	Steering: “Teach in steer angle setpoint” data record invalid Teach values deleted Automatically calculated zero position does not match the taught zero position.	- Switch the truck off and on again; - Set default values for steering parameters. - Set default values for Teach parameters. - Jack up the truck so that the steered wheel is clear of the ground. Carry out teach-in; do not interrupt the process! - Replace signal-issuing controller;
_	6	54	1	Operation	Event number unknown (implausible)	Steering: Event message not known. Event number received unknown (UART)	- Switch the truck off and on again; - Inquire about software update;
_	6	54	2	Operation	Event number unknown (implausible)	Steering: Event message not known. Own event number implausible (UART)	- Switch the truck off and on again; - Inquire about software update;
_	6	54	3	Operation	Event number unknown (implausible)	Steering: Event message not known to control processor. Event response received is implausible (UART)	- Switch the truck off and on again; - Inquire about software update;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	55	1	Undefined	Software error	Steering: Stack overrun (lower limit) Stack lower and upper limits protected and monitored against infringement by test sample.	- Switch the truck off and on again; - Check interference (radio, static charge); - Check CAN-Bus; - Inquire about software update;
_	6	55	2	Undefined	Software error	Steering: Stack overrun (upper limit) Stack lower and upper limits protected and monitored against infringement by test sample.	- Switch the truck off and on again; - Check interference (radio, static charge); - Check CAN-Bus; - Inquire about software update;
_	6	56	1	Operation	Monitoring of cyclical functions activated	Steering: Analog / digital channel conversion; If no analog readings are received within a certain time, the event message is generated.	- Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	6	56	2	System start	Monitoring of cyclical functions activated	Steering: Safety-critical functions not performed during system start	- Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	6	56	3	Self test	Monitoring of cyclical functions activated	Steering: Safety-critical functions not performed during the (initialisation) self-test (time monitoring 5 sec.)	- Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	6	56	4	Operation	Monitoring of cyclical functions activated	Steering: Safety-critical functions not performed during operation If not all routines are performed once within 20 msec. the event message is triggered.	- Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	6	56	5	Operation	Cycle time 20 msec. exceeded	The cycle time lay between 20 msec and 22 msec. The activation limit is 20 msec. The event message is retentive and can only be reset by an Emergency Stop reset.	- Reset event via emergency stop reset; - If the error occurs permanently contact Technical Support;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	56	6	Operation	Cycle time 22 msec. exceeded	The cycle time lay between 22 msec and 24 msec. The activation limit is 22 msec. The event message is retentive and can only be reset by an Emergency Stop reset.	- Reset event via emergency stop reset; - If the error occurs permanently contact Technical Support;
_	6	56	7	Operation	Cycle time 24 msec. exceeded	The cycle time was above 24 msec. The activation limit is 24 msec. The event message is retentive and can only be reset by an Emergency Stop reset.	- Reset event via emergency stop reset; - If the error occurs permanently contact Technical Support;
_	6	56	8	Operation	Timeout for 20ms-cyclical processing synchronicity with CANopen SYNC	The cycle time between CANopen SYNC and processing the operating system functionality was more than 2 msec.	- Reset event via emergency stop reset; - Replace controller - If this error occurs permanently contact Technical Support;
_	6	56	9	Operation	Cycle time 1ms exceeded	The cycle when the operating system is processing must be run fewer than 18 times within 20msec.	- Reset event via emergency stop reset; - Replace controller - If this error occurs permanently contact Technical Support;
_	6	57	1	Self test	Control and monitoring processor parameters not the same	Steering: During initialisation the parameters between the control and monitoring processors are different.	- Switch the truck off and on again; - Set default values for steering parameters. - Set default values for Teach parameters. - Jack up the truck so that the steered wheel is clear of the ground. Carry out teach-in; do not interrupt the process! - Replace signal-issuing controller;
_	6	58	1	Self test Operation	Steer table invalid	Steering: Steer table in monitoring processor invalid. Permissible limits exceeded.	- Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	6	59	1	Self test	Setpoint device invalid	The steering setpoint device type parameter does not match the steering setpoint device type that is connected.	- Set parameters to the correct setpoint device;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	60	1	Operation	Assigned warehouse area is less than 0 or greater than 31	An invalid warehouse area has been configured. The activation limit is 20 msec.	- Correct the warehouse area parameter settings via JUDIT;
_	6	62	1	Operation	Traverse/rotate movement: safety distance too short, risk of collision with rack	Below the rack safety distance setting. The activation limit is 20 msec.	- Adjust the traverse/rotate movement via JUDIT;
_	6	63	1	Operation	Brake force governor: difference between rated and actual values too great	Analog sensor nominal position deviates by more than 20°. The activation limit is 1000 msec.	- Check the mechanical freedom of movement;
_	6	63	7	Operation	Left hand support mushroom: difference between rated and actual values too great	Analog sensor nominal position deviates by more than 20°. The activation limit is 1000 msec.	- Check the mechanical freedom of movement;
_	6	63	9	Operation	Right hand support mushroom: difference between rated and actual values too great	Analog sensor nominal position deviates by more than 20°. The activation limit is 1000 msec.	- Check the mechanical freedom of movement;
_	6	70	12	Operation	Wire guidance aisle travel, load direction sensor has lost wire signal	Wire guidance aisle travel, sensor has lost wire signal. The activation limit is 20 msec.	- Check the guide wire routing: - Align the truck with the guide wire;
_	6	70	13	Operation	Wire guidance aisle travel, cornering sensor has lost wire signal	Wire guidance aisle travel, sensor has lost wire signal. The activation limit is 20 msec.	- Check the guide wire routing: - Align the truck with the guide wire;
_	6	70	14	Operation	Wire guidance aisle travel, drive direction sensor has lost wire signal	Wire guidance aisle travel, sensor has lost wire signal. The activation limit is 20 msec.	- Check the guide wire routing: - Align the truck with the guide wire;
_	6	70	44	Operation	Wire guidance aisle travel, load direction sensor has lost wire signal	Wire guidance aisle travel, sensor has lost wire signal. The activation limit is 20 msec.	- Check the guide wire routing: - Align the truck with the guide wire;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	70	45	Operation	Wire guidance aisle travel, cornering sensor has lost wire signal	Wire guidance aisle travel, sensor has lost wire signal. The activation limit is 20 msec.	- Check the guide wire routing: - Align the truck with the guide wire;
_	6	70	46	Operation	Wire guidance aisle travel, drive direction sensor has lost wire signal	Wire guidance aisle travel, sensor has lost wire signal. The activation limit is 20 msec.	- Check the guide wire routing: - Align the truck with the guide wire;
_	6	71	1	System start	Internal software versions invalid	MULTI-PILOT: Internal software versions invalid	- Flash software again; - Inquire about software update; - Replace controller;
_	6	74	1	Operation	Number of frequencies exceeds range used	Wire guidance frequency change: Number of frequencies exceeds range used. The activation limit is 20 msec.	- Check parameter set selection
_	6	74	2	Operation	Number of frequencies exceeds permissible range	Wire guidance frequency change: Number of frequencies exceeds permissible range. The activation limit is 20 msec.	- Check parameter set selection
_	6	74	3	Operation	Wire guidance sensors set to different frequencies	Wire guidance frequency change: Wire guidance sensors are set to different frequencies. The activation limit is 20 msec.	- Check sensor frequency setting;
_	6	75	1	Operation	Collector: “Rack area” parameter set shorter than warehouse area	Collector: “Rack area” parameter set shorter than warehouse area. The activation limit is 20 msec.	- Check current collector parameter;
_	6	75	2	Operation	Collector: "Entry stop distance to rack area" parameter implausible	Collector: "Entry stop distance to rack area" parameter implausible. The activation limit is 20 msec.	- Check current collector parameter;
_	6	75	3	Operation	Collector: "Entry inch distance to rack area" parameter implausible	Collector: "Entry inch distance to rack area" parameter implausible The activation limit is 20 msec.	- Check current collector parameter;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	76	1	Operation	Guidance change wire / rail: wire guidance mode is incorrect	Guidance change wire / rail: wire guidance mode is incorrect, rail guidance expected	- Check aisle recognition sensor system; - Check trip point settings;
_	6	76	2	Operation	Guidance change wire / rail: rail guidance mode is incorrect	Guidance change wire / rail: rail guidance mode is incorrect, wire guidance expected	- Check aisle recognition sensor system; - Check trip point settings;
_	6	81	1	Undefined	ISM: "Parameter 5" value > "Parameter 6"	ISM: Set standby timeout to be lower than truck timeout.	- Set parameter 5 to less than parameter 6;
_	6	81	2	Undefined	ISM: Parameters invalid (difference between 2 limits)	ISM: Set limit 1 (parameter #11) to be greater than the smallest difference between 2 switch limits (parameters #12-17).	- Differential value of parameter 11 is less than the differential values of the various levels of parameters 12-17
_	6	81	3	Undefined	ISM: Parameters invalid (difference between 2 limits)	ISM: Set limit 2 (parameter #20) to be greater than the smallest difference between 2 switch limits (parameters #21-26).	- Differential value of parameter 20 is less than the differential values of the various levels of parameters 21-26
_	6	81	4	Undefined	ISM: Parameters invalid (difference between 2 limits)	ISM: Set limit 3 (parameter #29) to be greater than the smallest difference between 2 switch limits (parameters #30-35).	- Differential value of parameter 29 is less than the differential values of the various levels of parameters 30-35
_	6	81	5	Undefined	ISM: Parameters 12-17 not ascending	ISM: Switch limit order (parameters #12-17) are not ascending.	- Set parameters 12-17 to be ascending;
_	6	81	6	Undefined	ISM: Parameters 21-26 not ascending	ISM: Switch limit order (parameters #21-26) are not ascending.	- Set parameters 21-26 to be ascending;
_	6	81	7	Undefined	ISM: Parameters 30-35 not ascending	ISM: Switch limit order (parameters #30-35) are not ascending.	- Set parameters 30-35 to be ascending;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	81	8	Undefined	ISM: Parameters 47-49 not ascending	ISM: Switch limit order (parameters #47-49) are not ascending.	- Set parameters 47-49 to be ascending;
_	6	81	9	Undefined	ISM: Parameters 50-52 not ascending	ISM: Switch limit order (parameters #50-52) are not ascending.	- Set parameters 50-52 to be ascending;
_	6	88	1	Undefined	Long-life mode/ saver mode activated	*Note:* Long-life mode is an option that is used for optimum battery charging / battery saving. The battery can be charged when the battery's set discharge level has been reached. The discharge level is based on the battery's capacity. *Requirement:* - Battery is not charged despite being connected to the charger; *Cause:* The current battery capacity is above the discharge level set in the parameter (0x256C).	- Explain the "long-life mode" option to the customer; - Increase the discharge level set in the parameter (0x256C). Talk to the customer before changing this parameter;
_	6	89	1…n	Undefined	EEPROM data implausible (non-critical)	Tiller head: One or more data records cannot be read (non-critical).	- Replace tiller head;
_	6	90	1…n	Undefined	EEPROM data implausible (non-critical)	Tiller head: One or more data records cannot be read (non-critical).	- Replace tiller head;
_	6	91	1	Undefined	RAM data error	Tiller head: RAM test failed at time of operation.	- Replace tiller head;
_	6	92	1	Undefined	Critical variable damaged	Tiller head: Critical variable is implausible.	- Replace tiller head;
_	6	93	2…n	Undefined	RAM checksum invalid (critical)	Tiller head: RAM parameter records saved via CRC.	- Replace tiller head;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	94	1	System start	Battery parameters invalid	Specific battery management Battery parameters (type, rated capacity, charge factor, serial number, …) are invalid or not set	- Check battery parameters against battery data plate and adjust as required; - Replace battery controller;
_	6	95	2…n	Undefined	RAM checksum invalid (non-critical)	Tiller head: RAM parameter records saved via CRC (checksum).	- Replace tiller head;
_	6	96	1	Undefined	Characteristic curve parameters reset	If the corresponding object is now described with a different value than before	- Set the correct parameter for the battery as required. Intended for information to establish by whom or when a characteristic curve was adjusted so that the battery was incorrectly charged;
_	6	97	1	Undefined	Mechanical characteristic selector applied	If the mechanical characteristic selector is adjusted	- Set the correct value on the mechanical characteristic selector OR better still, set it to 0 and adjust via software; Intended for information to establish by whom or when a characteristic curve was adjusted so that the battery was incorrectly charged;
_	6	98	1	System start	Information message: Debug mode activated in truck software	The debug mode is now activated. The truck must only be operated by test personnel. The activation limit is 20 msec.	➔ Event message should only appear in development test mode. - If this error occurs contact Technical Support;
_	6	99	1	Self test	Information message: Programming error in truck software	An invalid program condition has been detected. Detailed information shown in the event log book. The activation limit is 20 msec.	➔ Event message should only appear in development test mode. - If this error occurs contact Technical Support;
_	6	99	2	Self test	Lift request although nominal lift height exceeded	An invalid program condition has been detected. Detailed information shown in the event log book. The activation limit is 20 msec.	➔ Event message should only appear in development test mode. - If this error occurs contact Technical Support;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	6	99	3	Self test	Lower request although below nominal lift height	An invalid program condition has been detected. Detailed information shown in the event log book. The activation limit is 20 msec.	→ Event message should only appear in development test mode. - If this error occurs contact Technical Support;
_	6	99	4	Self test	Tolerance field violated although lift height is positioned	An invalid program condition has been detected. Detailed information shown in the event log book. The activation limit is 20 msec.	→ Event message should only appear in development test mode. - If this error occurs contact Technical Support;
_	7	01	1	Undefined	Stop monitoring: Travel	A truck function has requested truck deceleration via the mechanical brakes. However the required deceleration was not introduced within 1 second.	- Check truck controller cut-out function;
_	7	01	1	Undefined	Stop monitoring: Main Lift	A truck function has requested a main lift hydraulic stop. However the main lift cut-out was not introduced within 0.5 seconds.	- Check truck controller cut-out function;
_	7	01	2	Undefined	Stop monitoring: Aux. lift	A truck function has requested an aux. lift hydraulic stop. However the aux. lift cut-out was not introduced within 0.5 seconds.	- Check truck controller cut-out function;
_	7	01	3	Undefined	Stop monitoring: Sideshift	A truck function has requested a sideshift hydraulic stop. However the sideshift cut-out was not introduced within 0.5 seconds.	- Check truck controller cut-out function;
_	7	01	4	Undefined	Stop monitoring: Rotate	A truck function has requested a rotary movement hydraulic stop. However the rotary movement cut-out was not introduced within 0.5 seconds.	- Check truck controller cut-out function;
_	7	01	5	Undefined	Stop monitoring: Slack chain switch status	The slack chain switch status is implausible. The activation limit is 1 second.	- Check slack chain switch status; - Check slack chain switch and replace if necessary;
_	7	01	6	Undefined	Stop monitoring: slack chain not taut	The slack chain switches report chain not taut. The activation limit is 1 second.	- Check slack chain switch status; - Check slack chain switch and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	01	7	Undefined	Stop monitoring: emergency stop circuit all feedback messages	Emergency stop circuit power-up test: not all feedback messages received within 200 msec.	- Check emergency stop circuit wiring
_	7	01	8	Undefined	Stop monitoring: Emergency stop circuit feedback messages 3	Emergency stop circuit power-up test: feedback message 3 not received within 200 msec.	- Check emergency stop circuit wiring
_	7	01	9	Undefined	Stop monitoring: Emergency stop circuit feedback messages 6	Emergency stop circuit power-up test: feedback message 6 not received within 200 msec.	- Check emergency stop circuit wiring
_	7	01	10	Undefined	Stop monitoring: Emergency stop circuit feedback messages 2	Emergency stop circuit power-up test: feedback message 2 not received within 200 msec.	- Check emergency stop circuit wiring
_	7	01	11	Undefined	Stop monitoring: Emergency stop circuit feedback messages 5	Emergency stop circuit power-up test: feedback message 5 not received within 200 msec.	- Check emergency stop circuit wiring
_	7	01	12	Undefined	Stop monitoring: power emergency stop circuit	Emergency stop circuit power-up test: 24 volt power not received within 200 msec.	- Check emergency stop circuit wiring
_	7	01	13	Undefined	Stop monitoring: load circuit emergency stop circuit	Emergency stop circuit power-up test: load circuit release not received within 200 msec.	- Check emergency stop circuit wiring
_	7	01	14	Undefined	Stop monitoring: power and load circuit emergency stop circuit	Emergency stop circuit power-up test: 24 volt power and load circuit release not received within 3 seconds	- Check emergency stop circuit wiring
_	7	01	15	Undefined	Stop monitoring: two-channel signal emergency stop circuit	Emergency stop circuit power-up test: the signals of jxpSafeC1 and jxpSafe C2 are different for more than 20 msec.	- Check emergency stop circuit wiring

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	01	16	Undefined	Stop monitoring: steer angle nominal/actual value monitoring	The steer actual value does not follow the steer setpoint, or rather there is a jump in the actual/nominal value. The activation limit is 20 msec.	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	7	01	17	Undefined	Stop monitoring: steer angle sensor system	The actual value of the steer angle is not ok. The activation limit is 60 msec.	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	7	01	18	Undefined	Stop monitoring: Wire guidance steer angle	Aisle travel wire guidance, monitoring limit exceeded. The activation limit is 20 msec.	- Check the guide wire routing: - Align the truck with the guide wire; - Check distance signals for systems A and B, if there is a difference re-calibrate and teach-in the sensor;
_	7	01	19	Undefined	Stop monitoring: Wire guidance steer angle sensor system	Aisle travel wire guidance, steering actual value not ok. The activation limit is 20 msec.	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	7	01	20	Undefined	Stop monitoring: Wire guidance steer angle speed	Aisle travel wire guidance, travel speed not ok. The activation limit is 20 msec.	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	01	21	Undefined	Stop monitoring: Wire guidance distance	Aisle travel wire guidance, monitoring limit exceeded. The activation limit is 20 msec.	- Check the guide wire routing: - Align the truck with the guide wire; - Check the truck's behaviour in several lanes, if the deviation is the same in all lanes carry out wire guidance teach-in, if there is a deviation in a few lanes reduce the speed or clean the floor surface.
_	7	01	22	Undefined	Stop monitoring: Wire guidance distance sensor system	Aisle travel wire guidance, steering actual value not ok. The activation limit is 20 msec.	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	7	01	23	Undefined	Stop monitoring: Wire guidance distance speed	Aisle travel wire guidance, travel speed not ok. The activation limit is 20 msec.	- Check sensor wiring; - Check sensor; - Switch the truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	7	01	24		Steering referencing in the Safe computer has not worked	The 0° flank was not detected in the Safe computer within +/-2°	- Check sensor wiring; - Check sensor; - Switch truck off and on again; - Inquire about software update; - Replace signal-issuing controller;
_	7	02	1	Undefined	Endpoint monitoring: Travel	A truck function has requested truck deceleration via the inversion brake. However the required deceleration was not introduced within 1 second.	- Check truck controller cut-out function; - Check the brake ramp settings;
_	7	02	1	Undefined	Endpoint monitoring: Main Lift	A truck function has requested the termination of the main lift operation via the setpoint ramp. However the termination of the main lift operation was not introduced within 1 second.	- Check truck controller cut-out function; - Check the brake ramp settings;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	02	2	Undefined	Endpoint monitoring: Aux. lift	A truck function has requested the termination of the aux. lift operation via the setpoint ramp. However the termination of the aux. lift operation was not introduced within 1 second.	- Check truck controller cut-out function; - Check the brake ramp settings;
_	7	02	3	Undefined	Endpoint monitoring: Sideshift	A truck function has requested the termination of the sideshift operation via the setpoint ramp. However the termination of the sideshift operation was not introduced within 1 second.	- Check truck controller cut-out function; - Check the brake ramp settings;
_	7	02	4	Undefined	Endpoint monitoring: Rotate	A truck function has requested the termination of the rotary movement via the setpoint ramp. However the termination of the rotary movement was not introduced within 1 second.	- Check truck controller cut-out function; - Check the brake ramp settings;
_	7	02	20	Latent	Internal communication of safety computer interrupted	- Data pack not fully received - Data pack received indicates wrong number of data - Consecutive number faulty in data pack received - Checksum of data pack received faulty	- Replace controller - If this error occurs permanently contact Technical Support;
_	7	02	21	Latent	Safety computer data check interrupted	Faulty data bytes of sub-computer A/B detected within limit time (xxmsec)	- Replace controller - If this error occurs permanently contact Technical Support;
_	7	02	22	Latent	SYNC interrupted	Faulty SYNC detected within limit time (xxmsec)	- Replace controller - If this error occurs permanently contact Technical Support;
_	7	02	23	Latent	Slave identity interrupted	Faulty CANopen node ID detected within limit time (xxmsec)	- Replace controller - If this error occurs permanently contact Technical Support;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	02	24	Latent	Data backup interrupted	- Input image not fully received - Checksum (TPDO Checksum) according to data backup process faulty - Consecutive number (TPDO Count) according to data backup process faulty	- Replace controller - If this error occurs permanently contact Technical Support;
_	7	02	30	Latent	Emergency stop by safety computer 24V power supply interrupted	Faulty feedback signals of 24 volt power supply detected within limit time (xxmsec)	- Replace controller - If this error occurs permanently contact Technical Support;
_	7	02	31	Latent	Emergency stop by safety computer slave driver supply interrupted	Faulty feedback signals of driver power supply detected within limit time (xxmsec)	- Replace controller - If this error occurs permanently contact Technical Support;
_	7	02	40	Latent	"Battery latch" safety block reports fault	Faulty battery latch sensor signals of sub-computer A/B detected within limit time (xxmsec)	- Check wire connection; - Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	41	Latent	"Control pilot" safety block reports fault	Faulty control pilot signals of sub-computer A/B detected within limit time (xxmsec)	- Check wire connection; - Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace control;
_	7	02	42	Latent	"Dual pedal" safety block reports fault	Faulty total signal or channel A/B sensor signal of accelerator pedals (dual pedal) of sub-computer A/B detected within limit time (xxmsec)	- Check wire connection; - Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace accelerator pedal; - Replace controller;
_	7	02	43	Latent	"Single pedal" safety block reports fault	Faulty total signal or channel A/B sensor signal of accelerator pedal (single pedal) of sub-computer A/B detected within limit time (xxmsec)	- Check wire connection; - Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace accelerator pedal; - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	02	44	Latent	"Travel speed transmitter" safety block reports fault	Faulty speed sensor signals of sub-computer A/B detected within limit time (xxmsec)	- Check wire connection; - Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	45	Latent	"Parking brake release" safety block reports fault	Faulty parking brake button signal of sub-computer A/B detected within limit time (xxmsec)	- Check wire connection; - Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace control;
_	7	02	46	Latent	"Seat switch" safety block reports fault	Faulty seat switch signals (N.C / N.O. contacts) of sub-computer A/B detected within limit time (xxmsec)	- Check wire connection; - Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	47	Latent	"Accumulator brake" safety block reports fault	Faulty accumulator brake signals of sub-computer A/B detected within limit time (xxmsec)	- Check wire connection; - Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	48	Latent	"Manifold" safety block reports fault	Faulty feedback of signals of all hydraulic valves of sub-computer A/B detected within limit time (xxmsec)	- Check wire connection; - Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	49	Latent	"Cutout paths" safety block reports fault	Faulty "cutout path" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	50	Latent	"Control position" safety function reports fault	Faulty delay in monitoring "control position neutral setting" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	51	Latent	"Control parts" safety function reports fault	Faulty delay in monitoring "control part neutral setting" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	02	52	Latent	"Travel" safety function reports fault	Faulty delay in monitoring "travel function" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	53	Latent	"Travel direction" safety function reports fault	Faulty delay in monitoring "travel direction" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	54	Latent	"Parking brake" safety function reports fault	Faulty "parking brake" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - - Check outputs / inputs via JUDIT; - - Replace the controller;
_	7	02	55	Latent	"Parking brake release" safety function reports fault	Faulty delay in monitoring "parking brake release" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	56	Latent	"Parking brake activation" safety function reports fault	Faulty "parking brake activation" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	58	Latent	"Hydraulics" safety function reports fault	Faulty "hydraulics" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	59	Latent	"Attachment" safety function reports fault	Faulty "acknowledge clamping attachment" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	60	Latent	"Battery latch" safety function reports fault	Faulty delay in monitoring "battery latch" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;
_	7	02	61	Latent	"Speed retention" safety function reports fault	Faulty delay in monitoring "speed retention" monitoring of sub-computer A/B detected within limit time (xxmsec)	- Check the sensor system attached - Check outputs / inputs via JUDIT; - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	03	1	Undefined	Inching speed monitoring: Travel	The truck function has requested a truck deceleration to 2.5 km/h. However the required deceleration to crawl speed was not introduced within 1 second.	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;
_	7	03	1	Undefined	Inching speed monitoring: Main Lift	The truck function has requested a reduction of the main lift speed to crawl speed. However the reduction of the main lift speed was not introduced within 1 second.	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;
_	7	03	2	Undefined	Inching speed monitoring: Aux. lift	The truck function has requested a reduction of the aux. lift speed to crawl speed. However the reduction of the aux. lift speed was not introduced within 1 second.	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;
_	7	03	3	Undefined	Inching speed monitoring: Sideshift	The truck function has requested a reduction of the sideshift speed to crawl speed. However the reduction of the sideshift speed was not introduced within 1 second.	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;
_	7	03	4	Undefined	Inching speed monitoring: Rotate	The truck function has requested a reduction of the rotary speed to crawl speed. However the reduction of the rotary speed was not introduced within 1 second.	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;
_	7	04	1	Undefined	Maximum speed monitoring: Travel	The travel speed has been exceeded by more than 0.5 km/h.	- Check the maximum speed setting against the data sheet values; - Check the brake ramp settings;
_	7	04	1	Undefined	Maximum speed monitoring: Main Lift	The main lift speed has been exceeded by more than 0.025 m/sec.	- Check the maximum speed setting against the data sheet values; - Check the brake ramp settings;
_	7	04	2	Undefined	Maximum speed monitoring: Aux. lift	The aux. lift speed has been exceeded by more than 0.025 m/sec.	- Check the maximum speed setting against the data sheet values; - Check the brake ramp settings;
_	7	04	3	Undefined	Maximum speed monitoring: Sideshift	The sideshift speed has been exceeded by more than 0.025 m/sec.	- Check the maximum speed setting against the data sheet values; - Check the brake ramp settings;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	04	4	Undefined	Maximum speed monitoring: Rotate	The rotary speed has been exceeded by more than 0.25 °/sec.	- Check the maximum speed setting against the data sheet values; - Check the brake ramp settings;
_	7	05	1	Operation	The truck moves despite travel cutout	The travel speed has been exceeded by more than the limit.	- Check the maximum speed setting against the data sheet values; - Check the brake ramp setting; - Check the application which led to the event being triggered (e.g. operation beyond specification due to high travel speed on leaving a ramp)
_	7	05	1	Operation	Main Lift raises despite lift cutout	Monitoring module: despite an active cutout a speed above a limit or an active lift drive is detected.	
_	7	05	2	Operation	Main Lift lowers despite lower cutout	Monitoring module: Despite an active cutout a speed > 10 mm/s is detected	- Check truck controller cut-out function; - Check the brake ramp settings;
_	7	05	3	Operation	The sideshift moves despite lower cutout	Monitoring module: Despite an active cutout a speed > 10 mm/s is detected	- Check truck controller cut-out function; - Check the brake ramp settings;
_	7	05	4	Operation	The truck moves despite rotate cutout	Monitoring module: Despite an active cutout a speed > 1 °/s is detected	- Check truck controller cut-out function; - Check the brake ramp settings;
_	7	05	10	Operation	The truck moves despite power-up test error	Monitoring module: Despite a power-up test error a speed > 0.1 km/s is detected	- Check truck controller cut-out function; - Check the brake ramp settings;
_	7	05	10	Operation	The Main Lift moves despite power-up test error	Monitoring module: Despite a power-up test error a speed > 10 mm/s is detected	- Check truck controller cut-out function; - Check the brake ramp settings;
_	7	05	11	Operation	The Main Lift moves despite an overspeed error	Monitoring module: Despite a stop a speed > 10 mm/s is detected	- Check truck controller cut-out function; - Check the brake ramp settings;
_	7	05	12		While travelling the rotary drive moves	Monitoring module: while the truck is travelling a rotate position change is detected	- Check position sensor signal quality; - Check sensor and replace if necessary; - Check the hydraulic restraint of the rotary function;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	05	12		As the Main Lift is moving the rotary drive also moves	Monitoring module: while the Main Lift is moving a rotate position change is detected	- Check position sensor signal quality; - Check sensor and replace if necessary; - Check the hydraulic restraint of the rotary function;
_	7	05	13		While travelling the sideshifter moves	Monitoring module: while the truck is travelling a sideshift position change is detected	- Check position sensor signal quality; - Check sensor and replace if necessary; - Check the hydraulic restraint of the rotary function;
_	7	05	13		As the Main Lift is moving the sideshifter also moves	Monitoring module: while the Main Lift is lifting a sideshift position change is detected	- Check position sensor signal quality; - Check sensor and replace if necessary; - Check the hydraulic restraint of the rotary function;
_	7	05	14		Travel inching speed exceeded despite reduction to inching speed	Monitoring module: during an active speed reduction to inching speed a travel speed > V_INCH is detected	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;
_	7	05	14		Main Lift inching speed exceeded despite reduction to inching speed	Monitoring module: during an active speed reduction to inching speed a Main Lift speed > V_INCH is detected	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;
_	7	05	15		The Main Lift moves despite a slack chain error	Monitoring module: Despite a slack chain error a speed > 10 mm/s is detected	- Check truck controller cut-out function; - Check the brake ramp settings;
_	7	05	16		Travel inching speed exceeded despite foot switch error	Monitoring module: during an active speed reduction to inching speed, due to a foot switch error a travel speed > V_INCH is detected	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;
_	7	05	17		Travel inching speed exceeded despite gate error	Monitoring module: during an active speed reduction to inching speed, due to a gate error a travel speed > V_INCH is detected	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;
_	7	05	20		Travel inching speed exceeded despite brake force governor error	Monitoring module: during an active speed reduction to inching speed, due to a brake force governor error a travel speed > V_INCH is detected	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	05	20	Operation	The Aux. Lift moves despite power-up test error	Monitoring module: Despite a power-up test error a speed > 10 mm/s is detected	- Check truck controller cut-out function;
_	7	05	21	Operation	The Aux. Lift moves despite an overspeed error	Monitoring module: Despite a stop a speed > 10 mm/s is detected	- Check truck controller cut-out function;
_	7	05	22		As the Aux. Lift is moving the rotary drive also moves	Monitoring module: while the Aux. Lift is moving a rotate position change is detected	- Check position sensor signal quality; - Check sensor and replace if necessary; - Check the hydraulic restraint of the rotary function;
_	7	05	23		As the Aux. Lift is moving the sideshifter also moves	Monitoring module: while the Aux. Lift is moving a sideshift position change is detected	- Check position sensor signal quality; - Check sensor and replace if necessary; - Check the hydraulic restraint of the rotary function;
_	7	05	24		Truck moves despite personal protection system stop	Monitoring module: Despite a PPS stop a speed > 0.1 km/s is detected	- Check truck controller cut-out function;
_	7	05	24		Aux. Lift inching speed exceeded despite reduction to inching speed	Monitoring module: during an active speed reduction to inching speed an Aux. Lift speed > V_INCH is detected	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;
_	7	05	25		The truck moves despite protection field change error	Monitoring module: Despite a PPS protection field stop a speed > 0.1 km/s is detected	- Check truck controller cut-out function;
_	7	05	30		The sideshifter moves despite power-up test error	Monitoring module: Despite a power-up test error a speed > 10 mm/s is detected	- Check truck controller cut-out function;
_	7	05	31		The sideshifter moves despite an overspeed error	Monitoring module: Despite a stop a speed > 10 mm/s is detected	- Check truck controller cut-out function;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	05	34	Operation	Sideshift or tilt inching speed exceeded despite reduction to inching speed	Monitoring module: during an active speed reduction to inching speed an excessive sideshift or tilt speed is detected	- Switch the truck off and on again; - Check lift height sensor system; - Check load weight sensor system; - Inquire about software update; - Replace signal-issuing controller;
_	7	05	40		The rotary drive moves despite power-up test error	Monitoring module: Despite a power-up test error a speed > 5 °/s is detected	- Check truck controller cut-out function;
_	7	05	41		The rotary drive moves despite an overspeed error	Monitoring module: Despite a stop a speed > 5 °/s is detected	- Check truck controller cut-out function;
_	7	05	44		Rotate inching speed exceeded despite reduction to inching speed	Monitoring module: during an active speed reduction to inching speed a rotate speed > V_INCH is detected	- Check the inching speed setting against the data sheet values; - Check the brake ramp settings;
_	7	06	1	Operation	Emergency stop through safety computer	Emergency stop during operation through safety computer (response to EMCY emergency stop)	- If this error occurs permanently contact Technical Support;
_	7	51	1...10	**Operation**	**"Sub index" test stage timeout**	**Event message for monitoring testing in development. The activation limit is 20 msec.**	**Event message should only appear in development test mode.** **- If this error occurs contact Technical Support;**
_	7	52	12	**Operation**	**Wire guidance aisle travel, load direction wire guidance sensor permissible distance exceeded**	**Aisle travel wire guidance, monitoring limit exceeded. The activation limit is 20 msec.**	**- Check wire routing;**
_	7	52	13	**Operation**	**Wire guidance aisle travel, cornering sensor permissible distance exceeded**	**Aisle travel wire guidance, monitoring limit exceeded. The activation limit is 20 msec.**	**- Check wire routing;**

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	52	14	Operation	Wire guidance aisle travel, drive direction wire guidance sensor permissible distance exceeded	Aisle travel wire guidance, monitoring limit exceeded. The activation limit is 20 msec.	- Check wire routing;
_	7	53	1	Operation	Wire guidance aisle travel, permissible steer angle actual value exceeded	The steer angle actual value has been exceeded by more than 1.8°. The activation limit is 20 msec.	- Check wire routing and ground conditions;
_	7	53	2	Operation	Wire guidance aisle travel, permissible steer angle setpoint exceeded	The steer angle setpoint has been exceeded by more than 1.5°. The activation limit is 20 msec.	- Check wire routing and ground conditions;
_	7	54	1	Self test	UPC specific: No starting conditions provided	No positive signal at 7B33.1 and 7B33.2. Negative signal at 7B35.1	- Set the shuttle in the travel channel - Clear the 2nd pallet location in the channel - Check rail hole sensors 7B33.1, 7B33.2 for contamination, incorrect settings and faults - Check pallet detection sensor 7B35.1 for contamination, incorrect settings and faults - Check wire connection.
_	7	55	1	Operation	UPC specific: Excessive distance travelled	Excessive travel distance recorded	- Manually move the shuttle to the channel start, remove any blockage (use recovery vehicle) - Check drive chain.
_	7	56	1	Operation	UPC specific: Pallet positioning sensor faulty	After the positive flank of 7B37.4 there is no positive flank at 7B37.2 After the positive flank of 7B37.3 there is no positive flank at 7B37.1	- Manually move the shuttle to the channel start - Check pallet detection sensors 7B37.1-7B37.4 for contamination, incorrect settings and faults - Check wire connection
_	7	57	1	Operation	UPC specific: Invalid travel setpoint specification	Speed specification too high	- Manually move the shuttle to the channel start - Repeat the travel command

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	58	1	Operation	UPC specific: Invalid shuttle position	Too many signal changes at 7B33.1 and 7B33.2	- Manually move the shuttle to the channel start - Check rail hole sensors 7B33.1, 7B33.2 for contamination, incorrect settings and faults - Check wire connection - Check number of rail holes - Check rail holes and travel channel for contamination - Check the shuttle in a different travel channel.
_	7	59	1	Operation	UPC specific: The job could not be completed	Order runtime in controller exceeded	- Manually reverse the shuttle, start the job again - Check sensors for contamination, incorrect settings and faults - Check pallet - Check rail holes for contamination - Test drive system (manual travel) - If the shuttle remains near a rail hole, you may need to adjust the pallet distance parameters or the channel end distance parameters slightly.
_	7	60	1	Operation	UPC specific: Pallet lift error at start	Incorrect signal constellation at sensors 7B37.1 - 7B37.4 No signals from incremental transmitter 1B5	- Repeat travel job - Position pallet correctly at first pallet location - Check pallet - Check pallet detection sensors 7B37.1-7B37.4 for contamination, incorrect settings and faults - Check incremental transmitter 1B5 - Check wire connection - Check drive chain
_	7	60	2	Operation	UPC specific: Pallet lift error	Incorrect signal constellation at sensors 7B37.1 - 7B37.4	- Manually reverse shuttle - Repeat travel job - Check pallet - Check pallet detection sensors 7B37.1-7B37.4 for contamination, incorrect settings and faults - Check wire connection.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	7	61	1	Operation	UPC specific: Obstacle detection	Negative signal at sensors 7B34.1 - 7B34.4	- Manually reverse shuttle while checking for possible obstacles in the way of the shuttle - Check obstacle sensors 7B34.1 - 7B34.4 for contamination, incorrect settings and faults - Check wire connection - Check channel for obstacles (load, wooden remains and shrink wrap) - Check channel for possible reflection causes
_	7	62	1	Operation	UPC specific: Requirement for travel order not maintained	Within defined travel distance positive flank at 7B37.1	- Manually move the shuttle to the channel start - The 1st and 2nd pallet locations viewed from the channel start should not be filled for the "compress at start" function
_	7	95	1...n		Reserved for software development	Not included in standard software.	-
_	7	96	1...n		Reserved for software development	Not included in standard software.	-
_	7	97	1...n		Reserved for software development	Not included in standard software.	-
_	7	98	1...n		Reserved for software development	Not included in standard software.	-
_	7	99	1...n		Reserved for software development	Not included in standard software.	-

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
–	8	01	1	Operation	CAN Bus faulty	Driver error from stack. Sub index means: 1: Bus off The master has been informed via CiA Emergency Error Code 8140 that a node is reporting error "Recovered from Bus Off". Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component. Events recognised by the master are entered with node number 1 and function assembly 0.	- Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Check CAN-Bus via JUDIT (CAN-Bus load, ...); - Bypass components connected to the CAN-Bus in turn; - Replace controller;
–	8	01	2	Operation	CAN Bus faulty	Driver error from stack. Sub index means: 2: Driver switched to “passive” The master has been informed via EMCY ID 8120 that a node is reporting error "CAN in Error Passive Mode". Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component. Events recognised by the master are entered with node number 1 and function assembly 0.	- Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Check CAN-Bus via JUDIT (CAN-Bus load, ...); - Bypass components connected to the CAN-Bus in turn; - Replace controller;
–	8	01	3	Operation	CAN Bus faulty	Driver error from stack. Sub index means: 3: Telegram buffer in CAN driver has overrun The master has been informed via EMCY ID 8110 that a node is reporting error "CAN overrun (objects lost)". Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component. Events recognised by the master are entered with node number 1 and function assembly 0.	- Check CAN-Bus load via JUDIT; - Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Bypass components connected to the CAN-Bus in turn; - Switch optional components off from CAN-Bus, e.g. road traffic lighting. - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
–	8	01	4	Operation	CAN Bus faulty	Driver error from stack. Sub index means: 4: Receive buffer (Rx) has overrun (software) Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component. Events recognised by the master are entered with node number 1 and function assembly 0.	- Check CAN-Bus load via JUDIT; - Switch optional components off from CAN-Bus, e.g. road traffic lighting.
–	8	01	5	Operation	CAN Bus faulty	Driver error from stack. Sub index means: 5: Transmit buffer (Tx) has overrun (software) Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component. Events recognised by the master are entered with node number 1 and function assembly 0.	- Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Check CAN-Bus via JUDIT (CAN-Bus load, ...); - Bypass components connected to the CAN-Bus in turn; - Replace controller;
–	8	02	1…n	System start	CAN node shows no response	For T = 10 sec.: Mandatory CAN-Bus component not found. Sub-index: Node number of the CAN-Bus component not found.	- Check power supply of the CAN-Bus component not found. - Check parameter setting for the optional component, e.g. Option ISM, Option Can-Code, ...; - Via JUDIT try to access the faulty component; - Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Bypass components connected to the CAN-Bus in turn; - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	03	1…32	Undefined	CAN-Bus or software error	No service data object (SDO) feedback: No reply from the component; CANopen object not present; Sub index not present; Parameter range invalid (too high / too low); Sub-index: Node number of requested node.	- Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Check CAN-Bus via JUDIT (CAN-Bus load, ...); - Bypass components connected to the CAN-Bus in turn; - Replace faulty controller; - Inquire about JUDIT update; - Inquire about software update;
_	8	04	1…n	Undefined	Software error	Internal software error (error return value of a stack function).	- Read logbook: - Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Check CAN-Bus via JUDIT (CAN-Bus load, ...); - Bypass components connected to the CAN-Bus in turn; - Inquire about software update; - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_ _ _	8	05	1…32	Operation	Heartbeat telegram monitoring	For T = 3.5 x heartbeat time of monitored node: Heartbeat telegram not received Sub-index: monitored node. The master has been informed via EMCY ID 8130 that a node is reporting error "Life Guard Error or Heartbeat Error". Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component. Events recognised by the master are entered with node number 1 and function assembly of the remaining heartbeat. The sub index represents the node number of the remaining heartbeat.	- Check power supply of the component connected to the CAN-Bus (faulty contact); - Check component heartbeat time (CANopen object 1017); - Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Check CAN-Bus via JUDIT (CAN-Bus load, ...); - Bypass components connected to the CAN-Bus in turn; - Replace controller;
_	8	06	1…n	System start	Unexpected CAN node report	Boot up message of an optional component which is set as not being present.	- Read logbook: - Check optional components (unexpected nodes); - Release / activate or remove unexpected node by parameter if not required.
_	8	07	1	Self test	Unexpected CAN node self-test end	Unexpected reply of a node to the self-test request	- Inquire about software update; - Look for faulty controller during self-test. - Replace controller;
_	8	08	1	Operation	Telegram between master/ slave implausible / software error	The master is informed via EMCY ID 8210 that a node has received an unexpectedly short process data object (PDO). Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component. Events recognised by the master are entered with node number 1 and function assembly 0.	- Inquire about software update;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	08	2	Operation	Telegram between master/ slave implausible (too long) / software error	The master is informed via EMCY ID 8220 that a node has received an unexpectedly long process data object (PDO). Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component. Events recognised by the master are entered with node number 1 and function assembly 0.	- Inquire about software update;
_	8	08	3	Operation	Unexpected Multiplex-PDO	The master has been informed via EMCY ID 8230 that a node is reporting error "DAM MPDO not processed, destination object not available". Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component. Events recognised by the master are entered with node number 1 and function assembly 0.	- Inquire about software update;
_	8	09	1…32	Operation	Receive error; telegram remains off	For T = 3.5 x PDO cycle of the monitored node: PDO not received Sub-index: monitored node. The master is informed via EMCY ID 8250 that a node has not received a receipt PDO in the expected time. Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component. Events recognised by the master are entered with node number 1 and function assembly 0.	- Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Check CAN-Bus via JUDIT (CAN-Bus load, ...); - Bypass components connected to the CAN-Bus in turn; - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	10	1…32	Undefined	No reply to service data object	Service data object (SDO) monitoring. After repeating 4 times (with 10 msec interval) no response from contacted node Sub-index: contacted node.	- Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Check CAN-Bus via JUDIT (CAN-Bus load, ...); - Bypass components connected to the CAN-Bus in turn; - Replace controller;
_	8	11	1	Self test	Error bit set for CANOpenSync in Safe computers	Safe computer missed CANopenSync from slave. The activation limit is 20 msec.	- Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances; - Replace faulty component;
_	8	11	2	Self test	Error bit set for CANOpenPDO in Safe computers	Safe computer missed process data object (PDO) from slave. The activation limit is 20 msec.	- Check the physical properties of the CAN Bus; - Measure the CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances; - Replace faulty component;
_	8	11	33	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 1/33	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	11	34	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 2/34	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	35	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 3/35	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	36	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 4/36	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	37	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 5/37	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	38	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 6/38	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	11	39	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 7/39	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	40	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 8/40	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	41	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 9/41	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	42	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 10/42	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	43	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 11/43	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	11	44	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 12/44	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	45	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 13/45	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	46	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 14/46	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	47	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 15/47	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	48	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 16/48	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	11	49	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 17/49	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	50	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 18/50	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	51	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 19/51	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	52	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 20/52	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	53	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 21/53	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	11	54	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 22/54	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	55	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 23/55	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	56	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 24/56	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	57	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 25/57	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	58	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 26/58	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	11	59	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 27/59	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	60	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 28/60	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	61	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 29/61	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	62	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 30/62	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	11	63	Self test	Emergency telegram: JH-CANopen SafetyPDOs node ID monitoring 31/63	The Safe computer has missed the Slave PDO and sent an emergency telegram with the corresponding node ID. The activation limit is 20msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	12	1	Operation	Error message evaluated incorrectly	Controller reports faulty (non-defined) emergency telegram. The activation limit is 20 msec.	- Switch the truck off and on again; ➔ The event message should not occur. Otherwise contact troubleshooting specialists;
_	8	12	2	Operation	No emergency telegram	Master has not received emergency telegram from controller. The activation limit is 20 msec.	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances, - Replace faulty component;
_	8	13	1	Operation	SRDO monitoring timeout telegram 1	1. No telegram after 2.5x repeat time	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Check CAN-Bus via JUDIT (CAN bus load, ...): - Bypass components connected to the CAN-Bus in turn; - Inquire about software update; - Replace controller;
_	8	13	2	Operation	SRDO monitoring timeout telegram 2	2. No telegram after 0.2x repeat time (distance from 1st to 2nd telegram)	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Check CAN-Bus via JUDIT (CAN bus load, ...): - Bypass components connected to the CAN-Bus in turn; - Inquire about software update; - Replace controller;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	13	3	Operation	SRDO data implausible	1st and 2nd data (inverted) do not match	- Check the physical properties of the CAN Bus; - Measure CAN-Bus signal; - Check CAN-Bus signals for frame leakage; - Check equipotential bonding; - Check terminal resistances (60 Ω ± 10%); - Check CAN-Bus via JUDIT (CAN bus load, ...): - Bypass components connected to the CAN-Bus in turn; - Inquire about software update; - Replace controller;
_	8	13	4	Undefined	CRC checksum or current number from PDO of a monitored CANopen slave faulty		-
_	**8**	**14**	**1...32**	**Operation**	**Collision of CAN-ID's**	**The master has been informed via EMCY ID 8150 that a node is reporting the collision of CAN-ID's. Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component. Events recognised by the master are entered with node number 1 and function assembly 0.**	**- Inquire about software update;**
_	**8**	**15**	**1...32**	**Operation**	**Unexpected synch length**	**The master is informed via EMCY ID 8240 that a node has received an unexpected SYNCH length. Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component.**	**- Inquire about software update;**

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	8	16	1...32	Operation	Non-assigned CAN-Open CiA error in emergency report of a node	The master has been notified via EMCY of a CAN-Open CiA error code to which no event message has been assigned. Events are entered with the node number of the transmitting component The function assembly used is the function assembly of the transmitting component.	- Inquire about software update;
_	9	01	1	System start Operation	"Safety switch" input and “travel” setpoint invalid	This event message is triggered if for T >= 500 msec the following applies: A travel setpoint is present at the system start. A travel setpoint was already present when the safety switch was pressed This event message can be triggered by incorrect operation.	- Release travel switch / accelerator pedal / twin pedal; - Check wire connections; - Check travel switch / accelerator pedal / dual pedals and replace if necessary; - Check safety switch and replace if necessary; - Check “zero position” parameter; - Check signal-evaluating controller and replace if necessary; ➔ Safety switches can include: - Deadman (foot switch), - Seat switch, - Tiller switch. For system trucks: - Switch the truck off and on again. Do not apply the control lever on power up. - If the error still occurs, check the sensor components and recuperating springs;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	02	1	System start Operation	“Safety switch” input and “lift” setpoint invalid	This event message is triggered if for T >= 500 msec the following applies: A lift setpoint is present at the system start. A lift setpoint was already present when the safety switch was pressed This event message can be triggered by incorrect operation.	- Set the “lift” control lever to neutral; - Check wire connections; - Check the lift setpoint device and replace if necessary; - Check safety switch and replace if necessary; - Check “zero position” parameter; - Check signal-evaluating controller and replace if necessary; ➔ Safety switches can include: - Deadman (foot switch), - Seat switch, - Tiller switch. For system trucks: - Switch the truck off and on again. Do not apply the control lever on power up. - If the error still occurs, check the sensor components and recuperating springs;
_	9	03	1	System start Operation	“Safety switch” input and “lower” setpoint invalid	This event message is triggered if for T >= 500 msec the following applies: A lower setpoint is present at the system start. A lower setpoint was already present when the safety switch was pressed This event message can be triggered by incorrect operation.	- Set the “lower” control lever to neutral; - Check wire connections; - Check the lower setpoint device and replace if necessary; - Check safety switch and replace if necessary; - Check “zero position” parameter; - Check signal-evaluating controller and replace if necessary; ➔ Safety switches can include: - Deadman (foot switch), - Seat switch, - Tiller switch.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	04	1	Operation	“Travel” setpoint and “no travel direction” combination invalid	This event message is triggered if for T >= 500 msec the following applies: No travel direction present when travel switch applied This event message can be triggered by incorrect operation.	- Specify travel direction; - Check wire connections; - Check direction switch and replace if necessary; - Check signal-evaluating controller and replace if necessary;
_	9	05	1	Operation	“Jog mode” and “travel switch” setpoint combination invalid	This event message is triggered when the "jog mode" button and travel switch are pressed simultaneously. This event message can be triggered by incorrect operation.	- Check wire connections; - Check the jog mode button and replace if necessary; - Check the travel switch and replace if necessary; - Check signal-evaluating controller and replace if necessary;
_	9	06	1	Operation	“Safety switch input" and “jog mode” setpoint combination invalid	This event message is triggered when the safety switch and the "jog mode" button are pressed simultaneously. This event message can be triggered by incorrect operation.	- Check wire connections; - Check the jog mode button and replace if necessary; - Check safety switch and replace if necessary; - Check signal-evaluating controller and replace if necessary; ➔ Safety switches can include: - Deadman (foot switch), - Seat switch, - Tiller switch.
_	9	07	1	Operation	“Drive direction” and “fork direction” jog mode setpoints invalid	This event message is triggered when the "drive direction" and "forks direction" buttons are pressed simultaneously. This event message can be triggered by incorrect operation.	- The buttons must not be pressed simultaneously; - Check wire connections; - Check the buttons and replace if necessary; - Check signal-evaluating controller and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	08	1	Operation	“Travel and/or lift setpoint” and “safety switch open” combination invalid	This event message is triggered if for T >= 500 msec the following applies: Travel / hydraulic setpoint not equal to zero and safety switch not applied This event message can be triggered by incorrect operation.	- Close safety switch; - Check wire connections; - Check safety switch and replace if necessary; - Check signal-evaluating controller and replace if necessary; ➔ Safety switches can include: - Deadman (foot switch), - Seat switch, - Tiller switch.
_	9	09	1	Operation	“Travel” and “handbrake” setpoint combination invalid	This event message is triggered if for T >= 500 msec the following applies: Travel setpoint not equal to zero and handbrake applied This event message can be triggered by incorrect operation.	- Release handbrake; - Check magnetic brake and replace if necessary (feedback contacts);
_	9	10	1	Operation	“Lift/lower” and “safety height” setpoint combination invalid	This event message is triggered if the “lift/lower” and “safety height” setpoint combination is invalid. This event message is an information message.	- Extend the mast; - Raise the fork carriage; - Check wire connections; - Check the “safety height” switch and replace if necessary; - Check signal-evaluating controller and replace if necessary;
_	9	11	1	Operation	“Gate open” signal applied	This event message is an information message.	- Close the gate; - Check the “gate open” switch and replace if necessary; - Check signal-evaluating controller and replace if necessary;
_	9	12	1	Operation	“Aisle travel" signal applied	This event message is an information message.	- Check the “aisle travel” sensors and replace if necessary; - Check signal-evaluating controller and replace if necessary;
_	9	13	1		Pin code error	This event message is not currently used.	

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	14	1	System start	Operator protection switch applied during system start-up	The operator protection switch was pressed on system start-up. This event message is an information message.	- Do not press the operator protection switch on system start-up; - Check wire connections; - Check the operator protection switch and replace if necessary; - Check signal-evaluating controller and replace if necessary;
_	9	14	2	System start	Tiller switch applied during system start-up	The tiller switch was pressed on system start-up. This event message is an information message.	- Do not press the tiller switch on system start-up; - Check wire connections; - Check the tiller switch and replace if necessary; - Check signal-evaluating controller and replace if necessary;
_	9	15	1	Operation	Battery door not closed and travel speed less than 1 km/h	The “battery latch open” signal is applied when the truck is idle (< 1 km/h). This event message is triggered if for T >= 500 msec the following applies: Battery door not closed and travel speed less than 1 km/h This event message can be triggered by incorrect operation.	- Latch battery / close battery door; - Check wire connections; - Check “battery latch” sensor, adjust and replace if necessary; - Check signal-evaluating controller and replace if necessary;
_	9	15	2	Operation	Battery door not closed and travel speed greater than or equal to 1 km/h	The “battery latch open” signal is applied when the truck is moving (>=1 km/h). This event message is triggered if for T >= 500 msec the following applies: Battery door not closed and travel speed greater than or equal to 1 km/h This event message can be triggered by incorrect operation.	- Latch battery / close battery door; - Check wire connections; - Check “battery latch” sensor, adjust and replace if necessary; - Check signal-evaluating controller and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	15	3	System start	Battery door not closed when battery management active and travel speed < 1 km/h	Charger: The “battery latch open” signal is applied when the truck is idle (< 1 km/h). This event message is triggered if for T >= 500 msec the following applies: Battery door not closed. Battery management active and simultaneously travel speed < 1 km/h. This event message is an information message.	- Latch battery / close battery door; - Check wire connections; - Check “battery latch” sensor, adjust and replace if necessary; - Check signal-evaluating controller and replace if necessary;
_	9	15	4	Undefined	Plausibility check: main contactor closed BUT charger connected to mains	for T>= 500 msec.: main contactor closed BUT charger connected to mains	- Insert mains connect in socket again - Check wire connections - Check controller that is evaluating the signal - Check steering controller and freewheel diode if necessary;
_	9	15	5	System start	“Battery latch open” signal not applied during charging	Charger: When the truck is stationary the “battery latch open” signal is not applied, but the charger transmission status is present (battery being charged).	- Latch battery / close battery door; - Check wire connections; - Check “battery latch” sensor, adjust and replace if necessary; - Set battery management parameter to 2. - Check signal-evaluating controller and replace if necessary;
_	9	16	1	Operation	Travel cutout through external functions/devices	This event message is triggered if for T >= 500 msec. (debounce time): travel cutout with open input activated through external functions/devices. This event message is an information message.	- Check condition for travel cutout; - Check wire connections; - Check travel cutout sensors; - Check signal-evaluating controller and replace if necessary; ➔ Travel cutout deactivated if the travel setpoint is zero and the input is closed.
_	9	16	2	System start	Power-up test: keypad switch pressed during power up	Power-up test: keypad switch pressed during power up -> Operating error.	- Switch the truck off and on again. Do not apply the keypad switch on power up. - Replace the keypad switch;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	17	1	Operation	“Travel” and “pedal brake” setpoint combinations invalid	This event message is triggered if for T >= 500 msec the following applies: Accelerator pedal and brake pedal pressed simultaneously. This event message can be triggered by incorrect operation.	- Press one pedal only; - Check wire connections; - Check the accelerator pedal and replace if necessary; - Check the brake pedal and replace if necessary; - Check signal-evaluating controller and replace if necessary;
_	9	17	2	System start	Power-up test: function pre-select switch pressed during power up	Power-up test: function switch pressed during power up -> Operating error.	- Switch the truck off and on again. Do not apply the function pre-select switch on power up. - Replace the function pre-select switch;
_	9	18	1	Operation	Cabin door open	This event message is triggered if for T >= 500 msec the following applies: Cabin door not closed. Simultaneously safety switch pressed and travel setpoint > 0 This event message is an information message.	- Close cabin door; - Check wire connections; - Check “cabin door” switch; - Check safety switch and replace if necessary; - Check signal-evaluating controller and replace if necessary; ➔ Safety switches can include: - Deadman (foot switch), - Seat switch, - Tiller switch.
_	9	18	2	System start	Power-up test: foot switch pressed during power up	Power-up test: foot switch pressed during power up -> Operating error.	- Switch the truck off and on again. Do not apply the foot switch on power up. - Check wire connections; - Set the foot switch; - Replace the foot switch;
_	9	19	1	Operation	Lift overload	The maximum load has been exceeded. This event message is an information message.	- Perform a reference measurement of the load; - Teach the load measurement; - Check wire connections; - Check load measurement sensors; - Check signal-evaluating controller and replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	20	1	Operation	“Service brake test” service function	The truck brakes to a halt (activated via JUDIT). This tests the service brake. This event message is an information message. The event message and the brake activation are reset when the truck is switched off and on again.	
_	9	21	1	Operation	“Emergency Stop test” service function active	The main contactor is opened by the service engineer (activated via JUDIT). This allows the engineer to check whether the main contactor can switch as an emergency stop device. This event message is an information message. The event message and the JUDIT control are reset when the truck is switched off and on again.	
_				Self test		Information message: travel function test message. Event for activating the cutout response of the main contactor for UVV testing. The main contactor is opened by the service engineer (activated via JUDIT). This allows the engineer to check whether the main contactor can switch as an emergency stop device. This event message is an information message. The event message and the JUDIT control are reset when the truck is switched off and on again.	
_				Self test		Information message: steering test message Event for activating the cutout response of the main contactor for UVV testing. The main contactor is opened by the service engineer (activated via JUDIT). This allows the engineer to check whether the main contactor can switch as an emergency stop device. This event message is an information message. The event message and the JUDIT control are reset when the truck is switched off and on again.	
_	9	22	1	Operation	“Mechanical service brake test” service function	The regenerative brake is switched off by the service engineer to test the mechanical service brake (activated via JUDIT). This allows the mechanical service brake to be tested in isolation. When the test has been completed switch the truck off and on again. This event message is an information message. The event message and the regenerative brake cutout are reset after 5 min. or when the truck is switched off and on again.	
_	9	23	1	Operation	“Safety valve test” service function	To test the safety valve the lowering valve is opened in full (activated via JUDIT). This event message is an information message.	

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	24	1	Operation	“Depressurise hydraulic manifold” service function active	When the truck is idle and all hydraulic levers are in the home position, press the SET key on the display for 3 seconds to start the process for depressurising the ZH (auxiliary) functions. The start is indicated by a beep, the end by two beeps. The truck must then be switched off.	- This event message is an information message.
_	9	25	1	System start	Shunting switch pressed during system start-up	Shunting switch pressed during system start-up	- Switch the truck off and on again. Do not press the shunting switch during system start-up. - Check wire connections; - Check the shunting switch and replace if necessary; - Check signal-evaluating controller and replace if necessary;
_	9	26	1	Operation	Invalid setting combination for moving gates	Combination of digital inputs for gates (1/0) or (0/1) for more than 500 ms	- Check the position of both moving side restraints; - Check switch; - Check wire connections;
_	9	27	1	System start	Pedal brake applied on system start-up	During the hydraulic emergency stop device self-test the pedal brake is applied, hence the test cannot be performed hydraulic emergency stop device released but brake pressure on the load wheel brakes (from brake pedal) > 5 bar	- Train driver; - Check brake pedal; - Check pressure sensor on steering B, replace if necessary;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	28	1	System start Operation	Platform lift/lower setpoint activated during system start	For T >= limit time: at least one button is active for the platform lift/lower function during system start	- Switch the truck off and on again. - Do not press the foot / hand button during power-up. - Test foot / hand button for jamming / activation during system start - Check wire connections; - check foot / hand button and replace if necessary; - Check signal-generating controller and replace if necessary;
_	9	29	1	Operation	'Test spring-loaded brake of automatic parking brake' service function activated	The spring-loaded brake of the automatic parking brake can be applied by the service engineer (activated via JUDIT). This enables service work to be performed on the spring brake cylinder.	- 'This event message is an information message. The event message and the JUDIT control are reset when the truck is switched off and on again.
_	9	51	1…n	System start Operation	“Hydraulic setpoint” on system start or safety switch application invalid	MULTI-PILOT: This event message is triggered if for T >= 500 msec the following applies: When the system starts the setpoint of at least one hydraulic function is not equal to zero. When the safety switch was pressed a setpoint of at least one hydraulic function was present. This event message can be triggered by incorrect operation.	- Do not apply the MULTI-PILOT; - Check the MULTI-PILOT zero position; - Check wire connections within the MULTI-PILOT; - Check the control on MULTI-PILOT and replace if necessary; - Re-teach the MULTI-PILOT; - Replace the MULTI-PILOT; ➔ Safety switches can include: - Totmanntaster (Fußtaster), - Seat switch, - Tiller switch.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	52	1	System start	“Travel direction switch applied” on system start-up or safety switch application invalid	MULTI-PILOT: This event message is triggered if for T >= 500 msec the following applies: Travel direction button pressed when the system starts, The travel direction button was pressed when the safety switch was applied. This event message can be triggered by incorrect operation.	- Do not press the travel direction switch; - Check the travel direction switch zero position on the MULTI-PILOT; - Check wire connections within the MULTI-PILOT; - Check the direction switch on the MULTI-PILOT and replace if necessary; - Re-teach the MULTI-PILOT; - Replace the MULTI-PILOT; ➔ Safety switches can include: - Deadman (foot switch), - Seat switch, - Tiller switch.
_	9	53	1	Operation	MULTI-PILOT operating error (status switch ZH 3)	MULTI-/SOLO-PILOT applied or status switch ZH 3 pressed, but conditions for function not met -> Operating error.	- see truck operating instructions data plate;
_	9	53	2	Operation	MULTI-PILOT specific: Pilot operating error	MULTI-/SOLO-PILOT applied or button pressed, but conditions for function not met Lift height reached and MULTI-PILOT does not pass zero.	- Do not apply the MULTI-PILOT; - Check the MULTI-PILOT zero position; - Check wire connections within the MULTI-PILOT; - Check the control on MULTI-PILOT and replace if necessary; - Re-teach the MULTI-PILOT; - Replace the MULTI-PILOT;
_	9	54	1	Self test	Control unit specific: "Button is pressed - self test cannot start"	For min. 5 seconds a travel mode button is pressed and the control unit self-test is running.	- This is an information message. - Train driver; - If the button(s) is/are pressed for more than 5 seconds, self-test error 181 is activated.

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
–	9	61	1	System start operation	Vertical ISM impact event (level 1)	ISM: This event message is an information message. A level 1 (weak) vertical impact event has occurred.	- Check the truck impact and check the impact limit parameters if necessary; - Carry out electrostatic suppression (ESD) (equipotential bonding measures: controllers, reservoir return line, seat, earth chain, data recorder screening case, ...);
–	9	61	2	System start operation	Vertical ISM impact event (level 2)	ISM: This event message is an information message. A level 2 (medium) vertical impact event has occurred.	- Check the truck impact and check the impact limit parameters if necessary; - Carry out electrostatic suppression (ESD) (equipotential bonding measures: controllers, reservoir return line, seat, earth chain, data recorder screening case, ...);
–	9	61	3	System start operation	Vertical ISM impact event (level 3)	ISM: This event message is an information message. A level 3 (strong) vertical impact event has occurred.	- Check the truck impact and check the impact limit parameters if necessary; - Carry out electrostatic suppression (ESD) (equipotential bonding measures: controllers, reservoir return line, seat, earth chain, data recorder screening case, ...);
–	9	62	1	System start operation	Horizontal ISM impact event (level 1)	ISM: This event message is an information message. A level 1 (weak) horizontal impact event has occurred.	- Check the truck impact and check the impact limit parameters if necessary; - Carry out electrostatic suppression (ESD) (equipotential bonding measures: controllers, reservoir return line, seat, earth chain, data recorder screening case, ...);
–	9	62	2	System start operation	Horizontal ISM impact event (level 2)	ISM: This event message is an information message. A level 2 (medium) horizontal impact event has occurred.	- Check the truck impact and check the impact limit parameters if necessary; - Carry out electrostatic suppression (ESD) (equipotential bonding measures: controllers, reservoir return line, seat, earth chain, data recorder screening case, ...);

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	62	3	System start operation	Horizontal ISM impact event (level 3)	ISM: This event message is an information message. A level 3 (strong) horizontal impact event has occurred.	- Check the truck impact and check the impact limit parameters if necessary; - Carry out electrostatic suppression (ESD) (equipotential bonding measures: controllers, reservoir return line, seat, earth chain, data recorder screening case, ...);
_	9	63	1	Self test	Personal Protection System (PPS): laser scanner error message	Personal protection system (PPS) - scanner reports error.	- To check the personal protection system (PPS) with the SICK software, see chapter 005 042 000 00005 "Seven segment displays and indicators"
_	9	70	1	System start	"Controls applied" error bit set for power up test in Safe computers	Safe computer detected a control button pressed during power-up test.	- Switch the truck off and on again. Do not apply controls on power up. - If the event still occurs, check the sensor components and recuperating springs;
_	9	71	1	System start	Power-up test: button pressed in rider mode on power up	On power-up test: rider mode button pressed on power up -> Operating error.	- Switch the truck off and on again. Do not press the rider mode button on power up. - If the event still occurs, check the sensor components and recuperating springs; - Replace the rider mode button;
_	9	71	2	System start	Power-up test: emergency operation button pressed on power up	On power-up test: emergency operation button pressed on power up -> Operating error.	- Switch the truck off and on again. Do not press the emergency operation button on power up. - If the event still occurs, check the sensor components and recuperating springs; - Replace the emergency operation button;

F	E	XX	S	Operational Status	Description	Cause / Triggering Event	Action
_	9	71	3	System start	Power-up test: button on working platform pressed during power up/insertion	Power-up test: button on working platform pressed during power up. Switch on the truck again.	- Switch the truck off and on again. Do not press the working platform button on insertion; - If the event still occurs, check the sensor components and recuperating springs; - Replace the working platform button;
_	9	90	1	Undefined	Battery electrolyte level low	Battery controller: This event message is displayed when the electrolyte level sensor sends a “no electrolyte” signal (electrolyte level sensor not immersed in electrolyte).	- Check electrolyte level; - Check wire connections; - Check electrolyte level sensor on battery controller and replace if necessary; - Replace battery controller;
_	9	92	1	System start	Charger: No radio network established	Charger: This event message is displayed if no connection to the radio network could be established when the battery management system is switched on	- Inquire about software update; - Check fuse in charging cable, replace charging cable if required; - Replace battery controller; - Replace charger;

CAN bus node IDs

CAN bus node ID	Description	Lift of components with fixed CAN Bus node ID
1	Master	
2	MULTI-PILOT / SOLO-PILOT 1	- Multifunction armrest controls;
3	Display 1	- CANDIS; - JULIA; - On board computer; - Multifunction armrest display;
4	Steer 1	- Control processor;
5	Steer 2 (RIGHT load wheel)	- Control processor;
6	Steer 3 (LEFT load wheel)	- Control processor;
7	Lifting	
8	Travel 1	
9	Travel 2	
10	MULTI-PILOT / SOLO-PILOT 2	
11	Interface 1	- MFC 1 (brakes); - E box;
12	Interface 2	- MFC 2 (hydraulics);
13	Interface 3	- Travel switch;

CAN bus node ID	Description	Lift of components with fixed CAN Bus node ID
14	Interface 4	- MFC 05;
15	Display 2	
16	Battery controller	
17	Charger	
18	Spare	
19	Display 3	- Rack Height Select;
20	Display 4	- Cold store cab user interface;
21	Interface 5	- Interface 1 of multifunction armrest; - Auxiliary interface EFG 213-320
22	Interface 6	- Interface 2 of multifunction armrest; - Auxiliary interface EFG 425-430
23	Interface 7	- Interface 3 of multifunction armrest;
24	Interface 8	- Interface 4 of multifunction armrest;
25	Steer 1	- Control processor;
26	Steer 2 (RIGHT load wheel)	- Control processor;
27	Steer 3 (LEFT load wheel)	- Control processor;
28	Access 1	- CANCODE;

CAN bus node ID	Description	Lift of components with fixed CAN Bus node ID
29	Access 2	- ISM;
30	Service PC	
31	APM +	- Automation interface (PLC);