

12.1 Error Messages

Overview

Error-Message	Error Source	Error cause	Remarks	Board + Plug + PIN	Involved Components	Testing process		
1.2.5.1-000	Temperature, brush motor	Temperature to high	> 130°C, reset at 83°C 10,5A Defective, corroded wiring etc.	>	A1/X7PIN1 (DGNG1) and A1/X7PIN4 (DIGIN1)	M3/PIN1 (measurement) und M3/PIN2 (ground)	Check the temperature of the brush motor Check the current consumption of the brush motor Check the wiring of the brush motor's thermal switch	
1.2.6.1-000	Blocking protection, brush motor	Open load - power supply	Defective wiring etc.	/	A1/X4 (Power1)	M3/PIN(P/1)	Check wiring for damage	
1.2.6.1-001	Blocking protection, brush motor	Over load (Slowfilter) - power supply	Brushes are tight continuous current >30A Defective wiring etc.	Maximum	Overload (output protection 30A) triggered after approx. 3s	A1/X4 (Power1)	M3/PIN(P/1)	Check the combination of brush and floor Check the current consumption of the brush motor Check wiring for damage
1.2.6.1-002	Blocking protection, brush motor	Over load (Fastfilter) - power supply	Brushes cannot be moved easily by hand	/	/	/	Check brush motor for ease of movement	
1.2.6.1-003	Blocking protection, brush motor	Short cut - power supply	Short cut in brush motor	Coil resistance < ?ohm or > ?ohm	/	Between M3/PIN(P/1) (power) and M3/PIN(N/1) (ground)	Check resistance in brush motor	
1.2.6.1-004	Blocking protection, brush motor	Over load (continuous) - power supply	Brushes cannot be moved easily by hand Maximum continuous current >10,5A Defective wiring etc.	Overload (max load consumer) after 1min. less in between, starting from 0 again	If A1/X4 (Power1)	M3/PIN(P/1) (power)	Check brush motor for ease of movement Check the current consumption of the brush motor Check wiring for damage	
1.2.6.1-008	Blocking protection, brush motor or suction turbine	Open load - ground supply	Defective wiring etc.	/	A1/X2 (GND) or at W3/XS1 to A1/X2 (GND)	X4PIN2 M2/PIN(N) or M3/PIN(N/1)	Check wiring for damage	
1.2.6.1-009	Blocking protection, brush motor or suction turbine	Over load (Slowfilter) - ground supply	Brushes or suction turbine are tight Maximum continuous current >30A (brushes) or (suction turbine) etc.	>15A Defective wiring	Overload (output protection 30A/15A) triggered after approx. 3s	A1/X2 (GND) or at W3/XS1 to A1/X2 (GND)	X4PIN2 M2/PIN(N) or M3/PIN(N/1)	Check the combination of brush and floor Check suction turbine for ease of movement Check the current consumption of the brush motor or suction turbine Check wiring for damage
1.2.6.1-010	Blocking protection, brush motor or suction turbine	Over load (Fastfilter) - ground supply	Brushes or suction turbine cannot be moved easily by hand	/	/	/	Check brush motor or suction turbine for ease of movement	
1.2.6.1-011	Blocking protection, brush motor or suction turbine	Short cut - ground supply	Short cut in brush motor or suction turbine	Coil resistance < ?ohm or > ?ohm	/	Between M3/PIN(P/1) (power) and M3/PIN(N/1) (ground) or M2/PIN(P) (power) and M2/PIN(N) (ground)	Check resistance in brush motor or suction turbine	
1.2.6.1-012	Blocking protection, brush motor or suction turbine	Over load (continuous) - ground supply	Brushes or suction turbine cannot be moved easily by hand Maximum continuous current >10,5A (brushes) or (suction turbine) wiring etc.	>11A Defective	Overload (max load consumer) after 1min. less in between, starting from 0 again	If A1/X2 (GND) or at W3/XS1 to A1/X2 (GND)	X4PIN2 M2/PIN(N)or M3/PIN(N/1)	Check brush motor for ease of movement Check suction turbine for ease of movement Check the current consumption of the brush motor or suction turbine Check wiring for damage
1.4.6.3-000	Blocking protection, suction turbine	Open load - power supply	Defective wiring etc.	/	A1/X5 (Power2) via X4PIN1	M2/PIN(P)	Check wiring for damage	
1.4.6.3-001	Blocking protection, suction turbine	Over load (Slowfilter) - power supply	Suction turbine tight continuous current >15A wiring etc.	Maximum Defective	Overload (output protection 15A) triggered after approx. 3s	A1/X5 (Power2) via X4PIN1	M2/PIN(P)	Check suction turbine for ease of movement Check the current consumption of the suction turbine Check wiring for damage
1.4.6.3-002	Blocking protection, suction turbine	Over load (Fastfilter) - power supply	Suction turbine cannot be moved easily by hand	/	/	/	Check suction turbine for ease of movement	
1.4.6.3-003	Blocking protection, suction turbine	Short cut - power supply	Short cut in suction turbine	Coil resistance < ?ohm or > ?ohm	/	Between M2/PIN(P) (power) and (ground)	M2/PIN(N)	Check resistance in suction turbine
1.4.6.3-004	Blocking protection, suction turbine	Over load (continuous) - power supply	Suctionturbine cannot be moved easily by hand Maximum continuous current >11A Defective wiring etc.	Overload (max load consumer) after 1min. less in between, starting from 0 again	If A1/X5 (Power2) via X4PIN1 and	M2/PIN(P)	Check suction turbine for ease of movement Check the current consumption of the suction turbine Check wiring for damage	
1.5.9.1-000	Blocking protection, water valve	Open load	Defective wiring etc.	/	A1/X9PIN1 (GND1) and A1/X9PIN3 (Load1, Interval)	Y1/PIN(1) (power, interval) and Y1/PIN(2) (ground)	Check wiring for damage	
1.5.9.1-003	Blocking protection, water valve	Short cut	Short cut in valve coil	Coil resistance < ?ohm or > ?ohm	/	Between Y1/PIN(1) (power, interval) and Y1/PIN(2) (ground)	Check the resistance of the Y1 solenoid valve	

Overview

Error-Message	Error Source	Error cause	Remarks	Board + Plug + PIN	Involved Components	Testing process		
3.1.1.2-000	Fleet communication Fleet not found	Wrong configuration (Chapter1/Configuration7)	Not provided in B5	/	/	in chapter 1, check the configuration7 for correct content (0 = without Fleet or 1= with Fleet)		
3.1.1.2-001	Fleet communication Fleet does not log off when shutting down	Internal error fleet recorder	Not provided in B5	/	/	Replace fleet recorder		
3.1.1.2-002	Fleet communication Fleet communications lost	Internal error fleet recorder	Not provided in B5	/	/	Replace fleet recorder		
3.1.1.2-003	Fleet communication Fleet (network management status) is not correct	Internal error fleet recorder	Not provided in B5	/	/	Replace fleet recorder		
3.1.1.2-004	Fleet communication Fleet (Third Party Dokument 01) Timeout	Internal error fleet recorder	Not provided in B5	/	/	Replace fleet recorder		
3.1.1.2-005	Fleet communication Fleet (Third Party Dokument 04) Timeout	Internal error fleet recorder	Not provided in B5	/	/	Replace fleet recorder		
3.1.1.2-006	Fleet communication Fleet error code received	Internal error fleet recorder	Not provided in B5	/	/	Replace fleet recorder		
3.1.1.2-007	Fleet communication Fleet Event could not be transferred	Internal error fleet recorder	Not provided in B5	/	/	Replace fleet recorder		
3.1.4.7-000	Main contactor Open load	Defective wiring etc.	In B5 no main contactor; Output is switching input Fleet (A20)	A1/X6PIN7 (OUT_PWR) to A20/PIN2 (IGN)	/	Check wire 20 in harness W3		
3.1.4.7-003	Main contactor Short cut	Short cut output main contactor	In B5 no main contactor; Output is switching input Fleet (A20)	Between A1/X6PIN7 (OUT_PWR) and A20/PIN2 (IGN)	/	Check wire 20 in wire harness W3 for resistance		
3.1.6.E-000	Power stage No voltage at power stage	Voltage < 18V (also briefly for < 0.1sec) at A1/X1	Collective message fuse on A1 (A1/F201) Voltage at A1/X1 must be identical to battery voltage	G1 (Batt+) via W1 (B+) to A1/X1 (Batt+) and (Batt-) via W1 (B-) to A1/X2 (GND)	G1 G1 (24V) and (ground)	Compare voltage at G1 (Batt+) and A1/X1 voltage between G1 (Batt-) and A1/X2	No	
3.1.6.E-001	Power stage Voltage at power stage	Voltage < 18V (also briefly for < 0.1sec) at fuse A1/F201	Collective message fuse on A1 (A1/F201) Voltage at A1/X1 must be identical to battery voltage	G1 (Batt+) via W1 (B+) to A1/X1 (Batt+) and (Batt-) via W1 (B-) to A1/X2 (GND)	G1 G1 (24V) and (ground)	Fuse A1/F201 defective		
3.3.1.1-000	Service timer Service timer expired	Maintenance overdue	The message is displayed after the "last error" display and before the operating hours counter (duration 5s) or when the working unit is ON	/	A1	Perform maintenance, reset service interval	then	
4.5.2.5-000	Control panel communication Control panel not found	No voltage or ground on control panel panel defective	Control	/	A1/X10PIN1 (Batt+_OUT) to A2/X1PIN14 (+24V IN) A1/X10PIN2 (D-GND) to A2/X1PIN13 (GND Batt)	A1 and A2	Check control panel (A2) power supply control panel (A2)	Check
4.5.2.5-001	Control panel communication Control panel does not log off when shutting down	Internal control panel error	/	/	A2	Replace control panel		
4.5.2.5-002	Control panel communication Control panel object could not be transferred	Internal control panel error	/	/	A2	Replace control panel		
4.5.2.5-003	Control panel communication Control panel error code received	Internal control panel error	/	/	A2	Replace control panel		
4.5.2.5-004	Control panel communication Control panel error code received	Internal control panel error	/	/	A2	Replace control panel		
4.5.2.5-005	Control panel communication Control panel no keyboard found	Internal control panel error keyboard - control (control panel) defective	Conductors	/	A2	Replace control panel		
4.5.2.5-006	Control panel communication Control panel bail switch has the same levels	Enabling switch S2 or wiring defective control panel error	Internal	/	A2/X4PIN4 (DIG GND) to S2/PIN1 and S2/PIN2 to A2/X4PIN3 (DIG IN2) or S2/PIN4 to A2/X4PIN1 (DIG IN1)	A2 and S2	Check switch S2 wiring S2 replace control panel	Check If o.k.
4.5.3.5-000	Control panel communication Control panel no machine control found	No communication between control board and control panel	/	/	A1/X10PIN4 (TX) to A2/X1PIN8 (RX) A1/X10PIN6 (RX) to A2/X1PIN7(TX)	A1 and A2	Check connection cable control unit (A1) - control panel (A2) Check power supply controlunit (A1) "Water drops" on CAN driver (A1) can also lead to this error	
4.6.1.2-000	Memory Memory no valid memory data found	Memory access (A1) no function	/	/	A1	Switch the machine OFF and ON several times	If the error persists => replace A1	
4.6.1.4-000	Master data Master data control board not available	Data from memory (A1) not readable	/	/	A1	Switch the machine OFF and ON several times	If the error persists => replace A1	
4.6.1.5-000	Master Data Master data calibration not available	Calibration values on A1 not readable	/	/	A1	Switch the machine OFF and ON several times	If the error persists => replace A1	

Overview

Error-Message	Error Source	Error cause	Remarks	Board + Plug + PIN	Involved Components	Testing process		
5.9.3.1-000	BMS communication	BMS not found	Defective connector and/or wiring defective	BMS	Communication between the machine control A1 and the battery management system (G1) disrupted (CAN bus)	A1/X6PIN4 (CAN_H) via W3/XS4 and X2/PIN1 (W1) to G1/C-H and A1/X6PIN9 (CAN_L) via W3/XS5 and X2/PIN2 (W1) to G1/C-L	G1 (CAN_High) und (CAN_Low)	Check plug connections (G1/X2/A1X6) and/or check wiring W1 and W3 (incl. splice XS4+5) if o.k. replace BMS
5.9.3.1-001	BMS communication	BMS does not log off when shutting down	Internal error BMS	/	/	/	G1	Replace battery
5.9.3.1-002	BMS communication	BMS communication lost	Defective connector and/or wiring defective	CAN-BMS	Communication between the machine control A1 and the battery management system (G1) disrupted (CAN bus)	G1 (Batt+) via W1 (B+) to A1/X1 (Batt+) and G1 (Batt-) via W1 (B-) to A1/X2 (GND) as well as A1/X6PIN4 (CAN_H) via W3/XS4 and X2/PIN1 (W1) to G1/C-H and A1/X6PIN9 (CAN_L) via W3/XS5 and X2/PIN2 (W1) to G1/C-L	G1 (CAN_High) und (CAN_Low)	Check plug connections (G1/X2/A1X6) and/or check wiring W1 and W3 (incl. splice XS4+5) if o.k. check BMS, possibly replace control board A1
5.9.3.1-003	BMS communication	BMS (status network management) is not correct	Internal error BMS (NMT = Network Management Object)	/	/	/	G1	Replace battery
5.9.3.1-004	BMS communication	BMS (Third Party Dokument 01) Timeout	Internal error BMS (TPD = Third Party Data)	/	/	/	G1	Replace battery
5.9.3.1-005	BMS communication	BMS (Third Party Dokument 02) Timeout	Internal error BMS (TPD = Third Party Data)	/	/	/	G1	Replace battery
5.9.3.1-006	BMS communication	BMS (Third Party Dokument 01) data wrong	Internal error BMS (TPD = Third Party Data)	/	/	/	G1	Replace battery
5.9.3.1-007	BMS communication	BMS (Third Party Dokument 02) data wrong	Internal error BMS (TPD = Third Party Data)	/	/	/	G1	Replace battery
5.9.7.1-000	BMS	BMS warning over voltage	Charge voltage > 29,75V	/	/	/	G1	Wrong charger?
5.9.7.1-001	BMS	BMS warning low voltage	Discharge voltage < 19,6V ?	/	/	/	G1	High contact resistance
5.9.7.1-002	BMS	BMS warning battery temperature too high	Battery temperature > 55°C	/	/	/	G1	Let cool down
5.9.7.1-003	BMS	BMS warning battery temperature too low	Battery temperature < 0°C	/	/	/	G1	Let it warm up
5.9.7.1-004	BMS	BMS warning MosFet temperature too high	BMS temperature > 55°C	/	/	/	G1	Let cool down
5.9.7.1-005	BMS	BMS warning unequal cell voltage levels	Difference between the 7S4P (28) cells > ? V ?	/	/	/	G1	Repeat charging process
5.9.7.1-006	BMS	BMS warning temperature of cells unequal	Difference between the 7S4P (28) cells > ?°C ?	/	/	/	G1	Defective cell; observe
5.9.7.1-007	BMS	BMS warning low battery	SOC < ?% ?	/	/	/	G1	Charge battery
5.9.7.2-000	BMS	BMS error over voltage	Charge voltage > 30,45V	Battery is switched off	/	/	G1	Wrong charger?
5.9.7.2-001	BMS	BMS error low voltage	Discharge voltage < 17,5V ?	Battery is switched off	/	/	G1	High contact resistance
5.9.7.2-002	BMS	BMS error battery temperature too high	Battery temperature > 80°C	Battery is switched off	/	/	G1	Let cool down
5.9.7.2-003	BMS	BMS error battery temperature too low	Battery temperature < -15°C	Battery is switched off	/	/	G1	Let it warm up
5.9.7.2-004	BMS	BMS error MosFet temperature too high	BMS temperature > 80°C	Battery is switched off	/	/	G1	Let cool down
5.9.7.2-005	BMS	BMS error unequal cell voltage levels	Difference between the 7S4P (28) cells > ? V ?	Battery is switched off	/	/	G1	Replace battery
5.9.7.2-006	BMS	BMS error temperature of cells unequal	Difference between the 7S4P (28) cells > ?°C ?	Battery is switched off	/	/	G1	Replace battery
5.9.7.2-007	BMS	BMS error low battery	SOC < ?% ?	Battery is switched off	/	/	G1	Charge battery
5.9.7.2-008	BMS	BMS over load	Discharge current > 40A or 60A ?	Battery is switched off	/	/	G1	Check the power consumption of the consumers
5.9.7.2-009	BMS	BMS short cut	Between the 7S4P (28) cells ?	Battery is switched off	/	/	G1	Replace battery
5.9.7.2-010	BMS	BMS MosFet defective	?	Battery is switched off	/	/	G1	Replace battery
5.9.7.2-011	BMS	BMS NTC (resistance) no function	?	Battery is switched off	/	/	G1	Replace battery
5.9.7.2-012	BMS	BMS NTC (resistor) short circuit	?	Battery is switched off	/	/	G1	Replace battery
5.9.7.2-015	BMS	BMS unknown error	unknown error	Battery is switched off	/	/	G1	Replace battery

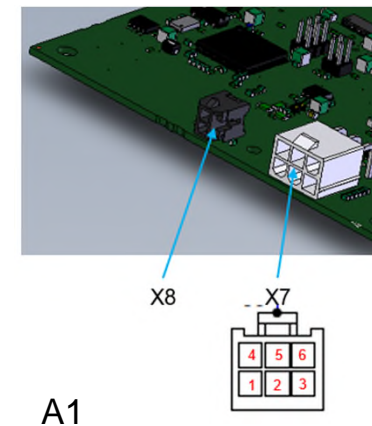
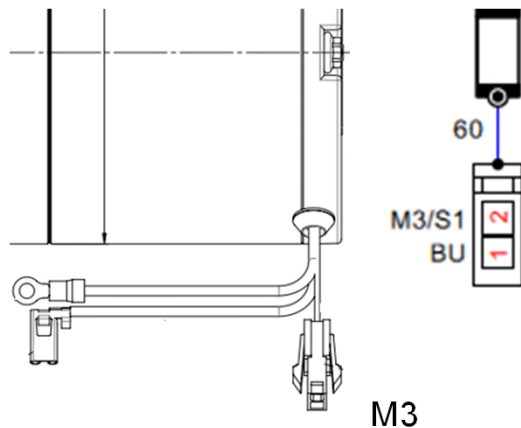
Error 1.2.5.1 – 000

Error description : Temperature, brush motor – Temperature to high

Error cause : > 130°C, reset at 83°C
> 10,5A
defektive, corroded wiring

Remarks : /

Involved components and electric connections : M3/PIN1 (measurement) and M3/PIN2 (ground)
A1/X7PIN1 (DGNG1) and A1/X7PIN4 (DIGIN1)



Troubleshooting : Check the temperature of the brush motor
Check the current consumption of the brush motor
Check the wiring of the brush motor's thermal switch

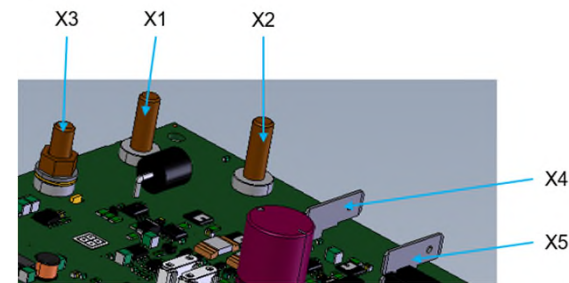
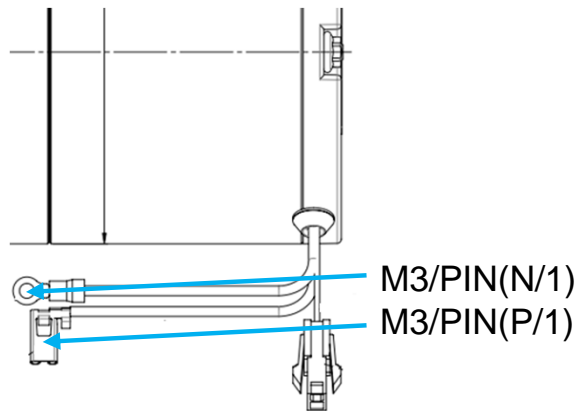
Error 1.2.6.1 - 000

Error description : Blocking protection, brush motor – Open load, power supply

Error source : Defective wiring

Remarks : /

Involved components and electric connections : M3/PIN(P/1)
A1/X4 (Power1)



A1

Testing process : Check wiring for damage

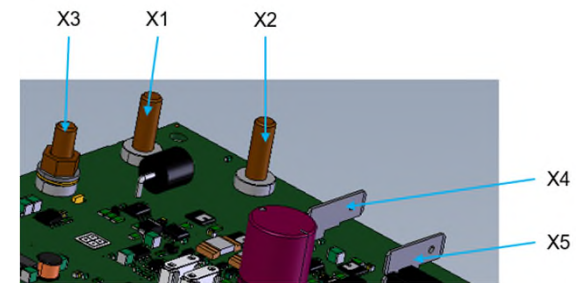
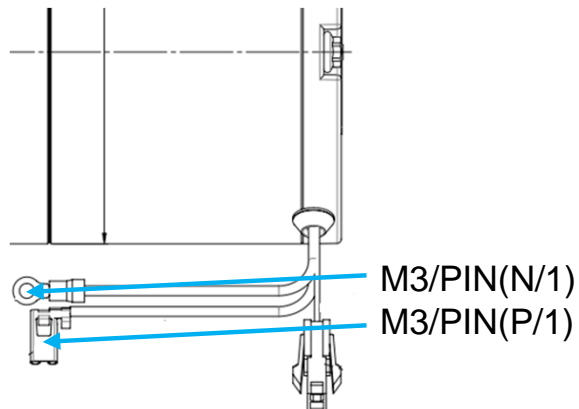
Error 1.2.6.1 - 001

Error description : Blocking protection, brush motor – Over load (Slowfilter), power supply

Error source : Brushes are tight
Maximum continuous current >30A
Defective wiring

Remarks : Overload (output protection 30A) triggered after approx. 3s

Involved components and electric connections : M3/PIN(P/1)
A1/X4 (Power1)



A1

Testing process : Check the combination of brush and floor
Check the current consumption of the brush motor
Check wiring for damage

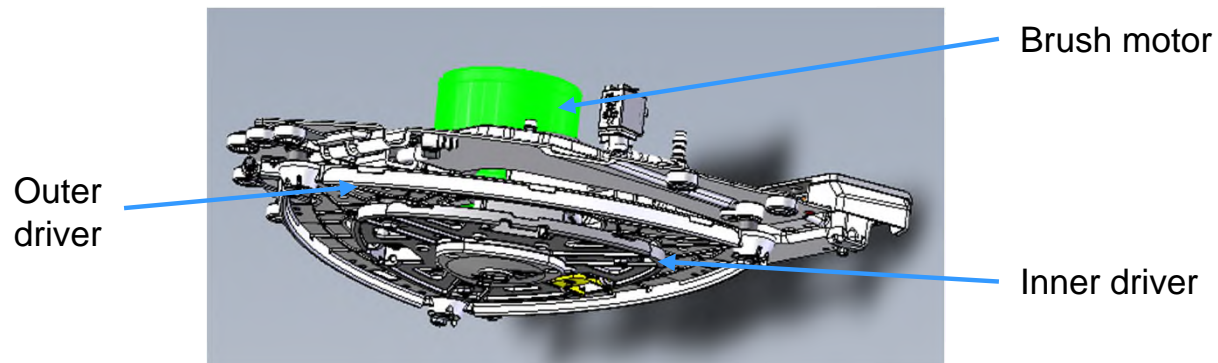
Error 1.2.6.1 - 002

Error description : Blocking protection, brush motor – Over load (Fastfilter), power supply

Error source : Brushes cannot be moved easily by hand

Remarks : /

Involved components and electric connections : /



Testing process : Check brush motor for ease of movement

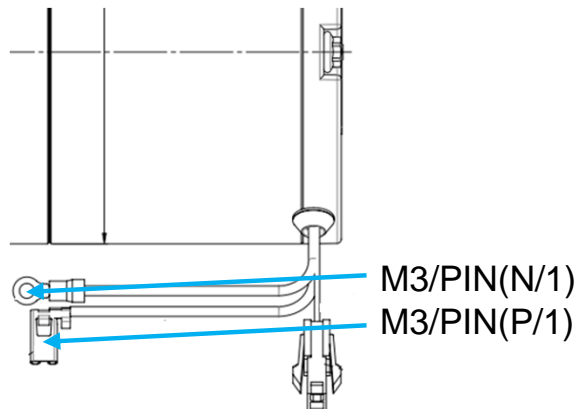
Error 1.2.6.1 - 003

Error description : Blocking protection, brush motor – Short cut, power supply

Error source : Short cut in brush motor

Remarks : Coil resistance < ?ohm or > ?ohm

Involved components and electric connections : Between M3/PIN(P/1) (24V) and M3/PIN(N/1) (ground)



Testing process : Check resistance in brush motor

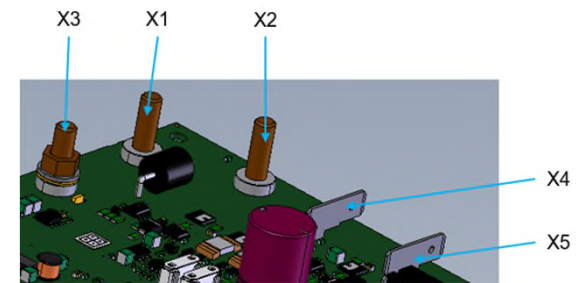
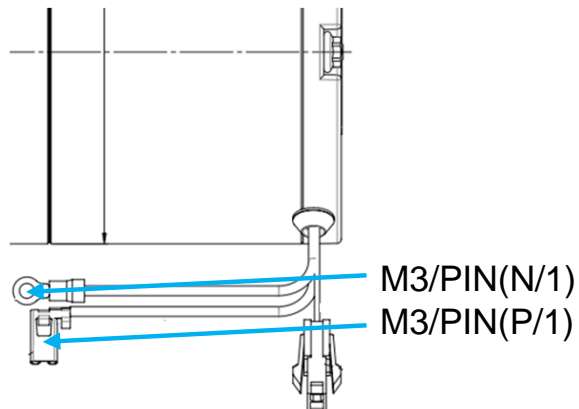
Error 1.2.6.1 - 004

Error description : Blocking protection, brush motor – Over load (continuous), power supply

Error source : Brushes cannot be moved easily by hand
Maximum continuous current >10,5A
Defective wiring

Remarks : Overload (max load consumer) after 1min. If less in between starting from 0 again

Involved components and electric connections : M3/PIN(P/1)
A1/X4 (Power1)



A1

Testing process : Check brush motor for ease of movement
Check the current consumption of the brush motor
Check wiring for damage

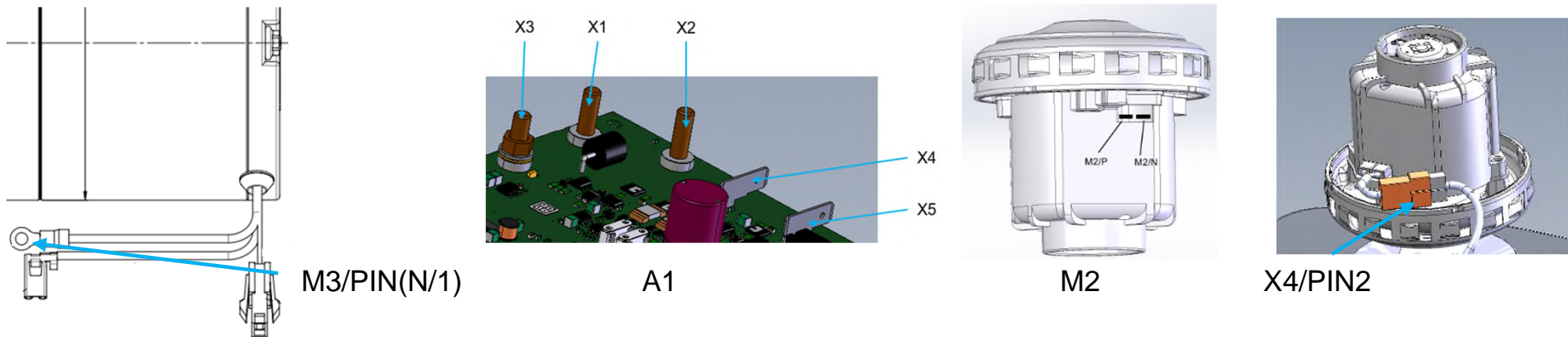
Error 1.2.6.1 - 008

Error description : Blocking protection, brush motor or suction turbine – Open load, ground supply

Error source : Defective wiring

Remarks : /

Involved components and electric connections : M2/PIN(N) or M3/PIN(N/1)
A1/X2 (GND) or X4/PIN2 at W3XS1 to A1/X2 (GND)



Testing process : Check wiring for damage

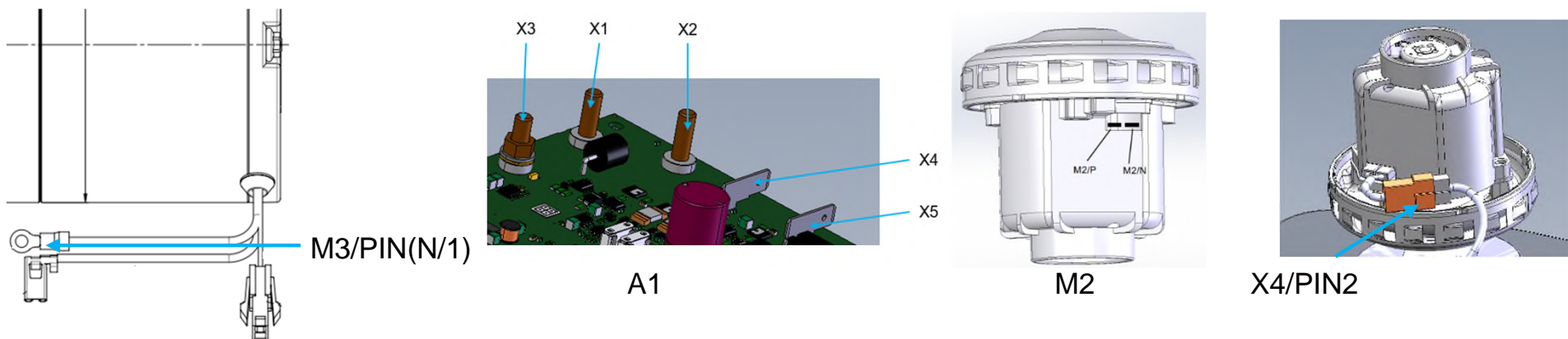
Error 1.2.6.1 - 009

Error description : Blocking protection, brush motor or suction turbine – Over load (Slowfilter), ground supply

Error source : Brushes or suction turbine are tight
Maximum continuous current >30A (brushes) or >15A (suction turbine)
Defective wiring

Remarks : /

Involved components and electric connections : M2/PIN(N) or M3/PIN(N/1)
A1/X2 (GND) or X4/PIN2 at W3XS1 to A1/X2 (GND)



Testing process : Check the combination of brush and floor
Check suction turbine for ease of movement
Check the current consumption of the brush motor or suction motor
Check wiring for damage

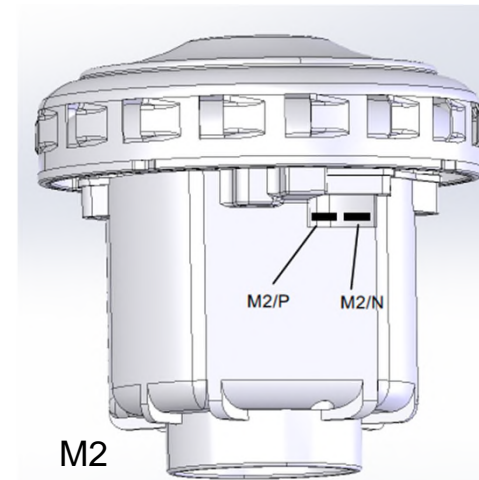
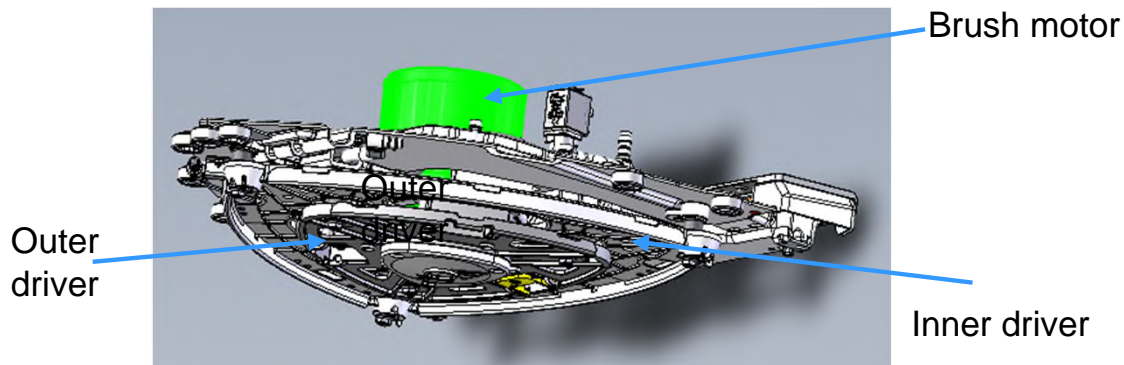
Error 1.2.6.1 - 010

Error description : Blocking protection, brush motor or suction turbine – Over load (Fastfilter), ground supply

Error source : Brushes or suction turbine cannot be moved easily by hand

Remarks : /

Involved components and electric connections : /



Testing process : Check brush motor or suction turbine for ease of movement

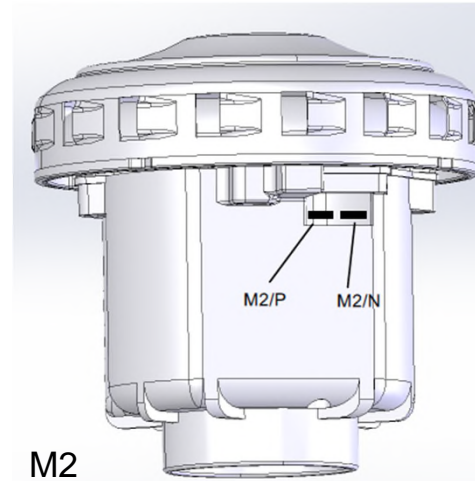
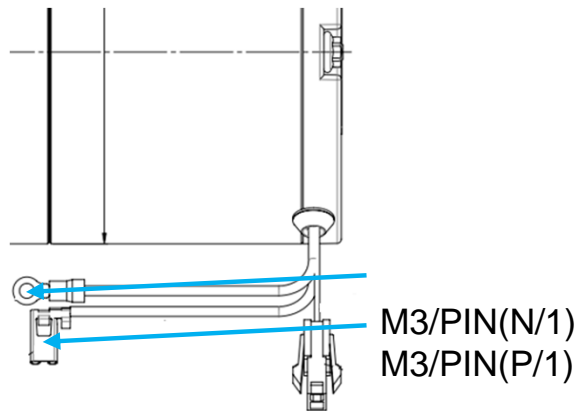
Error 1.2.6.1 - 011

Error description : Blocking protection, brush motor or suction turbine – Short cut, ground supply

Error source : Short cut in brush motor or suction turbine

Remarks : Coil resistance < ?ohm or > ?ohm

Involved components and electric connections : Between M3/PIN(P/1) (24V) and M3/PIN(N/1) (ground) or M2/PIN(P) (24V) and M2/PIN(N) (ground)



Testing process : Check resistance in brush motor or suction turbine

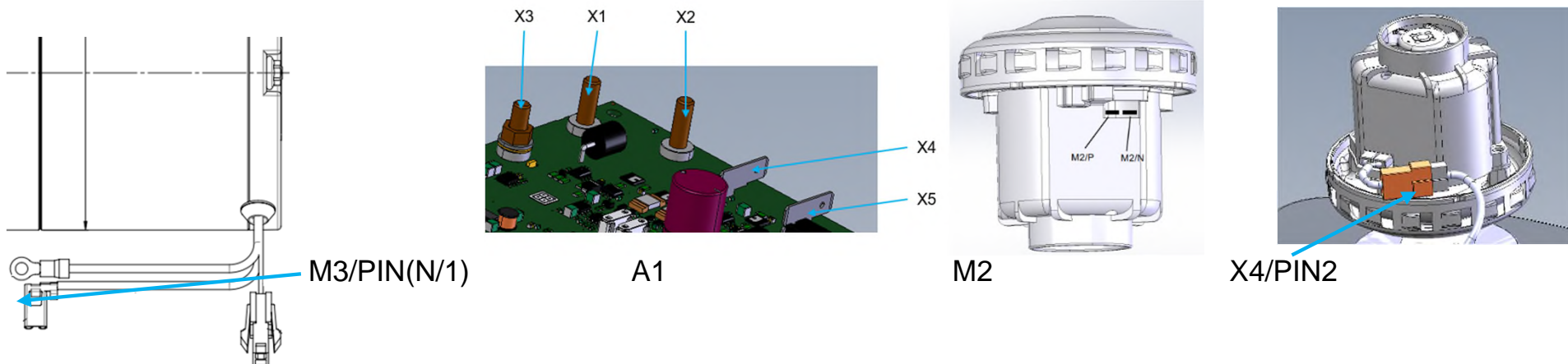
Error 1.2.6.1 - 012

Error description : Blocking protection, brush motor or suction turbine – Over load (continuous), ground supply

Error source : Brushes cannot be moved easily by hand or
Suction turbine cannot be moved easily by hand
Maximum continuous current >10,5A (brushes) or >11A (suction turbine)
Defective wiring

Remarks : Overload (max load consumer) after 1min. If less in between
starting from 0 again

Involved components and electric connections : M2/PIN(N) or M3/PIN(N/1)
A1/X2 (GND) or X4/PIN2 at W3XS1 to A1/X2 (GND)



Testing process : Check brush motor or suction turbine for ease of movement
Check the current consumption of the brush motor or suction turbine
Check wiring for damage

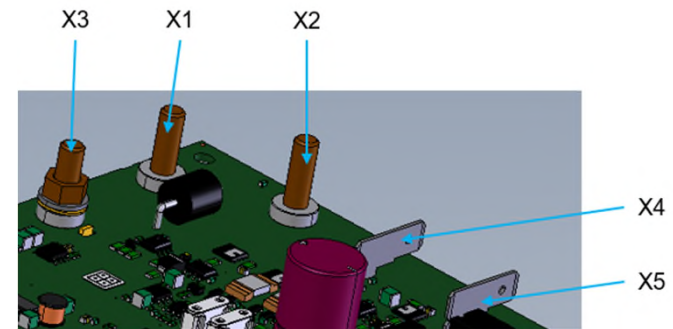
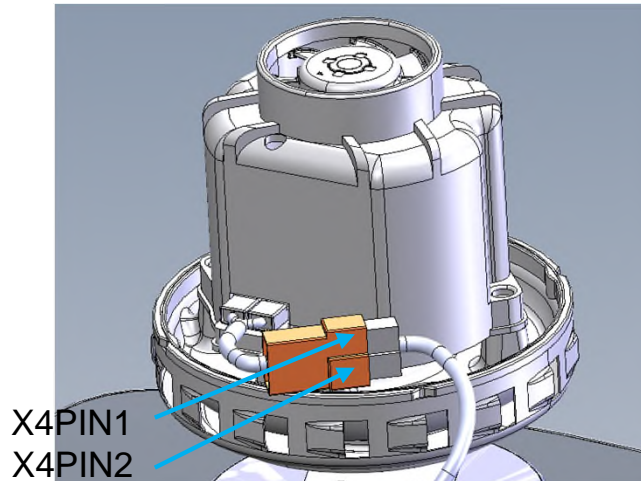
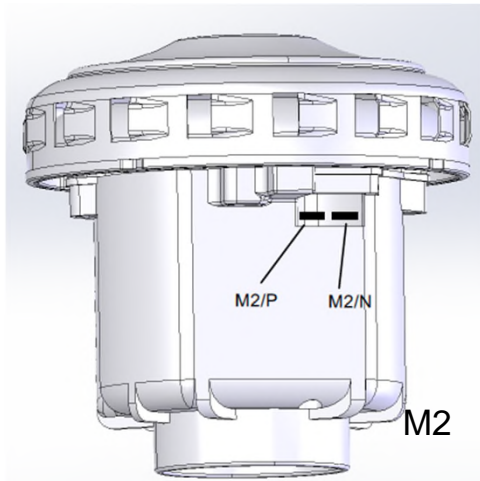
Error 1.4.6.3 - 000

Error description : Blocking protection, suction turbine – Open load, power supply

Error source : Defective wiring

Remarks : /

Involved components and electric connections : M2/PIN(P)
A1/X5 (Power2) via X4PIN1



A1

Testing process : Check wiring for damage

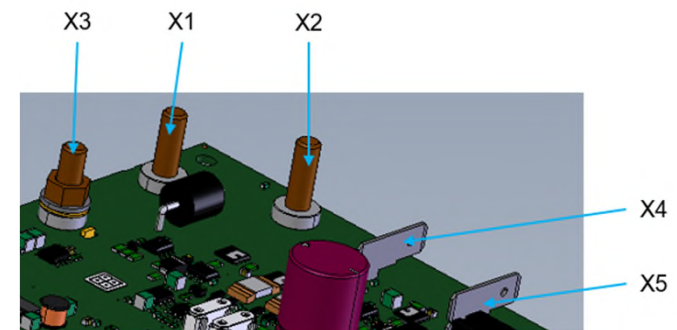
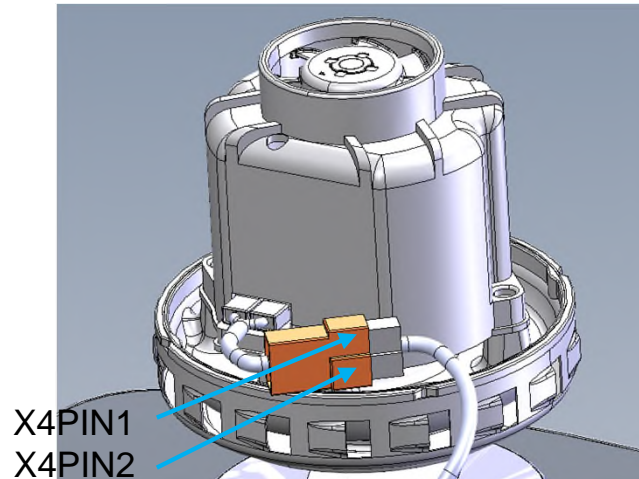
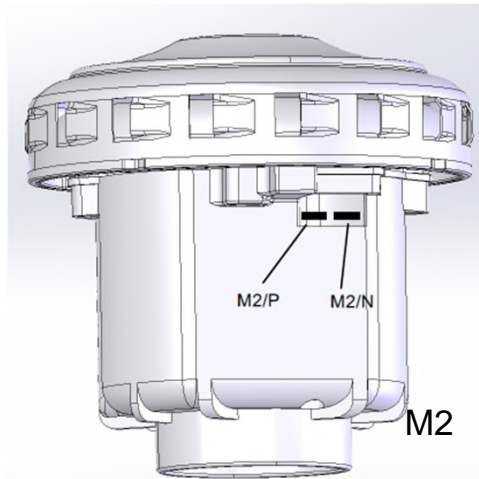
Error 1.4.6.3 - 001

Error description : Blocking protection, suction turbine – Over load (Slowfilter), power supply

Error source : Suction turbine tight
Maximum continuous current >15A
Defective wiring etc.

Remarks : /

Involved components and electric connections : M2/PIN(P)
A1/X5 (Power2) via X4PIN1



A1

Testing process : Check suction turbine for ease of movement
Check the current consumption of the suction turbine
Check wiring for damage

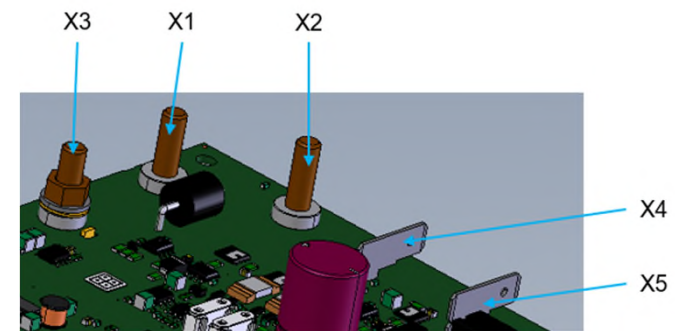
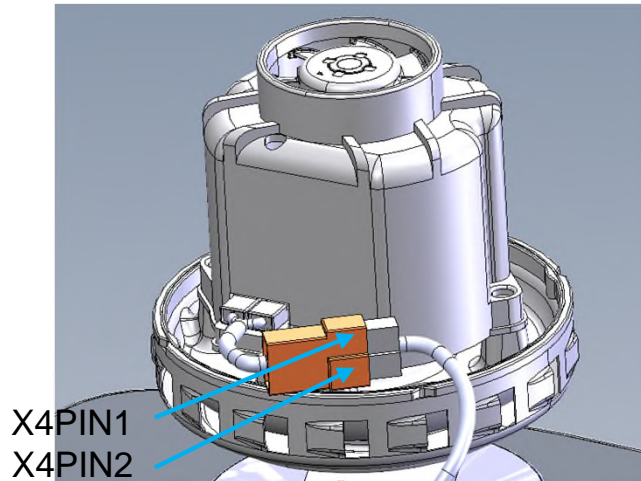
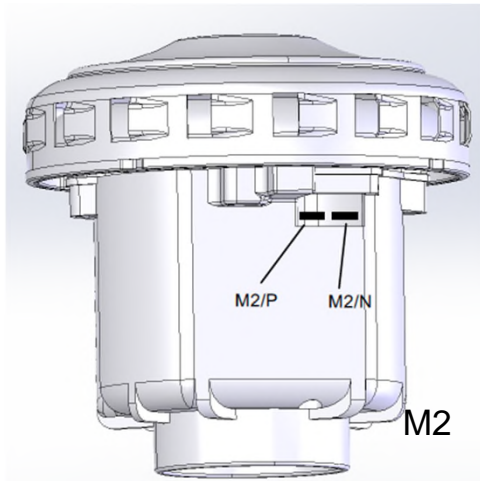
Error 1.4.6.3 - 002

Error description : Blocking protection, suction turbine – Over load (Fastfilter), power supply

Error source : Suction turbine cannot be moved easily by hand

Remarks : /

Involved components and electric connections : /



A1

Testing process : Check suction turbine for ease of movement

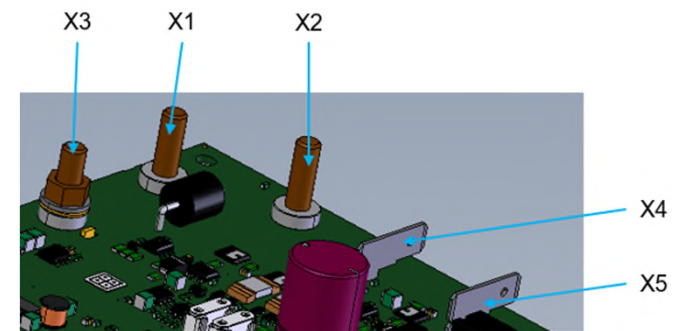
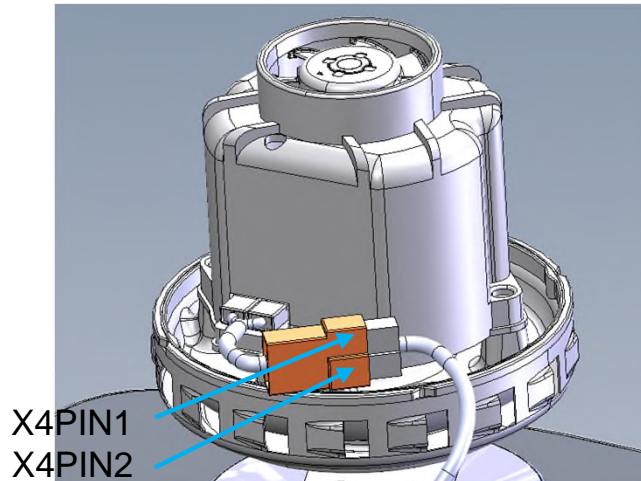
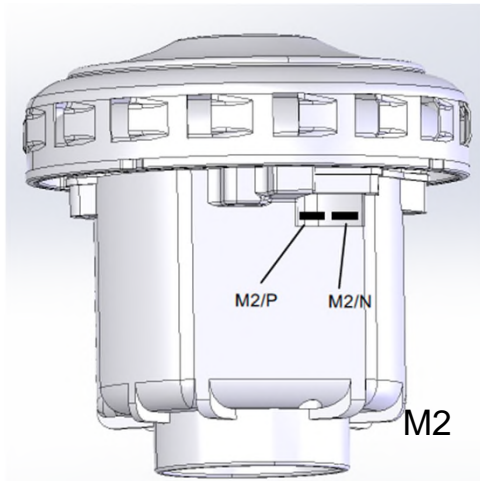
Error 1.4.6.3 - 003

Error description : Blocking protection, suction turbine – Short cut, power supply

Error source : Short cut in suction turbine

Remarks : Coil resistance < ?ohm or > ?ohm

Involved components and electric connections : Between M2/PIN(P) and M2/PIN(N)



A1

Testing process : Check resistance in suction turbine

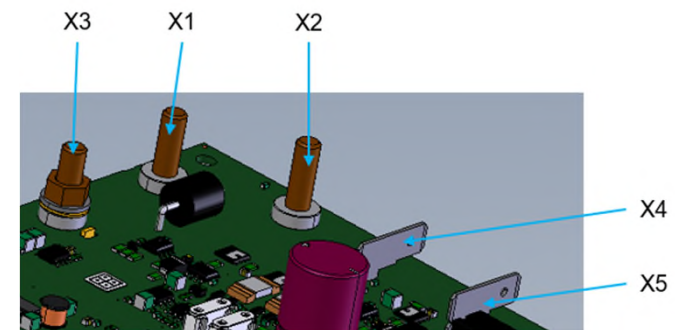
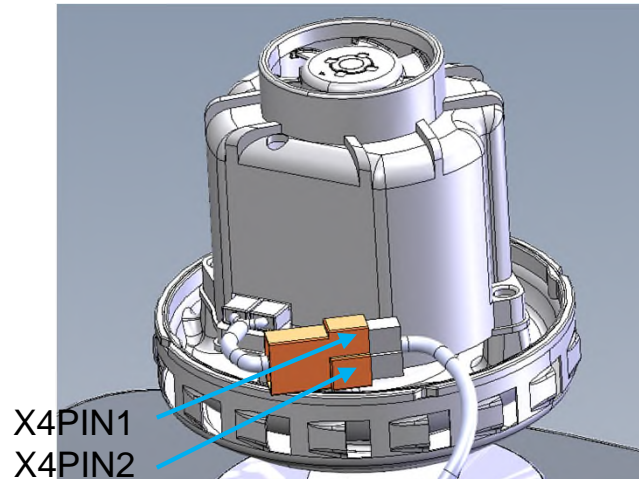
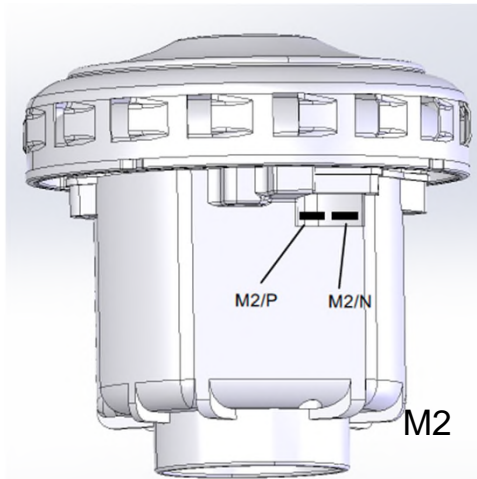
Error 1.4.6.3 - 004

Error description : Blocking protection, suction turbine – Over load (continuous), power supply

Error source : Suction turbine cannot be moved easily by hand
Maximum continuous current >11A
Defective wiring

Remarks : Overload (max load consumer) after 1min. If less in between starting from 0 again

Involved components and electric connections : M2/PIN(P)
A1/X5 (Power2) via X4PIN1



A1

Testing process : Check suction turbine for ease of movement
Check wiring for damage

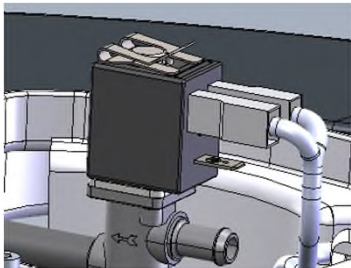
Error 1.5.9.1 - 000

Error description : Blocking protection, water valve – Open load

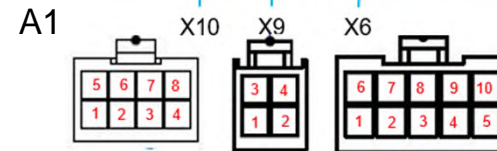
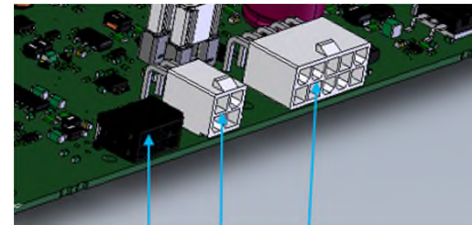
Error source : Defective wiring

Remarks : /

Involved components and electric connections : Y1/PIN(1) (power, interval) and Y1/PIN(2) (ground)
 A1/X9PIN1 (GNDI1) and A1/X9PIN3 (Load1, Interval)



Y1/PIN(1)
Y1/PIN(2)



Testing process : Check wiring for damage

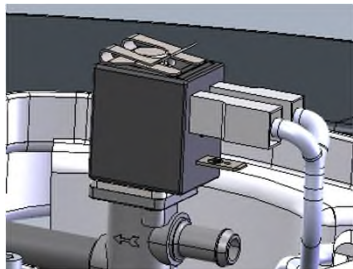
Error 1.5.9.1 - 003

Error description : Blocking protection, water valve – Short cut

Error source : Short cut in valve coil

Remarks : Coil resistance < ?ohm or > ?ohm

Involved components and electric connections : Between Y1/PIN(1) (power, interval) and Y1/PIN(2) (ground)



Y1/PIN(1)
Y1/PIN(2)

Testing process : Check the resistance of the Y1 solenoid valve

Error 3.1.1.2 - 000

Error description : Fleet communication – Fleet not found

Error source : Wrong configuration (Chapter1/Configuration7)

Remarks : Not provided in B5

Involved components and
electric connections : /

Testing process : In chapter 1, check the configuration7 for correct content
(0 = without Fleet or 1= with Fleet)

Error 3.1.1.2 - 001

Error description : Fleet communication – Fleet does not log off when shutting down

Error source : Internal error fleet recorder

Remarks : Not provided in B5

Involved components and
electric connections : /

Testing process : Replace fleetrecorder

Error 3.1.1.2 - 002

Error description : Fleet communication – Fleet communications lost

Error source : Internal error fleet recorder

Remarks : Not provided in B5

Involved components and
electric connections : /

Testing process : Replace fleetrecorder

Error 3.1.1.2 - 003

Error description : Fleet communication – Fleet (network management status) is not correct

Error source : Internal error fleet recorder

Remarks : Not provided in B5

Involved components and
electric connections : /

Testing process : Replace fleetrecorder

Error 3.1.1.2 - 004

Error description : Fleet communication – Fleet (Third Party Dokument 01) Timeout

Error source : Internal error fleet recorder

Remarks : Not provided in B5

Involved components and
electric connections : /

Testing process : Replace fleetrecorder

Error 3.1.1.2 - 005

Error description : Fleet communication – Fleet (Third Party Dokument 04) Timeout

Error source : Internal error fleet recorder

Remarks : Not provided in B5

Involved components and
electric connections : /

Testing process : Replace fleetrecorder

Error 3.1.1.2 - 006

Error description : Fleet communication – Fleet error code received

Error source : Internal error fleet recorder

Remarks : Not provided in B5

Involved components and
electric connections : /

Testing process : Replace fleetrecorder

Error 3.1.1.2 - 007

Error description : Fleet communication – Fleet Event could not be transferred

Error source : Internal error fleet recorder

Remarks : Not provided in B5

Involved components and
electric connections : /

Testing process : Replace fleetrecorder

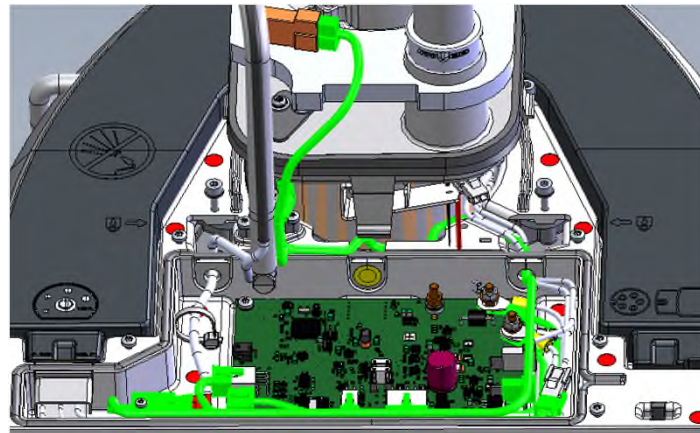
Error 3.1.4.7 - 000

Error description : Main contactor – Open load

Error source : Defective wiring

Remarks : In B5 no main contactor; Output is switching input Fleet (A20)

Involved components and electric connections : A1/X6PIN7 (OUT_PWR) to A20/PIN2 (IGN)



Testing process : Check wire 20 in harness W3

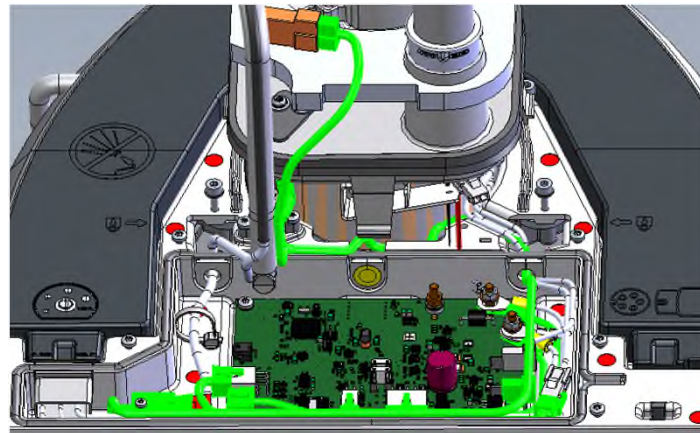
Error 3.1.4.7 - 003

Error description : Main contactor – Short cut

Error source : Short cut output main contactor

Remarks : In B5 no main contactor; Output is switching input Fleet (A20)

Involved components and electric connections : Between A1/X6PIN7 (OUT_PWR) and A20/PIN2 (IGN)



Testing process : Check wire 20 in wire harness W3 for resistance

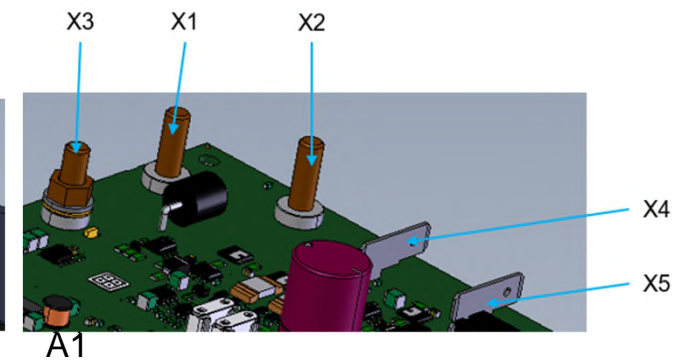
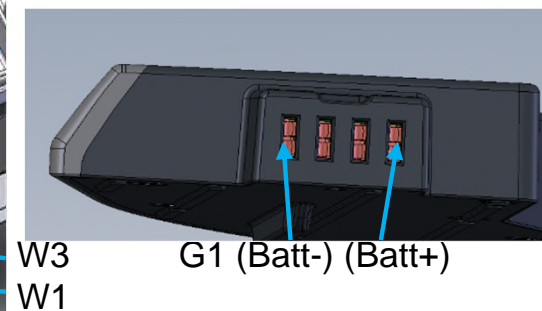
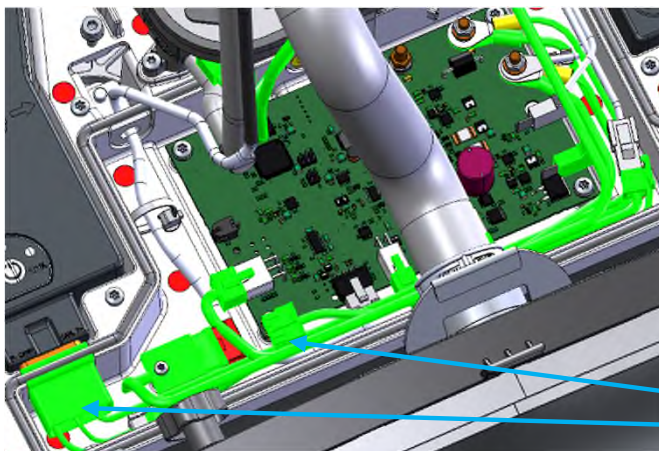
Error 3.1.6.E - 000

Error description : Power stage – No voltage at power stage

Error source : Spannung < 18V (auch kurzzeitig für $t < 0,1\text{sec}$) an A1/X1

Remarks : Voltage < 18V (also briefly for $t < 0.1\text{sec}$) at A1/X1
Voltage at A1/X1 must be identical to battery voltage

Involved components and electric connections : G1 (24V) and (ground)
G1 (Batt+) via W1 (B+) to A1/X1 (Batt+) and G1 (Batt-) via W1 (B-) to A1/X2 (GND)



Testing process : Compare voltage at G1 (Batt+) and A1/X1
No voltage between G1 (Batt-) and A1/X2

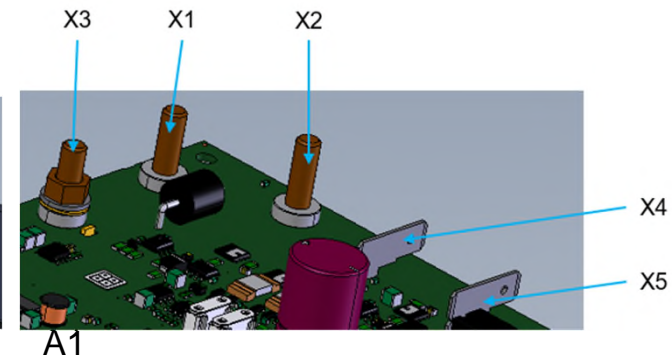
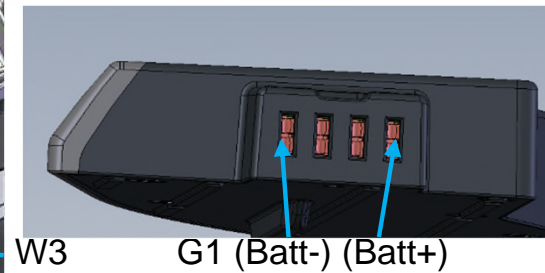
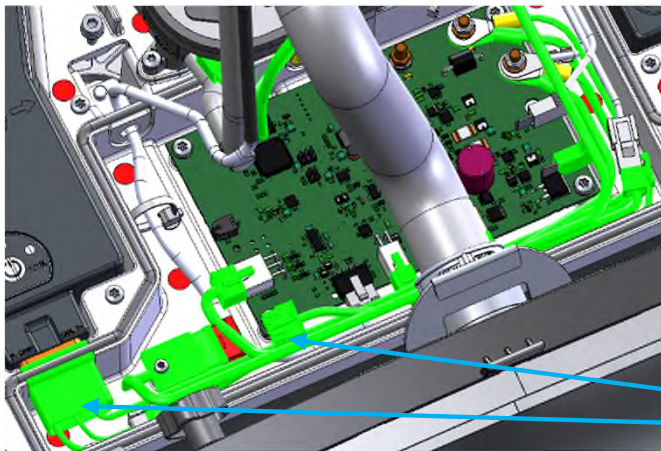
Error 3.1.6.E – 001

Error description : Power stage – Voltage at power stage

Error source : Voltage < 18V (also briefly for $t < 0.1\text{sec}$) at fuse A1/F201

Remarks : Voltage < 18V (also briefly for $t < 0.1\text{sec}$) at A1/X1
Voltage at A1/X1 must be identical to battery voltage

Involved components and electric connections : G1 (24V) and (ground)
G1 (Batt+) via W1 (B+) to A1/X1 (Batt+) and G1 (Batt-) via W1 (B-) to A1/X2 (GND)



Testing process : Fuse A1/F201 defective

Error 3.3.1.1 - 000

Error description : Service timer – expired

Error source : Maintenance overdue

Remarks : The message is displayed after the "last error" display and before the operating hours counter (duration 5s) or when the working unit is ON

Involved components and electric connections : A1



Testing process : Perform maintenance, then reset service interval

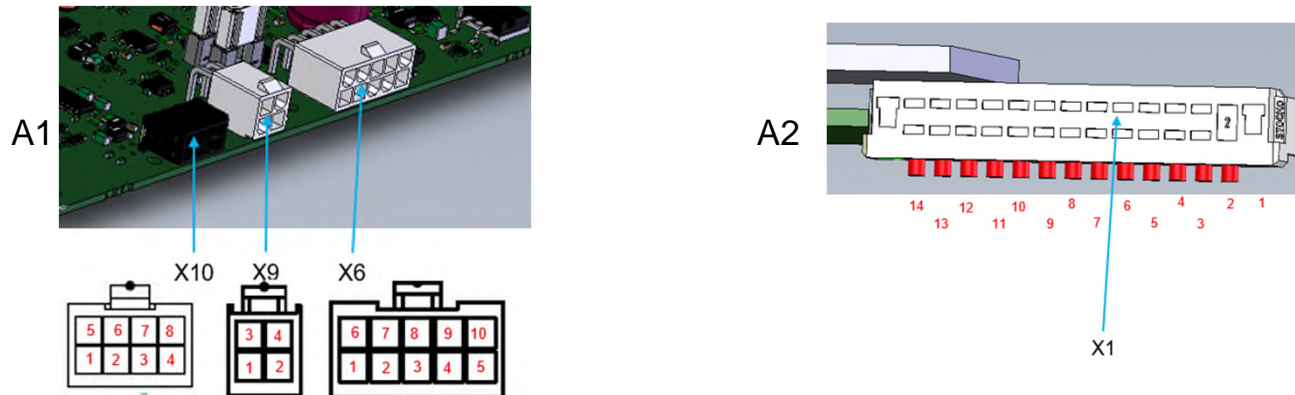
Error 4.5.2.5 - 000

Error description : Control panel communication – Control panel not found

Error source : No voltage or ground on control panel
Control panel defective

Remarks : /

Involved components and electric connections : A1/X10PIN1 (Batt+ OUT) to A2/X1PIN14 (+24V IN)
A1/X10PIN2 (D-GND) to A2/X1PIN13 (GND Batt)
A1/X10PIN4 (TX) to A2/X1PIN8 (RX)
A1/X10PIN6 (RX) to A2/X1PIN7(TX)



Testing process : Check control panel (A2)
Check power supply control panel (A2)

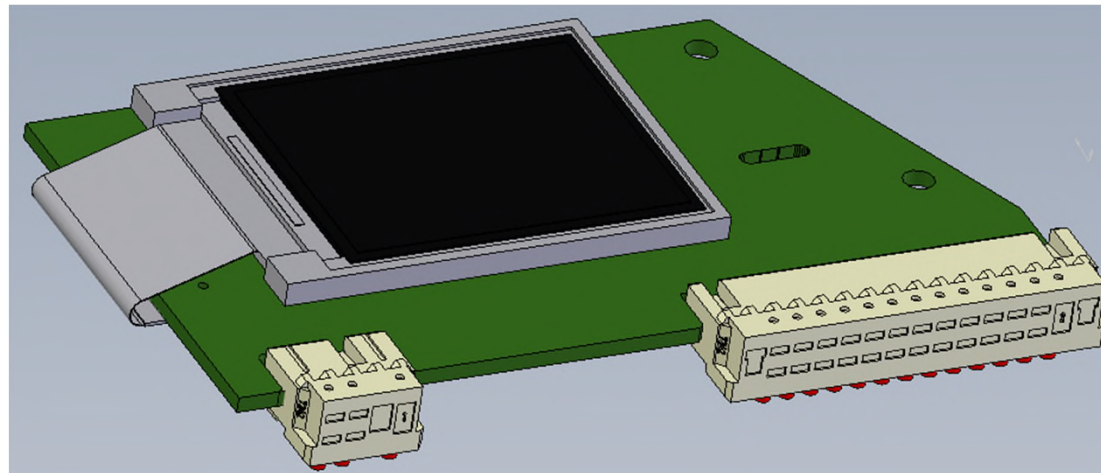
Error 4.5.2.5 - 001

Error description : Control panel communication – Control panel does not log off when shutting down

Error source : Internal control panel error

Remarks : /

Involved components and electric connections : A2



Testing process : Replace control panel

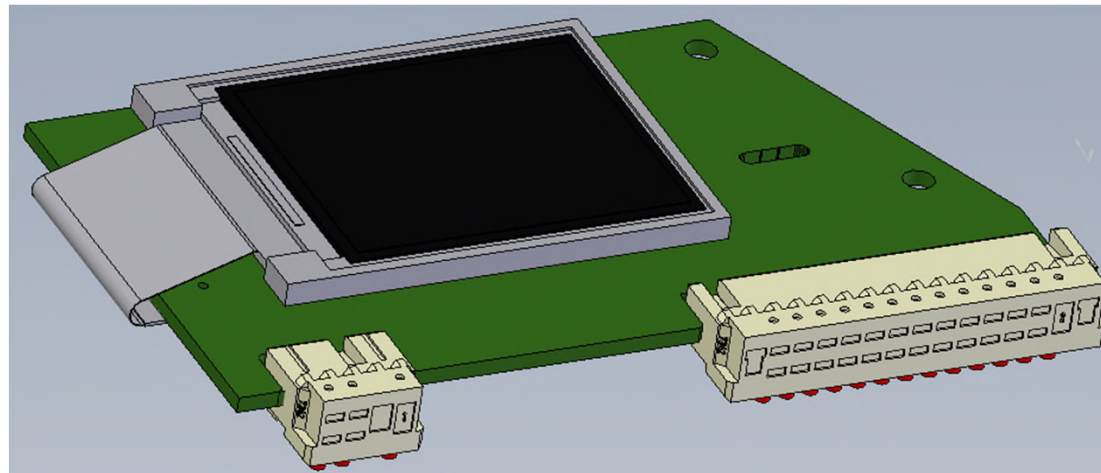
Error 4.5.2.5 - 002

Error description : Control panel communication – Control panel object could not be transferred

Error source : Internal control panel error

Remarks : /

Involved components and electric connections : A2



Testing process : Replace control panel

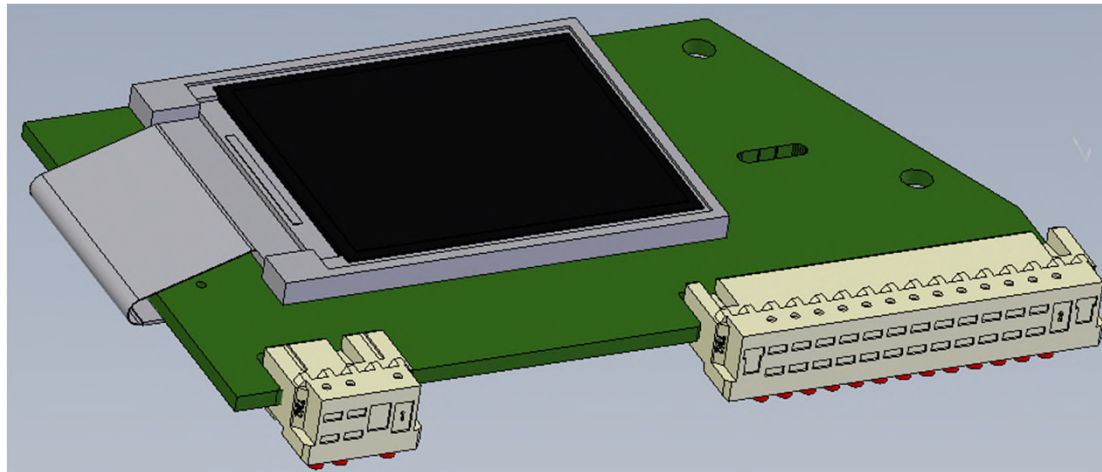
Error 4.5.2.5 - 003

Error description : Control panel communication – Control panel error code received

Error source : Internal control panel error

Remarks : /

Involved components and electric connections : A2



Testing process : Replace control panel

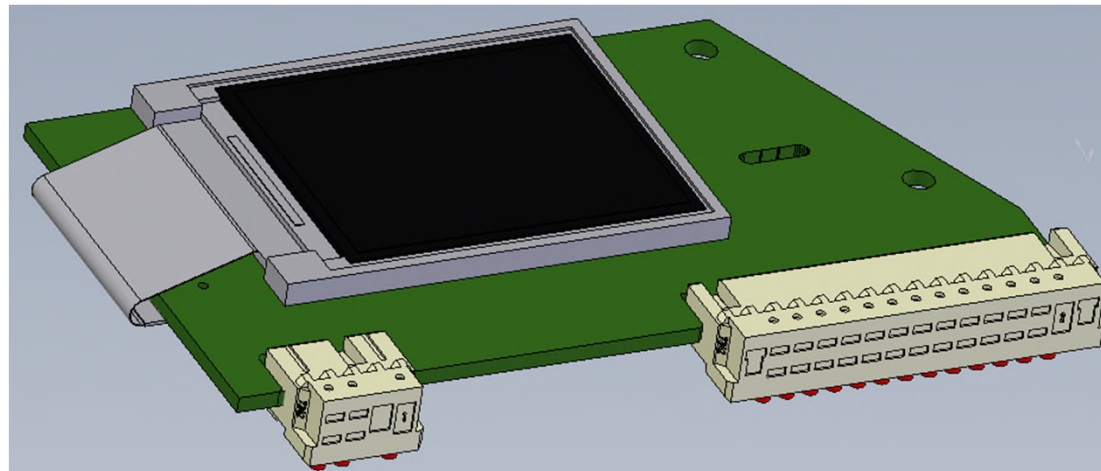
Error 4.5.2.5 - 004

Error description : Control panel communication – Control panel error code received

Error source : Internal control panel error

Remarks : /

Involved components and electric connections : A2



Testing process : Replace control panel

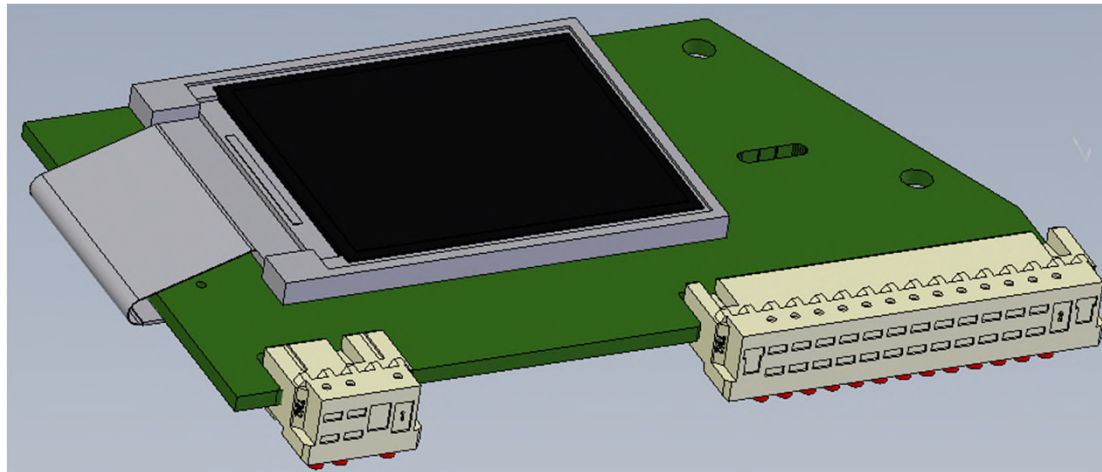
Error 4.5.2.5 - 005

Error description : Control panel communication – Control panel no keyboard found

Error source : Internal control panel error
Conductors keyboard - control (control panel) defective

Remarks : /

Involved components and electric connections : A2



Testing process : Replace control panel

Fehler 4.5.2.5 - 006

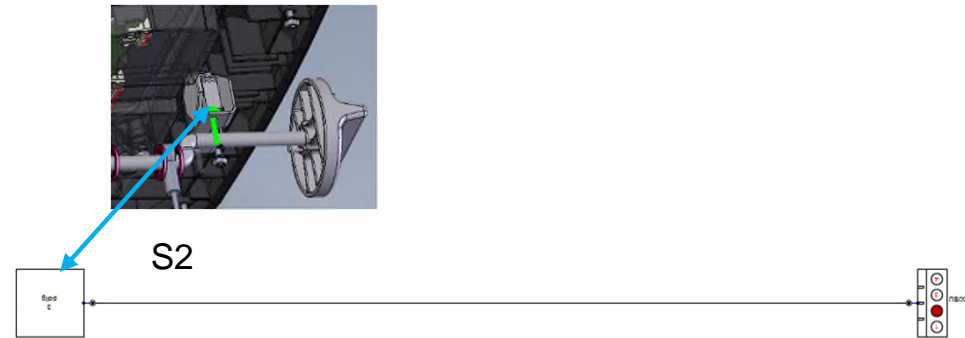
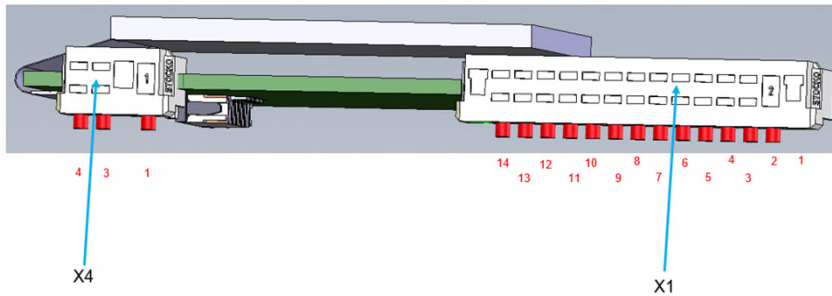
Error description : Control panel communication – Control panel bail switch has the same levels

Error source : Enabling switch S2 or wiring defective
Internal control panel error

Remarks : /

Involved components and electric connections

: A2 und S2
A2/X4PIN4 (DIG GND) to S2/PIN1 and S2/PIN2 ton A2/X4PIN3 (DIG IN2)
or S2/PIN4 to A2/X4PIN1 (DIG IN1)A2



Testing process : Check switch S2
Check wiring S2
Replace control panel

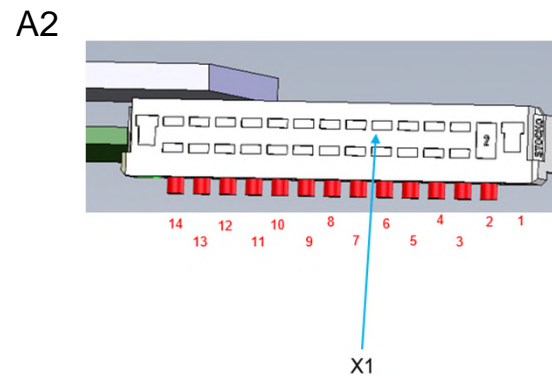
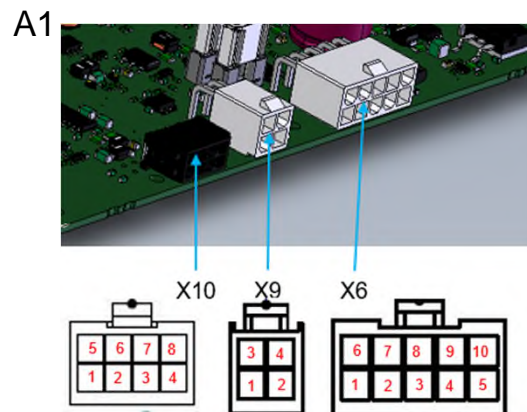
Error 4.5.3.5 - 000

Error description : Control panel communication – Control panel no machine control found

Error source : No communication between control board and control panel

Remarks : /

Involved components and electric connections : A1/X10PIN4 (TX) to A2/X1PIN8 (RX)
A1/X10PIN6 (RX) to A2/X1PIN7(TX)



Testing process : Check connection cable control unit (A1) - control panel (A2)
Check power supply control panel (A1)
“Water drops” on CAN driver (A1) can also lead to this error

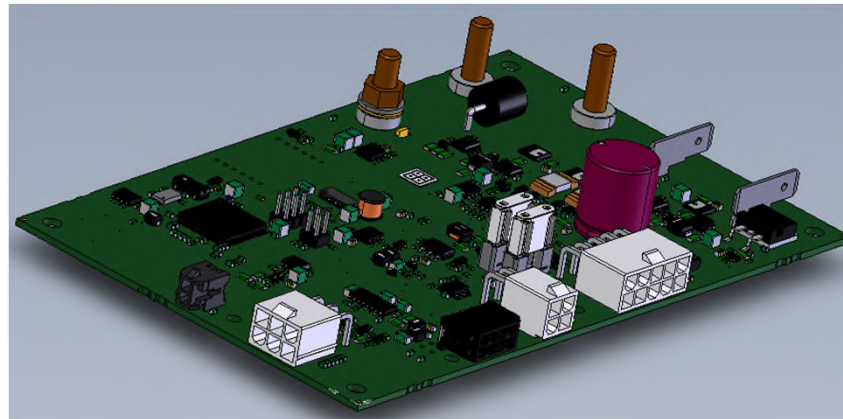
Error 4.6.1.2 - 000

Error description : Memory – Memory no valid memory data found

Error source : Memory access (A1) no function

Remarks : /

Involved components and electric connections : A1



Testing process : Switch the machine OFF and ON several times
If the error persists => replace A1

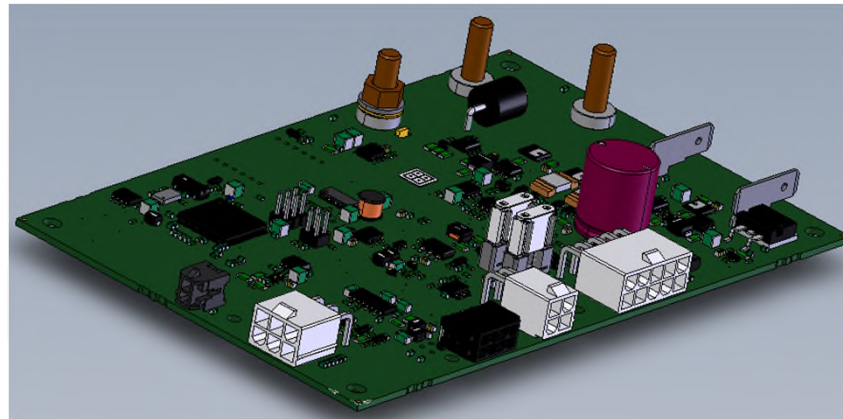
Error 4.6.1.4 - 000

Error description : Master data– Master data control board not available

Error source : Data from memory (A1) not readable

Remarks : /

Involved components and electric connections : A1



Testing process : Switch the machine OFF and ON several times
If the error persists => replace A1

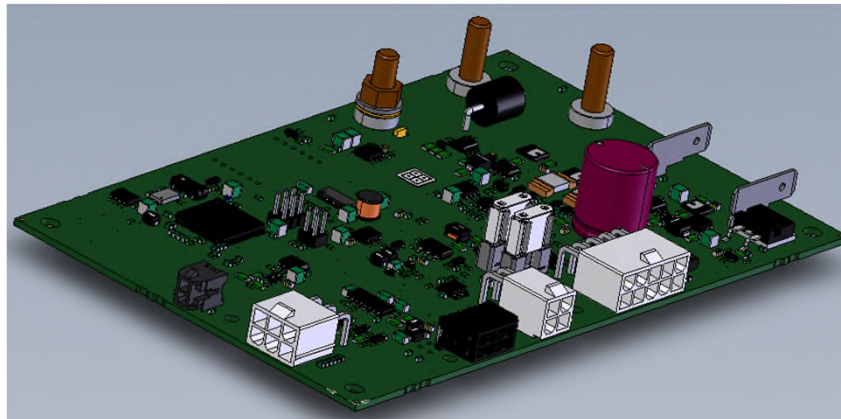
Error 4.6.1.5 - 000

Error description : Master data – Master data calibration not available

Error source : Calibration values on A1 not readable

Remarks : /

Involved components and electric connections : A1



Testing process : Switch the machine OFF and ON several times
If the error persists => replace A1

Error 5.9.3.1 - 000

Error description : BMS communication – BMS not found

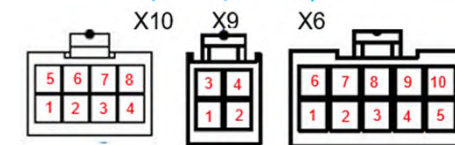
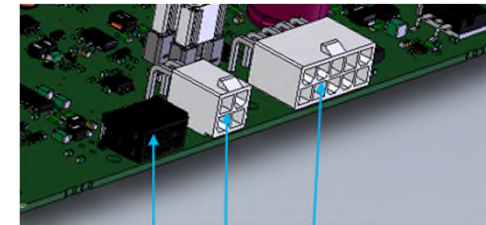
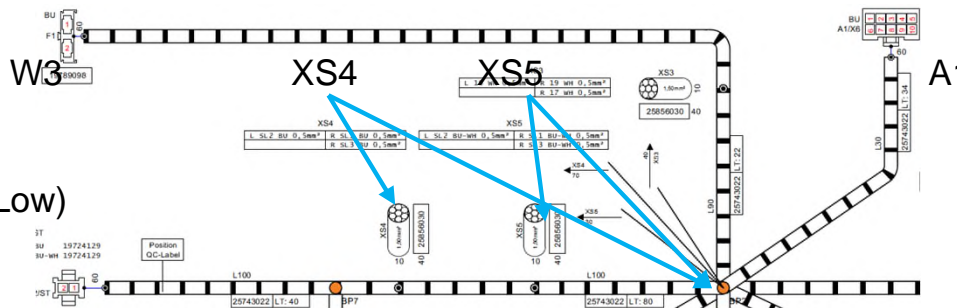
Error source : Defective connector and/or wiring
BMS defective

Remarks : Communication between the machine control A1 and the battery management system (G1) disrupted (CAN bus)

Involved components and electric connections : A1/X6PIN4 (CAN_H) via W3/XS4 and X1/PIN1 (W1) to G1/C-H and A1/X6PIN9 (CAN_L) via W3/XS5 and X1/PIN2 (W1) to G1/C-L
G1 (CAN_High) and (CAN_Low)



G1(CAN_High CAN_Low)



Testing process : Check plug connections (G1/X2/A1X6) and/or check wiring W1 and W3 (incl. splice XS4+5) if o.k. replace BMS

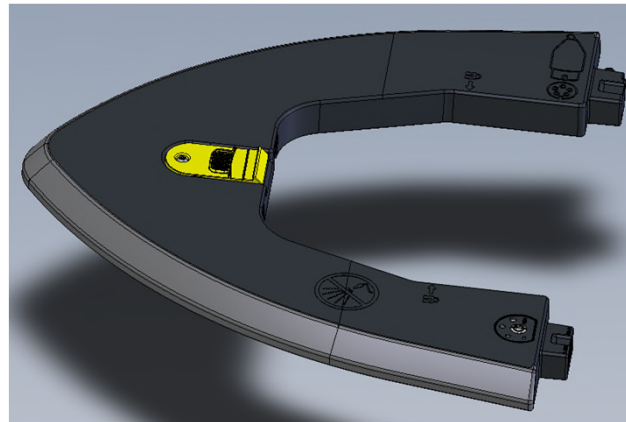
Error 5.9.3.1 - 001

Error description : BMS communication – BMS does not log off when shutting down

Error source : Internal Error BMS

Remarks : /

Involved components and electric connections : G1



Testing process : Replace battery

Error 5.9.3.1 - 002

Error description : BMS communication – BMS communication lost

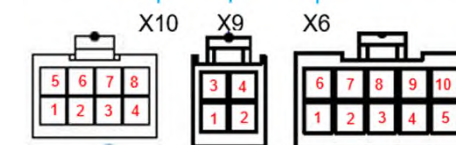
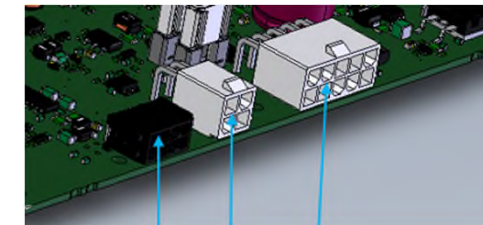
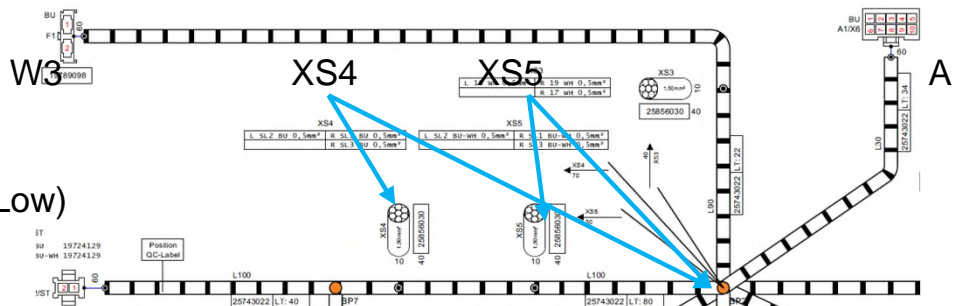
Error source : Defective connector and/or wiring
CAN-Bus defective
BMS defective

Remarks : Communication between the machine control A1 and the battery management system (G1) disrupted (CAN bus)

Involved components and electric connections : G1 (Batt+) via W1 (B+) to A1/X1 (Batt+) and G1 (Batt-) via W1 (B-) to A1/X2 (GND) as well as A1/X6PIN4 (CAN_H) via W3/XS4 and X2/PIN1 (W1) to G1/C-H and A1/X6PIN9 (CAN_L) via W3/XS5 and X2/PIN2 (W1) to G1/C-L



G1(CAN_High CAN_Low)



Testing process : Check plug connections (G1/X2/A1X6) and/or check wiring W1 and W3 (incl. splice XS4+5) if o.k. replace BMS, possibly replace control board A1

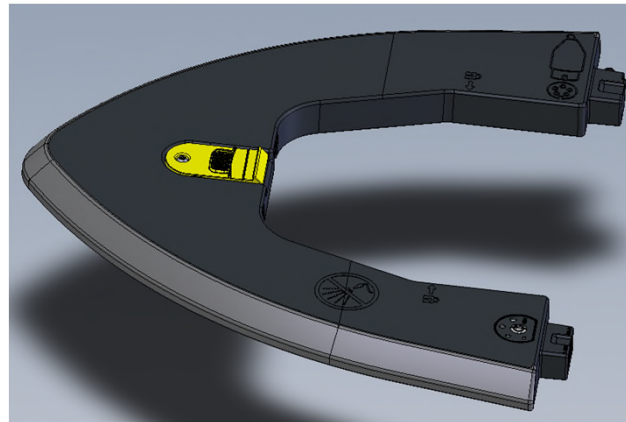
Error 5.9.3.1 - 003

Error description : BMS communication – BMS (status network management) is not correct

Error source : Internal Error BMS (NMT = netzwerk management Object)

Remarks : /

Involved components and electric connections : G1



Testing process : Replace battery

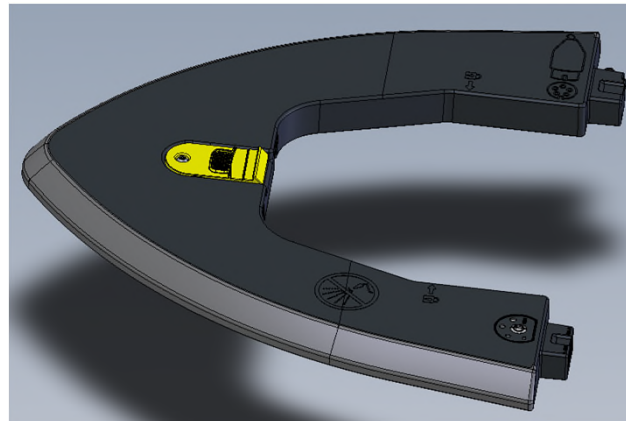
Error 5.9.3.1 - 004

Error description : BMS communication – BMS (Third Party Document 01) Timeout

Error source : Internal Error BMS (TPD = Third Party Data)

Remarks : /

Involved components and electric connections : G1



Testing process : Replace battery

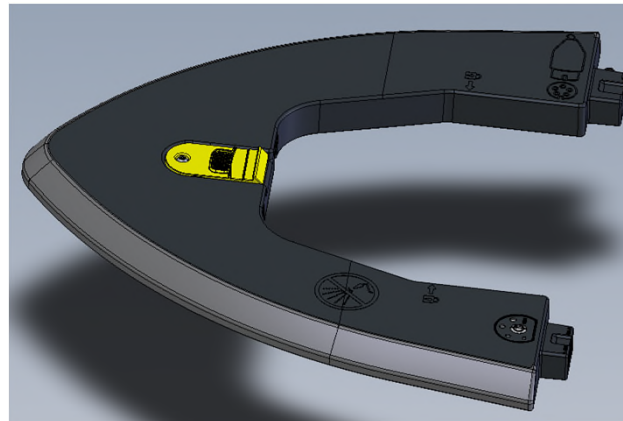
Error 5.9.3.1 - 005

Error description : BMS communication – BMS (Third Party Document 02) Timeout

Error source : Internal Error BMS (TPD = Third Party Data)

Remarks : /

Involved components and electric connections : G1



Testing process : Replace battery

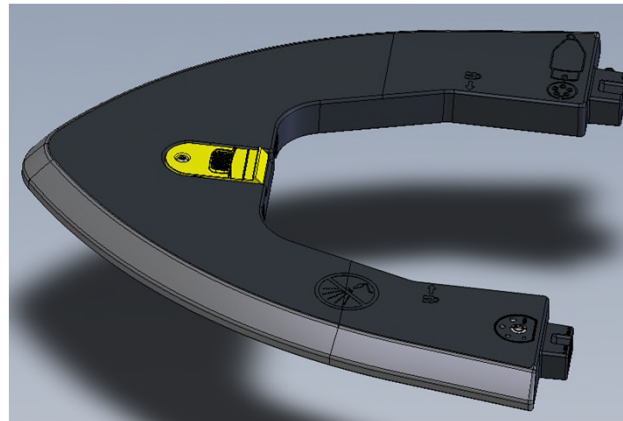
Error 5.9.3.1 - 006

Error description : BMS communication – BMS (Third Party Document 01) data wrong

Error source : Internal Error BMS (TPD = Third Party Data)

Remarks : /

Involved components and electric connections : G1



Testing process : Replace battery

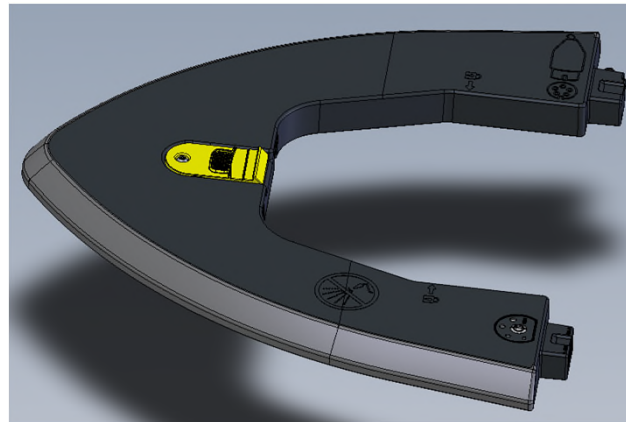
Error 5.9.3.1 - 007

Error description : BMS communication – BMS (Third Party Document 02) data wrong

Error source : Internal Error BMS (TPD = Third Party Data)

Remarks : /

Involved components and electric connections : G1



Testing process : Replace battery

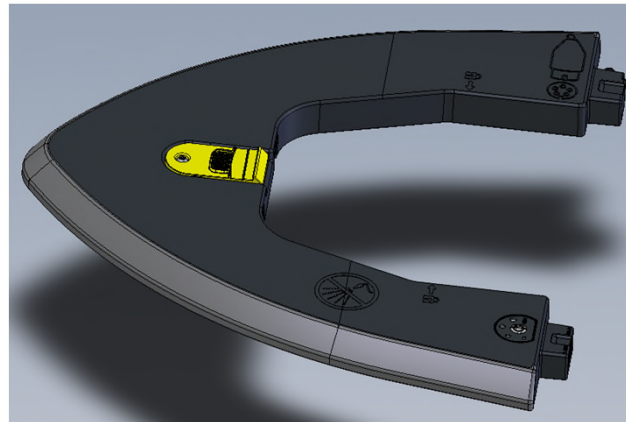
Error 5.9.7.1 - 000

Error description : BMS – BMS warning over voltage

Error source : Charge voltage > 29,75V

Remarks : /

Involved components and electric connections : G1



Testing process : Wrong charger?

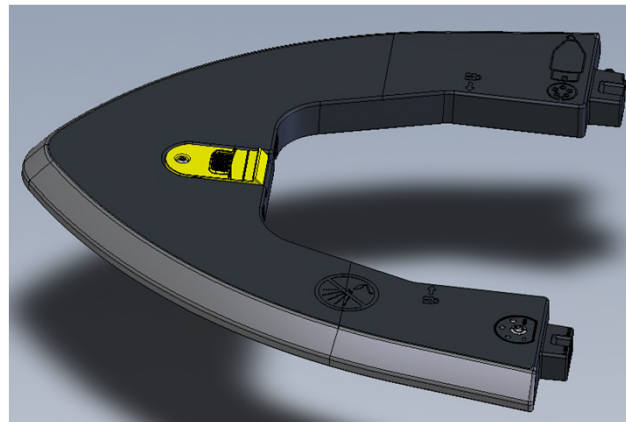
Error 5.9.7.1 - 001

Error description : BMS – BMS warning low voltage

Error source : Discharge voltage < 19,6V

Remarks : /

Involved components and electric connections : G1



Testing process : High contact resistance

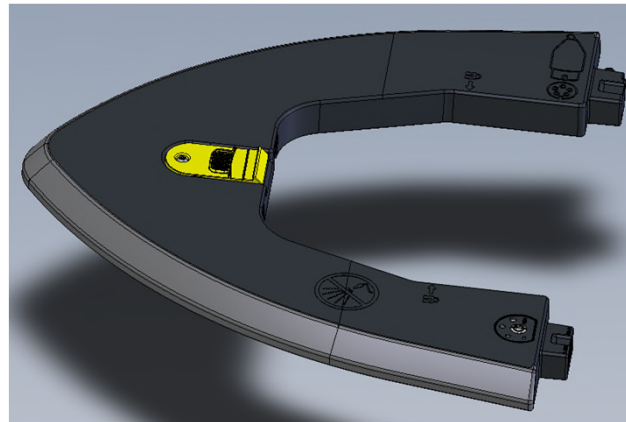
Error 5.9.7.1 - 002

Error description : BMS – BMS warning battery temperature too high

Error source : Battery temperature > 55°C

Remarks : /

Involved components and electric connections : G1



Testing process : Let cool down

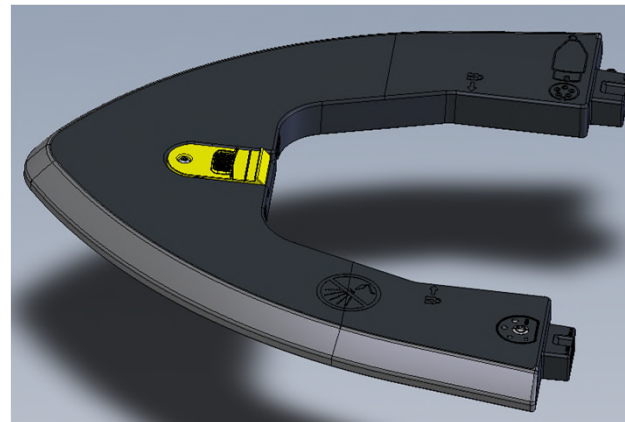
Error 5.9.7.1 - 003

Error description : BMS – BMS warning battery temperature too low

Error source : Battery temperature < 0°C

Remarks : /

Involved components and electric connections : G1



Testing process : Let it warm up

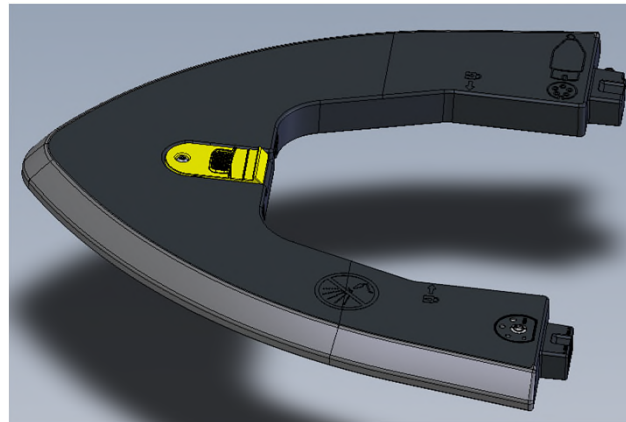
Error 5.9.7.1 - 004

Error description : BMS – BMS warning MosFet temperature too high

Error source : BMS temperature > 55°C

Remarks : /

Involved components and electric connections : G1



Testing process : Let cool down

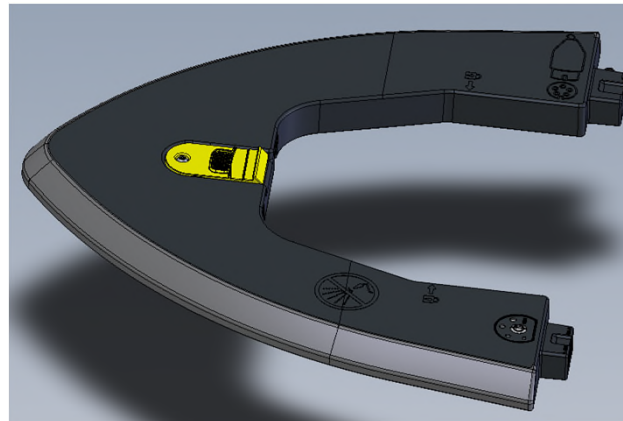
Error 5.9.7.1 - 005

Error description : BMS – BMS warning unequal cell voltage levels

Error source : Difference between the 7S4P (28) cells > ? V ?

Remarks : /

Involved components and electric connections : G1



Testing process : Repeat charging process

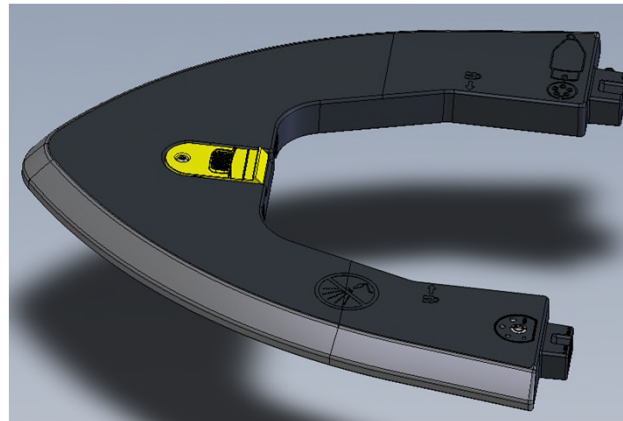
Error 5.9.7.1 - 006

Error description : BMS – BMS warning temperature of cells unequal

Error source : Difference between the 7S4P (28) cells > ?°C

Remarks : /

Involved components and electric connections : G1



Testing process : Defective cell; observe

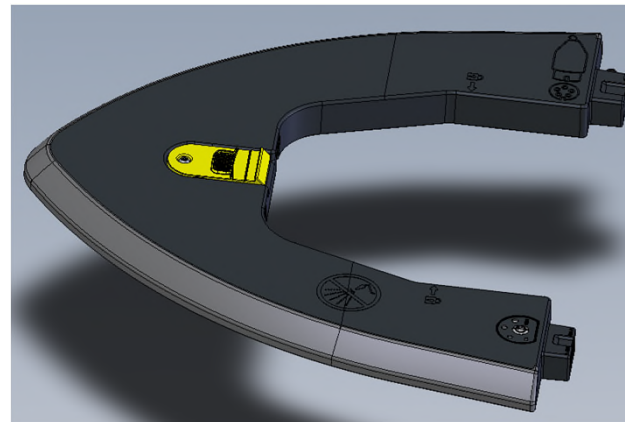
Error 5.9.7.1 - 007

Error description : BMS – BMS warning low battery

Error source : SOC <?%

Remarks : /

Involved components and electric connections : G1



Testing process : Charge battery

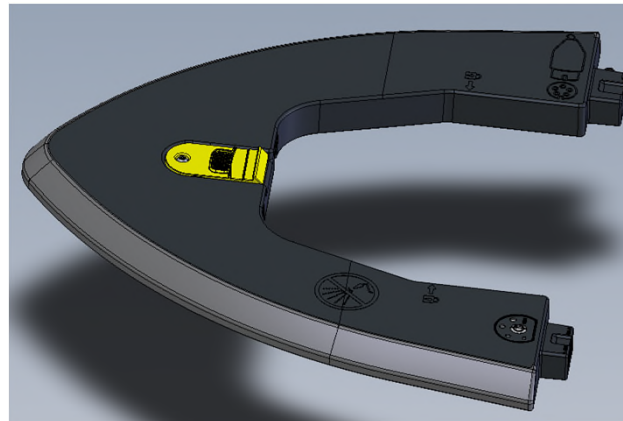
Error 5.9.7.2 - 000

Error description : BMS – BMS error over voltage

Error source : Charge voltage > 30,45V

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Wrong charger?

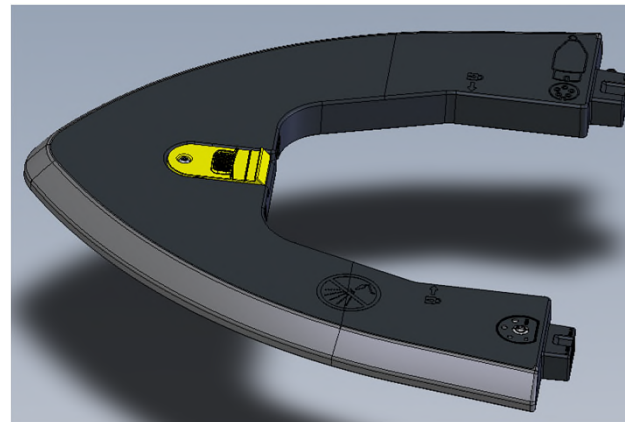
Error 5.9.7.2 - 001

Error description : BMS – BMS error low voltage

Error source : Discharge voltage < 17,5V

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : High contact resistance

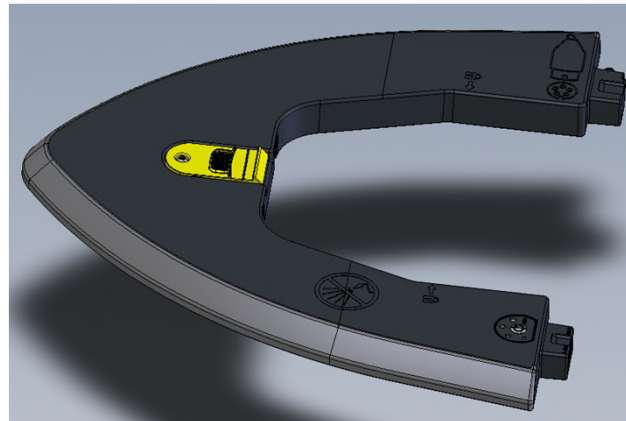
Error 5.9.7.2 - 002

Error description : BMS – BMS error battery temperature too high

Error source : Battery temperature > 80°C

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Let cool down

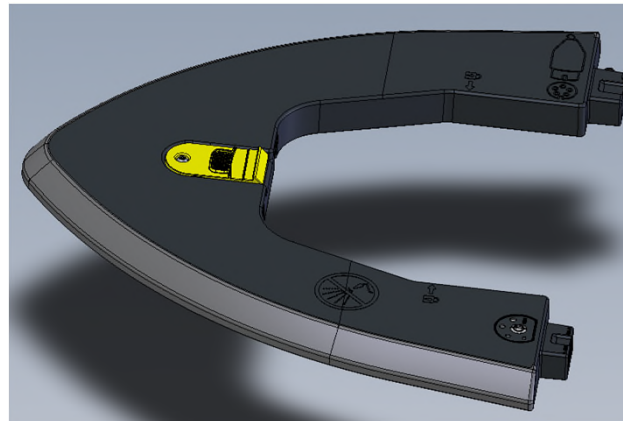
Error 5.9.7.2 - 003

Error description : BMS – BMS error battery temperature too low

Error source : Battery temperature < -15°C

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Let it warm up

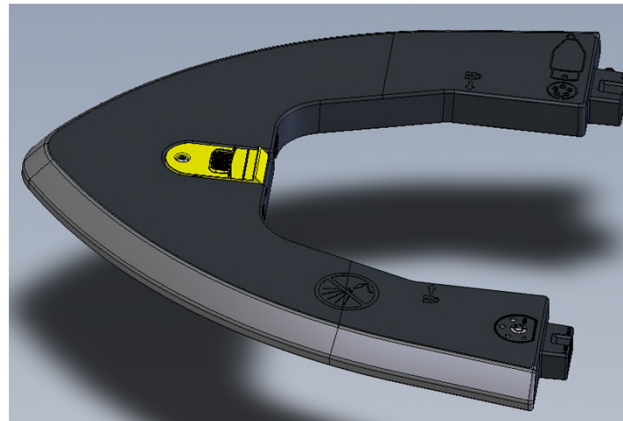
Error 5.9.7.2 - 004

Error description : BMS – BMS error MosFet temperature too high

Error source : BMS temperature > 80°C

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Let cool down

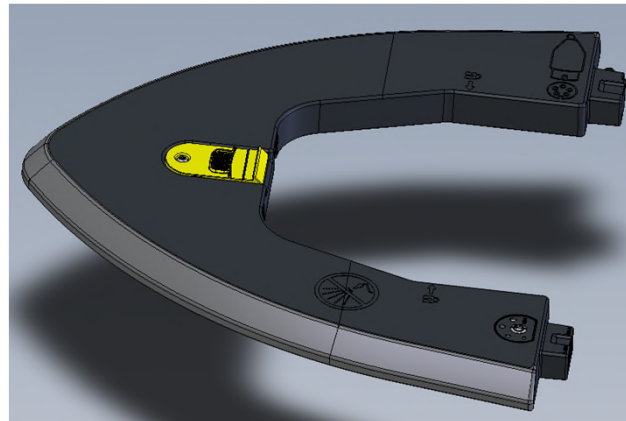
Error 5.9.7.2 - 005

Error description : BMS – BMS error unequal cell voltage levels

Error source : Difference between the 7S4P (28) cells > ?V

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Defective cell; Replace battery

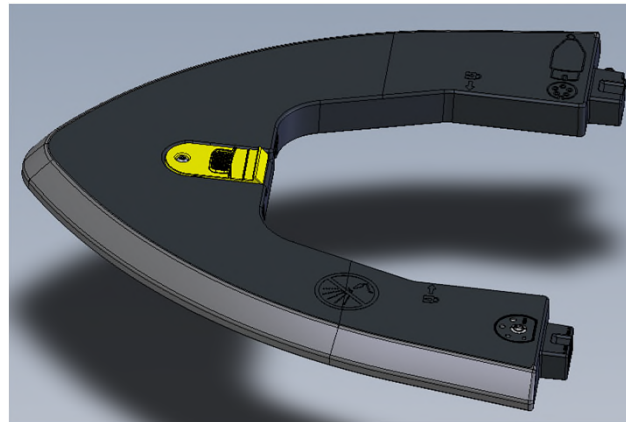
Error 5.9.7.2 - 006

Error description : BMS – BMS error temperature of cells unequal

Error source : Difference between the 7S4P (28) cells > ?°C

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Defective cell; Replace battery

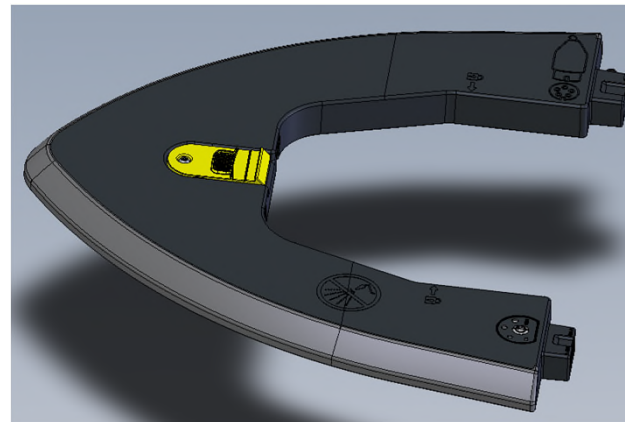
Error 5.9.7.2 - 007

Error description : BMS – BMS error low battery

Error source : SOC <?%

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Charge battery

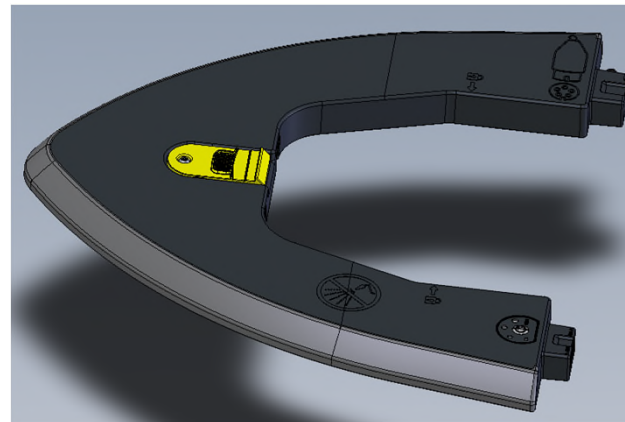
Error 5.9.7.2 - 008

Error description : BMS – BMS error Überstrom

Error source : Discharge current > 40A od. 60A?

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Check the power consumption of the consumers

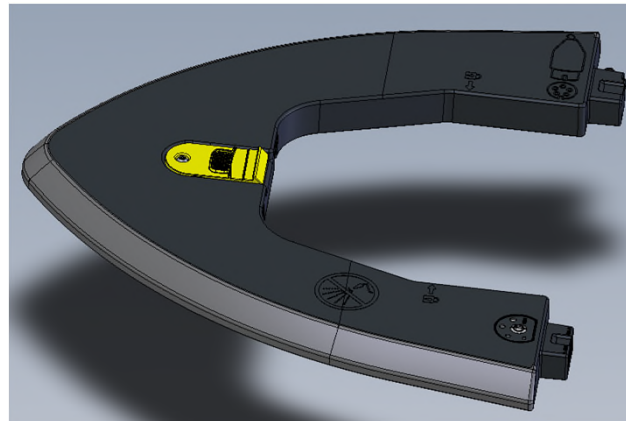
Error 5.9.7.2 - 009

Error description : BMS – BMS error short cut

Error source : Short cut between the 7S4P (28) cells

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Replace battery

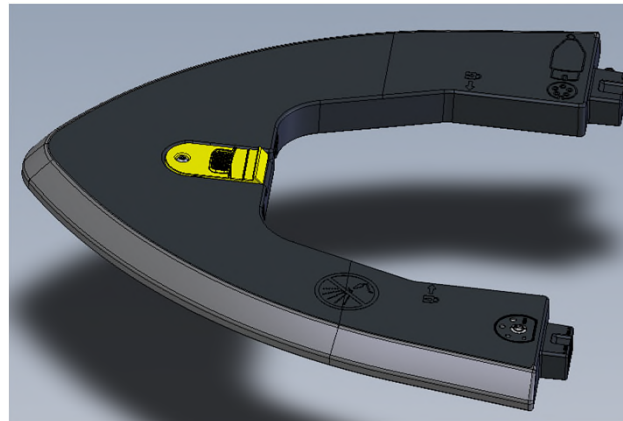
Error 5.9.7.2 - 010

Error description : BMS – BMS error MosFet defective

Error source : /

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Replace battery

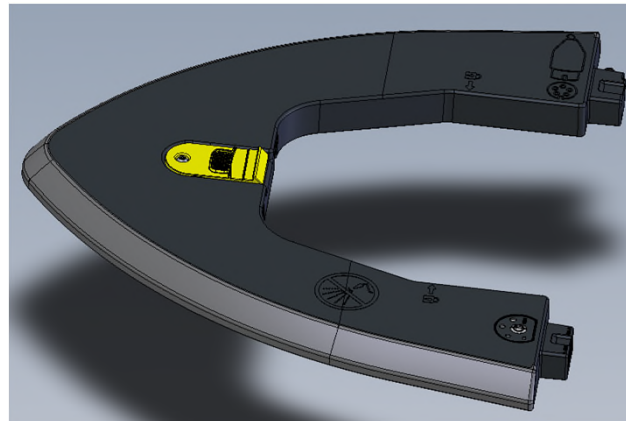
Error 5.9.7.2 - 011

Error description : BMS – BMS error NTC (resistance) no function

Error source : /

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Replace battery

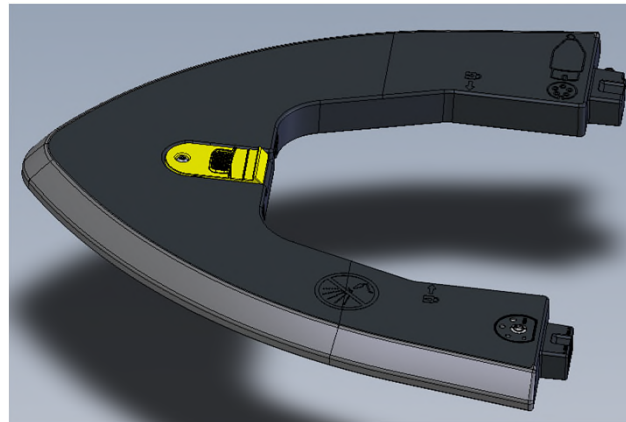
Error 5.9.7.2 - 012

Error description : BMS – BMS error NTC (resistance) short cut

Error source : /

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : Replace battery

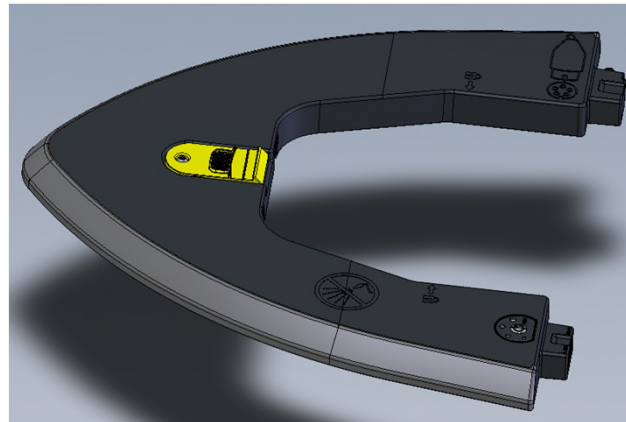
Error 5.9.7.2 - 015

Error description : BMS – BMS unknown error

Error source : ?

Remarks : Battery is switched off

Involved components and electric connections : G1



Testing process : ?