

Error	Description	Component	Display text	Cause / Action	Effect
1	Low voltage during system start	F, H, L, F-AC, H-AC	Low voltage ELECTRICAL SYSTEM	Check battery voltage, charge battery; Check wire connection to controller; check main current fuse; check main contactor; replace control part; Replace component; (Limit $V_N = 80V$: $V_{Batt} < 64V$ or $V_{Cap.} < 56V$ Limit $V_N = 48V$: $V_{Batt} < 34V$ or $V_{Cap.} < 34V$ Limit $V_N = 24V$: $V_{Batt} < 17V$)	Travel is inhibited. Reduced power for travel and lifting. Warning symbol flashing (Else-Check).
2	Overvoltage	F, H, L, F-AC, H-AC	Overvoltage BATTERY CONTROLLER	Check battery voltage; replace controller part; replace component; (Limit $V_N = 80V$: $V_{Batt} > 92V$ Limit $V_N = 48V$: $V_{Batt} > 62V$ Limit $V_N = 24V$: $V_{Batt} > 28V$)	No travel or hydraulic functions Warning symbol flashing (Else-Check).
3	Temperature limit for controllers > 80°C (>70°C MP1510C) or ACS only: Info at > 85°C Err at > 115°C Err at < -20°C	F, H, L, F-AC, H-AC	TEMPERATURE CONTROLLER	Check sensor and wire connections Allow controllers to cool down; check fan operation, improve cooling. Warm up the controller and operate at reduced level until the controller has warmed up.	Reduced power for travel and lifting. Warning symbol flashing (Else-Check).
4	Emergency Disconnect applied during travel	F	POWER SUPPLY	Warning ($V < 20V$ MP1510C)	Brake applies, travel inhibited

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5	Overvoltage	F, F-AC, H-AC	ELECTRICAL SYSTEM	Check wire connection to battery, check Battery, replace controller part; Replace component; (Limit for Retrak: $V_{Batt} > 62\text{ V}$ Limit for MP1510C: $V > 32\text{ V}$)	Brake applies, travel inhibited
6	Wire breakage: - Travel setpoint device	C, I2, I3, I4, I5, Travel switch	TRAVEL SWITCH	Check wire connection; Replace travel setpoint device; Replace Canion/ Interface;	Travel stop. "Warning" symbol flashes (Else-Check). Hydraulic functions possible
7	Key switch applied during travel	F, F-AC, H-AC	KEY SWITCH	Warning ($V < 13\text{ V}$ for 200ms MP1510C)	Brake applies, travel inhibited
8	2 travel directions applied simultaneously	F-AC, H-AC, C, MP, S, I2, I3, I5, FS	ELECTRICAL SYSTEM	Warning, replace travel direction switch, replace Interface 7 Canion; replace Multipilot / Solopilot For twin pedal, check the electrical system.	Travel stop. "Warning" symbol flashing (Else-Check). Hydraulic functions possible
9	Operator protection switch faulty	I2, FS	ELECTRICAL SYSTEM	Check switch, check wire connections	
10	$V_{Cap.} <> V_{Batt}$; (main contactor jammed or not open)	F, H, F-AC, H-AC L	MAIN CONTACTOR	Check main contactor, check wire connection; check output pin 2 (ACS) of traction controller; replace component	No travel, hydraulics Warning symbol Flashing warning (Else-Check).
11	Offset error armature / field current (DC) Stator current (AC); Current measurement point	F, H, L, F-AC, H-AC	CONTROLLER	Check main current wire, replace component	Travel no function
12	Disable driver field rheostat faulty for DC Disable driver power stage faulty (for AC)	F, H F-AC, H-AC L	CONTROLLER	Replace component; for AC: Check flat belt wire connection; replace power part	No travel, hydraulics Warning symbol Flashing warning (Else-Check).

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13	Disable Watchdog field faulty	F, H	CONTROLLER	Replace components	Travel no function
14	- Main contactor not closed - Field power stage cannot be switched on (DC)	F, H, F-AC, H-AC	CONTROLLER/ MAIN CONTACTOR	Check wire connection; check main contactor; check charging connection, Check field supply fuse, Replace component.	No travel, hydraulics Warning symbol Flashing warning (Else-Check).
15	Disable field faulty; Illegal address (for AC)	F, H, F-AC, H-AC L	CONTROLLER	Replace controlpart; replace component	Travel no function
16	Disable driver armature actuator faulty; Software reset (for AC)	F, H, F-AC, H-AC	CONTROLLER	Replace controlpart (AC); replace component	Travel no function
17	Disable Watchdog armature faulty	F, H	CONTROLLER	Replace components	Travel no function
18	DC: Armature power stage cannot be switched on AC: one of the 3 phases cannot be switched on	F, H, F-AC, H-AC L	CONTROLLER	Check armature wire connection; replace power part; replace component	Travel no function

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19	<p>Disable armature faulty; Power stage short circuit (for AC) The error may be triggered by the faulty speed sensor in connection with AS4814Plus controllers. Sensor wheel wobbles (elliptical) or the sensor-sensor wheel gap is too big. In this case the component is not faulty. A short circuit cannot be resolved by switching the truck off/on.</p>	F, H, F-AC ,H-AC, L-AC	CONTROLLER	<p>Replace power part; Replace component. Can occur in connection with error 70, in this case: check power supply behind the main contactor contact, in the event of an error the voltage will be much lower here than the rated operating voltage. Disconnect the positive supply from the components to target the error cause. The exception here is the F1 traction controller which must remain connected. One component overloads the testing voltage due to internal short circuit. The testing voltage arises by charging the internal capacitor batteries via a resistor to the level of the control voltage supply.</p> <p>Check sensor, replace sensor and / or sensor wheel.</p>	Travel no function
20	Armature incorrectly connected	F, H	ELECTRICAL SYSTEM	Check armature main current wire connection	Travel no function
21	Armature overvoltage (short circuit / high side faulty)	F, H, F-AC, H-AC L	CONTROLLER/ ELECTR	<p>Check main current wire to armature; check settings(for AC); $A_{\text{Armature}} > 360\text{A}$ for 250ms (MP1510); Replace component.</p>	

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22	Watchdog error; Watchdog does not run out	F, H, L, M, S, A, I2, I3, I4, C, F-AC, H-AC, FS	CONTROLLER/ CANION	Truck reset, Replace controlpart; replace component	No travel, hydraulics Warning symbol Flashing warning (Else-Check).
23	- Computer overload - Permanent interrupt - "ACS" timeout on CAN connection	F, H, L, M, S, A, I2, I3, I4, C, F-AC, H-AC, FS	CONTROLLER / CAN	Check CAN bus connection; Check CANION connector and component; Replace component	No travel, hydraulics Warning symbol Flashing warning (Else-Check).
24	EEPROM cannot be contacted / parameters not plausible / parameter set to default Faulty checksum	F, H, L, I2, I3, I4, C, F-AC, H-AC MFC brake MFC hydr. , travel switch	CONTROLLER/ CANION	Check battery cable; check V_{Batt} ; set trucktype, set default parameters; replace control part; replace component Delete logbook, change parameters, set hourmeter, replace component	Flashing warning symbol (Else-Check).
25	No telegrams: - no logon from interface - no telegrams from Can-Bus travel switch	F, H, I4, I8 F-AC, H-AC L	INTERFACE / CAN	Check CANBus connection, check wire connection between proportional valve – modulation; check fuse 1F8; replace iInterface (I2, I4, I8) ; replace lift potentiometer, Multipilot, Solopilot or interface; <u>MP1510C</u> : Voltage collapses, controller logs on again, interface does not, controller remains blocked and waits for interface. Check battery voltage (with load!); charge or replace battery if necessary; <u>AS2409K</u> : no "live" telegram received from CAN Bus travel switch for more than 300 ms; replace travel switch	

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26	Wire breakage: - Lift potentiometer	M, S, I2, I3	MULTIPILOT / SOLOPILOT / LIFT POTENTIOMETER	Check wire connection	Lift stop. "Warning" symbol flashes (Else-Check), travel enabled
27	Wire breakage: - Steering setpoint device; ◇ Reach truck: for 45° steering bolster movement no flank from proximity switch. ◇ Canion: "Steer angle acquire active" parameter has incorrect value ◇ Juniors PM2402L: "Operating mode" parameter incorrectly set	C, L, I3, I4	STEER ACTUAL ANGLE	Check wire connection; Replace steer angle sensor / potentiometer; Replace Canion / Interface; Replace steering; PM2402L from software version 1.60: set parameter P511 "operating mode" correctly ◇ 1 = analog sensor (potentiometer), 2 = digital sensor on steer motor	Crawl speed, Flashing warning symbol (Else-Check), hydraulic functions enabled. This error produces an emergency stop on the reach truck and the Juniors.
28	Wire breakage: - Steering sensor	C, L, I3, I4	STEER NOMINAL ANGLE	Check wire connection, replace steering wheel sensor; replace Canion / interface; replace steering	Crawl speed, Flashing warning symbol (Else-Check), hydraulic functions enabled. This error produces an emergency stop on the reach truck
29	Wire breakage: - Traverse potentiometer	M	Traverse nominal value MULTIPILOT	Replace Multipilot	
30	Wire breakage: - Tilt potentiometer	M	Tilt nominal value MULTIPILOT	Replace Multipilot, Teach Multipilot (Hall sensor 2003 only)	
31	Wire breakage: - ZH1 setpoint device - Initial lift / lower Setpoint device	M, S Travel switch	Sideshift nominal value MULTIPILOT / SOLOPILOT	Replace Multipilot / Solopilot, Teach Multipilot (Hall sensor 2003 only); Travel switch: Check / replace switch	Hydraulic functions stop, "Warning" symbol flashes (Else-Check), travel enabled

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32	Wire breakage: - ZH2 setpoint device	M, S	MULTIPILOT / SOLOPILOT	Replace Multipilot / Solopilot, Teach Multipilot (Hall sensor 2003 only)	Hydraulic functions stop, "Warning" symbol flashes (Else-Check), travel enabled
33	Wire breakage: - ZH3 setpoint device	M, I8	MULTIPILOT	Replace Multipilot	
34	CANBus damaged	F, H, L, M, S, A, I2, I3, I4, I5, C, F- AC, H-AC Travel switch	CAN-BUS	Check CAN bus connection; replace faulty component; Check terminal resistances	No travel, hydraulics Warning symbol Flashing warning (Else-Check). Only stored in logbook (from 2004).
35	No travel zero position Deadman and accelerator pedal applied when truck switched on	I2, I3, I4, C Travel switch	TRAVEL ZERO POSITION	Warning, check travel switch; Intermittent contact in interface power supply (12 volts) Check Canion, for twin pedal check electrical system	Travel stop, Flashing warning symbol (Else- Check), hydraulic functions enabled.
36	No lift zero position	M, I2, I3,FS	LIFT ZERO POSITION	Warning, check lift setpoint device.	Hydraulic functions stop, "Warning" symbol flashes (Else-Check), travel enabled
37	No steering angle nominal value	L	CONTROLLER / CAN	Check steering setpoint device;Check CANBus connection; check "steer type" parameter; Replace component (I5)	
38	Component does not log on, self test not concluded.	F, H, L, I2, I3, I4, C, A, M, S, F-AC, H-AC	CONTROLLER / CAN	Check CAN-Bus connection and voltage; check DIL switch 7 encoding (MP1510); steering controller monitoring activated? (AS2412F); check ACS encoding; replace component	No travel, lifting Warning symbol Flashing warning (Else-Check).

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39	Implausible truck type 1. Discovered during the self test phase that at least one component has a different truck type as a parameter. A different truck type was discovered in operating mode. Caused by intermittent contacts in the power supply connections	F, H, L, I2, I3, I4, I5, A, M, F-AC, H-AC	TRUCK TYPE	For 1. Set truck type; For 2. Examine and if necessary replace switch (key switch) or rectify intermittent contact in power supply plug connections. Set truck type.	
40	Motor overtemperature Traction motor overtemperature in operating mode.> 150°C And travel speed < 1km/h For ACS: Info > 145°C Err > 165°C	L, F, H F-AC, H-AC	TEMPERATURE MOTOR	Warning; check motor sensor system and wire connections; Check motor; traction motor brake open?	Reduced power for travel and lifting. Warning symbol flashing (Else-Check). For steering only warning symbol flashing.
41	Brake magnet potentiometer Potentiometer voltage less than 0.3 volts or greater than 2.7 volts for more than 500ms.	L	BRAKE MAGNETPOTENTIOMETER	Check potentiometer; check potentiometer attachment; check wire connection	

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42	- Short circuit between the output and battery positive.(EJC, ELE) -Brake magnet control, below minimum difference on potentiometer for 500 ms when magnet applied. (150mV) No brake pressure during initialization. Brake pressure after the Emergency Stop magnet has applied;	L,F	BRAKE MAGNET	Check wire connection, check brake magnet; replace component	
43	Adjust brake	L	ADJUST BRAKE	Adjust brake; check potentiometer	
44	- Brake not connected or connection wire short circuit -Brake cable torn <i>Only for steer category_3:</i> Internal driver of failsafe brake cannot connect the relay Or short circuit bypass (contact jams) on the output during power up test	L,F	BRAKE FAULTY	-Check brake wiring, replace brake if necessary -Replace brake cable, check potentiometer; Check potentiometer attachment; <i>Only for steer category_3:</i> -Check brake driver output, check switch contact plausibility, Replace steer component.	No release

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45	Too many pulses from steering setpointdevice Intermittent contact or perturbing radiation. More than 255 pulses identified within 100ms	L,15	STEERING WHEEL	Check wire connection, replace sensor bearing; replace component	
46	Steering setpoint devicewrongly connected AS4803L: More than 3 pulses identified in one direction and more than 3 pulses in another within 100ms.	L,15	STEERING WHEEL	Check sensor bearing connection; check wireconnectio AS4803L: Check steering wheel recognition input.	
47	No pulses from steer setpointdevice ETVQ steering wheel no pulses from 1st sensor bearing. More than 10 pulses were obtained from the stepper motor but fewer than 3 pulses were counted within 200ms from the sensor bearing.	L,15	STEERING WHEEL	Check wire connection, replace sensor bearing; replace component	No release

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48	Does not match the "Steering type" parameter ETVQ steering wheel no pulses from stepper motor or 2nd sensor bearing. More than 10 pulses were obtained from the sensor bearing but fewer than 2 pulses were counted within 200ms from the stepper motor sensor bearing.	L	STEERING TYPE	Set steering type correctly ETVQ: Check stepper motor coupling, tighten grub screw. Test both setpoint device branches, set defaults and truck type Otherwise faulty, replace component.	
49	CAN supply interrupted; Supply above 14 volts or less than 10 volts, Can or sensor bearing incorrectly supplied	AS 2412 F,H-AC	Can Bus CAN supply	Supply on CAN connector greater than 14 volts (electrical system short circuit, component)	Travel disabled
50	NRG Multipilot wire breakage Horizontal tilt	M	Setpoint device horizontal	Check Multipilot wire connection Parameter 540 set to 1 by mistake	Travel and lifting disabled.
51	Teach-In: steering actual value potentiometer	L	Incorrect setting SETTING	Repeat calibration, check wire connection;check potentiometer;replace component	
52	Teach-In: Brake magnet potentiometer	L	Incorrect setting SETTING	Repeat calibration, check wire connection;check potentiometer;replace component	
53	Teach-In: Steering setpoint potentiometer	L	Incorrect setting SETTING	Repeat calibration, check wire connection;check potentiometer;replace component	

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54	Motor wire breakage during power-up test ETVQ: Temperature voltage level less than 0.3 volts or greater than 2.7 volts	L, F, H	MOTOR WIRE BREAKAGE	Check wire connection; Check temperature sensor lines; replace component; replace motor	
55	Motor short circuit; Current not ok; Power stage faulty	L, F-AC, H-AC	SHORT CIRCUIT MOTOR	Check wire connection; Replace motor; Replace component	Traction motor stops, Hydraulic motor stops Warning symbol flashing (Else-Check).
56	Motor or actual value transmitter incorrectly connected	L,F,H	MOTOR REVERSE POLARITY	Check motor connection; check actual value transmitter potentiometer; AC: Phases L1,L2 or L3 swapped on motor;	
57	No actual value change Motor turns despite control signal	L,F,H	Steering controller ACTUAL VALUE TRANSMITTER	Check motor; check actual angle potentiometer; rectify mechanical wheel block; AS4803L: Check incremental bearings; replace component; AC: Check actual value transmitter wire breakage signals PM2402L check operating mode	
58	Steering angle actual value fluctuates ETVQ: Reference mark 0° could not be started within 5 seconds or no valid segment reached. Steer motor does not turn	L	STEER ACTUAL ANGLE	Check actual value transmitter (on steer motor) Check steer motor, fuse and incremental bearing, rectify mechanical wheel block; Check proximity switch distance.	

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59	Steering angle nominal value fluctuates	L	Steer angle setpoint device TILLER POTENTIOMETER	Check setpoint device potentiometer (on tiller)	
60	Swivelling bolster does not follow steering wheel directions Deviation of > 15° for 100ms The wheel turns more than 5° without change of nominal value on steering wheel, less than 2°/sec after reaching the nominal position. Tyres over-tensioned, the actual value cannot follow the nominal value.	L	STEERING CONTROL	Check steering bolster mechanics; check chain and chain tension; check motor; check actual value transmitter attachment; Check tyres, replace wheel if necessary.	
61	Power stage error	L	CONTROLLER	Replace controller	
62	Power stage error	L	CONTROLLER	Replace controller	
63	Sensor power supply out of range AS4803L: < 10V oder >16V	L,F-AC,H-AC	CONTROLLER	The 12 volt supply not in valid range. Monitoring of 12 volt sensor supply greater than 15 volts and less than 11 volts. Switch controller off and on, replace fuse and controller if necessary.	
64	Software version differs	L	CONTROLLER	Different software versions in the AS4803Ls in the ETV-Q. Update software to same level.	

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65	NRG Multipilot wire breakage centre shifter	M	Centre switch MP centre shifter	Check Multipilot wire connection Parameter 540 set to 1 by mistake	Travel and lifting disabled.
66	NRG Multipilot wire breakage 180° / 360° steering toggle	M	180-360 switch MP toggle switch 180°/ 360°	Check Multipilot wire connection Parameter 543 set to 1 by mistake	Travel and lifting disabled.
67	NRG-Multipilot setpoint device travel direction switch jams on MP when system starts	M	Travel direction MP setpoint device	Check Multipilot switch, values in Judit MP teach window, recalibrate values	Travel and lifting disabled.
68	Safety switch wire breakage	I2, I3, I4, I5	DEADMAN	Check wire connection to safety switch (deadman, seat switch); replace safety switch	
69	Both lift and lower requested simultaneously	I2, I5, FS	LIFT/LOWERSWITCH	Check wire connection; check switch	
70	Component fails to respond or responds incorrectly to self test	F-AC, H-AC, M, S, A, I2, C	SELF TEST	Check displays on basic component (LED); note other error messages on basic card; Check wireconnectionsandcheck connector; check power supply behind the main contactor contact, in the event of an error the voltage will be much lower here than the rated operating voltage. Disconnect the positive supply from the components to target the error cause. One component overloads the testing voltage due to internal short circuit. The testing voltage arises by charging the internal capacitor batteries via a resistor to the level of the control voltage supply.	No travel, hydraulics Warning symbol Flashing warning (Else-Check).

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71	Lower potentiometer wire breakage	I2, FS	LOWER POTENTIOMETER	Check wire connection; replace lower potentiometer; replace Multipilot; replace interface	
72	No lowering zero position	I2, FS	LOWER RESTPOSITION	Warning, check lower setpoint device	
73	Valve output interface faulty	I2	VALVE OUTPUT	Warning, check valve outputs	
74	Interface valve output faulty	I2	INTERFACE FAULTY	Replace interface	
75	Proportional valve does not draw any current Correct Multipilot ??	I2,I4,C	PROP. VALVE	Check wire connection, replace proportional valve;replace Canion / interface; replace proportional valve	Flashing warning symbol (Else-Check).
76	Proportional valve short circuit	I2, I4C	PROP. VALVE	Check wire connection, replace proportional valve;replace Canion / interface; replace proportional valve	Flashing warning symbol (Else-Check).
77	Button wire breakage	I2,	BUTTON WIRE BREAKAGE	Check wire connection; replace button; replace interface	
78	Button and travel switch pressed simultaneously	I2	BUTTON / TRAVEL SWITCH	Warning: Check wire connection; replace button; replace interface	
79	Switch and deadman switch pressed simultaneously	I2	BUTTON / DEADMAN	Warning: Check wire connection; replace button; replace interface	
80	2 travel directions simultaneously	I2	ELECTRICAL SYSTEM	Check wire connection; replace button; replace interface	
81	Different parameters for the two traction controllers	F, F-AC	MOTORS	reset parameters (EFG traction controllers)	Travel inhibited
82	Sensor wire breakage	I2	ELECTRICAL SYSTEM	Safety height: Check wire connection; replace button; replace interface	

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83	2 of the same components report on the truck e.g. AS4803L: Key switch voltage cannot be assigned to components Elle_1, Elle_2 or Elle_3	F, H, I4, F-AC L-AC	ELECTRICAL SYSTEM	Check component encoding; check wire connection; replace component;	Travel inhibited
84	Faulty speed sensor: ◇ AS4803L: - Speed changes by 50% within 4ms; - Reference speed less than half the rated speed; - Steer transmission blocked; - Tear identification: a valid sensor reading is reduced to zero within 4ms and remains at this level for 50ms without producing a new valid reading. ◇ PM2402L/2 from V1.60: - Too many pulses on encoder 3 on steer motor	F,H,L-AC	SPEED SENSOR	Check speed sensor; Sensor bearing drift; Check wire connection; Replace speed sensor; Replace component; Check wire routing, do not route together with motor supply wires!	Travel stop, Lift stop, Flashing warning symbol (Else-Check), hydraulic functions enabled.
85	Power release low voltage Travel/Steer: Capacitor voltage drops to 30V (48V) for 0.5 seconds	F,H-AC L-AC	ELECTRICAL SYSTEM TRAVEL	Switch truck on and off; check battery; check battery cable connections; check fuse; Check power connections; replace component	Travel, hydraulics no function, warning symbol Flashing warning (Else-Check).

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86	Improbable speed, sudden change: ◇ AS4803L: 2 sensor systems differ from each other. ◇ PM2402L/2 from V1.60: Encoders 3 and 4 supply different sensor signals	F,H-AC L-AC	SPEED IMPLAUS	Check wire connection; Replace speed sensor; Replace component; Pulse counts correct: 8 or 64 pulses/revolution? Check wiring and plug connections, check wire routing, do not route together with motor supply wires!	
87	Sensor line interrupted AS4803L: no voltage drop on a 100 Ohm internal measurement resistor MFC brake: load wheel speed sensing	F-AC L-AC MFC brake	Electrics DISCONNECTION SENSOR BEARING	Sensor wire disconnected, motor consumes maximum current and makes buzzing noise. Check sensor wires.	
88	Hydraulic speed sensor faulty on AS4814H	H (AS4814H)	SPEED SENSOR H	Check speed sensor; Check wire connection; replace speed sensor; replace component;	Hydraulics stop, Flashing warning symbol (Else-Check), travel enabled.
89	Hydraulics power release low voltage	H	ELECTRICS- HYDRAULICS	Check battery, check battery wire connection; Check fuse; replace component	Reduced power for travel and lifting. Warning symbol flashing (Else-Check).
90	Travel with handbrake on	C	ELECTRICAL SYSTEM	Check magnetic brake switch	Flashing warning symbol (Else-Check).
91	24 volts out of range Info at <17 V Err at <15 V	C	ELECTRICAL SYSTEM	Check power supply; check wire connection	For a warning, only the warning symbol flashes (Else-Check). For an error, the truck stops.

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92	Wrong component reporting on Canion	M, S, A	ELECTRICAL SYSTEM	Check Master/Solopilot; check display; replace component Check jumper in XB 27 and XB 44 from pin 2 to pin 6,	Travel, lifting function, warning symbol flashes (Else-Check).
93	ACS capacitors not charged	F, H, C	ELECTRICAL SYSTEM	Check charging connection, main contactor does not apply, check bus voltage, check transformer, fuses and cable set, Replace component	Travel, lifting no function, warning symbol flashes (Else-Check).
94	SDO error	F, H, C	SDO ERROR	Software incompatible check software version Reload software. Check jumper in XB 41 from pin 12 to pin 13.	Travel, lifting no function, warning symbol flashes (Else-Check).
95	Pin code error	C	PIN CODE ERROR	Component pin codes not identical	Travel, lifting no function, warning symbol flashes (Else-Check).
96	No zero position for hydraulics Masterpilot, Solopilot,	M,S	Hydraulics zero position MP/SOLOPILOT	Check Master/Solopilot; lift, lower, tilt, ZH1, ZH2, ZH3, horn switch not in zero position Replace component	Hydraulic functions stop, "Warning" symbol flashes (Else-Check), travel enabled
97	Segment beyond tolerance limits ◇ PM2402L/2 from V1.60: Referencing error on power up, no switch signal from proximity switch (NS) or time interval exceeded	L	FAULTY SEGMENT	Segment on swivelling bolster not within tolerance level. Check wiring and proximity switch, check distance from switch to trip cam on swivelling bolster	

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98	The position of the sensor bearing and proximity switch (segment) deviate by more than 1.1 degrees. When the truck starts up, the direction of rotation from the steering wheel sensor system to the motor power connection or the steer motor sensor system is inversed. ◇ PM2402L/2 from V1.60: Referencing error during operation, unexpected switch signal from proximity switch.	L	POSITION DEVIATION	Check wiring. Check wiring and proximity switch, check distance from switch to trip cam on swivelling bolster	
99	CANBus damaged; CANBus driver temporarily deactivated	F,H,M,S,A, I3, I4, C	CAN-BUS	Check wire connection, check terminal resistors, install truck anti-interferencemeasures;	Travel, hydraulics no function, warning symbol flashes (Else-Check).
100	NRG software versions of internal component parts implausible	M	Multipilot software	Replace component part with corresponding component, as flashing currently not possible in the field.	

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101	Input / output error	JUBES	Jubes input/output	Check I/Oa, rectify contact error, check operating voltage, replace external transmitter Index info in display: a--- Sensor 1 supplies values, but not defined. Check parameters 11-17 b--- Sensor 2 supplies values, but not defined. Check parameters 20-26 c--- Sensor 3 supplies values, but not defined. Check parameters 29-35 Or a sensor 1-3 supplies a voltage outside the range of 0.5V – 9.5V.	Shown in the driver's display with error 101
102	Internal error	JUBES	Jubes internal	Check operating voltage. Index info in display: a --- Communication between access module and data recording faulty, check connection e --- Radio module faulty f --- Radio channel number is "0", should be >0, check parameter 100 g --- Radio transmitting power is "0", Check parameter 101 h --- Lock number is invalid, replace access module i --- Impact sensor faulty, replace data recorder	Shown in the driver's display with error 102

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103	Parameter error	JUBES	Jubes parameters	Set parameters Index info in display: a --- Parameter 5 greater than parameter 6, should be smaller. b --- Differential value of parameter 11 is greater than the differential values of the various stages of parameters 12-17 c --- Differential value of parameter 20 is greater than the differential values of the various stages of parameters 21-26 d --- Differential value of parameter 29 is greater than the differential values of the various stages of parameters 30-35 e --- the stages of parameters 12-17 ... f --- the stages of parameters 21-26 ... g --- the stages of parameters 30-35 ... h --- Impact stages of parameters 47-49 i --- Impact stages of parameters 50-52are not in increasing order	Shown in the driver's display with error 103
104	Sensor bearing provides no pulses on system start up	F,H	(SENSOR BEARING)	Check sensor bearing and wire, replace sensor bearing or controller	
105	Motor temperature gauge provides incorrect values Sensor line wire breakage	F,H,L	Temp.Motor	Check sensor connection and lines, if possible replace sensor, otherwise replace the entire motor...	
106	Controller temperature gauge provides incorrect values	F,H,L	Temp. controller	Internal error, replace controller.	

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107	Key switch voltage out of range Hardware encoding incorrect	F,H,L MFC hydr. MFC brake	Electrics	Error in controller connection (Saab connector) on component	No travel No lifting No steering Main contactor open
108	Calibration reading incorrect	F,H	(CONTROLLER internal)	Internal error, replace controller.	
109	Brake pedal faulty	MFC brake	BRAKE PEDAL	Brake pedal signals implausible	
110	Current output faulty	MFC brake MFC hydr. MFC option	CONTROLLER	Check outputs for short circuits	MFC_Hydr.: no lifting MFC_Brake: crawl speed only
111	Steering controller is monitored by traction controller for signs of life telegrams Traction controller does not receive these telegrams. The Can Bus is overloaded.	F	Steering controller	Check steering controller	Travel inhibited Main contactor open
112	Steering controller_2 is monitored by traction controller_1 for signs of life telegrams The Can Bus is overloaded.	F	Traction controller	Check Can Bus, measure terminal resistor 60Ohm	
113	Lift controller does not send lift telegrams	H	LIFT CONTROLLER		
114	No traverse distance reference on power up	MFC hydr.	Info 32 Traverse reference	None	Reduced traverse speed until both stops have been reached once.

Error	Description	Component	Display text	Cause / Action	Effect
115	Main contactor improbable, contacts not closed. Wire connection interrupted, faulty main contactor driver on traction controller	F,H,L ??	Main contactor improbable	Check wire connection. If error 19 is also present, disconnect the shorted power stage Disconnect the power positive. Check driver voltage (switched against negative). If reading OK, check contactor coil and mechanics.	No truck functions
116	After software flashing (field operation), the item number of the software is implausible and parameters may also be implausible.	F,H, MFC brake MFC prop	Info 54 SET TRUCK TYPE	Set truck type and switch truck off / on (wait approx. 35 seconds). On request, automatically: all parameters are set to default, the software item number is set to plausible, the log book is deleted, the hourmeter set to zero and entry 116 made in the log book.	In the log book only error 116 stands as a marker for this process and all parameters can be at default.
117	Cab position implausible, rotary potentiometer value does not match 180 degree switch	CANION	Cab position	Check rotary potentiometer, re-adjust if necessary, check 180 degree switch	No TRAVEL release
118	Steering controller reports error	L	Steering controller	Check display on steering controller	TRAVEL inhibited, EMERGENCY STOP activated
119	Weigher button faulty	MFC brake	Button faulty	Check wire and button	Weighing interrupted
120	Weigher pressure sensor faulty	MFC hydraulics	Sensor faulty	Check wire and sensor	Weighing interrupted
121	Battery incorrectly locked	F-AC	Battery lock	Locking strips stuck. Check proximity switch	No truck functions
201	Optical sensor faulty	Rack height select	sensor		

Error	Description	Component	Display text	Cause / Action	Effect
202	Too many reference points during calibration	Rack height select	Calibration wrong		
203	Sensor evaluation improbable	Rack height select	sensor		
204	Error when reading EEPROM	Rack height select	Controller		All settings set to default
205	No Multipilot in truck	Rack height select	MP missing		
240	Internal process interrupted	Rack height select	Controller		
250	No height actual value on job input	Rack height select			The height is invalid for the warehouse level entered
252	Rack height select incorrect	Rack height select			
253	Rotary field implausible – transmission overloaded, excess load on incline	F	Controller	None, switch truck off/on	Main contactor opened
254	Diagnostics piracy	Judit Box	None	Create authorisation	No diagnosis possible

Components:

A	C = 064	Display / Operation (LISA / JULIA)
	C = 065	Display / Operation (Else-Check)
	C = 066	Display/Operation (CANCode)
	C = 067	Display (CANDis)
	C = 068	Display/Operation (on board computer)
	C = 3	Comfort display [CANopen]
C		Canion (Atlas Copco) [CANopen]
	C = 1	- Master
	C = 11	- Slave
F	C = 016	Travel (MP1510C / AS2405F / AS2409K / AS2412F)
	C = 016	Travel 1 (MP1514F / AS4814Fplus)
	C = 017	Travel 2 (MP1514F / AS4814Fplus)
F-AC	C = 016	Travel (AS4812/14F)
	C = 8	ACS Traction (Atlas Copco AC 8011/18, Inmotion) [CANopen]
Travel switch	C = 096	Can-Bus travel switch
H	C = 032	Lift (MP1514H / AS4814Hplus)
H-AC	C = 032	Lift (AS4814H)
	C = 7	ACS Pump (Atlas Copco AC 8011/18, Inmotion) [CANopen]
Rack height select	C = 128	Rack Select
I	C = 21	I/O-Board 1 [CANopen]
	C = 22	I/O-Board 2 [CANopen]
	C = 23	I/O-Board 3 [CANopen]
	C = 24	I/O-Board 4 [CANopen]

I2	C = 146	Interface 2
	C = 155	Interface 21
	C = 156	Interface 71
I3	C = 147	Interface 3
I4	C = 148	Interface 4 = MFC_brake
I5	C = 149	Interface 5
I6	C = 150	Interface 6 = MFC_Prop
I7	C = 151	Interface 7
I8	C = 152	Interface 8 = MFC_Option
Jubes	C = 069	ISM Access Module
	C = 29	ISM Access Module [CANopen]
	C = 070	ISM-Data recorder
	C = 071	ISM-radio module
L	C = 048	Steer (MP1502L / PM2402L / AS4803L)
	C = 048	Steer 1 (AS4803L)
	C = 049	Steer 2 (AS4803L)
	C = 050	Steer 3 (AS4803L)
	C = 4	Steer computer [CANopen]
M	C = 096	Multipilot / Masterpilot
	C = 2	Multipilot / Solopilot [CANopen]
S	C = 112	Solopilot / Hand lever

Travel setpoint device: travel potentiometer, accelerator pedal

Steering actual value transmitter: steer potentiometer, proximity switch (on steered wheel)

ONLY in 1st generation!

All messages numbered above 100 come from the interface and correspond to messages 1- xx -99!

Error	Description/Cause	Component	Display text	Action	Effect
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Warning / Information Messages

		INFO 01	SEAT SWITCH_OPEN		
		INFO 02	NO_TRAVEL_DIRECTION		
		INFO 03	NO_TRAVEL_RELEASE		
		INFO 04	NO_NOMINAL_VALUE		
		INFO 05	LIFTING_OFF		
		INFO 06	DEADMAN_KEY_OPEN		
		INFO 07	START_INCORRECT		
		INFO 08	PARKING_BRAKE		
		INFO 09	SLOW_SPEED		
		INFO 10	TEMPERATURE_DRIVE_MOTOR		
		INFO 11	TEMP_LIFT_MOTOR		
		INFO 12	TEMP_STEER_MOTOR		
		INFO 13	BRUSH_WEAR_OUT_DRIVE_MOTOR		
		INFO 14	BRUSH_WEAR_OUT_LIFT_MOTOR		
		INFO 15	BRUSH_WEAR_OUT_STEER_MOTOR		
		INFO 16	DRIVING_DISABLE		
		INFO 17	LIFT_END_DIS.		
		INFO 18	SECURITY_HEIGHT		
		INFO 19	DOOR_OPEN		
		INFO 20	AISLE_MODE		
		INFO 21	RESCUE_STEERING		
		INFO 22	STEERING_MISSING		
		INFO 23	DIAGNOSTIC_MODE		
		INFO 24	SWITCH_POWER_OFF		
		INFO 25	TEMP_TRAVEL		
		INFO 26	TEMP_LIFT		
		INFO 27	TEMP_STEER		
		INFO 28	SPARE_1		
		INFO 29	DISPLAY_SWITCHES_THE_EXTERNAL_BUZZER		

		INFO 30	TWIN PEDAL BOTH APPLIED		
		INFO 31	NO ZERO POSITION		
		INFO 32	NO TRAVERSE REFERENCE ON POWER UP		
		INFO 33	ONLY CRAWL SPEED POSSIBLE AS BATTERY NOT LOCKED		
		INFO 34	ONLY CRAWL SPEED POSSIBLE, AS INFO FROM STEERING CONTROLLER		
		INFO 35	LOW VOLTAGE TRAVEL		
		INFO 36	LOW VOLTAGE LIFT		
		INFO 37	LOW VOLTAGE STEER		
		INFO 40	CHECK MOTOR SENSOR SYSTEM		
		INFO 48	IMPACT EVENT VERTICAL FORCE 1		
		INFO 49	IMPACT EVENT VERTICAL FORCE 2		
		INFO 50	IMPACT EVENT VERTICAL FORCE 3		
		INFO 51	IMPACT EVENT HORIZONTAL FORCE 1		
		INFO 52	IMPACT EVENT HORIZONTAL FORCE 2		
		INFO 53	IMPACT EVENT HORIZONTAL FORCE 3		
		INFO 54	SET TRUCK TYPE		
		INFO 73	CHECK VALVE OUTPUTS		