

Diagnostics and Fault Processing

The fault chart below gives a description of all the diagnostics/faults and details the set and clear conditions

Table 4 TROUBLESHOOTING CHART

FLASH CODE	NAME	POSSIBLE CAUSE	CLEAR CONDITION	STEER FAULT ACTION	TRACTION FAULT ACTION
12	Controller Overcurrent	1. The steer motor wires shorted. 2. Controller defective.	Cycle KSI	Shutdown	1 = Stop
13	Current Sense Fault	1. Controller defective.	Cycle KSI	Shutdown	1 = Stop
14	Precharge Fault	1. Controller defective.	Cycle KSI	Shutdown	1 = Stop
15	Controller Severe Undertemp	1. Controller is operating in extreme low temperature. 2. the temperature sensor is broken.	Heatsink temperature above –35°C.	Warning Only	3 = No Action
16	Controller Severe Overtemp	1. Excessive load on vehicle. 2. Controller is operating in extreme high temperature. 3. Improper mounting of controller.	Cycle KSI	Warning then Shutdown	1 = Stop
17	Severe Undervoltage	1. Battery or battery cables or battery connections defective. 2. Excessive non-controller hydraulic system drain on battery. 3. Battery discharged or improper battery.	Cycle KSI	Shutdown	1 = Stop
18	Severe Overvoltage	1. Battery or battery cable resistance too high for a given regen current. 2. Battery disconnected while regen braking.	Cycle KSI	Shutdown	1 = Stop
23	Motor Polarity Fault	1. The motor polarity is reversed. 2. The position feedback device polarity is reversed.	Cycle KSI	Shutdown	1 = Stop
24	5V Supply Failure	1. Overload for the 5V supply 2. Controller defective 3. Load wiring open for the 5V supply	Cycle KSI	Hold then Shutdown	1 = Stop
25	12V Supply Failure	1. Overload for the 12V supply 2. Controller defective	Cycle KSI	Warning then Shutdown	1 = Stop
26	Motor Temp Hot Cutback	1. Excessive load on vehicle. 2. Controller is operating in extreme high temperature.	Bring Steering Motor temperature backs to range.	Warning and Reduce Current Limit	2 = Reduce Speed
31	Main Driver Fault	1. Internal relay coil is broken. 2. Internal relay driver is open or shorted.	Cycle KSI	Warning then Shutdown	1 = Stop
33	Motor Short	1. The steer motor wires shorted.	Cycle KSI	Shutdown	1 = Stop
34	Encoder Fault	1. Encoder is broken. 2. Encoder wiring is open. 3. Controller defective.	Cycle KSI	Hold then Shutdown	1 = Stop
35	Fault Output Failure	1. Incorrect Fault Output wiring. 2. Controller defective.	Cycle KSI	Shutdown	1 = Stop
36	Motor Stalled	1. Stalled steer motor. 2. Steer motor encoder failure or wires open. 3. Steer motor wires open. 4. Related parameters do not match with steer motor.	Cycle KSI	Shutdown	1 = Stop
37	Motor Open	1. Steer motor wires open. 2. Faulty motor cable wiring. 3. Controller defective.	Cycle KSI	Warning then Shutdown	1 = Stop
38	Relay Welded	1. Internal relay welded. 2. Controller defective.	Cycle KSI	Shutdown	1 = Stop
39	Relay Did Not Close	1. Internal relay was commanded to be close but it did not. 2. Controller defective.	Cycle KSI	Shutdown	1 = Stop
41	Command Analog1 Out of Range	1. Command Analog Input 1 (J3-6) is out of range. 2. Incorrect parameter settings.	Cycle KSI	Hold then Shutdown	1 = Stop

42	Command Analog2 Out of Range	1. Command Analog Input 2 (J3-13) is out of range. 2. The crosscheck on Command Analog Input 1 (J3-6) and Command Analog Input 2 (J3-13) failed. 3. Incorrect parameter settings.	Cycle KSI	Hold then Shutdown	1 = Stop
43	Feedback Analog1 Out of Range	1. Analog Input (J3-2) is out of range. 2. Incorrect parameter settings.	Cycle KSI	Hold then Shutdown	1 = Stop
44	Feedback Analog2 Out of Range	1. Position Analog Input 2 (J3-9) is out of range. 2. The crosscheck on Position Analog Input 1 (J3-2) and Position Analog Input 2 (J3-9) failed. 3. Incorrect parameter settings.	Cycle KSI	Hold then Shutdown	1 = Stop
45	CAN Not Operational	1. 1220E CAN NMT State did not go operational within 80 ms of interlock being applied.	Cycle KSI	Warning then Shutdown	1 = Stop
46	NV Failure	1. Internal Non-Volatile Memory defective.	Cycle KSI	Shutdown	1 = Stop
47	Parameter Change	1. A parameter value was changed that requires a power cycle. 2. Parameters are restored to the default settings.	Cycle KSI	Shutdown	1 = Stop
51	Interlock Switch Supervision	1. A fault is set if the 2 switch inputs are not matched. 2. Interlock switch defective.	Cycle KSI	Interlock = OFF	1 = Stop
52	Home Switch Supervision	1. When the wheel position is not close to home, the redundant home switch inputs are checked and a fault is set if they disagree. 2. Home switch defective.	Cycle KSI	Warning then Shutdown	1 = Stop
53	Home Position Not Found	1. Home switch defective. 2. Mounting or wiring defective.	Cycle KSI	Shutdown	1 = Stop
54	Home Reference Tolerance Fault	1. Home switch defective.	Cycle KSI	Shutdown	1 = Stop
55	Steer Command Supervision	1. Command input device defective.	Cycle KSI	Hold then Shutdown	1 = Stop
56	Wheel Position Supervision	1. Position feedback device defective.	Cycle KSI	Hold then Shutdown	1 = Stop
71	Software Fault	1. Software defective. 2. Controller defective.	Cycle KSI	Shutdown	1 = Stop
72	PDO1 Timeout	1. Communication between the traction controller and the 1220E has halted.	Cycle KSI	Warning then shutdown	1 = Stop
73	Following Error	1. Incorrect parameter settings. 2. Position feedback device defective. 3. Steer motor defective.	Cycle KSI	Shutdown	1 = Stop
74	Hardware Fault	A hardware error has been detected. 1. Power MOSFETs shorted. 2. MODFETs driver defective. 3. Watchdog cross checking defective. 4. Internal +15V defective. 5. Poor connection to battery terminals	Cycle KSI	Shutdown	1 = Stop
75	Parameter Conflict	1. Parameter settings are selected that are in conflict with each other. 2. Parameter setting out of range.	Cycle KSI	Shutdown	1 = Stop
78	CAN Bus Loading	1. CAN bus defective. 2. The message sending is too fast.	Cycle KSI	Warning then Shutdown	1 = Stop
79	PDO Mapping Error	1. Incorrect CAN mapping data.	Cycle KSI	Shutdown	1 = Stop
81	Bad Calibrations	1. Calibration data is out of range	Cycle KSI	Shutdown	1 = Stop
82	Parameter Out of Range	1. Parameter data out of range	Cycle KSI	Shutdown	1 = Stop
84	Supervision	1. Supervisor defective	Cycle KSI	Shutdown	1 = Stop