

Level	LED Flashes	Type	Display	Message
1	2	Warning	F12001	Handbrake Fault
1	5	Warning	F15006	No Motor Speed Signal
1	5	Warning	F15007	Tow Mode
1	6	Warning	F16002	Safety Case 1
1	6	Warning	F16003	Safety Case 2
1	6	Warning	F16004	Analogue Output Over Current (warn)
1	6	Warning	F16005	Analogue Output Off with Failsafe (warn)
1	6	Warning	F16006	Analogue Output Over Temperature (warn)
1	6	Warning	F16007	Analogue Output Under Current (warn)
1	6	Warning	F16008	Analogue Output Short Circuit (warn)
1	7	Warning	F17001	BDI Warning
1	7	Warning	F17002	BDI Cutout
1	7	Warning	F17003	Low Battery Cut
1	7	Warning	F17004	High Battery Cut
1	7	Warning	F17005	High Capacitor Cut
1	7	Warning	F17006	Vbat below rated min
1	7	Warning	F17007	Vbat above rated max
1	7	Warning	F17008	Vcap above rated max
1	7	Warning	F17009	Motor in low voltage cutback
1	7	Warning	F17010	Motor in high voltage cutback
1	8	Warning	F18001	Device too cold
1	8	Warning	F18002	Device too hot
1	8	Warning	F18003	Motor in thermal cutback
1	8	Warning	F18004	Motor too cold
1	10	Warning	F10101	Unit in preoperational
1	10	Warning	F10102	IO can't init
1	10	Warning	F10103	RPDO Timeout (warning)
1	11	Warning	F11101	Encoder Alignment Warning
2	2	Drive Inhibit	F22001	Seat Fault
2	2	Drive Inhibit	F22002	Two Direction Fault
2	2	Drive Inhibit	F22003	SRO Fault
2	2	Drive Inhibit	F22004	Sequence Fault

2	2	Drive Inhibit	F22005	FS1 Recycle Fault
2	5	Drive Inhibit	F25001	Motor Overspeed
2	5	Drive Inhibit	F25002	PST Fault
2	6	Drive Inhibit	F26001	Throttle Fault
2	7	Drive Inhibit	F27002	Entering Cutback
2	8	Drive Inhibit	F28001	Cutback
2	10	Drive Inhibit	F20101	RPDO Timeout (drive inhibit)
3	5	Severe	F35002	Motor Open Circuit Fault
3	5	Severe	F35003	No Motor Speed Signal
3	7	Severe	F37003	Power Supply Critical
3	12	Severe	F32102	EMCY send failed
3	13	Severe	F33101	Internal Fault
3	13	Severe	F33102	Out of memory
3	13	Severe	F33103	General DSP error
3	13	Severe	F33104	Timer Failed
3	13	Severe	F33105	Queue Error
3	13	Severe	F33106	Scheduler Error
3	13	Severe	F33107	DSP Heartbeat Error
3	13	Severe	F33108	I/O SS Error
3	13	Severe	F33109	GIO SS Error
3	13	Severe	F33110	LCM SS Error
3	13	Severe	F33111	LCP SS Error
3	13	Severe	F33112	OBD SS Error
3	13	Severe	F33113	VA SS Error
3	13	Severe	F33114	DMC SS Error
3	13	Severe	F33115	TracApp SS Error
3	13	Severe	F33116	New Powerframe Detected
3	13	Severe	F33117	DSP Not Detected
3	13	Severe	F33118	DSP Comms Error
3	13	Severe	F33119	App Manager SS Error
3	13	Severe	F33120	Autozero range error
3	13	Severe	F33121	DSP parameter error
3	13	Severe	F33122	Motor in wrong direction
3	13	Severe	F33123	Motor stalled
4	1	Very Severe	F41001	Bad NVM Data
4	4	Very Severe	F44001	Line Contactor o/c
4	4	Very Severe	F44002	Line Contactor welded
4	5	Very Severe	F45001	Beltloader Fault
4	5	Very Severe	F45002	Ren Signal
4	5	Very Severe	F45003	VERLOG
4	6	Very Severe	F46001	Digital Input Wire Off
4	6	Very Severe	F46002	Analogue Input Wire Off
4	6	Very Severe	F46003	Analogue Output Over Current
4	6	Very Severe	F46004	Analogue Output On with No Failsafe
4	6	Very Severe	F46005	Analogue Output Off with Failsafe
4	6	Very Severe	F46006	Analogue Output Over Temperature
4	6	Very Severe	F46007	Analogue Output Under Current
4	6	Very Severe	F46008	Analogue Output Short Circuit

4	8	Very Severe	F48001	Heatsink overtemp
4	11	Very Severe	F41101	DSP Encoder Fault
4	11	Very Severe	F41102	DSP Overcurrent Fault
5	3	Return to Base	F53001	DSP Overvoltage
5	3	Return to Base	F53002	DSP Powerframe Fault
5	3	Return to Base	F53003	MOSFET s/c M1>B+
5	3	Return to Base	F53004	MOSFET s/c M1>B-
5	3	Return to Base	F53005	MOSFET s/c M2>B+
5	3	Return to Base	F53006	MOSFET s/c M2>B-
5	3	Return to Base	F53007	MOSFET s/c M3>B+
5	3	Return to Base	F53008	MOSFET s/c M3>B-
5	3	Return to Base	F53009	MOSFET s/c checks incomplete
5	3	Return to Base	F53010	Pump Mosfet S/C
5	3	Return to Base	F53010	IGBT M1 Low Driver Fail
5	3	Return to Base	F53011	IGBT M1 High Driver Fail
5	3	Return to Base	F53012	IGBT M2 Low Driver Fail
5	3	Return to Base	F53013	IGBT M2 High Driver Fail
5	3	Return to Base	F53014	IGBT M3 Low Driver Fail
5	3	Return to Base	F53015	IGBT M3 High Driver Fail
5	13	Return to Base	F53101	Invalid Powerframe Rating

Description
Handbrake is active when direction selected.
No speed feedback from motor
Tow mode has been activated
Throttle appears to be stuck. This fault will clear if throttle starts to work again.
Throttle appears to be stuck. This fault will latch and can only be cleared by repairing the throttle and recycling power.
Contactactor driver over current
Contactactor driver not working
Contactactor driver over temperature
Contactactor driver unable to achieve current target in current mode
Contactactor driver MOSFET short circuit detected
BDI remaining charge (0x2790,1) is less than BDI Warning level (0x2C30,5)
BDI remaining charge (0x2790,1) is less than BDI Cutout level (0x2C30,4)
Battery voltage (0x5100,1) is less than Under Voltage limit (0x2C02,2) for longer than the protection delay (0x2C03,0)
Battery voltage (0x5100,1) is greater than Over Voltage limit (0x2C01,2) for longer than the protection delay (0x2C03,0)
Capacitor voltage (0x5100,3) is greater than Over Voltage limit (0x2C01,2) for longer than the protection delay (0x2C03,0)
Battery voltage (0x5100,1) is less than rated minimum voltage for controller for longer than 1s.
NOTE: This fault is sometimes seen at power down.
Battery voltage (0x5100,1) is greater than rated maximum voltage for controller for longer than 1s.
Capacitor voltage (0x5100,3) is greater than rated maximum voltage for controller for longer than 1s.
Motor control has entered low voltage cutback region.
Motor control has entered high voltage cutback region.
Low heatsink temperature (0x5100,4) has reduced power to motor
High heatsink temperature (0x5100,4) has reduced power to motor
High measured (0x4600,3) or estimated (0x4602,8) motor temperature has reduced power to motor
Low Measured temperature has reached -30deg
Controller is in pre-operational state
Controller has not received all configured RPDOs at power up
One or more configured RPDOs not received with 3s at start up or 500ms during normal operation.
Encoder is not aligned properly.
Valid direction selected with operator not seated or operator is not seated for a user configurable time in drive.
Both the forward and reverse switches have been active simultaneously for greater than 200 ms.
FS1 active for user configurable delay (0x2914,2) without a direction selected.
Any drive switch active at power up.

FS1 active after a direction change and FS1 recycle function enabled (0x2914,1 bit 1)
An issue has occurred with the PST unit
Throttle value (0x2620,0) is greater than 20% at power up.
Controller has entered thermal or voltage cutback region
Thermal or voltage cutback factors have reduced below user defined levels.
One or more configured RPDOs not received with 3s at start up or 500ms during normal operation.
Motor terminal is open circuit or disconnected from controller
No speed feedback from motor
Battery voltage has dropped below critical level
Unable to transmit EMCY message
Internal software fault
Out of memory
Unknown error raised by motor model code
Unable to allocate timer
Unable to post message to queue
Unable to create task in scheduler
Communication lost between host and DSP processors
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
New power frame detected.
Communication lost between host and DSP processors
Communication lost between host and DSP processors
Internal software fault
Current sensor auto-zero current out of range
Communication error between host and DSP processors
Motor rotation detected as wrong direction. No longer supported
Motor rotation stalled. No longer supported
EEPROM or flash configuration data corrupted and data can not be recovered.
Line contactor did not close when coil is energized.
Line contactor closed when coil is deenergized.
Unable to change between traction and pump motors on beltloader.
Fault signalled by Renault vehicle network
VERLOG signal failure
Digital input wire-off
Analogue input outside of allowed range (0x46cX)
Contact driver over current
Internal hardware failsafe circuitry not working
Contact driver not working
Contact driver over temperature
Contact driver unable to achieve current target in current mode
Contact driver MOSFET short circuit detected

Controller heat sink has reached critical high temperature, and has shut down.
Encoder input wire-off is detected.
Motor current exceeded controller rated maximum
Voltage on B+ terminal exceeds rated maximum for controller
Motor current exceeded controller rated maximum
MOSFET s/c detection on M1 top devices
MOSFET s/c detection on M1 bottom devices
MOSFET s/c detection on M2 top devices
MOSFET s/c detection on M2 bottom devices
MOSFET s/c detection on M3 top devices
MOSFET s/c detection on M3 bottom devices
Unable to complete MOSFET s/c tests at power up
MOSFET s/c detection Pump Mosfet Devices
IGBT driver failure
IGBT driver failure
IGBT driver failure
IGBT driver failure
IGBT driver failure
IGBT driver failure
IGBT driver failure
Unable to identify hardware



Recommended Action
Release handbrake
Check encoder wiring and speed measurement signal
Disable tow mode if not required
Check throttle wiring and installation.
Check throttle wiring and installation.
Ensure contactor doesn't exceed maximum current and check contactor wiring
Internal hardware fault
Ensure contactor doesn't exceed maximum current and check contactor wiring
Ensure contactor driver current target is within range
Internal hardware fault
Charge battery
Charge battery
Charge battery
Charge battery
Charge battery
Charge battery
Charge battery
Charge battery
Charge battery
Charge battery
Charge battery
Allow controller to warm up to normal operating temperature.
Allow controller to cool down to normal operating temperature.
Allow motor to cool down to normal operating temperature.
Check motor thermistor connection or allow motor to warm up.
If configured and ready for use, change state to operational.
Check PDOs on all CANbus nodes are configured correctly and match up.
Check status of all nodes on CANbus. Check PDOs on all CANbus nodes are configured correctly and match up.
Ensure encoder offset is correctly set or re-align encoder
Must be seated with switches inactive
Check vehicle wiring and reset switches
Deselect FS1
Deselect all drive switches

Deselect FS1
Check PST unit
Release throttle
Check for temperature or voltage cutback condition and take appropriate action
Check for temperature or voltage cutback condition and take appropriate action
Check status of all nodes on CANbus. Check PDOs on all CANbus nodes are configured correctly and match up.
Check motor wiring. Check controller condition
Check encoder wiring and speed measurement signal
Check controller voltage supply
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal hardware fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Internal software fault
Recycle keyswitch
Internal hardware fault
Internal hardware fault
Internal software fault
Internal hardware fault
Internal software fault
Check line contactor and wiring
Check line contactor and wiring
Check change over contactors and motor wiring.
Check peripheral Renault devices
Check peripheral Renault devices
Check wiring
Check wiring
Ensure contactor doesn't exceed maximum current and check contactor wiring
Internal hardware fault
Internal hardware fault
Ensure contactor doesn't exceed maximum current and check contactor wiring
Ensure contactor driver current target is within range
Internal hardware fault

