

G2V3 (>=b414) Updated: 12/12/2016

Fault Number / Name	Type	Action	Display to User	Supplier Code	Brief Description
f101_IO_PTOEnable	Permanent	Controlled SD	TRUE	NA	HCU output driver/signal issue
f102_IO_EngineStart	Permanent		TRUE	NA	HCU output driver/signal issue
f103_IO_HydraulicOrClutchRequest	Permanent		TRUE	NA	HCU output driver/signal issue
f104_IO_EngineStop	Permanent		TRUE	NA	HCU output driver/signal issue
f105_IO_DCtoDCEnable	Permanent		TRUE	NA	HCU output driver/signal issue
f106_IO_InverterEnable	Permanent		TRUE	NA	HCU output driver/signal issue
f107_IO_CoolingPumpEnable	Permanent		TRUE	NA	HCU output driver/signal issue
f108_IO_DisplayEnable	Permanent		TRUE	NA	HCU output driver/signal issue
f109_IO_PackEnable	Permanent		TRUE	NA	HCU output driver/signal issue
f110_IO_CompressorDriver	Permanent		TRUE	NA	HCU output driver/signal issue
f111_IO_CrankInhibit	Permanent		TRUE	NA	HCU output driver/signal issue
f112_IO_HeaterEnable	Permanent		TRUE	NA	HCU output driver/signal issue
f113_IO_Brusa_PathwaysEnable	Permanent		TRUE	NA	HCU output driver/signal issue
f114_IO_EngineSpeedUp	Permanent		TRUE	NA	HCU output driver/signal issue
f115_IO_HornEnable	Permanent		TRUE	NA	HCU output driver/signal issue
f116_IO_EnableEngineSpeed	Permanent		TRUE	NA	HCU output driver/signal issue
f117_IO_AirConditioningEnable	Permanent		TRUE	NA	HCU output driver/signal issue
f118_IO_HVJBDischarge	Permanent		TRUE	NA	HCU output driver/signal issue
f119_IO_CompressorFanEnable	Permanent		TRUE	NA	HCU output driver/signal issue
f120_IO_ExportablePowerEnable	Permanent		TRUE	NA	HCU output driver/signal issue
f121_IO_PTOPressureSense	Not Permanent		TRUE	NA	PTO pressure signal not detected
f122_BMS_HVIL	Permanent	Critical SD	TRUE	NA	BMS HVIL input not detected. Note: This fault action is hardcoded.
f123_AC_CompSpeed	Permanent		TRUE	NA	Major speed difference between commanded and actual
f124_Mitsubishi_Compressor_Faulted	Not Permanent		TRUE	NA	A faulted status is coming from the Mitsubishi compressor controller
f125_Switch_HVJB_DCDC_Charger_Motor_HVIL	Permanent	Critical SD	TRUE	NA	HVIL input not detected Note: This fault action is hardcoded.
f126_ExportablePower_And_AC_HVIL	Permanent	Critical SD	TRUE	NA	Exportable Power & AC HVIL input not detected Note: This fault is hardcoded.
f127_Ignition_SwitchOORHigh	Not Permanent		TRUE	NA	Ignition switch input higher than expected
f128_Ignition_SwitchOORLow	Not Permanent		TRUE	NA	Ignition switch input lower than expected
f129_HVACHighSidePressSensOORHigh	Not Permanent		TRUE	NA	HVAC highside pressure sensor input higher than expected
f130_HVACHighSidePressSensOORLow	Not Permanent		TRUE	NA	HVAC highside pressure sensor input lower than expected
f131_Brusa_ChrgPrxSwhOORHigh	Not Permanent		TRUE	NA	Charger prox switch input higher than expected
f132_Brusa_ChrgPrxSwhOORLow	Not Permanent		TRUE	NA	Charger prox switch input lower than expected
f133_HydPressureRequestOORHigh	Not Permanent		TRUE	NA	Hydraulic pressure request input higher than expected
f134_HydPressureRequestOORLow	Not Permanent		TRUE	NA	Hydraulic pressure request input lower than expected
f135_HydraulicFlowSensorOORHigh	Not Permanent		TRUE	NA	Hydraulic flow sensor input higher than expected
f136_HydraulicFlowSensorOORLow	Not Permanent		TRUE	NA	Hydraulic flow sensor input lower than expected
f137_CurrentWays_ChrgPrxSwhOORLow	Not Permanent		TRUE	NA	Charger prox switch input lower than expected
f138_CurrentWays_ChrgPrxSwhOORHigh	Not Permanent		TRUE	NA	Charger prox switch input higher than expected
f139_BMS_HVILoorHigh	Not Permanent		TRUE	NA	BMS HVIL input higher than expected
f140_BMS_HVILoorLow	Not Permanent		TRUE	NA	BMS HVIL input lower than expected
f141_HighSpeedRequestOORHigh	Not Permanent		TRUE	NA	High speed request input higher than expected
f142_HighSpeedRequestOORLow	Not Permanent		TRUE	NA	High speed request input lower than expected
f143 - f145 Spare					
f146_HVDischargeTimeout	Not Permanent		TRUE	NA	HV Discharge failed, with Phoenix Inverter or HVJB resistor
f147_Switch_HVJB_DCDC_Charger_Motor_HVILoorHigh	Not Permanent		TRUE	NA	HVJB/DCDC/Charger/Motor HVIL input higher than expected
f148_Switch_HVJB_DCDC_Charger_Motor_HVILoorLow	Not Permanent		TRUE	NA	HVJB/DCDC/Charger/Motor HVIL input lower than expected
f149_ExpPwrAndAC_HVILoorHigh	Not Permanent		TRUE	NA	Exportable Power & AC HVIL input higher than expected
f150_ExpPwrAndAC_HVILoorLow	Not Permanent		TRUE	NA	Exportable Power & AC HVIL input lower than expected
f151_AC_BlowerEnabledOORHigh	Not Permanent		TRUE	NA	AC blower enabled input higher than expected
f152_AC_BlowerEnabledOORLow	Not Permanent		TRUE	NA	AC blower enabled input lower than expected
f153_Boss_CompressorTempSsrOORHigh	Not Permanent		TRUE	NA	Compressor temperature sensor input higher than expected
f154_Boss_CompressorTempSsrOORLow	Not Permanent		TRUE	NA	Compressor temperature sensor input lower than expected
f155_CompressorRecvrPressSsrOORHigh	Not Permanent		TRUE	NA	Compressor receiver pressure sensor input higher than expected
f156_CompressorRecvrPressSsrOORLow	Not Permanent		TRUE	NA	Compressor receiver pressure sensor input lower than expected
f157_CompressorResvrPressSsrOORHigh	Not Permanent		TRUE	NA	Compressor reservoir pressure sensor input higher than expected
f158_CompressorResvrPressSsrOORLow	Not Permanent		TRUE	NA	Compressor reservoir pressure sensor input lower than expected

f159_Vanair_CompressorTempSsrOORHigh	Not Permanent		TRUE	NA	Compressor temperature sensor input higher than expected
f160_Vanair_CompressorTempSsrOORLow	Not Permanent		TRUE	NA	Compressor temperature sensor input lower than expected
f161_CabinTempSensorOORHigh	Not Permanent		TRUE	NA	Cabin temperature sensor input higher than expected
f162_CabinTempSensorOORLow	Not Permanent		TRUE	NA	Cabin temperature sensor input lower than expected
f163_AirFlowSensorOORHigh	Not Permanent		TRUE	NA	Air flow sensor input higher than expected
f164_AirFlowSensorOORLow	Not Permanent		TRUE	NA	Air flow sensor input lower than expected
f165_HydrPressSensorOORHigh	Not Permanent		TRUE	NA	Hydraulic pressure sensor 1 input higher than expected
f166_HydrPressSensorOORLow	Not Permanent		TRUE	NA	Hydraulic pressure sensor 1 input lower than expected
f167_PTO_Slip	Permanent		TRUE	NA	RPM delta between input and output speed higher than expected
f168_IO_HoodSwitch	Not Permanent		TRUE	NA	Hood is open while engine is off
f169_PTOPressureSenseOORHigh	Not Permanent		TRUE	NA	PTO pressure sensor input higher than expected
f170_PTOPressureSenseOORLow	Not Permanent		TRUE	NA	PTO pressure sensor input lower than expected
f171_Spare					
f172_Switch_CANTimeout	Not Permanent		TRUE	NA	Switch CAN message was not received as expected
f173_HoodSwitchOORHigh	Not Permanent		TRUE	NA	Hood switch input higher than expected
f174_HoodSwitchOORLow	Not Permanent		TRUE	NA	Hood switch input lower than expected
f175_ServiceDisableOORHigh	Not Permanent		TRUE	NA	Hybrid disable switch input higher than expected
f176_ServiceDisableOORLow	Not Permanent		TRUE	NA	Hybrid disable switch input lower than expected
f177_IO_ServiceDisable	Not Permanent	Controlled SD	TRUE	NA	Hybrid system has been disabled with service disable connector or calibration
f178_OutAirTempSensOORHigh	Not Permanent		TRUE	NA	Outside air temperature sensor input higher than expected
f179_OutAirTempSensOORLow	Not Permanent		TRUE	NA	Outside air temperature sensor input higher than expected
f180_IO_MPRD	Permanent		TRUE	NA	HCU output driver/signal issue
f181_CAN1BusPassive	Not Permanent	Controlled SD	TRUE	NA	CAN1 bus not responding
f182_CAN1TxError	Not Permanent	Controlled SD	TRUE	NA	CAN1 bus has more errors than expected
f183_CAN1RxError	Not Permanent	Controlled SD	TRUE	NA	CAN1 bus has more errors than expected
f184_CAN2BusPassive	Not Permanent	Controlled SD	TRUE	NA	CAN2 bus not responding
f185_CAN2TxError	Not Permanent	Controlled SD	TRUE	NA	CAN2 bus has more errors than expected
f186_CAN2RxError	Not Permanent	Controlled SD	TRUE	NA	CAN2 bus has more errors than expected
f187_Spare					
f188_CompressorOverPressure	Not Permanent		TRUE	NA	Compressor pressure higher than expected
f189_CompressorOverTemp	Not Permanent		TRUE	NA	Compressor temperature higher than expected
f190_MiniView_CANTimeout	Not Permanent		TRUE	NA	Miniview CAN message was not received as expected
f191_HVACOverPressure	Not Permanent		TRUE	NA	HVAC pressure higher than expected
f192_EngineStartFault	Not Permanent		TRUE	NA	Could not start engine
f193_CAN3BusPassive	Not Permanent	Controlled SD	TRUE	NA	CAN3 bus not responding
f194_CAN3TxError	Not Permanent	Controlled SD	TRUE	NA	CAN3 bus has more errors than expected
f195_CAN3RxError	Not Permanent	Controlled SD	TRUE	NA	CAN3 bus has more errors than expected
f196_J1939CANTimeout	Not Permanent	Controlled SD	TRUE	NA	Chassis J1939 CAN message was not received as expected
f197_TelematicsCANTimeout	Not Permanent		TRUE	NA	Telematics CAN message was not received as expected
f198_MotorOverSpeedFault	Not Permanent		TRUE	NA	Motor/shaft speed higher than PTO RPM max limit
f199_EngineSpeedCalMismatch	Permanent	Controlled SD	TRUE	NA	Engine PTO set speed differs from HCU PTO set speed by more than 100 rpm
f200_LaunchRegenFault	Permanent		TRUE	NA	PTO slip occurred during launch or regen operation
f201_SpeedControlFault	Permanent	Controlled SD	TRUE	NA	Desired motor speed not achieved
f202_CompressorClutchFault	Permanent		TRUE	NA	Compressor or clutch not engaged as expected due to blow down
f203_HydraulicPressSens2OORHigh	Not Permanent		TRUE	NA	Hydraulic pressure sensor 2 input higher than expected
f204_HydraulicPressSens2OORLow	Not Permanent		TRUE	NA	Hydraulic pressure sensor 2 input lower than expected
f205_12V_BusLow	Not Permanent	Controlled SD	TRUE	NA	12V bus lower than expected
f206_Spare					
f207_Charger_CmdDiscrepancy	Not Permanent		TRUE	NA	Charger output is not following command.
f208_PackCurrentUneven	Not Permanent		TRUE	NA	Current difference between JCS batteries is higher than expected
f209_SystemCurrentDiscrepancy	Not Permanent		TRUE	NA	Current sensor values do not sum as expected
f210_Inverter_VoltageCorrelation	Not Permanent		TRUE	NA	Voltage reported from Phoenix is not as expected under load.
f211_PumpCmdDiscrepancy	Not Permanent		TRUE	NA	EMP Pump not following command.
f212_FanCmdDiscrepancy	Not Permanent		TRUE	NA	EMP Fan not following command.
f213_Inverter_CmdDiscrepancy	Not Permanent		TRUE	NA	Phoenix motor torque not following command.
f214_ExpPwrCmdDiscrepancy	Not Permanent		TRUE	NA	Bel output not following command.
f215_Pack1_CmdDiscrepancy	Not Permanent		TRUE	NA	JCS1 contactors not following command.
f216_Pack2_CmdDiscrepancy	Not Permanent		TRUE	NA	JCS2 contactors not following command.
f217_DCDCCmdDiscrepancy	Not Permanent		TRUE	NA	DCDC output is not following command.
f218_EVSE_Contactor	Not Permanent		TRUE	NA	EVSE not closing contactors to provide grid power

f219_PackSOC_Conflict	Permanent	Controlled SD	TRUE	NA	SOC difference between pack 1 & 2 greater than limit
f220_Inverter_HVMismatch	Not Permanent		TRUE	NA	Inverter voltage does not match other voltage measurements
f221_Charger_HVMismatch	Not Permanent		TRUE	NA	Charger voltage does not match other voltage measurements
f222_Pack1_HVMismatch	Not Permanent		TRUE	NA	Pack1 voltage does not match other voltage measurements
f223_Pack2_HVMismatch	Not Permanent		TRUE	NA	Pack2 voltage does not match other voltage measurements
f224_DCDC_HVMismatch	Not Permanent		TRUE	NA	DCDC voltage does not match other voltage measurements
f225_Inverter_LVMismatch	Not Permanent		TRUE	NA	Inverter low voltage does not match other low voltage measurements
f226_DCDC_LVMismatch	Not Permanent		TRUE	NA	DCDC low voltage does not match other low voltage measurements
f227_Motor_TempHigh	Not Permanent	Controlled SD	TRUE	NA	Motor temperature too high to continue operating
f228_Inverter_TempHigh	Not Permanent	Controlled SD	TRUE	NA	Inverter temperature too high to continue operating
f229_Pack1_TempHigh	Not Permanent	Controlled SD	TRUE	NA	Pack1 temperature too high to continue operating
f230_Pack2_TempHigh	Not Permanent	Controlled SD	TRUE	NA	Pack2 temperature too high to continue operating
f231_Pack1_TempLow	Not Permanent	Controlled SD	TRUE	NA	Pack1 temperature too low to continue operating
f232_Pack2_TempLow	Not Permanent	Controlled SD	TRUE	NA	Pack2 temperature too low to continue operating
f233_HV_IsolationFault	Permanent	Critical SD	TRUE	NA	Isolation measurement of HV system is below acceptable limits.
f234_0SocShutdownKO	Not Permanent	Controlled SD	TRUE	NA	SOC is 0% in key-on mode, and hybrid is disabled to avoid locking out the RESS.
f235_0SocShutdownPI	Not Permanent	Controlled SD	TRUE	NA	SOC is 0% in plug-in mode, and hybrid is disabled to avoid locking out the RESS.
f236_HVACLowSidePressSwOORHigh	Not Permanent		TRUE	NA	
f237_HVACLowSidePressSwOORLow	Not Permanent		TRUE	NA	
f238- f299_Spare					
f300_Phoenix_APhaseHighGateDriverFault	Not Permanent		TRUE	520302/6	Phase A Low Side Gate Drive Fault
f301_Phoenix_APhaseLowGateDriverFault	Not Permanent		TRUE	520303/6	Phase A High Side Gate Drive Fault
f302_Phoenix_BPhaseLowGateDriverFault	Not Permanent		TRUE	520304/6	Phase B Low Side Gate Drive Fault
f303_Phoenix_BPhaseHighGateDriverFault	Not Permanent		TRUE	520305/6	Phase B High Side Gate Drive Fault
f304_Phoenix_CPhaseLowGateDriverFault	Not Permanent		TRUE	520306/6	Phase C Low Side Gate Drive Fault
f305_Phoenix_CPhaseHighGateDriverFault	Not Permanent		TRUE	520307/6	Phase C High Side Gate Drive Fault
f306_Phoenix_APhaseOverCurrent	Not Permanent		TRUE	522912/0	Phase A Overcurrent Fault
f307_Phoenix_BPhaseOverCurrent	Not Permanent		TRUE	522911/0	Phase B Overcurrent Fault
f308_Phoenix_CPhaseOverCurrent	Not Permanent		TRUE	522910/0	Phase C Overcurrent Fault
f309_Phoenix_MotorOverSpeed	Not Permanent		TRUE	524039/16	Motor Over Speed Warning
f310_Phoenix_MotorTripSpeed	Not Permanent		TRUE	524039/0	Motor Trip Speed Fault
f311_Phoenix_BusHardwareOverVoltage	Not Permanent		TRUE	522819/16	HVDC Bus Overvoltage Fault
f312_Phoenix_BusSoftwareOverVoltage	Not Permanent		TRUE	522819/15	HVDC Bus Overvoltage Warning
f313_Phoenix_BusSoftwareUnderVoltage	Not Permanent		TRUE	522819/17	HVDC Bus Low Voltage Warning
f314_Phoenix_HardwareInverterOverTemp	Not Permanent		TRUE	521362/0	HW Drive Temperature Fault
f315_Phoenix_SoftwareInverterOverTemp	Not Permanent		TRUE	521362/16	SW Drive Temperature Fault
f316_Phoenix_MotorWindingOverTemp	Not Permanent		TRUE	521212/0	Motor Winding Temperature Fault
f317_Phoenix_BusInterlock	Permanent	Critical SD	TRUE	521371/31	HVDC Bus Interlock Fault
f318_Phoenix_PhaseInterlock	Permanent	Critical SD	TRUE	521371/12	Phase Interlock Fault
f319_Phoenix_DriveCommandMissing	Permanent	Controlled SD	TRUE	2003/9	Drive Command Missing Fault
f320_Phoenix_EOLCompatibility	Not Permanent		TRUE	521372/31	EOL Compatibility Fault
f321_Phoenix_EOLChecksum	Not Permanent		TRUE	521601/31	EOL Checksum Fault
f322_Phoenix_EEPROMChecksum	Not Permanent		TRUE	628/31	NVM Section Fault
f323_Phoenix_BatteryVoltageHighWarn	Not Permanent		TRUE	168/3	Battery Voltage High Warning
f324_Phoenix_BatteryVoltageLowWarn	Not Permanent		TRUE	168/4	Battery Voltage Low Warning
f325_Phoenix_BatteryVoltageHigh	Not Permanent		TRUE	168/0	Battery High Voltage Fault
f326_Phoenix_BatteryVoltageLow	Not Permanent		TRUE	168/1	Battery Low Voltage Fault
f327_Phoenix_15VVoltageHigh	Not Permanent		TRUE	521786/3	15V Power Supply High Voltage Warning
f328_Phoenix_15VVoltageLow	Not Permanent		TRUE	521786/4	15V Power Supply Low Voltage Warning
f329_Phoenix_MotorNotDetected	Not Permanent		TRUE	521785/7	Motor Not Detected Fault
f330_Phoenix_ResolverSignalError	Not Permanent		TRUE	522919/2	Position Sensor Signal Fault
f331_Spare					
f332_Phoenix_PCBOverTemp	Not Permanent		TRUE	523455/0	PCB Temperature Fault
f333_Phoenix_FactoryCalibration	Not Permanent		TRUE	520579/13	Factory Calibration Warning
f334_Phoenix_PositionDirectionMismatch	Not Permanent		TRUE	522919/7	Motor And Position Sensor Direction Mismatch Fault
f335_Phoenix_HardStopFault	Not Permanent		TRUE	3118/31	External Drive Disable Fault
f336_Phoenix_PowerDownWithHighVoltage	Not Permanent		TRUE	523719/0	Shut Down with Voltage Warning
f337_Phoenix_PowerDownWithSpeed	Not Permanent		TRUE	523719/16	Shut Down with Speed Warning
f338_Phoenix_PowerDownWithDriveEnabled	Not Permanent		TRUE	523719/31	Shut Down with Drive Enabled Warning
f339_Phoenix_PhaseANotConnected	Not Permanent		TRUE	521268/5	Phase A Missing Fault

f340	Phoenix_PhaseBNotConnected	Not Permanent		TRUE	521272/5	Phase B Missing Fault
f341	Phoenix_PhaseCNotConnected	Not Permanent		TRUE	521278/5	Phase C Missing Fault
f342	Phoenix_PositionSensorPositionChangeError	Not Permanent		TRUE	522919/10	Position Sensor No Change Fault
f343	Phoenix_AttemptPrechargeInverterNotInStandby	Not Permanent		TRUE	524020/31	Power Up While Drive Not in Standby Warning
f344	Phoenix_CANTimeout	Not Permanent	Controlled SD	TRUE	NA	Inverter CAN message was not received as expected
f345	Phoenix_AttemptPrechargeInverterNotInStandby	Not Permanent		TRUE	523716/4	Precharge Timeout Fault
f346	Phoenix_PositionReadFault	Not Permanent		TRUE	522919/31	Position Sensor Read Fault
f347	Phoenix_DischargeTimeout	Not Permanent		TRUE	521359/3	Discharge Timeout Fault
f348	Phoenix_PositionOffsetNotFound	Not Permanent		TRUE	522919/11	Position Offset Not Found Fault
f349	Phoenix_PositionNotCalibrated	Not Permanent		TRUE	522919/14	Position Not Calibrated Warning
f350	Phoenix_PositionOutOfTolerance	Not Permanent		TRUE	522919/13	Position Out Of Tolerance Warning
f351	Phoenix_OtherFault	Not Permanent		TRUE	Others	Phoenix inverter fault/warning which is not specified in HCU.
f352	Sevcon_CANTimeout	Not Permanent	Controlled SD	TRUE	NA	Sevcon inverter CAN messages not received
f353	Sevcon_InverterFaulted	Not Permanent		TRUE	NA	Sevcon inverter is reporting it is faulted
f354 - f374 Spare						
f375	Allison_CANTimeout	Not Permanent		TRUE	NA	Allison EM77 CAN message was not received as expected
f376	Allison_NoECMComm	Not Permanent		TRUE	NA	TCM not able to communicate with ECM
f377 - f400 Spare						
f401	Brusa_PowerLimitedByLowMainsVoltage	Not Permanent		TRUE	NA	Charger output is limited because input voltage is low.
f402	Brusa_PowerLimitedByChargerOverTemp	Not Permanent		TRUE	NA	Charger output is limited because charger is hot.
f403	Brusa_VeHI_na_PowerLimitedByLowBatteryVoltage	Not Permanent		TRUE	NA	Charger output is limited because battery voltage is low.
f404	Brusa_ValueOutOfRange	Not Permanent		TRUE	NA	Charger commanded value is out of range.
f405	Brusa_WatchdogTimeout	Not Permanent		TRUE	NA	Charger watchdog timer failed.
f406	Brusa_TransformerTempSensor	Not Permanent		TRUE	NA	Internal charger transformer temperature sensor failed.
f407	Brusa_PowerStageTempSensor	Not Permanent		TRUE	NA	Internal charger power stage temperature sensor failed.
f408	Brusa_TempSensor3	Not Permanent		TRUE	NA	Temperature sensor 3 failed.
f409	Brusa_TempSensor2	Not Permanent		TRUE	NA	Temperature sensor 2 failed.
f410	Brusa_TempSensor1	Not Permanent		TRUE	NA	Temperature sensor 1 failed.
f411	Brusa_DiodeTempSensor	Not Permanent		TRUE	NA	Internal charger diode temperature sensor failed.
f412	Brusa_PrimaryCapTempSensor	Not Permanent		TRUE	NA	Internal charger capacitor temperature sensor failed.
f413	Brusa_ChargingTimeExceeded	Not Permanent		TRUE	NA	Charging time exceeded charger limit.
f414	Brusa_BatteryVoltExceeded	Not Permanent		TRUE	NA	Charger output voltage exceeded limit.
f415	Brusa_BatteryTempExceeded	Not Permanent		TRUE	NA	Charger sensed battery temperature limit exceeded.
f416	Brusa_AmpHoursExceeded	Not Permanent		TRUE	NA	Charger output amp hours exceeded.
f417	Brusa_PowerStageShortCircuit	Not Permanent		TRUE	NA	Charger internal power stage short circuit detected.
f418	Brusa_OutputVoltagePlausibility	Not Permanent		TRUE	NA	Charger output voltage sensor not reading correctly.
f419	Brusa_MainsVoltagePlausibility	Not Permanent		TRUE	NA	Charger input voltage sensor not reading correctly.
f420	Brusa_BatteryOutputVoltage	Not Permanent		TRUE	NA	Charger output voltage exceeded user defined limit.
f421	Brusa_OutputFuse	Not Permanent		TRUE	NA	Charger output fuse has failed.
f422	Brusa_NVSRAMChecksum	Not Permanent		TRUE	NA	Internal charger non volatile memory failure.
f423	Brusa_MainsOvervoltage2	Not Permanent		TRUE	NA	Charger input voltage exceeded limit.
f424	Brusa_VeHI_na_MainsOvervoltage1	Not Permanent		TRUE	NA	Charger input voltage exceeded limit.
f425	Brusa_MainsFuseDefective	Not Permanent		TRUE	NA	Charger input fuse has failed.
f426	Brusa_InitializationError	Not Permanent		TRUE	NA	Internal charger controller failure.
f427	Brusa_FlashMemoryChecksum	Not Permanent		TRUE	NA	Internal charger flash memory failure.
f428	Brusa_SysEEPROMChecksum	Not Permanent		TRUE	NA	Internal charger system EEPROM memory failure.
f429	Brusa_PowEEPROMChecksum	Not Permanent		TRUE	NA	Internal charger power EEPROM memory failure.
f430	Brusa_CANTx	Not Permanent		TRUE	NA	Charger detected error sending CAN messages.
f431	Brusa_CANTimeout	Not Permanent		TRUE	NA	Brusa not communicating with HCU, determined by Brusa.
f432	Brusa_CANReceiveBufferFull	Not Permanent		TRUE	NA	Charger CAN message receive buffer overflowed.
f433	Brusa_CANOff	Not Permanent		TRUE	NA	Charger CAN is disabled
f434	Brusa_BatteryPolarity	Not Permanent		TRUE	NA	Charger detected incorrect connection at output.
f435	Brusa_CANTimeout	Not Permanent	Controlled SD	TRUE	NA	Brusa CAN message was not received as expected
f436 - f439 Spare						
f440	EMP_PumpCANTimeout	Not Permanent		TRUE	NA	EMP pump CAN message was not received as expected
f441	EMP_FanCANTimeout	Not Permanent		TRUE	NA	EMP fan CAN message was not received as expected
f442	HCT_FanCANTimeout	Not Permanent		TRUE		HCT fan CAN message was not received as expected
f443 - f449 Spare						
f450	PumpMotorOverTemp	Not Permanent		TRUE	NA	Cooling system pump is over temperature.
f451 - f461 Spare						

f462_FanMotorOverTemp	Not Permanent		TRUE	NA	Cooling system fan motor is over temperature.
f463 - f469 Spare					
f470_CurrentWays_CANTimeout	Not Permanent	Controlled SD	TRUE	NA	Current Ways CAN message was not received as expected.
f471_CurrentWays_PFCOverTemp	Not Permanent		TRUE	NA	Charger power factor correction stage temperature exceeded limit.
f472_CurrentWays_DCDCOverTemp	Not Permanent		TRUE	NA	Charger DCDC converter temperature exceeded limit.
f473_CurrentWays_OutputOverCurrent	Not Permanent		TRUE	NA	Charger output current > 110% of maximum limit.
f474_CurrentWays_OutputOverVoltage	Not Permanent		TRUE	NA	Charger output voltage > 110% of maximum limit.
f475_CurrentWays_OutputOverPower	Not Permanent		TRUE	NA	Charger output power > 115% of maximum limit.
f476_CurrentWays_InterlockFailure	Permanent	Critical SD	TRUE	NA	Charger interlock circuit failure detected.
f477_CurrentWays_BiasVoltOutOfTolerance	Not Permanent		TRUE	NA	Internal supply out of range.
f478_CurrentWays_ACOutOfRange	Not Permanent		TRUE	NA	Charger input voltage out of range.
f479 - f499 Spare					
f500_Delphi_LowVoltageSystemFault	Not Permanent		TRUE	0	Sets when there is temperature imbalance between sensors, phase current imbalance or gate drive voltage failure
f501_Delphi_CANTimeout	Not Permanent	Controlled SD	TRUE	NA	DC/DC CAN message was not received as expected
f502_Delphi_HighVoltageHighFault	Not Permanent		TRUE	2	HV input greater than 430V limit.
f503_Delphi_HighVoltageLowFault	Not Permanent		TRUE	3	HV input less than 207V limit.
f504 - f505 Spare					
f506_Delphi_LowVoltageHighFault	Not Permanent		TRUE	6	LV output greater than 16.3V limit.
f507_Delphi_LowVoltageLowFault	Not Permanent		TRUE	7	LV output less than 9.5V limit.
f508_Delphi_BuckOnVoltageLowFault	Not Permanent		TRUE	8	LV output less than 6.56V in buck mode.
f509 - f511 Spare					
f512_Delphi_BoostOnHighVoltageFault	Not Permanent		TRUE	12	HV output less than 172V in boost mode.
f513_Delphi_LossOfCom	Not Permanent		TRUE	13	CAN command message not received by DCDC converter.
f514_Delphi_HeatPlateTempFault	Not Permanent		TRUE	14	Coolant greater than 85C or electronics greater than 95C limits.
f515_Delphi_14VCurrentHighFault	Not Permanent		TRUE	15	LV current greater than 205A limit.
f516_Delphi_HVCurrentHighFault	Not Permanent		TRUE	16	HV current greater than 15.6A limit.
f517_Delphi_ILIM_Diagnostics	Not Permanent		TRUE	17	DCDC current sensor output invalid.
f518_Delphi_CmdOutOfRange	Not Permanent		TRUE	19	DCDC command out of range
f519 - f524 Spare					
f525_Bel_EP_CANTimeout	Not Permanent		TRUE	NA	BelPower CAN message was not received as expected
f526_Bel_EP_L1OverCurrent	Not Permanent		TRUE	NA	Over current on output L1
f527_Bel_EP_OverTemp	Not Permanent		TRUE	NA	Over temperature protection has been activated
f528_Bel_EP_PosBusOverVoltage	Not Permanent		TRUE	NA	Positive internal bus is over limit
f529_Bel_EP_PosBusUnderVoltage	Not Permanent		TRUE	NA	Positive internal bus is under limit
f530_Bel_EP_NegBusOverVoltage	Not Permanent		TRUE	NA	Negative internal bus is over limit
f531_Bel_EP_NegBusUnderVoltage	Not Permanent		TRUE	NA	Negative internal bus is under limit
f532_Bel_EP_Fault	Not Permanent		TRUE	NA	Inverter general fault
f533_Bel_EP_I2CFault	Not Permanent		TRUE	NA	Internal I2C bus fault
f534_Bel_EP_DriverFault	Not Permanent		TRUE	NA	Internal IGBT driver fault
f535_Bel_EP_CANfault	Not Permanent		TRUE	NA	CAN bus fault
f536_Bel_EP_CBC_OverCurrent	Not Permanent		TRUE	NA	Cycle by cycle current limit has been activated
f537_Bel_EP_EEPROMCRCFault	Not Permanent		TRUE	NA	Internal EEPROM CRC fault
f538_Bel_EP_L2OverCurrent	Not Permanent		TRUE	NA	Over current on output L2
f539_Bel_EP_ShortCircuit	Not Permanent		TRUE	NA	Short circuit occurs on output
f540_Bel_EP_ThermistorFault	Not Permanent		TRUE	NA	Temperature sensor failed, temperature reading can't be trusted
f541 - f449 Spare					
f550_PathWays_CANTimeout	Not Permanent		TRUE	NA	Pathways CAN message was not received as expected
f551_PathWays_ServerNotFound	Not Permanent		TRUE	NA	The smart energy server was not found.
f552_PathWays_PrevSessionNotComplete	Not Permanent		TRUE	NA	User might have unplugged the charger, or communications could have been lost.
f553_PathWays_PrevSessionHybError	Not Permanent		TRUE	NA	If the Hybrid Controller had an error which was indicated to the MPR1.
f554 - f459 Spare					
f560_Bel_DC_InputUV	Not Permanent		TRUE	0	Input under-voltage on Bel DC/DC
f561_Bel_DC_InputOV	Not Permanent		TRUE	1	Input over-voltage on Bel DC/DC
f562_Bel_DC_OutputUV	Not Permanent		TRUE	2	Output under-voltage on Bel DC/DC
f563_Bel_DC_OutputOV	Not Permanent		TRUE	3	Output over-voltage on Bel DC/DC
f564_Bel_DC_OutputOC	Not Permanent		TRUE	4	Output over-current on Bel DC/DC
f565_Bel_DC_OTP	Not Permanent		TRUE	5	Bel DC/DC is over temperature threshold
f566_Bel_DC_CANFault	Not Permanent		TRUE	7	CAN bus fault on Bel DC/DC
f567_Bel_DC_ShortCircuit	Not Permanent		TRUE	9	Output of Bel DC/DC is short-circuit

f568_Bel_DC_ThermistorFault	Not Permanent		TRUE	10	Temperature sensor in Bel DC/DC failed. Reading cannot be trusted.
f569_Bel_DC_Overload	Not Permanent		TRUE	11	Bel DC/DC Overload
f570_Bel_DC_OutputOVLatch	Not Permanent		TRUE	12	Output voltage over-voltage latch on Bel DC/DC
f571_Bel_DC_HVIL	Not Permanent	Critical SD	TRUE	55	The Bel DC/DC is indicating an HVIL error.
f572_Bel_DC_CANTimeout	Not Permanent	Controlled SD	TRUE	NA	DC/DC CAN message was not received as expected
f573 - f596 Spare					
f597_JCS1_MILLevel1MIL	Not Permanent		TRUE	NA	MIL state is at level 1
f598_JCS1_MILLevel3LOS	Permanent	Controlled SD	TRUE	NA	MIL state is at level 3
f599_JCS1_MILLevel4QOR	Permanent	Controlled SD	TRUE	NA	MIL state is at level 4
f600_JCS1_CANTimeout	Not Permanent	Controlled SD	TRUE	NA	JCI pack 1 CAN message was not received as expected
f601_JCS1_InternalControlModuleMemoryChecksumError	Not Permanent		TRUE	1537	Set fault if the LLSW flags a flash CRC fault
f602_JCS1_HighVoltageSystemInterlockCircuit	Permanent	Critical SD	TRUE	2570	Set fault if HVIL is not measured (HVIL state = STD_IDLE)
f603_JCS1_ContactorEnableFault	Not Permanent		TRUE	2571	Set fault if the contactors command signal is active and HVIL is inactive for the calibrated debounce time or Set fault if contactors are not enabled and the system on time is greater than contactor enable startup time calibration
f604_JCS1_HighVoltageSystemInterlockCircuit	Not Permanent		TRUE	2573	Set if error with HVIL system.
f605_JCS1_PackStateOfChargeLow	Not Permanent		TRUE	2685	This fault will set when a cell voltage is less than the calibrated minimum limit for the calibrated debounce time. The battery will open contactors after a ten second delay.
f606_JCS1_PackOverTemp	Not Permanent		TRUE	2686	Temperature fault is set if the max cell temperature is greater than the high temperature fault threshold for the calibrated debounce time.
f607_JCS1_TempSensorRat	Not Permanent		TRUE	2716	This error will set if any of the temperature sensors vary from the average temperature by more than the calibration or a temp sensor rate of change is greater than calibration.
f608_JCS1_TempSensor0CircuitLow	Not Permanent		TRUE	2717	Temp sensor 0 out of range low
f609_JCS1_TempSensor0CircuitHigh	Not Permanent		TRUE	2718	Temp sensor 0 out of range high
f610_JCS1_PosContactorCircuit	Not Permanent		TRUE	2720	Set fault if the main high side driver feedback voltage is greater than the main high side driver feedback voltage out of range high calibration
f611_JCS1_PosContactorCircuitStuckClosed	Not Permanent		TRUE	2721	Set fault if the vcross 2 voltage measurement is greater than the calibrated threshold
f612_JCS1_PosContactorCircuitStuckOpen	Not Permanent		TRUE	2722	Set fault if the vcross 2 voltage measurement is less than the calibrated threshold
f613_JCS1_NegContactorCircuitStuckClosed	Not Permanent		TRUE	2724	Set fault if the vcross 1 voltage measurement is greater than the calibrated threshold
f614_JCS1_NegContactorCircuitStuckOpen	Not Permanent		TRUE	2725	Set fault if the vcross 1 voltage measurement is less than the calibrated threshold
f615_JCS1_VoltageSystemIsolationFault	Permanent	Critical SD	TRUE	2726	Sets fault if the isolation calculated is less than the min limit ohms per volt calibration
f616_JCS1_VoltageIsolationSensorCircuit	Not Permanent	Critical SD	TRUE	2727	Set if isolation measurement error
f617_JCS1_VoltageIsolationSensorPower	Not Permanent		TRUE	2728	Set if isolation circuit reports a power supply error.
f618_JCS1_VoltageIsolationSensorVrefLow	Not Permanent		TRUE	2729	Set fault is reference voltage is below minimum for isolation measurement.
f619_JCS1_VoltageIsolationSensorVrefHigh	Not Permanent		TRUE	2730	Set fault is reference voltage is above maximum for isolation measurement.
f620_JCS1_PackVoltageSenseRat	Not Permanent		TRUE	2747	Set fault if the battery rational voltage calculation is greater than the pack voltage cell sum voltage delta percent calibration.
f621_JCS1_PackVoltageSenseCircuitLow	Not Permanent		TRUE	2748	Set if Pack Voltage is below the Out of Range Low Voltage CAL
f622_JCS1_PackVoltageSenseCircuitHigh	Not Permanent		TRUE	2749	Set if Pack Voltage is greater than the Out of Range High Voltage CAL
f623_JCS1_PackCurrentSensorCircuitRat	Not Permanent		TRUE	2752	Set if trip amp hours disagrees with trip delta cell voltage by more than calibration.
f624_JCS1_PackCurrentSensorCircuitLow	Not Permanent		TRUE	2753	Sets fault if the battery current is lower than the out of range low battery current amp calibration.
f625_JCS1_PackCurrentSensorCircuitHigh	Not Permanent		TRUE	2754	Sets fault if the battery current is higher than the out of range high battery current amp calibration.
f626_JCS1_TempSensor1CircuitLow	Not Permanent		TRUE	2759	Temp sensor 1 out of range low
f627_JCS1_TempSensor1CircuitHigh	Not Permanent		TRUE	2760	Temp sensor 1 out of range high
f628_JCS1_TempSensor2CircuitLow	Not Permanent		TRUE	2764	Temp sensor 2 out of range low
f629_JCS1_TempSensor3CircuitHigh	Not Permanent		TRUE	2765	Temp sensor 2 out of range high
f630_JCS1_PosContactorControlCircuitPerf	Not Permanent		TRUE	2778	Set fault if the positive main contactor low side driver feedback voltage is greater than the positive main contactor low side driver feedback voltage out of range high calibration
f631_JCS1_PosContactorControlCircuitLow	Not Permanent		TRUE	2779	Set fault if the positive main contactor low side driver short to ground open circuit calculation is greater than the positive main contactor low side driver short to ground open circuit delta voltage calibration

f632_JCS1_PosContactorControlCircuitHigh	Not Permanent		TRUE	2780	Set fault if the positive main contactor low side driver feedback voltage is greater than the positive main contactor low side driver short to battery voltage calibration
f633_JCS1_NegContactorControlCircuitPerf	Not Permanent		TRUE	2782	Set fault if the negative main contactor low side driver feedback voltage is greater than the negative main low side driver feedback voltage out of range high calibration
f634_JCS1_NegContactorControlCircuitLow	Not Permanent		TRUE	2783	Set fault if the negative main contactor short to ground open circuit calculation is greater than the negative main contactor low side driver short to ground open circuit delta voltage calibration
f635_JCS1_NegContactorControlCircuitHigh	Not Permanent		TRUE	2784	Set fault if the negative main contactor low side driver feedback voltage is greater than the negative main low side driver short to battery calibration
f636_JCS1_PrechargeContactorCircuit	Not Permanent		TRUE	2785	Set fault if the battery current is greater than the maximum calculated precharge current calibration
f637_JCS1_PrechargeContactorCircuitPerf	Not Permanent		TRUE	2789	Set fault if the precharge relay low side driver feedback voltage is greater than the precharge relay low side driver feedback voltage out of range high calibration
f638_JCS1_PrechargeContactorControlCircuitLow	Not Permanent		TRUE	2790	Set fault if the precharge relay low side driver short to ground open circuit test calculation is greater than the precharge relay low side driver short to ground open circuit delta voltage calibration
f639_JCS1_PrechargeContactorControlCircuitHigh	Not Permanent		TRUE	2791	Set fault if the precharge relay low side driver feedback voltage is greater than the precharge relay low side driver short to battery voltage calibration
f640_JCS1_TempSensor3CircuitLow	Not Permanent		TRUE	2794	Temp sensor 3 out of range low
f641_JCS1_TempSensor3CircuitHigh	Not Permanent		TRUE	2795	Temp sensor 3 out of range high
f642_JCS1_PackSensorModule	Not Permanent		TRUE	2812	Set if Cell Voltage is greater than the Cell Voltage Out of Range CAL
f643_JCS1_PackTempTooLow	Not Permanent		TRUE	2813	This temperature fault will set if any of the temperature sensors is less than or equal to the no start fault threshold for the calibrated debounce time.
f644_JCS1_BusVoltageSenseCircuitHigh	Not Permanent		TRUE	2839	Set if the Pack Voltage is greater than the specified Out of Range High Voltage CAL
f645_JCS1_VC1VoltageSenseCircuitLow	Not Permanent		TRUE	2843	Set fault if the pack positive to bus negative voltage is less than the vcross 1 out of range low calibration
f646_JCS1_VC1VoltageSenseCircuitHigh	Not Permanent		TRUE	2844	Set fault if the pack positive to bus negative voltage is greater than the vcross 1 out of range high voltage calibration
f647_JCS1_VC2VoltageSenseCircuitLow	Not Permanent		TRUE	2848	Set fault if the bus positive to pack negative voltage is greater than the vcross 2 out of range low voltage calibration
f648_JCS1_VC2VoltageSenseCircuitHigh	Not Permanent		TRUE	2849	Set fault if the bus positive to pack negative is greater than the vcross 2 out of range high voltage calibration
f649_JCS1_DeltaCellVoltage	Not Permanent		TRUE	2876	Set fault if the change in cell voltage is outside of the delta cell voltage calibration.
f650_JCS1_VoltageSense0CircuitLow	Not Permanent		TRUE	2877	Voltage sensor 0 out of range low
f651_JCS1_VoltageSense0CircuitHigh	Not Permanent		TRUE	2878	Voltage sensor 0 out of range high
f652_JCS1_VoltageSense1CircuitLow	Not Permanent		TRUE	2882	Voltage sensor 1 out of range low
f653_JCS1_VoltageSense1CircuitHigh	Not Permanent		TRUE	2883	Voltage sensor 1 out of range high
f654_JCS1_VoltageSense2CircuitLow	Not Permanent		TRUE	2887	Voltage sensor 2 out of range low
f655_JCS1_VoltageSense2CircuitHigh	Not Permanent		TRUE	2888	Voltage sensor 2 out of range high
f656_JCS1_VoltageSense3CircuitLow	Not Permanent		TRUE	2892	Voltage sensor 3 out of range low
f657_JCS1_VoltageSense3CircuitHigh	Not Permanent		TRUE	2893	Voltage sensor 3 out of range high
f658_JCS1_VoltageSense4CircuitLow	Not Permanent		TRUE	2897	Voltage sensor 4 out of range low
f659_JCS1_VoltageSense4CircuitHigh	Not Permanent		TRUE	2898	Voltage sensor 4 out of range high
f660_JCS1_VoltageSense5CircuitLow	Not Permanent		TRUE	2902	Voltage sensor 5 out of range low
f661_JCS1_VoltageSense5CircuitHigh	Not Permanent		TRUE	2903	Voltage sensor 5 out of range high
f662_JCS1_VoltageSense6CircuitLow	Not Permanent		TRUE	2907	Voltage sensor 6 out of range low
f663_JCS1_VoltageSense6CircuitHigh	Not Permanent		TRUE	2908	Voltage sensor 6 out of range high
f664_JCS1_VoltageSense7CircuitLow	Not Permanent		TRUE	2912	Voltage sensor 7 out of range low
f665_JCS1_VoltageSense7CircuitHigh	Not Permanent		TRUE	2913	Voltage sensor 7 out of range high
f666_JCS1_VoltageSense8CircuitLow	Not Permanent		TRUE	2917	Voltage sensor 8 out of range low
f667_JCS1_VoltageSense8CircuitHigh	Not Permanent		TRUE	2918	Voltage sensor 8 out of range high
f668_JCS1_VoltageSense9CircuitLow	Not Permanent		TRUE	2922	Voltage sensor 9 out of range low
f669_JCS1_VoltageSense9CircuitHigh	Not Permanent		TRUE	2923	Voltage sensor 9 out of range high
f670_JCS1_VoltageSense10CircuitLow	Not Permanent		TRUE	2927	Voltage sensor 10 out of range low
f671_JCS1_VoltageSense10CircuitHigh	Not Permanent		TRUE	2928	Voltage sensor 10 out of range high
f672_JCS1_VoltageSense11CircuitLow	Not Permanent		TRUE	2932	Voltage sensor 11 out of range low
f673_JCS1_VoltageSense11CircuitHigh	Not Permanent		TRUE	2933	Voltage sensor 11 out of range high
f674_JCS1_VoltageSense12CircuitLow	Not Permanent		TRUE	2937	Voltage sensor 12 out of range low
f675_JCS1_VoltageSense12CircuitHigh	Not Permanent		TRUE	2938	Voltage sensor 12 out of range high

f676_JCS1_VoltageSense13CircuitLow	Not Permanent		TRUE	2942	Voltage sensor 13 out of range low
f677_JCS1_VoltageSense13CircuitHigh	Not Permanent		TRUE	2943	Voltage sensor 13 out of range high
f678_JCS1_VoltageSense14CircuitLow	Not Permanent		TRUE	2947	Voltage sensor 14 out of range low
f679_JCS1_VoltageSense14CircuitHigh	Not Permanent		TRUE	2948	Voltage sensor 14 out of range high
f680_JCS1_VoltageSense15CircuitLow	Not Permanent		TRUE	2952	Voltage sensor 15 out of range low
f681_JCS1_VoltageSense15CircuitHigh	Not Permanent		TRUE	2953	Voltage sensor 15 out of range high
f682_JCS1_TempSensor4CircuitLow	Not Permanent		TRUE	3012	Temp sensor 4 out of range low
f683_JCS1_TempSensor4CircuitHigh	Not Permanent		TRUE	3013	Temp sensor 4 out of range high
f684_JCS1_MaxCellVoltHigh	Not Permanent		TRUE	3120	Set if Max Cell Voltage is greater than the Max Limit CAL
f685_JCS1_TempSensor5CircuitLow	Not Permanent		TRUE	3125	Temp sensor 5 out of range low
f686_JCS1_TempSensor5CircuitHigh	Not Permanent		TRUE	3126	Temp sensor 5 out of range high
f687_JCS1_12VSupplyOOR	Not Permanent		TRUE	3138	Set fault if the LLSW flags a 12V supply low fault or a 12V supply high fault
f688_JCS1_PackCoolantTempSensorCircuitRat	Not Permanent		TRUE	3139	Set fault if the coolant inlet temp is less than the coolant inlet temp out of range low temp degrees calibration
f689_JCS1_PackCoolantTempSensorCircuitLow	Not Permanent		TRUE	3140	Set fault if the LLSW flags a open circuit fault
f690_JCS1_PackCoolantTempSensorCircuitHigh	Not Permanent		TRUE	3141	Set fault if the LLSW flags a short to battery fault
f691_JCS1_SystemPrechargeTimeTooLong	Not Permanent		TRUE	3192	Set fault if the precharge state equals the precharge state timeout calibration
f692_JCS1_TempSensor6CircuitLow	Not Permanent		TRUE	3198	Temp sensor 6 out of range low
f693_JCS1_TempSensor6CircuitHigh	Not Permanent		TRUE	3199	Temp sensor 6 out of range high
f694_JCS1_TempSensor7CircuitLow	Not Permanent		TRUE	3203	Temp sensor 7 out of range low
f695_JCS1_TempSensor7CircuitHigh	Not Permanent		TRUE	3204	Temp sensor 7 out of range high
f696_JCS1_ChargingCurrentHigh	Not Permanent		TRUE	3238	Sets fault if the battery current is greater than the battery charge current maximum amp calibration for the calibrated debounce time.
f697_JCS1_DischargingCurrentHigh	Not Permanent		TRUE	3239	Sets fault if the battery current is less than the battery discharge current maximum amp calibration for the calibrated debounce time.
f698_JCS1_PowerLimitExceeded	Not Permanent	Controlled SD	TRUE	6667	Set if 0kW power is greater than threshold, or lithium plating reserve is negative or heating capacity is zero or number of invalid cell voltage measurements greater than calibration.
f699_JCS1_ControlModuleCommunicationBusBOff	Not Permanent		TRUE	116	Set fault if the CAN Bus off error is active
f700_JCS1_LostCommunicationWithHCU	Not Permanent		TRUE	659	Set fault if a new vehicle CAN message is not received from the vehicle in the calibrated debounce time
f701_JCS1_InvalidDataReceivedFromHCU	Not Permanent		TRUE	1428	Set fault if a 24E or 24F rolling counter fault is set
f702_JCS1_TempSensorFault	Not Permanent		TRUE	2719	This fault will set when the number of invalid temperature sensors equals the number of temperature sensors in the battery for the calibrated debounce time.
f703_JCS1_SystemClock	Not Permanent		TRUE	4099	Set fault if the alarm time set ok fault is inactive and the hardware alarm SPI fault compliment is inactive
f704_JCS1_ControlModule	Not Permanent		TRUE	12288	Set fault if the LLSW flags a peripheral device reset fault
f705_JCS1_ControlModuleImproperShutdown	Not Permanent		TRUE	12289	Set fault if the LLSW flags a reset hardware watchdog fault, reset divide by zero fault, memory address illegal fault, reset software watchdog fault, invalid opcode fault, stack overflow fault, stack underflow fault, exception trap fault, unexpected interrupt fault, low voltage IND fault, or a clock monitor fault.
f706_JCS1_SystemVoltage	Not Permanent		TRUE	12291	Set if system voltage is not rational or out of range
f707_JCS1_CellVoltageSensor	Not Permanent		TRUE	2879	Set if error detected with cell voltage sensor
f708_JCS1_BusOutOfRange	Not Permanent		TRUE	2750	Voltage sensing fault detected.
f709_JCS1_OtherFault	Not Permanent		TRUE	NA	JCS fault/warning which is not specified in HCU.
f710_JCS2_CANTimeout	Not Permanent	Controlled SD	TRUE	NA	JCI pack 2 CAN message was not received as expected
f711_JCS2_InternalControlModuleMemoryChecksumError	Not Permanent		TRUE	1537	Set fault if the LLSW flags a flash CRC fault
f712_JCS2_HighVoltageSystemInterlockCircuit	Permanent	Critical SD	TRUE	2570	Set fault if HVIL is not measured (HVIL sate = STD_IDLE)
f713_JCS2_ContactorEnableFault	Not Permanent		TRUE	2571	Set fault if the contactors command signal is active and HVIL is inactive for the calibrated debounce time or Set fault if contactors are not enabled and the system on time is greater than contactor enable startup time calibration
f714_JCS2_HighVoltageSystemInterlockCircuit	Not Permanent		TRUE	2573	Set if error with HVIL system.
f715_JCS2_PackStateOfChargeLow	Not Permanent		TRUE	2685	This fault will set when a cell voltage is less than the calibrated minimum limit for the calibrated debounce time. The battery will open contactors after a ten second delay.
f716_JCS2_PackOverTemp	Not Permanent		TRUE	2686	Temperature fault is set if the max cell temperature is greater than the high temperature fault threshold for the calibrated debounce time.
f717_JCS2_TempSensorRat	Not Permanent		TRUE	2716	This error will set if any of the temperature sensors vary from the average temperature by more than the calibration or a temp sensor rate of change is greater than calibration.

f718_JCS2_TempSensor0CircuitLow	Not Permanent		TRUE	2717	Temp sensor 0 out of range low
f719_JCS2_TempSensor0CircuitHigh	Not Permanent		TRUE	2718	Temp sensor 0 out of range high
f720_JCS2_PosContactorCircuit	Not Permanent		TRUE	2720	Set fault if the main high side driver feedback voltage is greater than the main high side driver feedback voltage out of range high calibration
f721_JCS2_PosContactorCircuitStuckClosed	Not Permanent		TRUE	2721	Set fault if the vcross 2 voltage measurement is greater than the calibrated threshold
f722_JCS2_PosContactorCircuitStuckOpen	Not Permanent		TRUE	2722	Set fault if the vcross 2 voltage measurement is less than the calibrated threshold
f723_JCS2_NegContactorCircuitStuckClosed	Not Permanent		TRUE	2724	Set fault if the vcross 1 voltage measurement is greater than the calibrated threshold
f724_JCS2_NegContactorCircuitStuckOpen	Not Permanent		TRUE	2725	Set fault if the vcross 1 voltage measurement is less than the calibrated threshold
f725_JCS2_VoltageSystemIsolationFault	Permanent	Critical SD	TRUE	2726	Sets fault if the isolation calculated is less than the min limit ohms per volt calibration
f726_JCS2_VoltageIsolationSensorCircuit	Not Permanent	Critical SD	TRUE	2727	Set if isolation measurement error
f727_JCS2_VoltageIsolationSensorPower	Not Permanent		TRUE	2728	Set if isolation circuit reports a power supply error.
f728_JCS2_VoltageIsolationSensorVrefLow	Not Permanent		TRUE	2729	Set fault is reference voltage is below minimum for isolation measurement.
f729_JCS2_VoltageIsolationSensorVrefHigh	Not Permanent		TRUE	2730	Set fault is reference voltage is above maximum for isolation measurement.
f730_JCS2_PackVoltageSenseRat	Not Permanent		TRUE	2747	Set fault if the battery rational voltage calculation is greater than the pack voltage cell sum voltage delta percent calibration.
f731_JCS2_PackVoltageSenseCircuitLow	Not Permanent		TRUE	2748	Set if Pack Voltage is below the Out of Range Low Voltage CAL
f732_JCS2_PackVoltageSenseCircuitHigh	Not Permanent		TRUE	2749	Set if Pack Voltage is greater than the Out of Range High Voltage CAL
f733_JCS2_PackCurrentSensorCircuitRat	Not Permanent		TRUE	2752	Set if trip amp hours disagrees with trip delta cell voltage by more than calibration.
f734_JCS2_PackCurrentSensorCircuitLow	Not Permanent		TRUE	2753	Sets fault if the battery current is lower than the out of range low battery current amp calibration.
f735_JCS2_PackCurrentSensorCircuitHigh	Not Permanent		TRUE	2754	Sets fault if the battery current is higher than the out of range high battery current amp calibration.
f736_JCS2_TempSensor1CircuitLow	Not Permanent		TRUE	2759	Temp sensor 1 out of range low
f737_JCS2_TempSensor1CircuitHigh	Not Permanent		TRUE	2760	Temp sensor 1 out of range high
f738_JCS2_TempSensor2CircuitLow	Not Permanent		TRUE	2764	Temp sensor 2 out of range low
f739_JCS2_TempSensor3CircuitHigh	Not Permanent		TRUE	2765	Temp sensor 2 out of range high
f740_JCS2_PosContactorControlCircuitPerf	Not Permanent		TRUE	2778	Set fault if the positive main contactor low side driver feedback voltage is greater than the positive main contactor low side driver feedback voltage out of range high calibration
f741_JCS2_PosContactorControlCircuitLow	Not Permanent		TRUE	2779	Set fault if the positive main contactor low side driver short to ground open circuit calculation is greater than the positive main contactor low side driver short to ground open circuit delta voltage calibration
f742_JCS2_PosContactorControlCircuitHigh	Not Permanent		TRUE	2780	Set fault if the positive main contactor low side driver feedback voltage is greater than the positive main contactor low side driver short to battery voltage calibration
f743_JCS2_NegContactorControlCircuitPerf	Not Permanent		TRUE	2782	Set fault if the negative main contactor low side driver feedback voltage is greater than the negative main low side driver feedback voltage out of range high calibration
f744_JCS2_NegContactorControlCircuitLow	Not Permanent		TRUE	2783	Set fault if the negative main contactor short to ground open circuit calculation is greater than the negative main contactor low side driver short to ground open circuit delta voltage calibration
f745_JCS2_NegContactorControlCircuitHigh	Not Permanent		TRUE	2784	Set fault if the negative main contactor low side driver feedback voltage is greater than the negative main low side driver short to battery calibration
f746_JCS2_PrechargeContactorCircuit	Not Permanent		TRUE	2785	Set fault if the battery current is greater than the maximum calculated precharge current calibration
f747_JCS2_PrechargeContactorCircuitPerf	Not Permanent		TRUE	2789	Set fault if the precharge relay low side driver feedback voltage is greater than the precharge relay low side driver feedback voltage out of range high calibration
f748_JCS2_PrechargeContactorControlCircuitLow	Not Permanent		TRUE	2790	Set fault if the precharge relay low side driver short to ground open circuit test calculation is greater than the precharge relay low side driver short to ground open circuit delta voltage calibration
f749_JCS2_PrechargeContactorControlCircuitHigh	Not Permanent		TRUE	2791	Set fault if the precharge relay low side driver feedback voltage is greater than the precharge relay low side driver short to battery voltage calibration
f750_JCS2_TempSensor3CircuitLow	Not Permanent		TRUE	2794	Temp sensor 3 out of range low
f751_JCS2_TempSensor3CircuitHigh	Not Permanent		TRUE	2795	Temp sensor 3 out of range high
f752_JCS2_PackSensorModule	Not Permanent		TRUE	2812	Set if Cell Voltage is greater than the Cell Voltage Out of Range CAL
f753_JCS2_PackTempTooLow	Not Permanent		TRUE	2813	This temperature fault will set if any of the temperature sensors is less than or equal to the no start fault threshold for the calibrated debounce time.

f644_JCS1_BusVoltageSenseCircuitHigh	Not Permanent		TRUE	2839	Set if the Pack Voltage is greater than the specified Out of Range High Voltage CAL
f645_JCS1_VC1VoltageSenseCircuitLow	Not Permanent		TRUE	2843	Set fault if the pack positive to bus negative voltage is less than the vcross 1 out of range low calibration
f646_JCS1_VC1VoltageSenseCircuitHigh	Not Permanent		TRUE	2844	Set fault if the pack positive to bus negative voltage is greater than the vcross 1 out of range high voltage calibration
f757_JCS2_VC2VoltageSenseCircuitLow	Not Permanent		TRUE	2848	Set fault if the bus positive to pack negative voltage is greater than the vcross 2 out of range low voltage calibration
f758_JCS2_VC2VoltageSenseCircuitHigh	Not Permanent		TRUE	2849	Set fault if the bus positive to pack negative is greater than the vcross 2 out of range high voltage calibration
f759_JCS2_DeltaCellVoltage	Not Permanent		TRUE	2876	Set fault if the change in cell voltage is outside of the delta cell voltage calibration.
f760_JCS2_VoltageSense0CircuitLow	Not Permanent		TRUE	2877	Voltage sensor 0 out of range low
f761_JCS2_VoltageSense0CircuitHigh	Not Permanent		TRUE	2878	Voltage sensor 0 out of range high
f762_JCS2_VoltageSense1CircuitLow	Not Permanent		TRUE	2882	Voltage sensor 1 out of range low
f763_JCS2_VoltageSense1CircuitHigh	Not Permanent		TRUE	2883	Voltage sensor 1 out of range high
f764_JCS2_VoltageSense2CircuitLow	Not Permanent		TRUE	2887	Voltage sensor 2 out of range low
f765_JCS2_VoltageSense2CircuitHigh	Not Permanent		TRUE	2888	Voltage sensor 2 out of range high
f766_JCS2_VoltageSense3CircuitLow	Not Permanent		TRUE	2892	Voltage sensor 3 out of range low
f767_JCS2_VoltageSense3CircuitHigh	Not Permanent		TRUE	2893	Voltage sensor 3 out of range high
f768_JCS2_VoltageSense4CircuitLow	Not Permanent		TRUE	2897	Voltage sensor 4 out of range low
f769_JCS2_VoltageSense4CircuitHigh	Not Permanent		TRUE	2898	Voltage sensor 4 out of range high
f770_JCS2_VoltageSense5CircuitLow	Not Permanent		TRUE	2902	Voltage sensor 5 out of range low
f771_JCS2_VoltageSense5CircuitHigh	Not Permanent		TRUE	2903	Voltage sensor 5 out of range high
f772_JCS2_VoltageSense6CircuitLow	Not Permanent		TRUE	2907	Voltage sensor 6 out of range low
f773_JCS2_VoltageSense6CircuitHigh	Not Permanent		TRUE	2908	Voltage sensor 6 out of range high
f774_JCS2_VoltageSense7CircuitLow	Not Permanent		TRUE	2912	Voltage sensor 7 out of range low
f775_JCS2_VoltageSense7CircuitHigh	Not Permanent		TRUE	2913	Voltage sensor 7 out of range high
f776_JCS2_VoltageSense8CircuitLow	Not Permanent		TRUE	2917	Voltage sensor 8 out of range low
f777_JCS2_VoltageSense8CircuitHigh	Not Permanent		TRUE	2918	Voltage sensor 8 out of range high
f778_JCS2_VoltageSense9CircuitLow	Not Permanent		TRUE	2922	Voltage sensor 9 out of range low
f779_JCS2_VoltageSense9CircuitHigh	Not Permanent		TRUE	2923	Voltage sensor 9 out of range high
f780_JCS2_VoltageSense10CircuitLow	Not Permanent		TRUE	2927	Voltage sensor 10 out of range low
f781_JCS2_VoltageSense10CircuitHigh	Not Permanent		TRUE	2928	Voltage sensor 10 out of range high
f782_JCS2_VoltageSense11CircuitLow	Not Permanent		TRUE	2932	Voltage sensor 11 out of range low
f783_JCS2_VoltageSense11CircuitHigh	Not Permanent		TRUE	2933	Voltage sensor 11 out of range high
f784_JCS2_VoltageSense12CircuitLow	Not Permanent		TRUE	2937	Voltage sensor 12 out of range low
f785_JCS2_VoltageSense12CircuitHigh	Not Permanent		TRUE	2938	Voltage sensor 12 out of range high
f786_JCS2_VoltageSense13CircuitLow	Not Permanent		TRUE	2942	Voltage sensor 13 out of range low
f787_JCS2_VoltageSense13CircuitHigh	Not Permanent		TRUE	2943	Voltage sensor 13 out of range high
f788_JCS2_VoltageSense14CircuitLow	Not Permanent		TRUE	2947	Voltage sensor 14 out of range low
f789_JCS2_VoltageSense14CircuitHigh	Not Permanent		TRUE	2948	Voltage sensor 14 out of range high
f790_JCS2_VoltageSense15CircuitLow	Not Permanent		TRUE	2952	Voltage sensor 15 out of range low
f791_JCS2_VoltageSense15CircuitHigh	Not Permanent		TRUE	2953	Voltage sensor 15 out of range high
f792_JCS2_TempSensor4CircuitLow	Not Permanent		TRUE	3012	Temp sensor 4 out of range low
f793_JCS2_TempSensor4CircuitHigh	Not Permanent		TRUE	3013	Temp sensor 4 out of range high
f794_JCS2_MaxCellVoltHigh	Not Permanent		TRUE	3120	Set if Max Cell Voltage is greater than the Max Limit CAL
f795_JCS2_TempSensor5CircuitLow	Not Permanent		TRUE	3125	Temp sensor 5 out of range low
f796_JCS2_TempSensor5CircuitHigh	Not Permanent		TRUE	3126	Temp sensor 5 out of range high
f797_JCS2_12VSupplyOOR	Not Permanent		TRUE	3138	Set fault if the LLSW flags a 12V supply low fault or a 12V supply high fault
f798_JCS2_PackCoolantTempSensorCircuitRat	Not Permanent		TRUE	3139	Set fault if the coolant inlet temp is less than the coolant inlet temp out of range low temp degrees calibration
f799_JCS2_PackCoolantTempSensorCircuitLow	Not Permanent		TRUE	3140	Set fault if the LLSW flags a open circuit fault
f800_JCS2_PackCoolantTempSensorCircuitHigh	Not Permanent		TRUE	3141	Set fault if the LLSW flags a short to battery fault
f801_JCS2_SystemPrechargeTimeTooLong	Not Permanent		TRUE	3192	Set fault if the precharge state equals the precharge state timeout calibration
f802_JCS2_TempSensor6CircuitLow	Not Permanent		TRUE	3198	Temp sensor 6 out of range low
f803_JCS2_TempSensor6CircuitHigh	Not Permanent		TRUE	3199	Temp sensor 6 out of range high
f804_JCS2_TempSensor7CircuitLow	Not Permanent		TRUE	3203	Temp sensor 7 out of range low
f805_JCS2_TempSensor7CircuitHigh	Not Permanent		TRUE	3204	Temp sensor 7 out of range high
f806_JCS2_ChargingCurrentHigh	Not Permanent		TRUE	3238	Sets fault if the battery current is greater than the battery charge current maximum amp calibration for the calibrated debounce time.

f807_JCS2_DischargingCurrentHigh	Not Permanent		TRUE	3239	Sets fault if the battery current is less than the battery discharge current maximum amp calibration for the calibrated debounce time.
f808_JCS2_PowerLimitExceeded	Not Permanent	Controlled SD	TRUE	6667	Set if 0kW power is greater than threshold, or lithium plating reserve is negative or heating capacity is zero or number of invalid cell voltage measurements greater than calibration.
f809_JCS2_ControlModuleCommunicationBusBOff	Not Permanent		TRUE	116	Set fault if the CAN Bus off error is active
f810_JCS2_LostCommunicationWithHCU	Not Permanent		TRUE	659	Set fault if a new vehicle CAN message is not received from the vehicle in the calibrated debounce time
f811_JCS2_InvalidDataReceivedFromHCU	Not Permanent		TRUE	1428	Set fault if a 24E or 24F rolling counter fault is set
f812_JCS2_TempSensorFault	Not Permanent		TRUE	2719	This fault will set when the number of invalid temperature sensors equals the number of temperature sensors in the battery for the calibrated debounce time.
f813_JCS2_SystemClock	Not Permanent		TRUE	4099	Set fault if the alarm time set ok fault is inactive and the hardware alarm SPI fault compliment is inactive
f814_JCS2_ControlModule	Not Permanent		TRUE	12288	Set fault if the LLSW flags a peripheral device reset fault
f815_JCS2_ControlModuleImproperShutdown	Not Permanent		TRUE	12289	Set fault if the LLSW flags a reset hardware watchdog fault, reset divide by zero fault, memory address illegal fault, reset software watchdog fault, invalid opcode fault, stack overflow fault, stack underflow fault, exception trap fault, unexpected interrupt fault, low voltage IND fault, or a clock monitor fault.
f816_JCS2_SystemVoltage	Not Permanent		TRUE	12291	Set if system voltage is not rational or out of range
f817_JCS2_CellVoltageSensor	Not Permanent		TRUE	2879	Set if error detected with cell voltage sensor
f818_JCS2_BusOutOfRange	Not Permanent		TRUE	2750	Voltage sensing fault detected.
f819_JCS2_OtherFault	Not Permanent		TRUE		JCS fault/warning which is not specified in HCU.
f820_JCS2_MILLevel1MIL	Not Permanent		TRUE	NA	MIL state is at level 1
f821_JCS2_MILLevel3LOS	Permanent	Controlled SD	TRUE	NA	MIL state is at level 2
f822_JCS2_MILLevel4QOR	Permanent	Controlled SD	TRUE	NA	MIL state is at level 3

Notes:

- 1) Fault types: Permanent fault which will require the ignition switch to be cycled to clear them, Not Permanent fault which will clear once the conditions that triggered it have cleared
- 2) Fault actions: Critical Shutdown will shut the system down immediate, Controlled Shutdown will shut the system off in a controlled manner