SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Hybrid Battery Pack Life	P0A7F	This DTC indicates the Battery Pack does not have enough Power and/or Energy to support IEO and Auto-Start Events	PropBattMinAllowed_SOC greater than or equal to 75% (KE_PackEndOfHybridLife_Percent)	CalculatedAmbientTemp_Valid = VALID	900 test failures in a 1200 test samples

Frequency:
1 sample/50 ms | DTC Type B |
| Battery Energy Control Module Long Term Memory Performance | P1A01 | This DTC indicates the Checksum of data stored in EEProm ~= Checksum stored in EEProm at power down. | When the checksum of data stored in EEProm is not equal to the checksum stored in EEProm at powerdown | One successful Powerdown completed with each new application | 1 test failure in a 1 test sample

Frequency:
1 sample / 1 time at power up | DTC Type B |
| Battery Energy Control Module Programming Read Only Memory (ROM) | P1A04 | This DTC indicates that an EEProm malfunction was detected | If an EEProm malfunction is detected, (e.g., CRC failure after a write operation) | N/A | 1 test failure in a 1 test sample

Frequency:
1 sample/ every write on the data | DTC Type B |
| Battery Energy Control Module Random Access Memory (RAM) | P1A05 | This DTC indicates that a RAM malfunction was detected | The current contents of the memory being checked shall be saved in a known correctly functioning alternate memory location. A set of two patterns will then be written to the memory under test (e.g., AA, 55). The contents of the memory under test shall be read and compared to the expected value. If the read value and the expected value do not match, the RAM_Fault shall be set | N/A | 1 test failure in a 1 test sample

Frequency:
1 sample/1 sec | DTC Type B |

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Battery Energy Control Module Read Only Memory (ROM)	P1A06	This DTC indicates that a ROM malfunction was detected	This test can be accomplished by comparing the run time calculated checksum of a predefined memory region with the expected checksum value which is stored outside the predefined memory region in ROM If the calculated value does not mach the expected value	N/A	1 test failure in a 1 test sample Frequency: 1 sample/1 sec	DTC Type B
Battery Energy Control Module 5 Volt Reference Circuit	P1A07	This DTC indicates One OR Both of the Reference Range Voltages are out of range.	When One or Both of the reference range voltages are out of range	N/A	45 test failures in a 60 test samples Frequency: 1 sample/ 1 sec	DTC Type B
Battery Energy Control Module Not Programmed	P1A0B	This DTC indicates the ESCM has not been programmed with the correct software	KE_ESCMProgramming_Flag = FALSE OR Application, GMCAL, and ISADCAL are not compatible with one another	N/A	1 test failure in a 1 test sample Frequency: 1 sample/ 1 time at powerup	DTC Type A
Hybrid Battery 1 Temperature Sensor Performance	P0A9C	This DTC determines if Temperature sensor 1 is within a certain amount of the average of the sensors	PropBattMdl1_Temp is not within 10 deg C (KE_PropBattMdlTempOutOfRangeRationality_degC) of the average module temperature	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattMdl1-3Temp_Valids = VALID	45 test failures in a 60 test samples Frequency: 1 sample/ 1 sec	DTC Type C
Hybrid Battery 1 Temperature Sensor Circuit Low Voltage	P0A9D	This DTC determines if Temperature sensor 1 is low	PropBattMdl1_Temp < 46 counts (KEISAD_PropBattMdlTempOutOfRangeLow_ADCTemp)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable	45 test failures in a 60 test samples Frequency: 1 sample/ 1 sec	DTC Type C
Hybrid Battery 1 Temperature Sensor Circuit High Voltage	P0A9E	This DTC determines if Temperature sensor 1 is High	PropBattMdl1_Temp > 899 counts (KEISAD_PropBattMdlTempOutOfRangeHigh_ADCTemp)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable	45 test failures in a 60 test samples Frequency: 1 sample/ 1 sec	DTC Type C

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Hybrid Battery 2 Temperature Sensor Performance	P0AC6	This DTC determines if Temperature sensor 2 is within a certain amount of the average of the sensors	PropBattMdl2_Temp is not within 10 deg C (KE_PropBattMdlTempOutOfRangeRationality_degC) of the average module temperature	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattMdl1-3Temp_Valids = VALID	45 test failures in a 60 test samples Frequency: 1 sample/ 1 sec	DTC Type C
Hybrid Battery 2 Temperature Sensor Circuit Low Voltage	P0AC7	This DTC determines if Temperature sensor 2 is low	PropBattMdl2_Temp < 46 counts (KEISAD_PropBattMdlTempOutOfRangeLow_ADCTemp)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable	45 test failures in a 60 test samples Frequency: 1 sample/ 1 sec	DTC Type C
Hybrid Battery 2 Temperature Sensor Circuit High Voltage	P0AC8	This DTC determines if Temperature sensor 2 is High	PropBattMdl2_Temp > 899 counts (KEISAD_PropBattMdlTempOutOfRangeHigh_ADCTemp)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable	45 test failures in a 60 test samples Frequency: 1 sample/ 1 sec	DTC Type C
Hybrid Battery 3 Temperature Sensor Performance	P0ACB	This DTC determines if Temperature sensor 3 is within a certain amount of the average of the sensors	PropBattMdl3_Temp is not within 10 deg C (KE_PropBattMdlTempOutOfRangeRationality_degC) of the average module temperature	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattMdl1-3Temp_Valids = VALID	45 test failures in a 60 test samples Frequency: 1 sample/ 1 sec	DTC Type C
Hybrid Battery 3 Temperature Sensor Circuit Low Voltage	P0ACC	This DTC determines if Temperature sensor 3 is low	PropBattMdl3_Temp < 46 counts (KEISAD_PropBattMdlTempOutOfRangeLow_ADCTemp)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable	45 test failures in a 60 test samples Frequency: 1 sample/ 1 sec	DTC Type C
Hybrid Battery 3 Temperature Sensor Circuit High Voltage	P0ACD	This DTC determines if Temperature sensor 3 is High	PropBattMdl3_Temp > 899 counts (KEISAD_PropBattMdlTempOutOfRangeHigh_ADCTemp)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable	45 test failures in a 60 test samples Frequency: 1 sample/ 1 sec	DTC Type C
Hybrid Battery 1 Circuit Low Voltage	P1A22	This DTC determines if Voltage sensor 1 is low	PropBattMdl1Measured_Voltage < 2V (KEISAD_PropBattMdlVoltageOutOfRangeLow_Voltage)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattCurrent_Valid = VALID AND PropBattMdl_Current > 0A AND BatteryDisconnectDevice_Status = DISCONNECTS CLOSED	100 test failures in a 200 test samples Frequency: 1 sample/ 50 ms	DTC Type C

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Hybrid Battery 1 Circuit High Voltage	P1A23	This DTC determines if Voltage sensor 1 is High	PropBattMdl1Measured_Voltage > 18V (KEISAD_PropBattMdlVoltageOutOfRangeHigh_Voltage)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattCurrent_Valid = VALID AND PropBattMdl_Current < 0A AND BatteryDisconnectDevice_Status = DISCONNECTS CLOSED	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type C
Hybrid Battery 1 Voltage	P1A24	This DTC determines if Voltage sensor 1 is within a certain amount of the average of the sensors	PropBattMdl1Measured_Voltage is not within 1V (KE_PropBattMdlDeltaV_Voltage) of the average module voltage	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattVoltageCorrelation_Fault = PASS AND PropBattCurrentCorrelation_Fault = PASS AND PropBattMdl1-3MeasuredVoltage_Valids = VALID AND run during discharge only (when the PropBatt_Current is between 0 and -600 Amps)	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type C
Hybrid Battery 1 Voltage High	P1A28	This DTC determines if Battery Module 1 Voltage above threshold which is function of V-Lid	PropBattMdl1Measured_Voltage is above the sum of 1V (KE_PropBattMdlSevereOvervoltage_Voltage) and PropBattModuleComp_Vlid	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattMdl1MeasuredVoltage_Valid = VALID AND PropBattMdlCompVlid_Valid = VALID	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type C
Hybrid Battery 2 Circuit Low Voltage	P1A29	This DTC determines if Voltage sensor 2 is low	PropBattMd2Measured_Voltage < 2V (KEISAD_PropBattMdlVoltageOutOfRangeLow_Voltage)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattCurrent_Valid = VALID AND PropBattMdl_Current > 0A AND BatteryDisconnectDevice_Status = DISCONNECTS CLOSED	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type C
Hybrid Battery 2 Circuit High Voltage	P1A2A	This DTC determines if Voltage sensor 2 is High	PropBattMdl2Measured_Voltage > 18V (KEISAD_PropBattMdlVoltageOutOfRangeHigh_Voltage)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattCurrent_Valid = VALID AND PropBattMdl_Current < 0A AND BatteryDisconnectDevice_Status = DISCONNECTS CLOSED	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type C

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Hybrid Battery 2 Voltage	P1A2B	This DTC determines if Voltage sensor 2 is within a certain amount of the average of the sensors	PropBattMdl2Measured_Voltage is not within 1V (KE_PropBattMdlDeltaV_Voltage) of the average module voltage	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattVoltageCorrelation_Fault = PASS AND PropBattCurrentCorrelation_Fault = PASS AND PropBattMdl1-3MeasuredVoltage_Valids = VALID AND run during discharge only (when the PropBatt_Current is between 0 and -600 Amps)	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type C
Hybrid Battery 2 Voltage High	P1A2F	This DTC determines if Battery Module 2 Voltage above threshold which is function of V-Lid	PropBattMdl2Measured_Voltage is above the sum of 1V (KE_PropBattMdlSevereOvervoltage_Voltage) and PropBattModuleComp_Vlid	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattMdl1MeasuredVoltage_Valid = VALID AND PropBattMdlCompVlid_Valid = VALID	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type C
Hybrid Battery 3 Circuit Low Voltage	P1A30	This DTC determines if Voltage sensor 3 is low	PropBattMdl3Measured_Voltage < 2V (KEISAD_PropBattMdlVoltageOutOfRangeLow_Voltage)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattCurrent_Valid = VALID AND PropBattMdl_Current > 0A AND BatteryDisconnectDevice_Status = DISCONNECTS CLOSED	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type C
Hybrid Battery 3 Circuit High Voltage	P1A31	This DTC determines if Voltage sensor 3 is High	PropBattMdl3Measured_Voltage > 18V (KEISAD_PropBattMdlVoltageOutOfRangeHigh_Voltage)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattCurrent_Valid = VALID AND PropBattMdl_Current < 0A AND BatteryDisconnectDevice_Status = DISCONNECTS CLOSED	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type C

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Hybrid Battery 3 Voltage	P1A32	This DTC determines if Voltage sensor 3 is within a certain amount of the average of the sensors	PropBattMdl3Measured_Voltage is not within 1V (KE_PropBattMdlDeltaV_Voltage) of the average module voltage	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattVoltageCorrelation_Fault = PASS AND PropBattCurrentCorrelation_Fault = PASS AND PropBattMdl1-3MeasuredVoltage_Valids = VALID AND run during discharge only (when the PropBatt_Current is between 0 and -600 Amps)	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type C
Hybrid Battery 3 Voltage High	P1A36	This DTC determines if Battery Module 3 Voltage above threshold which is function of V-Lid	PropBattMdl3Measured_Voltage is above the sum of 1V (KE_PropBattMdlSevereOvervoltage_Voltage) and PropBattModuleComp_Vlid	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND PropBattMdl1MeasuredVoltage_Valid = VALID AND PropBattMdlCompVlid_Valid = VALID	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type C
Hybrid Battery Current Sensor Circuit	P0ABF	This DTC indicates the VACError_Flag = TRUE	VACError_Flag = TRUE	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type B
Hybrid Battery Current Sensor Performance	P0AC0	This DTC indicates the Sign or Magnitude of Pack Current does not match reported loads	PropBatt_Current is not equal (+/-30A (KE_PropBattCurrentCorrelation_Current)) to SGCM42VBus_Current	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND BatteryDisconnectDevice_Status = DISCONNECTS CLOSED AND SGCM42VBusCurrent_Valid = VALID AND SGCM42VBusCorrelation_Status = PASS AND PropBattCurrent_Valid = VALID AND EHPSPowerDraw_Valid = VALID AND EHPS_PowerDraw is less than 250 W (KE_EHPSPowerDrawLow_Load)	900 test failures in a 1200 test samples Frequency: 1 sample/ 50 ms	DTC Type B
Hybrid Battery Current Sensor Circuit Low Current	P1A4C	This DTC determines if Current sensor is low	PropBatt_Current < -600A (KEISAD_PropBattCurrentOutOfRangeLow_Current)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND VACError_Flag = FALSE	150 test failures in a 200 test samples Frequency: 1 sample/ 50 ms	DTC Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Hybrid Battery Current Sensor Circuit High Current	P1A4D	This DTC determines if Current sensor is High	PropBatt_Current > 600A (KEISAD_PropBattCurrentOutOfRangeHigh_Current)	Reference Voltage is Stable and Accurate AND Configuration has been initialized correctly and is stable AND VACError_Flag = FALSE	150 test failures in a 200 test samples Frequency: 1 sample/ 50 ms	DTC Type B
Battery Energy Control Module Lost Communication With Starter / Generator Control Module	U1887	This DTC indicates that the ESCM lost communication with the SGCM	When the SGCM is not present on the GM LAN bus, or the SGCM_RollingCounter becomes stale	Configuration has been initialized correctly and is stable	100 test failures in a 200 test samples Frequency: 1 sample/ 50 ms	DTC Type C