
Vehicle no longer starts after undervoltage

Topic number	LI54.10-P-049295
Version	3
Design group	54.10 Battery, voltage supply, voltage converter
Date	04-26-2011
Validity	Models 221.095 and 221.195 (HYBRID)
Reason for change	Remedy updated

Complaint:

Internal combustion engine no longer starts after undervoltage in 12V on-board electrical system battery.

Cause:

If the voltage of the 12 V on-board electrical system battery drops below 7 V for a period longer than five seconds, the long-term monitoring function for the battery cells logs various fault codes in the battery management (BMS) control unit (see heading "Control unit / Fault code") which prevent the engine from being restarted.

In addition, the electric motor control unit SGEM (power electronics) may also be in the internal "Fail" state as a result of the undervoltage, preventing an engine start.

Remedy:

Note: Work through all the steps of the remedy in their entirety.

1. Connect Star Diagnosis and perform initial quick test.
2. If the initial quick test or the data from the battery sensor contain indications of discharge of the 12 V on-board electrical system battery, these faults must be processed as per the guided test in Star Diagnosis.

Note: The primary fault cause of the undervoltage can be read out during diagnosis under the following path: Control units > Body > CGW (Central Gateway) > Actual values > Last memory entry of bus keepawake detection.

3. Create SGEM control unit log.
4. Check the status of "Internal state" in the SGEM control unit event log.

If the control unit is in the internal state "Run", continue with step 7.

If the internal state "Fail" is shown, continue with step 5.

5. Perform a reset in the SGEM control unit. This is performed in the diagnostic unit under the following path: Control units > Drive > SG-EM electric motor control unit > Actuators > Control unit reset.

6. Generate the SGEM control unit event log again and again check the internal state.

If the SGEM control unit is still in the internal state "Fail", the electric motor control unit (SGEM) must be replaced.

If the control unit is in the internal state "Run", continue with step 7.

7. Check the software release (SW) of the battery management (BMS) control unit. The software version must be 10.23.00 or higher. If the software version is lower, perform a software update.

8. Check the software release (SW) of the electric motor control unit (SGEM). The software version must be 10.06.00 or higher. If the software version is lower, please perform a software update.

9. In addition, the 12 V on-board electrical system battery must be fully recharged and tested using a Midtronics tester.

Symptoms
Battery function / Battery discharges / Overall vehicle / Power supply / Battery/On-board electrical system /
Engine start/stop / Power generation / Engine management / Does not start /
Power generation / Engine management / READY indicator / Engine management indicator lamp / Does not illuminate /

Control unit/fault code		
Control unit	Fault code	Fault text
SG-EM-Electric motor control unit (SGEM)	P0A1E00	Component N129/1 (Power electronics control unit) has a malfunction.
SG-EM-Electric motor control unit (SGEM)	P056200	Local undervoltage of component N129/1 (Power electronics control unit) ((ECU1_DV_HEX@0101))
SG-BMS-Battery management system control unit (BMS221)	180500	The hardware monitoring function has detected a fault in the control unit.
SG-BMS-Battery management system control unit (BMS221)	180D00	Control unit 'High-voltage battery' has performed a system shutoff.

Parts							
Part number	ES1	ES2	Designation	Quantity	Note	EPC	Non-EPC
A 000 906 76 00			Rectifier	1	Electric motor control unit (SGEM)	X	
A 020 997 40 45			O-ring	1	Case cover	X	
A 020 997 41 45			O-ring	1	Inverter	X	

WIS-References			
Document number	Title	Note	Allocation
AR08.10-P-0011SXH	Remove/install power electronics with power distributor		Remedy