

## Functional impairment of 48 V on-board electrical system

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Topic number	LI54.10-P-069698
Version	3
Function group	54.10 Battery, power supply, voltage converter
Date	01-28-2020
Validity	Model series 257, 213, 238, 167, 290 with code B01
Reason for change	Refining Remedies
Reason for block	

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### Complaint:

1. Instrument cluster message 48 V on-board electrical system battery (G1/3) in yellow or red
2. Vehicle does not start
3. Limp home mode due to high engine operating temperatures

### Cause:

Cause 1/5: Communication error between 48 V on-board battery G1/3 and DC/DC converter: B183387 in DC/DC converter N83/1

Cause 2/5: Limp home mode with additional symptoms: overheating, A/C blowing hot, and loss of acceleration with fault code: B1873371 The battery for 48V on-board electrical system has a malfunction. The actuator is blocked.

Note: this fault code may include additional 48V system consequential faults although B1873371 is the primary root cause.

Cause 3/5: Red battery light or check engine light without fault B1873371

Cause 4/5: Battery Not found in Quick Test.

Cause 5/5: Fault B183301 in DC/DC or B183349 in 48V battery.

### Remedy:

Preliminary measures NOTE: It is imperative to document each one of these steps in detail. Some of the remedies will require opening a PTSS case. This information is vital in helping to expedite the diagnostic process.

- Make sure Add-ons are up to date in Xentry Machine
- Disconnect and inspect all chassis grounds such as W15/5, W15/7, W16/3, W16/4, and W16/5. If painted over, remove all paint such that ring terminal can press flush against bare surface.
- Complete guided test(s) and subsequent physical layer inspection.
- Confirm all 48v components can be actuated via Xentry guided tests: A1 = M75 electrical coolant pump, A2 = M60 Electrical turbo, A3 = A9/5 electric refrigerant (A/C)

# XENTRY TIPS

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- Test 12v battery with Midtronics. Document results in case.
- Detach line between DC/DC converter N83/1 and 48 V on-board electrical system battery. Check for: damage, soiling, corrosion, and check resistance of all cable pins (should be nearly 0.2 ohms).
- Road test to attempt to duplicate fault. Test drive under as many various driving styles as possible: manual, automatic, slow, aggressive, Comfort, Sport+, etc. SAFETY is more important than testing. Please proceed with caution.
- Make sure to indicate in file names or descriptions the order the uploaded documents occurred.
- If complaint cannot be replicated and this is vehicle's first visit clear all fault codes, save new quick test, field test for 20 miles with varying driving styles, and then open PTSS case.
- Upload all relevant documentation from above including:
  1. Screenshots showing completed guided test(s) for every fault code
  2. Initial quick test
  3. Upload any control unit logs only from relevant control units that have faults

## Remedy 1/5 -- if (No start)

- a. If first visit pull Quick Test
  - i. If fault code is B183387 in DC/DC converter N83/1
    1. Update Xentry with newest Add-Ons
    2. Inspect Physical layers (grounds, DC/DC to 48v battery connector, etc)
    3. Confirm all 48v components can be actuated via Xentry guided tests
    4. Complete guided test(s) for every fault code--not just 48v
    5. Clear all faults and test drive for 30 miles
      - a. If fault B183387 returns = replace battery only
      - b. If fault B183387 does not return = release vehicle
      - c. If additional faults = open PTSS case.
- b. If second visit open PTSS case

## Remedy 2/5 -- if limp home: CEL, overheating, loss of power/acceleration, etc.

- i. If First visit pull Quick Test AND if fault code B183371 The actuator is blocked is present in battery (regardless of other faults)
  1. Update Xentry with newest Add-Ons
  2. Inspect Physical layers (grounds, DC/DC to 48v battery connector, etc)
  3. Confirm all 48v components can be actuated via Xentry guided tests
  4. Confirm completed guided test(s) for every fault code--not just 48v
  5. Disconnect 12V battery more than 10 minutes for hard reset 48V system

# XENTRY TIPS

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6. Clear all faults and test drive for 30 miles
  - a. If fault B183371 returns = replace battery and DC/DC
  - b. If fault B183371 does not return = release vehicle
  - c. If additional faults = open PTSS case
- ii. If second or greater visit open TIPS case.

## Remedy for 3/5 Battery light or CEL (without limp home mode)

- a. If faults any of these faults exist (WITHOUT B183371): B183214, B183216, or B183217
- b. Check ground point W106/x or W30/11 exactly (correct torque, damage, soiling)
- c. Test drive.
  - i. If reproducible:
    1. unplug all 48 V components individually (on F153/2 disconnect the individual components of circuits 40) and perform a test drive each time.
    2. After each test drive, run a quick test to check if any of the 48 V components - except the unplugged ones - are detected as faulty.
      - a. Try to actuate all components that are still connected.
    3. If unable to actuate or detected faulty = replace component.
    4. Retest.
  - ii. If cannot reproduce = release

## Remedy for 4/5 and 5/5

- a. if 48v battery not found in quick test even though wiring harness G1/3 to N83/1 has no faults
- b. OR if fault B183301 in DC/DC
- c. OR if fault B183349 in 48v
  - i. Replace battery only
  - ii. Update DC/DC converter N83/1 if later software is available.

<b>Symptoms</b>
Overall vehicle / Power supply / Battery/On-board electrical system / Battery function / Battery discharges
Overall vehicle / Power supply / Battery/On-board electrical system / Battery/on-board electrical system display message / Battery/Alternator - Serviced Required

<b>Control unit/fault code</b>		
Control unit	Fault code	Fault text

# XENTRY TIPS

N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183301	The battery for the 48V on-board electrical system has a malfunction. There is a general electrical fault. (LIB48_222)
N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183217	The 48V on-board electrical system has a malfunction. The limit value for electrical voltage has been exceeded.
N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183216	The 48V on-board electrical system has a malfunction. The limit value for electrical voltage has not been attained.
N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183214	The 48V on-board electrical system has a malfunction. There is a short circuit to ground or an open circuit.
N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183214	The 48V on-board electrical system has a malfunction. There is a short circuit to ground or an open circuit. (LIB48_222)
N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183216	The 48V on-board electrical system has a malfunction. The limit value for electrical voltage has not been attained. (LIB48_222)
N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183217	The 48V on-board electrical system has a malfunction. The limit value for electrical voltage has been exceeded. (LIB48_222)
N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183319	The battery for the 48V on-board electrical system has a malfunction. The limit value for current has been exceeded. (LIB48_222)
N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183371	The battery for the 48V on-board electrical system has a malfunction. The actuator is blocked. (LIB48_222)
N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183371	The battery for the 48V on-board electrical system has a malfunction. The actuator is blocked.
N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183319	The battery for the 48V on-board electrical system has a malfunction. The limit value for current has been exceeded.
N83/1 - DC/DC converter (DDW) (DCDC48_222)	B183301	The battery for the 48V on-board electrical system has a malfunction. There is a general electrical fault.

Parts						
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A 000 901 45 09			48 V on-board electrical system battery (48 V LIB) G1/3	1		X
A 000 902 49 48			DC/DC converter (DDW) N83/1	1		X

Operation numbers/damage codes				
Op. no.	Operation text	Time	Damage code	Note
			540HY 73	Battery 48 V on-board electrical system - electrical fault
			09803 **	Electric additional compressor - not determinable
			1500X 92	Integrated starter alternator short circuit
			5416D 73	DC/DC converter 48 V on-board electrical system