

## Vehicle Range – Voltage difference of cells too great

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Topic number	LI54.10-P-069138
Version	1
Function group	54.10 Battery, power supply, voltage converter
Date	12-06-2018
Validity	Model 453.#91 (smart electric drive)
Reason for change	
Reason for block	

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### Complaint:

Customer complaint regarding vehicle's electrical range:

- Displayed electrical range is does not align with SOC during or after charging.
- Displayed electrical range reduces rapidly after short period of driving.
- High-voltage battery can no longer charge.

### Cause:

The voltage difference (maximum cell voltage minus minimum cell voltage) within the high-voltage battery is too great (> 100 mV). In an extreme case, no individual cell voltages are displayed in the Battery Management System (BMS) anymore (signal not available).

### Remedy:

Replace high-voltage battery.

### Note on analysis for transportability:

- In order to carry out a transportability measurement, the individual cell voltage drop must be determined (XENTRY Diagnosis-> Battery management system -> Actuation-> Measurement value protocol for self-discharge of battery cells)
- NOTE: Also, see WISnet AR54.10-P-1140SRE, operation step 11.
- The measurement of transportability (point C) should be carried out immediately, because a later measurement of transportability cannot be carried out due to high self-discharge.
- If no individual cell voltages can be read out anymore (signal not available - SNA), the transportability measurement for criterion C1 can be re-evaluated with the document located in the attachment.
- This additional measurement must be returned together with the "Analysis sheet for transportability of high-voltage batteries, form" with the high-voltage battery.

Attachments	
File	Description
Zusatzformular zum Analyseblatt BR 453 Hochvoltbatterie V3.pdf	Additional form for model series 453 analysis sheet
Analysis Sheet for Transportability for 453 High Voltage Battery V3.pdf	Additional analysis sheet for transportability of high-voltage batteries, form

# XENTRY TIPS

<b>Symptoms</b>
Communication/information / Information display / Trip computer / Driving time is imprecisely/incorrectly displayed
Communication/information / Information display / Trip computer / Fuel consumption is imprecisely/incorrectly displayed
Overall vehicle / Power supply / High-voltage on-board electrical system / High-voltage battery / Malfunction
Overall vehicle / Power supply / High-voltage on-board electrical system / High-voltage battery / Display message

<b>Control unit/fault code</b>		
Control unit	Fault code	Fault text
N82/2 - Battery management system (BMS) (BMS453)	P0DE616	The cell voltages of the high-voltage battery module are too low. The limit value for electrical voltage has not been attained.
N82/2 - Battery management system (BMS) (BMS453)	P0DE717	The cell voltages of the high-voltage battery module are too high. The limit value for electrical voltage has been exceeded.

<b>Parts</b>						
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A 789 340 28 06	80		LI-ION BATTERY	1		X

<b>Operation numbers/damage codes</b>				
Op. no.	Operation text	Time	Damage code	Note
54-1153	REPLACE HIGH-VOLTAGE BATTERY		540H0 TQ	

<b>WIS-References</b>			
Document number	Title	Note	Allocation
AR54.10-P-1140-SRE	Remove/install high-voltage battery		Remedy
OF54.10-P-3000-01F	Analysis sheet for transportability of high-voltage batteries		Remedy



**Additional "Analysis sheet for transportability of highvoltage batteries, form" (OF54.10-P-3000-01F)**

**Valid: Model 453.091/391/491**

This additional form can be used for cases, where "no values" or "0V" or "SNA values" were supplied, when reading out the single-cell voltages by using XENTRY Diagnosis. Communication with the Battery Management System (BMS) must be available. All other criteria of the analysis sheet on transportability must be confirmed with "no".

In these kind of cases, the HV battery can be transported in a normal way (like hv-batteries which are safe for transportation), if the hv battery has shown no external conspicuous (fire / smoke / heat development and electrolyte leakage) after removal and subsequent storage of **at least seven days**.

This additional form must be attached to the analysis sheet during transportation.

"Safe Transportation" analysis sheet for lithium-ion high-voltage batteries	
Company-owned sales and service outlet/agency:	.....
Name of assessor (block capitals):	.....
Telephone number:	.....
Repair order number:	.....
Vehicle identification number:	.....
Battery identification number:	.....
<b>Important: All fields must be filled out!</b>	

*Example of battery identification number for series production battery:*



Tips-case no.: \_\_\_\_\_

Date of initial evaluation: \_\_\_\_\_

Date of reevaluation (after at least 7 days storage) : \_\_\_\_\_

HV-Battery has an external conspicuousness after 7 days?      Yes:       No:

⇒ If „No“, the high-voltage battery is safe for transportation.

<b>Assessment and confirmation of transport safety:</b>	
<input type="checkbox"/> High-voltage battery is safe for transport.	<input type="checkbox"/> High-voltage battery is not safe for transport.
Date:.....	Signature:.....