

Insulation fault in high-voltage on-board electrical system

Topic number	LI08.30-P-057728
Version	1
Design group	08.30 Hybrid drive system
Date	12-04-2013
Validity	451ev3 (smart electric drive 3rd generation)
Reason for change	
Reason for block	

Complaint:

Vehicle does not start or IC message "Fault - Service Required".

Cause:

Insulation fault in HV on-board electrical system in combination with one or more of following fault codes in battery management system control unit (N82/2).

P1CA100 There is an insulation fault in the high-voltage on-board electrical system with open contactors.

P1CA200 There is an insulation fault in the high-voltage on-board electrical system with closed contactors.

P1CA300 There is an insulation warning in the high-voltage on-board electrical system with open contactors.

P1CA400 There is an insulation warning in the high-voltage on-board electrical system with closed contactors.

P1D0E00 There is an insulation advance warning in the high-voltage on-board electrical system with open contactors.

P1D0F00 There is an insulation advance warning in the high-voltage on-board electrical system with closed contactors.

The cause is reduced insulation resistance at one or more high-voltage components of the high-voltage on-board electrical system.

Remedy:

Create a PTSS case with the subject "Insulation fault in HV on-board electrical system". Further measures will be specified by the responsible market support in coordination with GSP.

In order to process the matter, the following documents are required in the form of editable (not scanned) pdf files in German or English for all complaints:

- Control unit logs of all control units in the high-voltage on-board electrical system with logged faults
- Control unit freeze frame data of all control units in the high-voltage on-board electrical system with logged faults

Important: If other components (e.g. the high-voltage battery) are defective due to the failure of the power electronics, these must be encoded with the damage code (DC) of the power electronics (the part causing the fault)..

Symptoms
Overall vehicle / Power supply / Alternator / Alternator function / Output too low
Power generation / Engine management / Engine running / Stalls/goes out
Overall vehicle / Power supply / Battery/On-board electrical system / Battery/on-board electrical system indicator lamp / Battery charge indicator/consumer shutoff / Illuminates red
Power generation / Engine management / Engine management indicator lamp / Engine diagnosis / lit
Overall vehicle / Power supply / Battery/On-board electrical system / Battery function / Battery cannot be charged
Power generation / Engine management / Engine start/stop / Does not start

Power generation / Engine management / Engine management, function / Nonfunctional
Power generation / Engine management / Boost effect / Nonfunctional
Power generation / Engine management / Electric drive / Nonfunctional
Power generation / Engine management / Regenerative braking / Nonfunctional
Overall vehicle / Power supply / High-voltage on-board electrical system battery / Nonfunctional
Overall vehicle / Power supply / High-voltage on-board electrical system battery / Display message
Overall vehicle / Power supply / Battery/On-board electrical system / Battery/on-board electrical system display message / Charging

Control unit/fault code		
Control unit	Fault code	Fault text
N82/2 (Battery management system control unit) (BMS)	P1CA100	There is an insulation fault in the high-voltage on-board electrical system with open contactors.
N82/2 (Battery management system control unit) (BMS)	P1CA300	There is an insulation warning in the high-voltage on-board electrical system with open contactors.
N82/2 (Battery management system control unit) (BMS)	P1D0F00	There is an insulation alert in the high-voltage on-board electrical system with closed contactors.
N82/2 (Battery management system control unit) (BMS)	P1CA200	There is an insulation fault in the high-voltage on-board electrical system with closed contactors.
N82/2 (Battery management system control unit) (BMS)	P1D0E00	There is an insulation alert in the high-voltage on-board electrical system with open contactors.
N82/2 (Battery management system control unit) (BMS)	P1CA400	There is an insulation warning in the high-voltage on-board electrical system with closed contactors.

Parts							
Part number	ES1	ES2	Designation	Quantity	Note	EPC	Other make part
A 451 900 75 02			Power electronics control unit	1		X	
A 451 982 23 21			Charger 3 kW	1	Vehicle without quick charger	X	
A 451 540 24 06			High-voltage distributor (electrical wiring harness)	1	Vehicle without quick charger	X	
A 451 340 17 00			Electric motor	1		X	

Work units				
Op. no.	Operation text	Time	Damage code	Note
08-1301	REMOVE/INSTALL ELECTRIC MOTOR WITH GEARING		04004 TJ	In event of insulation fault in electric motor
08-1302	REPLACE ELECTRIC MOTOR (ELECTRIC MOTOR WITH GEARING REMOVED)		04004 TJ	In event of insulation fault in electric motor

08-1199	REMOVE/INSTALL POWER ELECTRONICS, REPLACE IF NECESSARY		5961C TJ	In event of insulation fault in power electronics
08-1202	REMOVE/INSTALL POWER ELECTRONICS, REPLACE IF NECESSARY, VEHICLE WITH QUICK CHARGER		5961C TJ	In event of insulation fault in power electronics
08-1198	REMOVE/INSTALL HIGH-VOLTAGE DISTRIBUTOR, REPLACE IF NECESSARY		5960A TJ	In event of insulation fault in adapter plate (high-voltage distributor)
08-1203	REMOVE/INSTALL HIGH-VOLTAGE DISTRIBUTOR, REPLACE IF NECESSARY, VEHICLE WITH QUICK CHARGER		5960A TJ	In event of insulation fault in adapter plate (high-voltage distributor)
51-1152	REMOVE/INSTALL HIGH-VOLTAGE BATTERY		54719 TJ	In event of insulation fault in high-voltage battery
54-1148	REMOVE/INSTALL HIGH-VOLTAGE BATTERY CHARGER, REPLACE IF NECESSARY		5420W TJ	In event of insulation fault in high-voltage battery charger
54-1191	REMOVE/INSTALL HIGH-VOLTAGE BATTERY CHARGER, REPLACE IF NECESSARY, VEHICLE WITH QUICK CHARGER		5420W TJ	In event of insulation fault in high-voltage battery charger

Validity		
Vehicle	Engine	Transmission
451.390	*	*
451.392	*	*
451.490	*	*
451.492	*	*