93-23-08 - Determination of HV-Battery Health, Remaining Capacity

Release date: 9/3/2024

Condition

Applicable Vehicles					
Model(s)	**Year**	**Eng. Code**	**Trans. Code**	**VIN Range From**	**VIN Range To**
e-Golf	2015 – 2019	All	All	All	All
ID.4	2021 – 2024	All	All	All	All

Revision Table			
Instance Number	**Published Date**	**Version Number**	**Reason For Update**
2071535/3	9/3/24	93-23-08	Updated description of test plan.
2071535/2	12/7/23	93-23-08	Clarified location and description of test plan. Updated BHQ information.
2071535/1	11/06/23	93-23-08	Original publication.

Customer Concern:

Reduced electric vehicle range.

or

The customer is requesting information on the State of Health (SOH) of the high-voltage battery (e.g., in order to sell the vehicle).

Workshop Findings:

The customer concern can be reproduced.

No relevant DTCs (active/static) indicating concerns with the high-voltage battery are present in the Hybrid battery management **-J840-** (diagnostic address 008C).

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CAUTION

If there are DTCs (active/static) present in the Hybrid battery management -*J840*- (diagnostic address 008C), then this bulletin does not apply! The appropriate Guided Fault Finding (GFF) test plan(s) should be followed and resolved before any determination of the remaining battery capacity is performed.

Technical Background

Through normal usage over time, the high-voltage batteries of electric vehicles are subject to various aging effects, which could lead to a reduction of the overall battery capacity (energy density). This age-related reduction of the battery capacity is normal.

Production Solution

Not applicable.

Service

NOTICE

If a range complaint is presented by the customer, Technical Service Bulletin 2071494 should be reviewed before carrying out the procedures outlined below.

To determine the remaining battery capacity of the high-voltage battery, there are three different test plans available in Guided Fault Finding (GFF).

The significant differences of the test plans are explained in the following table:

	Battery Health Status (BHS)	**Battery Health Certificate (BHC)**	**Battery Health Quicktest (BHQ)**
Duration	About 25 to 50 time units (TU)	About 50 time units (TU) of productive tester time. Total duration up to 750 time units (TU)	About 25 to 50 time units (TU)
Output	Direction decision, no decimal value in %	Decimal value in %	Decimal value in %

Measuring tolerance	± 10 percentage points	± 1-2 percentage points	± 10 percentage points (without qualified measured value) ± 5 percentage points (with qualified measured value)
Warranty Accounting Options	Warranty with justified customer complaint	Warranty with justified customer complaint ***OR*** Customer pay (non-warranty)	Only used for customer pay (non-warranty)

NOTICE

Note: For e-Golf vehicles, "sedan" must be chosen and not "wagon" when selecting vehicle options at the start of GFF diagnosis, to ensure that the correct test plans are visible.

NOTICE

These three test plans are part of a singular test, "determine the residual energy content of the high-voltage battery", which can be found within Guided Fault Finding (GFF) under the following path:

- **> Test plan**
- **> Select self-test**
- **> 008C – Determine the residual energy content of the high-voltage battery**

To be covered under warranty, only the following test plans may be used for the check of the remaining battery capacity of the high-voltage battery:

1. Battery Health Status (BHS) – Required.

2. Battery Health Certificate (BHC) – Only as necessary based on BHS results.

At the customer's request (non-warranty), either of the following test plans may be used to check the remaining battery capacity of the high-voltage battery:

Battery Health QuickTest (BHQ)

Battery Health Certificate (BHC)

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CAUTION

Checking the remaining battery capacity of the high-voltage battery at the customer's request (e.g. without a warrantable customer complaint) is not covered under warranty policy!

To check the remaining battery capacity of the high-voltage battery as part of the warranty:

NOTICE

Note the information in the <attachment> to this bulletin. The customer can positively influence the test procedure by properly pre-conditioning the high-voltage battery according to the instructions within. By performing this pre-conditioning, a qualified measured value can be generated, which can improve the measuring tolerance. In the case of the long measurement, if required, they can also significantly reduce the duration of a workshop visit, due to the required battery discharge at the start of the check.

1. Carry out the "Battery Health Status" (BHS) portion of the "determine the residual energy content of the high-voltage battery" test plan through Guided Fault Finding (GFF).

IMPORTANT: Save a copy of the test plan result screen in ".pdf" format by using the "print" function in GFF. This printed result may be required for documentation through warranty!

"Battery capacity ≥ 70 %": If the result of the remaining battery capacity check is equal to or greater than 70%, it will be indicated by an "X" in this section (there is no decimal value output).

"Long measurement recommended": If the GFF test plan recommends no further testing, it will be symbolized by a "-" in this section. In this case the high-voltage battery remaining capacity is OK in the sense of warranty; do not perform any further actions from this bulletin.

"Long measurement recommended": If the GFF test plan recommends a longer measurement to determine the remaining battery capacity, it will be symbolized with an "X" in this section. In this case the BHS test was not sufficient to determine if the vehicle is above or below the warranty limit; therefore proceed to step 2.

2. If the long measurement was recommended by the BHS test in step 1, then carry out the "Battery Health Certificate" (BHC) portion of the "determine the residual energy content of the high-voltage battery" test plan through Guided Fault Finding (GFF).

IMPORTANT: Save a copy of the test plan result screen in ".pdf" format by using the "print" function in GFF. This printed result may be required for documentation through warranty!

There is an output of a decimal percentage value of the remaining battery capacity.

If the result of the remaining battery capacity check is equal to or greater than 70%, then the high-voltage battery is OK in the sense of warranty; do not perform any further actions from this bulletin.

If the result of the remaining battery capacity check is less than 70%, check the warranty conditions applicable to the vehicle to determine whether a warranty case applies. If there is an applicable warranty of the high-voltage battery, proceed to step 3.

3. If the remaining battery capacity was determined to be less than 70% by the BHC test in step 2, then contact the Volkswagen Group TAC for next steps.

Provide the complete GFF log as well as the ".pdf" copies of both the BHS test and the BHC test when opening a TAC ticket.

The appropriate warranty repair direction will be provided through the TAC ticket.

CAUTION

The high-voltage battery cannot be replaced under warranty without first contacting the Volkswagen Group TAC as outlined in this document!

To check the remaining battery capacity of the high-voltage battery as part of the customer's request (not covered under warranty):

Carry out either the "Battery Health Quick Test" (BHQ) or the "Battery Health Certificate" (BHC) portion of the "determine the residual energy content of the high-voltage battery" test plan through Guided Fault Finding (GFF).

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Warranty

CAUTION

The warranty information within this document only pertains to the testing required to determine the remaining capacity of the high-voltage battery! Any repairs to and replacement of the high-voltage battery, as determined through contact with the Volkswagen Group TAC, are outside the scope of this document. Please see the repair manual for any labor operations and special tools that may be required.

NOTICE

Only the "Battery Health Status (BHS)" and "Battery Health Certificate (BHC)" checks can be claimed via warranty with a justified customer complaint. For checking the remaining battery capacity at the customer's request, and for the "Battery Health Quicktest (BHQ)", no warranty applies.

To determine if this procedure is covered under Warranty, always refer to the Warranty Policies and Procedures Manual [1)]

Model(s)	Year(s)	Eng. Code(s)	Trans. Code(s)	VIN Range From	VIN Range To
e-Golf	2015 – 2019	All	All	All	All
ID.4	2021 – 2024	All	All	All	All

SAGA Coding			
Claim Type:	**Use applicable Claim Type [1)]**		
Service Number:	**Damage Code**	**HST**	**Damage Location (Depends on Service No.)**
9303	0039	--	--
Parts Manufacturer	e-Golf, ID.4	WWO [2)]	

<u>For BHS Test:</u>

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Labor Operation [3] : Battery charge	27068950 = see Elsa for latest time units	
For BHC Test (only if long measurement required according to BHS results):		
Labor Operation [3] : High voltage battery check	93030100 = see Elsa for latest time units	
Labor Operation [3] : Diagnose high-voltage battery	93050599 = 50 TU	
Causal Part:	01500060	
Diagnostic Time [4]		
GFF Time expenditure	01500060 = Actual GFF print out (up to 50 TU max)	YES
Road Test	01210002 = see Elsa for latest time units 01210004 = see Elsa for latest time units	NO
Technical Diagnosis	01320000 = 00 TU max.	NO
Claim Comment: Input “As per Technical Bulletin 2071535” in comment section of Warranty Claim.		

[1] Vehicle may be outside any Warranty in which case this Technical Bulletin is informational only.

[2] Code per warranty vendor code policy.

[3] Labor Time Units (TUs) are subject to change with ELSA updates.

[4] Documentation required per Warranty Policies and Procedures Manual.

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Required Parts and Tools

Tool Description	Tool No:
VAS Diagnostic Tool	VAS 6150/X & VAS 6160/X with ODIS Service with current online updates
VAS Battery Tester / Charger	VAS 5908

Additional Information

All part and service references provided in this Technical Bulletin are subject to change and/or removal. Always check with your Parts Dept. and Repair Manuals for the latest information.

Customer Information

Pre-conditioning of the high-voltage battery before determining the remaining high-voltage battery capacity

VWGoA | 31.10.2023

Pre-conditioning of the high-voltage battery for:
Battery Health Quicktest (BHQ) or Battery Health Status (BHS)

- The temperature of the high-voltage battery must be greater than 10°C / 50°F (outside temperature greater than 5°C / 41°F).
- Discharge the high-voltage battery by driving to as low a charge level as possible. A charge level below 10% is ideal.
- Lock the vehicle.
- Wait for 60 minutes.
  - The key must be kept at least 20 yards away from the vehicle for a full 60 minutes!
- Charge the high-voltage battery to a charge level of at least 90% (within a single charging cycle).
- Wait for 60 minutes.
  - The key must be kept at least 20 yards away from the vehicle for a full 60 minutes!
- Drive the vehicle to your VW dealer to perform the BHQ or BHS test.

Pre-conditioning of the high-voltage battery for:
Battery Health Certificate (BHC)

- The BHC test has specific requirements to begin – bringing the vehicle to the following conditions ahead of the test will shorten the time required at your VW dealer:
  - The charge level of the vehicle's high-voltage battery must be below 10%. The charge level can be reduced through normal driving of the vehicle.
  - The temperature of the high-voltage battery must be greater than 10°C / 50°F (outside temperature greater than 5°C / 41°F). At low outside temperatures, the vehicle may need to be acclimated inside the dealer workshop to achieve this condition.
  - At low outside temperatures, if possible, do not park the vehicle outside before the dealership visit.