



Regulation of Use
Battery Health Check CARA Approved®

Created by
CARA Europe Battery Health Workgroup
&
GEVERS European Intellectual Property Experts

Version 1.0

Approved by: Roland Gagel on Behalf of the CARA Board

Approved on: 16 February 2023

Table of Contents

Article 1	Name, address and purpose of the Holder	3
Article 2	Declaration of independence.....	3
Article 3	Representation of the EU certification mark	3
Article 4	The goods or services covered by the Certification Mark.....	4
Article 5	The characteristics of the services to be certified by Certification Mark	4
5.1	Technical requirements for the CARA Battery Health Checks.....	4
5.2	Requirements to cover the market.....	5
Article 6	The conditions governing the use of the Certification Mark, including sanctions	5
6.1	Conditions of use	5
6.2	Pricing of the certification	6
6.3	Liability	6
Article 7	Persons authorized to use the Certification Mark.....	6
Article 8	How the certifying body is to test those characteristics.....	7
8.1	Application process for the Certification Mark.....	7
8.1.1	Application procedure.....	7
8.1.2	Withdrawal of application	8
8.2	Testing Process	8
8.2.1	General testing requirements and setup.....	8
8.2.2	Testing for Basic Battery Health Check.....	9
8.2.3	Test Reports and outcome	10
8.2.4	Price of the testing.....	10
8.3	The Holders process to delegate testing to authorized Testing companies....	10
8.4	The Holder’s decision process to grant the Certification Mark	11
8.5	Process for proving compliance to the coverage of the models	12
8.5.1	Initial compliance confirmation	12
8.5.2	Second compliance confirmation.....	12
8.5.3	Nonconformity at moment of application	12
8.5.4	Nonconformity for authorized users	12

Article 1 Name, address and purpose of the Holder

Car Remarketing Association - Europe "CARA-EUROPE", Internationale vereniging zonder winstoogmerk, having its registered office at Teutseweg 25, 3520 Zonhoven, Belgium and known under the company number 0649.867.534 is the holder (hereafter the "Holder") of the following marks:

- EU certification trademark n° **018811222** BATTERY HEALTH CHECK CARA APPROVED;
- EU certification trademark n° **018811223**



; and

- EU certification trademark n° **018811224**



The acceptance of used electric vehicles highly depends on the trust of private individuals in the second and third lifecycle. To foster this adoption a clear and transparent communication of the battery conditions is crucial, on the one hand to find acceptance of the buyers to purchase a used electric vehicle, but also to protect the residual values of these cars. The Holder aims to give a clear and transparent overview of today's possibilities to answer the uncertainties the mobility change brings. In light hereof, the Holder came up with a certification of processes that are able to read out the Battery State of Health from the Battery Management System.

Article 2 Declaration of independence

The Holder declares that it does not carry on a business involving the supply of services of the kind certified.

The Holder declares to comply with the requirements laid down in Article 83(2) of Regulation (EU) 2017/1001 of the European Parliament and of the Council of 14 June of 2017 on the European Union trade mark.

Article 3 Representation of the EU certification mark

This regulation covers the use of the EU certification mark nr. 018811222 for the word combination "BATTERY HEALTH CHECK CARA APPROVED" (hereinafter the "Certification Mark").

Article 4 The goods or services covered by the Certification Mark

The Certification Mark is registered for the following services in class 42:

Class 42: Testing, authentication and quality control; consulting on testing of products, quality control and quality assurance; Analysis and testing services relating to electrical engineering apparatus; Inspection services for new and used vehicles for persons buying or selling their vehicles; Measurement evaluation services; Preparation of reports relating to technical research; Testing services for the certification of quality or standards; all the aforementioned services solely in relation to activities in the vehicle resale sector.

Article 5 The characteristics of the services to be certified by Certification Mark

5.1 Technical requirements for the CARA Battery Health Checks

The provider that applies to become certified under the scheme (applicant) must demonstrate that it can cover the following points with its system solution.

(i) Readout of the manufacturer State of health

The applicant shall ensure that it can read out and display the manufacturer-specific battery state of health (hereinafter "SOH") from the corresponding control units, such as the Battery Management System (hereinafter "BMS") of the vehicle, without manipulation.

If the applicant provides further information on the battery health status or carries out its own calculations and assessment of data, it must be ensured that this can be presented in a reproducible manner.

Furthermore, the applicant must plausibly present its assessment to the Holder (e.g., calculate SOH from a Deterioration factor [%] or a remaining energy absolute value [kWh]).

The value is intended to represent a percentage value.

It further ensures that this process is reproducibly repeatable.

(ii) Long-term access

The applicant must demonstrate and explain the methodology it uses to ensure long-term access to the data required to read out the battery health status.

(iii) Duration of the process

The applicant ensures a maximum readout time of 30 minutes.

5.2 Requirements to cover the market

The applicant must demonstrate that the test covers at least 80% of Battery Electric Vehicle (hereinafter the "BEV") passenger vehicle fleet registered in the previous year. This percentage can evolve over time and can be checked on <https://cara-europe.org/battery-health/>. Vehicle registrations are based on official sources¹ or third parties that state their sources as an official authority. For simplicity, the minimum percentage will be based on yearly registration at model level. As soon as new manufacturers of BEV vehicles enter the market relevant for the Holder, they are included in the list of OEMs according to their respective percentage market coverage. The list is updated on a yearly basis.

The geographical coverage retained for calculating the total minimum for all countries will be that of major five markets (Germany, UK, France, Spain, Italy) plus Benelux. In case that during any given year, there is not enough information to calculate the total BEV registrations of the aforementioned geographies, the calculation will be based on the total new BEV registrations perceived by those countries that account for 80% of total new registrations in Europe in a descending order. Also this percentage can evolve over time and can be checked on <https://cara-europe.org/battery-health/>.

The Holder reserves the right to provide the corresponding minimum coverage either as a list of obligatory models to cover, or a list of models with corresponding market share on sales.

Article 6 The conditions governing the use of the Certification Mark, including sanctions

6.1 Conditions of use

After receipt of the Certification Mark, the applicant becomes an authorized user and can use the term 'BATTERY HEALTH CHECK CARA APPROVED' as a certification mark from the day they receive the written certification from CARA Board. The use is limited to the test report itself and public marketing activities such as advertisements, websites, conferences etc.

The term must only be used for the test that was certified. Any use for tests that are not certified by the Holder will void the entire Certification Mark. In this case the Holder will notify the authorized user from the termination of the grant to use the term. The authorized user must stop using the Certification Mark within 3 days from notification and must remove the term from all marketing materials and documents shared with the public. Failing to do so will result in a contractual compensation fee of 100€ per day of non-compliance to the prohibition to use of the term and of 100€ per test sold with the term after the deadline.

¹ Official sources refer to either a local vehicle registration authority, ex. KBA in German, or a relevant association, ex. ACEA

Any authorized user must inform the Holder about any significant changes of the certified process. Failure to do so can result in the Certification Mark being declared void by the Holder under the same process described above.

The application for renewal must be available to the Holder within 2 months before expiry of the notification to assure that the applicant can continue to use the Term and certification without any gap.

The Holder reserves the right to not extend the Certification Mark after its expiry at its own discretion. The authorized user can terminate the agreement from their side with a written notice of 3 months. Any fees or payments are not subject to refund in case of a termination.

6.2 Pricing of the certification

Upon receipt of the nomination the authorized user must pay the yearly fee of 1.500€ per test type certified to receive the Certification Mark. A test type is a test that is technically similar by method, duration, and applicability (makes/models) of the test.

6.3 Liability

The Holder shall only be liable for damages resulting from its own, irrespective of the legal ground, in the context of fault-based liability in the event of intent or gross negligence, excluding any other grounds.

The limitation of liability according to the section above also applies to breaches of duty by or for the benefit of persons for whose fault the Holder is responsible pursuant to the statutory provisions and to any personal liability of executive bodies, experts, and other employees of the Holder.

Any person making claims under this contract shall without delay inform the Holder in textual form about any potential damage for which the Holder could be liable.

Article 7 Persons authorized to use the Certification Mark

In order to become an authorized user of the Certification Mark, the applicant must propose a solution in line with the current remarketing vehicle return process (including but not limited to the return of the vehicle after leasing and/or buying back the vehicle after the use by a hire car company), meaning

- (i) The maximum duration of a test end-to-end is 30 minutes
 - a. Without major disassembly (except removeable covers such as over OBD, charging outlet covers)
 - b. With minimal intervention of the inspector during this period
 - Plug-in and plug-out activity (OBD and / or charging connector)
 - Time to start and stop test < 2 min*
 - c. Must not involve test driving except minimal* distances within compound
 - d. Require minimal* hardware and no significant fixed installations
 - e. Result must be available within short timeframe; the goal is 30 min after test end

- (ii) Possible to test batteries at charging levels from 10 to 80 % SOC
- (iii) Use data sources available today plus own technology to determine the SOH
 - a. Vehicle, car data provider, inspection provider, car owner
- (iv) Generate a valid result of the battery health in % SOH of original certified capacity
- (v) Generate a certificate from an independent source (can use manufacturer information)

() high requirements for time, driving and hardware won't exclude applicants, but are likely to make solution not viable*

Article 8 How the certifying body is to test those characteristics

8.1 Application process for the Certification Mark

8.1.1 Application procedure

An application to obtain the Certification Mark can be made to the Holder, providing the required information (see below) or by using the provided application form. The application must be in writing (email is acceptable), written in English language, and minimum state the following:

- (i) Name of the company
- (ii) Name of the test (intended trade name used by the applicant)
- (iii) Desired timeframe for certification testing
- (iv) Description of the test procedure (required hardware, required software, time to test, how to apply the test to the vehicle; General description and per Model instructions, limitations, and exclusions) Note: The testing algorithms and calculation needn't to be disclosed.
- (v) Description of the test output e.g., example of a test report or certificate
- (vi) Confirmation that the test fulfils the CARA requirements laid out in section 5.1
- (vii) Confirmation, which brands and models can be tested with the test and any applicable exclusions. It is possible to provide a timeline of when tests for certain makes/models in future will be possible
- (viii) Evidence, that tests have been performed for the minimum set of vehicles required and results
- (ix) Geographical and language availability of test
- (x) Contact Data for technical and commercial contacts
- (xi) Optional: references

Upon receipt of the application, the Holder will notify the applicant of its acceptance or ask for further clarification to fulfil formal requirements. Once the Holder accepts the application, it will pass the application to one or several CARA recognized testing companies to perform the testing of the solution. The applicant then can choose one of the companies to perform the test and continue the application process. The testing contract will be established between the applicant and the testing company, and the fee must be paid for by the applicant to the testing company. There will not be a

contractual relation between the Holder and the applicant for the testing. The applicant and the testing company will agree on a date, site, and test vehicle to perform the physical tests.

The Holder reserves the right to stop or deny an application in case an applicant delays the process unduly or does not perform the testing after approval of the application for testing within 3 months.

8.1.2 *Withdrawal of application*

If an applicant decides not to pursue the application anymore within the 3 months test timing, the Holder shall be informed and consequently will confirm resignation within due time.

8.2 **Testing Process**

8.2.1 *General testing requirements and setup*

8.2.1.1 *Testing Contract*

The applicant will request a quotation for the testing of its test to obtain a Certification Mark from the Holder from a CARA designated testing company of his choice. The terms and conditions of the contract to perform the test will be negotiated and established between the applicant and the testing company. Any testing company can refuse to provide a quotation in case of unclear specification of the requirements, or a possible conflict of interest.

A testing company must deny the testing application in case the applicant is part of the testing company's group of companies; hence a conflict of interest exists.

8.2.1.2 *Document Check*

The applicant must provide a set of documents that declare the compliance with the testing requirements as per chapter 5.1 (technical requirements) and 5.2. (requirements to cover the market).

The testing company will validate the feasibility of the testing method, the technical foundation, and the fulfilment of the requirements before entering physical testing.

8.2.1.3 *Cars to be tested*

Physical live-testing with 6 different BEV's (out of the following pool: max. one out of each brand: Tesla Model 3 and Y, VW ID3 and ID4, Skoda Enyak, Renault Zoe, KIA e-Niro, Hyundai Kona electric, FIAT 500e, BMW i3, Mercedes EQA, Peugeot e-208, Audi e-tron).

8.2.1.4 *Deliver conditions of the test kit to be certified*

- (i) Test kit must be delivered ready to use by the applicant to the testing engineer
- (ii) Any batteries in the test kit must be charged
- (iii) The Installation and use of the test kit must be described in a manual in English not exceeding 10 pages

- (iv) The test kit must be able to communicate the test result with the applicants backend, i.e., using public data connections
- (v) The test kit must be power self-supplied or work with a 220V
- (vi) The presence (physical or virtual) of one representative from the applicant is required. Further participants need to be agreed upon.

8.2.1.5 *Testing environmental conditions*

- (i) Temperature at testing site between +5°C and +30°C
- (ii) LTE/4G connectivity or higher at test site
- (iii) 220 V Power supply for auxiliary equipment and battery recharge/ power connection

8.2.2 *Testing for Basic Battery Health Check*

In order to validate the test result from the applicant with the SOH measured by the OEM workshop, the following test procedure will be performed for each Car under Test (CUT)

- (i) Test at car dealer with OEM own diagnosis tool to generate the SOH stored in the BMS unit. Result: Document with the SOH of the battery measured with the date, time, VIN, odometer and executing workshop (SOH from OEM)
- (ii) Test with applicants test system to obtain the SOH from the BMS. Result: Document with the SOH of the battery measured with the date, time, VIN, odometer, and applicant's system name (SOH from Applicant's system)

The test shall be performed at one site without major movement of the car (except on the car dealer's premises). The sequence of step 1 and 2 can be permuted.

8.2.2.1 *Test Pass criteria*

- (i) The test results shall be the same with a maximum margin of +/- 1,0 %.
- (ii) The test criteria must fulfil criterion a) for all 6 CUT.
- (iii) If maximum one test result is not okay, it can be repeated once at cost of the applicant.

If the abovementioned prerequisites are not fulfilled, the test has failed and will be stopped. A test report with the tested vehicles, conditions, test values and calculations will be created and provided to the applicant.

If the test is failed, the applicant and the testing company can agree to re-perform the test at cost of the applicant as soon as the root cause of the failure has been fixed by the applicant.

If the test is passed, the testing engineer will create the test report and add a recommendation to the holder for certification of the test.

8.2.2.2 *Requirements for the SOH Check Document to be produced by the applicant*

The applicants will have to provide the data of any test in a document on the battery health (CARA approved BHC). They must provide the SOH in % of the original type approved usable battery energy.

In the CARA approved BHC it must be stated that the values are generated from vehicle own data and not independently tested from the vehicle.

Any additional data and values of the battery situation can be included.

The following data must be displayed on the test results as a minimum:

- (i) Vehicle VIN and number plate (for countries where the plate remains with the car during lifetime)
- (ii) Vehicle Make
- (iii) Vehicle Model (incl. specifics like Model 3 SR+ or EQA 300 4matic)
- (iv) Vehicle Mileage at time of test
- (v) Date and time of the test
- (vi) Nominal Battery Capacity in kWh
- (vii) SOH from BMS in %
- (viii) The name and the company and software version of the testing system (Release notes from the applicant of new software version incl. feedback to the Holder)
- (ix) The company performing the tests and the name of the testing expert

The following data are optional but desired:

- (i) Date of first registration
- (ii) Energy Consumption in kWh/100km based on WLTP test from CoC
- (iii) Energy Label A+-G
- (iv) OEM Battery Warranty period until date
- (v) SW Version of i.e., BMS or other relevant devices
- (vi) Battery Charging history (energy amount/times) home/normal/fast in hh:mm

8.2.3 Test Reports and outcome

The testing company summarizes the test results, evaluates them, and submits a report to the CARA Board. The testing company shall express a recommendation for the certification or whether to reject it.

The report shall be sent to the Holder by email within due time after the test is finalized.

The format of the report will be defined by the Holder at a later stage. Until then, the format is at the discretion of the testing company.

8.2.4 Price of the testing

Prices and terms and conditions to be agreed upon between the applicant and the testing company. The Holder does not become party of that contract. However, the regulation of this document applies.

8.3 The Holders process to delegate testing to authorized Testing companies

The Holder nominates one or many testing companies that the Holder delegates to the testing of any applicant's solution. Any applicant can freely choose the testing company within the list of nominations. However, the Holder reserves the right to ban certain

testing companies from the selection in case there are doubts on the impartiality of the testing company from the applicant to be tested.

Any testing company that applies for nomination for testing must fulfil the minimum requirement:

- (i) General impartiality from OEM / Carmakers, OEM Dealership associations, and leasing companies
- (ii) Proven know how of battery testing processes in used vehicles on both commercial and technical levels
- (iii) Nomination of expert to perform the testing

The above requirements are necessary but not sufficient to be nominated. The Holder reserves the right to reject applications based on its own judgement, e.g., of required number of companies.

The Holder will nominate testing companies for a period of maximum 3 years with a nomination letter.

After this time, testing companies must apply again. Within this timeframe, the Holder can withdraw the nomination at its own discretion at any time by simple written notice (e-mail) with an effect that no new test can be performed as of the Holder specified date, unless already agreed in writing between the applicant and the testing company before the termination notice.

The holder can change the requirements for testing companies at any time with a notice period of three months from the day the notice is published to the Holder nominated testing companies.

The testing companies will have no right to claim investment cost for test development or setup in case of a withdrawal or termination of the nomination.

The Holder reserves the right to audit the testing procedure of any nominated testing company by means determined by the Holder.

Any nominated company must agree to submit to this right and the aforementioned terms and conditions when applying to the Holder to become a testing company. The application can be made in textual form to the CARA Board that will decide on it with simple majority. Decision can be made in circulation.

8.4 The Holder's decision process to grant the Certification Mark

Upon receipt of the recommendation from the testing company, the Holder will decide within due time, maximum 3 months, on the grant of a Certification Mark to the applicant.

The decision will be done by the CARA Board with single majority. The vote can be done by circulation.

The CARA Board will notify the applicant immediately after its decision in writing by email. The Holder will state the start date and end date of the right to use the name of the test in the notification to the applicant.

The Certification Mark is valid for one year and can be renewed upon application, stating the technical development and differences of the test during the year passed. The Holder will check the changes or delegate such a check to a testing company and will notify the applicant whether a new test will be required.

The Holder reserves the right to cancel the Certification Mark for important reason, such as violation of the key requirements for a test, significant changes of a test, complaints from the field, especially of CARA members about the testing and validity of the results.

The certification fee is due upon the receipt of the email communicating the grant of the Certification Mark and payable to the Holder's bank account mentioned on the invoice.

8.5 Process for proving compliance to the coverage of the models

8.5.1 Initial compliance confirmation

All certification applicants and all authorized users need to generate a yearly confirmation of coverage to the Holder no later than November 30th for review of authorized users, or at the event of application for the Certification Mark and upon specific request of the Holder. The Holder will then compare apparent coverage from the applicant/authorized user with required coverage. The Holder reserves the right to accept the filed documentation or to ask the test applicant/authorized user for real test results. Minimum coverage requirement could successfully end at this step if the Holder deems it appropriate.

8.5.2 Second compliance confirmation

In case of renewal of the Certification Mark, the authorized users must provide proper documentation of the increased model coverage for the following year. The Holder has the right to request the authorized user to generate one test report per model, that the authorized user cited as being covered. The Holder reserves the rights to request one or multiple tests to be carried out on selected vehicles and/or selected facilities. The Holder can delegate the process to a testing company. In case of compliance, the Holder will give the authorized user a confirmation of compliance with the minimum coverage required and may extend the certification as per defined process.

8.5.3 Nonconformity at moment of application

In the case that the applicant does not fulfil the minimum coverage stated in this section, the application for the Certification Mark will be denied. The Holder can - at discretion of its board - provide a single waiver of the requirement for that year based on availability of compliant test application.

After denial of an application, reapplication will not be valid for the next 3 months.

8.5.4 Nonconformity for authorized users

In the case that an authorized user does not comply with the minimum coverage stated in this section, the authorized user needs to communicate to the Holder the case of

nonconformity in a period not longer than 30 days. Said communication can include a proposal for achieving the minimum coverage requirements, which CARA could take into consideration. CARA will then deliberate on the infringement of this requirement and deliver a response on withdrawal of the certification or extension in a period no longer than 30 days. Any decision taken by CARA on nonconformity has an immediate effect on the validity of any certificate.

Any changes in the Applicants' details and/or information provided in this Application must be communicated to the CARA Board.