



# **China Green Car Assessment Program (C-GCAP) (Trial Version)**

## **Management Rules**

**China Automotive Technology and Research Center Co., Ltd.**

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## Preface

In recent years, with the rapid growth of China's economy, the automotive industry has developed quickly, leading the world in terms of automobile production and sales for thirteen consecutive years. At the same time, however, the phenomenon of product homogenization in the automotive market is becoming increasingly serious, and the problem that the consumers have no clear demands and thus may easily be misled is also becoming increasingly prominent. In this stage of development and the context of the times, the main problem faced by China's automotive society has transformed into the problem about numerous categories of automotive products and imbalance in consumers' knowledge. The rapidly-introduced new products, the rich information contents and the fragmented information dissemination have made it difficult for the consumers to fully understand an automotive product, and even more difficult for them to select the high-quality one from numerous products.

China Automotive Technology and Research Center Co., Ltd. (hereinafter referred to as "CATARC"), as a central enterprise providing the professional third-party comprehensive technical services, possesses the widely-recognized test and evaluation capabilities in the industry. In order to lead the progress of automotive technologies and guide the consumption of automotive products, CATARC, relying on the industrial strength and drawing on the domestic and foreign experience, successively launched C-ECAP, EV-TEST and CCRT programs in 2016, 2017, and 2018. so as to conduct the automotive test and evaluation around the consumers' concerns such as ecological health, pure electric vehicles and user survey.

With the continuous development of automotive technologies and quality level, as well as the upgrading of users' performance requirements, CATARC organized the relevant enterprises to conduct the research on CCRT (Version 2021) program under the guidance of the China Association for Consumer Products Quality and Safety Promotion in 2020. The CCRT (Version 2021) focuses on occupant health, energy conservation & environmental protection, driving performance, assisted driving, and perceived quality, so as to provide the users with independent, fair, professional and warm reference for selection of vehicles.

In order to further focus on the "green" development of automobiles and promote the "green" performance improvement of automobiles, CATARC launched the China Green CAR Assessment Program (C-GCAP) focusing on health, energy efficiency and low-carbon based on the CCRT (version 2021). In order to ensure the smooth transition of green evaluation system and indicators for automobiles, C-GCAP took the lead in launching a trial version. This version mainly focuses on migrating the indicators from the original CCRT system, with the test methods remaining basically unchanged, and the weights of each indicator being fine-tuned. Centering around the green performance (namely health, energy efficiency and low-carbon) of vehicles, the C-GCAP gives the star rating for each sector separately, so as to better reflect the performance characteristics of vehicles, while providing the authoritative reference for consumers to choose more suitable green vehicles.

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# Chapter 1 General Provisions

## 1.1 Tenet

The China Green Car Assessment Program aims to establish a high-standard, fair and objective evaluation method for green vehicles, so as to provide the consumers with sufficient information on health, energy efficiency, low-carbon and other green performance of automotive products, guide the green consumption, promote the manufacturers to improve the green performance of automotive products, and help the green development of China's entire automotive industry chain.

## 1.2 Management Body

The Automotive Assessment Management Center of CATARC (hereinafter referred to as "Management Center") is responsible for organizing the implementation of C-GCAP related matters, including determining the annual plan, selecting the tested models, reviewing the evaluation results, settling the disputes and difficult issues, and deciding the temporary matters. Its main responsibilities are detailed as follows:

Developing the annual implementation plan; analyzing the proposed vehicle models; carrying out the daily communication and industrial cooperation with enterprises.

Purchasing, managing and disposing of the tested vehicles; responsible for tested vehicle announcement management, plan issuance, process supervision, support, and special case handling; calculating the evaluation results based on the evaluation data; making coordination for test resources and progress.

Organizing the research on evaluation procedures and evaluation technology roadmap; organizing the evaluation benchmarking research, technical validation, and evaluation procedure revision in various technical fields; responsible for domestic and international technical exchanges.

Planning and organizing the release of evaluation results; organizing various activities; conducting the public science popularization and promotion; responsible for brand management, official publicity platform operation management, and communication with media and consumers.

In addition, a C-GCAP expert committee has been established to provide the opinions and suggestions on the technical requirements and operation of C-GCAP. The technical committee includes the experts and scholars from automotive companies, universities and research institutes, as well as the representatives from media.

## 1.3 C-GCAP Indicator System and Weights

The C-GCAP has three primary indicators, and the scoring method and evaluation method for the three primary indicators are shown in Appendix A through Appendix C. The names and weights of primary indicators and secondary indicators are shown in Tables 1-1.

Table 1-1 Names and Weights of Primary Indicators and Secondary Indicators of C-GCAP

No.	Name of Primary Indicator	Name of Secondary Indicator	Weight	
			Fuel Vehicle <sup>①</sup>	Pure Electric Vehicle
1	Health	Interior air	80%	80%
		Electromagnetic protection	20%	20%
2	Energy efficiency	Fuel consumption under Chinese	50%	-

		operating conditions		
		Fuel consumption under urban operating conditions	50%	-
		Range	-	60%
		Charging	-	40%
3	Low carbon	Carbon emission	100%	100%
Note: ① Applicable to non plug-in hybrid and plug-in hybrid vehicles (including extended-range plug-in hybrid vehicles)				

## 1.4 Calculation of Score and Rating of Results

### 1.4.1 Calculation of Score

The score of each primary indicator of C-GCAP shall be calculated according to the scores and weights of all secondary indicators under such primary indicator, and shall be rounded to two places after the decimal separator. The calculation method is shown in Equation (1-1).

$$S = \sum_{i=1}^n S_i \times a_i \quad (1-1)$$

In which: S is the score of each primary indicator of C-GCAP, i is the serial number of secondary indicator, and  $S_i$  and  $a_i$  are respectively the score and weight of the jth secondary indicator. The serial number and weight are set forth in Table 1-1.

The score of each secondary indicator is calculated according to the scoring method specified in the corresponding test rules.

### 1.4.2 Rating of Results

In order to guide the consumption, the scores of primary indicators will be rated according to Table 1-2.

Table 1-2 Rating Rules for C-GCAP

Score of Primary Indicator (Full Score: 100 Points)	Star Rating
$\geq 88$ points	★★★★★
$\geq 80$ points, and $< 88$ points	★★★★
$\geq 70$ points, and $< 80$ points	★★★
$\geq 60$ points, and $< 70$ points	★★
$< 60$ points	★

## 1.5 Statement

C-GCAP is a registered trademark of China Automotive Technology and Research Center Co., Ltd. Without the permission of China Automotive Technology and Research Center Co., Ltd., other institutions are not allowed to use C-GCAP for public or commercial test, evaluation or release of

automotive products, except for technology development tests conducted by enterprises themselves.

The test results, scores and ratings obtained from the model evaluated under C-GCAP are only valid for the purchased model and the configuration thereof. All parties using the evaluation results under C-GCAP shall be responsible for the authenticity, completeness and accuracy thereof.

## **Chapter 2 Operation Management**

### **2.1 Selection of Tested Model**

#### **2.1.1 Selection Principle**

2.1.1.1 The tested model means the passenger vehicles (i.e. Category-M1 vehicles) launched in the past two years, with a total sales volume of over 3,000 sets (for plug-in hybrid vehicles (including extended-range plug-in hybrid vehicles), pure electric vehicles and popular vehicles, there is no requirement on sales volume), to be selected by the Management Center based on market data.

2.1.1.2 Among the tested models, the popular models with high consumer attention within six months after launch shall be selected through public voting.

2.1.1.3 There shall be no plan to discontinue the production of the tested vehicle model in the near future.

#### **2.1.2 Determination Procedures**

2.1.2.1 The Management Center shall determine the candidate vehicle models based on the selection principle in 2.1.1 hereof. During the selection of candidate vehicle models, the Management Center shall confirm whether any vehicle model is in a recall state. If the recall work related to a vehicle model has not yet ended, such vehicle model shall not be selected.

2.1.2.2 The Management Center shall notify the manufacturers of the candidate vehicle models, and the manufacturers shall provide the relevant technical information of such vehicle models.

2.1.2.3 After receiving the information from the manufacturers, the Management Center shall select the tested model and the configuration thereof with relatively large sales volume.

### **2.2 Purchase of Vehicle**

After determining the tested vehicle model, the Management Center shall, following the principle of randomness, independently purchase the vehicle from the dealer of tested model without informing the manufacturer in advance. The purchasing process shall be subject to supervision from media and consumers.

After acquiring the vehicle, the Management Center shall announce the tested vehicle model and the configuration thereof on its official platform, and send a notice to the vehicle manufacturer.

### **2.3 Test and Evaluation**

#### **2.3.1 Formation of Test Plan**

After announcing the tested model, the Management Center shall formulate the test implementation plan.

After the Management Center announces the tested model, if a recall event related to such model occurs, the test of such model will be terminated.

#### **2.3.2 Publicity and Arrangement of Test Plan**

After the test plan is formulated, the C-GCAP official platform will publicly arrange the test plan for the tested vehicle. Before the test, the C-GCAP test implementation notification form (see Annex 1) shall be sent to the manufacturer, stating the tested model, configuration, software versioning, test contents and test time.

#### **2.3.3 Test Preparation**

2.3.3.1 After receiving the test implementation notice, the manufacturer shall provide the Management Center with the test parameter table of the tested vehicle (see Annex 2 and Annex 3) and a plan for software upgrade using over-the-air (OTA) technology (if any, the OTA materials filed with the corresponding regulatory body shall be provided) within 5 working days.

2.3.3.2 For the tested vehicle with an OTA upgrade plan, after the Management Center approves the relevant materials, the OTA upgrade shall be carried out by the manufacturer's personnel before the first test is officially implemented, and the Management Center's personnel shall supervise and record the upgrade process; after the official implementation of the first test, the OTA upgrade may not be carried out.

2.3.3.3 All preparatory work before the test, including preparation of tested vehicle, installation of tested equipment, and calibration of tested equipment, shall be carried out by the professional test personnel as organized by the Management Center. The manufacturer's technical personnel may observe the preparation of the test within the specified time, and confirm the necessary parameters; provided that they shall not carry out any operation on vehicle, equipment and instruments (except for those specified in 2.3.3.2 hereof).

#### 2.3.4 Test Implementation

The objective test and data processing shall be carried out by the professional test personnel in accordance with the operating procedures. The manufacturer's technical personnel may watch the test process at the designated time and location.

The objective test shall be conducted in the test chamber and test site recognized by the Management Center.

During the formal test, the manufacturer is not allowed to conduct any specialized performance enhancement for the tested vehicle through remote control or hinder the test of the tested vehicle by any means such as limitation of function. If the above situation occurs, the test shall be terminated and the relevant situation shall be made public.

#### 2.3.5 Data Management

After each test is completed, the person in charge of the test shall promptly submit the data obtained from the test to the data management system for unified management by the Management Center.

#### 2.3.6 Scoring for Indicator

The Management Center shall process the test data according to the scoring methods specified in the relevant test rules, and calculate the scores of evaluation indicators.

#### 2.3.7 Review of Results

After the completion of each test, the Management Center shall verify the score of each evaluation indicator based on the test data, so as to ensure the accuracy.

### 2.4 Release of Evaluation Results

The scores and rating obtained for each primary indicator with respect to the tested vehicle shall be released, while the score of each secondary indicator under each primary indicator and the test results of typical indicators shall also be released.

The C-GCAP test results and ratings shall be released through official channels (such as C-NCAP official website and WeChat account).

### 2.5 Funds

China Automotive Technology and Research Center Co., Ltd. sets up a special fund budget every year for covering the costs arising from purchase of vehicles, implementation of tests and management, so as to ensure the long-term operation of C-GCAP.

### 2.6 Management of External Personnel and Relevant Affairs During Test

#### 2.6.1 Management of Personnel Watching the Test Process

2.6.1.1 The specific test time for each test item of the evaluated vehicle model shall be notified to the vehicle manufacturer in advance and announced on the official website and WeChat account.

2.6.1.2 The vehicle manufacturer shall submit a list of personnel who will watch the test to the Management Center three days before the test implementation date.



2.6.1.3 The personnel of vehicle manufacturer must wear the corporate watching card when entering the test chamber.

#### **2.6.2 Management of Test-related Affairs of Manufacturer's Personnel**

2.6.2.1 The vehicle manufacturer's personnel may confirm the status of the tested vehicle before various tests. If any problem is found, they shall promptly communicate and ultimately reach a consensus with the responsible personnel of the Management Center.

2.6.2.2 When confirming the test conditions, the vehicle manufacturer's personnel shall separately record any content that may have a significant impact on the test results in the record form made by the Management Center while making confirmation with the responsible personnel of the Management Center.

2.6.2.3 The vehicle manufacturer's personnel shall not perform any operation on the tested vehicle and test components during confirmation. However, when any special need is confirmed and approved by the responsible person of the Management Center, the relevant operation may be carried out by the relevant personnel from the Management Center.

### **2.7 Appeal and Handling of Objections to Evaluation Results**

If the manufacturer has any objection to the evaluation results, it may submit an appeal form (see Annex 4) to the Management Center within 10 days after the results are released. The Management Center shall provide a reply within one month after receiving the appeal form the manufacturer. When there is still a dispute, the Management Center may arrange a meeting for discussion at the request of the manufacturer.

If there are significant deviations in the evaluation results due to failure to follow the procedures during the test, the evaluation may be conducted again, and the explanation may be given when the results are released. The expenses of re-evaluation shall be borne by the Management Center.

### **2.8 Post-disposal of Vehicle**

The vehicle with no objection to evaluation results shall be disposed of by the Management Center according to its internal management documents.

### **2.9 Use of C-GCAP Evaluation Results and Relevant Signs**

The results released by C-GCAP and the relevant signs may be used by relevant parties for free; provided that, when they are used for commercial purposes, the user must apply to the Management Center in advance, explaining the place and form of use of such signs. The Management Center has the right to impose the restrictions on use.

### **2.10 Technical Exchange**

The Management Center holds the C-GCAP thematic seminars and technical exchange activities every year, which may also be combined with the evaluation results release activities. The manufacturers and relevant institutions may engage in various forms of communication and technical cooperation with the Management Center.

### **2.11 Communication and Public Promotion Activities**

The Management Center may participate in or organize the public promotion activities, and carry out various forms of communication with all concerned parties.

## Annex 1: C-GCAP Test Implementation Notification Form

Vehicle manufacturer					
Vehicle model					
Configuration					
Test contents and test implementation date	Health		From		to
	Energy efficiency		From		to
	Low carbon		From		to
Matters needing attention					
Contact person		Tel.		Fax	
Official seal	<div style="text-align: right;">Date:</div>				

## Annex 2: Table of Parameters of Tested Vehicle under C-GCAP (Fuel Vehicles, and Plug-in Hybrid Vehicles)

Completed by: \_\_\_\_\_

Date of Completion: \_\_\_\_\_

Setting method for rotation mode: (Explanatory documents may be attached)	Vehicle model	
	Vehicle type	M <sub>1</sub>
	Number of axles	
	Chassis model	
	Chassis manufacturer	
	VIN	
	Odometer reading (km)	
	Curb weight (kg)	
	Maximum design total mass (kg)	
	Design number of occupants (person)	
	Maximum speed (km/h)	
	Dimension: length × width × height (mm)	
	Test mass (kg)	
	Minimum ground clearance (mm)	
	Wheelbase (mm)	
	Track width (front/rear) (mm)	
	Type of vehicle body (or cab)	
	Drive type and position	<input type="checkbox"/> Front wheel drive <input type="checkbox"/> Rear wheel drive <input type="checkbox"/> Four-wheel drive
	Whether the non-driving wheel follows up	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Setting method for rotation mode	(Explanatory documents may be attached)

	Minimum fuel designation	
	Number of tyres/manufacturer	
	Specifications and air pressure of tyres (kPa)	
	Suspension type	
	Type of service brake system	
	Driving mode of service brake system	
	Booster type of service brake system	
	Brake type of service brake system	
	Braking force adjustment mode of service brake system	
	Control mode of ABS system	
	Diameter of steering wheel (mm)	
Engine	Engine layout	
	Engine manufacturer	
	Specification and model	
	Engine number	
	Displacement (L)	
	Number of cylinders - cylinder diameter × stroke (mm)	
	Air intake method	
	Cooling method	
	Fuel	
	Rated power/speed (kW/(r/min))	
	Maximum torque/speed (N·m/(r/min))	

	Sound insulation material of engine compartment	
Transmission	Manufacturer	
	Type/control mode	
	Model	
	Number of forward gears	
	Each gear ratio	
Final drive ratio of drive axle		
Minimum total transmission ratio		

### Annex 3: Table of Parameters of Tested Vehicle under C-GCAP (Pure Electrical Vehicles)

Date of Completion:

Trademark and name of vehicle			Model for sale	
Manufacturer			Announced model	
Vehicle identification number (VIN)				
Production date of vehicle				
Basic parameters and configuration of vehicle	Dimension	Length × width × height (mm)		
		Wheelbase (mm)		
	Mass	Maximum total mass (kg)		
		Curb weight (kg)		
		Load distribution between front and rear axles (unloaded)		
		Load distribution between front and rear axles (fully-loaded)		
	Motor (in case of multiple motors, please attach the additional pages)	Type of motor		
		Manufacturer of motor		
		Voltage (V)		
		Peak power/rated power (kW)		
		Peak torque/rated torque (N·m)		
	Battery	Type of battery		
		Capacity of battery (Ah)		
		Electricity quantity of battery (kWh)		
		Rated voltage (V)		
		Voltage range (V)		
		Minimum temperature that can be withstood during low-temperature charging		
		Type of battery thermal management system		

		Whether it is equipped with the low-temperature charging preheating function	
	Drive mode	Front wheel/rear wheel/four-wheel drive	
	Electronic stability program (ESP)		
	Suspension form		
	Brake system	Control mode (mechanical, hydraulic, or pneumatic)	
		Type of wheel brake (disc or drum)	
Performance parameters of vehicle	Dynamicity	0-50/50-80/0-100km/h acceleration time	/ /
		Maximum speed	
		30min maximum speed	
	Range and electricity consumption	Range (NEDC) (km)	
		Range (60km/h) (km)	
		Electricity consumption per 100km (NEDC) (kWh/100km)	
	Charging	Charging time (AC)	
		Charging time (DC)	
		Specification and requirements of AC (voltage, and power)	
		Specification and requirements of DC (voltage, and power)	

#### Annex 4: C-GCAP Evaluation Objection Appeal Form

<p>Manufacturer (Official seal)</p>	<p>Date:</p>
<p>Vehicle model</p>	
<p>Evaluation time</p>	
<p>Evaluation item for which the appeal is lodged</p>	
<p>Reasons for appeal</p>	
<p>Time of re-evaluation applied for</p>	
<p>Handling opinions (Official seal)</p>	<p>Date:</p>



**Appendix A: Detailed Rules on Health Evaluation (Separately Attached)**

**Appendix B: Detailed Rules on Energy Efficiency Evaluation (Separately Attached)**

**Appendix C: Detailed Rules on Low-Carbon Emissions Evaluation (Separately Attached)**