



National Standard of the People’s Republic of China

GB 36980.1—XXXX

Replaces GB 36980—2018

Energy consumption limits for electric vehicles—Part 1: Passenger cars

电动汽车能量消耗量限值 第 1 部分：乘用车

*(English Translation)*

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# Contents

Foreword .....	II
Introduction .....	III
1 Scope .....	1
2 Normative References .....	1
3 Terms and Definitions .....	1
4 Overall Requirements .....	1
5 Type Approval Application and Determination .....	1
6 Energy Consumption Limits .....	2
7 Conformity of Production .....	3
8 Same Type Approval .....	3
9 Implementation .....	4
Appendix A (Normative) Energy Consumption Type Approval Report / Type Approval Application Report .....	5

## Foreword

This document was drafted in accordance with the provisions given in GB/T 1.1—2020 Directives for Standardization—Part 1: Rules for the Structure and Drafting of Standards.

This document is the first part of GB 36980 Energy Consumption Limits for Electric Vehicles. The following parts of GB 36980 have been published:

—Part 1: Passenger Cars.

This document replaces GB/T 36980 — 2018 Energy Consumption Limits for Electric Vehicles. Compared with GB/T 36980—2018, the main technical changes except for the structural adjustment and editorial changes are as follows:

- a) Added the type approval application and determination (see Chapter 5);
- b) Modified the energy consumption limit requirements (see Chapter 6 herein, and Chapter 5 of the 2018 edition);
- c) Added requirements for conformity of production (see Chapter 7);
- d) Added requirements for same type approval (see Chapter 8);
- e) Added the energy consumption type approval report/type approval application report (see Appendix A).

Please note that some content in this document may involve patents. The publishing institution of this document does not assume responsibility for identifying patents.

This document was proposed by and is under the centralized management of the Ministry of Industry and Information Technology of the People's Republic of China.

The previous editions replaced by this document are as follows:

- It was first published as GB/T 36980—2018 in 2018;
- This is the first revision.

# Introduction

With the continuous and rapid increase of new energy utilization, the proportion of energy consumption in the automobile industry is also increasing. How to effectively control the energy consumption level of such vehicle type also becomes more important to the low-carbon development of China's automobile industry. GB 36980 aims to determine unified requirements for energy consumption limits for electric vehicles, and is planned to consist of three parts:

- Part 1: Passenger Cars;
- Part 2: Light-duty Commercial Vehicles;
- Part 3: Heavy-duty Commercial Vehicles.

In 2018, China released the world's first energy consumption limit standard for pure electric vehicles to promote energy saving and consumption reduction of electric vehicles. With the continuous progress of the technical level and the change of testing conditions, the technical index in the standard can no longer meet the needs of further regulating the development of the industry. For this reason, it is necessary to revise GB/T 36980 — 2018 to continuously adapt to new changes in technology and new demands of industrial change.

GB/T 36980 — 2018 is only applicable to pure electric passenger cars. Driven by the strategy of carbon peaking and carbon neutrality and the industrial planning, pure electric commercial vehicles will also have a great space for development, which requires targeted energy consumption management in due time. Given the obvious differences in the energy consumption tests of passenger cars, light-duty commercial vehicles and heavy-duty commercial vehicles, and the time period for the development of the technical level is also significantly different, it is necessary to develop the standard in parts.

This revision is an important basis for implementing the energy-saving target in the Medium and Long-term Development Plan for the Auto Industry and Development Plan for New Energy Vehicle Industry (2021-2035), as well as the core component of the implementation of energy consumption standards of passenger cars. By establishing unified requirements for energy consumption limits and improving the management mechanism of energy consumption of electric vehicles, it is helpful to further promote the healthy development of the industry and technological progress.

# Energy consumption limits for electric vehicles—Part 1:

## Passenger cars

### 1 Scope

This document specifies the energy consumption limits for pure electric passenger vehicles, the type approval application and determination, conformity of production, and same type approval.

This standard applies to category M<sub>1</sub> pure electric vehicles with a maximum design total mass not exceeding 3,500 kg.

### 2 Normative References

The following normative documents contain provisions which, through reference in this text, constitute indispensable provisions of this document. For dated references, only the dated edition applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 3730.1—2022 Terms and definitions of motor vehicles, trailers and combination vehicle— Part 1: Types  
GB/T 15089 Classification of power-driven vehicles and trailers  
GB/T 18385—2024 Battery electric vehicles—Power performance—Test method  
GB/T 18386.1—2021 Test methods for energy consumption and range of electric vehicles—Part 1: Light-duty vehicles  
GB/T 18488—2024 Drive motor system for electric vehicles  
GB/T 19596 Terminology of electric vehicles

### 3 Terms and Definitions

Terms and definitions defined in GB/T 15089 and GB/T 19596 apply to this document.

### 4 Overall Requirements

4.1 The vehicle type energy consumption shall be determined according to GB/T 18386.1—2021. When comparing with the limit value, the unit of vehicle type energy consumption shall be converted from Wh/km to kWh/100 km, and the same significant figure shall be remained after conversion.

4.2 Vehicle type energy consumption shall meet the corresponding limits specified in this standard.

### 5 Type Approval Application and Determination

#### 5.1 General rules

Vehicles shall be subject to type approval application and determination in accordance with 5.2 and 5.3.

## 5.2 Type approval application

5.2.1 The type approval of energy consumption for a particular vehicle type or family that meets the requirements of 8.1 in GB/T 18386.1—2021 shall be applied by the manufacturer or its legal representative.

5.2.2 The application shall be accompanied by a report of the energy consumption type approval application as specified in Appendix A, but the content of A.7.2~A.7.4 and A.8 therein shall not be completed.

5.2.3 Vehicle samples representing approval vehicle types or families shall be submitted to the testing institution responsible for type approval test.

## 5.3 Determination and recording of type approval value

5.3.1 The testing institution responsible for type approval test shall determine the type approval value of vehicle type energy consumption according to GB/T 18386.1—2021.

5.3.2 The energy consumption type approval value determined in 5.3.1 shall be compared with the corresponding limit value in Chapter 6, and the type approval value and comparison result shall be recorded in the energy consumption type approval report specified in Appendix A.

## 6 Energy Consumption Limits

6.1 For the non-all-wheel drive vehicle types with less than three rows of seats<sup>1</sup>, the energy consumption limit shall be calculated according to formula (1), and the calculated results shall be rounded to one decimal place.

$$EC_L = \begin{cases} 10.1, (CM \leq 1090) \\ 0.00556 \times (CM - 1780) + 13.92, (1090 < CM \leq 2710) \\ 19.1, (CM > 2710) \end{cases} \quad (1)$$

Where:

$EC_L$  —Energy consumption limit of the vehicle type, in kWh/100 km;

$CM$  —Curb mass of the vehicle, in kilograms (kg).

6.2 Except for vehicle types specified in 6.1, the energy consumption limit should be multiplied by 1.03 based on the corresponding energy consumption limit specified in 6.1. The result should be rounded to one decimal place.

6.3 If the vehicle types are in accordance with one of the following characteristics a)~c), its energy consumption limit should be multiplied by 1.20 based on the corresponding energy consumption limit specified in 6.1 or 6.2. The result should be rounded to one decimal place.

a) For passenger cars other than sport utility vehicles and off-road passenger cars specified in 4.1 of GB/T 3730.1—2022, that are simultaneously in accordance with the following characteristics:

1) The power-to-mass ratio (PMR) calculated according to formula (2) is not less than 250 kW/t;

$$PMR = \frac{\sum_{j=1}^m P_{n,j}}{CM} \times 1000 \quad (2)$$

Where:

$PMR$  — Power-to-mass ratio, rounded to the nearest integer, in kW/t;

$j$  — Drive motor number;

$m$  — Number of drive motors;

$P_{n,j}$  — Peak power of the  $j^{\text{th}}$  drive motor, measured according to 6.3.6 of GB/T 18488—2024,

<sup>1</sup> A "seat" exists as long as there is a usable seat mounting point.

with the test result rounded to one decimal place, in kW;

*CM* — Curb mass of the vehicle, in kilograms (kg).

- 2) The 0-100 km/h acceleration time measured according to 6.4.2.1 of GB/T 18385—2024 does not exceed 3.0 seconds;
- b) For sport utility vehicles specified in 4.1.2 of GB/T 3730.1—2022, that are simultaneously in accordance with the following characteristic:
  - 1) The PMR calculated according to formula (2) is not less than 230 kW/t;
  - 2) The 0-100 km/h acceleration time measured according to 6.4.2.1 of GB/T 18385—2024 does not exceed 3.3 seconds.
- c) For off-road passenger cars specified in 4.1.3 of GB/T 3730.1—2022, and that are simultaneously in accordance with the characteristics stated in description b) or simultaneously are in accordance with the following characteristics:
  - 1) The PMR calculated according to formula (2) is not less than 200 kW/t, or the torque-to-mass ratio (TMR) calculated according to formula (3) is not less than 6000 N·m/t;

$$TMR = \frac{\sum_{j=1}^m (T_{nj} \times i_j)}{CM} \times 1000 \dots\dots\dots (3)$$

Where:

*TMR*—Torque-to-Mass Ratio, rounded to the nearest integer, in N·m/t;

*j* —Drive motor number;

*m* —Number of drive motors;

*T<sub>n,j</sub>* —Peak torque of the drive motor of the *j*<sup>th</sup> drive motor, measured according to 6.3.5 of GB/T 18488—2024, rounded to one decimal place, in N·m;

*i<sub>j</sub>* —Transmission ratio of the *j*<sup>th</sup> drive motor, for multi-speed transmissions, take the highest value, rounded to two decimal places, the manufacturer should submit relevant explanatory materials to the testing agency;

*CM* —Curb mass of the vehicle, in kilograms (kg).

- 2) The maximum gradeability measured according to 6.6 of GB/T 18385—2024 is not less than 100%.

## 7 Conformity of Production

The conformity of production of vehicles shall meet the requirements of Chapter 9 of GB/T 18386.1—2021.

## 8 Same Type Approval

If the following regulations are met, it may be determined as the same type:

- a) The model and manufacturer of battery cell/supercapacitor are the same;
- b) The total nominal voltage and total nominal capacity of the battery pack/supercapacitor assembly are the same;
- c) The model and the manufacturer of battery pack/supercapacitor pack are the same;
- d) The model, manufacturer, location and quantity of drive motor are the same;
- e) The hardware models, software versions and manufacturers of control system (including vehicle controller, vehicle energy management system, motor controller) are the same, software version number changes are allowed without increasing the energy consumption of the vehicle model.
- f) The driving type is the same;
- g) The cooling type of drive motors, energy saving system is the same (water cooling, oil cooling, air cooling, etc);



GB 36980.1—XXXX

- h) The curb mass of the vehicle is the same or reduced, and the type approval value of energy consumption of the basic vehicle model meets the limit requirements corresponding to the equivalent vehicle model;
- i) The transmission type is the same, the number of transmission gears is the same, and the gear ratios for each gear are either the same or vary by no more than 8%;
- k) The change of tyre static load radius is not more than 5%;
- l) Same shape of the front part of the vehicle body, and same or reduced windward area.

## 9 Implementation

For vehicle types applying for new type approval, this document shall be implemented from the date of its issuance. For vehicle types that have already obtained type approval, this document shall be implemented starting from the 25<sup>th</sup> month after its issuance.

## Appendix A

(Normative)

Energy Consumption Type Approval Report/Energy Consumption Type Approval Application Report<sup>2)</sup>

## A.1 Basic information of vehicle and manufacturer

A.1.1 Product name or brand of the vehicle: \_\_\_\_\_

A.1.2 Vehicle model: \_\_\_\_\_

A.1.3 Vehicle category: M<sub>1</sub>

A.1.4 Name and address of the manufacturer: \_\_\_\_\_

A.1.5 Name and address of the legal representative of the manufacturer (if applicable): \_\_\_\_\_

## A.2 Vehicle description

## A.2.1 Vehicle parameters

A.2.1.1 Curb mass of the vehicle: \_\_\_\_\_ kg

A.2.1.2 Maximum design total mass: \_\_\_\_\_ kg

A.2.1.3 Test mass: \_\_\_\_\_ kg

A.2.1.4 Rated seating capacity: \_\_\_\_\_ person(s)

A.2.1.5 Vehicle body type: \_\_\_\_\_

A.2.1.6 Windward area of the vehicle body: \_\_\_\_\_ m<sup>2</sup>

A.2.1.7 0-100 km/h acceleration time (if applicable): \_\_\_\_\_ s

A.2.1.8 Driving type: front, rear, 4×4, other<sup>2)</sup>

A.2.1.9 Hardware model of control system (including vehicle controller, onboard energy management system, motor controller): \_\_\_\_\_

A.2.1.10 Software version number of control system (including vehicle controller, onboard energy management system, motor controller): \_\_\_\_\_

A.2.1.11 Manufacturer of control systems (including vehicle controllers, onboard energy management systems, and motor controllers): \_\_\_\_\_

## A.2.2 Drive motor

A.2.2.1 Model of drive motor: \_\_\_\_\_

A.2.2.2 Manufacturer of drive motor: \_\_\_\_\_

A.2.2.3 Type of drive motor: \_\_\_\_\_

A.2.2.4 Layout mode of drive motor: \_\_\_\_\_

A.2.2.5 Number of drive motor: \_\_\_\_\_

A.2.2.6 Driving type: \_\_\_\_\_

A.2.2.7 Cooling type: \_\_\_\_\_

<sup>2)</sup> Delete those inapplicable.

GB 36980.1—XXXX

A.2.2.8 Peak power: \_\_\_\_\_ kW, \_\_\_\_\_ r/min

A.2.2.9 Peak torque: \_\_\_\_\_ N·m, \_\_\_\_\_ r/min

### A.2.3 Energy storage

A.2.3.1 Model of battery cell/supercapacitor<sup>2</sup>: \_\_\_\_\_

A.2.3.2 Manufacturer of battery cell/supercapacitor<sup>2</sup>: \_\_\_\_\_

A.2.3.3 Model of battery pack/supercapacitor pack<sup>2</sup>:: \_\_\_\_\_

A.2.3.4 Manufacturer of battery pack/supercapacitor pack<sup>2</sup>:: \_\_\_\_\_

A.2.3.5 The total nominal voltage of battery pack/supercapacitor assembly<sup>2</sup>: \_\_\_\_\_ V

A.2.3.6 The total nominal capacity of battery pack/supercapacitor assembly<sup>2</sup>: \_\_\_\_\_ Ah

A.2.3.7 Type of single battery (if applicable): \_\_\_\_\_

A.2.3.8 Voltage of single battery (if applicable): \_\_\_\_\_ V

A.2.3.9 Capacity of single battery (if applicable): \_\_\_\_\_ Ah

A.2.3.10 Mass specific energy: \_\_\_\_\_ Wh/kg

A.2.3.11 Cooling type: \_\_\_\_\_

### A.2.4 Transmission

A.2.4.1 Transmission type: \_\_\_\_\_

A.2.4.2 Number of gears and transmission ratios for each gear: \_\_\_\_\_

### A.2.5 Tyre

Model: \_\_\_\_\_ Size: \_\_\_\_\_ Inflation pressure: \_\_\_\_\_ kPa

Tyre static load radius: \_\_\_\_\_; Rolling circumference under load: \_\_\_\_\_

### A.2.6 Driving mode

A.2.6.1 Main mode: Yes/No<sup>2)</sup>

A.2.6.2 All driving modes of the vehicle: \_\_\_\_\_

A.2.6.3 The driving mode selected in type approval test: \_\_\_\_\_

A.2.6.4 All energy recovery modes of the vehicle: \_\_\_\_\_

A.2.6.5 The energy recovery mode selected in type approval test: \_\_\_\_\_

### A.3 Structure characteristics

A.3.1.1 With three or more rows of seats, Yes/No<sup>2)</sup>.

A.3.1.2 Off road passenger vehicles that meet the conditions specified in 4.1.3 of GB/T 3730.1—

2022: Yes/No<sup>2)</sup>. If so, the following contents shall be filled in:

a) Calculated vehicle gradeability: \_\_\_\_\_ %

b) Approach angle (°): \_\_\_\_\_

c) Departure angle (°): \_\_\_\_\_

- d) Ramp angle (°): \_\_\_\_\_
- e) Ground clearance of the front axle: \_\_\_\_\_ mm
- f) Ground clearance of the rear axle: \_\_\_\_\_ mm
- g) Ground clearance between front and rear axles: \_\_\_\_\_ mm

#### A.4 Driving resistance

A.4.1 Determination method of driving resistance: road slipping method/torquemeter method/calculation method/wind tunnel method/others<sup>2)</sup>

A.4.2 Copies of test report, calculation report or other relevant materials

#### A.5 Test cycle

Cycle condition: CLTC-P

#### A.6 Test method

Test method: Conventional condition method/shortening method<sup>2)</sup>. If it is shortening method, the speed of the constant speed section is required: \_\_\_\_\_ km/h

#### A.7 Energy consumption and driving range results

##### A.7.1 Declared composite value

A.7.1.1 Driving range: \_\_\_\_\_ km

A.7.1.2 Energy consumption: \_\_\_\_\_ Wh/km

##### A.7.2 Test value

A.7.2.1 Driving range: \_\_\_\_\_ km

A.7.2.2 Energy consumption: \_\_\_\_\_ Wh/km

A.7.2.3 Energy consumption arithmetic mean value in the 1st test cycle: \_\_\_\_\_ Wh/km

##### A.7.3 Type approval value

A.7.3.1 Driving range: \_\_\_\_\_ km

A.7.3.2 Energy consumption: \_\_\_\_\_ Wh/km

##### A.7.4 Limit

A.7.4.1 Limit for this vehicle type: \_\_\_\_\_ kWh/100 km

A.7.4.2 Certified value of this vehicle type in type approval:  $\leq$  or  $>$  the limit <sup>2</sup>

#### A.8 Information of testing institution

A.8.1 Date of vehicle submission for approval: \_\_\_\_\_

A.8.2 Testing institution: \_\_\_\_\_

A.8.3 Test report No.: \_\_\_\_\_

GB 36980.1—XXXX

A.8.4 Location: \_\_\_\_\_

A.8.5 Date: \_\_\_\_\_

A.8.6 Signature: \_\_\_\_\_

\_\_\_\_\_