

ICS 43.140
CCS Y14



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 44677-2024

**Test methods of energy consumption and range for electric
bicycles**

电动自行车能量消耗量和续行里程试验方法

Issued on: October 26, 2024

Implemented on: May 1, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1	Scope
2	Normative references
3	Terms and definitions
4	Test conditions
5	Instruments and equipment
5.2	Chassis dynamometer
6	Test vehicle
7	Test procedures
7.2	Test preparation
7.3	Installation of the test vehicle
7.4	Method
7.5	Method
8	Test data processing...

1 Scope

GB/T 44677-2024 gives the Chinese test methods for the energy consumption and range of electric bicycles. China has several hundred million electric bicycles and the range figure is the principal thing a buyer compares, yet it is the easiest figure to inflate: quoted at a low constant speed, on a level surface, with a light rider and a new battery, a machine will show a range no owner ever sees. The standard defines the conditions that make the number honest and comparable. It sets the test conditions, the rider or load mass, the tyre pressure, the ambient temperature and the state and conditioning of the battery, the test track or the roller bench and its calibration, the test cycles representing real riding, the procedure for the constant speed and cycle-based tests, the measurement of the energy drawn from the battery and of the distance covered, the end-of-test criterion, and the calculation and expression of the energy consumption and the range. It takes effect on 1 May 2025.

This document describes the test methods of energy consumption and range for electric bicycles. This document applies to the determination of energy consumption and range for electric bicycles that are driven by electricity.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the version

corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB 17761-2018, Safety technical specification for electric bicycle QB/T 5886-2023, Electric bicycle - Vocabulary

3 Terms and definitions

For the purpose of this document, the following terms and definitions, as well as those given in GB 17761-2018 and QB/T 5886-2023, apply.

3.1 energy consumption The ratio of the grid energy consumed during the process of recharging an electric bicycle to a fully-charged state after the range test to the range obtained from the test.

4 Test conditions

The test environment shall meet the following conditions.

- a) Temperature. $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$;
- b) Relative humidity. not greater than 75%;
- c) Atmospheric pressure. 86 kPa ~ 106 kPa.

5 Instruments and equipment

5.1 Resolution and accuracy of instruments and equipment The resolution and accuracy of instruments and equipment shall meet the requirements of Table 1.

5.2 Chassis dynamometer

5.2.1 The functions of the chassis dynamometer shall meet the following requirements.

- a) Resistance setting function, meeting the requirements of A.1 in Appendix A;
- b) Specified speed point setting and its error calculating functions, meeting the requirements of A.2;
- c) Running loop setting, meeting the requirements of Appendix B;
- d) Roller diameter, not be less than 400 mm.

5.2.2 Calibrate the chassis dynamometer according to its actual usage. The calibration interval should be 1 year.

6 Test vehicle

The test vehicle shall meet the following requirements.

- a) Fully assemble the electric bicycle;
- b) Use the matching battery and run it through for no less than 3 charge-discharge cycles according to the manufacturer's specified procedure; if the manufacturer has not specified a running-in procedure, run it through at the maximum vehicle speed as described in 7.2 ~ 7.4;
- c) Conduct test vehicle debugging according to the product manual and relevant technical documents.

7 Test procedures

7.1 Deviation in test speed and time The permissible deviation for instantaneous speed of the test shall be ± 1 km/h, and the permissible deviation for time shall be ± 0.5 s, as shown in Figure 1.

7.2 Test preparation

7.2.1 Fully discharge the battery used in the test vehicle before the first charge. Drive the vehicle under load via road or chassis dynamometer until the battery equipped on the test vehicle reaches the termination voltage, or the vehicle's undervoltage protection device is activated to cut off the main circuit current output.

7.2.2 Fully charge the battery equipped on the test vehicle according to the battery charging procedure specified in the product manual. If the manufacturer has not specified the battery charging procedure, charge the battery using a charger compatible with the test vehicle's battery in an environment where the temperature is $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ until the charger indicates that the battery is fully charged. Start the test within 4 hours after the battery charging is completed.

7.2.3 Inflate the tire to the maximum recommended pressure indicated on the tire label, with a pressure error not exceeding ± 10 kPa.

7.2.4 Turn off the lighting and signal devices of the test vehicle.

7.3 Installation of the test vehicle

7.3.1 The rollers of the chassis dynamometer shall be cleaned and dried to prevent tire slippage.

7.3.2 Vertically mount the body of the test vehicle on the chassis dynamometer; clamp its driven wheels, with the tires of its drive wheels contacting the highest radial point of the roller.

7.3.3 Load the test vehicle with a mass of $75\text{ kg} \pm 1\text{ kg}$, of which 50 kg is loaded on the saddle and the remaining mass is loaded on the foot pedal or foot rest.

7.3.4 Based on the reference mass of the test vehicle, select the equivalent inertial mass type according to Table A.1, and set the front wheel rolling resistance and air resistance coefficient on the chassis dynamometer. Example. If the test vehicle mass is 51 kg and the load mass is 75 kg, the equivalent inertial mass is selected as 130 kg; if the test vehicle mass is 50 kg and the load mass is 75 kg, the equivalent inertial mass is selected as 120 kg.

7.3.5 Confirm the setting error of the chassis dynamometer according to A.2.