

Regulations on Electric Bicycles in Japan

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I. Legal Standards Related to Electric Bicycles in Japan

Standards related to electric bicycles in Japan are established based on the “Road Traffic Law” under the jurisdiction of the Police Administration. The full text of related laws is as follows:

11-2, Article 2, the Road Traffic Law (Definition)

“Bicycles” means vehicles with more than two wheels that use pedals or hand grabs and run through human energy (excluding those running on rails), other than wheelchairs, walk assist vehicles, etc. for the handicapped and vehicles for children, and use prime movers to assist human energy (including those consistent with standards established in Primer Minister’s Office Order).

3, Article 1, the Implementation Rules for the Road Traffic Law (the Prime Minister’s Office Order)

Standards established in the Prime Minister’s Office Order of 2, No. 11, Item 1, Article 2, Standard Law of Bicycles Using Prime Movers to Assist Human Energy are described as follows:

1. Prime movers used for assisting human energy are those that match any of the following conditions.

A. Motors.

- B. To let bicycles run in the speed less than 24km/h, prime movers are used for assisting human energy and the rate of assistant power is respectively the value established in (1) or (2) corresponding to the speed differentiation described in (1) or (2).

(1) Speed less than 15km/h

(2) Speed over 15km/h and less than 24km/h

First, subtracting 15 from the value of running speed shown in km/h; then, dividing the result with 9; and finally, subtracting the result from 1.

$$X = [\text{speed (km/h)} - 15] / 9$$

- C. To let bicycles run in the speed over 24km/h, prime movers are used without adding assistant power.

D. Prime movers consistent with any from A to C are of the structure that cannot be easily modified to those inconsistent with any from A to C.

2. The function that uses prime movers to assist human energy works smoothly and the smooth working of the function is to ensure complete service and avoid occurrence of hindrances.

II. Explanations Related to Laws in Japan

1. Relation between Assist Rate and Speed

3, Article 1, the Implementation Rules for the Road Traffic Law (Prime Minister's Office Order)

B and C of Standard 1 for bicycles that use prime movers to assist human energy (hereinafter referred to as "assist rate") are shown with graphics as follows:

Assist Rate

Human Energy Ratio

Motor Power Ratio

Running Speed

1) In speed less than 15km/h, the assist rate is below 1:1.

2) In the speed range over 15km/h and less than 24km/h, the assist rate reduces in contrast as speed increases while in speed over 24km/h, motor power becomes zero.

2. General Understandings Regarding the Basis of Standard Values

Regarding the relation between assist rate and speed, though the basis of the established standard values remain unclear, it is assumed that the values established in JIS – common speed of practical bicycles = 15km/h and common speed of sport bicycles = 24km/h are the bases.

Moreover, it is understood that setting the assist rate below 1:1 in maximum is due to the fact that it is deemed necessary for vehicles to use human energy as the main driving force to be dealt with as bicycles.

It is understood that the purpose of reducing assist rate in the high-speed range is to suppress the running speed from becoming too high, then preventing sudden and dramatic changes in driving force at the point of 24km/h.

These performance standards are determined by investigating the actual conditions of bicycle utilization and road traffic environments, etc. in the country and continue to have strong impacts on the unique road environments in Japan such as generally narrow road space, bicycles sharing sidewalks with pedestrians, etc.

Regarding the highest speed and assist rate, it is important to establish standards suitable for traffic environments in different countries.

3. Regarding Battery and Motor Outputs

In Japan, there are no legal standards regarding battery and motor outputs. It is understood that this is due to the fact that motor assist rate and ceiling speed are already established and battery output is not likely to rise without due cause.

III. Model Authorization System

In Japan, model authorization is being carried out by the National Public Safety Commission in order to ensure that electric assist bicycles comply with legal standards.

Items to be examined during model authorization are summarized as follows:

- (1) Designs and performance that are established as common bicycles.
- (2) Designs and performance that are established as electric assist bicycles.
Testing results of assist rates are presented by public examination institutes.
- (3) Consistency in manufacture of products
Clarify quality control systems, etc.
- (4) Structure that cannot be easily modified

Definition of Assist Rate

$$\alpha = (P2 - P1) / P1$$

α : rate of drive assist power

P1: crank revolving output (watt)

P2: drive output after vehicle correct

The assist rate test corrects the loss horsepower, etc. as it uses chassis dynamo.

III. Issues and Movements of Regulations on Electric Assist Bicycles in Japan

(1) Necessity for improving safety and convenience.

(2) Review from the perspective of universal design in the aging society.

(3) Review on regulations corresponding to new technological renovations

Engine Hybrid Type

Fuel Battery, etc.

(4) Global harmonization of regulations

ISO specification

(5) Battery standardization