CEN/TC 333
Cycles

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WI 00333008 "Cycles – Electrically power assisted cycles"

Stage 11

Note: This is the updated version of WI 00333008, modified during last CEN/TC 333/WG5 Meeting of 15th March, 2001.

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Cycles – Electrically power assisted cycles
Part 1 – EPAC Bicycle

Foreword

This European Standard was prepared by Technical Committee CEN/TC "333 Cycles" the secretariat of which is held by UNI.
According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Introduction

Some test methods has been elaborated by CEN/TC333 to give a tool to check regulatory requirements of national regulation.

Wording to be improved by M. Fletcher

To be completed if necessary

1 Scope

This standard specifies safety and performance requirements for the design, assembly and testing of electrically power assisted cycles and sub-assemblies, and lay down guidelines for instruction on the use of electrically power assisted cycles.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of the publications of any of the publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to apply.

To be completed

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 cycle: A vehicle that has at least two wheels and is propelled solely or mainly by the muscular energy of the person on that vehicle, in particular by means of pedals.

3.2: bicycle: Two-wheeled cycle.

3.3 fully assembled bicycle: A bicycle fitted with all components necessary for its intended use.
3.4 electrically power assisted cycles (E.PAC): Cycles, equipped with pedals and an auxiliary electric motor, which cannot be propelled exclusively by means of this auxiliary engine.

3.5 No load current point: current for which there is no torque on the driving wheel.

3.6 Full discharge of the battery: point at which the battery does not deliver any power/energy to the engine.

4 Requirements

4.1 General
Excepted for the requirements defined in clause XX to clause YY which are specific to the electrically power assisted cycles, apply the European Standard xxxx “Bicycles for use on public roads – Safety requirements and test methods”.

[WG1 draft will be circulated to the WG5 experts for checking the applicability of the test to the EPAC] Action :MM. Neuberger and Legrand.
Waiting for WG1 draft. (15/03/01)

4.2 EPAC specific requirements

4.2.1 Electric circuit.
Proposal n°1 : [The electrical control system shall be so designed that in the event of its malfunction power to the motor will be terminated]

Proposal n° 2 : [Measure shall be taken to protect the electrical equipment against the effects of :
- over current arising from short circuit;
- overload current;
- earth fault;
- over voltage due to lightning and switching surges;
- abnormal temperature;
- loss of or reduction in the supply voltage;
incorrect phase sequence.]

WG5 experts are required to study these two proposals by the next meeting . Action All WG5 experts.

If symbols are used, their meaning shall be mentioned in the instructions for use and they design shall be according to ISO [2575].

4.2.2 Batteries.
The batteries shall conform to [prEN 50272, EN 61429:1996] .
The safety of the combination battery/charger shall be ensured.

[WG5 experts are invited to check if these standard are applicable] Action : all WG5 experts.

4.2.3 Electric cables and connections.
The electrical cables and connections shall conform to [IEC 60034-1 and EN 24165].

Action : M. La Fragola will make a proposal by the next meeting .

4.2.4 Power management.
The assistance shall be provided only when the cyclist is pedalling forward and the assistance shall be out off when the cyclist is stopping pedalling forward.

4.2.5 Electro magnetic compatibility.

[M. Peters and M. La Fragola will make a proposal based on the two wheeled practice by the next meeting]

4.2.6 Battery charging.
The battery charger shall conform [EN 61000-3-2:1995, EN 61000-3-3:1995, EN 55014-1:1993 + A1:1997+A2:1999, EN 55014-2:1997, ENV 50275-1:1998, ENV 50275-2-2:1998, ENV 50275-2-3:1998, EN 60335-2-29].
The battery charger shall be designed to avoid overcharging.
The battery charger shall be compatible with the type of batteries used on the EPAC.

[Dr Gössel will provide the feedback on this subject]

[WG5 experts are invited to check if these standards are applicable] Action : all WG5 experts.

[4.2.7 Post equipped bicycles.
Post-equipped bicycles shall comply with the requirements of this standard.]

WG5 will have to decide to keep this subclause at the end of its work.

4.2.8 Maximum speed for which the electric motor give assistance.

The maximum speed for which the electric motor gives assistance as determined during the test may differ from the maximum speed as specified by the manufacturer by 10%.

5 Test method

5.1 Cut off speed measurement.

5.1.1 Test conditions.
The test may be performed either on a test track or on a test bench.
The speed-measuring device shall have the following characteristics:

- Accuracy: ± 2%
- Resolution: 0,1 km/h

The ambient temperature shall be between 5°C and 35°C.
Maximum wind speed : 3m/s
The battery shall be fully charged according to the manufacturer instructions..

5.1.2 Test procedure.
Measure the no load current;

WG5 experts shall made proposal by the next meeting.

Record the no load current value;
Measure the speed corresponding to the no load current value.
Note the speed on the test report..

5.2 Maximum power measurement.
The maximum power shall be measure according to 60034-1 standards.

[WG5 experts are invited to identify the applicable standards] Action : all WG5 experts.

5.3 Engine management test

[WG5 experts are invited to make proposal by the next meeting] Action : all WG5 experts.

5.4 Maximum range measurement.

5.4.1 Test conditions.
The test may be performed either on test track or on test bench.
The speed-measuring device shall have the following characteristics:

- Accuracy: ± [2] %

- Resolution: [0,5] km/h

The ambient temperature shall be between 5°C to 32°C.
The wind speed shall be less than 3 m/s.
The test track may be a ring or straight road. The longitudinal slope at any point of the test track shall be [0 ± 2%].
The battery shall be fully charged.
The mass of the rider shall be [80 ± 1] kg.
The bicycle shall set according to the manufacturer specifications.

[M. Gössel will provide data to the WG5 in order to decide to consider the wind resistance effect].

5.4.2 Test cycle.
The test cycle shall be as described in figure 1.

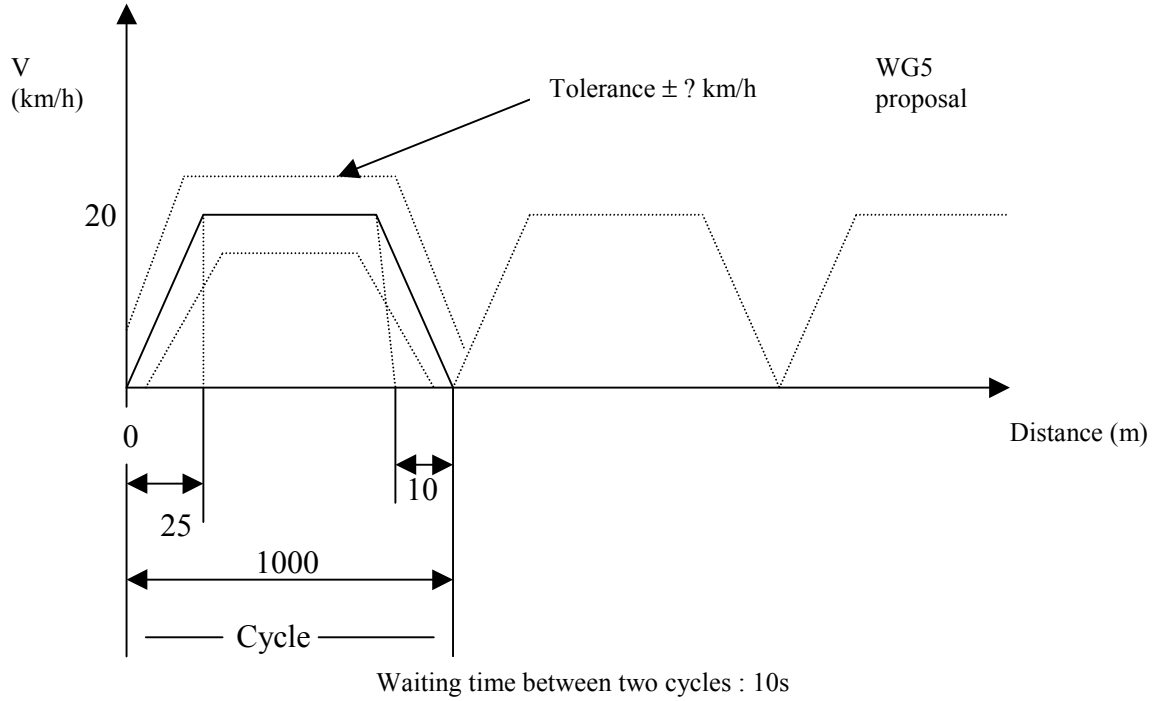

Figure 1- Test cycle

5.4.3 Test procedure.
If the test if performed on a test bench, set it according to ???? *[to be discussed*].
If the test is performed on test track, run cycles front and forth.
Select the assistance mode providing the greatest assistance from the engine.
Run cycles to the full discharge of the battery.
Note the zero assistance point.
Calculate the range and note the result on the test report.

6 Instructions for use.

To be completed

[WG5 experts are invited to make proposals] Action all WG5 experts]