



SLOVENSKI STANDARD
SIST EN 1986-1:2000
01-december-2000

Electrically propelled road vehicles - Measurement of energy performances - Part 1: Pure electric vehicles

Electrically propelled road vehicles - Measurement of energy performances - Part 1: Pure electric vehicles

Elektrisch angetriebene Straßenfahrzeuge - Meßverfahren für Energieausnutzung - Teil 1: Reine Elektrofahrzeuge

Véhicules routiers a propulsion électrique - Mesurage des performances énergétiques - Partie 1: Véhicules électriques purs

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Ta slovenski standard je istoveten z: EN 1986-1:1997

ICS:

43.120 Electric road vehicles

SIST EN 1986-1:2000 **en**

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EUROPEAN STANDARD

EN 1986-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English version

Electrically propelled road vehicles - Measurement of energy performances - Part 1: Pure electric vehicles

Véhicules routiers à propulsion électrique
Mesurage des performances énergétiques - Partie
1: Véhicules électriques purs

Elektrisch angetriebene Straßenfahrzeuge -
Meßverfahren für Energieausnutzung - Teil 1:
Reine Elektrofahrzeuge

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels



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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 301 "Electrically propelled road vehicles", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 1998, and conflicting national standards shall be withdrawn at the latest by January 1998.

The European Standard EN 1986 consists of the following parts under the general title "Electrically road vehicles - Measurement of energy performances" :

- Part 1 : Pure electric vehicles ;
- Part 2 : Thermal electric hybrid vehicles ;
- Part 3 : Other electric hybrid vehicles than those fitted with a thermal machine.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This standard specifies the procedure to apply in order to measure the range and the consumption of the electrically propelled road vehicles (pure electric vehicles).

This standard applies to the categories of vehicles M₁, M₂, N₁ and N₂ ¹⁾ motor tricycles and quadricycles ²⁾ from the motorcycles type.

This standard does not apply to electric hybrid or partially electrically propelled road vehicles.

NOTE : An electrically propelled road vehicle is also named an electric vehicle.

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 these 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 applies.

EN 1821-1 1996 Electrically propelled road vehicles - Measurement of road operating ability - Part 1. Pure electric vehicles.

IEC 687 1992 Alternating current static watt-hour meters for active energy (classes 0,2 S and 0,5 S).

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3 Definitions

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

3.1 energy consumption

The quantity of active energy from the mains, divided by the test distance travelled, that the vehicle uses after driving one of the two proposed test sequences (see 4.1), from a fully charged battery, expressed in watthours per kilometre.

3.2 range

Distance covered in kilometres by an electric vehicle over the test sequence n°2 from a fully charged battery (see 7.1.3 in EN 1821-1:1996) to the end of test criteria.

¹⁾ Categories of vehicles M₁, M₂, N₁ and N₂, are defined in Directive 92/53/EEC.

²⁾ Motor tricycles and quadricycles are defined in Directive 92/61/EEC.

4 Test sequences

4.1 Composition

Test sequence n° 1 (see figure 1) is composed of one urban cycle made of four basic urban cycles. Its theoretical average speed is 18,77 km/h.

Test sequence n° 2 is composed of two parts (see figure 1) :

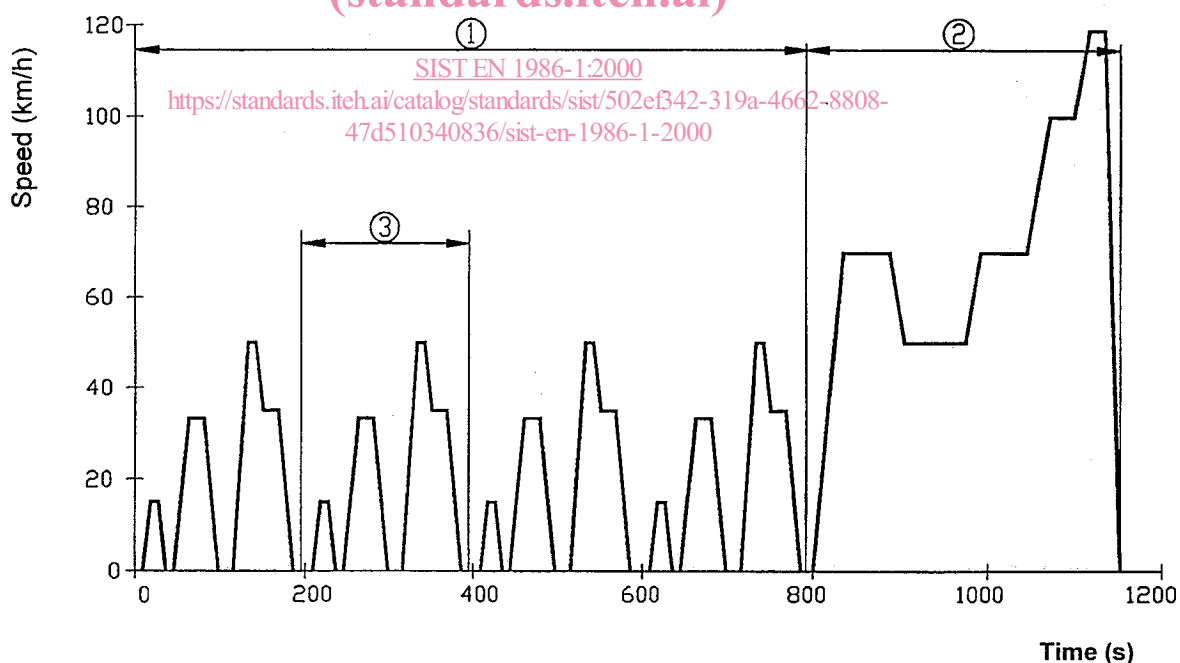
- an urban cycle made of four basic urban cycles;
- an extra-urban cycle.

Its theoretical average is 33,6 km/h.

NOTE: These cycles are the same as those described in Directive 91/441/EEC, except the changing gear steps.

In case where the vehicle is fitted with a manual gear box with several gears, the test driver shall change the gear in order to best match the reference curve.

If the vehicle has several driving modes (sport, comfort, economical, etc.) which can be selected by the test driver, the one to best match the reference curve shall be selected.



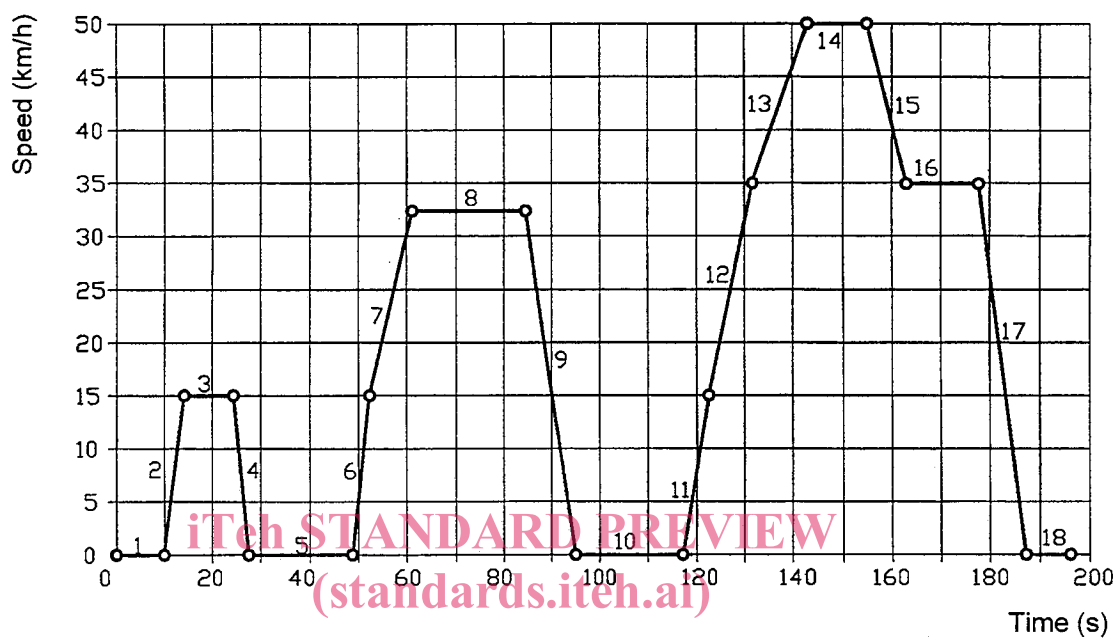
- 1 Urban cycle = Test sequence n° 1
- 2 Extra-urban cycle (see figure 3)
- 3 Basic urban cycle (see figure 2)
- 1 + 2 Test sequence n° 2

Figure 1 : Test sequences

4.1.1 Urban cycle

The urban cycle is composed of four basic cycles of 195 s each and lasts 780 s in total.

The description of the basic urban cycle is given in figure 2 and table 1.



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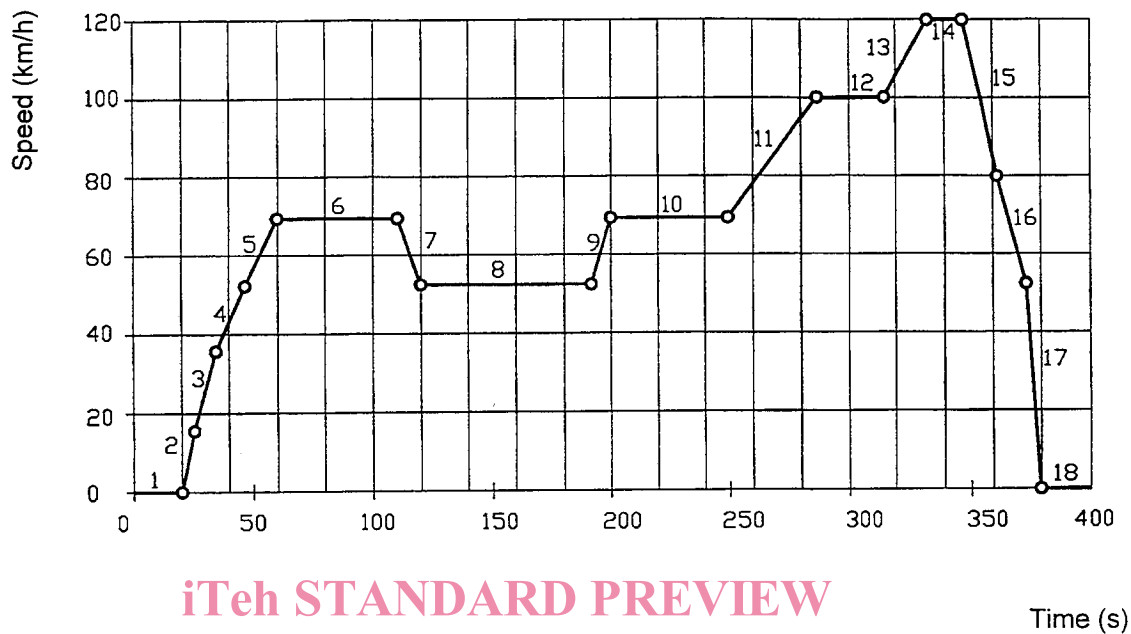
Figure 2 : Basic urban cycle

Table 1 : Basic urban cycle

Basic urban cycle							
Operation n°	Operation type	Mode n°	Acceleration m/s ²	Speed km/h	Operation duration s	Mode duration s	Total time s
							0
1	Stop	1	0,00	0	11	11	11
2	Acceleration	2	1,04	0 to 15	4	4	15
3	Constant speed	3	0,00	15	8	8	23
4	Deceleration	4	-0,83	15 to 0	5	5	28
5	Stop	5	0,00	0	21	21	49
6	Acceleration	6	0,69	0 to 15	6	12	55
7	Acceleration		0,79	15 to 32	6		61
8	Constant speed	7	0,00	32	24	24	85
9	Deceleration	8	-0,81	32 to 0	11	11	96
10	Stop	9	0,00	0	21	21	117
11	Acceleration	10	0,69	0 to 15	6	26	123
12	Acceleration		0,51	15 to 35	11		134
13	Acceleration		0,46	35 to 50	9		143
14	Constant speed	11	0,00	50	12	12	155
15	Deceleration	12	-0,52	50 to 35	8	8	163
16	Constant speed	13	0,00	35	15	15	178
17	Deceleration	14	-0,97	35 to 0	10	10	188
18	Stop	15	0,00	0	7	7	195
Generalities							
				Time	Percentage		
				s	%		
Stop				60	30,77		
Acceleration				42	21,54		
Constant speed				59	30,26		
Deceleration				34	17,44		
Total				195	100,00		
Theoretical average speed					18,77 km/h		
Working time					195 s		
Theoretical distance by basic urban cycle					1 017 m		
Theoretical distance for four basic urban cycles					4 067 m		

4.1.2 Extra-urban cycle

The description of the extra-urban cycle is given in figure 3 and table 2.



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Time (s)

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NOTE : The procedure to be adopted when the vehicle fails to meet the speed requirements of this curve is detailed in 4.2.

Figure 3 : Extra-urban cycle

Table 2 : Extra urban cycle

Extra urban cycle							
Operation n°	Operation type	Mode n°	Acceleration m/s ²	Speed km/h	Operation duration s	Mode duration s	Total time s
							0
1	Stop	1	0,00	0	20	20	20
2	Acceleration	2	0,69	0 to 15	6	41	26
3	Acceleration		0,51	15 to 35	11		37
4	Acceleration		0,42	35 to 50	10		47
5	Acceleration		0,40	50 to 70	14		61
6	Constant speed	3	0,00	70	50	50	111
7	Deceleration	4	-0,69	70 to 50	8	8	119
8	Constant speed	5	0,00	50	69	69	188
9	Acceleration	6	0,43	50 to 70	13	13	201
10	Constant speed	7	0,00	70	50	50	251
11	Acceleration	8	0,24	70 to 100	35	35	286
12	Constant speed	9	0,00	100	30	30	316
13	Acceleration	10	0,28	100 to 120	20	20	336
14	Constant speed	11	0,00	120	10	10	346
15	Deceleration	12	-0,69	120 to 80	16	34	362
16	Deceleration	13	-1,04	80 to 50	8		370
17	Deceleration		-1,39	50 to 0	10		380
18	Stop	13	0,00	0	20	20	400
Generalities							
				Time s	Percentage %		
Stop				40	10,00		
Acceleration				109	27,25		
Constant speed				209	52,25		
Deceleration				42	10,50		
Total				400	100,00		
Theoretical average speed					62,60 5 (km/h)		
Working time					400 (s)		
Theoretical distance					6 956 (m)		