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Road vehicles — Fuse-links —

Part 6: Single-bolt fuse-links

Véhicules routiers — Liaisons fusibles —

Partie 6: Liaisons fusibles à poste singulier

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles,* Subcommittee SC 32, *Electrical and electronic components and general system aspects*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This second edition cancels and replaces the first edition (ISO 8820-6:2007) which has been technically revised.

The main changes compared to the previous edition are as follows:

— 30 A, 40 A and 225 A have been added;

— editorial changes have been made.

A list of all parts in the ISO 8820 series can be found on the ISO website.

This document is intended to be used in conjunction with ISO 8820-1 and with 8820-2. The numbering of its clauses corresponds to that of ISO 8820-1 whose requirements are applicable, except where modified by requirements particular to this document.

Road vehicles — Fuse-links —

Part 6:
Single-bolt fuse-links

1 Scope

This document specifies single-bolt fuse-links in road vehicles. It establishes, for this fuse-link type, the rated current, test procedures, performance requirements and dimensions.

This document is applicable to those fuse-links with a rated voltage of 58 V, a current rating of ≤300 A and a breaking capacity of 2 000 A, intended for use in road vehicles at a nominal voltage of 12 V, 24 V and/or 48 V.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8820-1, *Road vehicles — Fuse-links — Part 1: Definitions and general test requirements*

ISO 6722-1, *Road vehicles — 60 V and 600 V single-core cables — Part 1: Dimensions, test methods and requirements for copper conductor cables*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 2768-2, *General tolerances — Part 2: Geometrical tolerances for features without individual tolerance indications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8820-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
insulating nut
electrically insulated device used to assemble a single-bolt fuse

4 Marking and labelling

The requirements given in ISO 8820-1 and Table 1 of this document shall apply.

Table 1 — Fuse-link rating

Fuse-link rating A
30
40
50
75
100
125
150
175
200
225
250
300

5 Tests and requirements

5.1 General

5.1.1 Criteria

In addition to carrying out the test procedures in accordance with ISO 8820-1, the following criteria shall apply:

Test shall be performed following the test sequences in Table 2.

The test fixtures for electrical tests shall be designed in accordance with Figure 4. The connection resistance shall be 0,35 MΩ maximum to ensure the proper function of the test fixture.

Terminals shall have a suitable finish which assures corrosion protection, and shall have satisfactory mechanical and electrical properties.

The mounting torque shall be (12 ± 1) Nm.

The insulation resistance measured with 100 V DC of the insulating nut shall be ≥200 kΩ.

5.1.2 Test sequence

Table 2 — Test sequence

No.	Requirement/test	Clause	Sample groups[a]						
			1	2	3	4	5	6	7
1	Dimensions	6	X	X	X				
2	Marking and labelling	4	X	X	X	X	X	X	X
3	Strength of insulating body	5.9	X	X	X	X	X	X	X
4	Voltage drop	5.2	X	X	X				
5	Accelerated ageing	5.4				X			

[a] Each sample group shall contain a minimum of 10 fuse links.

[b] For these operating time tests (Y) the sample groups 2, 4, 5, 6 and 7 shall be divided equally. These fuses are intended to be subjected to a single operating time test only.

Table 2 *(continued)*

No.	Requirement/test		Clause	Sample groups[a]						
				1	2	3	4	5	6	7
6	Fluid compatibility		5.4					X		
7	Mechanical load		5.4						X	
8	Transient current cycling		5.3							X
9	Voltage drop		5.2.				X	X	X	X
10	Current step		5.6			X				
11	Breaking capacity		5.7	X						
12	Operating time rating	1,00 I_N	5.5		X		X	X	X	X
		1,35 I_N			Y[b]		Y	Y	Y	Y
		1,50 I_N			Y		Y	Y	Y	Y
		2,00 I_N			Y		Y	Y	Y	Y
		3,50 I_N			Y		Y	Y	Y	Y
		6,00 I_N			Y		Y	Y	Y	Y
13	Strength of insulating body		5.9	X	X	X	X	X	X	X

[a] Each sample group shall contain a minimum of 10 fuse links.

[b] For these operating time tests (Y) the sample groups 2, 4, 5, 6 and 7 shall be divided equally. These fuses are intended to be subjected to a single operating time test only.

5.1.3 Test cable sizes

Test cable sizes shall be as given in Table 3. All tests for a particular fuse-link rating shall be performed using the same cable size.

Test cable sizes are specified to allow comparative fuse-link tests to be carried out. The cable size specified does not necessarily indicate the size of cable to be used in the vehicle application.

Table 3 — Test cable sizes

Fuse-link rating A	Conductor cross-sectional area[a] mm^2
30	2,5
40	4
50	10
75	
100	16
125	
150	25
175	
200	35
225	50
250	
300	70

[a] Conductor material according ISO 6722-1.

5.2 Voltage drop

5.2.1 Tests

The test given in ISO 8820-1 and Figure 3 of this document shall apply.

5.2.2 Requirements

The requirements given in Table 4 shall apply.

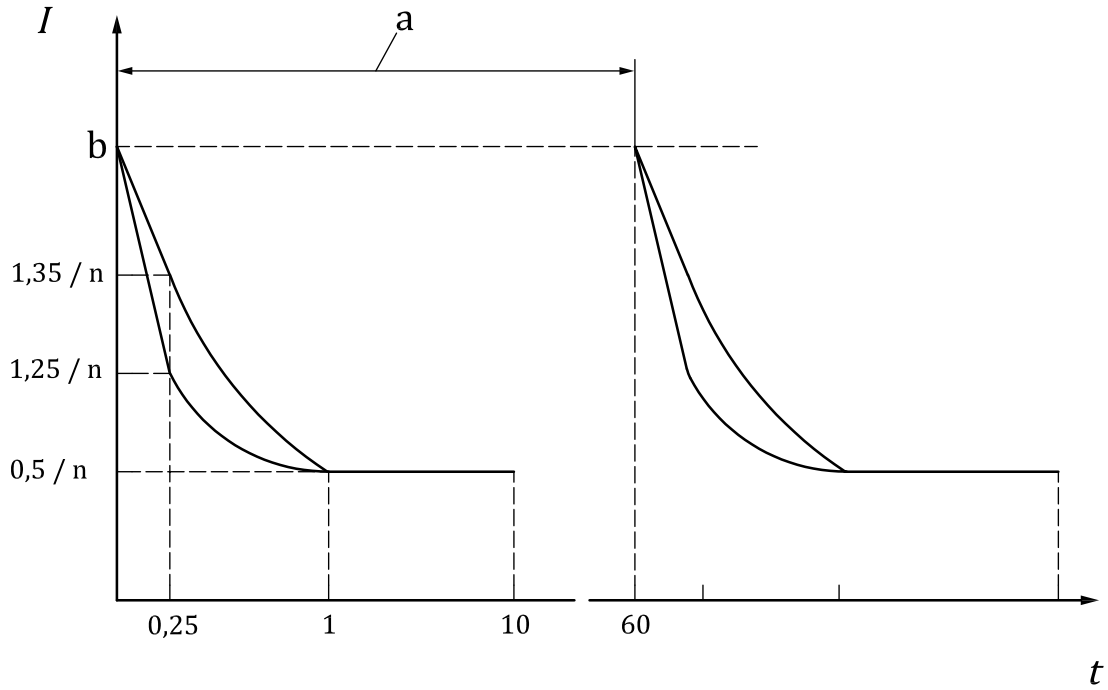
Table 4 — Voltage drop

Fuse rating A	Max. fuse-link voltage drop mV
30	120
40	115
50	110
75	105
100	100
125	95
150	90
175	85
200	80
225	
250	75
300	70

5.3 Transient current cycling

5.3.1 Test

Figure 1 of this document and the test given in ISO 8820-1 shall apply. This test shall be performed at an environmental temperature of (90 ± 5) °C. At an elapsed time of 0,25 s on-time, the current shall fall to a value between 1,25 I_n and 1,35 I_n. At no time shall the steady state current fall below 0,50 I_n.



Key

I	current in A
t	time in s
a	One cycle.
b	4 I_n.

Figure 1 — Transient current cycling

5.3.2 Requirement

The requirements given in ISO 8820-1 shall apply.

5.4 Environmental conditions

The tests and requirements given in ISO 8820-1 shall apply.

5.5 Operating time rating

5.5.1 Test

The test given in ISO 8820-1 shall apply.

5.5.2 Requirement

The requirements given in Table 5 shall apply

After activation, the current through the fuse-link shall not exceed 0,5 MA at the rated voltage of the fuse-link.