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Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy —

Part 1: General principles and terminology

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Véhicules routiers — Méthodes d'essai d'un véhicule soumis à des perturbations électriques par rayonnement d'énergie électromagnétique en bande étroite —

Partie 1: Principes généraux et terminologie

AMENDEMENT 1

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

Amendment 1 to ISO 11451-1:2005 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy —

Part 1: General principles and terminology

AMENDMENT 1

Page 11, Annex A

Replace the whole of Annex A with the following.

Annex A
(normative)

Function performance status classification (FPSC)

A.1 General

This annex provides a general method for defining the acceptable performance of electrical/electronic functions of automotive electrical systems during and after vehicle immunity test for electrical disturbances from narrowband radiated electromagnetic energy. This method is based on the following considerations:

a) a vehicle can include one or several functions (e.g. an electronic unit can manage front wiping, courtesy lighting and low beam lighting);

b) a function can have one or several operating modes (e.g. low beam ON, low beam OFF, courtesy lighting ON, courtesy lighting OFF);

c) an operating mode can have several statuses (I, II, III, IV) (e.g. in low beam ON operating mode, the status II can be associated to low beam OFF during disturbance application with automatic recovery of low beam after disturbance suppression).

The functional performance status classification is applicable to each function.

A.2 FPSC approach

The approach is based on the following principles:

a) functional performance status classification is applicable to each individual function; hence, a vehicle is likely to include several functions (e.g. an electronic unit can manage front wiping, courtesy lighting and low beam lighting);

b) a function can be a simple on-off operation or it can be complex, like data communication on a data bus.

It has to be emphasized that vehicles shall only be tested under the conditions, as described in ISO 11451, that represent the simulated automotive electromagnetic environments to which the devices would actually be subjected. This will help to ensure a technically and economically optimized design for potentially susceptible components and systems.

It should also be noted that this annex is not intended to be a product specification and cannot function as one. It should be used in conjunction with a specific test procedure in ISO 11451. Therefore, no specific values for the test signal severity level are included in this annex since they should be determined by the vehicle manufacturers and component suppliers. Nevertheless, using the concepts described in this annex and by careful application and agreement between manufacturer and supplier, this annex can be used to describe the functional status requirements for a specific device. This can then, in fact, be a statement of how a particular device can be expected to perform under the influence of the specified test signals.

A.3 Essential elements of FPSC

There are two elements, listed below, required to describe a FPSC.

A.3.1 Function performance status

This element defines the expected performance objectives for the function of the vehicle subjected to the test conditions. The four function performance statuses of the function (expected behaviour of the function observed during test) are listed below.

NOTE 1 This element is applicable to every single individual function of a DUT and describes the operational status of the defined function during and after a test.

NOTE 2 The minimum functional status is given in each test. An additional test requirement can be agreed between supplier and vehicle manufacturer.

a) **Status I:** the function performs as designed during and after the test.

b) **Status II:** the function does not perform as designed during the test, but returns automatically to normal operation after the test.

c) **Status III:** the function does not perform as designed during the test and does not return to normal operation without a simple driver/passenger intervention, such as turning off/on the DUT, or cycling the ignition switch after the disturbance is removed.

d) **Status IV:** the function does not perform as designed during and after the test and cannot be returned to proper operation without more extensive intervention, such as disconnecting and reconnecting the battery or power feed. The function shall not have sustained any permanent damage as a result of the testing.

A.3.2 Test severity level

This element defines the specification of test severity level of essential signal parameters. The test severity level is the stress level applied to the vehicle for any given test method. The test severity levels should be determined by the vehicle manufacturer and supplier depending on the required operational characteristics of the function.

A.4 FPSC approach example

A.4.1 General example of FPSC application

The following example demonstrates the relationship between the test signal severity levels and their corresponding function performance status classification.

Comments listed in Figure A.1 can be interpreted as follows:

a) the function should be nominal event No. 1 (Status I) up to test severity level L_1;

b) unexpected event No. 2 is allowed above test severity level L_1;

c) unexpected event No. 3 is allowed above test severity level L_2.

Users may group functions into categories to allow the use of different test levels.

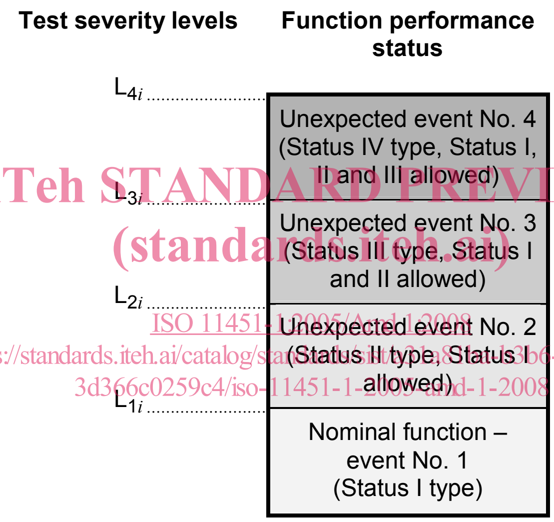

Figure A.1 — Illustration of function performance status classification

A.4.2 Classification of test severity levels

Examples of test severity levels are given in each part of ISO 11451.

