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Road vehicles — Electrical disturbances from conduction and coupling —

Part 1:

Definitions and general considerations

AMENDMENT 1

*Véhicules routiers — Perturbations électriques par conduction et par
couplage —*

Partie 1: Définitions et généralités

AMENDEMENT 1



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Foreword

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Amendment 1 to ISO 7637-1:2002 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

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Road vehicles — Electrical disturbances from conduction and coupling —

Part 1: Definitions and general considerations

AMENDMENT 1

Page iv, Introduction

Add the following paragraph immediately after the second paragraph:

“Annex A of this part of ISO 7637 specifies a general method for function performance status classification (FPSC). Typical severity levels are included in an annex of each of the other parts of ISO 7637.”

Page 5, Clause 4

Add the following paragraph at the end of Clause 4:

“The user should specify the test severity level for the various transients. The concept of FPSC is detailed in Annex A.”

Page 5

Add the following new Annex A between Clause 4 and the Bibliography:

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 the components immunity test for electrical disturbances from conduction and coupling. This method is based on the following considerations:

- a) a DUT 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 DUT 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 components or systems shall only be tested under the conditions, as described in ISO 7637, 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 7637. 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 an FPSC.

A.3.1 Function performance status

This element defines the expected performance objectives for the function of the DUT 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 device under test 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 illustration 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 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.

Test severity levels	Function performance status
L_{4i}	Unexpected event No. 4 (Status IV type, Status I, II and III allowed)
L_{3i}	Unexpected event No. 3 (Status III type, Status I and II allowed)
L_{2i}	Unexpected event No. 2 (Status II type, Status I allowed)
L_{1i}	Nominal function – event No. 1 (Status I type)

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 7637.