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**Road vehicles — Electrical disturbances  
from conduction and coupling —**

**Part 2:**

**Electrical transient conduction along  
supply lines only**

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

*Partie 2: Perturbations électriques transitoires par conduction  
uniquement le long des lignes d'alimentation*



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Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@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.

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.

ISO 7637-2 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

This third edition cancels and replaces the second edition (ISO 7637-2:2004), which has been technically revised. It also incorporates the Amendment ISO 7637-2:2004/Amd.1:2008. It does not specify test pulses 4, 5a, and 5b, which are now specified in ISO 16750-2 and ISO 21848.

ISO 7637 consists of the following parts, under the general title *Road vehicles — Electrical disturbances from conduction and coupling*:

- *Part 1: Definitions and general considerations*
- *Part 2: Electrical transient conduction along supply lines only*
- *Part 3: Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines*

# Road vehicles — Electrical disturbances from conduction and coupling —

## Part 2: Electrical transient conduction along supply lines only

### 1 Scope

This part of ISO 7637 specifies test methods and procedures to ensure the compatibility to conducted electrical transients of equipment installed on passenger cars and commercial vehicles fitted with 12 V or 24 V electrical systems. It describes bench tests for both the injection and measurement of transients. It is applicable to all types of road vehicles independent of the propulsion system (e.g. spark ignition or diesel engine, electric motor).

Function performance status classification for immunity to transients is given in Annex A.

### 2 Normative references

The following referenced documents are indispensable for the application 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 7637-1, *Road vehicles — Electrical disturbances from conduction and coupling — Part 1: Definitions and general considerations*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7637-1 apply.

### 4 Test procedure

#### 4.1 General

Methods for measuring the transient emission on supply lines and test methods for the immunity of devices against such transients are given. These tests, called “bench tests”, are performed in the laboratory.

The bench test methods, some of which require the use of the artificial network, will provide comparable results between laboratories.

A bench test method for the evaluation of the immunity of a device against supply line transients may be performed by means of a test pulse generator. This may not cover all types of transients which can occur in a vehicle; therefore, the test pulses described in 5.6 are characteristic of typical pulses.

In special cases, it may be necessary to apply additional test pulses. However, some test pulses may be omitted if a device, depending on its function or its connection, is not influenced by comparable transients in the vehicle. It is part of the vehicle manufacturer's responsibility to define the test pulses required for a specific device.

## 4.2 Test temperature and supply voltages

The ambient temperature during the test shall be  $(23 \pm 5) ^\circ\text{C}$ .

The supply voltages shall be as shown in Table 1 unless other values are agreed upon by the users of this part of ISO 7637, in which case such values shall be documented in the test reports.

$U_A$  is the supply voltage defined in Table 1, which shall be measured at the output of the pulse generator.

**Table 1 — Supply voltages**

Supply voltage	Nominal 12 V system V	Nominal 24 V system V
$U_A$	$13,5 \pm 0,5$	$27 \pm 1$

## 4.3 Voltage transient emissions test

### 4.3.1 General

This clause defines a test procedure to evaluate automotive electrical and electronic components for conducted emissions of transients along battery fed or switched supply lines of a device under test (DUT). A DUT which is considered a potential source of conducted disturbances should be tested according to the procedure described in this clause.

Care shall be taken to ensure that the surrounding electromagnetic environment does not interfere with the measurement set-up.

The test method applies to DUT with or without internal mechanical or electronic switch driving inductive loads.

Voltage transients from the disturbance source, the DUT, are measured using the artificial network to standardize the impedance loading on the DUT (see 5.1).

All wiring connections between the artificial network, switch, and the DUT shall be spaced  $(50 \pm 5)$  mm above the metal ground plane.

The cable sizes shall be chosen in accordance with the real situation in the vehicle, i.e. the wiring shall be capable of handling the operating current of the DUT, and as agreed between vehicle manufacturer and supplier.

Grounding of the DUT case to the ground plane shall reflect the vehicle installation and shall be defined in a test plan.

If no requirements are specified in the test plan, then the DUT shall be placed on a non-conductive material  $(50 \pm 5)$  mm above the ground plane.

The supply voltage  $U_A$  and the disturbance voltage shall be measured (see 4.3.2 and 4.3.3 for measurement guidance) using a voltage probe (see 5.5) and an oscilloscope or waveform acquisition equipment.

For values, see Annex B.

DUT operating conditions of particular interest in the measurements are the switch-off and the exercising of the various operating modes of the DUT. Exact operating conditions of the DUT shall be specified in the test plan.

NOTE Measurements at turn-on can be of interest in some instances.