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Road vehicles — Interchange of digital information on electrical connections between towing and towed vehicles —

Part 2: Application layer for brakes and running gear

Véhicules routiers — Échange d'informations numériques sur les connexions électriques entre véhicules tracteurs et véhicules tractés —

Partie 2: Couche d'application pour les équipements de freinage et les organes de roulement

Reference number
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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 31, *Data communication*.

This fourth edition cancels and replaces the third edition (ISO 11992-2:2014), which has been technically revised.

The main changes are as follows:

— introduced requirements structure;

— added new parameter specifications;

— added new message definitions;

— updated all figures.

A list of all parts in the ISO 11992 series can be found on the ISO website.

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.

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Introduction

The ISO 11992 series specifies the interchange of digital information between road vehicles with a maximum authorised total mass greater than 3 500 kg, and towed vehicles, including communication between towed vehicles in terms of parameters and requirements of the lower OSI layers (physical and data link layer) of the electrical connection used to connect the electrical and electronic systems.

This document is structured according to the Open Systems Interconnection (OSI) Basic Reference Model, in accordance with ISO/IEC 7498-1 and ISO/IEC 10731, which structures communication systems into seven layers. When mapped on this model, the application layer protocol and data link layer framework requirements specified/referenced in the ISO 11992 series standard are structured according to Figure 1.

Figure 1 illustrates a simplified communication framework:

— vehicle normal communication framework,

— vehicle diagnostic communication framework,

— vehicle-specific use case framework, and

— vehicle lower-layers framework.

The vehicle normal communication framework is composed of this document and ISO 11992-3.

The vehicle diagnostic communication framework is composed of ISO 14229-1, ISO 14229-2, ISO 14229-3 and ISO 11992-4.

The vehicle-specific use case framework is composed of ISO 11992-4, ISO 22901-1 or vehicle manufacturer-specific diagnostic data definition.

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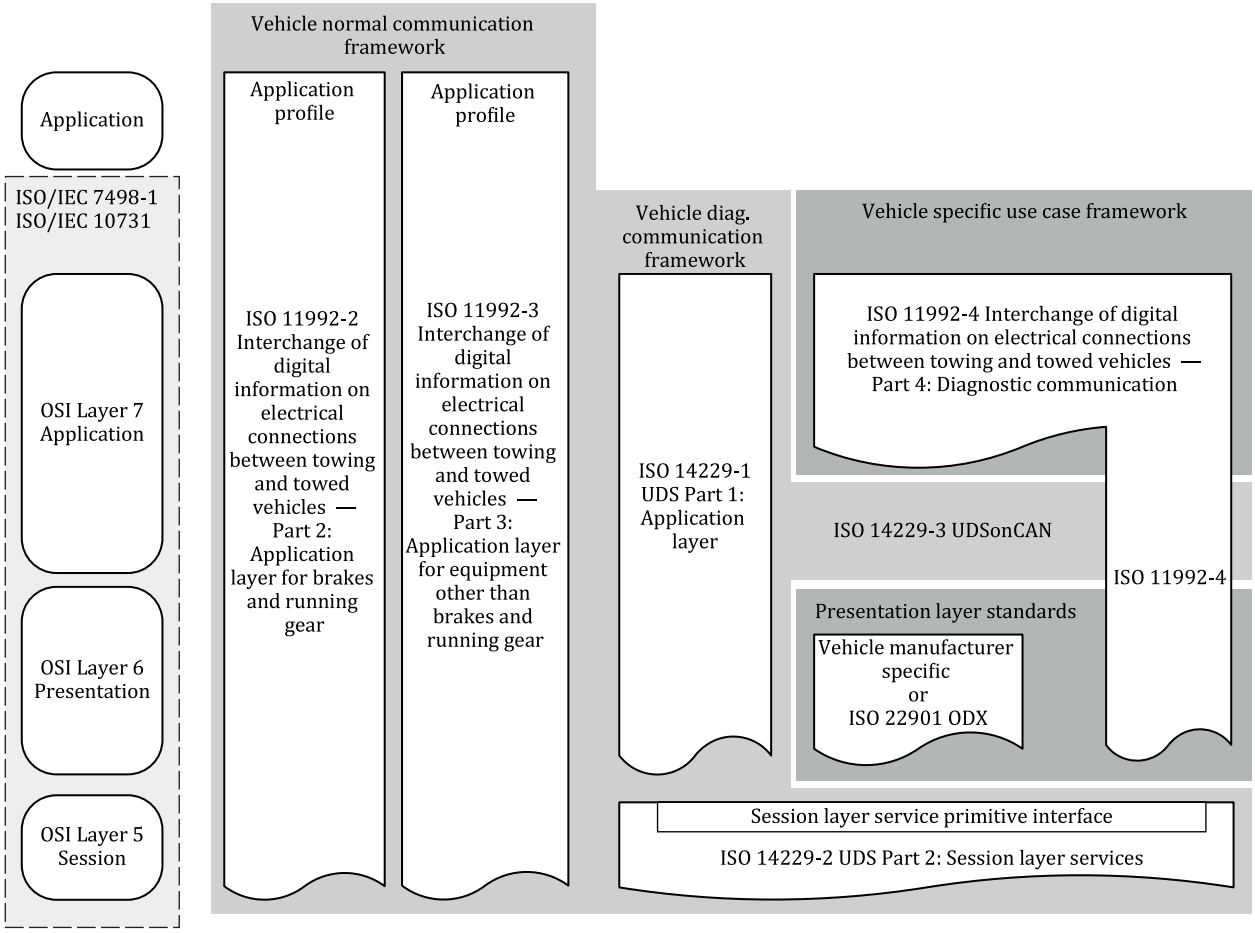


Figure 1 — Referenced documents according to the OSI model

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Road vehicles — Interchange of digital information on electrical connections between towing and towed vehicles —

Part 2: Application layer for brakes and running gear

1 Scope

This document specifies the SAE J1939-based application layer, the payload of messages, and parameter groups for electronically controlled braking systems, including anti-lock braking systems (ABS), vehicle dynamics control systems (VDC), and running gears equipment, to ensure the interchange of digital information between road vehicles with a maximum authorized total mass greater than 3 500 kg and their towed vehicles, including communication between towed vehicles.

Conformance and interoperability test plans are not part of this document.

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 3779, *Road vehicles — Vehicle identification number (VIN) — Content and structure*

ISO 11992-1, *Road vehicles — Interchange of digital information on electrical connections between towing and towed vehicles — Part 1: Physical and data-link layers*

ISO 11992-3:2021, *Road vehicles — Interchange of digital information on electrical connections between towing and towed vehicles — Part 3: Application layer for equipment other than brakes and running gear*

ISO 80000-1, *Quantities and units — Part 1: General*

SAE J1939-21, *Recommended Practice for a Serial Control and Communications Vehicle Network — Data Link Layer*

SAE J1939-71: *Recommended Practice for a Serial Control and Communications Vehicle Network — Vehicle Application Layer*

SAE J1939-DA, *Recommended Practice for a Serial Control and Communications Vehicle Network — J1939 Digital Annex*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11992-1 and the following apply.

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

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

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

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3.1
ABS
anti-lock braking system
control function, which automatically modulates the pressure producing the braking forces at the wheels to limit the degree of wheel slip, or a system that provides an anti-lock braking function

3.2
ASR
anti-spin regulation
control function, which automatically modulates the engine torque or the pressure producing the braking forces at the wheels to limit the degree of wheel spin, or a system that provides an anti-spin control

3.3
axle group
assembly of two or more consecutive axles considered together in determining their combined load effect

3.4
centre-axle towed vehicle
towed vehicle (3.19) equipped with a rigid towing device, and in which the axle(s) is (are) positioned close to the centre of gravity of the vehicle

3.5
converter towed vehicle
dolly unit that couples to a *semi towed vehicle* (3.18) with a *fifth-wheel coupling* (3.8) and thereby "converts" the semi towed vehicle to a *full towed vehicle* (3.9)

3.6
EBS
electronic braking system
braking system in, which control is generated and processed as an electrical signal in the control transmission

3.7
ECU
electronic control unit
electronic item consisting of a combination of basic parts, subassemblies, and assemblies packaged together as a physically independent entity

3.8
fifth-wheel coupling
link between a *towing vehicle* (3.22) and a *towed vehicle* (3.19), designed for towing a *semi towed vehicle* (3.18)

3.9
full towed vehicle
towed vehicle (3.19) equipped with a towing device, which can move vertically (in relation to the towed vehicle), and in which the axle(s) is (are) positioned farther from the centre of gravity of the vehicle

3.10
gateway
unit connecting different networks or parts of one network and performing any necessary protocol translation

3.11
link towed vehicle
towed vehicle (3.19) with a *fifth-wheel coupling* (3.8), designed for towing a *semi towed vehicle* (3.18)

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3.12
network segment
part of a network that is within the domain of a single link layer

3.13
node
device capable of sending or receiving data whose identification will be unambiguous for authentication purposes

3.14
RGE
running rear equipment
equipment of a vehicle, including steering, suspension, and tyres

3.15
road train
combination of *towing vehicle* (3.22) and *towed vehicles* (3.19) connected via a communication link

3.16
road train session number
randomised number that is used to identify a set of vehicles that are connected via a communication link with their *ECUs* (3.7) powered up

3.17
ROP
roll-over prevention
roll-over protection
control function to prevent roll-over situations of a vehicle

Note 1 to entry: ROP is part of a *VDC* (3.23) function.

3.18
semi towed vehicle
towed vehicle (3.19), which is designed to be coupled to a semi towed vehicle towing vehicle and to impose a substantial part of its total weight on the *towing vehicle* (3.22)

3.19
towed vehicle
non-power-driven road vehicle, which, on account of its design and appointments, is used to transport persons or goods and is intended to be towed by a motor vehicle

3.20
towing full towed vehicle
towed vehicle (3.19) equipped with a towing device, which can move vertically (in relation to the towed vehicle), and in which the axle(s) is (are) positioned less close to the centre of gravity of the vehicle that is capable of towing another vehicle

3.21
towing semi towed vehicle
towed vehicle (3.19), which is designed to be coupled to a semi towed vehicle towing vehicle and to impose a substantial part of its total weight on the *towing vehicle* (3.22) that is capable of towing another vehicle

3.22
towing vehicle
motor vehicle or non-power-driven vehicle, which tows a succeeding vehicle

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3.23
VDC
vehicle dynamic control
control function as part of the braking system that reacts to stabilize the vehicle during dynamic manoeuvres

Note 1 to entry: VDC has the possible sub-functions *ROP* (3.18) and *YC* (3.25).

3.24
wheel base
horizontal distance between the centres of the front *axle group* (3.3) and rear *axle group*

3.25
YC
yaw control
control function to reduce an unwanted lateral movement of a vehicle

Note 1 to entry: Yaw control is part of a *VDC* (3.23) function.

4 Symbols and abbreviated terms

4.1 Symbols

$p_{\text{axle number}}$	position number of axle
—	empty table cell or feature undefined

4.2 Abbreviated terms

ABS	anti-lock braking system
AI	address information
ASR	anti-spin regulation
Cvt	convention
CAN	controller area network
DA	destination address
DLC	data length code
DP	data page
EDP	extended data page
GE	group extension
LSb	least significant bit
LSB	least significant byte
MSb	most significant bit
MSB	most significant byte
Msg	message

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