INTERNATIONAL STANDARD

ISO 26021-3

Second edition
2022-05

Road vehicles — End-of-life activation of in-vehicle pyrotechnic devices —

Part 3: Data definitions

Véhicules routiers — Activation en fin de vie des dispositifs pyrotechniques embarqués —

Partie 3: Définition des données

Reference number
ISO 26021-3:2022(E)

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Published in Switzerland

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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).

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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 second edition cancels and replaces the first edition of ISO 26021-1:2008, ISO 26021-2:2008, ISO 26021-2:2008/Cor 1:2009, ISO 26021-3:2009, ISO 26021-4:2009, ISO 26021-5:2009, which has been technically revised.

The main changes are as follows:

— restructuring of four parts into a new Part 1 document including use cases and application requirements and a new Part 3 document including data definitions;

— introduction of requirement structure with numbering and name;

— support of ISO 13400 DoIP (diagnostic communication over Internet Protocol);

— support of ISO 13400-4 DoIP diagnostic connector.

A list of all parts in the ISO 26021 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.

Introduction

End-of-life deployment activation of on-board pyrotechnical devices is part of a wider regime designed to ensure that pyrotechnical devices in road vehicles are scrapped in a safe and environmentally acceptable condition after their use.

The ISO 26021 series is based on the Open Systems Interconnection (OSI) basic reference model specified in ISO/IEC 7498-1[2] and ISO/IEC 10731[4], which structures communication systems into seven layers. When mapped on this model, the application protocol and data link framework requirements specified/referenced in the ISO 26021 series are structured according to Figure 1.

Figure 1 illustrates a standard-based documentation concept, which consists of the following main clusters:

— vehicle diagnostic communication framework: covers all relevant basic vehicle diagnostic communication specifications of OSI layers 7, 6 and 5;

— vehicle diagnostic communication use case framework: covers the master specification, which specifies the use cases and requirements of the subject matter of OSI layer 7;

— presentation layer framework: covers all data relevant specifications of OSI layer 6;

— conformance test plan: covers the conformance test plan requirements of the use cases and communication requirements of OSI layers 7, 6 and 5;

— lower OSI layer framework: covers all vehicle diagnostic protocol standards of OSI layers 4, 3, 2 and 1, which are relevant and referenced by the use case specific standard.

Figure 1 shows the document reference according to OSI model.

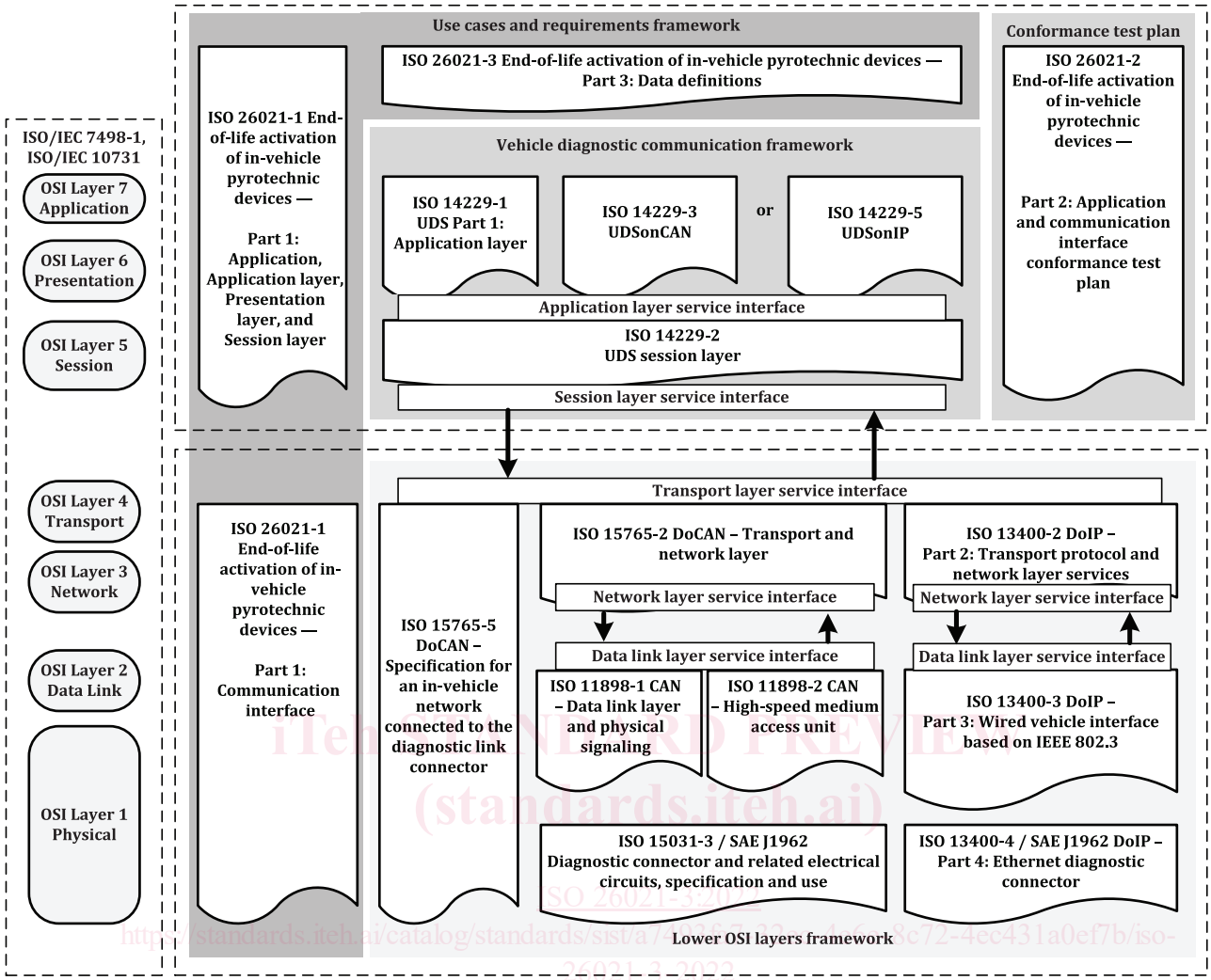

Figure 1 — ISO 26021 documents reference according to OSI model

Road vehicles — End-of-life activation of in-vehicle pyrotechnic devices —

Part 3:
Data definitions

1 Scope

This document specifies all end-of-life activation of in-vehicle pyrotechnical devices identifiers, data identifiers, routine identifiers, data types, computations, and units.

This document is based on:

— new safety-relevant system technology designed into the vehicles,

— new or more effective end-of-life activation of in-vehicle pyrotechnical devices, which requires additional test data, and routine controls.

This document describes the end-of-life activation of in-vehicle pyrotechnical devices data definitions and associated technical requirements.

This document specifies:

— identifiers for end-of-life activation of in-vehicle pyrotechnical devices data definitions and associated technical requirements,

— data identifiers applicable to end-of-life activation of in-vehicle pyrotechnical devices data definitions and associated technical requirements,

— routine identifiers applicable to end-of-life activation of in-vehicle pyrotechnical devices data definitions and associated technical requirements.

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 14229-1, *Road vehicles — Unified diagnostic services (UDS) — Part 1: Application layer*

ISO 15765-5, *Road vehicles — Diagnostic communication over Controller Area Network (DoCAN) — Part 5: Specification for an in-vehicle network connected to the diagnostic link connector*

ISO 26021-1:2022, *Road vehicles — End-of-life activation of in-vehicle pyrotechnical devices — Part 1: Application and communication interface*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14229-1 and ISO 26021-1:2022 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/

4 Abbreviated terms

DID	data identifier
MI	malfunction indicator
RCOR	routineControlOptionRecord
RCTP	routineControlParameter
SF	SubFunction
VM	vehicle manufacturer

5 Parameter specification

Annex A specifies the data identifier (DID) parameters and shall be followed.

Annex B specifies the deployment loop parameters and shall be followed.

Annex C specifies the routine control parameters and shall be followed.

Annex A
(normative)

Data identifier (DID) parameter definitions

A.1 DID = NumberOfPcu

Table A.1 specifies the DID, which contains the overall number of PCUs (including the mandatory fixed-address PCU) installed in the vehicle (default 1).

EXAMPLE If there is only one fixed-address PCU in the vehicle, a value of one (1) is reported. If there are two (2) additional PCUs in the vehicle, a value of three (3) is reported.

Table A.1 — DID = NumberOfPcu

DID	Definition	Symbolic name	A_Data byte	Scaling
$FA00_{16}$	NumberOfPcu	DID_NUM_PCU	—	—
	This DID shall be read-only and shall be supported by the fixed-address PCU in the vehicle.		1	8 bit unsigned numeric 00_{16}: not valid 01_{16} to $F0_{16}$: valid number $F0_{16}$ to FF_{16}: reserved by this document

A.2 DID = PcuHardwareDeploymentMethod

Table A.2 specifies the data identifier, which contains the version of the PCU deployment method implemented by the PCU and an identification string for the PCU. This data identifier is read-only.

Table A.2 — DID = PcuHardwareDeploymentMethod

DID	Definition	Symbolic name	A_Data byte	Scaling
$FA01_{16}$	PcuHardwareDeploymentMethodVersion	DID_HW_DPLY_MV	—	—
	This parameter of the PcuHardwareDeploymentMethodVersion contains the deployment method version of the diagnostic protocol services and the sequence used for the PCU deployment.		1	8 bit unsigned character00_{16}: default value: 01_{16}: ISO 26021-2 Edition 1 02_{16}: ISO 26021-1 Edition 2 03_{16} to FF_{16}: reserved by this document
	PcuIdentificationString This parameter of the PcuHardwareDeploymentMethod contains the PCU identification string that is assigned to the PCU by the vehicle manufacturer (VM).		2 to 10	8 bit unsigned character 00_{16}: default value 01_{16} to FF_{16}: VM-specific
	Additional data reserved for future use.		---	reserved by this document

A.3 DID = PcuAddressInfo

Table A.3 specifies the data identifier, which contains the address type (11 bit, 29 bit) and address numbers (request and response) to be used to communicate with the PCUs in the vehicle. This information is dependent upon the physical link (see ISO 15765-5). Only “normal addressing” and “normal fixed addressing” as defined in ISO 15765-5 shall be supported on CAN. This data identifier shall only be supported by the fixed-address PCU in the vehicle.

The structure defined below shall be repeated in the response message for each PCU (including the fixed-address PCU) in the vehicle. This data identifier is read-only.

Table A.3 — DID = PcuAddressInfo

DID	Definition	Symbolic name	A_Data byte	Scaling
$FA02_{16}$	PcuAddressInfo	DID_PCU_ADDR_INFO	—	—
	PcuAddressFormatId #1 This format identifier specifies the format of the 1st PCU's address information. The 1st PCU address information type contains the address format of the PCU to be deployed first. Address information types are defined in ISO 26021-1.		1	8 bit unsigned numeric 01_{16}: 11 bit normal addressing 02_{16}: 11 bit extended addressing 03_{16}: 11 bit mixed addressing 04_{16}: 29 bit normal fixed addressing 05_{16}: 29 bit mixed addressing 06_{16}: 29 bit unique addressing
	PcuRequestMsgAddr #1 This parameter contains the diagnostic request address to which the PDT shall transmit the diagnostic requests to communicate with a PCU. Depending on the address information format, this is either an 11-bit or a 29-bit CAN-identifier. The 1st PCU request address shall be that of the PCU to be fired first. The unused most significant bits shall be padded with zeros (0).		2 to 5	32 bit unsigned numeric
	PcuResponseMsgAddr #1 This parameter contains the diagnostic response address to which the PCU will respond to the requests of the PDT. Dependent upon the address information format this is either an 11-bit or 29-bit CAN-identifier or an 8-bit K-Line address. The 1st PCU request address shall be that of the PCU to be fired first. The unused most significant bits shall be padded with zeros (0).		6 to 9	32 bit unsigned numeric
	PcuAddressFormatId #*n* This format identifier specifies the format of the n^{th} PCU's address information.		$(n - 1) \times 9 + 1$	8 bit unsigned numeric (see PCU address format #1)
	RequestMsgAddrPcu #*n* This is the diagnostic request address of the n^{th} PCU in the vehicle.		$(n - 1) \times 9 + 2$ to $(n - 1) \times 9 + 5$	32 bit unsigned numeric
	ResponseMsgAddrPcu #*n* This is the diagnostic response address of the n^{th} PCU in the vehicle.		$(n - 1) \times 9 + 6$ to $(n - 1) \times 9 + 9$	32 bit unsigned numeric

A.4 DID = DeploymentLoopIdTable

Table A.4 specifies the data identifier, which contains the number of loop table records in this PCU. Every loop record is made up of the type and the associated status of the deployment loops supported by the PCU. This data identifier is read-only.

Table A.4 — DID = DeploymentLoopIdTable

DID	Definition	Symbolic name	A_Data byte	Scaling
$FA06_{16}$	DeploymentLoopIdTable	DID_DPLY_LIDT	—	—
	ACLType The PCU deployment identifies the type of ACL required by the diagnostic protocol services and the sequence used for deployment of the pyrotechnic device. It shall be incremented every time a protocol service or a data identifier is changed and is no longer backward-compatible.		1	8 bit unsigned numeric 01_{16}: No_ACL_Line 02_{16}: ACL_CommMode_12V 03_{16}: ACL_PWM_FixedLevel_8V 04_{16}: ACL_CommMode_24V 05_{16}: ACL_PWM_UBattLevel_12V 06_{16}: ACL_PWM_UBattLevel_24V 07_{16} to FF_{16}: reserved by this document
	ACLMethodVersion The ACL method version identifies the version of the diagnostic protocol services and sequence used for PCU deployment. It shall be incremented every time a protocol service or a data identifier is changed in the relevant parts of the ISO 26021 series and is no longer backward-compatible.		2	8 bit unsigned character 02_{16}: ISO 26021:2022 series (this document series)
	NumOfLoopTableRecords		3	8 bit unsigned numeric 00_{16}: not valid 01_{16} to $F0_{16}$: number $F0_{16}$ to FF_{16}: reserved by this document
	DeploymentLoopId #1 This parameter contains the identification of the 1st loop in the PCU providing the function this loop is assigned to.		4	8 bit unsigned numeric Refer to B.1 for the definition of the available loop IDs.
	DeploymentLoopStatus #1 This parameter contains the current status of the loop identified in the parameter “loop identification”.		5	8 bit unsigned numeric Refer to B.2 for the definition of the loop status information.
	DeploymentLoopId #*n* This parameter contains the identification of the n^{th} loop in the PCU providing the function this loop is assigned to.		($n \times 2$) + 2	8 bit unsigned numeric Refer to B.1 for the definition of the available loop IDs.
	DeploymentLoopStatus #*n* This parameter contains the current status of the loop identified in the parameter “loop identification”.		($n \times 2$) + 3	8 bit unsigned numeric Refer to B.2 for the definition of the loop status information.

A.5 DID = DismantlerIdentification

Table A.5 specifies the DID, which is used to reference the dismantler identification data. The data shall be written to the PCU prior to the execution of any loop ignition procedure. This data identifier shall