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**Road vehicles — End-of-life activation of  
on-board pyrotechnic devices —**

**Part 4:  
Additional communication line with  
bidirectional communication**

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

*Partie 4. Ligne de communication additionnelle avec communication  
bidirectionnelle*

ISO 26021-4:2009

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Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
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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.

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 26021-4 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

ISO 26021 consists of the following parts, under the general title *Road vehicles — End-of-life activation of on-board pyrotechnic devices*:

- *Part 1: General information and use case definitions*
- *Part 2: Communication requirements*
- *Part 3: Tool requirements*
- *Part 4: Additional communication line with bidirectional communication*
- *Part 5: Additional communication line with pulse width modulated signal*

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## Introduction

Worldwide, nearly all new vehicles are equipped with one or more safety systems. This can include advanced protection systems based on pyrotechnic actuators. All components which contain pyrotechnic substances can be handled in the same way.

Recycling these vehicles demands a new process to ensure that the deactivation of airbags is safe and cost-efficient. Due to the harmonization of the on-board diagnostic (OBD) interface, there is a possibility of using it for on-board deployment, which is based on the same tools and processes.

Representatives of the global automobile industry agreed that automobile manufacturers

- do not support reuse as an appropriate treatment method for pyrotechnic devices,
- believe treatment of pyrotechnic devices is required before shredding, and
- support in-vehicle deployment as the preferred method.

Based on this agreement, the four big associations of automobile manufacturers (ACEA, Alliance, JAMA and KAMA) started to develop a method for the “in-vehicle deployment of pyrotechnic components in cars with the pyrotechnic device deployment tool (PDT). The objective is that in the future a dismantler will use only one tool without any accessories to deploy all pyrotechnic devices inside an end-of-life vehicle (ELV) by using an existing interface to the car.

Because of different requirements and safety concepts an additional communication line (ACL) is added to the basic CAN communication method. In this part of ISO 26021 ACL is used to mean an additional communication line with bidirectional communication. This bidirectional communication is used for systems with a specific concept that the initiation requires ECU acknowledgement.

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# Road vehicles — End-of-life activation of on-board pyrotechnic devices —

## Part 4: Additional communication line with bidirectional communication

### 1 Scope

This part of ISO 26021 defines the requirements of redundancy hardware or software systems independent from the controller area network (CAN) line, which are activated by the additional communication line (ACL hardware line).

It also describes the additional sequences of the deployment process, and the technical details for the direct hardware connection between the pyrotechnic device deployment tool (PDT) and the pyrotechnic control unit (PCU).

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### 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 14230-1, *Road vehicles — Diagnostic Systems — Keyword Protocol 2000 — Part 1: Physical layer*

ISO 15031-3, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 3: Diagnostic connector and related electrical circuits, specification and use*

ISO 15765-3, *Road vehicles — Diagnostics on Controller Area Networks (CAN) — Part 3: Implementation of unified diagnostic services (UDS on CAN)*

ISO 15765-4, *Road vehicles — Diagnostics on Controller Area Networks (CAN) — Part 4: Requirements for emissions-related systems*

ISO 26021-1, *Road Vehicles — End-of-life activation of on-board pyrotechnic devices — Part 1: General information and use case definitions*

ISO 26021-2, *Road Vehicles — End-of-life activation of on-board pyrotechnic devices — Part 2: Communication requirements*

ISO 26021-3, *Road Vehicles — End-of-life activation of on-board pyrotechnic devices — Part 3: Tool requirements*

### 3 Terms and definitions, abbreviated terms

#### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14230-1, ISO 15031-3, ISO 15765-3, ISO 15765-4, ISO 26021-1, ISO 26021-2 and ISO 26021-3 apply.

**3.2 Abbreviated terms**

ACL	additional communication line
PDT	pyrotechnic device deployment tool
PCU	pyrotechnic control unit
OBD	on-board diagnostic
OSI	open systems interconnection

**4 Conventions**

This International Standard is based on the conventions discussed in the OSI service conventions (ISO/IEC 10731) as they apply for diagnostic services.

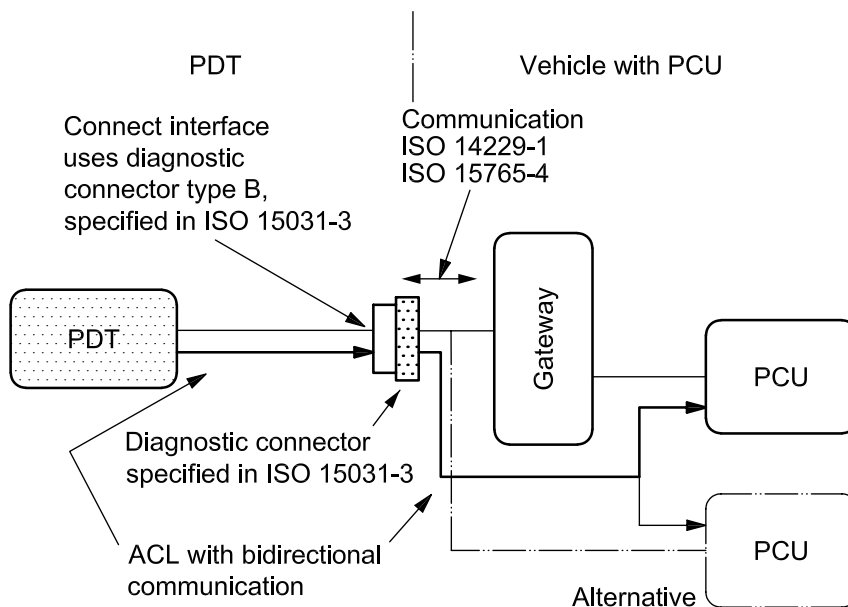
**5 Pyrotechnic device deployment via on-board diagnostic architecture**

**5.1 Vehicle system description**

This International Standard is based on an envisaged diagnostic network architecture in combination with the PCU deployment architecture, as described in this subclause.

ISO 26021-2 defines the mandatory vehicle interface of the PCU and PDT. The PCU is connected with the vehicle diagnostic connector and the communication specifications comply with ISO 15765-3 and ISO 15765-4. The PDT communicates with the PCU on CAN\_H and CAN\_L and enables deployment with bidirectional communication.

Depending upon the vehicle-specific architecture, the mandatory link of the PCU may be connected via a gateway to the OBD connector (see Figure 1), thus a CAN interface in the PCU for the mandatory link may not be required.



**Figure 1 — Access to the vehicle via diagnostic connector**



### 5.2 Example of in-vehicle hardware and software provision

To execute the on-board deployment via the OBD link, the PCU software shall have full access to the output driver stage, which controls the deployment loops. To achieve this, the saving path is controlled via the ACL with a bidirectional signal (see Figure 2).

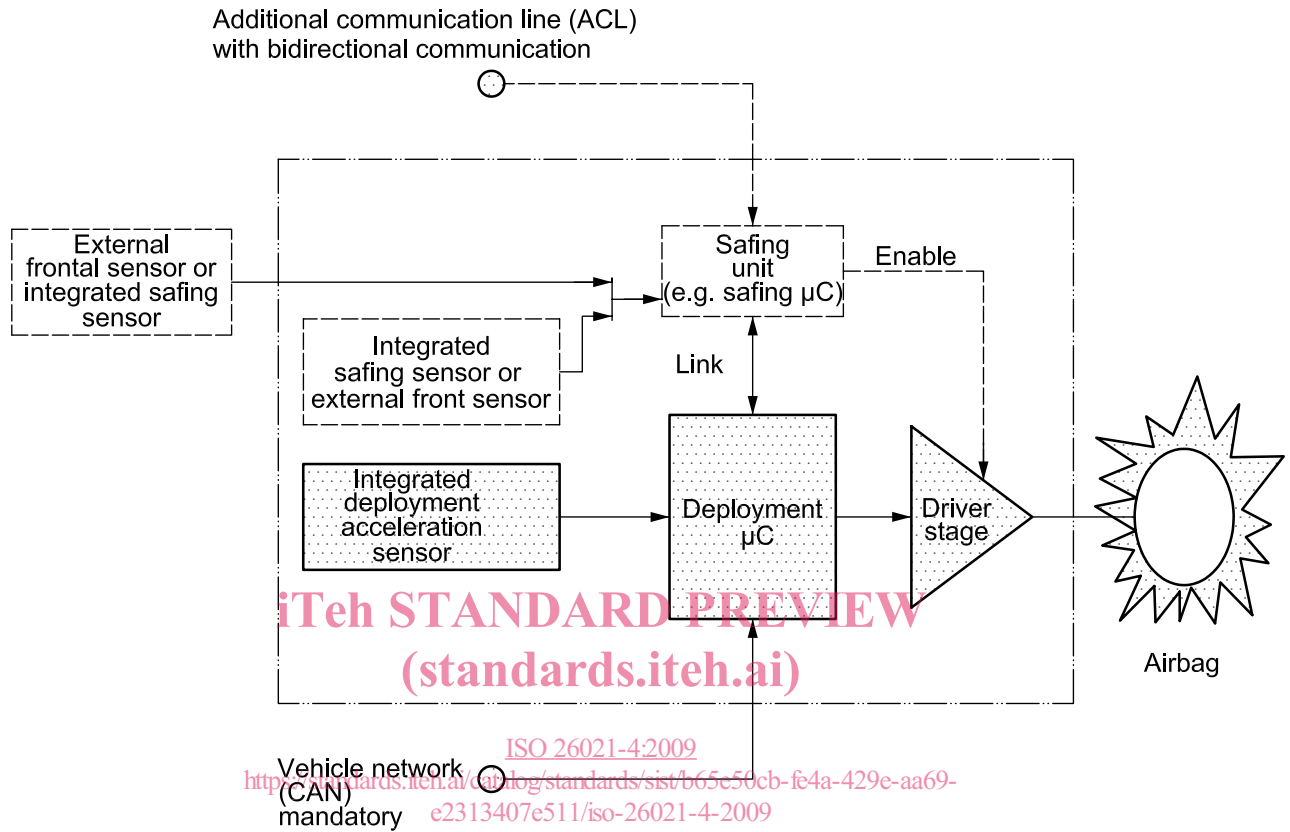


Figure 2 — Overview of hardware and software provision

### 5.3 Additional communication line

Depending on the hardware architecture of the PCU an additional signal is used. General requirements for the interface between deployment sequence and ACL sequence are given in Clauses 6 and 7.

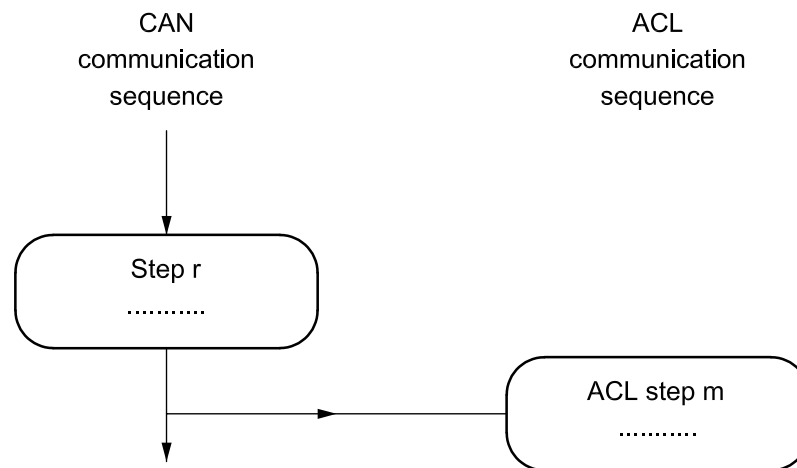


Figure 3 — Integration of ACL communication into deployment process