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

Part 1: General information and use case definitions

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

Partie 1: Informations générales et définitions de cas d'usage



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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 26021-1 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*

NOTE Additional parts will be introduced as necessary to take into account requirements not yet covered by the standard.

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Introduction

ISO 26021 describes a method for the in-vehicle deployment of pyrotechnically activated components (also referred to as pyrotechnic components or pyrotechnic devices) in cars.

Worldwide, nearly all new vehicles are equipped with one or more safety systems. Advanced protection systems using pyrotechnic actuators are becoming more common. All components which contain pyrotechnic substances should be handled in the same way.

Recycling of these vehicles requires a new process which ensures that the deployment of all the pyrotechnic components will be safe and cost-efficient. Based on the harmonization of the on-board diagnostics (OBD) interface, there is an opportunity to use this interface for on-board deployment, utilizing the same tools and processes.

The representatives of the global automobile industry have decided the following:

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

Based on this decision, the four major automobile manufacturer associations (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 vision is that, one day, a dismantler will need only one tool without any accessories in order to deploy all the pyrotechnic devices inside an end-of-life vehicle (ELV). The target is to use an existing interface to the car.

This International Standard has been developed in order to define common requirements for communication between the tool and the pyrotechnic control unit (PCU) when deploying pyrotechnic devices. This communication should use earlier standardized hardware and software. Based on emissions-related diagnostics (see ISO 15031-3), the physical layer specified for legislated OBD and the diagnostic connector was defined. The software used is an implementation of diagnostic services and transaction protocols on CAN.

Because of the automobile manufacturers' specific requirements and safety concepts, an additional communication line (ACL) may be used beside the basic CAN communication method. This line is usable in two different ways:

- as an additional communication line with bidirectional communication for additional communication functions;
- as an additional communication line with a pulse width modulated signal for hardware safing.

Although primarily intended for airbag deployment systems, ISO 26021 has also been developed to meet requirements for other pyrotechnically activated systems.

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To achieve this, this International Standard makes use of on-board diagnostics and is based on 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 services used by a diagnostic tester (client) and an electronic control unit (ECU) (server) are broken down in accordance with Table 1, as follows:

- a pyrotechnic devices deployment application using application services, specified in this International Standard;
- application services (layer 7), specified in ISO 14229-1;
- communication services (layers 1 to 6).

Table 1 — Deployment of pyrotechnic devices — Specifications applicable to the OSI layers

Applicability	OSI layer	Airbag deployment application
Seven layers in accordance with ISO/IEC 10731	User application	ISO 26021-1
	Application (layer 7)	ISO 14229-1/ISO 15765-3
	Presentation (layer 6)	—
	Session (layer 5)	ISO 14229-1
	Transport (layer 4)	ISO 15765-2
	Network (layer 3)	ISO 15765-2
	Data link (layer 2)	ISO 11898/ISO 26021-4 and ISO 26021-5
	Physical (layer 1)	ISO 11898/ISO 26021-4 and ISO 26021-5

For the deployment of pyrotechnic devices via on-board diagnostics by a dismantler, it is required that future modifications to this International Standard provide long-term backwards compatibility.