TECHNICAL SPECIFICATION

ISO/TS 19072-3

Second edition
2012-02-15

Road vehicles — Connection interface for pyrotechnic devices, two-way and three-way connections —

Part 3: Pyrotechnic device and harness connector assembly - type 1

Véhicules routiers — Interface de raccordement pour dispositifs pyrotechniques, deux voies et trois voies —

Partie 3: Assemblage du dispositif pyrotechnique et du connecteur faisceau - type 1

Reference number
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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

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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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

ISO/TS 19072-3 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

This second edition cancels and replaces the first edition (ISO/TS 19072-3:2008), which has been technically revised.

ISO 19072 consists of the following parts, under the general title *Road vehicles — Connection interface for pyrotechnic devices, two-way and three-way connections*:

— *Part 1: Pocket interface definition*

— *Part 2: Test methods and general performance requirements*

— *Part 3: Pyrotechnic device and harness connector assembly - type 1* [Technical Specification]

The following parts are under preparation:

— *Part 4: Pyrotechnic device and harness connector assembly - type 2* [Technical Specification]

Introduction

Road vehicles integrate an increasing number of pyrotechnic devices contributing to occupant safety in vehicles, e.g. frontal and side air bag, safety belt pretensioner.

To build the complete system providing the function requires a supply of various components from several different equipment makers. Vehicle manufacturers need to define a common specification to ensure that connectors designed and produced for the various equipment makers can be mated without any difficulty.

In the current design of this vehicle equipment, three areas of connection have been identified:

— connection between the pyrotechnic device (e.g. initiator) and the harness connector;

— connection between the tab holder and the clip holder of the harness connector;

— connection between the harness connector and the electronic control module.

The connection between the pyrotechnic device and the harness connector is the only connection that can be standardized and it forms the subject of this Technical Specification. Due to the location of the safety device in the vehicle, the connector design could be right angle or straight.

Due to the fact that several electrostatic discharge (ESD) protection levels are requested by vehicle manufacturers, a two-way without ground option of the pyrotechnic device/initiator and harness connector assembly is also defined.

The International Organization for Standardization (ISO) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent.

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Road vehicles — Connection interface for pyrotechnic devices, two-way and three-way connections —

Part 3:
Pyrotechnic device and harness connector assembly - type 1

1 Scope

This Technical Specification defines the general minimum specifications of a type 1 three-way connection interface, including ground connection, linking the pyrotechnic device and harness connector built into a road vehicle.

A two-way without ground variant of the pyrotechnic device/initiator and harness connector assembly is also defined. All requirements apply also to the two-way design, except all items related to ground connection.

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 178, *Plastics — Determination of flexural properties*

ISO 8092-2, *Road vehicles — Connections for on-board electrical wiring harnesses — Part 2: Definitions, test methods and general performance requirements*

ISO 14647, *Metallic coatings — Determination of porosity in gold coatings on metal substrates — Nitric acid vapour test*

ISO 19072-1, *Road vehicles — Connection interface for pyrotechnic devices, two-way and three-way connections — Part 1: Pocket interface definition*

ISO 19072-2, *Road vehicles — Connection interface for pyrotechnic devices, two-way and three-way connections — Part 2: Test methods and general performance requirements*

ISO 27874, *Metallic and other inorganic coatings — Electrodeposited gold and gold alloy coatings for electrical, electronic and engineering purposes — Specification and test methods*

RAL German Institute for Quality Assurance and Certification e.V., RAL Colours homepage, https://www.ral-farben.de/ral-farben.html

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8092-2 and the following apply.

3.1
connector
assembly of contact and housing that terminates conductors for the purpose of providing connection and disconnection to a suitable mating connector

NOTE A male (female) connector is a housing containing male (female) contacts and accessory items. A male connector can be permanently fixed to a wiring harness or to an appliance, e.g. an electronic control unit (ECU). A female connector is, in general, permanently fixed to a wiring harness.

3.2
housing
connector without its contacts

3.3
initiator
part of the pyrotechnical device holding the two male contacts

3.4
retainer
ring, generally made of plastic, holding an optional shorting clip and providing coding and electrical insulation

NOTE The shorting clip may be omitted on agreement between manufacturer and supplier.

3.5
shorting clip
shunt
metallic bar of the retainer providing the electrical connection between two male contacts

3.6
squib holder
part of the pyrotechnical device holding the initiator and the retainer

4 Dimensional features and performance requirements

4.1 General

The female connector shall be designed to avoid damage to male contacts and the initiator in the case of improper mating.

The connector, retainer and squib holder assembly shall comply with the requirements in ISO 19072-1 and ISO 19072-2.

4.2 Retainer and squib holder assembly

The dimensions of the retainer shall comply with Figure 1. The dimensions of the squib holder interface are defined in ISO 19072-1.

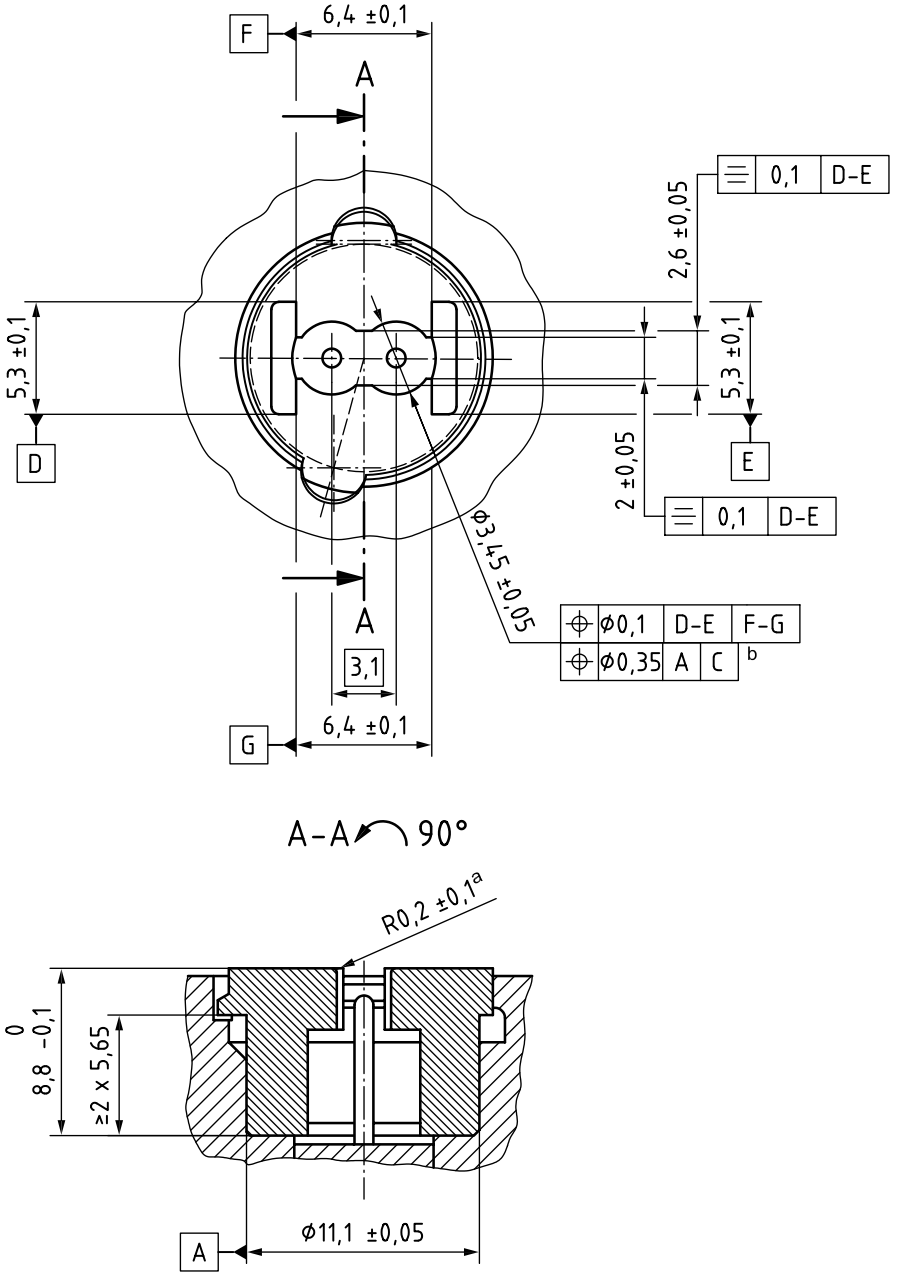
4.3 Codings and polarization

Coding and polarization are determined by the dimensions and position of the coding keys, each of which has its own colour code (see Figure 2 and Table 1).

The colour code shall be in accordance with RAL[1)]; however, there needs to be an agreement about the range between the customer and supplier.

1) RAL colour space system developed by Reichsausschuß für Lieferbedingungen und Gütesicherung (German Institute for Quality Assurance and Certification e.V.); see Clause 2.

Dimensions in millimetres

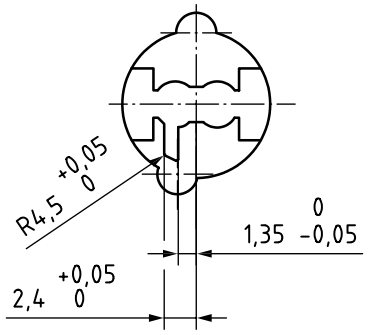


a The radius also applies to the complete top edge, including coding features.

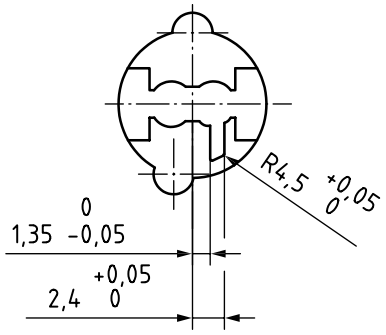
b Datum A and datum C are defined in ISO 19072-1.

Figure 1 — Retainer and squib holder assembly

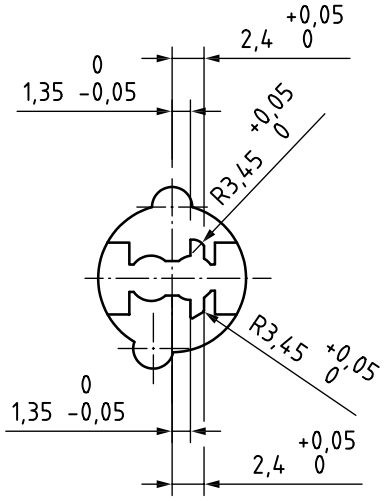
Dimensions in millimetres



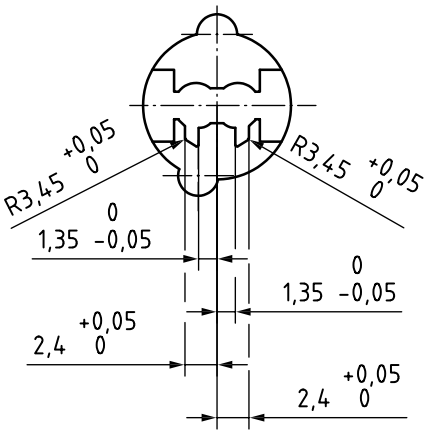
a) Coding A/E



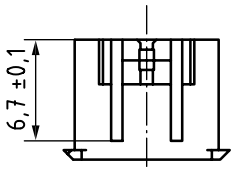
b) Coding B/F



c) Coding C/G



d) Coding D/H



e) Cut out depth

Figure 2 — Dimensions and position of coding keys

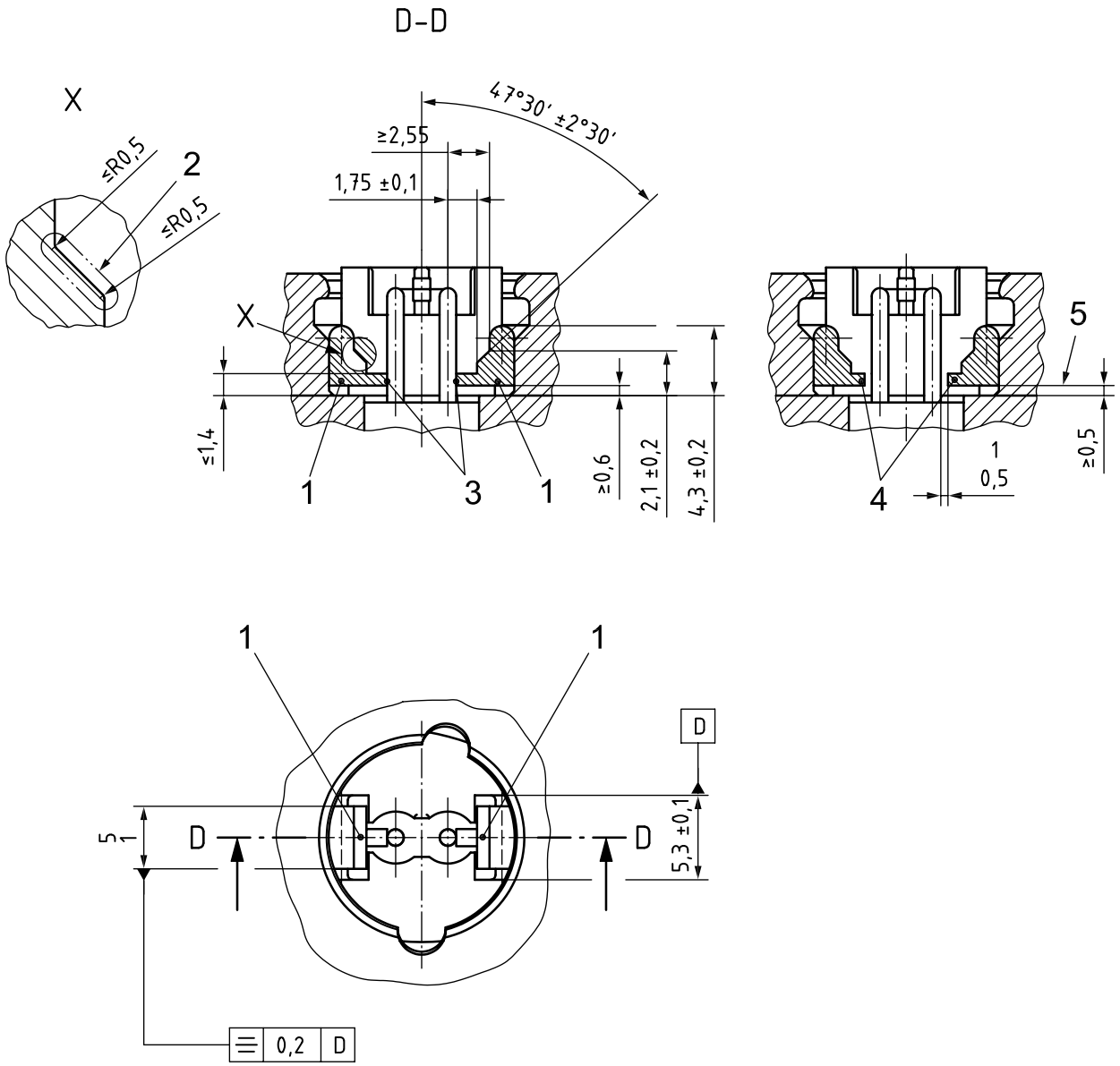
Table 1 — Type of coding used and assigned colour code

Colours RAL		Connection							
		Three-way				Two-way			
No.	Colour description	A	B	C	D	E	F	G	H
9011	graphite black	X							
6017	may green		X						
2007	luminous bright orange			X					
4008	signal violet				X				
4006	traffic purple					X			
9003	signal white						X		
6027	light green							X	
1018	zinc yellow								X

4.4 Dimensional features and properties for shorting clip function

The dimensions of the actuation area for opening the short-circuit in the retainer shall comply with Figure 3.

Dimensions in millimetres



Key

1 space reserved for short-circuit
2 shorting clip actuation surface
3 contact area for shorting clip
4 short-circuit position when open

[a] The two short-circuits shall be simultaneously activated by the connector.

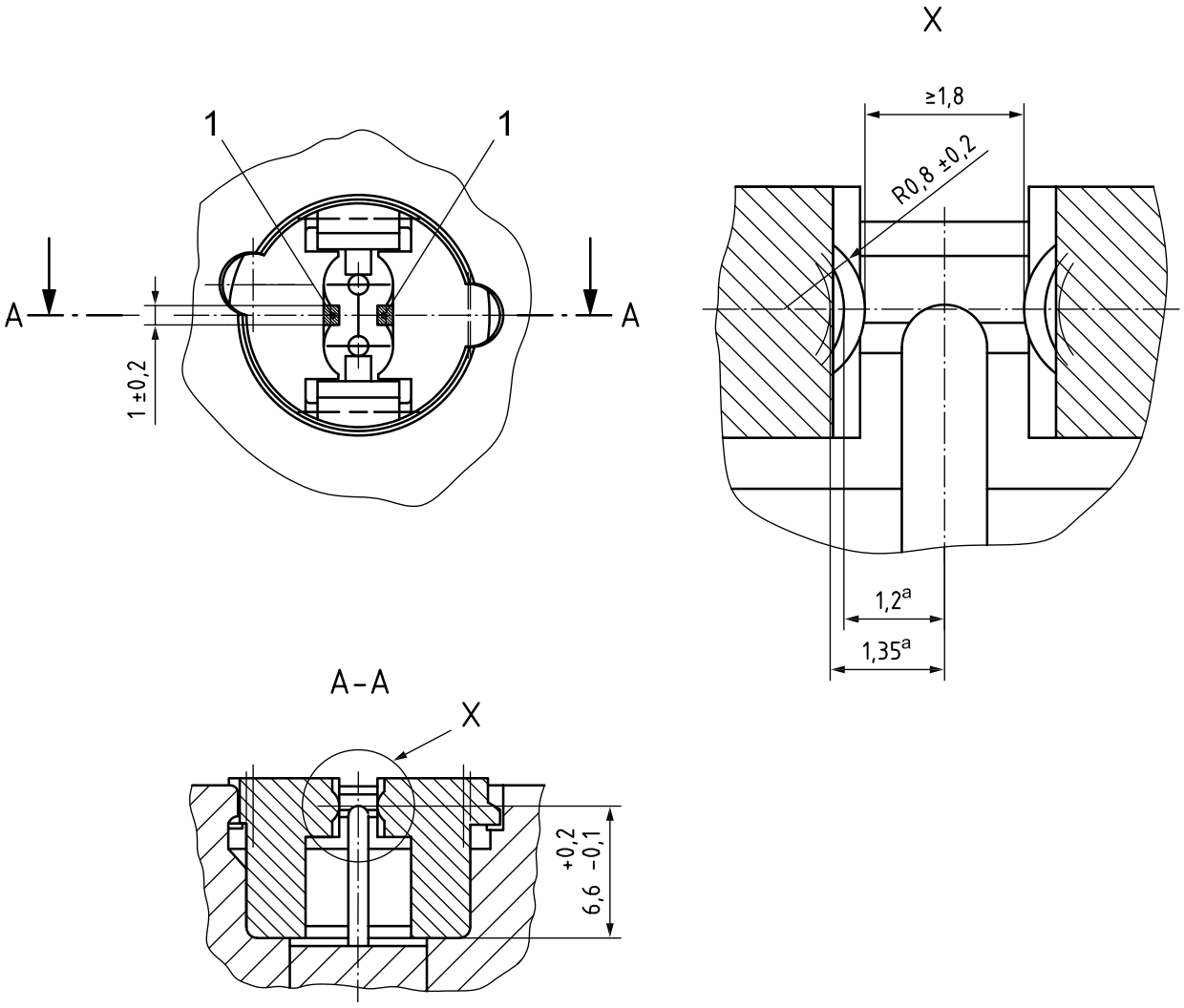
Figure 3 — Dimensions of actuation area for short-circuit opening in retainer

4.5 Dimensional features and nominal forces for ground function

The dimensions of the actuation area and the nominal forces for opening the ground contact shall comply with Figure 4.

NOTE The details regarding the connection between the ground contact and the squib holder are not covered in this Technical Specification. They are to be agreed between customer and supplier.

Dimensions in millimetres



Key

1 area of electrical ground contact

a Nominal forces between 2 N and 8 N shall be maintained within the dimensions indicated.

Figure 4 — Dimensions of area and nominal forces for ground contact

5 Material characteristics

5.1 Contact specifications

5.1.1 Shorting clip contact

The contact area (see Figure 3) of the shorting clip shall comply with the following characteristics:

— ISO 27874, type (coating purity) and class (coating thickness) to be agreed between customer and supplier, but coating thickness shall be no less than 0,5 µm;

— ISO 14647, porosity not greater than 2 pores/mm^2;

— underlayer material: nickel ≥1 µm.

5.1.2 Ground contact

The contact area of the ground function (see Figure 4) shall comply with the following characteristics:

— plating material: tin;

— thickness of plating: 2 µm to 5 µm.

5.2 Retainer

The modulus of elasticity of the plastic used for the retainer shall be minimum 4 500 MPa, in compliance with ISO 178.

ICS 43.040.10

Price based on 8 pages