INTERNATIONAL STANDARD

ISO 7638-1

Third edition
2018-05

Road vehicles — Connectors for the electrical connection of towing and towed vehicles —

Part 1: Connectors for braking systems and running gear of vehicles with 24 V nominal supply voltage

Véhicules routiers — Connecteurs pour liaisons électriques entre véhicules tracteurs et véhicules tractés —

Partie 1: Connecteurs pour les équipements de freinage et les organes de roulement des véhicules à tension nominale de 24 V

Reference number
ISO 7638-1:2018(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).

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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles,* Subcommittee SC 32, *Electrical and electronic components and general system aspects*.

This third edition cancels and replaces the second edition (ISO 7638-1:2003), which has been technically revised. The main changes compared to the previous edition are as follows:

— figures in the document have been revised.

A list of all the parts in the ISO 7638 series can be found on the ISO website.

Road vehicles — Connectors for the electrical connection of towing and towed vehicles —

Part 1:
Connectors for braking systems and running gear of vehicles with 24 V nominal supply voltage

1 Scope

This part of ISO 7638 gives the dimensions of, and specifies the contact allocation and tests and test requirements for, connectors for the electrical connection of the braking systems and running gear of towing and towed vehicles with 24 V nominal supply voltage. In addition, it specifies a park socket used to receive and store the plug when disconnected.

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 4091, *Road vehicles — Connectors for the electrical connection of towing and towed vehicles — Definitions, tests and requirements*

ISO 4141 (all parts), *Road vehicles — Multi-core connecting cables*

ISO 7638-2, *Road vehicles — Connectors for the electrical connection of towing and towed vehicles — Part 2: Connectors for braking systems and running gear of vehicles with 12 V nominal supply voltage*

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

ISO 11992-2, *Road vehicles — Interchange of digital information on electrical connections between towing and towed vehicles — Part 2: Application layer for brakes and running gear*

ISO 12098, *Road vehicles — Connectors for the electrical connection of towing and towed vehicles — 15 pole connector for vehicles with 24 V nominal supply voltage*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4091 apply.

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

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

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

4 Dimensional characteristics

4.1 General

Details not specified are at the manufacturer's discretion.

The contacts shall be floating and shall align to the datum position when plug and socket are engaged.

4.2 Plug

Dimensions of the plug shall be in accordance with Figure 1. The locking lever design shall take into consideration the space required for screws used to fasten the socket (see Figure 2).

4.3 Socket

Dimensions of the socket shall be in accordance with Figure 2. The cover is shown in the open position: it shall close automatically when the plug is disconnected.

4.4 Park socket

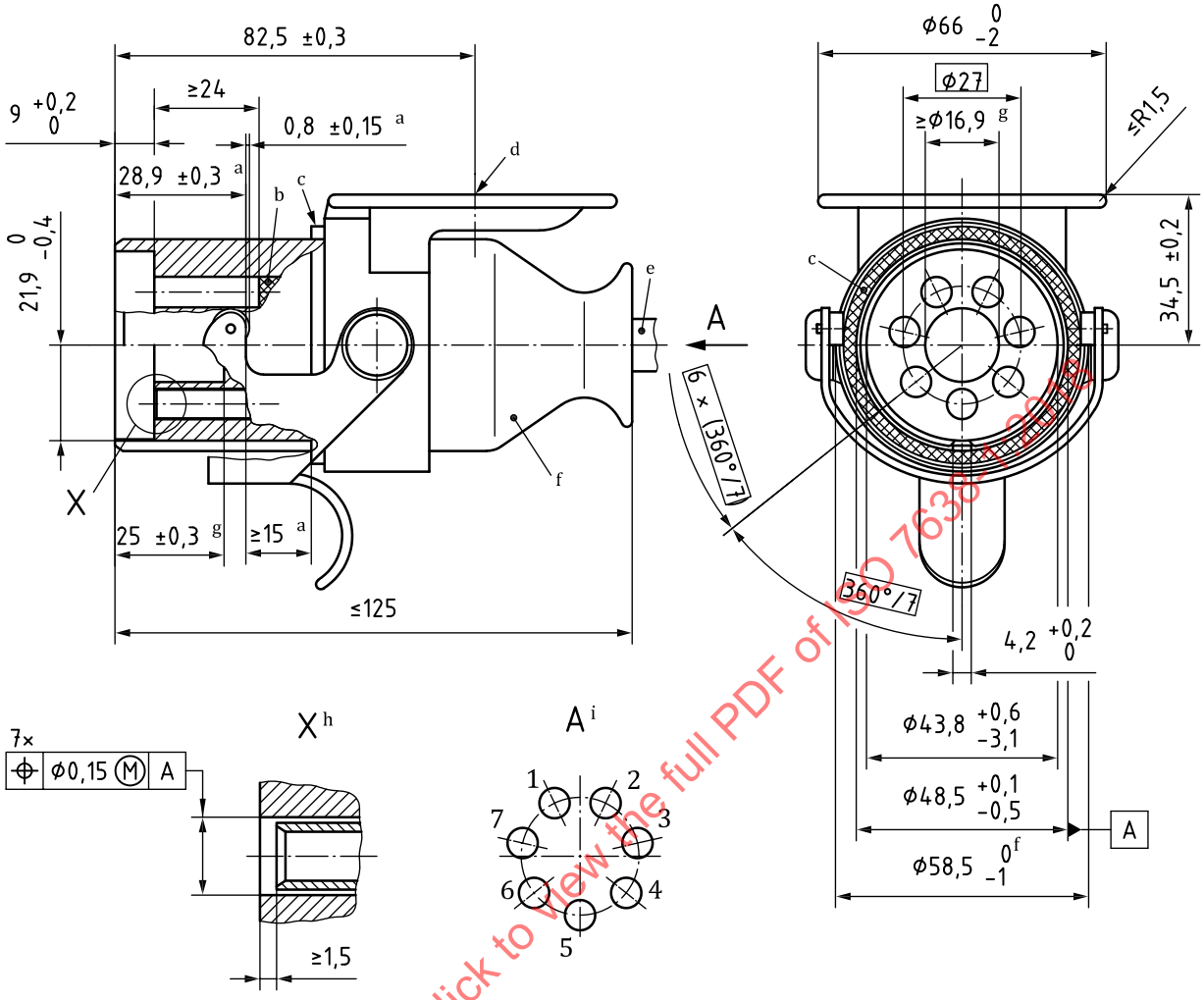
Dimensions of the park socket shall be in accordance with Figure 3. The cover is shown in the open position: it shall close automatically when the plug is disconnected.

5 Application of the connector

5.1 General

The coiled cable assembly is fitted to the semi-trailer towing vehicle (fifth wheel tractor) and may be connected to the electrical on-board network of the towing vehicle with or without the connection (see Figure 4).

The uncoiled cable assembly is fitted to the drawbar trailer. Therefore, the trailer towing vehicle (drawbar tractor) shall be fitted with a socket mounted at the rear of the vehicle (see Figure 4).



Key

a Dimension refers to the locking lever in its locked position.

b If contacts 6 and 7 are not used, blanking plugs shall, where applicable, be inserted to accept later fitment of pins and tubes. These blanks shall permit 5-pole versions to be mated with 7-pole versions.

c The sealing ring shall be mounted such that it cannot become detached under normal use.

d Centre of cover rest.

e See ISO 4141-3.

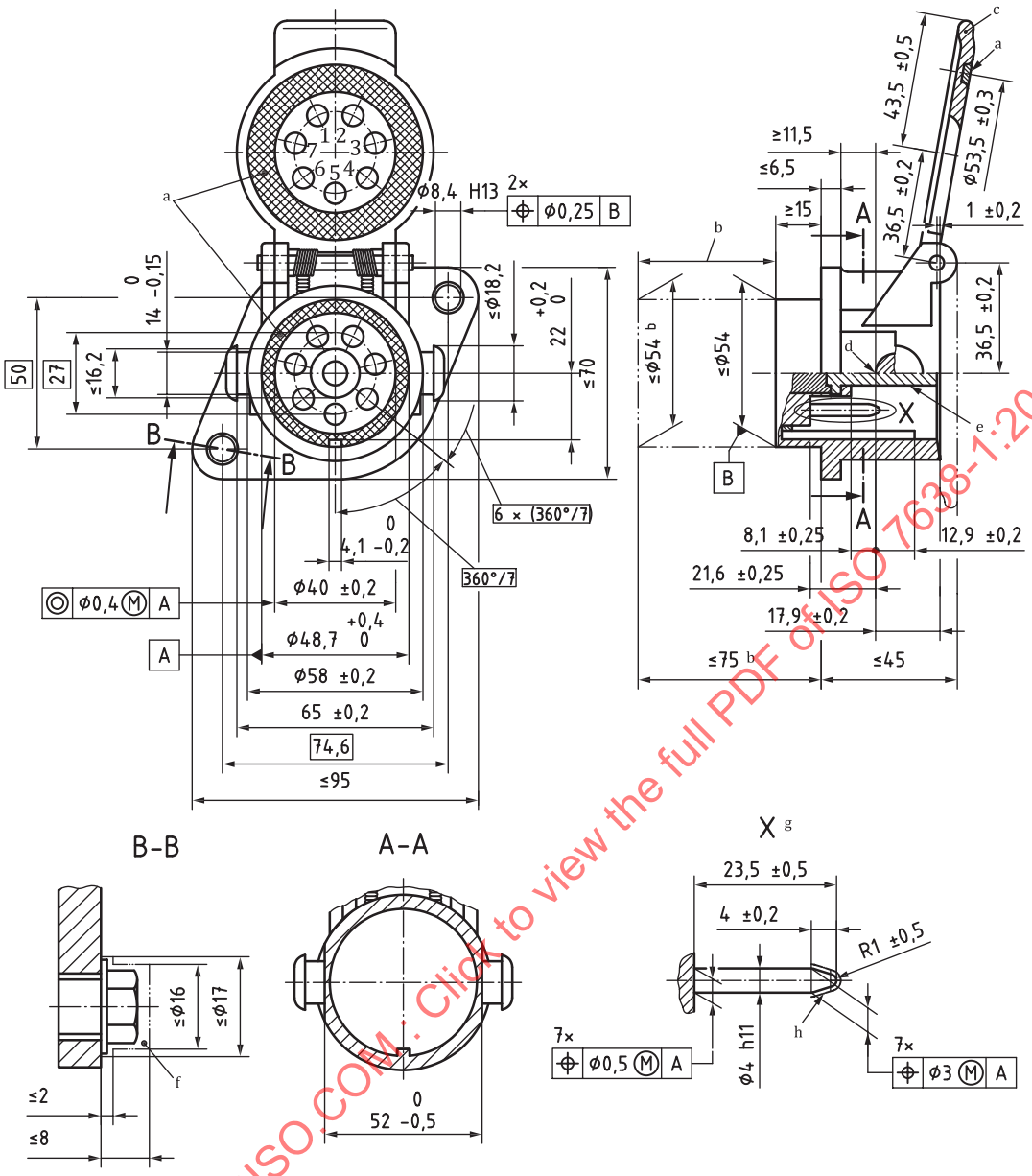
f Other housing designs are permitted provided they are in compliance with the maximum distance of 58 mm for the locking lever.

g Minimum space required for the ejection from the socket.

h Spring tube.

i Contact numbers.

Figure 1 — Plug



Key

a The sealing ring shall be mounted such that it cannot become detached under normal use.

b For existing products for which the cable outlet is mounted from the rear, the outside diameter of the outlet may be larger with the vehicle manufacturer's agreement. However, to ensure socket exchangeability, future applications should have a maximum outside diameter of 54 mm over a maximum length of 75 mm.

c Opening angle ≥120°.

d Reference point for engaged locking lever.

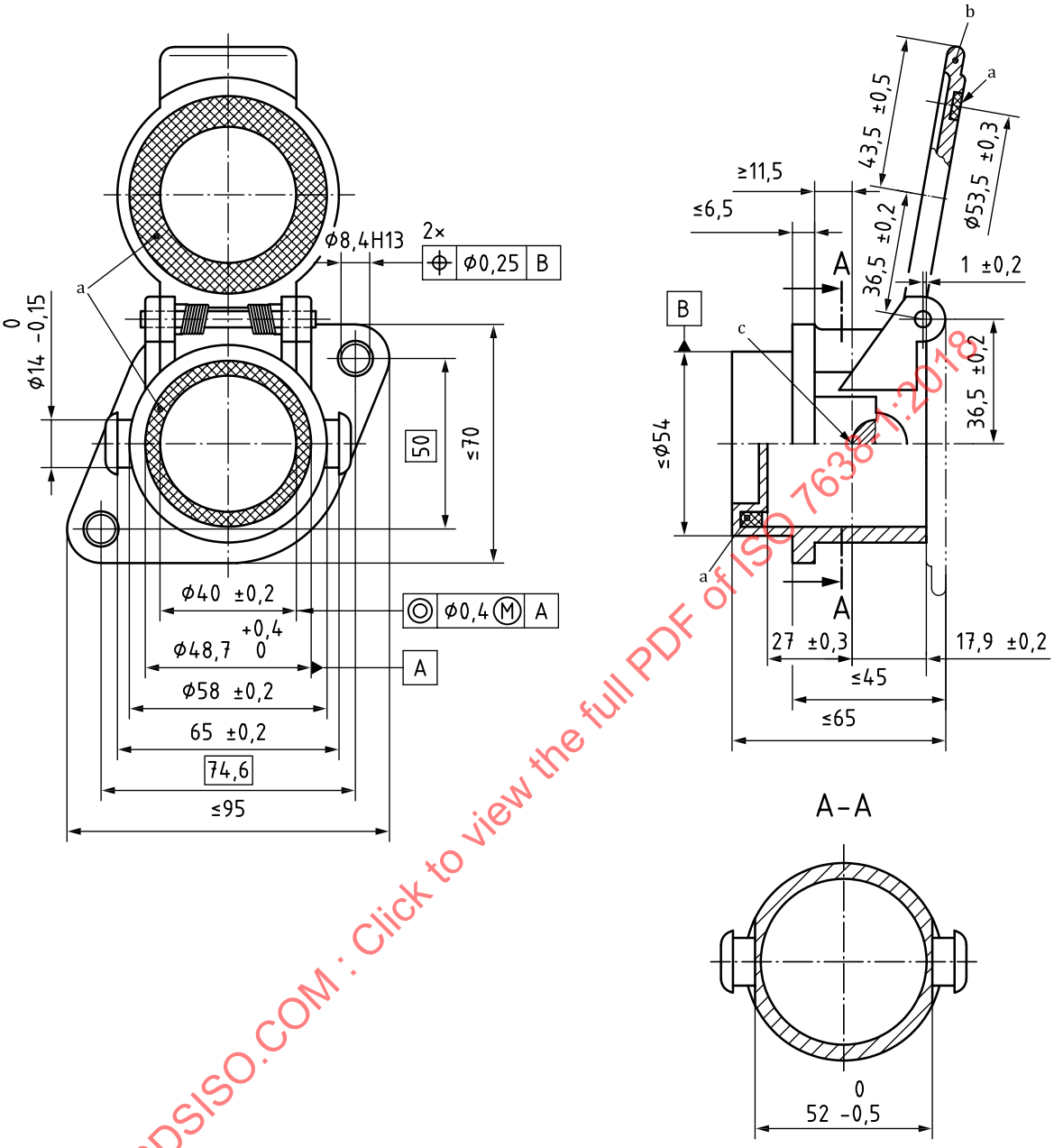
e Ejector.

f Minimum space required for screws used to fasten the socket.

g If contacts 6 and 7 are not used, blanking plugs shall, where applicable, be inserted to accept later fitment of pins and tubes. These blanks shall permit 5-pole versions to be mated with 7-pole versions.

h This area shall be smooth and burr-free.

Figure 2 — Socket



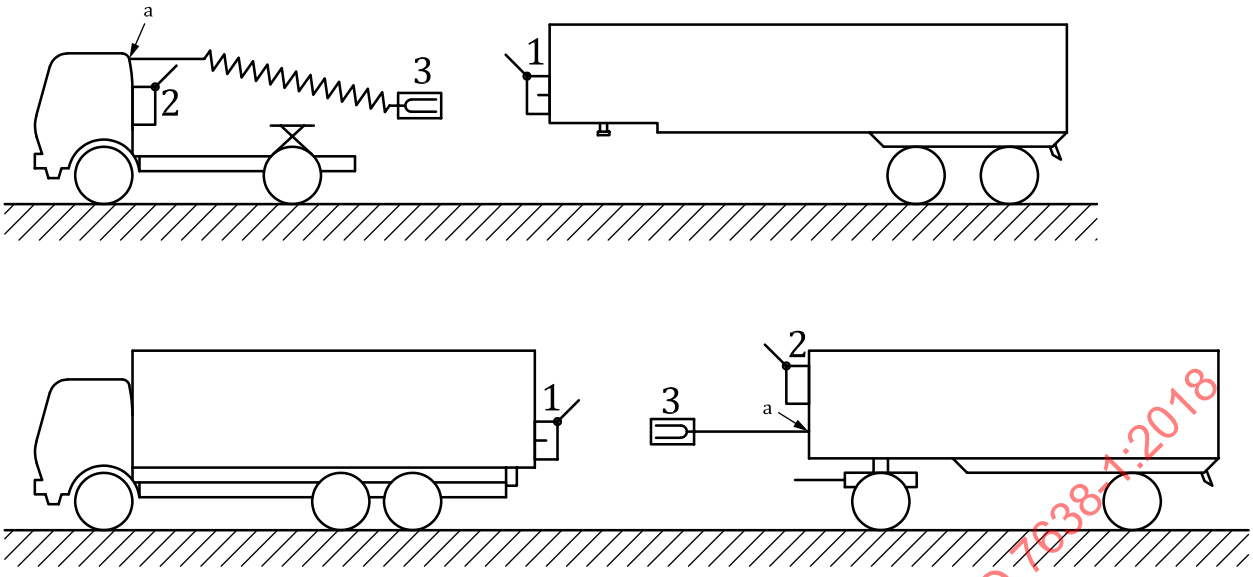
Key

a The sealing ring shall be mounted such that it cannot become detached under normal use.

b Opening angle ≥120°.

c Reference point for engaged locking lever.

Figure 3 — Park socket



Key

1 socket
2 park socket
3 plug
a See 5.1.

Figure 4 — Electrical connection positions

5.2 Contact allocation

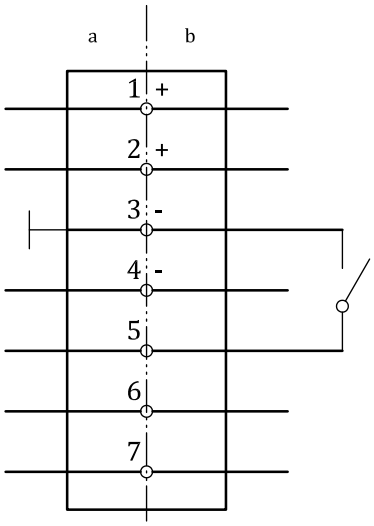
For contact allocation, see Table 1.

Table 1 — Contact allocation

Contact no.	Function
1	Plus electrovalve
2	Plus electronics
3	Minus electronics
4	Minus electrovalve
5	Warning device[a]
6	CAN_H[b]
7	CAN_L[b]

[a] The warning device is controlled through Contact 5. This contact has an open circuit during normal operation (see Figure 5).

[b] In accordance with ISO 11992-1 and ISO 11992-2.



Key

a Towing vehicle

b Towed vehicle

Figure 5 — Warning device

5.3 Contact designation

The contact designation numbers shall be permanently marked on the inside of the socket cover, and on the terminal faces of both plug and socket.

The character size shall not be less than 2 mm. However, where limited space is available, a smaller size may be used on the terminal face.

5.4 Terminals

The terminals at the rear side of the pins and tubes shall be capable of accepting cables with the following nominal cross-sectional areas.

— Contacts 1 and 4: 4 mm^2

— Contacts 2, 3, 5, 6 and 7: 1,5 mm^2

Terminals accepting cables of a different cross-sectional area shall be as agreed between manufacturer and user.

5.5 Connecting cable

The connecting cable shall meet the requirements of the applicable parts of ISO 4141.

6 Tests and specific requirements

6.1 General

Connectors according to this part of ISO 7638 shall be tested in accordance with ISO 4091, whose requirements they shall meet except where specified differently in the following sub clauses.