
**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*



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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 7638-1 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 7638-1:1997), which has been technically revised taking into account the very latest revisions of ISO 4009 and ISO 4091.

ISO 7638 consists of the following parts, under the general title *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*
- *Part 2: Connectors for braking systems and running gears of vehicles with 12 V nominal supply voltage*

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 referenced documents are indispensable for 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 4009, *Commercial vehicles — Location of electrical and pneumatic connections between towing vehicles and trailers*

ISO 4091, *Road vehicles — Connectors for the electrical connection of towing vehicles 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 12098¹⁾, *Road vehicles — Connectors for the electrical connection of towing and towed vehicles — 15-pole connector for vehicles with 24 V nominal supply voltage*

1) To be published. (Revision of ISO 12098:1994)

3 Terms and definitions

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

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

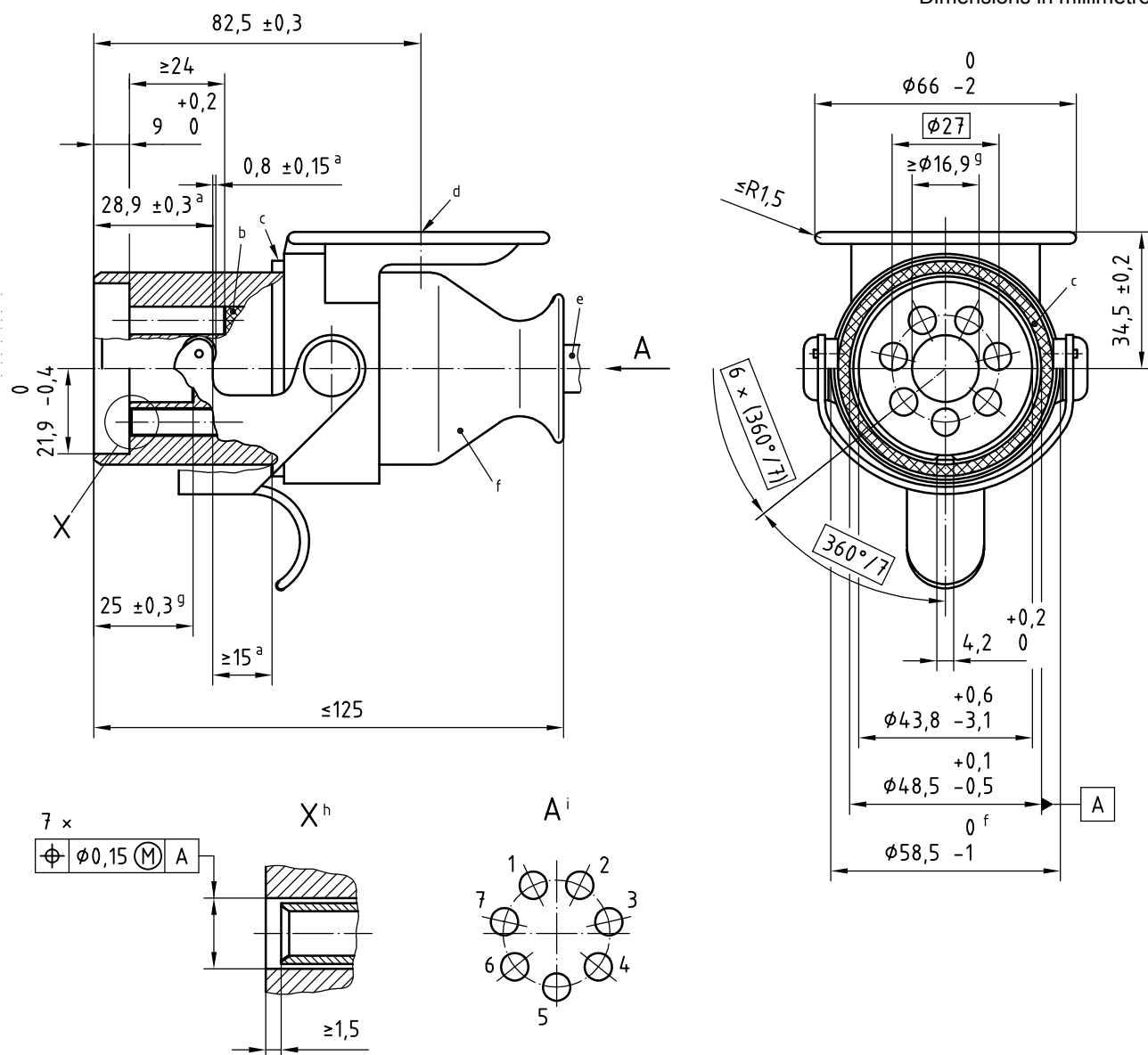
The coiled cable assembly is fitted to the semi-trailer towing vehicle (fifth-wheel tractor) and may be connected to the electrical on-board network of the towing vehicle with or without the connection (see Figure 4).

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).

5.2 Connector positions and free space

The positions of, and free space around, the connectors shall be in accordance with ISO 4009.

Dimensions in millimetres



- a Dimension refers to the locking lever in its locked position.
- b If Contacts 6 and 7 are not used, blanking plugs shall be inserted to accept later fitment of that pins and tubes.
- 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

Dimensions in millimetres

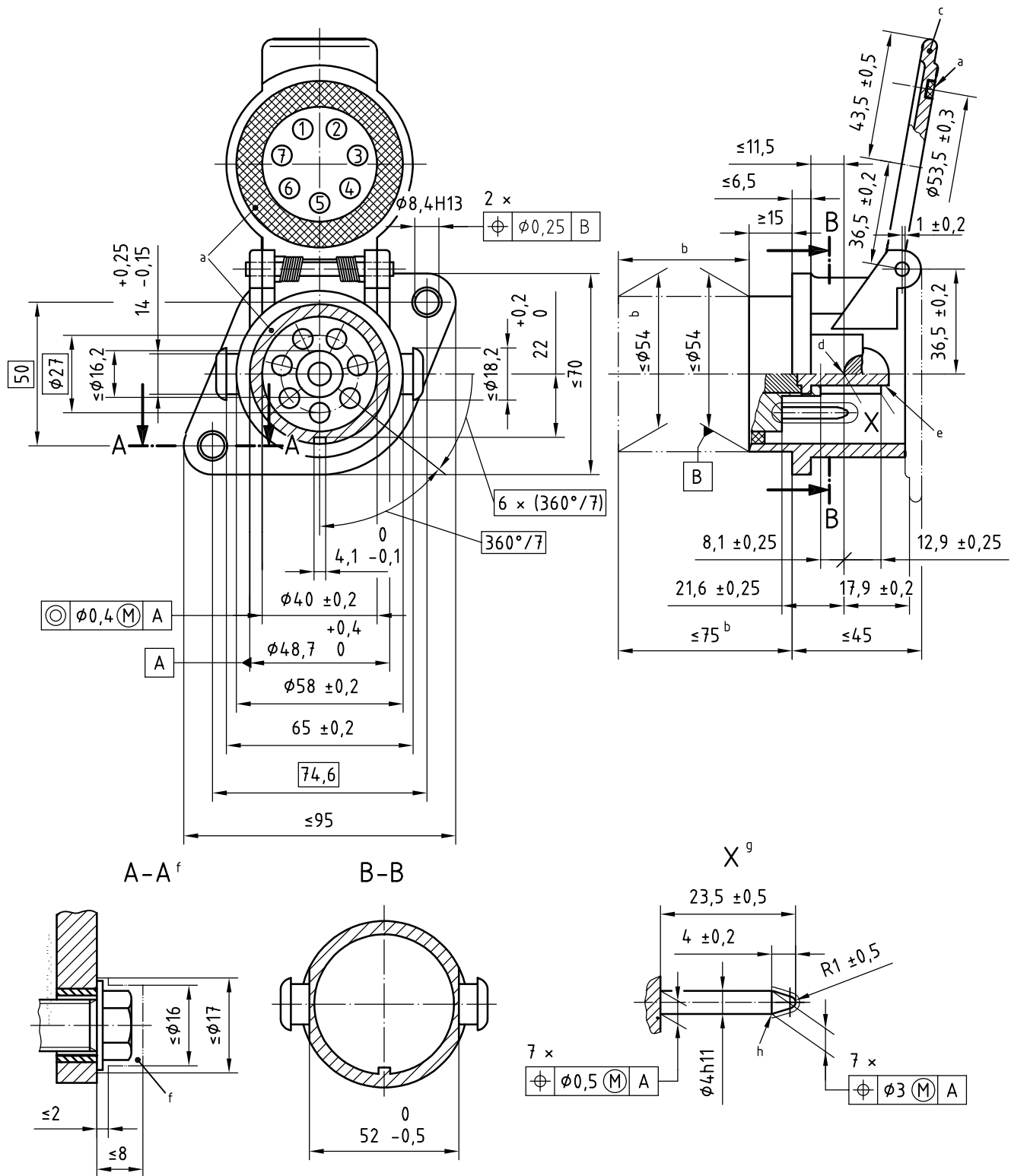
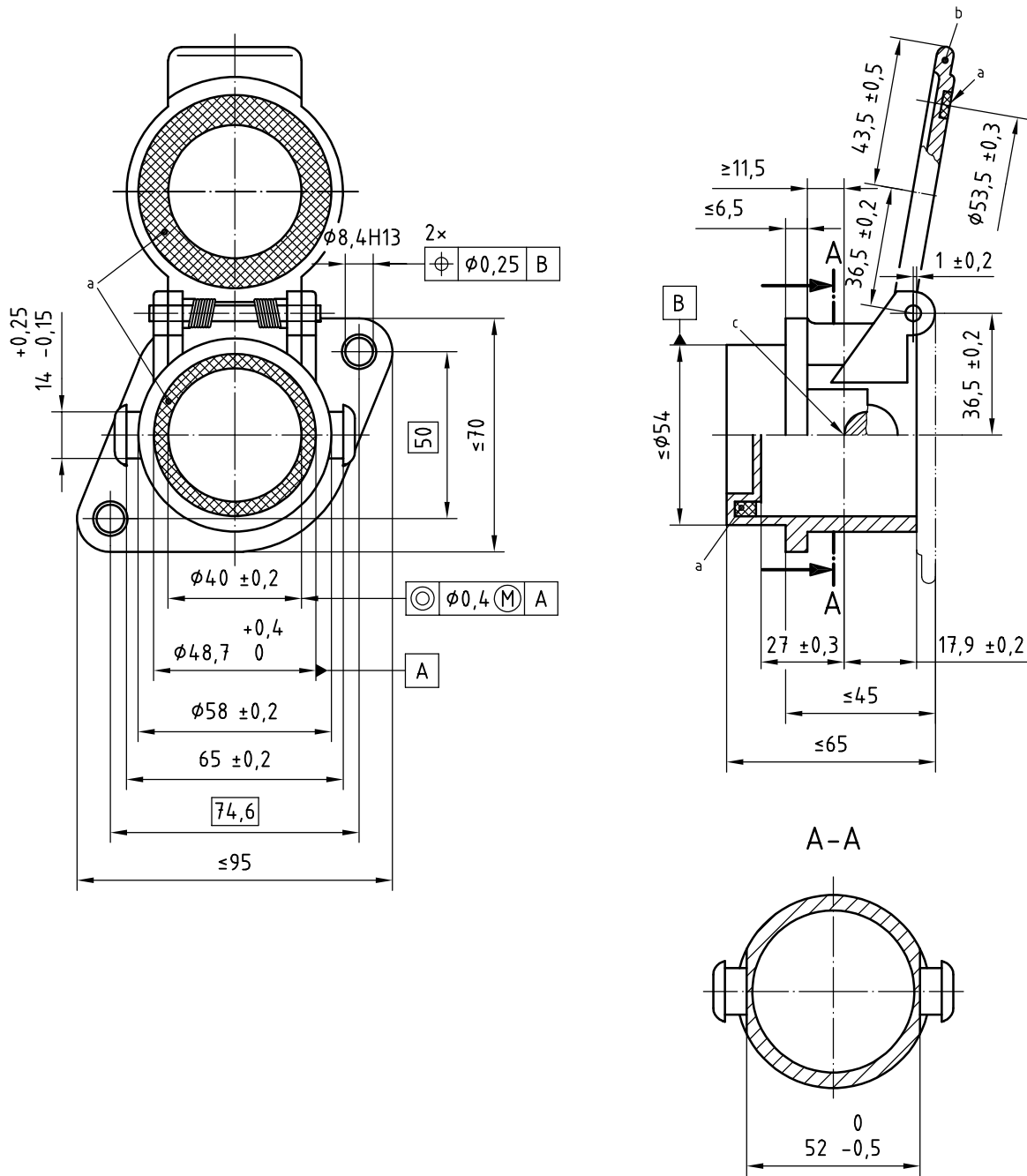


Figure 2 — Socket

- 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 $\geq 120^\circ$.
- 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.

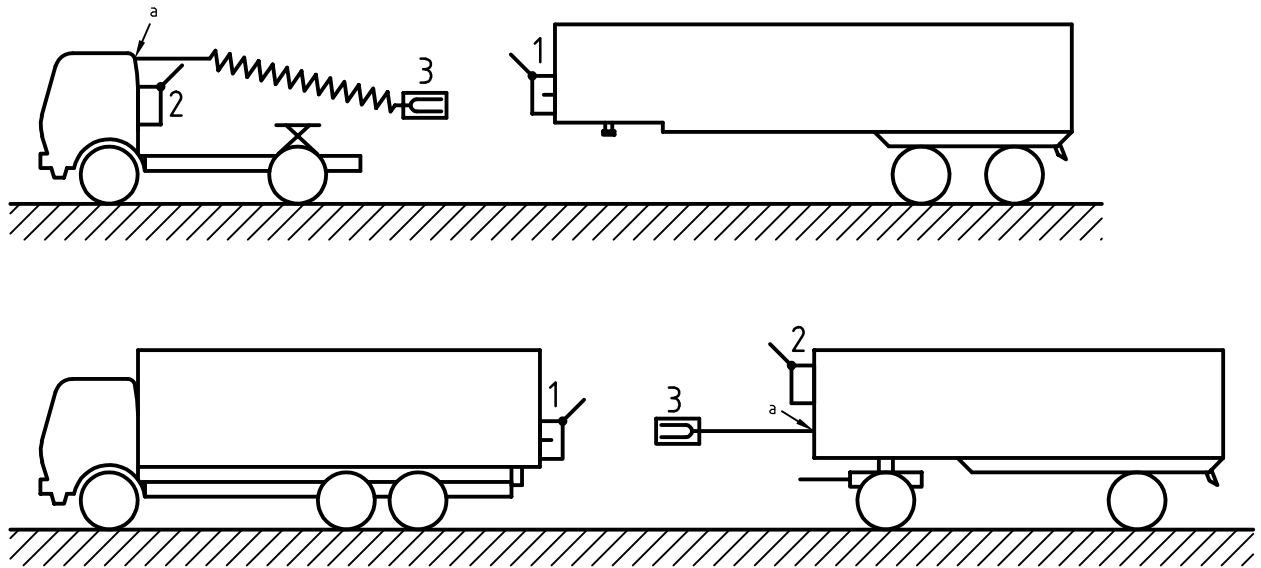
Figure 2 (*continued*)

Dimensions in millimetres



- a The sealing ring shall be mounted such that it cannot become detached under normal use.
- b Opening angle $\geq 120^\circ$.
- 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

5.3 Contact allocation

The contact allocation shall be in accordance with 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.

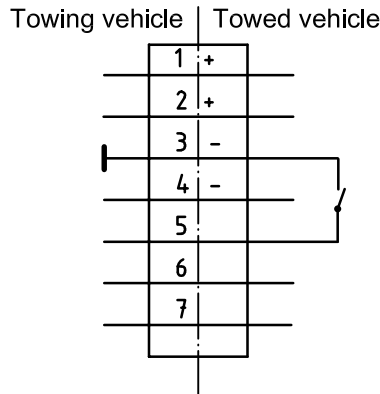


Figure 5 — Warning device

5.4 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.

5.5 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 mm².
- Contacts 2, 3, 5, 6 and 7: 1,5 mm².

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

5.6 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 subclauses.

6.2 Mismatching

It shall be impossible to make contact between any tube or pin of the plugs and sockets according to this part of ISO 7638 and the pins and tubes of connectors according to ISO 12098 and ISO 7638-2 without the use of excessive force.

6.3 Connection and disconnection

The connection and disconnection forces shall not exceed 35 N when tested in accordance with ISO 4091.

6.4 Endurance

Carry out the endurance test in accordance with ISO 4091, but for 10 000 cycles.

ICS 43.040.10; 43.040.40

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