INTERNATIONAL STANDARD

ISO 1185

Third edition
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Road vehicles — Connectors for the electrical connection of towing and towed vehicles — 7-pole connector type 24 N (normal) for vehicles with 24 V nominal supply voltage

Véhicules routiers — Connecteurs pour liaisons électriques entre véhicules tracteurs et véhicules tractés — Connecteur à 7 contacts de type 24 N (normal) pour les véhicules à tension nominale de 24 V

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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

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 1185 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

This third edition cancels and replaces the second edition (ISO 1185:1997), which has been technically revised.

Road vehicles — Connectors for the electrical connection of towing and towed vehicles — 7-pole connector type 24 N (normal) for vehicles with 24 V nominal supply voltage

1 Scope

This International Standard specifies the dimensions of, and gives particular requirements for, 7-pole connectors of type 24 N and their contact allocation for the electrical connection of towing and towed vehicles with 24 V nominal supply voltage, thus ensuring interchangeability.

NOTE For new developments and where more than 7 poles are required, as an alternative to the use of the 7-pole connector in accordance with this International Standard and ISO 3731, the use of the 15-pole connector in accordance with ISO 12098 [1] may be required.

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 3731, *Road vehicles — Connectors for the electrical connection of towing and towed vehicles — 7-pole connector type 24 S (supplementary) for vehicles with 24 V nominal supply voltage*

ISO 4009, *Commercial vehicles — Location of electrical and pneumatic connections between towing vehicles and trailers*

ISO 4091:2003, *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*

3 Terms and definitions

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

4 Dimensions

4.1 General

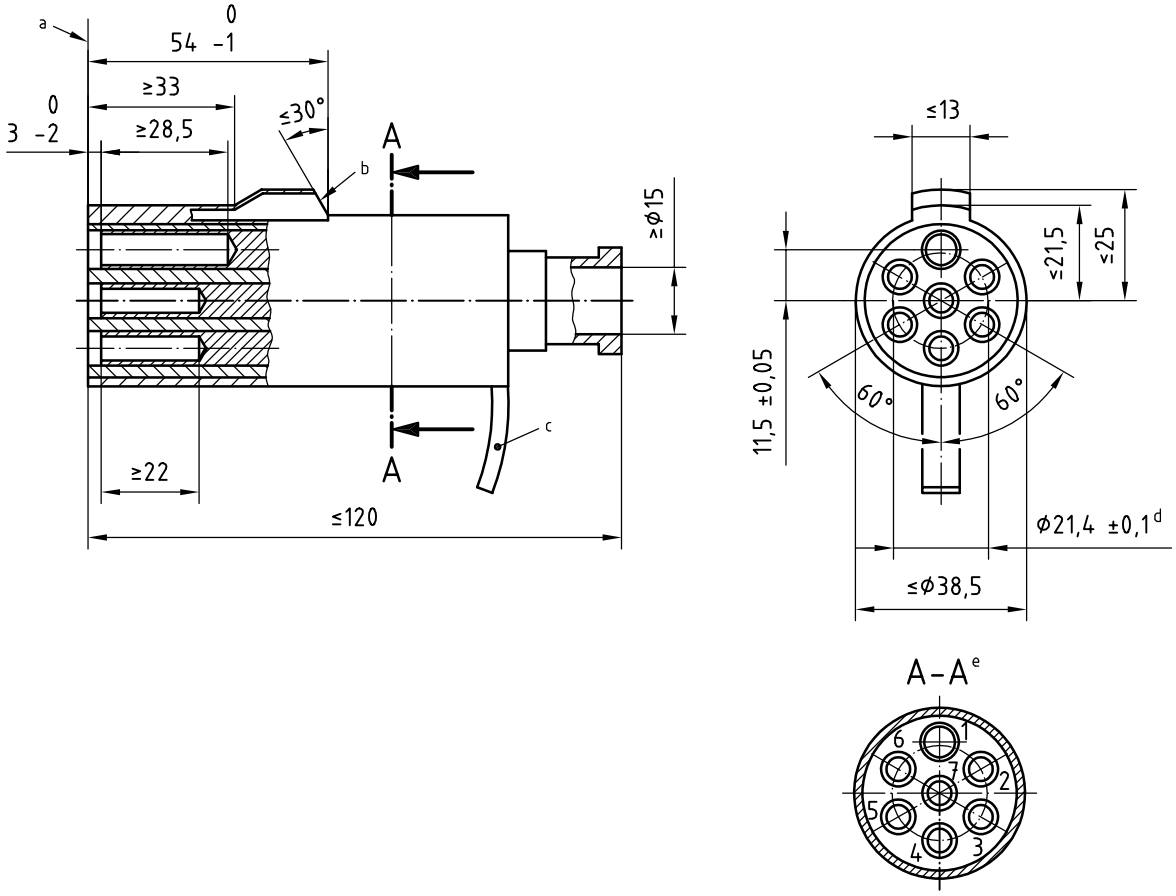
Details not specified are at the manufacturer's discretion.

4.2 Plug

Dimensions shall be in accordance with Figure 1.

The plug shall have six spring tubes, numbered 2 to 7, corresponding to Pin Nos. 2 to 7 of the socket, and one large spring tube, No. 1, corresponding to Pin No. 1 of the socket.

Dimensions in millimetres



a Reference plane.

b Locking collar.

c Handle downwards or to right and left, at the discretion of the manufacturer.

d Pitch circle diameter.

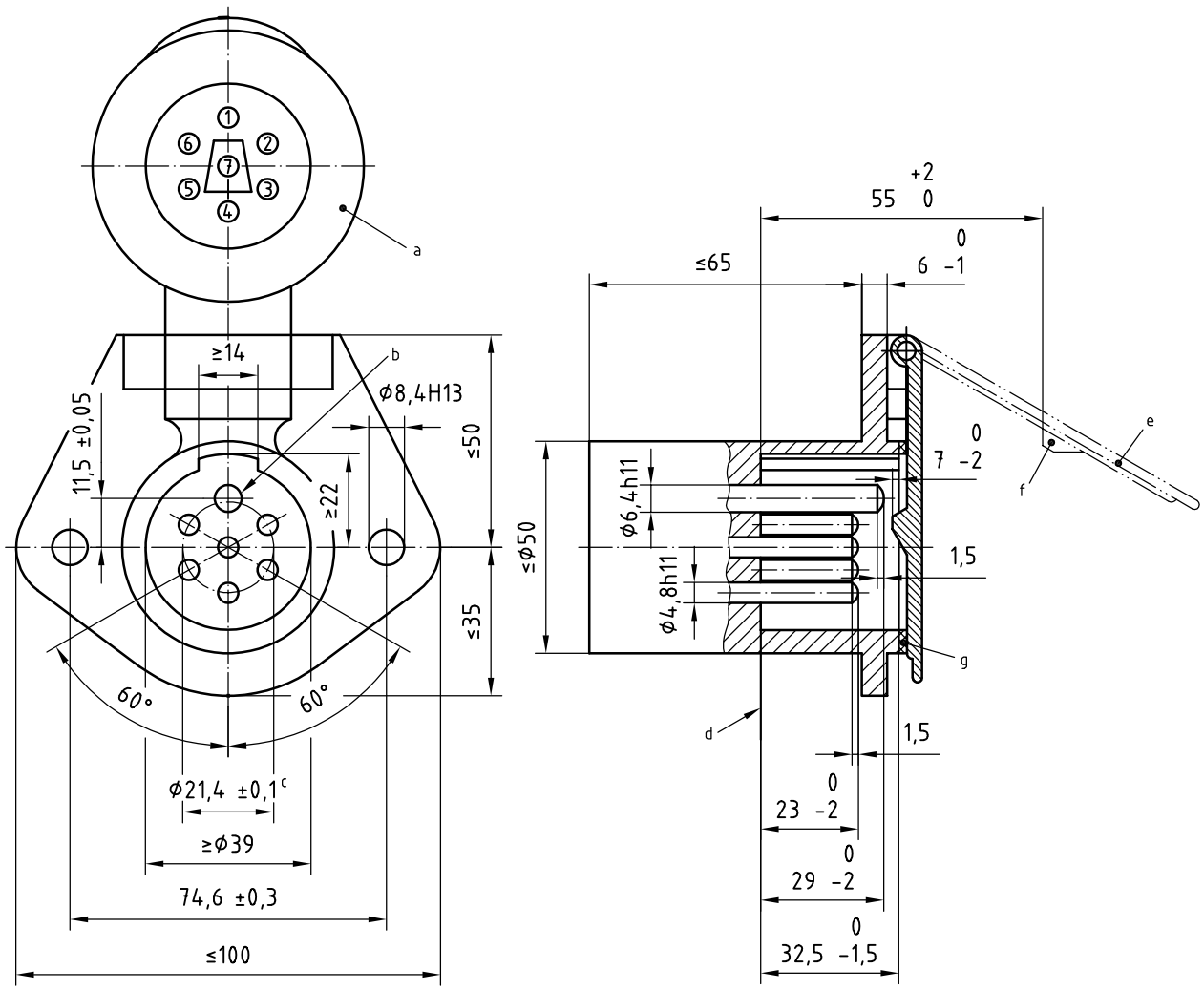
e Rear view of the terminals.

Figure 1 — Plug

4.3 Socket

Dimensions shall be in accordance with Figure 2. The socket shall have six pins, numbered 2 to 7, and one larger pin, No. 1.

Dimensions in millimetres



a Cover drawn in the open position.

b Contact No. 1.

c Pitch circle diameter.

d Reference plane.

e Position of the cover with plug introduced.

f Locking lug.

g Sealing ring.

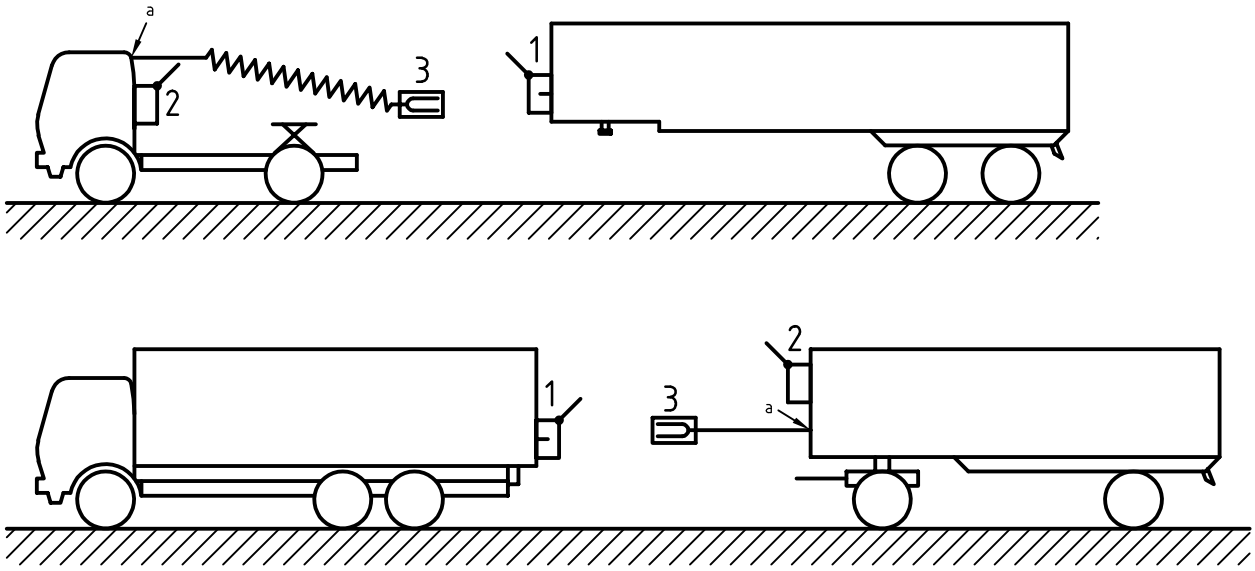
Figure 2 — Socket

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 3).

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 3).



Key

1 socket
2 park socket
3 plug

a See 5.1.

Figure 3 — Electrical connection positions

5.2 Distinguishing marking

The 24 N connectors shall be distinguished from 24 S connectors (see ISO 3731) by means of a different colouring of at least the insulating parts. A dark and permanent colour, preferably black, shall be used for the 24 N connector.

5.3 Connector positions and free space

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

5.4 Contact allocation

The allocation of the seven contacts shall be in accordance with Table 1.

Table 1 — Contact allocation

Contact No.	Function	Core insulation colour (for information)
1	Common return	White
2	Left-hand rear position and marker lights, and rear registration plate illumination device [a]	Black
3	Left-hand direction indicator light	Yellow
4	Stop lights	Red
5	Right-hand direction indicator light	Green
6	Right-hand rear position and marker lights, and rear registration plate illumination device [a]	Brown
7	Braking control for trailers	Blue

[a] The rear registration plate illumination device shall be connected such that no lamp of the device has a common connection to both contacts 2 and 6.

5.5 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.

5.6 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.

— Contact No. 1: 2,5 mm^2.

— Contact Nos. 2 to 7: 1,5 mm^2.

5.7 Connecting cable

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

5.8 Protection of disconnected plug

A means of storing the plug when disconnected shall be provided on the vehicle or vehicles, intended to protect the plug from the ingress of water or foreign bodies and from accidental damage.

6 Tests and requirements

6.1 General

Connectors in accordance with this International Standard shall be tested in the sequences given in Table 2; for test procedures, see ISO 4091. They shall meet the requirements of ISO 4091, except where this is specified differently in the following subclauses.

Table 2 — Test sequences

Test	Sample group				
	A	B	C	D	E
Visual examination	1, 9	1, 11	1, 8	1, 10	1, 11
Dimensional check	2				
Mismating	3				
Connection	4	2	2	2	2
Disconnection	8	10	7	9	9
Locking device and cable retention strength	5	3, 9		3, 8	3, 8
Lateral strength at low temperature	7				
Current carrying capacity			4		
Connection resistance		4, 7	3, 6	4, 7	4, 7
Current cycling			5		
Withstand voltage		5, 8		6	5, 10
Static load	6				
Endurance					6
Temperature/humidity cycling		6			
Salt spray				5	

6.2 Mismating

6.2.1 Test

Check whether it is possible to make contact between Contact No. 1 of the socket in accordance with this International Standard and

a) Contact Nos. 2 to 7 of the plug from this International Standard, or

b) Contact Nos. 2 to 7 of the plug in accordance with ISO 3731.

6.2.2 Requirement

No contact is permitted.

6.3 Locking device and cable retention strength

Perform the locking device and cable retention test according to ISO 4091. Apply the specified force on the cable retention only of the disengaged plug. Apply a force of (500 ± 5) N.

6.4 Connection and disconnection

Perform the connection and disconnection tests according to ISO 4091.

The connection and disconnection forces shall be (150 ± 50) N.

6.5 Salt spray

Perform the salt spray test according to ISO 4091:2003, except that arrangements b) and c) shall not apply.

6.6 Temperature/humidity cycling

Perform the temperature/humidity cycling test according to ISO 4091:2003, but with Steps d) to g) modified as follows:

…

d) Lower t_c to ($-$ 25 $\pm$ 2) °C within 2,5 h.

e) Hold t_c at ($-$ 25 $\pm$ 2) °C for 2 h.

f) Raise t_c to (75 $\pm$ 2) °C within 1,5 h.

g) Hold t_c at (75 $\pm$ 2) °C for 2 h.

6.7 Endurance

Perform the endurance test in accordance with ISO 4091, but for 1 000 cycles only.

Bibliography

[1] ISO 12098 [1)], *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)

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