TC 22

INTERNATIONAL STANDARD ISO 4055

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Road vehicles — Caravans and light trailers — Electromagnetic braking

Véhicules routiers — Caravanes et remorques légères — Freinage électromagnétique

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4055 was developed by Technical Committee ISO/TC 22, *Road vehicles*, and was circulated to the member bodies in June 1976.

It has been approved by the member bodies of the following countries :

Australia	Iran	Romania
Austria	Italy	Spain
Belgium	Japan	Switzerland
Chile	Korea, Rep. of	United Kingdom
Czechoslovakia	Mexico	U.S.S.R.
France	New Zealand	Yugoslavia
Hungary	Philippines	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Germany
South Africa, Rep. of
Sweden
U.S.A.

Printed in Switzerland

Road vehicles — Caravans and light trailers — Electromagnetic braking

1 SCOPE

This International Standard covers :

— the definition, and the indication of the values of, the electrical characteristics of electromagnetic braking systems fitted to road trains comprising a towing vehicle and a caravan or light trailer;

— the determination of the braking performance as a function of these characteristics;

— the definition of conditions affecting interchangeability between towing vehicles and towed vehicles.

2 FIELD OF APPLICATION

This International Standard applies to road trains comprising a towing vehicle and a caravan or light trailer, of which the "maximum total weight" does not exceed 3,5 t.[1)]

It concerns electromagnetic braking equipment functioning on a nominal voltage of 12 V.

3 REFERENCES

ISO 611, *Braking of motor vehicles and their trailers — Terminology.*

ISO 1724, *Road vehicles — Electrical connections between towing vehicles and towed vehicles with 6 or 12 V electrical equipment — Type 12 N (normal).*

ISO 3732, *Road vehicles — Electrical connections between towing vehicles and trailers with 6 or 12 V electrical equipment — Type 12 (supplementary).*

3 DEFINITIONS

See ISO 611.

4 GENERAL REQUIREMENTS

4.1 Electromagnetic braking devices

The specifications of this International Standard are applicable to electromagnetic braking devices designed according to the following general principles :

4.1.1 *System A*

The current-regulating device for the braking of the trailer is mounted on the towing vehicle.

The regulation of the trailer-retarding effort (T_R) can be effected as a function of the operating force of the service braking device on the towing vehicle or of another force.

4.1.2 *System B*

The current-regulating device for the braking of the trailer is mounted on the trailer.

The regulation of the trailer-retarding effort (T_R) is effected as a function of the deceleration of the tractor/trailer combination or of another force.

4.2 Automatic braking (mechanical or electrical operation)

4.2.1 In the event of an accidental separation between the tractor and the trailer, the trailer brakes would be automatically applied and in this case a device for the releasing of the automatic brake shall allow the movement of the detached trailer.

1) This value is chosen to include categories 01 and 02 of trailers according to the classification of vehicles given in document E/ECE/324/Rev. 1/Add. 12 of the Economic Commission for Europe of the United Nations. This document is entitled : *"Agreement concerning the adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts* — done at GENEVA on 20 March 1958 — Addendum 12 : Regulation 13 to be annexed to the Agreement : *Uniform provisions concerning the approval of vehicles with regard to braking".*

4.2.2 Automatic braking shall operate during 15 min minimum and the value for braking force shall be 0,25 W_R at least.

NOTE — If the control of the trailer electric brake is linked to the hydraulic circuit of the towing vehicle, this shall be able to supply at least 0,5 cm^3 of fluid to the control of the trailer electric brake. (If this cannot be achieved, a larger master cylinder, recommended by the vehicle manufacturer, shall be fitted.) The hydraulic fluid requirement of a trailer electric braking system control shall not exceed 0,5 cm^3.

4.3 Trailer battery supply

If the trailer is fitted with a battery, the connection between this battery and the supply line shall be interrupted during service braking.

4.4 Operating threshold of electromagnetic brake

The electromagnetic brake shall begin to operate with a maximum deceleration of the tractor/trailer combination of 0,4 m/s^2.

When pre-braking is provided, this shall have a maximum value of 0,1 W_R measured at the trailer wheels.

5 SPECIFIC REQUIREMENTS

5.1 System A

5.1.1 *Towing vehicles*

With a deceleration of 5,3 m/s^2 of the fully laden towing vehicle, and with a supply of 12 V to the controller of the electromagnetic braking system, the voltage at the towing vehicle outlet shall be $10 \pm 0,5$ V measured with a resistance of 1 Ω connected across the outlet terminals.

5.1.2 *Towed vehicles*

With a supply voltage of 12 V measured at the connection and with a series resistance R_c of 0,2 Ω, the corresponding retarding effort T_R shall be 0,45 W_R [1)] minimum.

NOTE — R_c corresponds to the total electrical resistance of the towing vehicle at a deceleration of 5,3 m/s^2 in accordance with 5.1.1.

5.2 System B

With a deceleration of 5,3 m/s^2 of the tractor/trailer combination, the corresponding retarding effort T_R shall be 0,45 W_R [1)] minimum.

5.3 Systems A and B

The maximum current consumption of the trailer brakes shall not exceed 15 A.

6 INTERCHANGEABILITY

6.1 Functional interchangeability

Caravans or light trailers with braking systems designed according to system A can only be coupled with towing vehicles designed according to system A.

Caravans or light trailers having braking systems designed according to system B, which will normally be coupled to towing vehicles conforming to system B, can also be coupled to towing vehicles complying with system A (see annexes A and B).

The interchangeability requirements for system A are given in 5.1.

6.2 Electrical connections

A plug and socket allocated exclusively to electromagnetic braking shall be employed. It shall be identical to that defined in ISO 1724, subject to the requirements of this International Standard. It shall not be interchangeable with the plugs and sockets defined in ISO 1724 (12 N) and ISO 3732 (12 S).

The allocation of pins and colours of connecting wires is given in the table. See also annexes A and B.

1) W_R = maximum static weight transmitted to the ground, through the wheels of the towed vehicles. Under all circumstances, during the test, the maximum effective weight of the trailer shall not exceed the manufacturer's weight.

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INTERNATIONAL STANDARD ISO 4055-1977 (E)/ERRATUM

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ERRATUM

Page 3

In the table, replace the representation of plug 12 B, towing vehicle side, by the following :

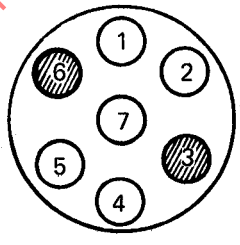
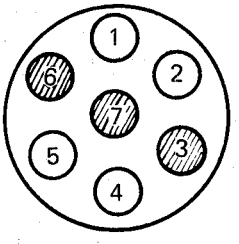
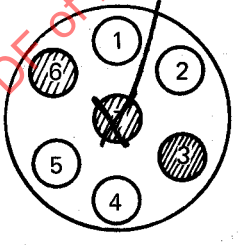
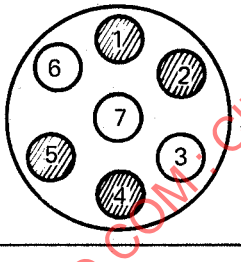
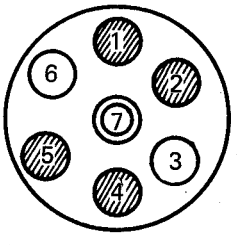


TABLE — **Allocation of pins and colours of connecting wires**

pin / socket / empty	**Plug 12 A**	**Connecting wire colour or references**	**Plug 12 B**	**Connecting wire colour or references**
Towing vehicle side		1 — Blue 2 — Blue 3 — White 4 — Red 5 — Red 6 — Yellow 7 — — (g)		1 — — 2 — — 3 — White 4 — Red 5 — Red 6 — Yellow 7 — — (g)
Trailer side		1 — Blue 2 — Green 3 — White 4 — Red 5 — Brown 6 — Yellow 7 — — (g)		1 — — 2 — — 3 — White 4 — Red 5 — Brown 6 — Yellow 7 — — (g)
Allocations of terminals	1, 2 } Regulated current 3 — Earth 4, 5 } Supply 6 — Relay control (stop) 7 —		1 — 2 — 3 — Earth 4, 5 } Supply 6 — Relay control (stop) 7 —	

ANNEX A

CIRCUIT DIAGRAM, SYSTEM A