INTERNATIONAL STANDARD

ISO 8704

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Caravans and light trailers — Couplings — Strength tests

Caravanes et remorques légères — Dispositifs d'accouplement — Essais de résistance

Reference number
ISO 8704:1991(E)

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.

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.

International Standard ISO 8704 was prepared by Technical Committee ISO/TC 22, *Road vehicles*.

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Introduction

The values adopted in this International Standard are derived from road tests on various towing vehicle/trailer combinations. These tests revealed the existence of forces as depicted in the distribution diagram in figure 0.1.

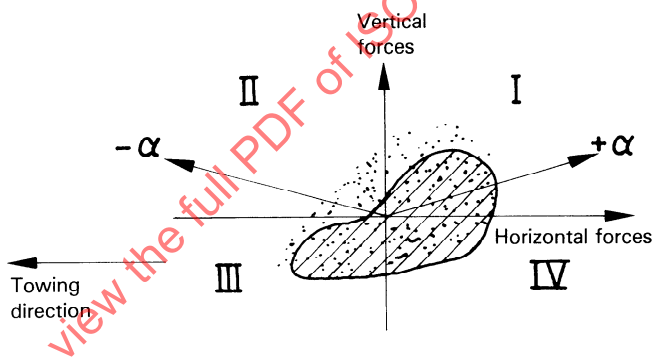

Figure 0.1 — Force distribution diagram

Without disregarding the importance of the forces in quadrants I and III, it was felt that a dynamic test with a force of 0,6D (with D determined as indicated in clause 3) and at an angle of — 15° would permit simultaneous verification of the locking mechanism and of the mechanical strength of the coupling head, and would therefore provide an adequate guarantee of the reliability of the coupling head.

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Caravans and light trailers — Couplings — Strength tests

1 Scope

This International Standard specifies the strength requirements to be met by mechanical coupling devices fitted to trailers or caravans of categories 01 and 02 in the case of ball couplings in accordance with ISO 1103 and a static load within the limits fixed in ISO/TR 4114.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1103:1976, *Road vehicles — Caravans and light trailers — Coupling ball — Dimensional characteristics.*

ISO 3853:1977, *Road vehicles — Caravans and light trailers — Towing brackets and coupling balls — Strength test.*

ISO/TR 4114:1979, *Road vehicles — Caravans and light trailers — Static load on ball couplings.*

ISO 7237:1981, *Road vehicles — Masses and dimensions of caravans — Terms and definitions.*

3 Determination of longitudinal force between towing vehicle and trailer

The longitudinal force, D, occurring between the towing vehicle and the trailer, in newtons, is calculated from the equation

$$D = g \times \frac{32000 \times m_R}{32000 + m_R}$$

where

g is the acceleration due to gravity, conventional value $g_n = 9{,}806\,65$ m/s^2;

m_R is the maximum total mass, as defined in ISO 7237, calculated by the trailer manufacturer and expressed in kilograms, when the value 32 000, also in kilograms, represents the maximum total permissible mass of the towing vehicle.

4 Dynamic strength test

4.1 General requirements

The test shall be carried out on a coupling ball with the dimensions specified in ISO 1103 and the strength as laid down in ISO 3853 for category 2.

The coupling shall be fixed to the test bench in accordance with the manufacturer's recommendations for attachment to the trailer. Care should be taken during mounting to ensure that no force other than the specified test force is induced at any time.

4.2 Test conditions

The test force, F_t, of amplitude $0{,}6D$, shall be applied approximately sinosoidally at an angle of $-15° \pm 1°$ to the horizontal (see figure 1) and in a plane passing through the ball centre corresponding to the longitudinal vehicle mid-plane.

The test frequency shall not exceed 35 Hz, the number of cycles being 2×10^6.

NOTE 1 The test conditions for 4.2 include forces derived from the maximum vertical static load as defined in ISO/TR 4114.

4.3 Strength requirements

For the duration of the test, the coupling and its constituent parts shall not exhibit any permanent deformation or visible external deterioration. No rupture shall occur.

Following testing, the coupling function, as intended by the manufacturer, shall be checked to reveal any defects.

5 Static strength test

5.1 General requirements

The test shall be carried out with a coupling ball of diameter

$$49 \text{ mm } {}^{+0,13}_{0} \text{ mm}$$

The coupling shall be fixed to the test bench in accordance with the manufacturer's recommendations for attachment to the trailer.

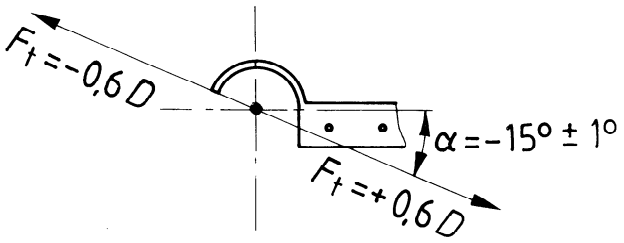

Figure 1 — Dynamic test

5.2 Test conditions

The test load shall be applied to the ball vertically (see figure 2) and gradually over at least 10 s, to value W (where W is the weight, in newtons, of the manufacturer's maximum total mass, m_R of the trailer, as defined in clause 3). This load shall then be maintained for 10 s.

5.3 Strength requirements

For the duration of the test, the coupling and its constituent parts shall not exhibit any permanent deformation or visible external deterioration. There shall be no breakage, nor shall the ball be pulled out of the coupling.

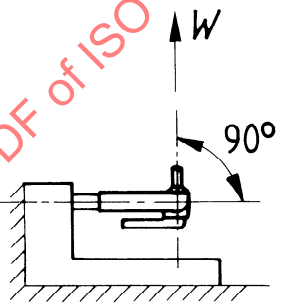

Figure 2 — Static test