INTERNATIONAL STANDARD

ISO 3853

Second edition
1994-09-15

Road vehicles — Towing vehicle coupling device to tow caravans or light trailers — Mechanical strength test

Véhicules routiers — Dispositifs d'attelage montés sur les véhicules tractant des caravanes ou des remorques légères — Essai de résistance mécanique

Reference number
ISO 3853:1994(E)

Contents

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

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 3853 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 4, *Caravans and light trailers*.

This second edition cancels and replaces the first edition (ISO 3853:1977), of which it constitutes a technical revision.

This page intentionally left blank

Road vehicles — Towing vehicle coupling device to tow caravans or light trailers — Mechanical strength test

1 Scope

This International Standard specifies a simplified procedure for testing the mechanical strength of coupling devices fitted to towing vehicles for towing caravans or light trailers of categories O_1 and O_2.[1)]

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 1176:1990, *Road vehicles — Masses — Vocabulary and codes.*

ISO 7237:1993, *Caravans — Masses and dimensions — Vocabulary.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 1176 for towing vehicles and ISO 7237 for caravans, and the following definitions apply.

3.1 coupling device: Device including towing bracket and ball.

NOTE 1 Current terms are shown in figure 1.

3.2 static load, F_{stat}: Permissible load on the coupling device transmitted by the coupling ball.

3.3 reference line: Approximately horizontal line through the centre of the coupling device, given by the car manufacturer for the laden car, and within set limits.

1) Definitions in accordance with UN-ECE classification of road vehicles:

Category O_1: single-axled trailers, other than semi-trailers, with a maximum mass not exceeding 750 kg.

Category O_2: trailers with a maximum mass not exceeding 3 500 kg, other than trailers of category O_1.

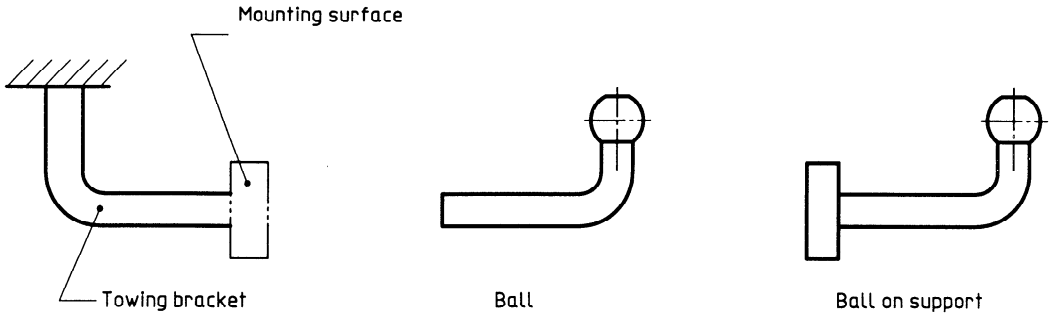

Figure 1 — Coupling device nomenclature

4 Symbols

For the purposes of this International Standard, the following symbols apply.

m_M is the maximum design total mass of the towing vehicle (see ISO 1176, code ISO-M07)

m_R is the maximum manufacturer's total mass of the towed vehicle for specific operating conditions (see ISO 7237:1993, definition 4.1.3)

D is the value, in newtons, determined by the following equation corresponding to the longitudinal force between the towing vehicle and the trailer:

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

where g is the acceleration due to gravity, i.e. a conventional value of 9,806 65 m/s^2

F_{res} is the resulting test force, expressed in newtons

α is the test angle at which the test force F_{res} is set in relation to the reference line, expressed in degrees of angle

F_{stat} is the maximum permissible static load of the trailer on the towing vehicle coupling point (see ISO 1176:1990, definition 4.2.4). This value is determined by the towing vehicle manufacturer

h is the vertical distance between the ball centre and the mounting device centre

l is the horizontal distance between the ball centre and the ball support attachment point or ball attachment point

5 General conditions

5.1 The test shall be carried out with coupling devices whose dimensions comply with ISO 1103.

The devices submitted to the test shall have all design details which might influence the strength criteria fitted or included (e.g. electrical socket plates, any marking, etc.).

5.2 The test periphery ends at the anchorage or fitting points. The geometric location of the coupling ball and the fixing points of the coupling device related to the reference line shall be indicated by the vehicle manufacturer and quoted in the test report.

5.3 The strength tests in clause 6 are dynamic tests to be performed on a test bench (e.g. a resonance pulser).

5.4 The test loads do not take account of the side (transverse) loads generated, for example, by tandem axle trailers and certain types of stabilizers.

5.5 The test angles are derived from the force distribution diagram in figure 2, which is the result of road tests with various combinations of passenger cars and trailers.