

# INTERNATIONAL STANDARD

# ISO 7141

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## Road vehicles — Light alloy wheels — Impact test

*Véhicules routiers — Roues en alliage léger — Essai de choc*

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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 7141 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 19, *Wheels*.

This third edition cancels and replaces the second edition (ISO 7141:1995), the title and scope of which have been modified to include all road applications (not just passenger car applications) for light alloy wheels.

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# Road vehicles — Light alloy wheels — Impact test

## 1 Scope

This International Standard specifies a laboratory test procedure to evaluate the axial (lateral) kerb impact collision properties of a wheel manufactured either wholly or partly of light alloys. It is intended for passenger car applications, and special vehicle applications where the wheel may impact the kerb, with the purpose of screening and/or quality control of the wheel.

The vocabulary used is in accordance with ISO 3911.

## 2 Normative references

The following referenced documents are indispensable for the 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 3911, *Wheels and rims for pneumatic tyres — Vocabulary, designation and marking*

## 3 Test equipment

**3.1 New wheels**, fully processed, representative of wheels intended for vehicle application, fitted with a tyre.

Tyres and wheels used in the tests should not be used subsequently on a vehicle.

**3.2 Impact loading test machine** with a vertically acting steel striker having an impacting face at least 125 mm wide and at least 375 mm long and sharp edges broken by radius or chamfer, in accordance with Figure 1. The striker mass,  $m$ , within a tolerance of  $\pm 2\%$ , expressed in kilograms, shall be as follows:

$$m = 0,6W + 180$$

where  $W$  is the maximum static wheel loading, as specified by the wheel and/or vehicle manufacturer, expressed in kilograms.

**3.3 Mass** of 1 000 kg.

## 4 Calibration

Ensure, by means of a test calibration adapter, that the 1 000 kg mass (3.3) applied vertically to the centre of the wheel fixing as shown in Figure 2 causes a deflection of  $7,5 \text{ mm} \pm 0,75 \text{ mm}$  when measured at the centre of the beam.

## 5 Test procedure

**5.1** Mount the test wheel (3.1) and tyre in the test machine (3.2) such that the impact loading is applied to the rim flange of the wheel. The wheel shall be mounted with its axis at an angle of  $13^\circ \pm 1^\circ$  to the vertical with its highest point presented to the striker.

The tyre mounted on the test wheel shall be specified by the vehicle manufacturer. If no tyre is specified, the tyre shall be the smallest nominal section width tubeless radial-ply tyre intended for use on that wheel. The inflation pressure shall be that specified by the vehicle manufacturer or, in the absence of such specification, it shall be 200 kPa.

The temperature of the test environment shall remain within the range  $10^\circ\text{C}$  to  $30^\circ\text{C}$  throughout the test period.

**5.2** Ensure that the wheel is mounted on the hub fixture with dimensionally representative fixings such as would be used on a vehicle. Manually tighten the fixings to a value or by a method recommended by the vehicle or wheel manufacturer.

Because the design of wheel centre members can vary, test a sufficient number of locations on the wheel rim circumference to ensure that the integrity of the centre members is assessed. Use new wheels each time.

**5.3** Ensure that the striker is over the tyre, and overlaps the rim flange by  $25\text{ mm} \pm 1\text{ mm}$ . Raise the striker to a height of  $230\text{ mm} \pm 2\text{ mm}$  above the highest part of the rim flange and allow it to fall.

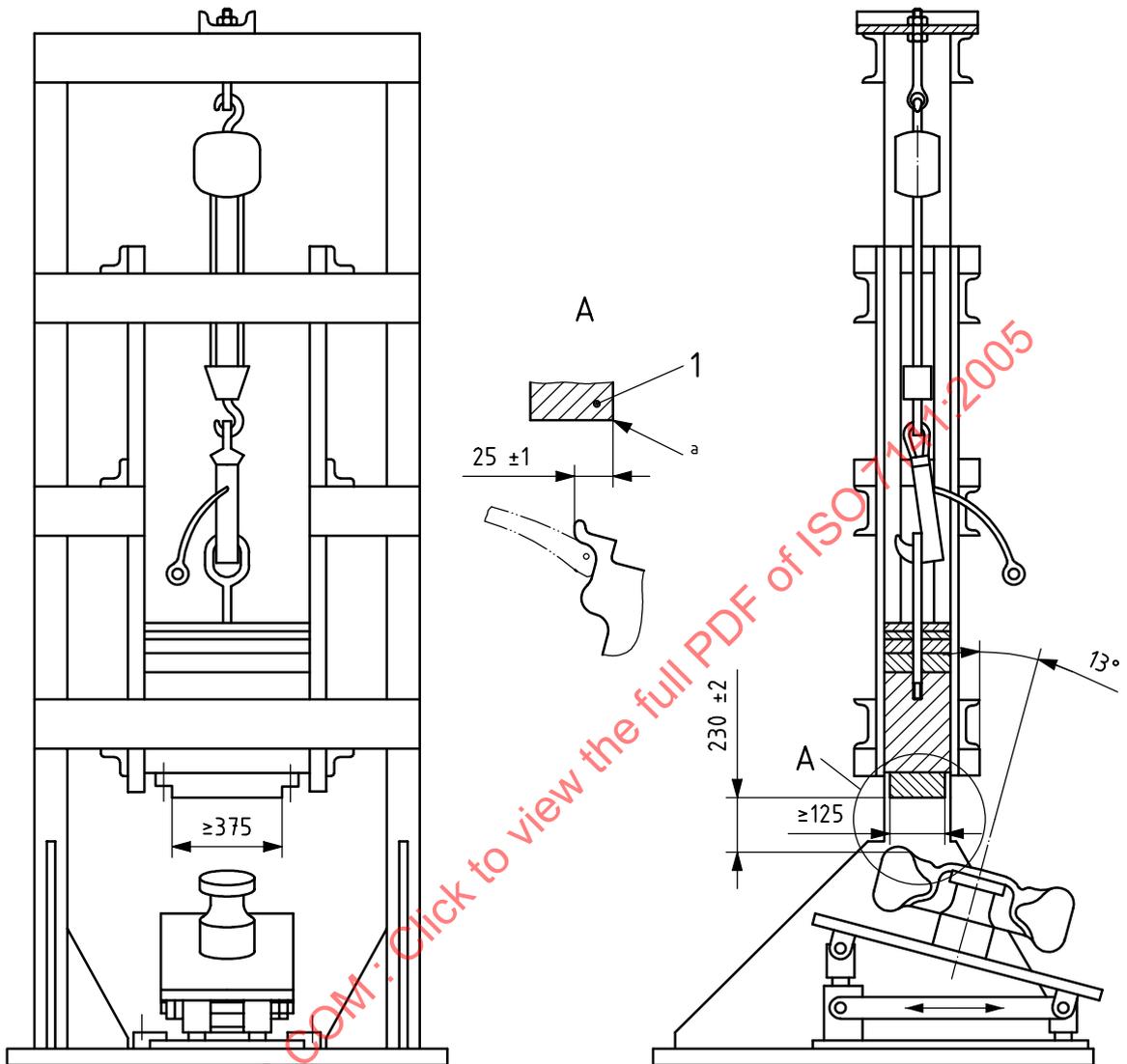
## 6 Failure criteria

The wheel is considered to have failed the test if any of the following apply:

- a) visible fracture(s) penetrate through a section of the centre member of the wheel assembly;
- b) the centre member separates from the rim;
- c) the tyre loses all air pressure within 1 min.

The wheel is not considered to have failed the test by deformation of the wheel assembly or by fractures in the area of the rim section struck by the face plate of the striker.

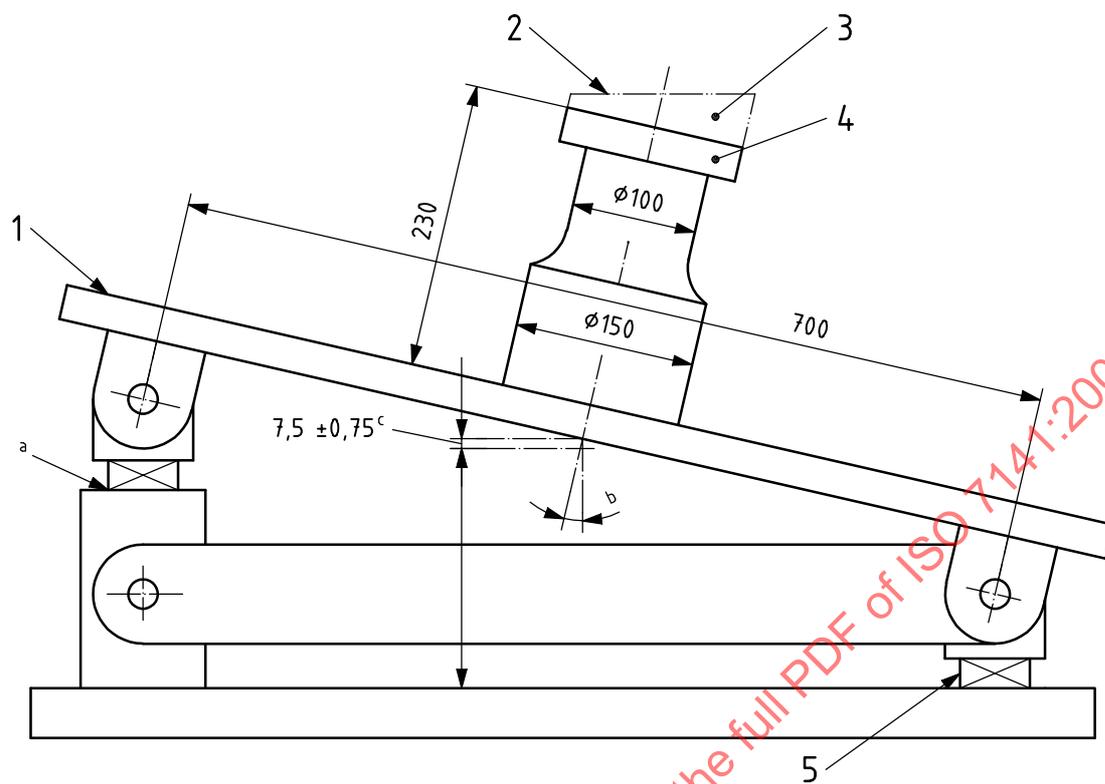
Dimensions in millimetres



**Key**

- 1 steel striker
- a Sharp edge broken by radius or chamfer.

**Figure 1 — Impact loading test machine**



**Key**

- 1 steel beam, 200 × 25
- 2 1 000 kg calibration load
- 3 calibration adapter
- 4 wheel hub adapter
- 5 4 natural rubber mounts (or equivalent): hardness, 50 Shore; diameter, 51; uncompressed height, 27
- a Adjust for 13°.
- b 13° before calibration.
- c Vertical deflection measured from base.

**Figure 2 — Application of loading to centre of wheel mount**