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Earth-moving machinery — Laboratory evaluations of roll-over and falling-object protective structures — Specifications for deflection-limiting volume

*Engins de terrassement — Étude en laboratoire des structures de
protection au retournement et contre les chutes d'objets —
Spécifications pour le volume limite de déformation*



Reference number
ISO 3164:1992(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 3164 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Sub-Committee SC 2, *Safety requirements and human factors*.

This fourth edition cancels and replaces the third edition (ISO 3164:1979), incorporating Amendment 1 of 1980 and constituting a technical revision.

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Earth-moving machinery — Laboratory evaluations of roll-over and falling-object protective structures — Specifications for deflection-limiting volume

1 Scope

This International Standard specifies the deflection-limiting volume to be used in laboratory evaluations of roll-over and falling-object protective structures.

It is used when performing laboratory evaluations of roll-over protective structures specified in ISO 3471-1 and falling-object protective structures specified in ISO 3449.

NOTE 1 ISO 3471-1 is currently under revision.

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 3449:1992, *Earth-moving machinery — Falling-object protective structures — Laboratory tests and performance requirements*.

ISO 3471-1:1986, *Earth-moving machinery — Roll-over protective structures — Laboratory tests and performance requirements — Part 1: Crawler, wheel loaders and tractors, backhoe loaders, graders, tractor scrapers, articulated steer dumpers*.

3 Definition

For the purposes of this International Standard, the following definition applies.

3.1 deflection-limiting volume (DLV): Orthogonal approximation of a large, seated, male operator wearing normal clothing and a hard hat (see figure 1).

4 Accuracy

For the purposes of this International Standard, all linear dimensions of the DLV shown in figure 1 shall have an accuracy of ± 5 mm. The accuracy of locating the DLV with respect to the seat shall be ± 13 mm.

5 Location of deflection-limiting volume (DLV)

5.1 The seat be adjusted to the rearmost position first and then to the lowest position¹⁾. The position of seats with suspension systems shall include that static deflection of the suspension systems which a 100 kg seated operator would impose on the suspension system, with all mechanical, hydraulic, or gas elements to be at the manufacturer's recommended settings for this size of operator.

5.2 For machines which have multiple seat positions, either rotatable or multiple locations, the seat location for mobile operation i.e. the seat position used by the operator to move the machine in the travel mode, shall be used.

5.3 The locating point (LP) shall be determined as follows:

5.3.1 The LP shall be in the middle vertical plane which is parallel to the longitudinal axis of the seat.

1) A lower position may be possible in a different, further forward, position.

5.3.2 The LP shall be at the intersection of the following two lines in this plane (see figure 2):

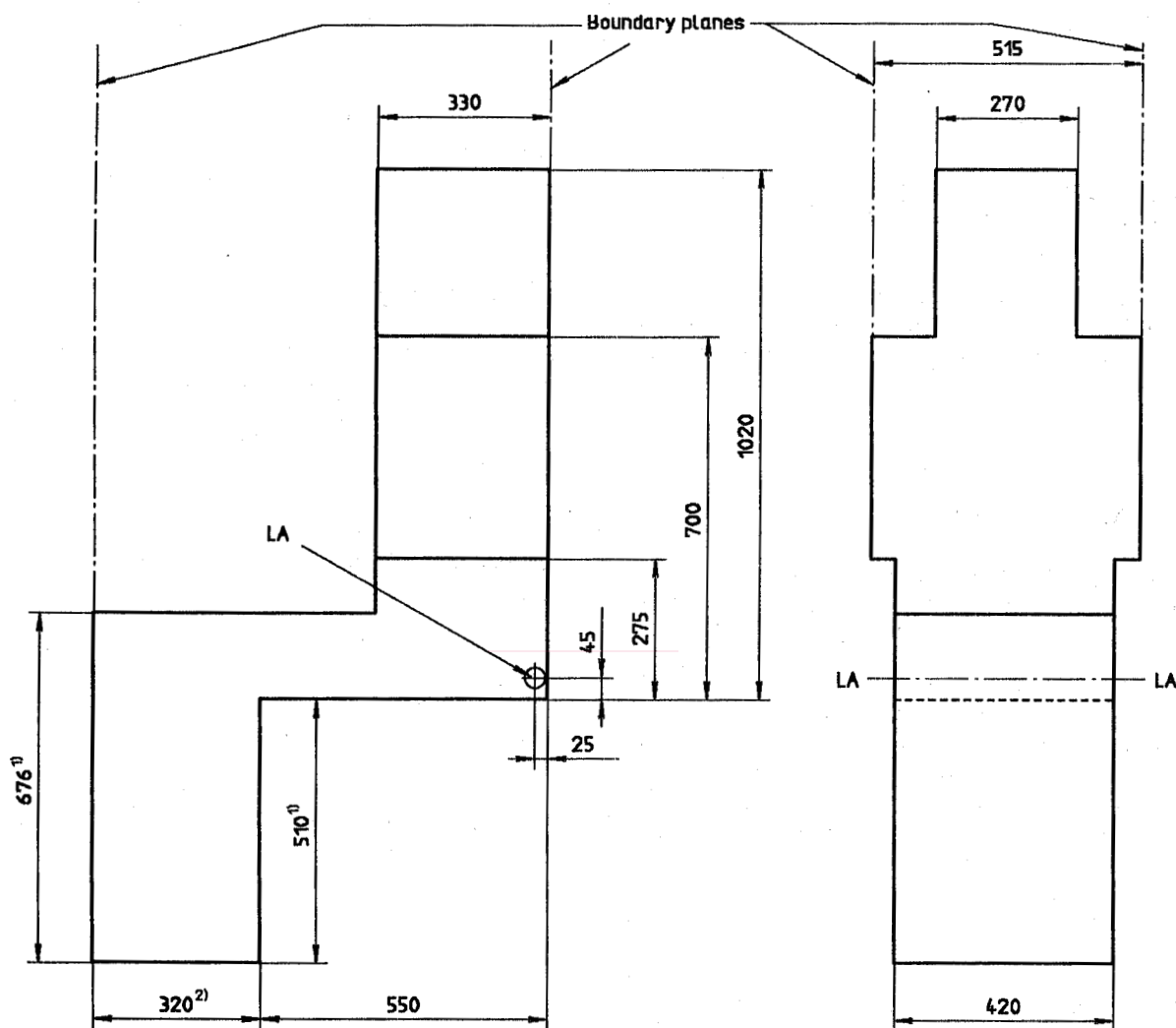
HH — the horizontal line which is tangent to the highest point of the seat cushion in this plane;

VV — the vertical line which is tangent to the most forward point of the seat back in this plane.

5.4 The DLV shall be positioned such that the line LA shown in figure 1 passes through the LP defined in 5.3. The DLV shall be centred transversely at the seat location, and its principal axes shall be parallel to lines HH and VV, as defined in 5.3.2. (This positioning takes nominal compression of the seat cushion and back into account.)

5.5 The location of the LA of the DLV shall remain coincidental with the LP even though that line may move during any or all of the laboratory loadings.

Dimensions in millimetres



1) Not below floorplates.

2) But not beyond the confines of the operator compartment.

Figure 1 — Deflection-limiting volume (DLV)