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Earth-moving machinery — Operator's seat — Dimensions and requirements

Engins de terrassement — Siège de l'opérateur — Dimensions et exigences

Reference number
ISO 11112:1995(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 11112 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 2, *Safety requirements and human factors*.

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Earth-moving machinery — Operator's seat — Dimensions and requirements

1 Scope

This International Standard specifies the dimensions, requirements and adjustment ranges for operator seats on earth-moving machinery as defined in ISO 6165. Additionally, it provides dimensions for armrests when fitted on these machines.

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 3411:—[1], *Earth-moving machinery — Human physical dimensions of operators and minimum operator space envelope.*

ISO 5353:1995, *Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point.*

ISO 6165:1987, *Earth-moving machinery — Basic types — Vocabulary.*

3 Seat requirements

3.1 Nominal values of dimensions regarding seat features, their mutual locations and adjustments are established on the basis of ergonomic requirements taking into consideration operator sizes, according to ISO 3411, from the 5th percentile through the 95th percentile.

3.2 The dimensions for the operator's seat and related adjustments are given in table 1 and figure 1. These include essential dimensions and optional requirements.

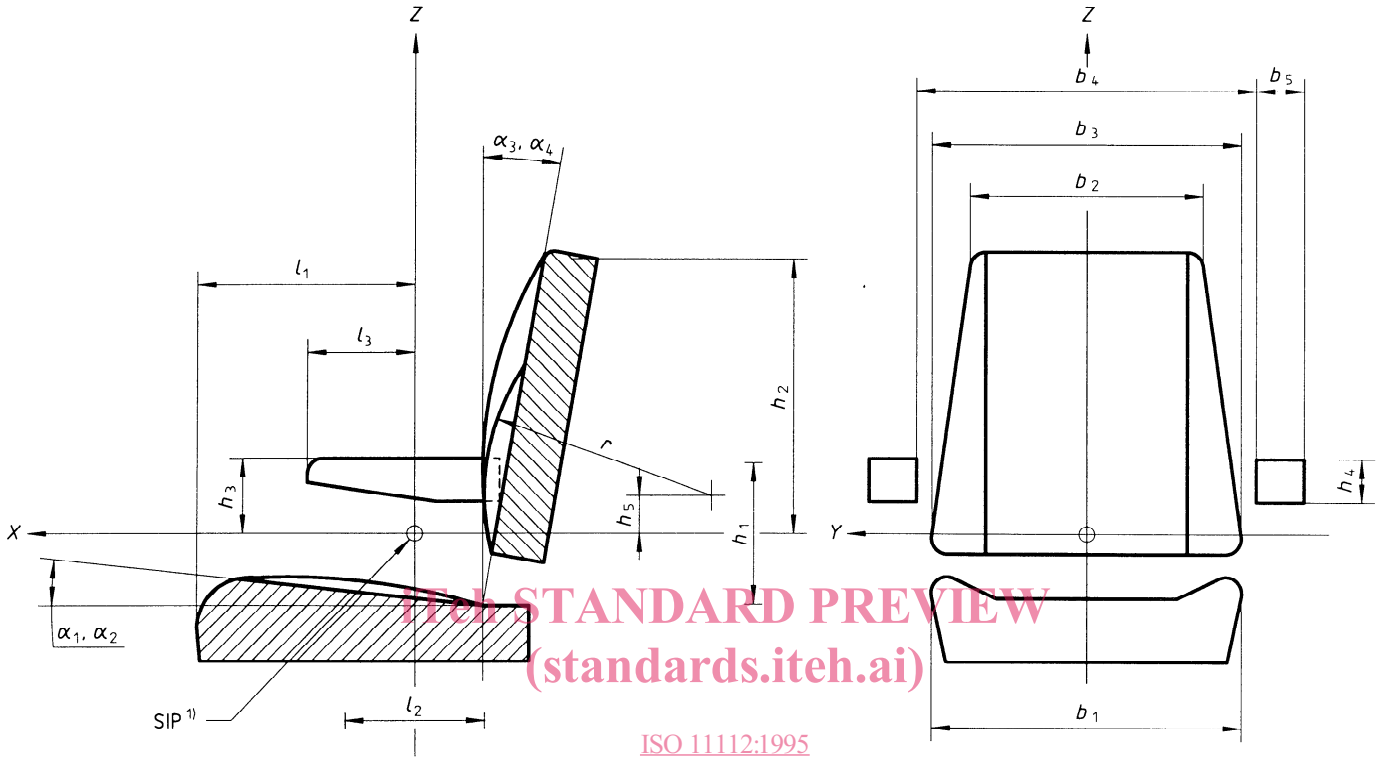
Seat dimensions and adjustments, if provided, are referenced to the seat index point (SIP) determined in accordance with ISO 5353. Dimensions and adjustments other than those specified in this International Standard may be used only if they provide better accommodation for the operator.

3.3 On those machines where a higher SIP is desirable, a reduced seat-back to seat cushion angle should be considered. See ISO 5353.

3.4 To ensure unimpeded ingress and egress of the operator at the seat, one or both of the armrests shall, where necessary, be movable. In such circumstances the armrest shall provide a firm support during operation of the machine.

3.5 Operator seats may be provided with a swivel or tilt. It may pivot to improve both the operator work position and the means of ingress and egress. A means of securing the work positions of the seat (swivel or tilt) shall be provided to prevent inadvertent seat movement during operation of the machine.

1) To be published. (Revision of ISO 3411:1982)



1) See ISO 5353.

Figure 1

Table 1

Dimensions in millimetres

Figure reference	Description	Dimension[1]		
		min.	nom.	max.
l_1	seat cushion, bottom length	215	265	315
b_1	seat cushion, bottom width	430	500	—
l_2	fore and aft adjustment[2]	100	150	—
h_1	vertical adjustment[2]	0	75	—
h_2	seat cushion, back height[3]	150	400	—
b_2	seat cushion, back width: upper[4]	300	—	500
b_3	seat cushion, back width: lower[4]	300	—	500
h_3	armrest height[5] [6]	95	140	160
l_3	armrest length[6]	90	140	190
b_4	width between armrests[6]	450	500	550
b_5	armrest width[6]	50	75	—
h_4	armrest depth[6]	50	100	—
h_5	height of lumbar centreline from SIP	115	130	145
r	lumbar radius[7]	150	300	—
α_1	seat cushion, bottom angle[8]	5°	10°	15°
α_2	seat cushion, bottom angle adjustment[9]	0°	± 5°	—
α_3	seat cushion, back angle[10]	5°	10°	15°
α_4	seat cushion, back angle adjustment[2]	0°	± 5°	—

1) The maximum and minimum values may be changed for better accommodation of the operator based on ergonomic justification. The nominal values are values of broad or general acceptance; they are not average or median values.

2) Adjustment values are total adjustments. Vertical adjustment shall be independent of the adjustment of the suspension.

3) Where free swing of shoulders and arms over the top of the back is necessary or appropriate for visibility when reversing or when controlling rear-mounted implements, the maximum seat-back height should be 300 mm.

4) Where free aft swing of the elbows is desired, the maximum width should be 330 mm. The seat may have a seat back with a greater or lower width.

5) Armrests attached to the seat should move with the vertical and horizontal seat adjustments. The ability to adjust the armrests vertical to the max./min. values of h_3 is desirable. h_3 is measured vertically from the SIP to the top of the armrest.

6) Reference value.

7) Radius of curvature of the lumbar support in the vertical plane should be nominally 300 mm with a minimum of 150 mm.

8) Angle of the top of the seat base of the SIP device after being positioned and weighted using the SIP measuring device and procedures given in ISO 5353.

9) Angle adjustment, if provided, is based from the mid-position. This is not necessarily a latched position.

10) Measure the angle of the centreline of the seat-back. If a lumbar support is provided, it should be set at the mid-range position, and the back angle measured on the centreline of the seat-back above the lumbar support. For seat-backs with lumbar support, the allowable angles may be increased by 5° or more.

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ICS 53.100

Descriptors: earth-moving equipment, seats, operator seats, specifications, dimensions, adjustment, ergonomics.

Price based on 3 pages