INTERNATIONAL STANDARD

ISO 2860

Fourth edition
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Earth-moving machinery — Minimum access dimensions

Engins de terrassement — Dimensions minimales des passages

Reference number
ISO 2860:1992(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 2860 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 2860:1983), of which it constitutes a technical revision.

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Earth-moving machinery — Minimum access dimensions

1 Scope

This International Standard specifies the minimum access openings on earth-moving machinery as defined in ISO 6165 for

a) hand access,

b) head access,

c) body access,

d) arm access,

e) two-handed access.

It provides engineers and designers with information in order that the access openings provided on equipment and machinery for purposes of inspection, adjustment and maintenance have sufficient dimensions for the intended function by personnel in the field or shop.

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 3411:1982, *Earth-moving machinery — Human physical dimensions of operators and minimum operator space envelope.*

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

3 Minimum access openings

The dimensions shown in 3.1 to 3.4 are the recommended minimum for limited activity through the opening. Larger openings will be needed in specific instances, depending upon the nature of the task, size and mass of the parts, etc. Such larger openings can be more useful and allow greater efficiency.

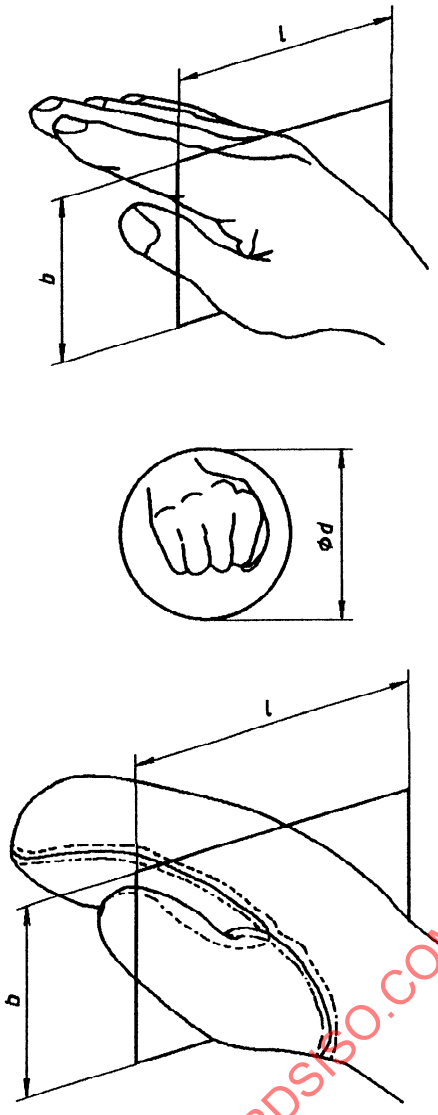
The larger openings for access with arctic clothing are for earth-moving machines and equipment intended for use in cold environments.

Based on available anthropometric data, the recommended openings, in figures 1 to 5, are the smallest that will accommodate the 95th percentile operator as defined in ISO 3411.

In all cases in 3.1 to 3.4, all corners may have an optional maximum 25 mm radius.

3.1 Hand access

Hand access shall be in accordance with figure 1.



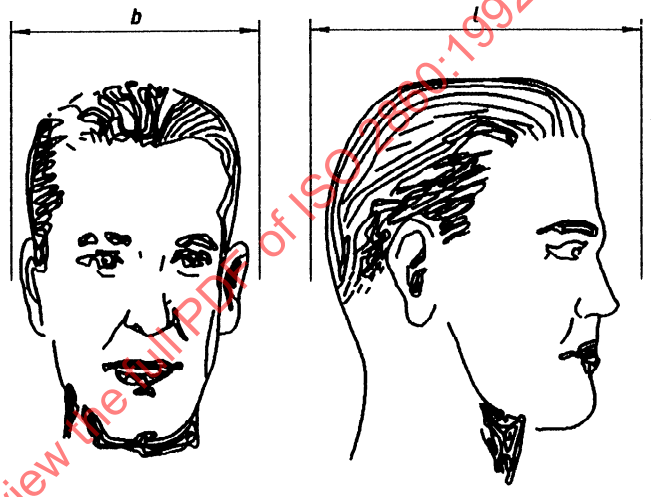
Dimensions in millimetres

Minimum dimensions	Round	Rectangular	
	d	*b*	*l*
Hand bare	110	65	110
With arctic mitten	150	100	150

Figure 1 — Minimum dimensions for hand access, 95th percentile

3.2 Head access

Head access shall be in accordance with figure 2.



Dimensions in millimetres

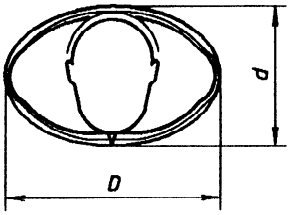
Minimum dimensions	Round	Rectangular	
	d	*b*	*l*
Head bare	230	210	230
With arctic clothing[1)]	300	280	300
With hat, helmet	330	290	330

1) Arctic clothing includes parka hood.

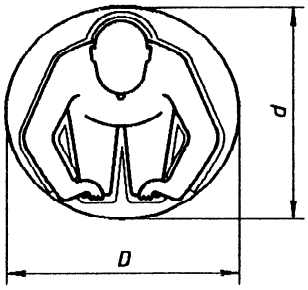
Figure 2 — Minimum dimensions for head access, 95th percentile

3.3 Body access

Body access shall be in accordance with figure 3.



a) Top and bottom access



b) Side access

Dimensions in millimetres

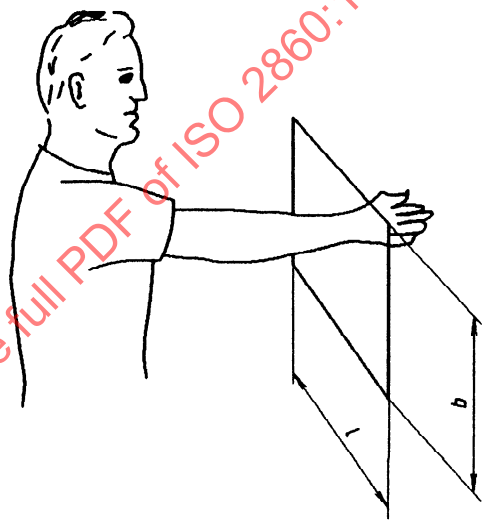
Minimum dimensions	Ellipse	
	d	*D*
Top and bottom access		
Normal clothing	330	580
With arctic clothing	470	690
Side access		
Normal clothing	660	760
With arctic clothing	740	870

Figure 3 — Minimum dimensions for body access, 95th percentile

3.4 Reach access

3.4.1 Arm access

Arm access shall be in accordance with figure 4.



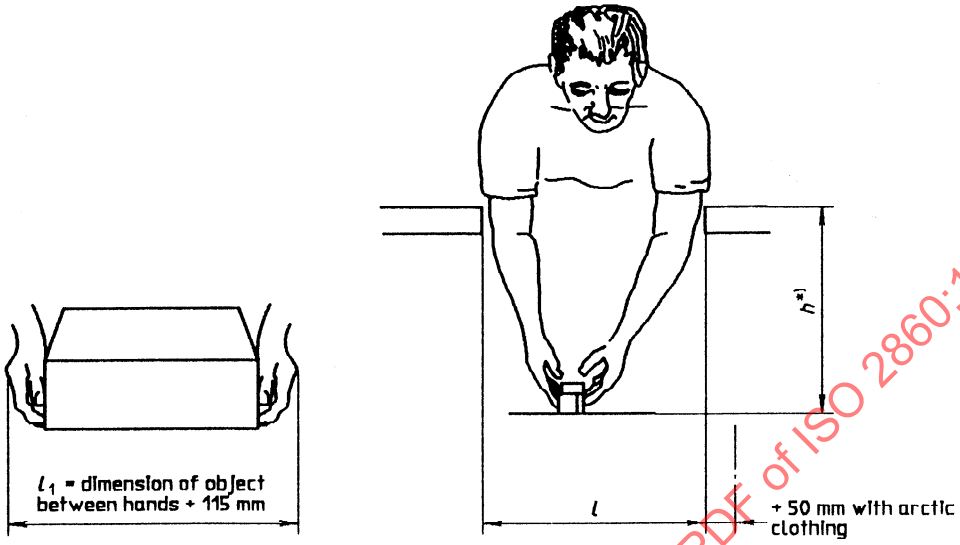
Dimensions in millimetres

Minimum dimensions (one arm)	Round	Rectangular	
	d	*b*	*l*
Arm bare	200	150	200
With arctic clothing	250	200	250

Figure 4 — Minimum dimensions for arm access, 95th percentile

3.4.2 Two-handed access

Two-handed access shall be in accordance with figure 5.



*) h = required reach.

Dimensions in millimetres

Minimum dimensions (two hands)	Rectangular	
	b 1)	l
Arms bare	150	$\frac{3}{4}h + l_1$ $(200 \leqslant h \leqslant 560)$
With arctic clothing	200	$\frac{3}{4}h + 50 + l_1$ $(250 \leqslant h \leqslant 650)$
1) b = width of opening.		

Figure 5 — Minimum dimensions for two-handed access, 95th percentile