

IS 10689 : 1993
ISO 2860 : 1992

भारतीय मानक

मिट्टी उठाने की मशीनरी — न्यूनतम अभिगम आयाम

(पहला पुनरीक्षण)

Indian Standard

EARTH-MOVING MACHINERY — MINIMUM ACCESS
DIMENSIONS

(*First Revision*)

UDC 621.878/879 : 62.77

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BUREAU OF INDIAN STANDARDS

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Price Group 2

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 2860 : 1992 'Earth-moving machinery — Minimum access dimensions', issued by International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendations of Bulk Handling Systems and Equipment Sectional Committee and approval of the Heavy Mechanical Engineering Division Council.

This standard was first published in 1983. ISO 2860 : 1992 has been adopted during this revision.

The text of ISO standard has been approved for publication as Indian Standard without deviations. Certain terminology and conventions are however, not identical to those used in Indian Standards. Accordingly, wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 3411	IS 11115 : 1993 Earth-moving machinery — Human physical dimensions of operators and minimum operator space envelope (<i>first revision</i>)	Identical
ISO 6165	IS 12138 : 1993 Earth-moving machinery — Basic types — Vocabulary (<i>first revision</i>)	Identical

Indian Standard

**EARTH-MOVING MACHINERY — MINIMUM ACCESS
DIMENSIONS**

(First Revision)

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.

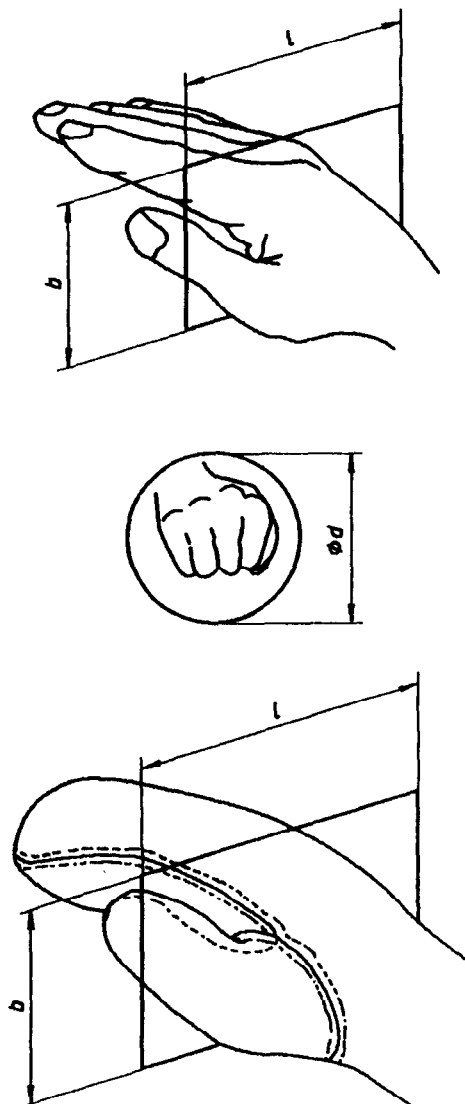
The larger openings for access with arctic clothing are for earth-moving machines and equipment intended for use in cold environments.

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.



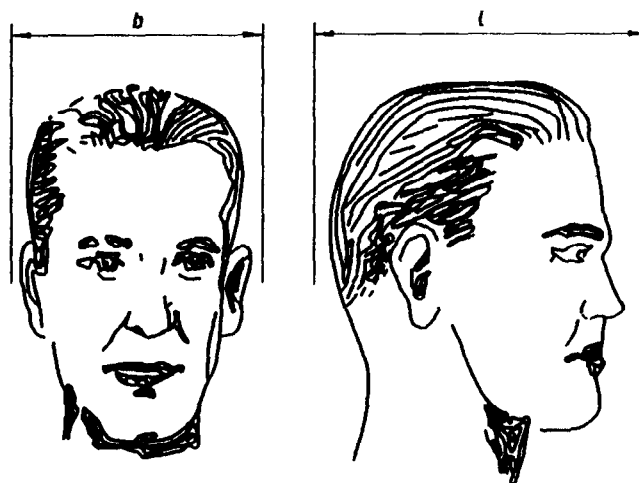
Dimensions in millimetres

Minimum dimensions	Round	Rectangular	
	<i>d</i>	<i>b</i>	<i>l</i>
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

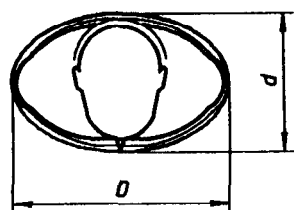
Minimum dimensions	Round	Rectangular	
	<i>d</i>	<i>b</i>	<i>l</i>
Head bare	230	210	230
With arctic clothing ¹⁾	300	280	300
With hat, helmet	330	290	330

1) Arctic clothing includes parka hood.

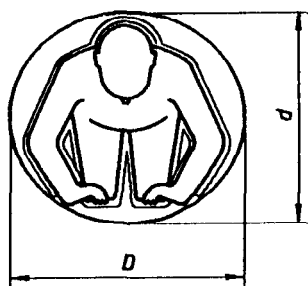
Figure 2 — Minimum dimensions for head access, 95th percentile

3.3 Body access

Body access shall be in accordance with figure 3.



a) Top and bottom access



b) Side access

Dimensions in millimetres

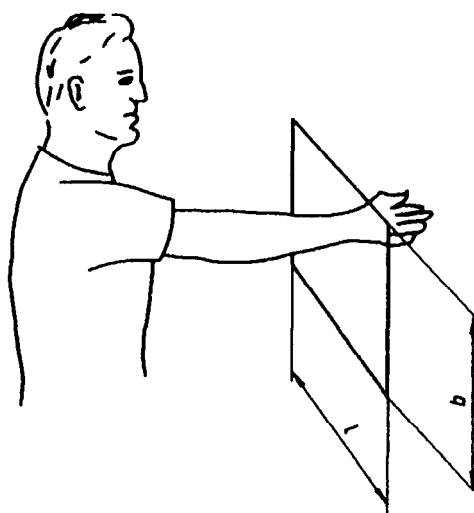
Minimum dimensions	Ellipse	
	<i>d</i>	<i>D</i>
Top and bottom access		
Normal clothing	330	580
With arctic clothing	470	690
Side access		
Normal clothing	660	760
With arctic clothing	740	870

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.



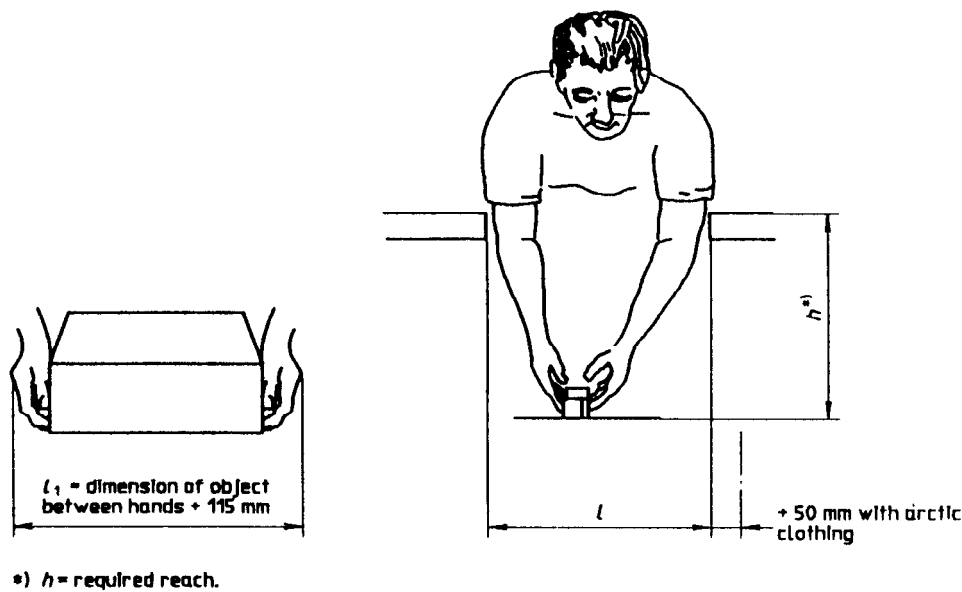
Dimensions in millimetres

Minimum dimensions (one arm)	Round	Rectangular	
	<i>d</i>	<i>b</i>	<i>l</i>
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.



Dimensions in millimetres

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

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

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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