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विशिष्टि

( दूसरा पुनरीक्षण )

*Indian Standard*

SOIL WORKING EQUIPMENT — ANIMAL DRAWN  
MOULDBOARD PLOUGH, FIXED TYPE —  
SPECIFICATION

( *Second Revision* )

ICS 65.060.20

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

## FOREWORD

This Indian Standard ( Second Revision ) was adopted by the Bureau of Indian Standards after the draft finalized by the Farm Implements and Machinery Sectional Committee had been approved by the Food and Agriculture Division Council.

Mouldboard plough is a primary tillage implement used for mechanical manipulation of soil. The mouldboard ploughs drawn by animals are being manufactured and used in large numbers in the country. Earlier this standard was published in two parts; Part 1 covering the requirements of turnwrest type and Part 2 fixed type mouldboard plough. As presently turnwrest type mouldboard plough are not being manufactured and used within the country, it was decided to withdraw the provision relating to this type of plough and publish the standard covering the requirements of fixed type only. In this revision the requirement of shares has been included which was earlier covered in separate standard IS 6327 : 1971 'Animal drawn mouldboard plough shares'.

The figures given in the standard are meant to serve only as illustrations and should not be considered as suggestive of any standard design.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values ( *revised* )'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

# SOIL WORKING EQUIPMENT — ANIMAL DRAWN MOULDBOARD PLOUGH, FIXED TYPE — SPECIFICATION ( *Second Revision* )

## 1 SCOPE

This standard prescribes material, dimensions and other requirements of fixed type animal drawn mouldboard plough.

## 2 REFERENCES

The Indian Standards listed in Annex A contain provisions which, through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated there.

## 3 TERMINOLOGY

3.0 For the purpose of this standard, the definition given in IS 9818 (Part 2) shall apply (*see also* Fig. 1, 2, 3 and 4).

## 4 MATERIAL

4.1 The shares shall be manufactured by chilled cast iron or steel conforming to Grade C75 of Schedule II of IS 1570.

4.2 The material of construction for components other than the share shall be cast iron preferably conforming to Grade 200 of IS 210 or mild steel preferably conforming to IS 2062. Well seasoned hardwood (*see* IS 399) may also be used for beam, handle and handle grip.

4.3 The material of construction of various components shall be declared by the manufacturer.

## 5 HARDNESS

5.1 The chilled cast iron shares shall have a Brinell hardness of 360 to 400 HB when tested in accordance with IS 1500 and depth of chilling shall be not less than 1.5 mm.

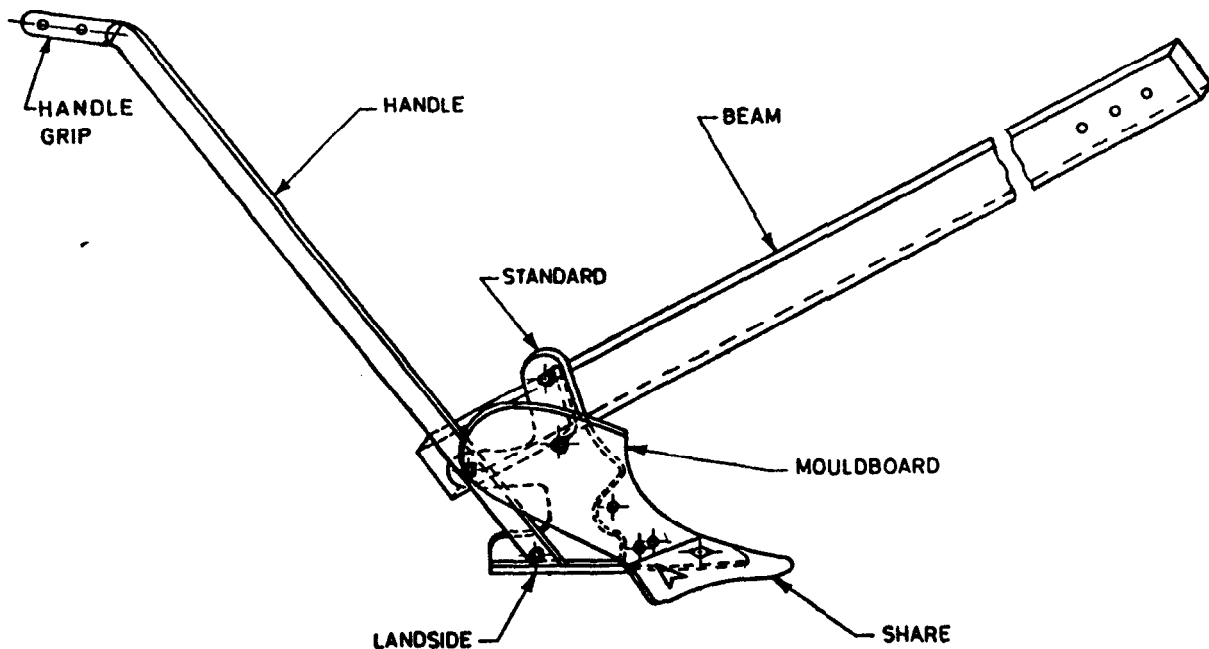


FIG. 1 NOMENCLATURE OF MAIN PARTS OF MOULDBOARD PLOUGH, FIXED TYPE ( LONG BEAM )

Table 1 Dimensions of Plough Share

( Clause 6.2 )

<i>W</i> mm ± 5	<i>A</i> mm ± 0.5 <sup>1)</sup>	<i>B</i> mm ± 0.5	<i>C</i> mm ± 0.5	<i>D</i> mm ± 0.5	<i>E</i> <sup>1)</sup> mm ± 1	$\alpha$	$\beta$
100	37.5	20	12.0	—	up to 16	15°-20°	115°-120°
125	50 37.5 <sup>2)</sup>	20	12.0	—	up to 20	15°-20°	125°-130°
150							
175							
200	5	25	12.0	95	up to 25	15°-20°	130°-135°
225							
250							

<sup>1)</sup> Dimension *E* to be declared by the manufacturer up to the prescribed limits.

<sup>2)</sup> Applicable only when shares have two holes.

5.2 The cutting edge of steel share shall be hardened and tempered to give a Brinell hardness of 350 to 450 HB when tested in accordance with IS 1500.

5.3 Cast iron components, other than share, shall have the hardness in range of 160 to 220 HB ( see IS 1500 ).

## 6 DIMENSIONS

6.1 The size of plough (see Fig. 3) shall be 100, 125, 150, 175, 200, 225 and 250 mm.

6.1.1 The tolerance on all the sizes shall be  $\pm 5$  mm.

6.2 The essential dimension of plough share (see

Fig.4) shall be as given in Table 1.

6.3 The horizontal and vertical suction (see Fig. 3) shall be in the range of 3 mm to 12 mm. These shall be declared by the manufacturer. The suction shall not differ by  $\pm 1$  mm of the declared value.

6.4 When the plough is set at its working position, the throat clearance (see Fig. 3) shall be at least twice the size of the plough (see 6.1). The throat clearance should, as far as possible, be adjustable.

6.5 The plough shall be provided with one or two handles. If two handles are provided, the distance between handle grips shall be between 550 mm and 650 mm.

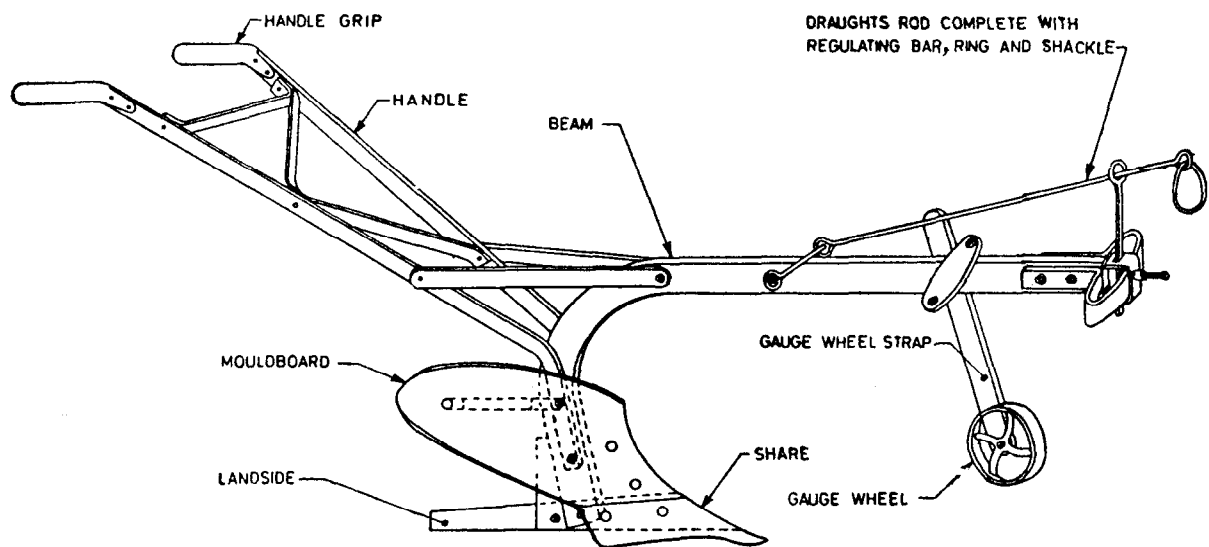


FIG. 2 NOMENCLATURE OF MAIN PARTS OF MOULDBOARD PLOUGH, FIXED TYPE ( SHORT BEAM )

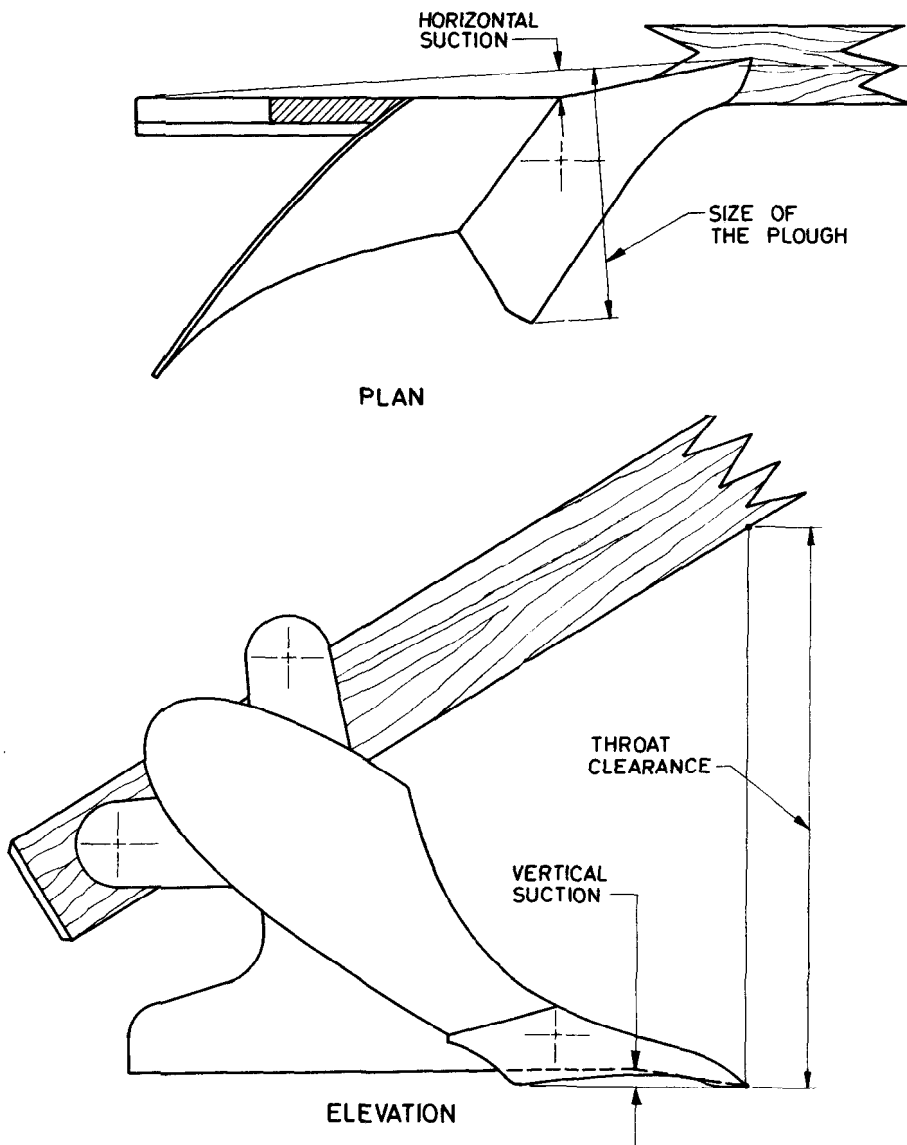


FIG. 3 MEASUREMENT OF SIZE, SUCTION AND CLEARANCE OF THE MOULDBOARD PLOUGH, FIXED TYPE

6.6 When the plough is set at its working position, the vertical distance between ground and the centre of grip shall be between 900 mm and 1 100 mm. The distance should preferably be adjustable.

NOTE — Based on anthropometry survey conducted by CIAE, Bhopal. It is recommended to provide vertical distance between ground and the handle between 650 and 950 mm and the dia of handle from 32 mm to 36 mm.

6.7 The handle grip shall be circular or oval in cross section. The diameter or minor axis shall be between 25 mm and 35 mm. The length of the grip shall be not less than 125 mm.

6.8 The gauge wheel, if provided, shall be not less

than 150 mm in diameter and its face width not less than 50 mm.

6.9 The gap between the cleavage edges of the share and the mouldboard shall be not more than 2 mm.

## 7 REQUIREMENTS

7.1 The cutting edge of the share shall be bevelled to a distance not more than 10 mm. The thickness of the cutting edge should be between 0.5 mm to 2 mm and should be uniform as far as possible.

7.2 The thickness of sheet used in the manufacture of share should be 5, 6 or 8 mm. The tolerance for

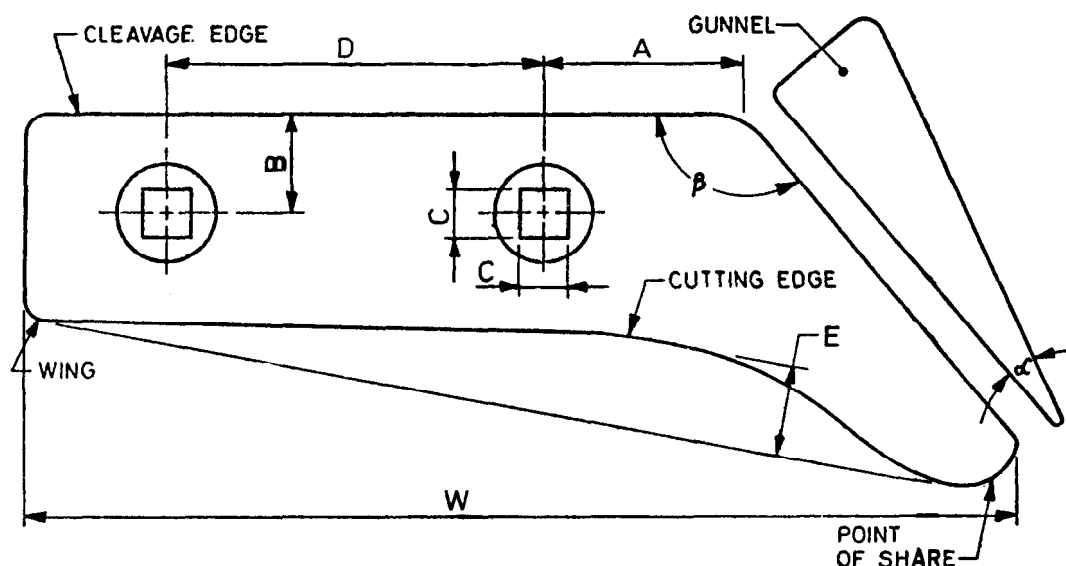


FIG. 4 PLOUGH SHARE

nominal thickness of sheet shall be  $\pm 10$  percent.

7.3 Two holes shall be punched in shares of size 200 mm to 250 mm and one hole shall be punched in shares of size 100 mm. Shares of size 125 mm to 175 mm may have either one or two holes as specified by the purchaser.

7.4 The countersunk bolts of 10 mm size shall be used for fixing the share with frog. As far as possible the bolt size should be M 10 as specified in IS 2609.

7.5 The shares shall be supplied with bolts in holes.

7.6 All the components should preferably be detachable.

7.7 The head of the fasteners, coming in contact with soil, shall be flush with the working surface. As far as possible bolt of 10 mm size should be used for all fastening to facilitate the use of minimum number of tools.

7.8 If desired by the purchaser, the plough shall be provided either with left or right hand soil turning arrangement.

7.9 The gauge wheel, if provided, shall roll smoothly on its axis. The height of the wheels should be adjustable.

7.10 When the plough is set at its working position and is placed on a plane surface, its bearing points

(point of share, wing and heel of the landside) should touch the ground and the plough shall be well balanced.

## 8 WORKMANSHIP AND FINISH

### 8.1 Plough

8.1.1 The components should be free from pits, burrs and other visual defects. The castings shall be free from blow holes. Welded joints shall not be porous and brittle.

8.1.2 The surface of parts of the plough shall be evenly dressed and shall have a protective coating which will prevent surface deterioration in transit and storage.

### 8.2 Share

8.2.1 The shares shall be free from flaws, scratches, cracks and other defects. All fins, burrs, flashes and sharp edges other than the cutting edge shall be removed.

8.2.2 In case of steel shares, the welding of gunnel shall be satisfactory in all respects. The welding shall not be porous or brittle.

8.2.3 A coating of protective paint or grease on soil facing surface of the share shall be provided. The bottom surface not in direct contact with soil shall have an anti rust paint coating.

## 9 MARKING AND PACKING

### 9.1 Marking

Each plough and share shall be marked on non-wearing surface with the following particulars:

- a) Manufacturer name and recognized trade-mark;
- b) Size of the plough;
- c) Batch or code number; and
- d) Year of manufacture.

### 9.2 BIS Certification Marking

The plough may also be marked with the Standard Mark.

9.2.1 The use of the Standard mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made there-under. The details of conditions under which the license for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

### 9.3 Packing

The plough and share shall be packed as agreed to between the purchaser and the supplier. The packing shall ensure safety of the parts in transit.

## 10 SAMPLING FOR LOT ACCEPTANCE

10.1 Unless otherwise agreed to between the purchaser and the supplier, the sampling of the plough for lot acceptance shall be done in accordance with 3 of IS 7201 (Part 1).

## ANNEX A

( Clause 2 )

### LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
210:1993	Grey iron casting ( <i>fourth revision</i> )	2609:1972	Coach bolts ( <i>first revision</i> )
399:1963	Classification of commercial timbers and their zonal distribution ( <i>revised</i> )	7201 ( Part 1 ): 1987	Method of sampling for agricultural machinery and equipment : Part 1 Hand tools and hand operated/animal drawn equipment ( <i>first revision</i> )
1500:1983	Method for Brinell hardness test for metallic materials ( <i>second revision</i> )	9818 ( Part 2 ): 1981	Glossary of terms relating to tillage and intercultivation equipment: Part 2 Terms relating to equipment
1570:1961	Schedules for wrought steels for general engineering purposes		
2062:1992	Steel for general structural purposes ( <i>fourth revision</i> )		

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards : Monthly Additions'.

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### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

## BUREAU OF INDIAN STANDARDS

### Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002  
Telephones : 323 01 31, 323 94 02, 323 33 75

Telegrams: Manaksanstha  
( Common to  
all offices )

### Regional Offices:

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg  
NEW DELHI 110002

Telephone

{ 323 76 17  
323 38 41

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola  
CALCUTTA 700054

{ 337 84 99, 337 85 61  
337 86 26, 337 86 62

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022

{ 60 38 43  
60 20 25

Southern : C. I. T. Campus, IV Cross Road, CHENNAI 600113

{ 235 02 16, 235 04 42  
235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)  
MUMBAI 400093

{ 832 92 95, 832 78 58  
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