



**LANDFORCE, DDM-2, TWO BOTTOM DISC PLOUGH  
(Tractor Mounted)**



भारत सरकार  
GOVT OF INDIA

कृषि एवं किसान कल्याण मन्त्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

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BISWANATH CHARIALI :: SONITPUR :: ASSAM, PIN - 784 176

## 1. SCOPE OF TEST

The scope of test was to check and assess the following:

### 1.1 Laboratory Test:

- Checking of specifications
- Hardness of soil engaging components.
- Wear analysis of critical components.
- Chemical analysis of critical components.

### 1.2 Field Test :

- Rate of work
- Quality of work
- Power requirement
- Labour requirement
- Ease of operation and adjustments
- Defects, Breakdowns & Repairs

## 2. METHOD OF SELECTION

The implement was directly submitted for test by the applicant at this Institute. Hence, the method of selection is not known.

## 3. TEST CODE AND PROCEDURE

The following codes were referred for testing of disc plough :

- |      |  |   |  |
|------|--|---|--|
| i)   | IS: 10233 - 1982<br>(Reaffirmed in Mar., 2009)         | : | Specification for Tractor Operated Disc Ploughs                                      |
| ii)  | IS: 4366 (Part 1 & 2): 1985<br>(Reaffirmed Feb., 2011) | : | Specification for Agricultural Tillage Discs: Part 1 Concave Type & Part 2 Flat Type |
| iii) | IS: 6288 - 1971<br>(Reaffirmed Mar., 2009)             | : | Test Code for Mould Board Plough   |
| iv)  | IS: 4468(Part-1) – 1997<br>(Reaffirmed in Feb., 2012)  | : | Specification of Three Point Linkage.  |

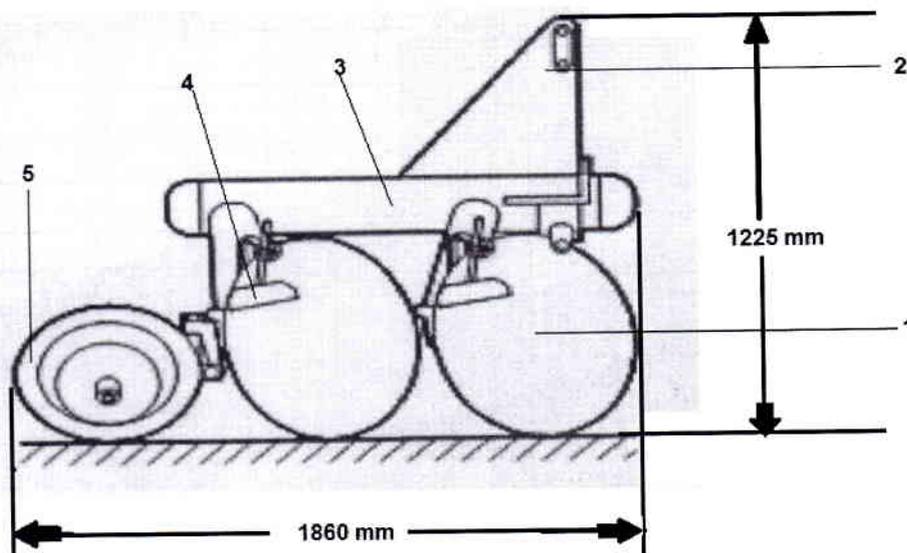
## 4. SPECIFICATION

### 4.1 General:

Name and address of the manufacturer : **M/s. Dasmesh Mechanical Works**  
Nabha-Malerkotla Road, Amargarh,  
Dist.: Sangrur (Pb.) – 148 022

Name & Address of Applicant	: <b>M/s. Dasmesh Mechanical Works</b> Nabha-Malerkotla Road, Amargarh, Dist.: Sangrur (Pb.) – 148 022
Make	: LANDFORCE
Model	: DDM-2
Type	: Tractor mounted , Disc Plough (2- Bottom)
Serial Number of machine	: 0215600122
Year of manufacture	: 2015- 2016
No. of plough Bottoms	: 02
Size of Plough (mm)	: 2 x 370 at 15° tilt angle
Country of origin	: India
Power Source as recommended	: Not recommended
Power source used during the test	: Swaraj 855 FE Tractor. (Specification given in <b>Annexure-II</b> )

#### 4.2 Constructional Details (Refer Fig.1) :



- |                 |                  |
|-----------------|------------------|
| 1. Disc         | 2. Hitch pyramid |
| 3. Main Frame   | 4. Scraper       |
| 5. Furrow wheel |                  |

**Fig.1: LANDFORCE DDM-2 DISC PLOUGH**

Sl. No.	Notation	Dimension (mm)		Wear (%)	
		Initial	Final	After 27.8 h	Per h
1	2	3	4	5	6
1	D1-D2 (front disc dia.)	660.4	658.5	0.28	0.01
2	D3-D4 (front disc dia.)	659.4	658.6	0.12	0.004
3	D1-D2 (Rear disc dia.)	663.4	661.2	0.33	0.01
4	D3-D4 (Rear disc dia.)	663.1	661.4	0.25	0.008
5	W1 ( Front bevel width)	14.1	13.7	2.83	0.10
6	W2 ( Front bevel width)	15.9	14.2	10.69	0.38
7	W3 ( Front bevel width)	14.3	13.1	8.39	0.30
8	W4 ( Front bevel width)	14.8	13.2	10.81	0.39
9	W1( Rear bevel width)	13.4	12.8	4.48	0.16
10	W2( Rear bevel width)	13.6	12.7	6.62	0.24
11	W3( Rear bevel width)	14.1	13.1	7.09	0.26
12	W4 ( Rear bevel width)	14.3	13.2	7.69	0.28
13	D1-D2 (furrow Wheel)	514.0	512	0.39	0.01
14	D3-D4 (furrow Wheel)	514.0	512	0.39	0.01
15	W1(furrow Wheel)	11.3	9.8	13.27	0.48
16	W2(furrow Wheel)	12.1	10.5	13.22	0.48
17	W3(furrow Wheel)	12.2	10.5	13.93	0.50
18	W4(furrow Wheel)	12.2	10.5	13.93	0.50

**Remarks:** The hourly percentage wear of discs and furrow wheel on dimensional basis was recorded as 0.004 to 0.50.

### **9. EASE OF OPERATION & ADJUSTMENTS**

- 9.1** The width of cut can be adjusted by rotating the cranks of cross bar
- 9.2** The tilt angle of disc can be adjusted by changing the slat provided on the disc flange holder. Total three adjustments are provided for these three slats. However the operator has to go down the tractor for this adjustment.

### **10. DEFECTS, BREAKDOWNS AND REPAIRS**

No breakdown was occurred during 27.8 h of field test of the disc plough.

### **11. SUMMARY OF OBSERVATIONS, COMMENTS AND RECOMMENDATIONS**

#### **11.1 Performance of the disc plough :**

##### **11.1.1 Rate of work :**

- a) The average area covered was recorded as 0.098 to 0.126 ha/h and the speed of operation vary from 2.50 to 2.61 kmph.
- b) The time required to cover one hectare was recorded as 7.9 to 10.2 h.

##### **11.1.2 Quality of work :**

- a) The depth of cut was recorded as 18 to 20 cm.
- b) Average working width was observed as 53 to 58 cm.
- c) Field efficiency was observed as 73 to 85%.

##### **11.1.3 Power requirement:**

The draft of implement was recorded from 597 to 685 kgf and power requirement was calculated as 4.2 to 4.9 kW.

**11.1.4 Labour requirement:**

One skilled operator was needed to operate the tractor with the implement.

**11.2** The specification of discs does not conform with IS: 4366-1985. Hence, it is recommended to look into at production level for standardization.

**11.3** The specification of disc plough does not conform to IS: 10233-1982. This should be looked into at future production level.

**11.4** The specification of hitch does not conform to IS: 4468 (Part-1)-1997. This should be modified according to the relevant IS for the effective weight transfer of the implements.

**11.5** The hardness of disc and furrow wheel were recorded as 36 and 22 HRC respectively against the requirements of 38-45 HRC as per IS: 4366 (Part-1 & 2)-1985. This should be looked into at future production level.

**11.6** The Chemical composition of discs and furrow wheel does not conform to relevant Indian Standards. This needs to be looked into for corrective action.

**11.7 Wear Assessment:**

The hourly rate of wear of the disc on mass and dimensional basis was recorded as 0.08 to 0.09% and 0.004 to 0.50% respectively. The hourly percentage of wear was considered normal.

**11.8 Labeling of the Implement:**

Labeling Plates are provided on the main frame. However, the information provided was insufficient as per the relevant codes. This should be looked into.

**11.9 Adequacy of Literature:**

An Operator cum Service Manual & Parts Catalogue was provided along with the implement during the course of testing. It is further recommended to bring out these manuals in Hindi and other vernacular languages as per IS: 8132-1999.

**TESTING AUTHORITY****S. G. PAWAR****AGRICULTURAL ENGINEER****J. J. R. NARWARE****DIRECTOR**

Test conducted and report compiled by -

Sh. K. Bora, Technical Assistant

**12. APPLICANT'S COMMENTS**

We agree with the report. As regard non-conformities, we will make the necessary changes in accordance to the relevant BIS Standards in next production line.