

**LANDFORCE, DCSS-9, SPRING LOADED NINE TYNE CULTIVATOR  
(Tractor Mounted)**



भारत सरकार  
GOVT OF INDIA

कृषि एवं किसान कल्याण मन्त्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि, सहकारिता एवं किसान कल्याण विभाग

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## 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 parts (Shovel)
- Chemical analysis of critical components (Shovel)
- Wear analysis of critical components (Shovel)

### 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 cultivator :

- |      |  |   |   |
|------|--|---|---|
| i)   | IS: 6638 – 1972 (Reaffirmed Feb.-2011)         | : | Specification for tractor mounted spring loaded cultivator.                                     |
| ii)  | IS: 7565 (Part-I): 1975 (Reaffirmed Mar. 2009) | : | Specification for Tines for Tractor operated cultivators: Part 1 Rigid tines                    |
| iii) | IS: 4468 (Part I): 1997 (Reaffirmed Feb. 2012) | : | Agricultural wheeled tractors – Rear-mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 |
| iv)  | IS: 3342:1998 (Reaffirmed Mar., 2009)          | : | Soil Working Equipment – Cultivators, Animal Drawn - Specification                              |

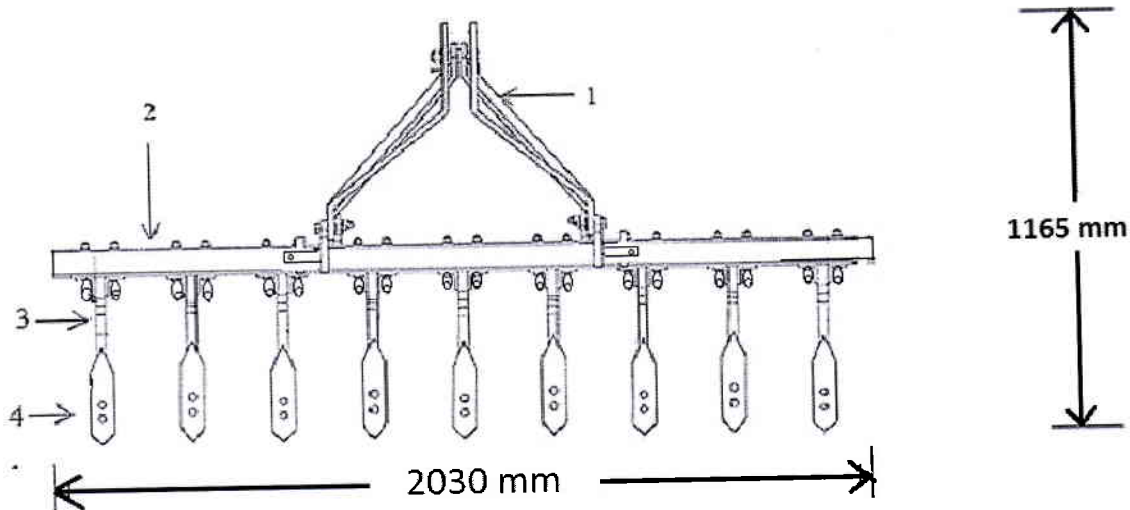
## 4. SPECIFICATION

### 4.1 General:

Name and address of the manufacturer : **M/s. Dasmesh Mechanical Works**  
Nabha-Malerkotla Road, Amargarh,  
Dist.: Sangrur (Pb.) – 148022

Name & Address of Applicant	: M/s. Dasmesh Mechanical Works Nabha-Malerkotla Road, Amargarh, Dist.: Sangrur (Pb.) – 148022
Make	: LANDFORCE
Model	: DCSS-9
Type	: Tractor Mounted
Serial Number of machine	: 0315600397
Year of manufacture	: 2015
Size of implement (mm)	: 9 x 235
Working width of implement (mm)	: 1845
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. Hitch pyramid | 3. Tyne   |
| 2. Mainframe     | 4. Shovel |

**Fig.1: LANDFORCE DCSS-9 SPRING LOADED NINE TYNE CULTIVATOR**

## 7.6.2 On dimension basis (Refer Fig. 4):

Sl. No	Notation	Dimension (mm)		Difference (mm)	Wear (%)	
		Initial	Final		After 27.8 h	Per h
1.	A	248.65	239.6	9.05	3.64	0.13
	B	60.95	57.9	3.05	5.00	0.18
	C	36.58	31.71	4.87	13.31	0.48
2.	A	248.47	240.2	8.27	3.33	0.12
	B	61.16	58.2	2.96	4.84	0.17
	C	37.36	33.59	3.77	10.09	0.36
3.	A	244.58	233.3	11.28	4.61	0.17
	B	61.47	58.2	3.27	5.32	0.19
	C	39.82	35.16	4.66	11.70	0.42
4.	A	248.10	239.1	9.00	3.63	0.13
	B	60.25	57.9	2.35	3.90	0.14
	C	36.57	33.44	3.13	8.56	0.31
5.	A	248.70	239.5	9.20	3.70	0.13
	B	59.47	57.55	1.92	3.23	0.12
	C	37.29	32.86	4.43	11.88	0.43
6.	A	250.34	237.7	12.64	5.05	0.18
	B	58.88	56.6	2.28	3.87	0.14
	C	36.05	29.53	6.52	18.09	0.65
7.	A	247.85	235.8	12.05	4.86	0.17
	B	60.27	57.4	2.87	4.76	0.17
	C	38.80	32.51	6.29	16.21	0.58
8.	A	248.15	241.3	6.85	2.76	0.10
	B	61.32	58.05	3.27	5.33	0.19
	C	40.60	33.12	7.48	18.42	0.66
9.	A	250.76	241.4	9.36	3.73	0.13
	B	59.54	56.80	2.74	4.60	0.17
	C	37.41	31.70	5.71	15.26	0.55

**Remarks:** The hourly percentage wear of reversible shovel on dimensional basis was recorded as 0.10 to 0.66.

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

No noticeable difficulty was observed during the operation and adjustment of cultivator.

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

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

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

#### **10.1 Performance of the cultivator :**

##### **10.1.1 Rate of work :**

- a) The average area covered as 0.942 to 1.013 ha/h at the speed of operation from 5.59 to 5.71 km/h, which is considered normal.
- b) The time required to cover one hectare area was recorded as 0.97 to 1.06 h.

**10.1.2 Quality of work :**

- a) The depth of cut was observed as 11 to 13 cm, which is considered normal for secondary tillage operations.
- b) Average working width was observed as 190 to 196 cm.
- c) Field efficiency was recorded as 86.4 to 93.7%.

**10.1.3 Power requirement:**

The draft of implement was recorded from 516 to 566 kgf and power requirement was calculated as 8.0 to 8.8 kW.

**10.1.4 Labour requirement:**

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

**10.2** The lower hitch point span only, does not conform with IS: 4468-1997 (Part-1) (Reaffirmed Feb., 2012). Hence, it is recommended to look into at production level for standardization.

**10.3** The specification of the reversible shovel and tyne does not conform to IS: 3342-1998(Reaffirmed Mar., 2009) and IS: 7565 (PART I) - 1975(Reaffirmed Mar., 2009) respectively. This should be improved and provided as per the requirement of Indian Standard..

**10.4** Chemical composition and hardness of shovel does not conform to relevant Indian Standards. This needs to be looked into for corrective action.

**10.5** The specification of springs for tractor mounted Spring loaded Cultivator, does not conform to IS: 6638 – 2006 (Reaffirmed Feb. 2011) This should be improved and provided as per the requirement of Indian Standard.

**10.6 Wear Assessment:**

The hourly rate of wear of the reversible shovel on mass and dimensional basis was recorded as 0.28 to 0.45% and 0.10 to 0.66% respectively. The hourly percentage of wear was considered on higher side. This should be looked into for corrective action.

**10.7** Provision was not made for adjustment of tyne spacing, which should be looked into for correction to suit different row spacing conditions.

**10.8** Most of the shovel fixing bolts were got stripped during dismantling, due to the use of inferior quality bolts. Therefore, it is recommended that fine threaded high tensile bolts with provision of both plain and spring washers should be used.

**10.9 Labeling of the Implement:**

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

**10.10 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. However, in respect of non-conformities, we will make the improvements in accordance to the relevant BIS Standards.