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व्यावसायिक परीक्षण रिपोर्ट  
COMMERCIAL TEST REPORT



संख्या / No.: Imp. 185/245  
माह / Month: February 2016



**LANDFORCE, ROTAVATOR, Model : DLRT-6 (Gear Drive)  
(Tractor Operated)**

FMTTI (NER), LIBRARY  
DATE: 20/2/16  
19.4.16



भारत सरकार  
GOVT OF INDIA

कृषि एवं किसान कल्याण मन्त्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि, सहकारिता एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE, COOPERATION AND FARMERS WELFARE

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

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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 (Rotavator blades)
- Chemical analysis of critical components (Rotavator blades)
- Wear analysis of critical components (Rotavator blades)

**1.2 Field Test :**

- Rate of work
- Quality of work
- Labour requirement
- Ease of operation, maintenance 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 PROCEDURE**

The following codes were referred for testing of Rotavator.

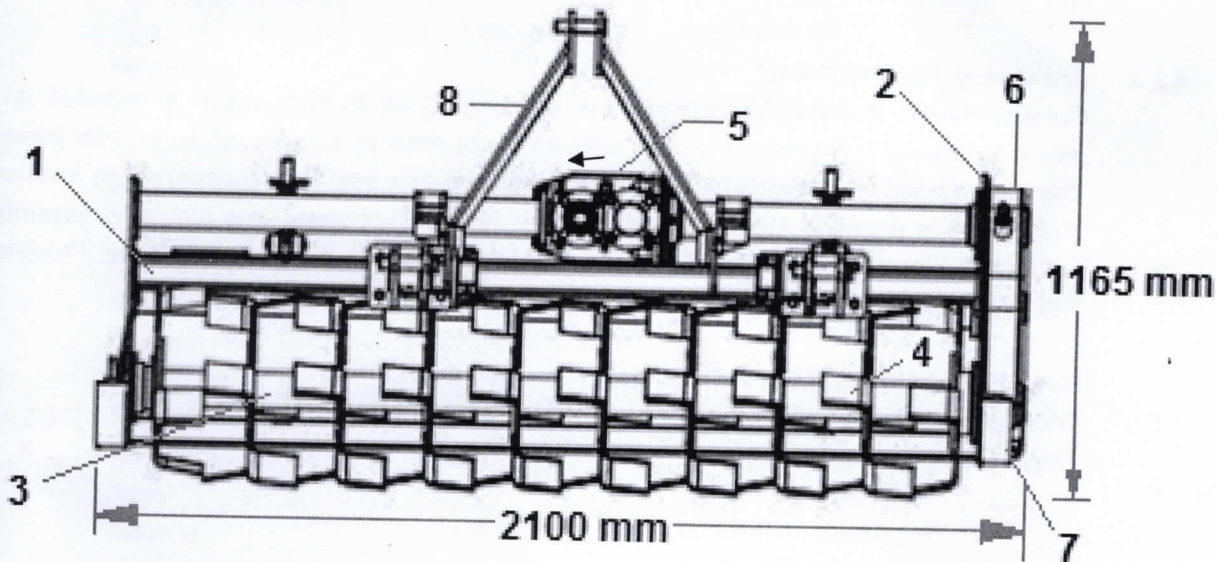
- |      |  |  |
|------|--|--|
| i)   | IS: 6690-1981<br>(Reaffirmed in 2002)            | : Specifications of blades for rotavator for power tillers         |
| ii)  | IS: 4931 – 1995<br>(Reaffirmed in December 1999) | : Agricultural tractors-Rear Mounted PTO shaft (Types 1, 2 & 3)    |
| iii) | IS: 4468 – 1997 (Part-1)<br>(Reaffirmed in 2012) | : Agricultural wheeled Tractors- Rear Mounted three point linkage. |
| iv)  | IS: 11531 – 2001                                 | : Test code for puddler  |

**4. SPECIFICATIONS****4.1 General:**

Name and address of the manufacturer	: <b>M/s. Dasmesh Mechanical Works</b> Nabha-Malerkotla Road, Amargarh, Dist.: Sangrur- 148022 (Punjab)
Name & Address of Applicant	: <b>M/s. Dasmesh Mechanical Works</b> Nabha-Malerkotla Road, Amargarh, Dist.: Sangrur- 148022 (Punjab)
Name of machine	: Landforce, Rotavator (Gear Drive) (Tractor Operated)
Make	: LANDFORCE
Model	: DLRT-6
Type	: Tractor Mounted
Serial Number of machine	: 051600803
Size	: 1680 x 430 $\Phi$
Year of manufacture	: 2015-16
Country of origin	: India

Power Source as recommended : Not recommend  
 Power source used during the test : John Deer-5310 & Swaraj 855 FE tractor  
 (Refer Annexure-III & IV)

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



#### KEYWORDS:

- |                |                                 |
|----------------|---------------------------------|
| 1. Mainframe   | 5. Primary reduction gear box   |
| 2. Side plate  | 6. Secondary reduction gear box |
| 3. Rotor shaft | 7. Skid                         |
| 4. Rotor blade | 8. Hitch pyramid                |

Fig.1: SCHEMATIC VIEW OF LANDFORCE (DLRT-6) ROTAVATOR

#### 4.2.1 Main Frame :

**Constructional Details :** It consisted of a square M.S. pipe of size 1790 x 50.09 x 50.09 mm welded with two size of cross member (plate) of size 480 x 116 x 5.0 mm and 478 x 116 x 4.62 in RHS and LHS respectively. One MS sheet was welded over the rotor unit on the frame (top cover) of size 1790 x 460 (curved) mm and 5.60 mm thick. One end of the M.S. hollow pipe of size 600 x 76.22 mm  $\Phi$  was fitted to the LHS plate. In the RHS of primary reduction gear box one more M.S. hollow pipe of size 800 x 76.11 mm  $\Phi$  was welded up to the RHS side plate.

Material : MS sheet, MS flat & MS hollow pipe  
 Dimensions of frame (mm) : 1800 x 455

#### 4.2.2 Side plates :

Number(s) : Two  
 Material : MS plate

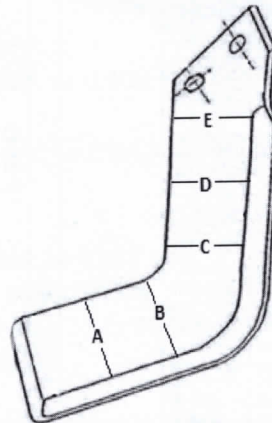


Fig 7 : DIMENSIONS FOR WEAR ANALYSIS

### 8. EASE OF OPERATION AND ADJUSTMENTS

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

### 9. DEFECTS, BREAKDOWNS AND REPAIRS

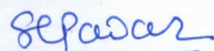
No breakdown was occurred during 41.6 h of field test of the Rotavator.

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

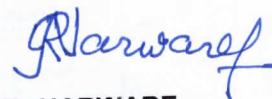
- 10.1 The dimensions of three point linkage (hitch pyramid) of the rotavator does not conform to Cat. I & Cat. II to IS: 4468-2012. This should be looked into for corrective action for standardization.
- 10.2 Dimensions of PIC and PIC yoke bore of implement do not conform to IS: 4931-1995 and therefore, it should be looked into for corrective action.
- 10.3 Chemical composition of rotor blades does not conform to IS: 6690-2002. The percentage of carbon and manganese content in composition of rotavator blade material was recorded as 0.291 and 1.281% respectively. The carbon content was on lower side and manganese content was on higher side when compared with the relevant Indian Standard. Moreover, the hardness of rotor blades also does not conform to relevant Indian Standard. It is therefore, recommended that the material of rotavator blade should be improved and provided as per requirement of Indian Standard.
- 10.4 The rate of work was recorded 0.406 to 0.602 ha/h at forward speed of 3.29 to 3.60 kmph in dry land operation.
- 10.5 The depth of operation in dry land operation was recorded as 6 to 7 cm with soil moisture content of 17 to 18 % in medium soil and considered on lower side for dry land operation. The depth of puddle was recorder as 19 to 26 cm which is considered as normal for wet land operation.
- 10.6 The hourly rate of wear of blade on mass basis in Wet land & Dry land operations was recorded as 0.02 to 0.07 % and 0.03 to 0.19 % respectively. The average wear of blade is considered as on higher side.

- 10.7 The hourly rate of wear of blade on dimensional basis in Wet land & Dry land operations was recorded as 0.02 to 0.22 % and 0.01 to 0.24 % respectively. The average wear of blade is considered as on higher side.
- 10.8 Size of implement and power requirement should also be indicated on the labeling plate.
- 10.9 Labeling plate is not provided with the implement. Hence, labeling plate along with the specifications such as - size of the implement, operating speed, make & model, sl. no., year of manufacture and power requirement are to be provided, during the commercial production of implement.
- 10.10 **Technical literature:**  
Only one page of leaflet is provided with the implement. Hence, it is recommended to provide Owner's manual/Operator's manual and Parts list with the implement to refer by the operator and field personnel.  
Also, it is recommended to bring out the 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

: Anshul Pandey, STA (Inst.)

**11. 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.