



**LANDFORCE ROTAVATOR, Model: DLRT-5
(Gear Drive) (Tractor Operated)**



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कृषि एवं किसान कल्याण मन्त्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि, सहकारिता एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE, COOPERATION AND FARMERS WELFARE

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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
- Ease of operation, maintenance and adjustments
- Labour requirement
- 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.

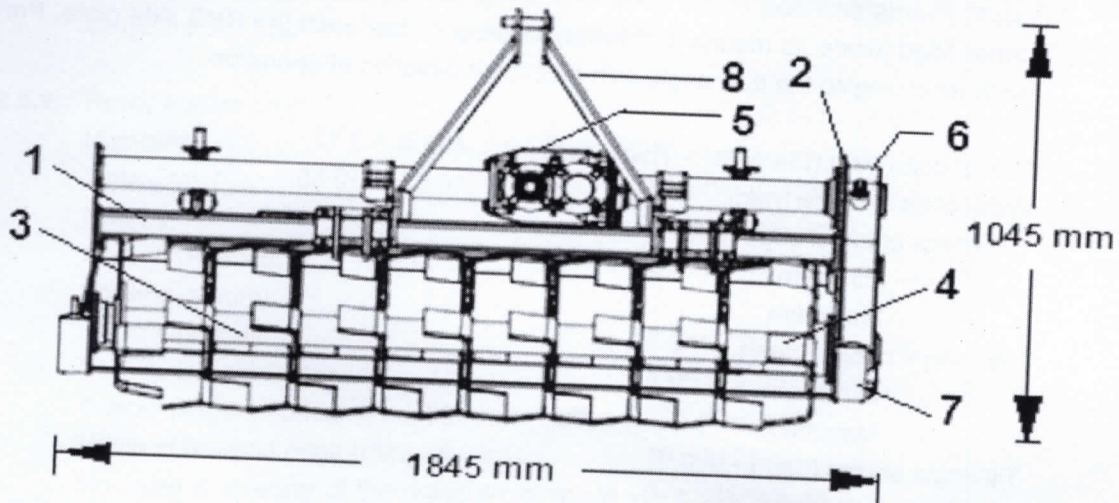
- | | |
|---|--|
| i) IS: 6690-1981
(Reaffirmed in 2002) | : Specifications of blades for rotavator for power tillers |
| ii) IS: 4931 – 1995
(Reaffirmed in December 1999) | : Agricultural tractors-Rear Mounted PTO shaft (Types 1, 2 & 3) |
| iii) IS: 4468 – 1997 (Part-1)
(Reaffirmed in 2012) | : Agricultural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

4. SPECIFICATIONS**4.1 General:**

- | | |
|--------------------------------------|--|
| Name and address of the manufacturer | : M/s. Dasmesh Mechanical Works
Nabha-Malerkotla Road, Amargarh,
Dist.: Sangrur- 148022 (Punjab) |
| Name & Address of Applicant | : M/s. Dasmesh Mechanical Works
Nabha-Malerkotla Road, Amargarh,
Dist.: Sangrur- 148022 (Punjab) |
| Name of machine | : Landforce, Rotavator (Gear Drive)
(Tractor Operated) |
| Make | : LANDFORCE |
| Model | : DLRT-5 |
| Type | : Tractor Mounted |
| Serial Number of machine | : 01151600789 |
| Size | : 1520 × 410 Φ |
| 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-5) ROTAVATOR**

4.2.1 Main Frame :

Constructional Details : It consisted of a square M.S. pipe of size 1625 x 50.1 x 50.1 mm welded with two size of cross member (MS plate) of size 480 x 107 x 5.1 mm and 480 x 105 x 5.0 mm in RHS and LHS respectively. One MS sheet was welded over the rotor unit on the frame (top cover) of size 1625 x 460 (curved) and 5.0 mm thick. One end of the M.S. hollow pipe of size 450 x 76.3 mm Φ was fitted to the LHS plate. In the RHS of primary reduction gear box one more M.S. hollow pipe of size 821 x 76.3 mm Φ was welded up to the RHS side plate.

Material	: MS sheet, MS flat & MS hollow pipe
Dimensions of frame(mm)	: 1625 x 460

4.2.2 Side plates :

Number(s)	: Two
Material	: MS plate
Dimensions (mm) :	
- LHS	: 613 x 480 x 8.0
- RHS	: 573 x 480 x 8.2

8. EASE OF OPERATION & ADJUSTMENTS

The operator can easily adjust and control the implement from operator's seat in the field as the adjustments are within the easy reach of operator. However the operator has to get down from the tractor in order to raise/lower the depth adjusting skids. No noticeable difficulty was observed during the operation and adjustment of Rotavator.

9. DEFECTS, BREAKDOWNS AND REPAIRS

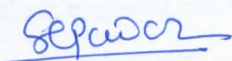
No breakdown was occurred during 40.8 h of wet land and dry land operation.

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 average area covered was recorded as 0.429 to 0.484 ha/h and the speed of operation vary from 3.56 to 3.77 kmph in dry land operation.
- 10.5 The depth of operation in dry land operation was recorded as 8 to 10 cm with soil moisture content of 22.5 to 24.5 % in medium soil and considered on lower side for dry land operation. The depth of puddle was recorded as 25 to 29 cm.
- 10.6 The hourly rate of wear of blade on mass basis in Wet land & Dry land operations was recorded as 0.01 to 0.07% and 0.10 to 0.21% 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 0.03 to 0.15 % and 0.06 to 0.27% 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 No ingress of mud and/or water was found in primary and secondary reduction boxes after 15.3 hr of wet land operations and the sealing provided on different subassemblies were found effective.

10.10 Technical literature:

An Operator cum Service Manual & Parts Catalogue was provided along with the machine 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

: Partha Lodh, TA and 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 Indian Standards.