

THIS TEST REPORT VALID UP TO : 30th June, 2029



**BORLAUG AGROSMART, 05 FT,
ROTARY TILLER (ROTAVATOR) TRACTOR MOUNTED**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि एवं किसान कल्याण विभाग

Department of Agriculture and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

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ROTAVATOR-367/2863/2022	BORLAUG AGROSMART, 05 FT, ROTARY TILLER, (ROTAVATOR) TRACTOR MOUNTED (COMMERCIAL)
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3.11 Lubricants:

Sr. No.	Particulars	As recommended by the manufacturer	As used during test
1	Primary Gear box	SAE-140	Oil originally filled in the rotavator was not changed
2	Secondary Gear box	SAE-140	
3	Rotor Hub	EP-140	EP-140
4	Propeller Shaft	Lithium base grease	Lithium base grease

4. RUNNING – IN

Rotavator was run in for 1.16 hour before field performance test.

5. LABORATORY TEST

5.1 Hardness: - The surface hardness of blade was recorded as under: -

Description	As per IS: 6690–1981 (HRC)	Hardness as observed (HRC)	Remarks
Edge portion	53 to 59	46.9 (Average)	Does not conform
On shank portion	37 to 45	46.3 (Average)	Does not conform

5.2 Chemical composition

The chemical composition of blades is tabulated as under:-

Constituents	As per IS: 6690–1981		Composition as observed (% of weight)	Remarks
	Carbon Steel	Silicon Manganese steel		
Carbon (C)	0.70 -0.85	0.50-0.60	0.196	Does not conform
Silicon (Si)	0.10 -0.40	1.50-2.00	0.814	Conforms
Manganese (Mn)	0.50 -1.0	0.50-1.00	0.779	Does not conform
Sulphur (S)	0.05(max)	0.05(max)	0.093	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.000	Conforms

6. FIELD PERFORMANCE TEST

The field tests of the rotavator comprising of dry land and wet land operation were conducted for 26.41 and 10.83 hours respectively to assess the performance test which is reported in **Annexure-I & II** for dry land and wet land operation respectively.

Observations of field performance test is summarized in the ensuing table:-

Summary of Field Performance Test

Sr. No.	Parameters/operations	Dry land operation	Wet land operation (Puddling)
I	II	III	IV
1.	Tractor used	John Deere-5036D	
2.	Gear used	L-1	L-1
3.	Type of soil	Sandy loam	
4.	Average soil moisture (%)	14.5 to 16.5	--
5.	Average depth of standing water (cm)	--	12.8 to 14.8
6.	Bulk density of soil (g/cc)	1.51 to 1.72	--
7.	Average speed of operation (kmph)	2.66 to 3.19	2.66 to 2.73
8.	Avg. travel reduction (%)	--	0.53 to 0.76
9.	Avg. wheel slip (%)	-1.84 to -2.87	--
10.	Average depth of puddle (cm)	--	16.2 to 16.8
11.	Average depth of cut (cm)	10.64 to 11.08	--
12.	Avg. effective width (cm)	130 to 133	--
13.	Area covered (ha/h)	0.277 to 0.366	--
14.	Time required for one ha (h)	2.73 to 3.61	--
15.	Field efficiency (%)	78.25 to 86.12	--
16.	Puddling index (%)	--	77.21 to 79.49
17.	Fuel consumption		
		l/h	4.40 to 5.15
		l/ha	13.73 to 18.05
18.	Avg. PTO power consumption, kW	11.99	--

6.1 Dry land operation

6.1.1 Rate of work

- i) The rate of work was recorded 0.277 to 0.366 ha/h, and the speed of operation varies from 2.66 to 3.19 kmph.
- ii) The time required to cover one hectare was recorded as 2.73 to 3.61 h

6.1.2 Quality of work

- i) The depth of operation was recorded as 10.64 to 11.08 cm.
- ii) Average effective width was observed as 130 to 133 cm.
- iii) Field efficiency was observed as 78.25 to 86.12 %.

6.2 Wet Land operation



6.2.1 Quality of work

- i) The depth of puddle was recorded as 16.2 to 16.8 cm.
- ii) The puddling index was recorded as 77.21 to 79.49 %.

12. COMMENTS AND RECOMMENDATIONS

- 12.1** The Dimension of three point linkage of implement does not conform, in toto, to the requirements of IS: 4468(Part-1)-1997 and therefore, it may be looked into for corrective action.
- 12.2** The hardness of blades does not conform, in toto, to the requirements of IS: 6690-1981. This needs to be looked into for corrective action.
- 12.3** The chemical composition of blades does not conform, in toto, to the requirements of IS: 6690-1981. This needs to be looked into for corrective action.
- 12.4** Provision against overload of Power take off drive shaft is not provided. It **MUST** be provided
- 12.5** The recommended PTO speed of prime mover is not specified on the labeling plate. It **MUST** be looked into.
- 12.6 Technical Literature:**
One booklet entitled "operator manual, service manual, part catalogue" was provided for reference during test. The same, however, needs to be updated as per IS:8132-1999.

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 30.06.2022

Test report compiled by Er. Dharmendra Kumar, Technical Assistant

13. APPLICANT'S COMMENTS

Para No.	Reference	Applicant's comments
13.1	12.1	The Dimension of three-point linkage will be taken care of in our regular production and our drawing will also be amended as per IS: 4468(Part-1)-1997.
13.2	12.2	Noted and will ensure that hardness of blades meet the requirements as per IS:6690-1981 in our regular production.
13.3	12.3	The chemical composition of blades will be taken care of in our regular production as per IS:6690-1981.
13.4	12.4	The overload protection/shear bolt will be incorporated in our regular production.
13.5	12.4	The label plate information will be updated with recommended PTO speed of prime mover.
13.6	12.6	Technical literature will be updated as per IS:8132-1999.