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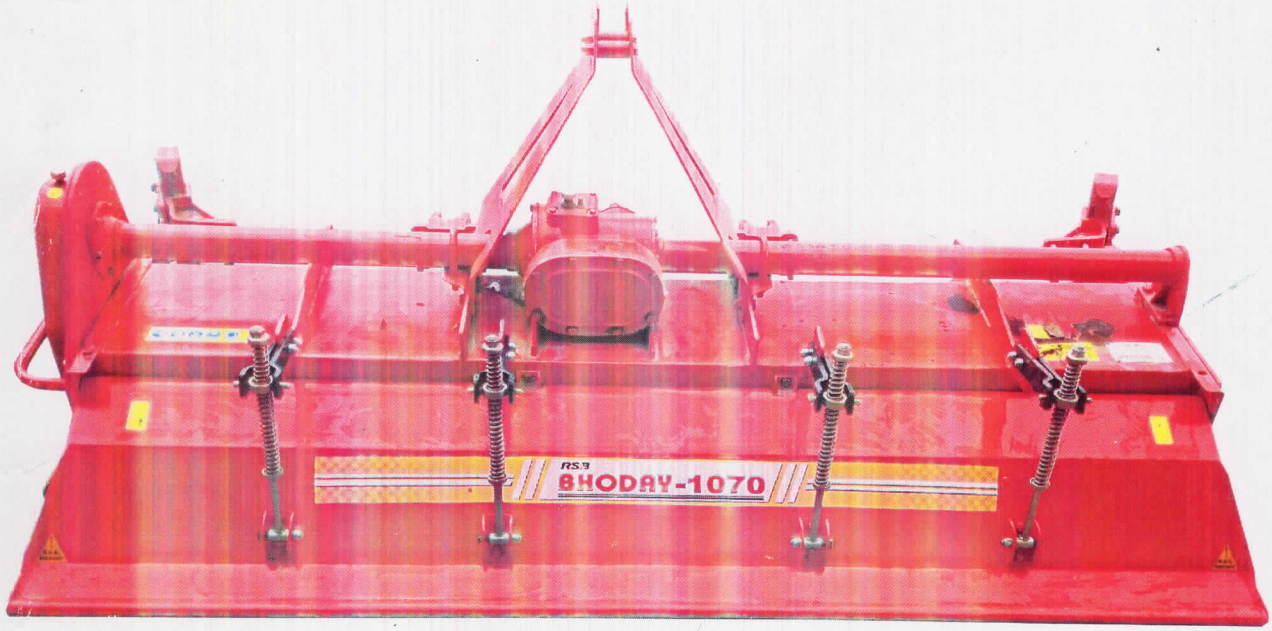
व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ **No.: IMP-1015/2357/2019**
माह/**Month : September, 2019**

THIS TEST REPORT VALID UP TO : 30st SEPTEMBER, 2026



R.S.B. AGRO BHODAY-1070 ROTAVATOR (TRACTOR MOUNTED)

सत्यमेव जयते
भारत सरकार
Government of India
कृषि एवं किसान कल्याण मंत्रालय
Ministry of Agriculture and Farmers Welfare
कृषि, सहकारिता एवं किसान कल्याण विभाग
Department of Agriculture, Cooperation and Farmers Welfare
उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
Northern Region Farm Machinery Training and Testing Institute
ट्रैक्टर नगर, सिरसा रोड, हिसार, (हरियाणा) - 125 001
Tractor Nagar, Sirsa Road, HISAR (Haryana)-125 001
[ISO 9001:2015 CERTIFIED]

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4.11 Lubricants:

Sl. No.	Particulars	As recommended by the manufacturer	As used during test
1	Primary Gear box	S. A. E 140	Oil originally filled in the machine was not changed
2	Secondary Gear box	**Not specified**	
3	Rotor Hub	**Not specified**	Servo M.P grease
4	Propeller Shaft	**Not specified**	Servo M.P grease

5. RUNNING – IN

Run in was not recommended by the applicant. However the Rotavator was run in for 0.58 hour before field performance test.

6. LABORATORY TEST

6.1 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	46.3 to 47.3	**Does not conform**
On shank portion	37 to 45	46.3 to 47.3	**Does not conform**

6.2 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	0.1736	**Does not conform**
Silicon (Si)	0.10 -0.40	1.50-2.00	0.3896	**Does not conform**
Manganese (Mn)	0.50 -1.0	0.50-1.00	1.4862	**Does not conform**
Sulphur (S)	0.05(max)	0.05(max)	0.0348	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.0354	Conforms

7. FIELD PERFORMANCE TEST

The field tests of the implement comprising of wet land and dry land operation were conducted for 11.08 and 27.21 hours respectively to assess the performance of the implement. The performance of implement is reported in **Annexure-I & III** for wet land and dry land operations respectively.

Observations of field performance test are summarized in the ensuing table:

Summary of Field Performance Test

Sl. No.	Parameters/operations	Wet land operation (Puddling)	Dry land operation
I	**II**	**III**	**IV**
1.	Tractor used	John Deere-5310 V2	
2.	Gear used	L-1	L-1
3.	Type of soil (Refer IS:7926-1975)	Sandy loam	
4.	Average soil moisture (%)	-	16.1 to 17.2
5.	Average depth of standing water (cm)	10.4 to 13.27	-
6.	Bulk density of soil (g/cc)	-	1.61 to 1.68
7.	Average speed of operation (kmph)	2.08 to 2.12	2.02 to 2.10
8.	Avg. travel reduction /Avg. wheel slip (%)	-4.77 to -1.26	-2.85 to -0.52
9.	Average depth of puddle/ Average depth of cut (cm)	8.3 to 9.0	10.0 to 11.11
10.	Avg. working width (cm)	-	217 to 240
11.	Area covered (ha/h)	-	0.366 to 0.407
12.	Time required for one ha (h)	-	2.46 to 2.73
13.	Field efficiency (%)	-	72.73 to 82.56
14.	Puddling index (%)	71.83 to 79.49	-
15.	Fuel consumption		
	l/h	4.20 to 5.29	7.17 to 8.64
	l/ha	-	18.94 to 22.85
16.	Average PTO power utilized (kW)	-	15.96

7.1 Wet Land operation

7.1.1 The tractor was fitted with half cage wheel on pneumatic tractor wheel for conduction the pudding operation. The brief specification of half cage wheel is given in **Annexure-II.**

7.1.2 Quality of work

i) The depth of puddle was recorded as 8.3 to 9.0 cm.

ii) The puddling index was recorded as 71.8 to 79.5%.

7.2 Dry land operation

7.2.1 Rate of work

i) The rate of work was recorded as 0.366 to 0.407 ha/h, and the speed of operation varies from 2.02 to 2.10 kmph.

ii) The time required to cover one hectare was recorded as 2.46 to 2.73 h.

7.2.2 Quality of work

i) The depth of operation was recorded as 10.0 to 11.1 cm.

ii) Average working width was observed as 217 to 240 cm.

iii) Field efficiency was observed as 72.7 to 82.6 %.

7.3 Labour requirement

In all, two skilled operators are needed to ensure continuous operation of machine for day long period.

7.4 Wear analysis (on mass basis)

Wear of hatchet blades (on mass basis) was measured and recorded in ensuing table:

6	Number of blades per flange	6 (Max.)	6 & 3	Conforms
7	Outer Diameter of rotor shaft, mm	75-90	90	Conforms
8	Rotor diameter, including flange and blade mounted on flange, mm	425 (Min.)	416	**Does not conform**
9	Side drive	Gear drive/Chain drive (Optional)	Gear drive	Conforms
10	Depth control mechanism	Arc shaped skid on both side of rotavator	Provided	Conforms
11	Material of blades	Boron 27/28/30 Mn (28MnCrB5)/High Carbon Steel of grade EN42/EN45/EN47	Carbon steel	--
12	Hardness of blade material, HRC	38 (Min.)	43.3 to 47.3	Conforms
13	Safety clutch/device (shear bolt) in PTO drive shaft	Must be provided	**Not provided**	**Does not conform**
14	Rotavator stand	Must be provided	Provided	Conforms
15	Guard over propeller shaft	Must be provided	Provided	Conforms
16	Sheet metal	AS36/IS 2062	--	--
17	Marking/labeling of machine	The labeling plate should be riveted on the body of machine having Name and address of manufacturer, County of origin, Make, Model, Year of manufacture, Serial number, Type, Size, required size of prime mover (kW)	Provided But without complete information	**Does not conform in toto**
18	Literature	Operator manual, service manual and parts catalogue should be provided	No literature supplied	**Does not conform**

12. COMMENTS AND RECOMMENDATIONS

12.1 No proper labeling plate is provided on machine. The labeling plate **MUST** be provided on machine with following information

-Make
-Model
-Year of Manufacturer
-Working width
-Recommended tractor power (kW)
-Manufacturer's address

12.2 The specifications of implement hitch, does not conform in toto to the 4468 (Part-1)-1997. Hence, it is recommended that implement should be provided with the hitch conforming to relevant Indian Standards.

12.3 Dimensions of PIC of implement do not conform in toto to IS: 4931-1995 and therefore, it should be looked in to for corrective action.

12.4 The chemical composition of blades does not conform to as per IS: 6690-1981. This needs to be looked into for corrective action at production level.

12.5 The safety device should be provided in propeller shaft against over load.

12.6 **Technical literature:-**

No literature was supplied with the rotavator during testing. The following literature should be developed and supplied with the rotavator.

i) Operator manual
ii) Spare parts catalogue
iii) Service manual

TESTING AUTHORITY

R. K. NEMA SENIOR AGRICULTURAL ENGINEER	
P. K. PANDEY **DIRECTOR**	

13. APPLICANT'S COMMENTS

No comments received from the applicant