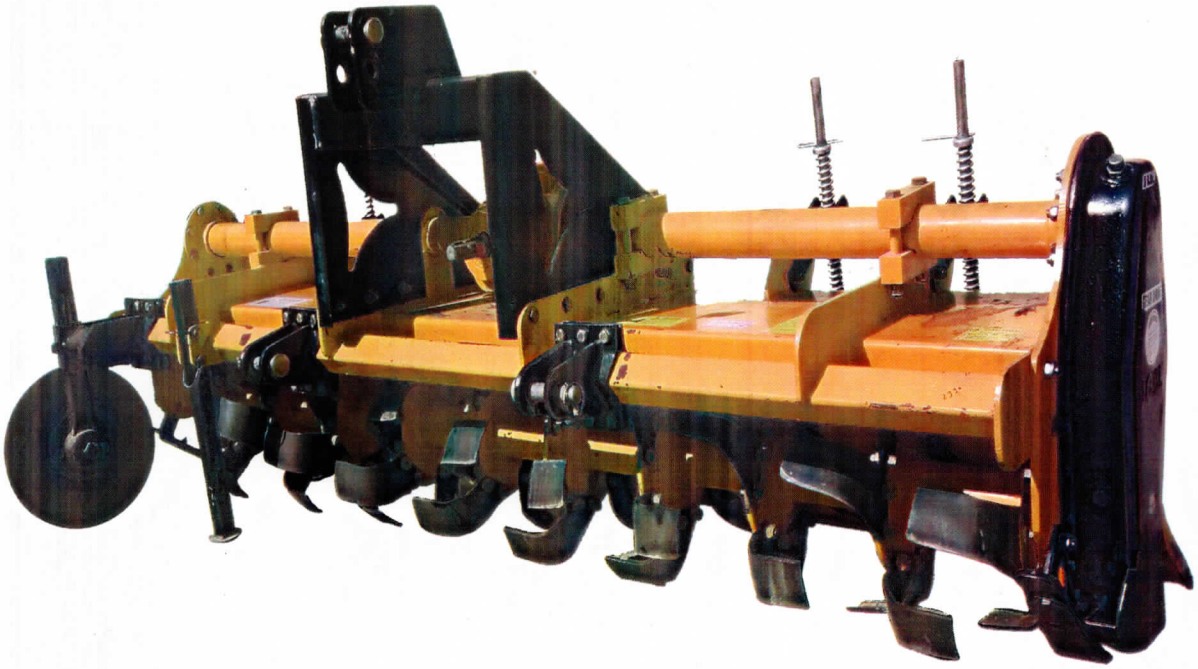
व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL **TEST REPORT**

संख्या/ **No.: ROTAVATOR-321/2613/2020**
माह/**Month: December, 2020**

THIS TEST REPORT VALID UP TO : 31st December, 2027



JCBL JCRT-08, 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
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[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	**Not specified**	Oil originally filled in the rotavator was not changed
2	Secondary Gear box	**Not specified**	
3	Rotor Hub	**Not specified**	M.P. Grease
4	Propeller Shaft	**Not specified**	

5. RUNNING – IN

Rotavator was run in for 1.15 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	44	**Does not conform**
On shank portion	37 to 45	44	Conforms

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	0.1633	**Does not conform**
Silicon (Si)	0.10 -0.40	1.50-2.00	0.4449	**Does not conform**
Manganese (Mn)	0.50 -1.0	0.50-1.00	1.0476	**Does not conform**
Sulphur (S)	0.05(max)	0.05(max)	0.0482	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.0343	Conforms

7. FIELD PERFORMANCE TEST

The field tests of the rotavator comprising of dry land and wet land operation were conducted for 27 and 11 hours respectively to assess the performance test 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

Sl. No.	Parameters/operations	Dry land operation	Wet land operation (Puddling)
I	II	III	IV
1.	Tractor used	Sonalika DI-750 III Power Plus	
2.	Gear used	L-1	L-1
3.	Type of soil	Sandy loam	
4.	Average soil moisture (%)	8.47 to 12.27	--
5.	Average depth of standing water (cm)	--	9.06 to 9.28
6.	Bulk density of soil (g/cc)	1.485 to 1.505	--
7.	Average speed of operation (kmph)	2.41 to 2.56	2.20 to 2.30
8.	Avg. travel reduction (%)	--	-2.4 to -0.30
9.	Avg. wheel slip (%)	-0.81 to -0.20	--
10.	Average depth of puddle (cm)	--	28.11 to 29.33
11.	Average depth of cut (cm)	10.40 to 10.89	--
12.	Avg. effective width (cm)	190 to 223	--
13.	Area covered (ha/h)	0.399 to 0.484	--
14.	Time required for one ha (h)	2.07 to 2.42	--
15.	Field efficiency (%)	81 to 87	--
16.	Puddling index (%)	--	77 to 83
17.	Fuel consumption		
	l/h	4.06 to 4.30	3.71 to 4.10
	l/ha	8.69 to 10.50	--

7.1 Dry land operation

7.1.1 Rate of work

i) The rate of work was recorded 0.399 to 0.484 ha/h, and the speed of operation varies from 2.41 to 2.56 kmph.

ii) The time required to cover one hectare was recorded as 2.07 to 2.42 h

7.1.2 Quality of work

i) The depth of operation was recorded as 10.40 to 10.89 cm.

ii) Average effective width was observed as 190 to 223 cm.

iii) Field efficiency was observed as 81 to 87 %.

7.2 Wet Land operation

7.2.1 The tractor was fitted with half cage wheel on rear pneumatic traction wheel for conducting the puddling operation. The brief specification of half cage wheel is given in Annexure-III

7.2.2 Quality of work

i) The depth of puddle was recorded as 28.11 to 29.33 cm.

ii) The puddling index was recorded as 77 to 83 %.

7.3 Labour requirement

In all, two skilled operators are needed to ensure continuous operation of rotavator 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:

Percentage wear of rotavator blades on mass basis

Sl. No.	Initial mass of blade (g)	Mass of blade after 38.8 hr. of operation (g)	Difference of weight (g)	Percentage of wear (%) after 38.8 hr.	Percentage of wear on hour basis (%)
1.	1032.7	1009.9	22.8	2.21	0.06
2.	1002.5	966.9	35.6	3.60	0.09
3.	1014.9	997.9	17	1.68	0.04
4.	1009.3	990.2	19.1	1.89	0.05
5.	1022.4	1006.2	16.2	1.58	0.04
6.	1000.6	985.2	15.4	1.54	0.04
7.	1044.9	1029.4	15.5	1.48	0.04
8.	1009.1	985.5	23.6	2.34	0.06
9.	1023.9	1001.0	22.9	2.24	0.06
10.	997.2	979.8	17.4	1.74	0.04

8. EFFECTIVENESS OF SEALINGS

After completion of wet land operation for 11 hours, the rotavator was dismantled for checking the effectiveness of sealing provided against ingress of dust, and water/mud in various sub-assemblies/components. The observations are given in ensuing table:-

Sl. No.	Location	Whether ingress of mud and/or water was observed (Yes/No)
1.	Primary reduction gear box	No
2.	Secondary reduction gear box	No
3.	Rotor assembly (hub)	No

9. EASE OF OPERATION & ADJUSTMENTS

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

10. DEFECTS, BREAKDOWN AND REPAIRS

No noticeable defect or breakdown was observed during the test.

11. CRITICAL TECHNICAL SPECIFICATION

Deferred till 31.03.2021 vide Ministry O.M. No 13-13/2020 M&T, (I&P) dated 22.12.2020.

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 Dimensions of PIC of implement does not conform, in toto, to the requirements of IS: 4931-1995 and therefore, it may be looked into for corrective action.

12.3 The Dimension of PIC yoke bore of implemented does not conform, in toto, the requirements of IS: 4931-1995 and therefore, it may be looked into for corrective action.

12.4 The grade of grease is not specified. It **MUST** be specified.

12.5 The grade of oil in primary reduction and secondary reduction is not specified. It **MUST** be specified.

12.6 The oil change period (h) of primary reduction & secondary reduction is not specified. It **MUST** be specified.

12.7 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.

12.8 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.

12.9 **Technical Literature:**

The following literature are provided with rotavator during the test

i) "Operator's manual and service manual"

ii) Spare parts catalogue

However, operator's manual and service manual needs to be updated as per IS:8132-1999.

TESTING AUTHORITY

SANJAY KUMAR AGRICULTURAL ENGINEER	
P. K. PANDEY **DIRECTOR**	

Draft test report compiled by Girdhari Lal, Technician

13. APPLICANT'S COMMENTS

No specific comment's received from the applicant.