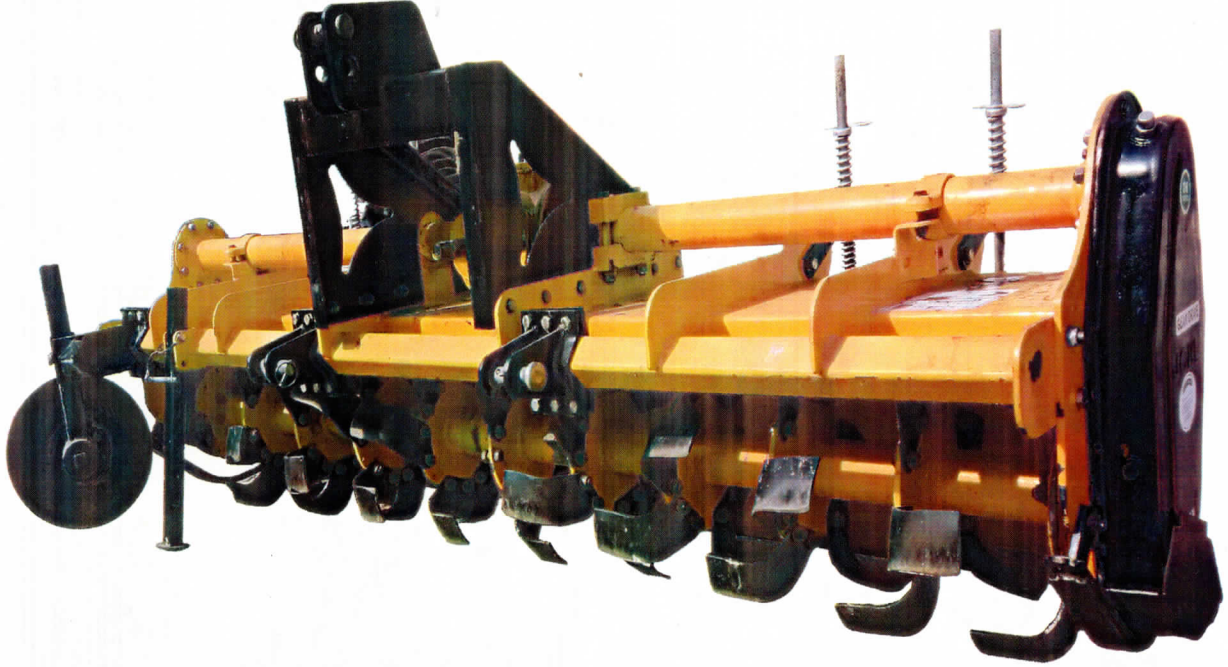


व्यावसायिक परीक्षण रिपोर्ट  
COMMERCIAL TEST REPORT

संख्या/ No.: ROTAVATOR-322/2614/2020  
माह/Month: December, 2020

**THIS TEST REPORT VALID UP TO : 31<sup>st</sup> December, 2027**



**JCBL JCRT - 9, ROTAVATOR  
(TRACTOR MOUNTED)**



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

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Tractor Nagar, Sirsa Road, HISAR (Haryana)-125 001

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<b>ROTAVATOR-322/2614/2020</b>	<b>JCBL JCRT – 9, ROTAVATOR (TRACTOR MOUNTED) (COMMERCIAL)</b>
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#### 4.11 Lubricants:

Sl. No.	Particulars	As recommended by the manufacturer	As used during test
1	Primary Gear box	<b>Not specified</b>	Oil originally filled in the rotavator was not changed
2	Secondary Gear box	<b>Not specified</b>	
3	Rotor Hub	<b>Not specified</b>	M.P. Grease
4	Propeller Shaft	<b>Not specified</b>	

#### 5. RUNNING – IN

Rotavator was run in for 1.38 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	45	<b>Does not conform</b>
On shank portion	37 to 45	45	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	0.1802	<b>Does not conform</b>
Silicon (Si)	0.10 -0.40	1.50-2.00	0.4764	<b>Does not conform</b>
Manganese (Mn)	0.50 -1.0	0.50-1.00	0.9882	Conforms
Sulphur (S)	0.05(max)	0.05(max)	0.0459	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.0313	Conforms

#### 7. FIELD PERFORMANCE TEST

The field tests of the rotavator comprising of dry land and wet land operation were conducted for 26 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	Escorts limited 60 F17	
2.	Gear used	M-1	M-1
3.	Type of soil	Sandy loam	
4.	Average soil moisture (%)	8.53 to 11.67	--
5.	Average depth of standing water (cm)	--	8.0 to 9.39
6.	Bulk density of soil (g/cc)	1.470 to 1.550	--
7.	Average speed of operation (kmph)	1.99 to 2.08	--
8.	Avg. travel reduction (%)	--	-4.03 to -1.03
9.	Avg. wheel slip (%)	-1.64 to 0.85	--
10.	Average depth of puddle (cm)	--	28.33 to 29.56
11.	Average depth of cut (cm)	10.33 to 10.56	--
12.	Avg. effective width (cm)	244 to 253	--
13.	Area covered (ha/h)	0.426 to 0.438	--
14.	Time required for one ha (h)	2.28 to 2.35	--
15.	Field efficiency (%)	85 to 87	--
16.	Puddling index (%)	--	87 to 88
17.	Fuel consumption		
		l/h	5.8 to 6.10
		l/ha	13.45 to 14.34

**7.1 Dry land operation****7.1.1 Rate of work**

- i) The rate of work was recorded 0.426 to 0.438 ha/h, and the speed of operation varies from 1.99 to 2.08 kmph.
- ii) The time required to cover one hectare was recorded as 2.28 to 2.35 h

**7.1.2 Quality of work**

- i) The depth of operation was recorded as 10.33 to 10.56 cm.
- ii) Average effective width was observed as 244 to 253 cm.
- iii) Field efficiency was observed as 85 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 28.33 to 29.56cm.
- ii) The puddling index was recorded as 87 to 88 %.

**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 37.87 hr. of operation (g)	Difference of weight (g)	Percentage of wear (%) after 37.87 hr.	Percentage of wear on hour basis (%)
1.	981.8	957.5	24.3	2.48	0.07
2.	1001.3	980.7	20.6	2.06	0.05
3.	1001.7	968.4	33.3	3.32	0.09
4.	1000.9	978.4	22.5	2.25	0.06
5.	1000.8	978.1	22.7	2.27	0.06
6.	993.0	978.6	14.4	1.45	0.04
7.	983.5	967.8	15.7	1.60	0.04
8.	996.8	977.3	19.5	1.96	0.05
9.	1018.4	994.1	24.3	2.39	0.06
10.	1007.4	986.4	21	2.08	0.05
11.	1026.2	1003.3	22.9	2.23	0.06

**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.

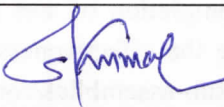
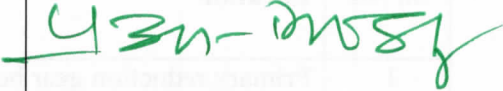
**11. CRITICAL TECHNICAL SPECIFICATION**

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 grade of oil in Primary reduction and Secondary reduction is not specified. It **MUST** be specified.
- 12.4 The grade of grease is not specified. It **MUST** be specified.
- 12.5 The oil change period (h) of primary reduction & secondary reduction is not specified. It **MUST** be specified.
- 12.6 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.
- 12.7 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.
- 12.8 **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.