

संख्या/ No.: ROTAVATOR-278/2517/2020

माह/ Month : September, 2020

COMMERCIAL TEST REPORT

THIS TEST REPORT VALID UP TO : 30th SEPTEMBER, 2027



SONALIKA, SLPSSJTR-6 ROTAVATOR (TRACTOR MOUNTED)



भारत सरकार

Government of India

कृषि एवं किसान कल्याण विभाग

Ministry of Agriculture and Farmers Welfare

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी परीक्षण एवं परीक्षण संस्थान

Northern Region Farm Machinery Training and Testing Institute

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The field tests of the rotavator comprising of Wet land and dry land operation were conducted for 12 and 27 hours respectively to assess the performance test is reported in Annexure-I & III for wet land and dry land operation respectively.
 Observations of field performance test is summarized in the ensuing table:-

7. FIELD PERFORMANCE TEST

Constituents	As per IS: 6690-1981		Remarks
	Carbon Steel	Silicon Manganese steel (% of weight)	
Carbon (C)	0.70-0.85	0.50-0.60	Does not conform
Silicon (Si)	0.10-0.40	1.50-2.00	Conforms to carbon steel
Manganese (Mn)	0.50-1.0	0.50-1.00	Does not conform
Sulphur (S)	0.05(max)	0.05(max)	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	Conforms

The chemical composition of blades is tabulated as under:-

6.2 Chemical composition

Description	As per IS: 6690:1981 (HRC)	Hardness as observed (HRC)	Remarks
Edge portion	53 to 59	47.2	Does not conform
On shank portion	37 to 45	43.6	Conforms

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

6. LABORATORY TEST

Rotavator was run in for 1.42 hour before field performance test.

5. RUNNING - IN

Sl. No.	Particulars	As recommended by the manufacturer	As used during test
1	Primary Gear box	EP-140	Oil originally filled in the rotavator was not changed
2	Secondary Gear box	EP-140	
3	Rotor Hub	EP-140	
4	Propeller Shaft	Not specified	M.P. Grease

4.11 Lubricants:

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Summary of Field Performance Test

Sl. No.	Parameters/operations	Wet land operation (Puddling)	Dry land operation
I	II	III	IV
1.	Tractor used	Eicher 485 USJ	
2.	Gear used	L-1	L-2
3.	Type of soil	Sandy loam	
4.	Average soil moisture (%)	--	19 to 21
5.	Average depth of standing water (cm)	12.4 to 13.2	--
6.	Bulk density of soil (g/cc)	--	1.63 to 1.69
7.	Average speed of operation (kmph)	2.62 to 2.65	4.13 to 4.31
8.	Avg. travel reduction (%)	-0.72 to 0.36	--
9.	Avg. wheel slip (%)	--	-0.77 to -3.78
10.	Average depth of puddle (cm)	17.0 to 19.0	--
11.	Average depth of cut (cm)	--	7.6 to 8.5
12.	Avg. effective width (cm)	--	160 to 178
13.	Area covered (ha/h)	--	0.513 to 0.69
14.	Time required for one ha (h)	--	1.49 to 1.95
15.	Field efficiency (%)	--	76 to 89
16.	Puddling index (%)	76 to 3.37	--
17.	Fuel consumption	3.01 to 3.37	6.00 to 7.10
		l/ha	10.16 to 11.80
18.	Average PTO power utilized (kW)	--	NR

- 7.1 Wet Land operation**
- 7.1.1 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-II
- 7.1.2 **Quality of work**
- i) The depth of puddle was recorded as 17.0 to 19.0 cm.
- ii) The puddling index was recorded as 76 to 81 %.
- 7.2 **Dry land operation**
- 7.2.1 **Rate of work**
- i) The rate of work was recorded as 0.513 to 0.669 ha/h, and the speed of operation varies from 4.13 to 4.31 kmph.
- ii) The time required to cover one hectare was recorded as 1.49 to 1.95 h
- 7.2.2 **Quality of work**
- i) The depth of operation was recorded as 7.6 to 8.5 cm.
- ii) Average effective width was observed as 160 to 178cm.
- iii) Field efficiency was observed as 76 to 89 %.



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 40 hr. of operation (g)	Difference of weight (g)	Percentage of wear (%) after 40 hr.	Percentage of wear on hour basis (%)
1.	532.7	504.5	28.2	5.29	0.13
2.	526.8	506.1	20.7	3.93	0.10
3.	513.5	494.6	18.9	3.68	0.09
4.	514.3	489.1	25.2	4.90	0.12
5.	519.3	498.9	20.4	3.93	0.10
6.	524.5	504.5	20.0	3.81	0.10
7.	508.3	488.9	19.4	3.82	0.10
8.	507.0	486.6	20.4	4.02	0.10
9.	514.2	487.2	27.2	5.29	0.13
10.	511.6	486.1	25.5	4.98	0.12
11.	520.6	492.1	28.5	5.47	0.14
12.	522.8	500.7	22.1	4.23	0.11

8. EFFECTIVENESS OF SEALINGS
After completion of wet land operation for 12 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 31.12.2020 vide Ministry O.M. No 13-13/2020 M&T, (I&P) dated 24.04.2020





Para No.	Our reference	Applicant comments
13.1	12.1	We will take care the same in our regular production/vendor end.
13.2	12.2	The dimension of PIC of implement will be improve at vnder/production end as pre IS: 4931-1995.
13.3	12.3	The chemical composition of blades will be improve at vnder/production end as pre IS: 6690-1981.
13.4	12.4	The hardness of blades will be improve at vnder/production end as pre IS: 6690-1981.
13.5	12.5	Technical literature will be updated as per IS: 8132-1999.

13. APPLICANT'S COMMENTS

Test Report is compiled by C.Veeranjaneyulu, Senior Technician

P. K. PANDEY DIRECTOR	
RINKU PRASAD GUPTA TECHNICAL ASSISTANT	

TESTING AUTHORITY

One booklet entitled "Service, Operating & Maintenance Manual cum Spare parts Catalogue with Warranty Card" was provided for reference during test. The same, however, needs to be updated as per IS-8132-1999.

- 12.5 Technical literature:-
to be looked into for corrective action
- 12.4 The hardness of blades does not conform, to the requirements of IS: 6690-1981. This needs 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: requirements of IS: 4931-1995 and therefore, it may be looked into for corrective action.
- 12.2 The Dimensions of PIC of implement and PIC yoke bore does not conform, in toto, to the action requirements of IS: 4468(Part-1)-1997 and therefore, it may be looked into for corrective
- 12.1 The Dimension of three point linkage of implement does not conform, in toto, to the

12. COMMENTS AND RECOMMENDATIONS

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