

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: IMP-1005/2339/2019

माह/Month : July, 2019

THIS TEST REPORT VALID UP TO : 31st JULY, 2026



**ESCORTS, FPJSMG-185 FARMPower
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]

Website: <http://nrfmtti.gov.in/>

E-mail: fmti-nr@nic.in

Tele./FAX: 01662-276984

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	S. A. E 140	
3	Rotor Hub	Servo AP3 Grease	As per recommended
4	Propeller Shaft	Servo AP3 Grease	As per recommended

5. RUNNING – IN

Run in was not recommended by the applicant. However the Rotavator was run in for 1.33 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	47.4 to 49.2	Does not conform
On shank portion	37 to 45	47.4 to 49.2	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	0.2700	Does not conform
Silicon (Si)	0.10 -0.40	1.50-2.00	0.3270	Does not conform
Manganese (Mn)	0.50 -1.0	0.50-1.00	1.1832	Does not conform
Sulphur (S)	0.05(max)	0.05(max)	0.0162	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.0351	Conforms

7. FIELD PERFORMANCE TEST

The field tests of the implement comprising of wet land and dry land operation were conducted for 11.12 and 27.80 hours respectively to assess the performance of the implement. The performance of implement is reported in **Annexure-I & II** for wet land and dry land operations respectively.

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

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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	Powertrac Euro-50	
2.	Gear used	L-1	L-2
3.	Type of soil (Refer IS:7926-1975)	Sandy loam	
4.	Average soil moisture (%)	-	8.5 to 16.6
5.	Average depth of standing water (cm)	10.7 to 15.7	-
6.	Bulk density of soil (g/cc)	-	1.50 to 1.63
7.	Average speed of operation (kmph)	1.99 to 2.15	3.34 to 3.48
8.	Avg. travel reduction /Avg. wheel slip (%)	-1.65 to -0.27	-2.67 to -1.33
9.	Average depth of puddle/ Average depth of cut (cm)	8.6 to 8.8	8.3 to 9.2
10.	Avg. working width (cm)	-	183 to 193
11.	Area covered (ha/h)	-	0.481 to 0.577
12.	Time required for one ha (h)	-	1.73 to 2.08
13.	Field efficiency (%)	-	73.4 to 92.0
14.	Puddling index (%)	75 to 80	-
15.	Fuel consumption		
	l/h	3.43 to 4.19	5.42 to 6.08
	l/ha	-	9.39 to 12.20
16.	Average PTO power utilized (kW)	-	15.6

7.1 Wet Land operation

7.1.1 Quality of work

- The depth of puddle was recorded as 8.6 to 8.8 cm.
- The puddling index was recorded as 75 to 80%.

7.2 Dry land operation

7.2.1 Rate of work

- The rate of work was recorded as 0.481 to 0.577 ha/h and the speed of operation varies from 3.34 to 3.48 kmph.
- The time required to cover one hectare was recorded as 1.73 to 2.08 h.

7.2.2 Quality of work

- The depth of operation was recorded as 8.3 to 9.2 cm.
- Average working width was observed as 183 to 198 cm.
- Field efficiency was observed as 73.4 to 92.0 %.

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:

5	No. of blades	30 (Min.)	72	Conforms
6	Total number of flanges	5 (Min.)	12	Conforms
7	Number of blades per flange	6 (Max.)	06	Conforms
8	Outer Diameter of rotor shaft, mm	75-90	90	Conforms
9	Rotor diameter, including flange and blade mounted on flange, mm	425 (Min.)	500	Conforms
10	Side drive	Gear drive	Gear drive	Conforms
11	Depth control mechanism	Arc shaped skid on both side of rotavator	Provided	Conforms
12	Material of blades	Boron (28MnCrB5)/High Carbon Steel EN42j	High carbon steel	Conforms
13	Hardness of blade material, HRC	38 (Min.)	47.4 to 49.2	Conforms
14	Safety clutch/device (shear bolt) in PTO drive shaft	Must be provided	Provided	Conforms
15	Rotavator stand	Must be provided	Not provided	Does not Conform
16	Guard over propeller shaft	Must be provided	Provided	Conforms
17	Sheet metal	AS36/IS 2062	--	--
18	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	Conforms
19	Literature	Operator manual, service manual and parts catalogue should be provided	Provided	Conforms

12. COMMENTS AND RECOMMENDATIONS

- 12.1** 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.
- 12.2** 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.

- 12.3 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.
- 12.4 The Rotavator stand should be provided with rotavator.
- 12.5 **Technical literature:-**
A booklet, named operator cum service manual with part catalogue was provided for reference during testing. However, the operator cum service manual needs to be update as per IS:8132.1999

TESTING AUTHORITY

R. K. NEMA SENIOR AGRICULTURAL ENGINEER	<i>Ren</i>
P. K. PANDEY DIRECTOR	<i>Libu-mish</i>

13. APPLICANT'S COMMENTS

Para No	Our reference	Applicant's comments
13.1	12.1	We will take care.
13.2	12.2	We will take care to achieve standard dimensions.
13.3	12.3	Will be implemented as per requirement.
13.4	12.4	Provided and is also part of standard product supply to the end customer.
13.5	12.5	We will take care.