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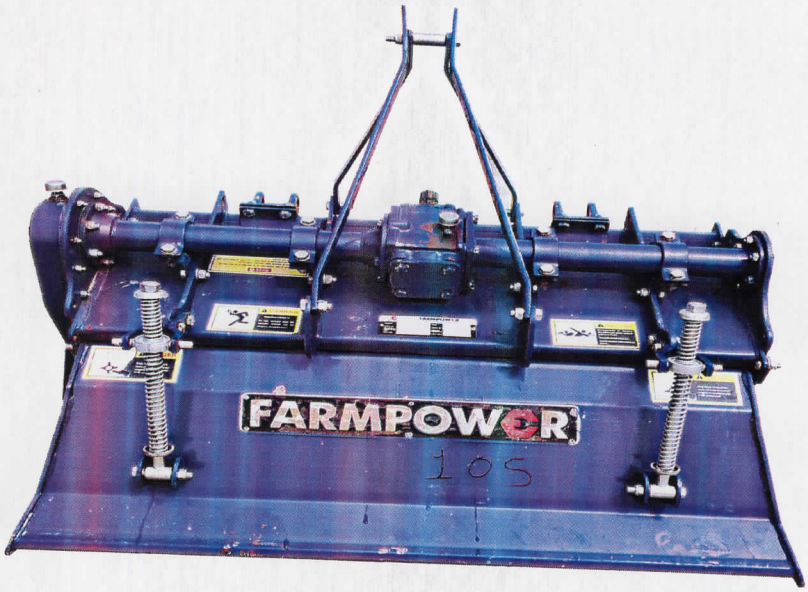
व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: IMP-1004/2338/2019

माह/Month : July, 2019

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



ESCORTS, FPCSSG-105, 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

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4.11 Lubricants:

Sl. No.	Particulars	As recommended by the manufacturer	As used during test
1	Primary Gear box	SAE140	Oil originally filled in the machine was not changed
2	Secondary Gear box	SAE140	
3	Rotor Hub	Servo AP3 Grease	As per recommended
4	Propeller Shaft	Servo AP3 Grease	As per recommended

5. RUNNING – IN

Not recommended by the manufacturer.

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	50.0 to 54.2	**Does not conform**
On shank portion	37 to 45	50.0 to 54.2	**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	0.3491	**Does not conform**
Silicon (Si)	0.10 -0.40	1.50-2.00	0.3101	**Does not conform**
Manganese (Mn)	0.50 -1.0	0.50-1.00	1.2150	**Does not conform**
Sulphur (S)	0.05(max)	0.05(max)	0.0210	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.0425	Conforms

7. FIELD PERFORMANCE TEST

The field tests of the implement comprising of dry land operation was conducted for 37.84 hours respectively to assess the performance of the implement. The performance of implement is reported in **Annexure-I** for dry land operations respectively.
Observations of field performance test are summarized in the ensuing table:

Summary of Field Performance Test

Sl. No.	Parameters/operations	Dry land operation
I	II	III
1.	Tractor used	Mahindra Yuvraj-215
2.	Gear used	L-2
3.	Type of soil (Refer IS:7926-1975)	Sandy loam
4.	Average soil moisture (%)	6.7 to15.0
5.	Bulk density of soil (g/cc)	1.66 to 1.89
6.	Average speed of operation (kmph)	2.84 to 3.20
7.	Avg. wheel slip (%)	0.70 to 7.61
8.	Average depth of cut (cm)	8.8 to 10.6
9.	Avg. working width (cm)	106 to 117
10.	Area covered (ha/h)	0.272 to 0.325
11.	Time required for one ha (h)	3.07 to 3.68
12.	Field efficiency (%)	80.9 to 90.6
13.	Fuel consumption	
	l/h	1.54 to 2.18
	l/ha	5.47 to 7.52
14.	Average PTO power utilized (kW)	NR

7.1 Dry land operation

7.1.1 Rate of work

i) The rate of work was recorded as 0.272 to 0.325 ha/h and the speed of operation varies from 2.84 to 3.20 kmph.

ii) The time required to cover one hectare was recorded as 3.07 to 3.68 h.

7.1.2 Quality of work

i) The depth of operation was recorded as 8.8 to 10.6 cm.

ii) Average working width was observed as 106 to 117 cm.

iii) Field efficiency was observed as 80.9 to 90.6 %.

7.2 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:

Percentage wear of rotavator blades on mass basis:

Sl. No.	Initial mass of blade (g)	Mass of blade after 37.84 hr. of operation (g)	Difference of weight (g)	Percentage of wear (%) after 37.84 hr.	Percentage of wear on hour basis (%)
1.	779.6	771.6	8.00	1.03	0.03
2.	782.4	774.0	8.40	1.07	0.03
3.	779.2	770.0	9.20	1.18	0.03
4.	784.2	772.7	11.50	1.47	0.04
5.	788.8	772.5	16.30	2.07	0.05

19	Literature	Operator manual, service manual and parts catalogue should be provided	Provided	Conforms

11. COMMENTS AND RECOMMENDATIONS

11.1 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.

11.2 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.

11.3 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.

11.4 Safety guard on P.T.O. drive shaft is not provided. It **MUST** be looked into.

11.5 The working width of rotavator does not conform to the requirement of Critical Technical Specifications. It **MUST** be looked into.

11.6 The number of blade does not meet the requirement of Critical Technical Specifications. It **MUST** be looked into.

11.7 The outer diameter of rotor shaft does not meet the requirement of Critical Technical Specifications. It **MUST** be looked into.

11.8 The rotor diameter with blade does not meet the requirement of Critical Technical Specifications. It **MUST** be looked into.

11.9 **Technical Literature-**

A booklet named operator cum service manual with parts catalogue was provided for reference doing testing. However, the operator cum service manual needs to be update as per IS: 8132-1999.

TESTING AUTHORITI

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

12. APPLICANT'S COMMENTS

Para No	Our reference	Applicant's comments
12.1	11.1	We will take care.
12.2	11.2	We will take care to achieve standard dimensions.
12.3	11.3	Will be implemented as per requirement.
12.4	11.4	Will take care in future supplies.
12.5	11.5	We will take care.