व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या / **No. : IMP-642/1573**
माह / **Month: January, 2014**

ROTAVATOR
'MSW R-7'

सत्यमेव जयते

भारत सरकार
कृषि मंत्रालय
(कृषि एवं सहकारिता विभाग)

उत्तरी क्षेत्र कृषि यन्त्र प्रशिक्षण एवं परीक्षण संस्थान
सत्यमेव जयते
पुस्तकालय
हिसार

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(DEPARTMENT OF AGRICULTURE & COOPEARATION)

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
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4.8.6 Safety clutch/device : Not Provided
4.9 Rotavator Stand : Not provided
4.10 Furrow wheel / side disc : Provided

4.11 **Overall Dimensions, mm** (Ref. Fig.5)
Length : 1255
Width : 2315
Height : 900
Mass, kg : 518

5. **LABORATORY TEST**

Material analysis: The hardness and chemical analysis with respect to critical components are given in Table-1 & 2 respectively.

5.1 The hardness of blades was determined at edge and shank portion. The results of hardness test are tabulated in Table-I.

TABLE-1 : Blade Hardness

S. No.	Portion of blade	Hardness (HRC)		Remark
		As per IS :6690-Jan. (2007)	As observed	
1	On Edge portion	53 to 59	45	**Does not conform**
2	On shank portion	37 to 45	35	**Does not conform**

5.2 **Chemical composition**

TABLE-2 : Chemical composition of primary elements

Sl. No.	Material	Requirement as per IS:6690-Jan. 2007 (% by weight)	As observed (% by weight)	Remark
1.	Carbon (C)	0.50 to 0.60	0.15	**Does not conform**
2.	Silicon(Si)	1.50 to 2.00	0.45	**Does not conform**
3.	Manganese (Mn)	0.50 to 1.00	1.37	**Does not conform**
4.	Phosphorous (P)	0.05 (Max)	0.036	Conforms
5.	Sulphur (S)	0.05 (Max)	0.022	Conforms

6. **FIELD TEST**

The field tests of the implement comprising of dry and wet land operations were conducted for 20.183 & 15.147 hours respectively at different soil moisture

conditions to assess the performance of the implement. The details of tractor used for field operations are given in Annexure-I.

The tractor pto speed was observed at 540 rpm at 1750 rpm of tractor. The performance of implement is reported in Annexure-II and summarized in Table-3.

TABLE-3 : Summary of field performance

Sl.No.	Parameters	Dry land operation	Wet land operation (puddling)
i)	Tractor used	International Sonalika 750 DI	
ii)	Type of soil	Clay loam	
iii)	Av. Soil moisture, %	13.9 to 19.0	-
iv)	Depth of standing water, cm	-	7.4 to 11.0
v)	Field efficiency, %	79.24 to 89.34	-
vi)	Puddling Index, %	-	61.11 to 74.88
vii)	Av. Speed of operation, kmph	2.16 to 2.78	2.34 to 2.83
viii)	Av. Depth of cut, cm	10.48 to 11.45	-
ix)	Av. depth of puddle, cm	-	10.20 to 12.92
x)	Av. Working width, m	2.168 to 2.194	-
xi)	Area covered, ha/h	0.419 to 0.523	-
xii)	Time required for one hectare, h	1.913 to 2.382	-
xiii)	Fuel consumption	17.8 to 24.0 (Avg. 21.9)	
	- l/h	5.079 to 6.081	5.033 to 5.507
	- l/ha	10.145 to 13.406	-
xiv)	A pto power required, kW	17.8 to 24.0 (Avg. 21.9)	-

6.1 Rate of Work

6.1.1 Dry land operation

-The rate of work in clay loam soil was recorded as 0.419 to 0.523 ha/h and the speed of operation as 2.16 to 2.78 kmph.

-The time required to cover one hectare area was recorded as 1.913 to 2.382 h.

6.1.2 Wet land operation

- Speed of operation varied from 2.34 to 2.83 kmph.

6.2 Quality of work

6.2.1 Dry land operation

-The depth of operation was recorded as 10.48 to 11.45 cm.

-The field efficiency was recorded as 79.24 to 89.34%.

2.	Secondary reduction gear drive	No
3.	Hub of rotor assembly	No

8. EASE OF OPERATION, ADJUSTMENTS & SAFETY

8.1 Neither the implement nor the drive shaft (universal coupling shaft) is provided.

8.2 Depth adjustment can be made by raising or lowering the skids.

8.3 Operator has to get down from tractor for making adjustment in rotavator

8.4 Rotavator furrow wheels are provided

9. SOUNDNESS OF CONSTRUCTION

No breakdown occurred during 35.33 hrs operation in the field.

10. COMMENTS & RECOMMENDATIONS

10.1 Dimensions of three point linkage system are not conforming to the requirements of IS:4468 Part-I-March 2007. This should be looked into at regular production level.

10.2 Dimensions of power input shaft are not conforming to the requirements of IS: 4931-Oct. 2004. Necessary improvements are required at regular production level.

10.3 Manoeuvering of tractor with Rotavator and quality of work were observed satisfactory.

10.4 The hardness at edge & shank of the blade are 45.0 HRC & 35.0 HRC as against the required hardness of 56±3 & 41±4 as per IS:6690-Jan, 2007 . This should be looked into at regular production level.

10.5 The percentage wear of hatchet blades on mass basis after field operation of 35.33 hr, ranged from 2.70 to 6.88% which is normal.

10.6 The percentage wear of hatchet blades on dimensional basis at edge & 65 mm from edge of blade after field operation of 35.33 hrs., ranged from 7.48 to 15.52% & 6.16 to 10.37% respectively.

10.7 The pto power requirement of tractor ranged from 17.8 to 24.0 (Avg. 21.9) kW as against the tractor power of 33.5 kW. Hence, 53.13 to 71.64 % of maximum tractor pto power was utilized during the dry land operation.

10.8 Safety clutch not provided with propeller shaft.

10.9 Chemical composition of rotavator blade is not meeting the requirement of IS: 6690-Jan, 2007 & therefore the blades conforming to relevant code should be used at regular production level.

11. LITERATURE

The manufacturer has not provided any workshop manual or operator manual therefore the same should be brought out as per IS: 8132-1999 for the guidance of users and technical personnel.