

व्यावसायिक परीक्षण रिपोर्ट  
COMMERCIAL TEST REPORT

संख्या/ No.: IMP-1078/3083/2023  
माह/Month: September, 2023

**THIS TEST REPORT VALID UP TO : 30<sup>th</sup> September, 2030**



**JAMNA, JAIMDSC-9, (9 TINE SPRING LOADED  
CULTIVATOR) TRACTOR MOUNTED**



भारत सरकार

**Government of India**

कृषि एवं किसान कल्याण मंत्रालय

**Ministry of Agriculture and Farmers Welfare**

कृषि एवं किसान कल्याण विभाग

**Department of Agriculture and Farmers Welfare**

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

**Northern Region Farm Machinery Training and Testing Institute**

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**Page 1 of 18**

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	0.81	Conforms
Silicon (Si)	0.10-0.40	1.50-2.00	0.22	Conforms
Manganese (mn)	0.50-1.0	0.50-1.00	0.68	Conforms
Sulphur (S)	0.05 (Max.)	0.05 (Max.)	0.005	Conforms
Phosphorus (P)	0.05 (Max.)	0.05 (Max.)	0.022	Conforms

### 6. Running-IN

The cultivator was Run-in for 1.33 hours in the field.

### 7. FIELD PERFORMANCE TEST

The field test of the implement was conducted for 26.72 hours in different soil moisture conditions to assess the performance of the implement.

The no load engine speed of tractor was maintained as 1600 rpm and the observations are summarized in Table-3.

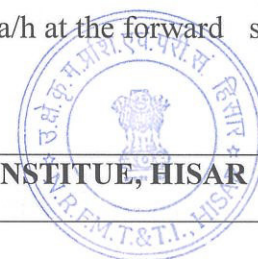
#### Summary of field performance test

Table-3

Sl. No.	Parameters	Range
1.	Tractor used	Swaraj 735 FE
2.	Gear used	L-4
3.	Type of soil	Sandy loam
4.	Soil moisture (%)	11.0 to 12.0
5.	Engine speed (rpm)	No load
		1600
		On load
6.	Bulk density of soil (g/cc)	1.62 to 1.68
7.	Speed of operation (kmph)	5.12 to 5.54
8.	Depth of cut (cm)	12.0 to 13.53
9.	Width of operation (cm)	192 to 200
10.	Wheel slippage (%)	6.06 to 7.84
11.	Covered (ha/h)	0.802 to 0.924
12.	Time required for one hectare (h)	1.07 to 1.25
13.	Field efficiency (%)	80.50 to 88.02
14.	Fuel consumption	
		l/h
		5.50 to 6.57
	l/ha	5.95 to 8.05
15.	Implement draft (kgf)	467 to 1120

#### 7.1 Rate of work

- Rate of work in sandy loam was recorded as 0.802 to 0.924 ha/h at the forward speed of 5.12 to 5.54 kmph.





- Time required to cover one hectare area was recorded as 1.07 to 1.25 h.

#### 7.2 Quality of work

- Depth of operation was recorded as 12.0 to 13.53 cm.

- Field efficiency was recorded as 80.50 to 88.02 %.

#### 7.3 Draft requirement

The average draft requirement was ranged from 291 to 1120 kgf.

#### 7.4 Wear analysis of shovel

##### 7.4.1 On mass basis

Sr. No.	Initial mass (g)	Final mass (g)	Percentage of wear	
			After 26.72 hrs. (%)	Per hour(%)
1.	742.2	730.4	1.59	0.059
2.	744.3	731.7	1.69	0.063
3.	752.6	739.4	1.75	0.065
4.	731.1	717.5	1.86	0.070
5.	734.8	721.8	1.77	0.066

### 8. EASE OF OPERATION AND ADJUSTMENT

No noticeable difficulty was observed during the operation and adjustment of cultivator.

### 9. DEFECTS, BREAKDOWN AND REPAIRS

No noticeable defect occurred in the cultivator during the test.

### 10. CRITICAL TECHNICAL SPECIFICATION

(Vide Ministry's communication No. 13-9/2019 M & T (I&P) dated 26.04.2019)

Sr. No	Parameters	Specification	Observed	Remarks
1.	Type	Rigid or spring loaded	Spring loaded	Conforms
2.	Hitch type	Three point linkage CAT-1(1N)/CAT-II (2N) CAT-III (3N)/CAT-IV (4N)	CAT-II (2N)	Conforms
3.	No. of tine	5, 7, 9,11 or 13 (11 and above preferably folding)	9	Conforms
4.	Working width, m	0.8 (Min.) 1.05 (Min.) 1.35 (Min.) 1.65 (Min.) 1.95 (Min.)	1.93 1.92 1.95 2.00 1.97	Conforms
5.	Row to row spacing between tine, mm	Adjustable, preferably in steps of 250 mm	250 mm	Conforms
6.	Frame	Rigid and strong	Rigid	Conforms
7.	Type of working tool	Reversible shovel, sweep and triangular shovel	Reversible shovel	Conforms

8.	Material of tine	High carbon steel for spring loaded & M.S. for rigid type	Carbon steel	Conforms
	Thickness of tine, mm	22 (Min.) & 25 (Max.)	23.4 mm	Conforms
9.	Material of shovel	High carbon steel	High carbon steel	Conforms
10.	Hardness of shovel and sweep, HRC	Min. 36-45	42 to 43	Conforms
11.	Centre to centre distance tool bar, mm	450 (Min.)	455	Conforms
12.	Marking/labelling of machine	The labelling plate should be riveted on the body of machine having Name and address of manufacture, Country of Origin, Make, Model, Year of manufacture, Serial Number, Type, Size, required of prime mover (kW)	Provided	Conforms
13.	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Provided	Conforms

### 11. SUMMARY OF OBSERVATIONS, COMMENTS AND RECOMMENDATIONS

- 11.1** Rate of work in sandy loam was recorded as 0.802 to 0.924 ha/h at the forward speed of 5.12 to 5.41 kmph. Time required to cover one hectare area was recorded as 1.07 to 1.25 h.
- 11.2** Depth of operation was recorded as 12.0 to 13.53 cm. Field efficiency was recorded as 80.50 to 88.02 %.
- 11.3** The average draft requirement was ranged from 291 to 1120 kgf.



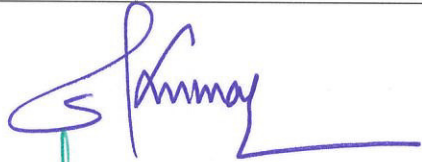

**12. TECHNICAL LITERATURES**

The following literatures were provided by the applicant during the field test.

1. Operator's manual
2. Service manual
3. Parts catalogue

However, the manuals need to be updated as per IS 8132:1999.

**TESTING AUTHORITY**

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 14.09.2023

**13. APPLICANT'S COMMENTS**

No specific comments received from the applicant.

