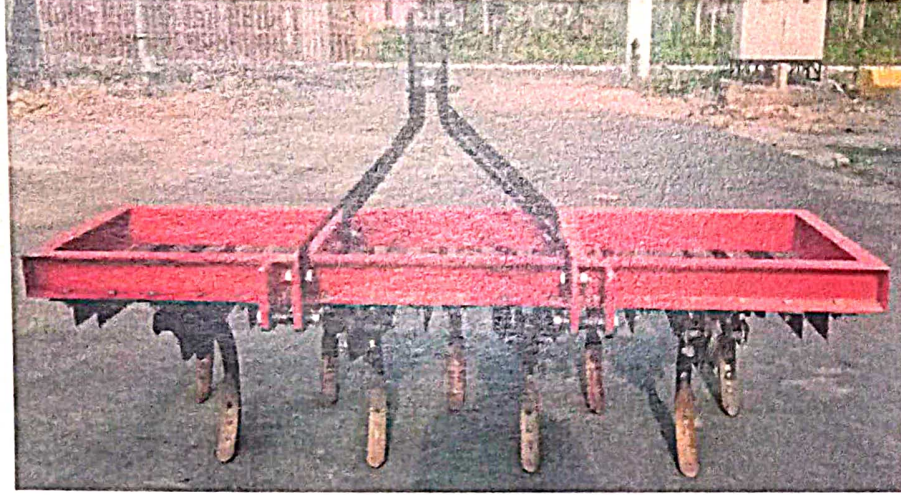


THIS TEST REPORT IS VALID UPTO 31.03.2028



**BHUMI DARSHAN, SPRING LOADED NINE TYNE CULTIVATOR
MODEL: 2018**



सत्यमेव जयते

भारत सरकार

GOVT OF INDIA

कृषि एवं किसान कल्याण मंत्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि, सहकारिता एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE

उत्तर पूर्व क्षेत्र कृषि यंत्र परीक्षण एवं प्रशिक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

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1. SCOPE OF TEST

The scope of test was to check and assess the following:

1.1 Laboratory Test:

- Checking of specifications
- Hardness of soil engaging parts (Shovel)
- Chemical analysis of critical components (Shovel)
- Wear analysis of critical components (Shovel)

1.2 Field Test :

- Rate of work
- Quality of work
- Power requirement
- Labour requirement
- Ease of operation and adjustments
- Defects, Breakdowns & Repairs

2. METHOD OF SELECTION

The test sample was selected by the testing authority through random selection. The following test sample were presented by the applicant during the random selection at Applicant site.

Serial No. of test sample	Remarks
0101, 0102, 0103, 0104, 0105, 0106, 0107, 0108, 0109, 0110, 0111, 0112, 0113, 0114, 0115, 0116, 0117 , 0118, 0119, 0120	Out of 20 samples Sl. no. 0117 has been randomly selected

3. TEST CODE AND PROCEDURE

The following codes were referred for testing of cultivator :

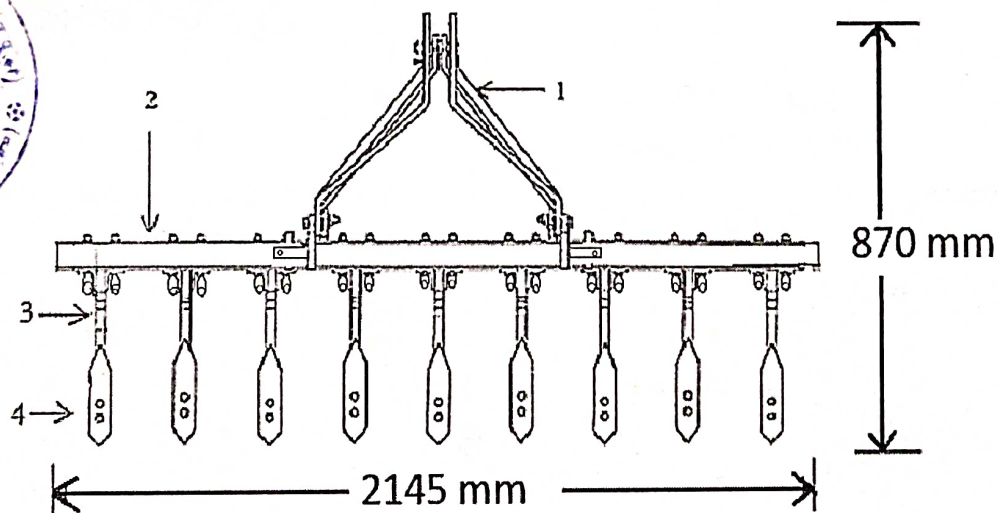
- i) IS: 6638 – 1972 (Reaffirmed Feb.-2011) : Specification for tractor mounted spring loaded cultivator.
- ii) IS: 7565 (Part-I): 1975 (Reaffirmed Mar. 2009) : Specification for Tines for Tractor operated cultivators: Part 1 Rigid tines
- iii) IS: 4468 (Part I): 1997 (Reaffirmed Feb. 2012) : Agricultural wheeled tractors – Rear-mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4
- iv) IS: 6813:2000 : Sowing Equipment seed cum Fertilizer Drill-Specifications

4. SPECIFICATION**4.1 General:**

Name and address of the manufacturer : **M/S Bharat Electric Welding Works,
PipliamandiRaod,Budha, Dist. Mandsaur,
Madhya Pradesh**

Name & Address of Applicant	: M/S Bharat Electric Welding Works, PipliamandiRaod,Budha, Dist. Mandasaur, Madhya Pradesh
Make	: Bhumi Darshan
Model	: 2018
Type	: Tractor Mounted
Serial Number of machine	: 0117
Year of manufacture	: 2020
Size of implement (mm)	: 9 x 225
Working size of implement (m)	: 2.025
Country of origin	: India
Power Source as recommended (apa)	: 45 Hp
Power source used during the test	: Kubota MU 4501
Chassis No./ Engine No.	: BL01754/KB1M30TNHNTH53229
Max. PTO Power, kW	: 30.7 kW

4.2 Constructional Details (Refer Fig.1) :



- | | |
|------------------|-----------|
| 1. Hitch pyramid | 3. Tyne |
| 2. Mainframe | 4. Shovel |

Fig.1: SPRING LOADED NINE TYNE CULTIVATOR

Constituents	Composition (%) by weight			Remarks
	As per IS: 6690-1981		As observed	
	Carbon steel	Silico Manganese steel		
Carbon (C)	0.70 -0.85	0.50-0.60	0.667	Does not Conform
Silicon (Si)	0.10 -0.40	1.50-2.00	0.223	Conforms
Manganese (Mn)	0.50 -1.0	0.50-1.00	0.958	Conforms
Sulphur (S)	0.05 (max)	0.05 (max)	0.021	Conforms
Phosphorous (P)	0.05 (max)	0.05 (max)	0.020	Conforms

7. FIELD PERFORMANCE TEST

The cultivator was operated for 26.17 hours in field to assess its performance. Total five trials were conducted during field test. The performance of implement is reported in **Annexure-I** and are summarized in ensuing table. Kubota MU 4501 tractor was used for field operations of the cultivator.

Summary of Field Performance Test

Sl. No.	Parameters/operations	Observations
1.	Gear used	L-3
2.	Type of soil	Light
3.	Average soil moisture (%)	7.07 to 16.94
4.	Bulk density of soil (g/cc)	1.30 to 1.50
5.	Engine speed (rpm) :	
	- No load	2645 to 2686
	- On load	2544 to 2613
6.	Average speed of operation (kmph)	4.34 to 5.90
7.	Av. Wheel slip (%)	9.75 to 14.95
8.	Average depth of cut (cm)	10.46 to 11.73
9.	Av. Working width (cm)	186 to 194
10.	Area covered (ha/h)	0.734 to 0.975
11.	Time required for one ha (h)	1.02 to 1.36
12.	Field efficiency (%)	75.52 to 93.13
13.	Fuel consumption	
	-/h	4.20 to 4.50
	-/ha	4.44 to 5.98
14.	Implement draft (kgf)	342.6 to 876.5
15.	Power requirement (kW)	4.05 to 13.37

7.1 Rate of work :

- The average area covered was 0.734 to 0.975 ha/h at the speed of operation from 4.34 to 5.90 km/h.
- The time required to cover one hectare area was recorded as 1.02 to 1.36 h.

7.2 Quality of work :

- The depth of cut was recorded as 10.46 to 11.73 cm.
- Average working width was observed as 186 to 194 cm.

Sl. No	Notation	Dimension (mm)		Difference (mm)	Wear (%)	
		Initial	Final		After 26.17 h	Per h
1.	A	279.68	256.16	23.52	8.41	0.32
	B	55.64	54.80	0.84	1.51	0.06
	C	48.0	40.85	7.15	14.90	0.57
2.	A	278.73	256.35	22.38	8.03	0.31
	B	54.94	54.66	0.28	0.51	0.02
	C	48.5	40.50	8.0	16.49	0.63
3.	A	279.16	254.17	24.99	8.95	0.34
	B	55.21	54.79	0.42	0.76	0.03
	C	48.0	40.20	7.80	16.25	0.62
4.	A	283.09	254.04	29.05	10.26	0.39
	B	55.26	54.67	0.59	1.07	0.04
	C	45.0	35.30	9.70	21.56	0.82
5.	A	281.71	253.32	28.39	10.26	0.39
	B	55.91	55.48	0.43	1.07	0.03
	C	45.0	35.58	9.42	21.56	0.80
6.	A	277.16	254.29	22.87	10.08	0.32
	B	54.70	54.33	0.37	0.77	0.03
	C	48.0	35.46	12.54	20.93	1.00
7.	A	281.67	245.23	36.44	8.25	0.49
	B	54.07	53.55	0.52	0.68	0.04
	C	45.0	33.69	11.31	26.13	0.96
8.	A	277.89	246.24	31.65	11.39	0.44
	B	55.65	55.13	0.52	0.93	0.04
	C	46.5	34.73	11.77	25.31	0.97
9.	A	283.44	249.38	34.06	12.02	0.46
	B	54.43	54.12	0.31	0.57	0.02
	C	43.0	32.61	10.39	24.16	0.92

Remarks: The hourly percentage of wear of reversible shovel on dimensional basis was recorded as 0.02 to 1.00

8. EASE OF OPERATION & ADJUSTMENTS

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

9. DEFECTS, BREAKDOWNS AND REPAIRS

No breakdown was occurred during 26.17 h of field test of the cultivator.

10. COMMENTS AND RECOMMENDATIONS

- 10.1 The specifications of implement hitch does not conform to IS: 4468-1997(Part-1). It should be looked into for corrective action.
- 10.2 The specification of the reversible shovel does not conform to IS 6813:2000. It should be looked into for corrective action.
- 10.3 The specification of springs for tractor mounted Spring loaded Cultivator, does not conform to IS: 6638 – 1972 (Reaffirmed Feb. 2011). It should be looked into for corrective action.
- 10.4 The hardness of shovels does not meet the requirement of IS 6813:2000. It should be looked into for corrective action.

- 10.5 The chemical composition of shovels does not meet the requirement of IS 6690:1981. It should be looked into for corrective action.
- 10.6 Provision was not made for lateral adjustment of tyne spacing, which should be looked into for correction to suit different crop row spacing conditions.
- 10.7 The information provided on labeling plate was insufficient as per the relevant codes. It should be looked into for corrective action.
- 10.8 **Adequacy of Literature:**
An Operator cum Service Manual & Parts Catalogue was not provided along with the implement during the course of testing. It is recommended to bring out these manuals in Hindi and other vernacular languages as per IS: 8132-1999.

TESTING AUTHORITY


(M.R. PATIL)

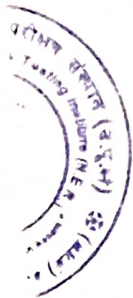
AGRICULTURAL ENGINEER


(J.P. MANDAL)

SENIOR AGRICULTURAL ENGINEER


(K.K. NAGLE)
DIRECTOR

Draft test report compiled by - Shri. Khagendra Bora,
Sr. Technical Assistant



11. APPLICANT'S COMMENTS

The draft report has been found correct and no need the corrections.