

व्यावसायिक परीक्षण रिपोर्ट  
COMMERCIAL TEST REPORT

संख्या/ No.: Power weed-179/3047/2023  
माह/Month: June, 2023

**THIS TEST REPORT VALID UP TO : 30<sup>th</sup> June, 2028**



**MAHAN, MBP-80,  
POWER WEEDER**



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

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**9. AIR CLEANER OIL PULL OVER TEST**

Dry air cleaner provided.

**10. HARDNESS & CHEMICAL COMPOSITION OF BLADES**

Hardness & chemical analysis of primary element of the blades were carried out as per IS: 6690 -1981. The details of same are given in table 2 & 3.

**10.1 Table 2 : Hardness of blades**

	Requirement as per IS: 6690-1981 (HRC)	Hardness (HRC) as observed	Remarks
At edge portion	56±3	52.07 (Average)	Does not conform
At shank portion	37 to 45	52.3 (Average)	Does not conform

**10.2 Table 3 : Chemical analysis of rotary blade**

Constituents	As per IS:6690-2002		As per Ministry's communication No. 13-9/2019 M&T (I&P) dated 26.04.2019	Composition as observed	Remarks
	Carbon Steel	Silicon Manganese steel	Boron 28 MnCrB5		
Carbon ( C )	0.70 -0.85	0.50-0.60	0.24-0.30	1.08	Does not conform
Silicon (Si)	0.10 -0.40	1.50-2.00	0.40 (Max.)	0.44	Does not conform
Manganese (Mn)	0.50 -1.00	0.50-1.00	1.10-1.40	0.36	Does not conform
Sulphur (S)	0.05 (Max.)	0.05 (Max.)	0.035 (Max.)	0.04	Does not conform
Phosphorous (P)	0.05 (Max.)	0.05 (Max.)	0.025 (Max.)	0.02	Conforms
Chrome (Cr)	--	--	0.3-0.6	0.15	Does not conform
Boron (B)	--	--	0.0008-0.005	0.003	Conforms

\* Power weeder blade partially conforms to Boron 28 MnCrB5.

**11. RUNING - IN**

The Power weeder was run-in for 0.17 and 1.00 hours at 1600 no load engine rpm and at 3600 no load rated engine rpm respectively before field performance test as recommended by the applicant. All the fasteners were checked & tightened thereafter.

**12. FIELD TEST**

The field tests under dry land condition were conducted for 26.25 h. The field tests were conducted at the rated 3600 rpm. In all, 5 tests/trials were conducted in sandy loam soil at NRFMTTI farm, Hisar. The summary of the field test for dry land operation is given in table-4.

**Crop parameters**

- |                        |                  |
|------------------------|------------------|
| i) Type of weed        | - Seasonal weeds |
| ii) Height of weed, cm | - 8 to 12        |



Table 4: SUMMARY OF FIELD PERFORMANCE TEST

Sr. no.	Parameter	Range
i)	Type of soil	Sandy loam
ii)	Soil moisture, %	6.20 to 8.50
iii)	Bulk density of soil, g/cc	1.25 to 1.29
iv)	Speed of operation, kmph	1.61 to 1.64
v)	Depth of cut, cm	4.83 to 5.40
vi)	Width of cut, m	0.57 to 0.63
vii)	Area covered, ha/h	0.071 to 0.081
viii)	Time required for one ha	12.35 to 14.08
ix)	Fuel consumption	
	l/h	0.43 to 0.56
	l/ha	5.51 to 7.88
x)	Weeding efficiency, %	88.33 to 90.13
xi)	Field efficiency, %	77.08 to 81.25

**13. ADJUSTMENT, DEFECTS, BREAKDOWNS & REPAIR**

No noticeable defect/breakdown observed during test.

**14. COMPONENTS/ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR**

<b>14.1</b>	<b>Engine :</b>						
	The Engine and other assemblies were dismantled after 28.67 hours of engine operation.						
<b>14.1.1</b>	<b>Cylinder :</b>						
<b>Cylinder bore diameter, mm</b>							
Top Position		Middle position		Bottom Position		Max. permissible wear limit	
Thrust	Non-thrust	Thrust	Non-thrust	Thrust	Non-thrust		
46.00	46.00	46.00	46.00	46.00	46.00	46.15	
<b>14.1.2</b>	<b>Piston:</b>						
<b>Piston diameter, mm</b>							
Top position		At skirt				Max. permissible wear limit, mm	
Thrust side	Non-thrust side	Thrust side	Non-thrust side	Piston to cylinder clearance, mm		Piston dia. at skirt	Piston to cylinder clearance
45.75	45.83	45.96	45.85	0.04		45.87	0.12
<b>14.1.3</b>	<b>Piston rings end gap:</b>						
Ring no.	Ring end gap, mm			Max. permissible wear limit, mm			
	At top	At middle	At bottom				
1 <sup>st</sup> compression ring	0.30	0.30	0.30	1.00			
2 <sup>nd</sup> compression ring	0.45	0.45	0.45	1.00			
Oil ring	Not measured due to ring design constraint						

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22.	Provision for shield/cover to prevent flying of mud & stone from rotor	Must be provided	Provided	Conforms
23.	Depth control mechanism	Must be provided	Provided	Conforms
24.	Provision for transport wheels	Optional	Provided	Conforms
25.	Provision for cover on exhaust	Must be provided	Provided	Conforms
26.	Direction of exhaust emission away from operator	Must be provided	Provided	Conforms
27.	Marking/labeling machine	The labeling plate should be riveted on the body of machine having Name and address of manufacturer & Applicant, Country of origin, Make, Model, Year of manufacturer, Serial number, Engine number, Engine HP, rated rpm & SFC.	<b>Only year of manufacture serial no. and model are provided on labeling plate</b>	<b>Partially Conform</b>
28.	Literature	Operator manual, service manual and Parts catalogue should be provided.	Provided	Conforms

## 16. COMMENTS & RECOMMENDATIONS

### 16.1 Mechanical vibration

The amplitude of mechanical vibration marked as (\*) on the relevant chapter, are on drastically higher side. It is not just directly concerned with operator's health, safety and comfort, but also adversely affects the useful life of the components. In view of above, this deserved to be given top priority for corrective action.

**16.2** The chemical composition of blades does not conform to the requirements of IS: 6690-1981. This needs to be looked into for corrective action.

**16.3** The hardness of blades does not conform to the requirements of IS: 6690-1981. This needs to be looked into for corrective action.

**16.4** Thickness of rotor blade does not meet the requirement as per Critical Technical Specification. This needs to be looked into for corrective action.

**16.5** The material of rotor shaft does not conform to the requirement of Critical Technical Specification. This needs to be looked into for corrective action.

- 16.6 The labeling plate provided on the power weeder does not meet the requirement as per the Critical Technical Specification. This needs to be looked into for corrective action.


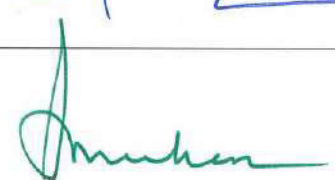
### 17. TECHNICAL LITERATURE

The following literatures were provided by the applicant.

- i) Operator manual
- ii) Parts catalogue
- iii) Service manual

However, the manual needs to be updated as per IS: 8132-1999

### TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 20.06.2023

The test report is compiled by Sh. Ajay Singh Yadav, (Sr. Tech).

### 18. APPLICANT'S COMMENT

Para no.	Our reference	Applicant's comments
18.1	16.1, 16.2, 16.3, 16.4, 16.5 & 16.6	Noted the same and we will take corrective actions and very soon a better available solution will be implemented in future production.

