

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: Powerweeder-127/2772/2022

माह/Month: January, 2022

THIS TEST REPORT VALID UP TO : 31st January, 2027



**HWASDAN, GRATIA-140
POWER WEEDER**



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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[ISO 9001:2015 CERTIFIED]

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12. FIELD TEST

The field tests under dry land condition were conducted for 26.62 h. The field tests were conducted at the rated 3600 rpm. In all, 6 tests trials were conducted in sandy loam soil at the NRFMTTI farm, Hisar. The summary of the field test for dry land operation is represented in table-6

Crop parameters

- i) Type of weed - Seasonal weeds
ii) Height of weed, cm - 2.5 to 11.3

Table 5: SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameter		Range
i)	Type of soil	:	Sandy loam
ii)	Average soil moisture, %	:	14.20 to 15.90
iii)	Average bulk density of soil, g/cc	:	1.62 to 1.68
iv)	Average speed of operation, kmph	:	1.92 to 2.20
v)	Average depth of cut, cm	:	6.22 to 7.08
vi)	Average width of cut, m	:	1.26 to 1.28
vii)	Average area covered, ha/h	:	0.184 to 0.228
viii)	Average time required for one ha	:	4.39 to 5.43
ix)	Average fuel consumption		
		l/h :	0.90 to 1.04
		l/ha :	3.95 to 5.27
x)	Average weeding efficiency (%)	:	73.03 to 86.11
xi)	Average field efficiency (%)	:	76.03 to 81.14

13. ADJUSTMENT, DEFECTS, BREAKDOWNS & REPAIR

No noticeable breakdown occurred during test.

14. COMPONENTS/ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR**14.1 Engine :**

The Engine and other assemblies were dismantled after 35.9 hours of operation.

14.1.1 Cylinder :

Cylinder bore dia. (mm)						Max. permissible wear limit
Top Position		Middle position		Bottom Position		
Thrust	Non-thrust	Thrust	Non-thrust	Thrust	Non-thrust	
86.04	86.04	86.02	86.00	86.02	86.00	86.185



- 14.2 Valve guides and valve springs**
Valve spring stiffness, kgf/mm :
Inlet valve : 1.82
Exhaust valve : 1.54
- Discard limit**
Not specified
- 14.3 Timing gears** : No noticeable defect observed
14.4 Clutch : No noticeable defect observed
14.5 Transmission : No noticeable defect observed
14.6 Rotary drive unit : No noticeable defect observed

14.7 Wear of blades:**14.7.1 Mass basis:**

The wear of the rotary weeder blades was measured after 27.12 hrs. of field operation and the observations are as under:

Sl. No.	Initial mass (g)	Mass after 27.12 hrs.(g)	Loss of mass (g)	Percent wear (%)	Percent wear per hour
1	364.93	363.10	1.83	0.50	0.02
2	366.73	364.44	2.29	0.60	0.02
3	361.13	359.34	1.79	0.50	0.02
4	346.83	343.73	3.1	0.89	0.03
5	349.91	346.33	3.58	1.02	0.04
6	385.27	382.00	3.27	0.85	0.03
7	365.27	363.10	2.17	0.59	0.02
8	376.27	374.40	1.87	0.50	0.02
9	388.50	385.77	2.73	0.74	0.02
10	374.90	372.82	2.08	0.60	0.02

15. CRITICAL TECHNICAL SPECIFICATIONS

Vide ministry's letter no. 13-9/2019- M&T (I&P)- Part dated 26.04.2019 and F.No. 9-4/2019 M&T (I&P) dated 20.08.2019.

Sr. No.	Parameters	Specifications	Observed	Remarks
1.	Type	Self-propelled, walk behind	Self propelled, walk behind type	Conforms
2.	Working width, mm	300-1500	1350	Conforms
3.	Type of engine	Compression/Spark ignition	Compression	Conforms
4.	Starting method	Manual/recoil/self-starting	Recoil	Conforms
5.	Type of clutch	Dry/Wet	Wet	Conforms

6.	Type of primary gear box	Sliding/constant mesh or combination of both	Sliding mesh	Conforms
7.	Type of secondary gear box	Gear type, chain & sprocket type	Gear type	Conforms
8.	Material for rotor shaft	SAE 1045 (CRS) / EN8 / EN9	EN9	Conforms
9.	No. of flanges	4 – 10	10	Conforms
10.	Types of flanges	Square/circular/rectangular	Square	Conforms
11.	Distance between consecutive flanges, mm	80 to 150	125	Conforms
12.	No. of blades in each flange	3-6	04	Conforms
13.	No. of rotor blade	12 (min.)	40	Conforms
14.	Thickness of rotor blade, mm	5 (min.)	5.5	Conforms
15.	Material of blade	Boron (28MnCrB5) / High carbon steel EN 42j	28 MnCrB5	Conforms
16.	Hardness of Blade, HRC	38 (min.)	38.73 (Average)	Conforms
17.	Shape of rotor blade	C / J shape	J shape	Conforms
18.	Provision for handle height adjustment	Must be provided	Provided	Conforms
19.	Provision for handle rotation	Must be provided	Provided	Conforms
20.	Provision for emergency stop of engine	Must be provided	Provided	Conforms
21.	Provision for easy start of engine	Must be provided	Provided	Conforms
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	Must be provided	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.	Provided	Conforms



28.	Literature	Operator manual, service manual and Parts catalogue should be provided.	Provided	Conforms
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16. COMMENTS & RECOMMENDATIONS

- 16.1** The maximum power and rated power is observed as 7.34 kW against the declared value of 5.5 kW and 5.3 kW respectively, which is 33.45% and 38.49% higher as compared to declared value, which should be looked into for quality control and corrective action.
- 16.2** The specific fuel consumption at maximum power was observed as 429 g/kWh against declared value of 400 g/kWh, which is 7.25 % higher. It should be looked into for corrective action.
- 16.3 Mechanical vibration**
The amplitude of mechanical vibration marked as (*) on the relevant chapter, are on higher side. It is not just directly concerned with operator's health, safety and comfort, but also adversely affect the useful life of the components. In view of above, this deserved to be given top priority for corrective action.
- 16.4** The chemical composition of blades does not conform in toto, to the requirements of IS: 6690-1981. This needs to be looked into for corrective action.
- 16.5** The hardness of blades does not conform in toto, to the requirements of IS: 6690-1981. This needs to be looked into for corrective action.



17. TECHNICAL LITERATURE

The following literatures are provided by the applicant during the test.

- Operator's manual
- Part catalogue
- Engine parts catalogue

However, the Operator's manual needs to be updated as per IS: 8132-1999.

TESTING AUTHORITY

G.R AMBALKAR AGRICULTURAL ENGINEER,	
Dr. MUKESH JAIN DIRECTOR	 17.01.2022

Draft test report compiled by Er. Dharmendra Kumar, Technical Assistant

18. APPLICANT'S COMMENTS

Para. No.	Our Reference	Applicant's Comments
18.5	16.1, 16.2, 16.3, 16.4, 16.5, 16.6 & 16.7	Corrective actions are being taken and very soon a better available solution will be implemented in future production.

