

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: Powerweeder-125/2755/2021

माह/Month: October, 2021

THIS TEST REPORT VALID UP TO : 31st October, 2026



**GREAVES COTTON LIMITED, GREAVES-GSW 500
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

Northern Region Farm Machinery Training and Testing Institute

ट्रैक्टर नगर, सिरसा रोड, हिसार, (हरियाणा) - 125 001

Tractor Nagar, Sirsa Road, HISAR (Haryana)-125 001

[ISO 9001:2015 CERTIFIED]

Website: <http://nrfmtti.gov.in/>

E-mail: fmti-nr@nic.in

Tele./FAX: 01662-276984

11. RUNNING - IN

The Power weeder was run-in for 2.0 hour before field performance test. All the fasteners were checked and tightened thereafter.

12. FIELD TEST

The field tests under dry land condition were conducted for 28.93 h. The field tests were conducted at the rated 3200 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 - 2.6 to 12.7

Table 4: SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameter		Range
i)	Type of soil	:	Sandy loam
ii)	Average Soil moisture, %	:	13.37 to 15.13
iii)	Average Bulk density of soil, g/cc	:	1.61 to 1.69
iv)	Average Speed of operation, kmph	:	1.04 to 1.21
v)	Average depth of cut, cm	:	5.92 to 7.14
vi)	Average Width of cut, m	:	0.91 to 0.93
vii)	Average Area covered, ha/h	:	0.076 to 0.094
viii)	Average Time required for one ha	:	10.64 to 13.16
ix)	Average Fuel consumption		
		l/h :	0.95 to 1.15
		l/ha :	10.33 to 13.16
x)	Average Weeding efficiency, %	:	80.20 to 85.29
xi)	Average Field efficiency, %	:	79.17 to 86.23

13. ADJUSTMENT, DEFECTS, BREAKDOWNS & REPAIR

No noticeable defect/breakdown observed during test.

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

The Engine and other assemblies were dismantled after 40.33 hours of engine operation.

14.1.1 Cylinder :**Cylinder bore dia. (mm)**

Top Position		Middle position		Bottom Position		Max. permissible wear limit
Thrust	Non-thrust	Thrust	Non-thrust	Thrust	Non-thrust	
70.00	70.01	70.00	70.01	70.00	70.01	70.035



- 14.2 Valve guides and valve springs**
Valve spring stiffness,
Kgf/mm : **Discard limit**
Inlet valve : 3.35 **Not specified**
Exhaust valve : 0.34
- 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 28.93 hrs. of field operation and the observations are as under:

Sl. No.	Initial mass (g)	Mass after 28.93 hrs.(g)	Loss of mass (g)	Percent wear (%)	Percent wear per hour
1	259.45	257.00	2.45	0.94	0.03
2	257.82	255.18	2.64	1.02	0.04
3	261.20	258.85	2.35	0.90	0.03
4	271.23	268.84	2.39	0.88	0.03
5	264.80	262.20	2.60	0.98	0.03
6	263.25	260.74	2.51	0.95	0.03

15. CRITICAL TECHNICAL SPECIFICATIONS

Vide Ministry O.M. No. 13-9/2019-M&T (I&P) dated 26.04.2019.

Sr. No.	Parameters	Specifications	Observed	Remarks
1.	Type	Self-propelled, walk behind	Self propelled, walk behind type	Conforms
2.	Working width, mm	300-1500	1075	Conforms
3.	Type of engine	Compression/Spark ignition	Spark ignition	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



Powerweeder-125/2755/2021	GREAVES COTTON LIMITED, GREAVES-GSW 500 POWER WEEDER (COMMERCIAL)
----------------------------------	--

8.	Material for rotor shaft	SAE 1045 (CRS) / EN8 / EN9	Q235 carbon steel	Does not conform
9.	No. of flanges	4 – 10	6	Conforms
10.	Types of flanges	Square/circular/rectangular	Square	Conforms
11.	Distance between consecutive flanges, mm	80 to 150	150	Conforms
12.	No. of blades in each flange	3-6	04	Conforms
13.	No. of rotor blade	12 (min.)	24	Conforms
14.	Thickness of rotor blade, mm	5 (min.)	5.0	Conforms
15.	Material of blade	Boron (28MnCrB5) / High carbon steel EN 42j	Mild steel, 65 Mn steel	Does not conform
16.	Hardness of Blade, HRC	38 (min.)	40.07 (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	Not Provided	Does not conform
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.	Partially meet the requirement	Partially conform



28.	Literature	Operator manual, service manual and Parts catalogue should be provided.	Provided	Conforms
-----	------------	---	----------	----------

16. COMMENTS & RECOMMENDATIONS

16.1 Engine performance

- 16.1.1 The average rated power in rating test of engine was observed as 4.03 kW at 3600 rpm against manufacturer declared power as 3.5 kW at 3600 rpm which is 15.14 % higher than the declared power.
- 16.1.2 The Specific fuel consumption at average rated power in rating test was observed as 404 g/kwh against declared value of 395 g/kwh which is 2.28 % higher than declared value.
- 16.1.3 The average Torque was observed as 10.68 Nm against the declared value of 10.50 Nm which is 1.71 % higher than declared value.

16.2 Governing test

- Momentary speed change in percentage of rated speed was observed as 5.49 .
- Permanent speed change in percentage of rated speed was observed as 5.01 .

16.3 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 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.
- 16.6 Make & model of governor are not specified. It should be specified.






17. TECHNICAL LITERATURE

The following literatures are provided by the applicant.

- i) Operator Manual
- ii) Spare parts manual
- iii) Owner's Manual of engine

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

TESTING AUTHORITY

G.R. AMBALKAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 18.10.2021 18.10.2021 

Test report compiled by Er. Dharmendra Kumar, Technical Assistant

18. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant comments
18.1	16.3	Suitable measures like providing Anti vibration mounting (AVM) to reduce the vibration level will be introduced during the production lot.
18.2	16.4	Action initiated at the supplier end for conformance to the raw material standards (as per IS: 6690-1981).
18.3	16.5	Action initiated at the supplier end for conformance to the raw material standards (as per IS: 6690-1981).

