व्यावसायिक परीक्षण रिपोर्ट COMMERCIAL TEST REPORT

संख्या/ No.: POWER WEEDER-102/2541/2020

माह/Month: October, 2020

THIS TEST REPORT VALID UP TO : 31st OCTOBER, 2025



SPRAYMAN, SP-830 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 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

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Phosphorous	0.05 (Max.)	0.0475	Conforms
Sulphur	0.05 (Max.)	0.0553	Does not conform

12. RUNING IN

In the agreement with applicant's representative the Power weeder was run-in for 0.65 hour before the actual test. All the fastness was checked tightened thereafter.

13. FIELD TEST

The field tests under dry land condition were conducted for 27 h. (including running in and field adjustment time) The field tests were conducted at the rated 3600 rpm. In all, 7 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-3.

Crop parameters

i) Type of weed

Seasonal weeds

ii) Height of weed, cm

15 to 30

Table 5: SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameter		Range
i)	Type of soil	:	Sandy loam
ii)	Average Soil moisture, %	:	08 to 17
iii)	Average Bulk density of soil, g/cc	:	1.610 to 1.900
iv)	Average Speed of operation, kmph	:	1.39 to 1.82
v)	Average depth of cut (cm)	:	6.5 to 7.0
vi)	Average Width of cut, m	:	0.44 to 0.48
vii)	Average Area covered, ha/h	:	0.049 to 0.069
viii)	Average Time required for one ha		14.49 to 20.41
ix)	Average Fuel consumption		9
	l/h	:	1.08 to 1.17
	1/ha	:	15.65 to 22.04
x)	Average Weeding efficiency (%)		70 to 86
xi)	Average Field efficiency (%)	:	79 to 89

14. ADJUSTMENT, DEFECTS, BREAKDOWNS & REPAIR

No noticeable breakdown occurred during test.

15. COMPONENTS/ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR

15.1 **Engine**:

The Engine and other assemblies were dismantled after 33h of engine operation.

15.1.1 **Cylinder**:

Cylinder bore dia. (mm)						
Top l	Position	Middle	e position	Botton	n Position	Max. permissible wear limit
Thrust	Non-	Thrust	Non-	Thrust	Non-	
*/	thrust		thrust		thrust	
68.02	68.02	68.02	68.01	68.02	68.00	68.165

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15.2 Valve guides and valve springs

Discard limit

Valve spring stiffness, N/mm:

Inlet valve : 4.88

Not specified.

Exhaust valve: 4.87 **15.3** Timing gears

No noticeable defect observed.

15.4 Clutch

No noticeable defect observed.

15.5 Transmission

No noticeable defect observed.

15.6 Rotary drive unit

No noticeable defect observed.

15.7 Wear of blades:

15.7.1 Mass basis:

The wear of the rotary weeder blades was measured after 27.48 hrs. of field operation and the observations are as under:

Sl.	Initial mass	mass after	Loss of mass	Percent wear	Percent wear per
No.	(g)	27.48 hrs.(g)	(g)	(%)	hour
1	268.3	257.8	10.5	3.91	0.14
2	276.0	267.4	8.6	3.12	0.11
3	264.9	250.4	14.5	5.47	0.20
4	265.8	258.5	7.3	2.75	0.10

16. SUMMARY OF OBSERVATIONS

S. No.	Characteristics	Declaration	Tolerance (as per IS :13539- 2008)	As observed	Whether within the tolerance limit (Yes/No)
1	2	3	4	5	6
16.1	Engine performance test				
i)	Average rated power in rating test, kW	3.7	± 5 %	3.69	Yes
ii)	Specific fuel consumption at average rated power in rating test, g/kwh	400	± 5 %	389	Yes
iii)	Governing test		Tolerance (as per IS:7347-1974)		À
CHIR & AIRE	Momentary speed change in percentage of rated speed.	-	For class-1 governing- 12% (Max) and class- 2 governing- 15% (Max)	6.22	Yes

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v)	Permanent change in	For class-1	5.42	Yes
٧)	speed in percentage of	governing- 6%	3.42	168
		(Max) and class-		
	rated speed	2 governing-		,
		10% (Max)		
16.2	Wear assessment	*		
S.	Characteristics	Declaration	As observed	Whether
No.				within the
				tolerance limit
				(Yes/No)
i)	Cylinder bore diameter	68.165	68.02	Yes
ii)	Clearance between piston & cylinder	0.12	0.03	Yes
	liner			
iii)	Ring end gap			192
	-Top ring -2 nd ring	100	0.40	Yes
	-2 nd ring	1.00	1.10	No
	-oil ring		Not	
			measured	8
	× =		due to ring	
			design	
			constraint	
iv)	Ring groove clearance:			
	-Top ring	0.15	0.07	Yes
	-2 nd ring	0.15	0.06	Yes
	-Oil ring		Not	
			measured	
		0	due to ring	Ta .
			design constraint	
	Classes Chiasadhasias		constraint	
v)	Clearance of big end bearing: -Diametrical	0.12	0.07	Yes
	The state of the s	1.1	0.65	Yes
-::\	-Axial	1.1	0.03	1 65
vi)	Clearance of main bearing -Diametrical	Ball bearing Prov	idad bath sida	,
	-Crankshaft end float	ball bearing Flow	ided both side	
	-Crankshart end float			
16.3		ety requirements		
i)	Provision of guards on moving parts		Provided	Yes
	other than rotary			
ii)	Provision of guard for tilling			Yes
	component as per clause 5.2 of IS		Provided	
	15925-2012			(20)
iii)	Location and direction of exhaust		Provided	Yes / Si
	emission to be away from the			15
	operator		B	
iv)	Covers on hot parts		Provided	Yes

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v)	Provision of parking stand with locking		Provided .	Yes
vi)	Identification of controls	Shall have the direction and/or method of operation clearly identified by durable label or mark	Provided	Yes
vii)	Marking/labels with Advice to read operator's manual Advice Wear eye and ear protection Cautionary information Safety signs near tines, Distance warning for bystanders	 	Provided	Yes
viii)	Pertinent instructions	Shall be provided as presented in Annex A of IS:15925-2012	Not provided	No

Sr.	Characteristics	Declaration	Tolerance (as	As	Whether
No.			per IS :13539-	observed	within the
			2008)		tolerance limit
					(Yes/No)
1	2	3	4	5	6
16.4	Amplitude of mechanical vibration (microns) at:				
i)	Steering handle grips				
	Left	100 max.		177	No
	Right	100 max.		341	No
ii)	Clutch/brake lever	100 max.		175	No
iii)	Accelerator lever	100 max.		1026	No

17. CRITICAL TECHNICAL SPECIFICATIONS

Defferred till 31.12.2020 vide Ministry O.M. No. 13-13/2020-M&T (I&P) dated 24.04.2020

18. COMMENTS & RECOMMENDATIONS

18.1 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 affect the useful life of the components. In view of above, this deserved to be given top priority for corrective action.

- 18.2 Discard limit for valve spring stiffness is not specified. It MUST be specified.
- 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.

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- 18.4 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.
- 18.5 Stand is not provided. It MUST be provided
- 18.6 Pertinent instructions are not mentioned. It MUST be mentioned.
- 18.7 Make & model of governor is not specified. It MUST be specified.
- 18.8 The piston ring end gap of 2nd ring has exceeded the discard limit. It should be looked into.
- 18.9 A suitable labeling plate needs to be provide with interlaid following instruction-
 - 1. Name and address of manufacturers & applicant
 - 2. Country of origin
 - 3. Make
 - 4. Model
 - 5. Year of manufacture
 - 6. Engine No.
 - 7. Serial No.
 - 8. Engine HP
 - 9. Rated rpm
 - 10. SFC

19. TECHNICAL LITERATURE

Instruction book & engine owner's manual is provided by the applicant during the test The following literature, therefore, **MUST** be provided as per IS: 8132-1999 for guidance of users.

- i) Operator's manual
- ii) Service manual
- iii) Part's catalog

TESTING AUTHORITY

RINKU PRASAD GUPTA TECHNICAL ASSISTANT	Tynked.
P. K. PANDEY DIRECTOR	43n-mosts

Test Report compiled by Manoj Sharma, B. Tech (Ag. Engg)

20. APPLICANT'S COMMENTS

No comments received from the applicant



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