

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

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Power weeder-102/2541/2020	SPRAYMAN, SP-830 POWER WEEDER (COMMERCIAL)
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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	
	l/h	1.08 to 1.17
	l/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 Position		Middle position		Bottom Position		Max. permissible wear limit
Thrust	Non-thrust	Thrust	Non-thrust	Thrust	Non-thrust	
68.02	68.02	68.02	68.01	68.02	68.00	68.165

15.2 Valve guides and valve springs **Discard limit**
 Valve spring stiffness, N/mm :
 Inlet valve : 4.88
 Exhaust valve : 4.87 **Not specified.**

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. No.	Initial mass (g)	mass after 27.48 hrs.(g)	Loss of mass (g)	Percent wear (%)	Percent wear per 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)		
iv)	Momentary speed change in percentage of rated speed.	-	For class-1 governing- 12% (Max) and class-2 governing- 15% (Max)	6.22	Yes

v)	Permanent change in speed in percentage of rated speed		For class-1 governing- 6% (Max) and class-2 governing- 10% (Max)	5.42	Yes
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16.2 Wear assessment

S. No.	Characteristics	Declaration	As observed	Whether within the tolerance limit (Yes/No)
i)	Cylinder bore diameter	68.165	68.02	Yes
ii)	Clearance between piston & cylinder liner	0.12	0.03	Yes
iii)	Ring end gap			
	-Top ring	1.00	0.40	Yes
	-2 nd ring	1.00	1.10	No
	-oil ring	--	Not measured 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 due to ring design constraint	--
v)	Clearance of big end bearing :			
	-Diametrical	0.12	0.07	Yes
	-Axial	1.1	0.65	Yes
vi)	Clearance of main bearing			
	-Diametrical	Ball bearing Provided both side		--
	-Crankshaft end float			--

16.3 Safety requirements

i)	Provision of guards on moving parts other than rotary	--	Provided	Yes
ii)	Provision of guard for tilling component as per clause 5.2 of IS 15925-2012	--	Provided	Yes
iii)	Location and direction of exhaust emission to be away from the operator	--	Provided	Yes
iv)	Covers on hot parts	--	Provided	Yes



Power weeder-102/2541/2020	SPRAYMAN, SP-830 POWER WEEDER (COMMERCIAL)
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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. No.	Characteristics	Declaration	Tolerance (as per IS :13539-2008)	As observed	Whether within the tolerance limit (Yes/No)
1	2	3	4	5	6
16.4	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.

18.3 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.

