

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: Powerweeder-114/2672/2021

माह/Month: February, 2021

THIS TEST REPORT VALID UP TO : 28th February, 2026



**BCS, GRATIA -105B
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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11. RUNNING IN

In the agreement with applicant's representative the Power weeder was run-in for 1.17 hour before the actual test. All the fastness was checked tightened thereafter.

12. FIELD TEST

The field tests under dry land condition were conducted for 26.86 h. The field tests were conducted at the rated 3600 rpm. In all, 5 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-4.

Crop parameters

- i) Type of weed - Seasonal weeds
ii) Height of weed, cm - 3.4 to 20.8

Table 4: SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameter	Range
i)	Type of soil	Sandy loam
ii)	Average Soil moisture, %	17.6 to 19.4
iii)	Average Bulk density of soil, g/cc	1.620 to 1.780
iv)	Average Speed of operation, kmph	1.79 to 2.08
v)	Average depth of cut (cm)	5.67 to 7.03
vi)	Average Width of cut, m	1.05 to 1.09
vii)	Average Area covered, ha/h	0.144 to 0.195
viii)	Average Time required for one ha	5.13 to 6.94
ix)	Average Fuel consumption	
	l/h	0.900 to 1.200
	l/ha	4.62 to 6.94
x)	Average Weeding efficiency (%)	85.90 to 90.52
xi)	Average Field efficiency (%)	76.60 to 89.50

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 33 hours of engine 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	
70.03	70.03	70.03	70.02	70.03	70.02	70.165



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14.2 Valve guides and valve springs

Valve spring stiffness, Kgf/mm :

Inlet valve : 0.5

Exhaust valve : 0.5

Discard limit

0.5 (Kgf/mm)

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 28.03 hrs. of field operation and the observations are as under:

Sl. No.	Initial mass (g)	mass after 28.03 hrs.(g)	Loss of mass (g)	Percent wear (%)	Percent wear per hour
1	386.6	379.1	7.5	1.94	0.04
2	371.1	366.5	4.6	1.24	0.04
3	368.0	363.1	4.9	1.33	0.05
4	368.1	356.7	11.4	3.10	0.11
5	382.2	375.1	7.1	1.86	0.07
6	362.7	357.2	5.5	1.52	0.05
7	375.9	371.1	4.8	1.28	0.05
8	369.0	364.1	4.9	1.33	0.05

15. SUMMARY OF OBSERVATIONS

S. No.	Characteristics	Declaration	Tolerance (as per IS :13539-2018)	As observed	Whether within the tolerance limit (Yes/No)
1	2	3	4	5	6
15.1	Engine performance test				
i)	Average rated power in rating test, kW	4.0	± 10 %	3.85	Yes
ii)	Specific fuel consumption at average rated power in rating test, g/kwh	400	+ 5 %	394	Yes
iii)	Governing test		Tolerance (as per IS :7347-1974)		

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iv)	Momentary speed change in percentage of rated speed,(%)	-	For class-1 governing- 12% (Max) and class-2 governing- 15% (Max)	5.06	Yes
v)	Permanent change in speed in percentage of rated speed, (%)		For class-1 governing- 6% (Max) and class-2 governing- 10% (Max)	2.89	Yes

15.2 Wear assessment

S. No.	Characteristics	Declaration (mm)	As observed (mm)	Whether within the tolerance limit (Yes/No)
i)	Cylinder bore diameter	70.165	70.03	Yes
ii)	Clearance between piston & cylinder liner	0.15	0.10	Yes
iii)	Ring end gap			
	-Top ring	1.0	0.30	Yes
	-2 nd ring	1.0	0.35	Yes
	-oil ring	--	Not measured due to ring design constraint	--
iv)	Ring groove clearance:			
	-Top ring	0.15	0.04	Yes
	-2 nd ring	0.15	0.04	Yes
	-Oil ring	--	Not measured due to ring design constraint	--
v)	Clearance of big end bearing :			
	-Diametrical	0.12	0.06	Yes
	-Axial	1.1	0.90	Yes
vi)	Clearance of main bearing			
	-Diametrical	Ball bearing Provided both side		--
	-Crankshaft end float			--

15.3 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

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iii)	Location and direction of exhaust emission to be away from the operator	--	Provided	Yes
iv)	Covers on hot parts	--	Provided	Yes
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	Provided in Operator's manual	Yes

Sr. No.	Characteristics	Declaration	Tolerance (as per IS :13539-2018)	As observed	Whether within the tolerance limit (Yes/No)
15.4	Amplitude of mechanical vibration (microns) at :				
i)	Steering handle grips				
	Left	100 max.	--	176	No
	Right	100 max.	--	124	No
ii)	Clutch/brake lever	100 max.	--	147	No
iii)	Accelerator lever	100 max.	--	99	Yes

16. CRITICAL TECHNICAL SPECIFICATIONS

Deferred till 31.03.2021 vide Ministry O.M. No. 13-13/2020-M&T (I&P) dated 22.12.2020.



17. COMMENTS & RECOMMENDATIONS**17.1 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.

17.2 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.

17.3 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.

17.4 Make & model of governor are not specified. It should be specified.

18. TECHNICAL LITERATURE

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

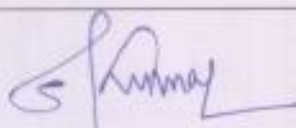
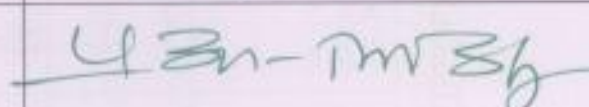
Operator's manual

Part catalogue

Engine parts catalogue

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

TESTING AUTHORITY

SANJAY KUMAR AGRICULTURAL ENGINEER	
P. K. PANDEY DIRECTOR	

Draft test report compiled by Manoj Sharma, B. Tech (Ag. Engg)

19. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's Comments
19.1	17.1	The high amplitude of mechanical vibration in some components are being studies for reduction.
19.2	17.2, 17.3 & 17.4	We are informing same to our manufacturer to correct the technical details as per requirements