

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: Powerweeder-123/2750/2021
माह/Month: September, 2021

THIS TEST REPORT VALID UP TO : 30th September, 2026



**FALCON, FRTC-2010 H
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. RUNING - IN

The Power weeder was run-in for 1.17 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 25.77 h. The field tests were conducted at the rated 3000 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 | - | 1.8 to 12.0 |

Table 4: SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameter	Range
i)	Type of soil	Sandy loam
ii)	Average Soil moisture, %	9.60 to 14.60
iii)	Average Bulk density of soil, g/cc	1.52 to 1.62
iv)	Average Speed of operation, kmph	1.65 to 1.88
v)	Average depth of cut (cm)	7.70 to 8.20
vi)	Average Width of cut, m	0.74 to 0.76
vii)	Average Area covered, ha/h	0.105 to 0.125
viii)	Average Time required for one ha	8.00 to 9.52
ix)	Average Fuel consumption	
	l/h	0.85 to 1.00
	l/ha	7.20 to 9.35
x)	Average Weeding efficiency (%)	79.44 to 85.03
xi)	Average Field efficiency (%)	82.95 to 88.65

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 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	
68.02	68.02	68.02	68.02	68.02	68.02	68.165

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

Sl. No.	Initial mass (g)	Mass after 26.94 hrs.(g)	Loss of mass (g)	Percent wear (%)	Percent wear per hour
1	304.9	298.7	6.2	2.03	0.08
2	314.1	308.0	6.1	1.94	0.07
3	302.1	297.0	5.1	1.69	0.06
4	306.5	301.6	4.9	1.60	0.06
5	328.0	323.3	4.7	1.43	0.05
6	298.0	294.5	.5	1.17	0.04

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	3.7	± 10 %	3.69	Yes
ii)	Specific fuel consumption at average rated power in rating test, g/kwh	380	+ 5 %	389.6	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

15.2 Wear assessment

S. No.	Characteristics	Declaration	As observed	Whether within the tolerance limit (Yes/No)
i)	Cylinder bore diameter	68.165	68.01	Yes
ii)	Clearance between piston & cylinder liner	0.12	0.05	Yes
iii)	Ring end gap			
	-Top ring	1.0	0.30	Yes
	-2 nd ring	1.0	0.40	Yes
	-oil ring	--	Not measured due to ring design constraint	--
iv)	Ring groove clearance:			
	-Top ring	0.15	0.03	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	0.05	Yes
	-Axial	1.1	0.45	Yes
vi)	Clearance of main bearing			
	-Diametrical			
	-Crankshaft end float		Ball bearing Provided both side	--
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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

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 the user'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.	--	151	No
	Right	100 max.	--	128	No
ii)	Clutch/brake lever	100 max.	--	186	No
iii)	Accelerator lever	100 max.	--	149	No



16. 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	905	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	chain & sprocket type	Conforms
8.	Material for rotor shaft	SAE 1045 (CRS) / EN8 / EN9	20CrMnTi	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	120	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.)	5.50	Conforms
15.	Material of blade	Boron (28MnCrB5) / High carbon steel EN 42j	65 Mn	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	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

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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

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.




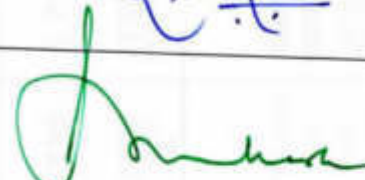
18. TECHNICAL LITERATURE

The following literatures are provided by the applicant.

- i) Operator Manual
- ii) Part's Catalogue
- iii) Service manual
- iv) 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	 15-09-2021

Test report compiled by Er. Dharmendra Kumar, Technical Assistant

19. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's comment
19.1	17.1	We will take corrective action to reduce the vibration in future.
19.2	17.2	We will take corrective action that chemical composition of blade is as per the requirement of IS: 6690-1981.
19.3	17.3	We will take corrective action that hardness of blade is as per the requirement of IS: 6690-1981.
19.4	18	Manuals will be updated as per requirement of IS: 8132-1999.

