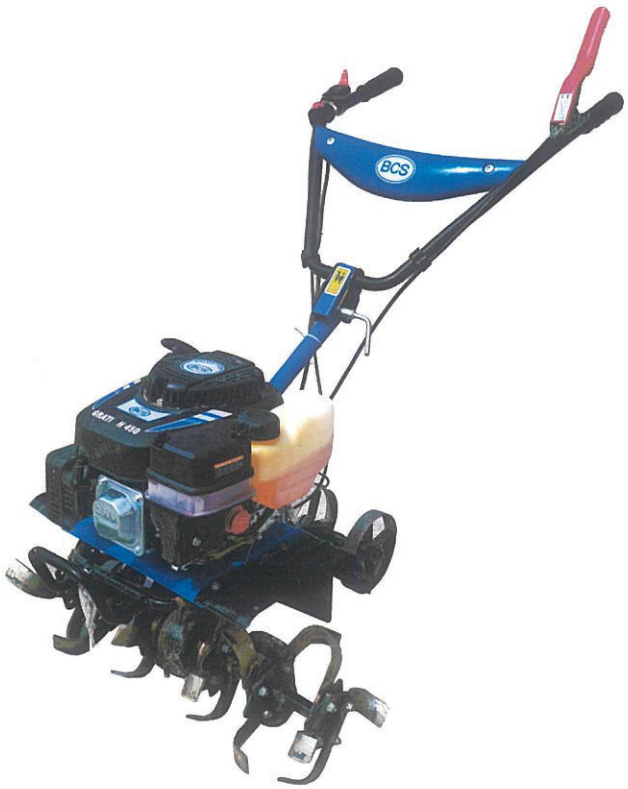
व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ **No.: Power weeder-188/3110/2023**
माह/**Month: November, 2023**

THIS TEST REPORT VALID UP TO : 30th November, 2028



BCS, GRATIA-H450
POWER WEEDER

सत्यमेव जयते

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
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[ISO 9001:2015 CERTIFIED]

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Chrome (Cr)	--	--	0.3 – 0.6	0.38	Conforms
Boron (B)	--	--	0.0008 – 0.005	0.0014	--

11. RUNNING IN

The Power weeder was run-in for 1.07 hour before the field performance test as recommended by the applicant. All the fastners were checked and tightened thereafter.

12. FIELD TEST

The field tests under dry land condition were conducted for 25.22 h. The field tests were conducted at the rated 3600 rpm. In all, 4 tests trials were conducted in sandy loam soil at Adampur, Hisar. The summary of the field test for dry land operation is represented in table-6.

Crop parameters

i) Type of weed - Seasonal weeds
ii) Height of weed, cm - 0.9 to 5.3

Table 5: SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameter		Range
i)	Type of soil	:	Sandy loam
ii)	Average soil moisture, %	:	11.20 to 12.60
iii)	Average bulk density of soil, g/cc	:	1.86 to 1.91
iv)	Average speed of operation, kmph	:	3.06 to 4.22
v)	Average depth of cut, cm	:	5.33 to 6.00
vi)	Average width of cut, m	:	1.09 to 1.14
vii)	Average area covered, ha/h	:	0.250 to 0.342
viii)	Average time required for one ha	:	2.92 to 4.00
ix)	Average fuel consumption		
	l/h	:	1.19 to 1.56
	l/ha	:	4.24 to 5.71
x)	Average weeding efficiency (%)	:	83.19 to 88.71
xi)	Average field efficiency (%)	:	67.02 to 83.63

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 25.22 hours of 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	
68.01	68.00	68.00	68.00	68.00	68.00	68.165

14.2 Valve guides and valve springs

Valve spring stiffness, kgf/mm :	Discard limit
Inlet valve : 0.47	Not specified
Exhaust valve : 0.63	

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 25.22 hrs. of field operation and the observations are given below:

Sl. No.	Initial mass (g)	Mass after 25.22 hrs.(g)	Loss of mass (g)	Percent wear (%)	Percent wear per hour
1	243.01	237.64	5.37	2.21	0.09
2	247.17	241.76	5.41	2.19	0.09
3	241.24	236.40	4.84	2.01	0.08
4	241.61	236.47	5.14	2.13	0.08
5	243.00	238.00	5.00	2.06	0.08
6	243.24	237.87	5.37	2.21	0.09

15. CRITICAL TECHNICAL SPECIFICATIONS

Vide ministry's letter no. 13-9/2019- M&T (I&P)- Part dated 26.04.2019 and F.No. 9-1/2019 M&T (I&P) dated 20.08.2019.

Sr. No.	Parameters	Specifications	Observed	Remarks
1.	Type	Self-propelled, walk behind	Self propelled, walk behind type	Conforms
2.	Working width, mm	300-1500	650	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	Constant	Conforms
7.	Type of secondary gear box	Gear type, chain & sprocket type	Gear type	Conforms

8.	Material for rotor shaft	SAE 1045 (CRS) / EN8 / EN9	EN9	Conforms
9.	No. of disc	4 – 10	06	Conforms
10.	Types of disc	Square/circular/rectangular	Square	Conforms
11.	Distance between consecutive disc, mm	80 to 150	100	Conforms
12.	No. of blades in each disc	3-6	04	Conforms
13.	No. of rotor blade	12 (min.)	24	Conforms
14.	Thickness of rotor blade, mm	5 (min.)	5.7	Conforms
15.	Material of blade	Boron (28MnCrB5) / High carbon steel EN 42j	Boron (28MnCrB5)	Conforms
16.	Hardness of Blade, HRC	38 (min.)	48.33 (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
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

16. COMMENTS & RECOMMENDATIONS

16.1 Mechanical vibration

The amplitude of mechanical vibration marked as (*) on the relevant chapter, are on 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.

16.2 Hardness of blade is within limits specified in IS: 6690-1981.

16.3 The governing test data is not given in the engine performance test report which was issued by ICAT.

17. TECHNICAL LITERATURE

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

a) Operator's manual
b) Part catalogue
c) Engine parts catalogue

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

TESTING AUTHORITY

Er. SANJAY KUMAR **AGRICULTURAL ENGINEER**	
Dr. MUKESH JAIN **DIRECTOR**	29.11.2023

The test report compiled by Er. S.K. Patil, Sr. Technical Assistant

18. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's Comments
18.1	16.1, 16.2 & 16.3	Corrective actions are being taken and very soon a better available solution will be implemented in future production.