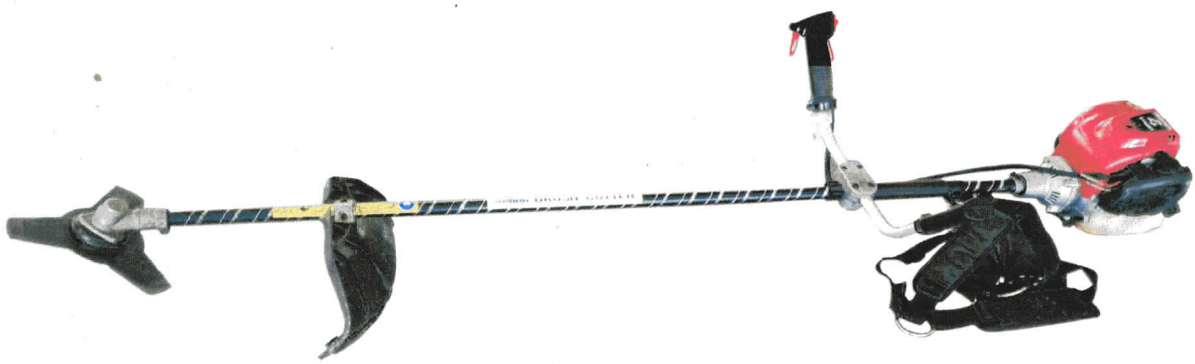
व्यावसायिक परीक्षण रिपोर्ट

COMMERCIAL TEST REPORT

संख्या/ **No.: MACHINE-25/2591/2020**

माह/**Month: November, 2020**

THIS TEST REPORT VALID UP TO : 30th NOVEMBER, 2025



BALWAAN BBC-4 SPN
BRUSH CUTTER

सत्यमेव जयते

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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[ISO 9001:2015 CERTIFIED]

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Pressure, kPa	:	97.5
Relative humidity, %	:	17.5
Background noise level, dB(A)	:	53.2
Observed noise level, dB(A) (operator ear Level)	:	88

11. HARDNESS AND CHEMICAL COMPOSITION OF ROTOR BLADES

11.1 Hardness:

11.1.1 Hardness of triangular blade:

Sr. No.	As per IS: 6025:1982 HRC	As observed (HRC)	Remarks
	48 to 58	44	**Does not conform**

11.2 Chemical composition analysis:

11.2.1 Triangular blade:

Constituents	As per IS: 6025-1982	Composition as observed (% of weight)	Remarks
Carbon (C)	0.70-0.95	0.3033	**Does not conform**
Manganese (Mn)	0.30 to 0.50	0.4773	**Does not conform**
Silicon (Si)	--	0.2875	--
Sulphur (S)	--	0.0642	--
Phosphorous (P)	--	0.0261	--

12. FIELD TEST

Field tests were conducted for 12 hours with nylon rope attachment and 14 hours with triangle blade attachment. Detailed results of field tests are shown in Annexure-I & II and summarized in the ensuing table. Details about the operator are show in Annexure-III.

Sr. No.	Parameters	Seasonal Grass cutting	
		For nylon rope	For triangular blade
1	Field condition	Level	Level
2	Intensity of grass	Medium	Medium
3	Average number of grass/weed in 1 sq.m	222 to 264	147 to 167
4	Avg. height of grass/weed, cm	37.5 to 75.5	43.3 to 82.3
5	Avg. Diameter of grass/weed, mm	2.07 to 2.3	4.9 to 6.2
6	Avg. Mass of grass cut (kg/h)	43.2 to 66.6	111.8 to 170.4
7	Avg. area covered (Rate of work), ha/h	0.020 to 0.033	0.038 to 0.040
8	Avg. Time required for one hectare, h	30.30 to 50.00	25.00 to 26.32
9	Avg. Fuel consumption l/h l/ha	 0.30 to 0.40 12.12 to 15.00	 0.40 to 0.50 10.00 to 13.16

12.1 Cutting using nylon rope assembly

12.1.1 Rate of work

i) Average area covered (rate of work)was observed as 0.020 to 0.033 ha/h.
ii) Average time required for one hectare was observed as 30.30 to 50.00 h.
iii) Average mass of grass cut was observed as 43.0 to 66.6 kg/h.
iv) Average No. of grass stem in one m^2 area was 222 to 264

12.1.2 Fuel consumption

Average fuel consumption was observed as 0.30 to 0.40 l/h. and 12.12 to 15.00 l/ha.

12.2 Cutting using triangular blade

12.2.1 Rate of work

i) The average area covered (rate of work) was observed as 0.038 to 0.040 ha/h.
ii) Average time required for one hectare was observed as 25.00 to 26.32 hours.
iii) Average numbers of perennial weed in one square meter are was 147 to 167.
iv) Average mass of perennial weed cut was 111.8 to 170.4 kg/h.

12.2.2 Fuel consumption

Fuel consumption was observed as 0.40 to 0.50 l/h and 10.00 to 13.16 l/ha.

12.3 Labor requirement

To ensure the cutting work without interruption, two operators are required to work alternates. Additionally, one more labor is needed gather the collected bush/weeds.

12.4 Adequacy of power of prime mover

The power of prime mover was found adequate.

12.5 Wear analysis of critical components

Component	Duration of operation (h)	Initial length/ mass (mm/g)	Length/ Mass after operation (mm/g)	Loss of length/ mass (mm/g)	Percentage wear	Percentage wear on hour basis
Nylon rope	12.27	3020	1780	1240	41.06	3.35
Triangular blade	16.43	231.2	221.52	9.9	4.28	0.26

13. EASE OF OPERATION & ADJUSTMENTS

Fatigue was observed just after half an hour of operation of the Bush cutter, mainly, due to excessive mechanical vibration and noise. The operator complained about pain in different parts of his body like wrist & shoulder etc during operation.

Work-Rest cycle for this brush cutter is observed on follows

30 minutes work – 10 minutes rest – 20 minutes work - 10 minutes rest – 20 minutes work -15 minutes rest & so on.

14. DEFECTS, BREAKDOWNS AND REPAIRS

No noticeable breakdowns were occurred during 29 hours of operation.

15. CRITICAL TECHNICAL SPECIFICATION

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

16. COMMENTS AND RECOMMENDATIONS

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

16.2 The chemical composition of blades does not conform, to the requirements of IS: 6025-1982. This needs to be looked into for corrective action.

16.3 The hardness of blades does not conform, to the requirements of IS: 6025-1982. This needs to be looked into for corrective action

16.4 Labeling plate should be riveted on machine with following information.

1. Name and address of manufacturer
2. Name and address of applicant
3. Country of origin
4. Make
5. Model
6. Year of manufacturer
7. Serial number
8. Engine number
9. Engine HP
10. Rated rpm
11. SFC

17. TECHNICAL LITERATURE

Owner's was provided by the applicant during the test.
The following literature, therefore, **MUST** be provided as per IS: 8132-1999 for guidance.

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

TESTING AUTHORITY

SANJAY KUMAR AGRICULTURAL ENGINEER	
P. K. PANDEY **DIRECTOR**	

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

18. APPLICANT'S COMMENTS

No specific comments received from the applicant.