

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: MACHINE - 52/3004/2023
माह/Month: April, 2023

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



**AGRIPRO, APBC43
SIDE PACK BRUSH CUTTER**



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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Sr. No.	Location		HD (μ)	VD (μ)
1.	Handle	Left	330*	200*
		Right	320*	220*
2.	Engine cover		250*	200*
3.	Frame pipe		240*	210*
4.	Grass deflector		400*	390*
5.	Starter		220*	240*
6.	Fuel tank		300*	440*
7.	On/off switch		230*	260*

* The amplitude of mechanical vibration is on higher side.

10. NOISE MEASUREMENT

Noise at operator's ear level

Date of test	: 28.03.2023
Type of sound level meter	: Casella CEL-63X
Temperature, °C	: 27.8
Pressure, kPa	: 741.5
Relative humidity, %	: 42.3
Background noise level, dB(A)	: 52.6
Observed noise level, dB(A)	: 90.4

Noise at By-stander's ear level

Observed noise level, dB(A)	: 76.6
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11. HARDNESS AND CHEMICAL COMPOSITION OF ROTOR BLADES

11.1 Hardness:

11.1.1 Hardness of straight blade:

Sr. No.	As per IS: 6025:1982 HRC	As observed (HRC)	Remarks
	48 to 58	18	Does not conform

11.2 Chemical composition analysis:

11.2.1 Straight blade:

Constituents	As per IS: 6025-1982	Composition as observed (% of weight)	Remarks
Carbon (C)	0.70-0.95	0.4657	Does not conform
Manganese (Mn)	0.30 to 0.50	0.5840	Does not conform
Silicon (Si)	--	0.4370	--
Sulphur (S)	--	0.0409	--
Phosphorous (P)	--	0.0182	--

12. FIELD TEST

Field tests were conducted for 11.91hours with straight blade attachment and 16.0 hours with Nylon rope attachment. Detailed results of field tests are shown in Annexure-I & II and summarized in the ensuing table. Details about the operator are shown in Annexure-III.

Machine- 52/3004/2023	AGRIPRO, APBC43 SIDE PACK BRUSH CUTTER (COMMERCIAL)
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Sr. No.	Parameters	Seasonal Grass cutting	
		For straight blade	For nylon rope
1.	Field condition	Leveled	Leveled
2.	Intensity of grass	High	High
3.	Number of grass/weed in 1 sq. m	296 to 362	276 to 343
4.	Height of grass/weed, cm	14 to 22	12 to 18
5.	Diameter of grass/weed, mm	1.7 to 2.3	1.1 to 1.8
6.	Mass of grass cut (kg/h)	25.78 to 28.0	22.4 to 26.95
7.	Area covered (Rate of work), ha/h	0.068 to 0.075	0.048 to 0.066
8.	Time required for one hectare, h	13.39 to 14.71	13.33 to 20.83
9.	Fuel consumption		
	-l/h	0.810 to 0.986	0.800
	-l/ha	10.84 to 14.50	10.66 to 16.66

12.1 Cutting using straight blade

12.1.1 Rate of work

- i) Area covered (rate of work) was observed as 0.068 to 0.075 ha/h.
- ii) Time required for one hectare was observed as 13.39 to 14.71 hours.
- iii) Numbers of perennial weed in one square meter was 296 to 362.
- iv) Mass of perennial weed cut was 25.78 to 28.0 kg/h.

12.1.2 Fuel consumption

Fuel consumption was observed as 0.810 to 0.986 l/h and 10.84 to 14.50 l/ha.

12.2 Cutting using nylon rope assembly

12.2.1 Rate of work

- i) Area covered (rate of work) was observed as 0.048 to 0.066 ha/h.
- ii) Time required for one hectare was observed as 13.33 to 20.83 h.
- iii) Mass of grass cut was observed as 22.40 to 26.95 kg/h.
- iv) Numbers of grass stem in one m² area was 276 to 343.

12.2.2 Fuel consumption

Fuel consumption was observed as 0.800 l/h and 10.66 to 16.66 l/ha.

12.3 Labor requirement

To ensure the cutting work without interruption, two operators are required to work alternatively. Additionally, one more labor is needed to 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 mass/Length(g/m)	Mass / Length after operation (g/mm)	Loss of mass / length(g/m)	Percentage wear	Percentage wear on hour basis
Straight blade	11.91	242.7	231.8	10.9	4.49	0.38
Nylon rope	15.00	3000	1900	1100	0.37	0.023

13. EASE OF OPERATION & ADJUSTMENTS

Fatigue was observed just after half an hour of operation of the brush 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.



17. COMMENTS AND RECOMMENDATIONS

- 17.1** 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.
- 17.2** The chemical composition of blades does not conform, to the requirements of IS: 6025-1982. This needs to be looked into for corrective action.
- 17.3** The hardness of blades does not conform, to the requirements of IS: 6025-1982. This needs to be looked into for corrective action.
- 17.4** No noticeable defect was observed during the field test. The performance of brush cutter was found to be satisfactory.
- 17.5** A suitable labeling plate (not sticker) needs to be provided with "Interlia" 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 manufacture
 7. Serial number
 8. Engine number
 9. Engine hp
 10. Rated rpm
 11. SFC

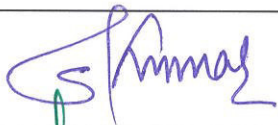

18. TECHNICAL LITERATURE

The following literatures are provided with brush cutter by the applicant during the test.

- a) Operator manual
- b) Parts catalogue
- c) Service manual

However, the manuals need to be updated as per IS: 8132-1999.

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 18.04.2023

19. APPLICANT'S COMMENTS

No specific comments received from the applicant.

