

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: MACHINE-34/2696/2021

माह/Month: May, 2021

THIS TEST REPORT VALID UP TO : 31ST MAY, 2026



**ASPEE-JONATHAN, CHS35/4S
BRUSH CUTTER (USED AS CROP HARVESTER)**



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

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Page 1 of 21

11. HARDNESS AND CHEMICAL COMPOSITION OF ROTOR BLADES**11.1 Hardness:****11.1.1 Hardness of Circular blade:**

Sr. No.	As observed (HRC)
	32.4 (Average)

11.2 Chemical composition analysis:**11.2.1 Circular blade:**

Constituents	Composition as observed (% of weight)
Carbon (C)	0.3030
Manganese (Mn)	0.7894
Silicon (Si)	0.3961
Sulphur (S)	0.0334
Phosphorous (P)	0.0079

12. FIELD TEST

The Brush Cutter was operated in field for 27.37 hours only in wheat harvesting. The crop parameters recorded during the test with wheat crop are as given in Annexure-I and summarized in Table -1

Table-1 : Crop parameter

Parameter	Wheat Crop
Variety	HD-343
Plant height (cm)	65 to 86
Plant population (No of tillers per m ²)	298 to 405
Straw grain ratio	2.34 to 2.79
Moisture (%)	
Grain	9 to 14
Straw	7 to 12

The results of field performance test are given in Annexure – II and are summarized in Table-2

Table 2 : Summary of field Test:

S. No.	Observation	Wheat harvesting
1	Area covered (ha/h)	0.013 to 0.020
2.	Width of cut (m)	0.91 to 1.00
3.	Fuel consumption	
		l/h 0.80 to 0.94
		l/ha 43.00 to 72.30
4.	Losses	
	a) Pre harvest losses (kg/ha)	13.33 to 22.00
	b) Uncut crop (Grain Wheat) (kg/ha)	2.35 to 4.10
	c) Grain loss due to shattering (kg/ha)	3.05 to 6.12
	d) Post harvest loss (kg/ha) (b+c)	6.91 to 9.67
5.	Stubble height after harvesting (cm)	5 to 8
6.	Time required to cover 1 ha. area (h)	50.00 to 76.92
7.	Mass of crop harvested (kg/ha)	13464 to 15681

12.1 Rate of work :

- i) During the tests, the rate of work varied from 0.013 to 0.020 ha/h.
- ii) The fuel consumption varied from 0.80 to 0.94 l/h in wheat harvesting.
- iii) The fuel consumption per unit area harvested varied from 43.0 to 73.3 l/ha

12.2 Quality of work :

- i) During test Post harvest losses varied from 6.91 to 9.67 kg/ha.
- ii) Stubble height after harvesting was observed from 6.5 to 7.1 cm.
- iii) Mass of crop harvested was observed as 13464 to 15681 kg/ha

12.3 Labor requirement

To ensure the cutting work without interruption, two operators are required to work alternately. Additionally, one more labor is needed to gather the harvested crop. .

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 (g)	Mass after operation (g)	Loss of mass (g)	Percentage wear	Percentage wear on hour basis
Circular blade	28.42	367.57	351.2	16.37	4.45	0.16

13. EASE OF OPERATION & ADJUSTMENTS

Fatigue was observed just after half an hour of operation of the crop harvester, 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 crop harvester is observed as follows:

30 minutes work – 30 minutes rest and so on for 8 hours duration of work

14. DEFECTS, BREAKDOWNS AND REPAIRS

No noticeable breakdowns were occurred during 29 hours of operation.

15. CRITICAL TECHNICAL SPECIFICATION (BRUSH CUTTER)

(Vide Ministry's communication No 13-9/2019 M & T (I&P) dated 26.04.2019)

Si. No	Parameters	Specification	Observed	Remarks
1.	Type	Self propelled, Portable	Self propelled	Conforms
2.	Type of cutting attachment	Circular disc/Straight blade/nylon rope	Circular disc	Conforms
Circular blade				
3.	Material of Circular/straight blade	Alloy Steel	Alloy Steel	Conforms
4.	No. of teeth on circular disc blade	50-100	80	Conforms
5.	Root diameter/Overall diameter (mm)	200-270	252	Conforms
6.	Thickness of disc (mm)	1.5 Min	1.2	Does not conform
7.	Teeth thickness (mm)	2.0 Min	2.10	Conforms
8.	Material of Blade	M42	Not specified by the applicant	Does not conform
9.	Hardness of Blade, HRC	68-70	32.4 (Average)	Does not conform

Machine- 34/2696/2021	ASPEE-JONATHAN, CHS35/4S BRUSH CUTTER (USED AS CROP HARVESTER) (COMMERCIAL)
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Straight blade				
10.	Diameter of straight blade (mm)	250-350	Not applicable, the manufacturer recommended circular blade only	--
11.	Width at ends/at center (mm)	50/70, Min.		
12.	Thickness of straight blade (mm)	1.5 Min		
Nylon rope				
13.	Length of nylon rope (mm)	2000-4000	Not applicable, the manufacturer recommended circular blade only	--
14.	Diameter of nylon rope (mm)	2.5 to 4.0		
15.	Type of engine	Compression ignition/Spark ignition	Spark ignition engine used	Conforms
16.	Starting method	Manual/recoil/self-starting	Recoil Start	Conforms
17.	Type of clutch	Cone/centrifugal	Centrifugal clutch provided	Conforms
18.	Type of gear drive	Bevel pinion	Bevel pinion type gear drive used	Conforms
19.	Capacity of fuel tank (l)	1.0 (min)	0.75 liter capacity	Does not conform
20.	On off provision in fuel supply system	Must be provided	No on/off valve	Does not conform
21.	Provision for easy start of engine	Must be provided	Provided	Conforms
22.	Provision for emergency stop of engine	Must be provided	Provided	Conforms
23.	Provision for shield/cover to prevent flying of mud and stone from rotor	Must be provided	Provided	Conforms
24.	Provision for Grass deflector at the rear of the cutting mechanism	Must be provided	Provided	Conforms
25.	Provision for Pad with shoulder belt to dampen the vibration	Must be provided	Provided	Conforms
26.	Provision for cover on exhaust.	Must be provided	Provided	Conforms
27.	Direction of exhaust emission away from operator	Must be provided	Provided	Conforms



Machine- 34/2696/2021	ASPEE-JONATHAN, CHS35/4S BRUSH CUTTER (USED AS CROP HARVESTER) (COMMERCIAL)
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28.	Provision for safety kit (helmet, ear plug, mask, hand gloves, safety glass, Protective cloth, safety shoes)	Must be provided	Safety kit provided with machine	Conforms
29.	Marking/labeling of machine	The labeling plate should be riveted in the body on 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
30.	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Only operator manual provided	Partially conforms

16. COMMENTS AND RECOMMENDATIONS

- 16.1 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 affects the useful life of the components. In view of above, this deserved to be given top priority for corrective action.
- 16.2 The hardness of blade does not conform, to the requirements of IS: 6025-1982 & critical technical specification. It **MUST** be looked into for corrective action
- 16.3 The capacity of Fuel tank does not meet the requirement of critical technical specification. It **MUST** be looked into.
- 16.4 Thickness of circular blade does not meet the requirement of critical technical specification. It **MUST** be looked into.
- 16.5 On/off provision in fuel supply system is not provided. It **MUST** be provided as requirement of critical technical specification.




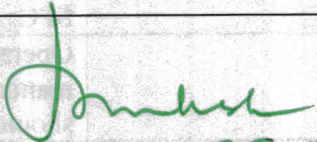
17. TECHNICAL LITERATURE

Operator Manual was provided by the applicant during the test.

The following literature, therefore, **MUST** be provided as per IS: 8132-1999 for guidance.

- i) Service manual
- ii) Parts catalog.

TESTING AUTHORITY

R.K NEMA SENIOR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 25.05.2021

18. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's comments
18.1	16.1, 16.2, 16.3, 16.4 & 16.5	Noted, we will do needful

