

व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT
(Initial)



संख्या/No.: Misc/NERFMTTI,
B. Chariali/2025-26/03/534
माह / Month: May 2025

THIS TEST REPORT IS VALID UPTO 31.05.2032



MHASWADKAR, BAM520BP, 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

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

बिश्वनाथ चारिआलि, जिला - बिश्वनाथ(असम)

BISWANATH CHARIALI, DIST- BISWANATH, ASSAM, PIN - 784 176

[AN ISO 9001:2015 CERTIFIED INSTITUTION]

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Website: <https://nerfmtti.nic.in>

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Name and Address of Applicant : M/S.MHASWADKAR AUTOLINES
PVT. LTD., 283/3/1B, Karanje, New
Radhika Road, Near Market Yard, Satara-
415001, Maharastra, INDIA

Make : Mhaswadkar

Model : BAM520BP

Serial No. : 520B230044

Type : Engine operated (Shoulder Mounted-Back
pack)

Type of cutting attachment : Nylon rope and Circular blade

Year of manufacture : 2025

Country of origin : CHINA

Type of crops/bush recommended : All kinds of weeds/bushes.



4.2 Constructional details :

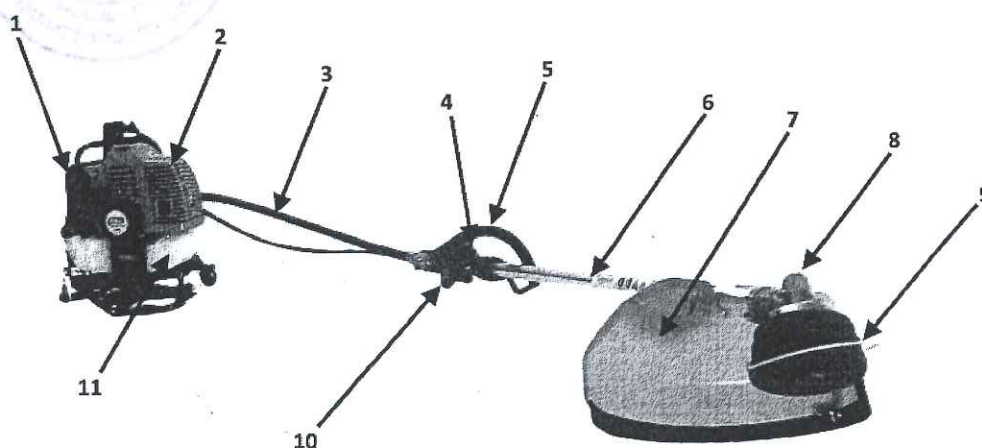


Fig. 1: MHASWADKAR, BRUSH CUTTER, MODEL: BAM520BP

Keywords:

- | | |
|--------------------------------|----------------------------|
| 1. Cushion for operator's back | 8. Gear case |
| 2. Engine cover | 9. Nylon rope |
| 3. Flexible drive shaft cover | 10. Engine stopping switch |
| 4. Throttle cum clutch trigger | 11. Fuel tank |
| 5. Handle grip | |
| 6. Transmission cover pipe | |
| 7. Deflector | |

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10. HARDNESS AND CHEMICAL COMPOSITION

10.1 Hardness of Circular blade

Sr. No.	Hardness as per IS: 6025 – 1982 (HRC)	Hardness as measured (HRC)	Remarks
1	48 to 58	44	Does not conform

10.2 Chemical composition of Circular blade:

The results of chemical analysis test of Circular blade

Constituents	As per IS: 6025 – 1982 (%)	Composition As observed (% by weight)	Remarks
Carbon (C)	0.70 to 0.95	0.075	Does not conform
Manganese (Mn)	0.3 to 0.5	0.205	Does not conform
Silicon (Si)	-----	0.074	-----
Sulphur (S)	-----	0.011	-----
Phosphorous (P)	-----	0.014	-----

11. WEAR ANALYSIS OF CRITICAL COMPONENTS

Component	Duration of operation (h)	Initial mass (g)	Mass after operation (g)	Loss of mass (g)	Percentage of wear	Percentage of wear on hourly basis
Circular blade	10.14	371.68	369.38	2.3	0.62	0.06

12. FIELD PERFORMANCE TEST

Field tests were conducted for total of 25.67 hours duration. Bush cutting using Circular blade and Grass/weeds cutting with nylon rope attachments were carried out for 10.14 hours and 15.53 hours, respectively. A total of seven test trials were conducted at rated speed of 7500 rpm. Detailed results of field tests are shown in ANNEXURE-I & II and summarized in the ensuing Table. Details of operators have been given in ANNEXURE-III.

SUMMARY OF FIELD PERFORMANCE TEST

Sr. No.	Parameters	Bush cutting	Grass/weeds cutting
1	2	3	4
1	Field Condition	Level	
2	Thickness of stem of Grass/Bush at cutting height (mm)	10.5 to 13.0	2.3 to 4.9
3	Average number of Grass/Bush in 1 m ²	54 to 58	56 to 209
4	Average height of Grass/Bush (mm)	1292 to 1380	196 to 530
5	Mass of Grass/Bush cut (kg/h)	523.0 to 548.9	63.4 to 157.5
6	Mass of Grass/Bush cut (kg/ha)	17200 to 19600	1220 to 2990



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1	2	3	4
7	Rate of work (ha/h)	0.028 to 0.030	0.048 to 0.053
8	Time required for one hectare (h)	32.89 to 35.71	18.98 to 20.75
9	Fuel consumption		
	-l/h	0.95 to 1.00	0.95 to 1.03
	-l/ha	31.25 to 35.71	18.03 to 21.37

12.1 Bush cutting using Circular blade

12.1.1 Rate of work

- The area of cut was recorded as 0.028 to 0.030 ha/h.
- Time required for one hectare was recorded as 32.89 to 35.71 h.
- Mass of bush cut was 523.0 to 548.9 kg/h.

12.1.2 Fuel consumption

- Fuel consumption was observed as 0.95 to 1.00 l/h and 31.25 to 35.71 l/ha.

12.2 Weeds cutting using nylon rope

12.2.1 Rate of work

- The area of cut was recorded as 0.048 to 0.053 ha/h.
- Time required for one hectare was recorded as 18.98 to 20.75 h.
- Mass of weeds cut was 63.4 to 157.5 kg/h.

12.2.2 Fuel consumption

- Fuel consumption was observed as 0.95 to 1.03 l/h and 18.03 to 21.37 l/ha.

12.3 Labour/operator requirement :

It was observed that an averagely built person can able to operate the brush cutter for 40 to 45 minutes at a stretch. Hence, two operators are required for continuous operation.

12.4 Adequacy of power of prime mover :

The power of prime mover was found adequate.

13. EASE OF OPERATION AND ADJUSTMENTS

No noticeable difficulties were observed in operation and adjustment during the field test.

14. DEFECTS, BREAKDOWNS AND REPAIRS

1. Recoil starter got damaged while starting the engine during field performance test and it was replaced with new one.
2. Welding of pivot pin of engine mounting base was found broken during field performance test and it was re-welded.
3. Engine mounting base was found broken during field performance test and it was re-welded.

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15. COMPONENTS/ASSEMBLY INSPECTION

The Engine was dismantled after 35.17 hours of operation.

15.1 Engine:

Cylinder bore:

Cylinder bore dia., mm						Max. permissible wear limit, mm
Top position		Middle position		Bottom position		
Thrust side	Non-thrust side	Thrust side	Non-thrust side	Thrust side	Non-thrust side	
44.03	44.02	44.03	44.02	44.01	44.03	44.165

Piston:

Piston dia., mm				Clearance between piston & cylinder liner at the skirt of the piston, mm	Maximum permissible clearance limit, mm
Top (above top compression ring)		At skirt			
Thrust side	Non-thrust side	Thrust side	Non-thrust side		
43.66	43.72	43.85	NR	0.18	0.30

*not recorded due to piston design constraints

Ring end gap:

Rings	Ring end gap, mm			Max. permissible end gap limit, mm
	Top	Middle	Bottom	
1 st comp. ring	0.5	0.5	0.5	1.0
2 nd comp. ring	0.40	0.40	0.40	
Oil ring	*	*	*	

*not recorded due to ring design constraints

Ring side clearance:

Rings	Ring side clearance, mm	Max. permissible clearance limit, mm
1 st comp. ring	0.09	0.30
2 nd comp. ring	0.07	
Oil ring	*	

Main bearings: 6202 – 2 No

Bearing No.	Type of bearing	Diametrical clearance, mm	Crankshaft end float, mm	Max. permissible clearance limit, mm	
				Diametrical clearance	Crankshaft end float
1	Ball bearing	NA	0.05	NA	0.30
2	Ball bearing	NA			



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Big end bearing:

Bearing No.	Clearance, mm		Max. permissible clearance limit, mm	
	Diametrical	Axial	Diametrical	Axial
1	Needle bearing	0.45	0.146	1.10

Measurement of big end bearing clearance was not possible as the piston along with connecting rod was not detachable.

15.2 Transmission system:

All the gears of the transmission system were found in normal condition.

16. CRITICAL TECHNICAL SPECIFICATIONS

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

Sr. No.	Parameters	Specifications	Observation	Remarks
1	2	3	4	5
1	Type	Self-propelled; portable	Self-propelled, portable	Conforms
2	Type of cutting attachment	Circular disc / Straight blade / nylon rope	Circular disc / nylon rope	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	253.6	Conforms
6	Thickness of disc (mm)	1.5 Min.	1.30	Does not conform
7	Teeth thickness (mm)	2.0 Min.	1.7	Does not conform
8	Hardness of blade, HRC	68 - 70	44	Does not conform
Straight blade				
9	Diameter of straight blade (mm)	250 - 350	NA	--
10	Width at ends /at center (mm)	50 / 70, Min.	NA	--
11	Thickness of straight blade (mm)	1.5 Min.	NA	--
Nylon rope				
12	Length of nylon rope (mm)	2000 - 4000	3000	Conforms
13	Diameter of nylon rope (mm)	2.5 to 4.0	2.6	Conforms

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1	2	3	4	5
14	Type of engine	Compression ignition / Spark ignition	Spark ignition	Conforms
15	Starting method	Manual / recoil / self -starting	Recoil starting	Conforms
16	Type of clutch	Cone / centrifugal	Centrifugal	Conforms
17	Type of gear drive	Bevel pinion	Bevel pinion	Conforms
18	Capacity of fuel tank (l)	1.0 (Min.)	1.3	Conforms
19	On /Off provision in fuel Supply system	Must be provided	Not provided	Does not conform
20	Provision for easy start of engine	Must be provided	Provided	Conforms
21	Provision for emergency stop of engine	Must be provided	Provided	Conforms
22	Provision for shield / cover to prevent flying of mud & stone from rotor	Must be provided	NA	--
23	Provision for Grass deflector at the rear of the cutting mechanism	Must be provided	Provided	Conforms
24	Provision for Pad with shoulder belt to dampen the vibration	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	Provision for safety kit (helmet, earplug, mask, hand gloves, safety protective cloth, safety shoes)	Must be provided	Not provided	Does not conform
28	Marking /labeling of 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.	Name and address of manufacturer & Applicant, Country of origin, Model, Year of manufacturer, rated rpm & SFC were not provided. Instead of labeling plate, a sticker was pasted on the machine.	Does not conform
29	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Provided	Conforms





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17. COMMENTS AND RECOMMENDATIONS

- 17.1 The average rated power in rating test of engine was observed as 0.41 kW against declared value of 1.00 kW by the applicant/ manufacturer. This should be looked into for corrective action.
- 17.2 The specific fuel consumption (SFC) corresponding to rated power in rating test of engine was observed as 1808 g/kWh against declared value of 450 g/kWh by the applicant/manufacturer which exceeded by more than 5 percent of that declared by the manufacturer and hence does not fulfill the requirement of IS 7347-1974 (Amended 2011). This should be looked into for corrective action.
- 17.3 The engine was not marked with Manufacturer name or trade-mark, Rated power, Rated speed and type of fuel used which does not fulfill the requirement of IS 7347-1974 (Amended 2021). This may be looked into.
- 17.4 Recoil starter got damaged while starting the engine during field performance test and it was replaced with new one. This should be looked into for quality improvement.
- 17.5 During field performance test, it was observed that welding of pivot pin of engine mounting base was found broken and on request of the applicant, it was re-welded. This should be looked into for quality improvement.
- 17.6 Engine mounting base was found broken during field performance test and it was re-welded. This should be looked into for quality improvement.
- 17.7 Noise at operator's ear level was observed on higher side against danger limit of 90 dB(A) as specified by International Labour Organization (ILO) for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve the operational comfort and safety.
- 17.8 The amplitude of mechanical vibration at various assemblies viz. steering handle, engine cover and drive shaft cover pipe was on higher side. This calls for dampening down of vibration to improve the operational comfort and service life of the components.
- 17.9 The hardness and chemical composition of circular blade does not conform to Indian Standard IS 6025-2024. This should be looked into for corrective action.
- 17.10 Safety wears were not provided with the machine. The applicant is strictly advised to provide the entire safety kit including helmet, safety shoes, ear plug, mask etc. along with each machine for the safety of operator.
- 17.11 The labeling plate should be riveted on the body of machine having name and address of the manufacturer, Country of origin, Make, Model, Year of manufacture, Serial number, Engine number, Engine HP, rated rpm and SFC. This should be looked into.

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17.12 Adequacy of Literature

The following literature in English language was provided for reference during testing:

- Operator's/ Service manual
- Parts catalogue

It is recommended to bring out the manual in Hindi and other vernacular languages as per IS: 8132-1999.

TESTING AUTHORITY

(M.R. PATIL)
SENIOR AGRICULTURAL ENGINEER

(P. KAMALABAI)
DIRECTOR



18. APPLICANT'S COMMENTS

Applicant's Comments
We gone through the comments and recommendation as Stated in Draft Test Report, and we will take care as per comments and recommendation in our future products.

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ANNEXURE-I

FIELD PERFORMANCE TEST

Cutting attachment : Circular Blade
Place of test : NERFMTTI Farm, Biswanath Chariali, Biswanath, Assam
Uses : Bush cutting

Sr. No.	Parameters	Test trial		
		I	II	III
1	Date of test	07.04.2025	09.04.2025	23.04.2025
2	Net test duration (h)	3.80	2.09	4.25
3	Avg. height of bush (mm)	1292	NR	1380
4	Avg. thickness of stem of bush at cutting height (mm)	10.5	NR	13.0
5	Avg. No. of bush per m ²	58	NR	54
6	Avg. mass of bush cut per m ² (g)	1720	NR	1960
7	Actual area cut (ha/h)	0.030	NR	0.028
8	Time required for one ha (h/ha)	32.89	NR	35.71
9	Mass of bush cut			
	kg/h	523.0	NR	548.9
	kg/ha	17200	NR	19600
10	Fuel consumption			
	l/h	0.95	0.81	1.00
	l/ha	31.25	NR	35.71



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ANNEXURE-II

FIELD PERFORMANCE TEST

Cutting attachment : Nylon rope
Place of test : NERFMTTI Farm, Biswanath Chariali, Biswanath, Assam
Uses : Weeds/grass cutting

Sr. No.	Parameters	Test trial			
		I	II	III	IV
1	Date of test	23.04.2025	24.04.2025		06.05.2025
2	Net test duration (h)	1.28	3.00	2.84	8.41
3	Avg. height of weeds/grass (mm)	NR	530	196	228
4	Avg. thickness of stem of weeds/grass at cutting height (mm)	NR	4.90	2.30	3.78
5	Avg. No. of weeds/grass per m ²	NR	56	143	209
6	Avg. mass of weeds/grass cut per m ² (g)	NR	299	149	122
7	Actual area cut (ha/h)	NR	0.053	0.048	0.052
8	Time required for one ha (h/ha)	NR	18.98	20.75	19.23
9	Mass of weeds/grass cut				
	kg/h	NR	157.5	71.81	63.4
	kg/ha	NR	2990	1490	1220
10	Fuel consumption				
	l/h	1.02	0.95	1.03	0.99
	l/ha	NR	18.03	21.37	19.04



ANNEXURE-III

DETAILS OF OPERATOR

Operator		I	II
Age, years	:	32	50
Height, cm	:	168	162
Weight, kg	:	63	60