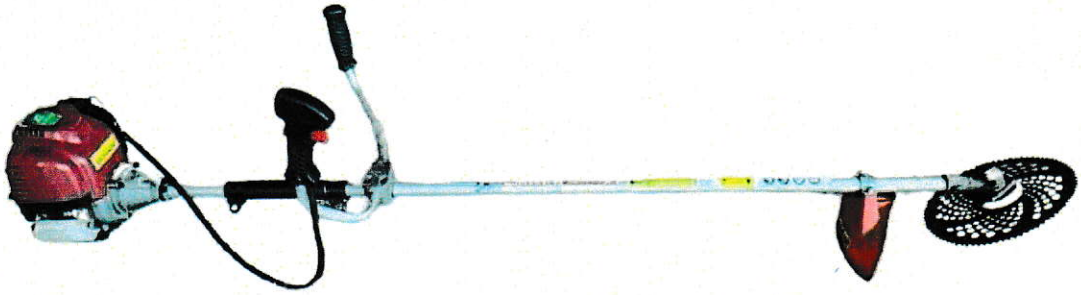
व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT (Initial)

स्वच्छ भारत
एक कदम स्वच्छता की ओर

संख्या/No.: Machine 117/488
माह / Month: March 2024

THIS TEST REPORT IS VALID UPTO 31.03.2031



SECHANAM AIBC-40 BRUSH CUTTER

सत्यमेव जयते

भारत सरकार
GOVT OF INDIA
कृषि एवं किसान कल्याण मंत्रालय
MINISTRY OF AGRICULTURE & 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
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1. SCOPE OF TEST

1.1 LABORATORY TEST

a) Checking of specifications
b) Mechanical vibration measurement
c) Noise measurement
d) Wear assessment of critical components
e) Engine performance test

1.2 FIELD TEST

a) Rate of work
b) Quality of work
c) Labour requirement
d) Adequacy of prime mover power
e) Ease of operation, adjustment & safety provisions
f) Defects, breakdowns and repairs

2. METHOD OF SELECTION

The test sample was selected by the testing authority through random selection. The following test samples were presented by the applicant during the random selection at Applicant's site.

Sl. No	Serial No. of test sample	Sl. No	Serial No. of test sample	Remarks
1	AIBC2106	6	AIBC2115	Out of 10 samples Sr. No. 09 sample was randomly selected.
2	AIBC2104	7	AIBC2105	
3	AIBC2121	8	AIBC2113	
4	AIBC2103	**9**	**AIBC2117**	
5	AIBC2101	10	AIBC2123	

3. TEST CODE AND PROCEDURE

There is no Indian Standard Test Code available for testing of brush cutter as such. However for engine performance test, IS 7347-1974 was referred.

4. SPECIFICATIONS

4.1 General

Name of the Machine : Brush Cutter

Name and address of the manufacturer : **Ningbo Aosheng Machine Co., Ltd., Linshan Industrial Park, Yuyao City, Zhejiang Province, China**

Name & Address of the Applicant	:	**Aquatix India, Madan Mohan Lane,1646/B, Near Binayak Steel, Gosala Road, Cuttack-753004, Odisha**
Make	:	SECHANAM
Model	:	AIBC-40
Serial No.	:	AIBC2117
Type	:	Engine Operated Machine
Type of cutting attachment	:	Nylon rope & circular blade
Year of manufacture	:	2023
Country of origin	:	**CHINA**
Type of crops/bush recommended	:	All kinds of weeds/Bushes.

4.2 Constructional details :

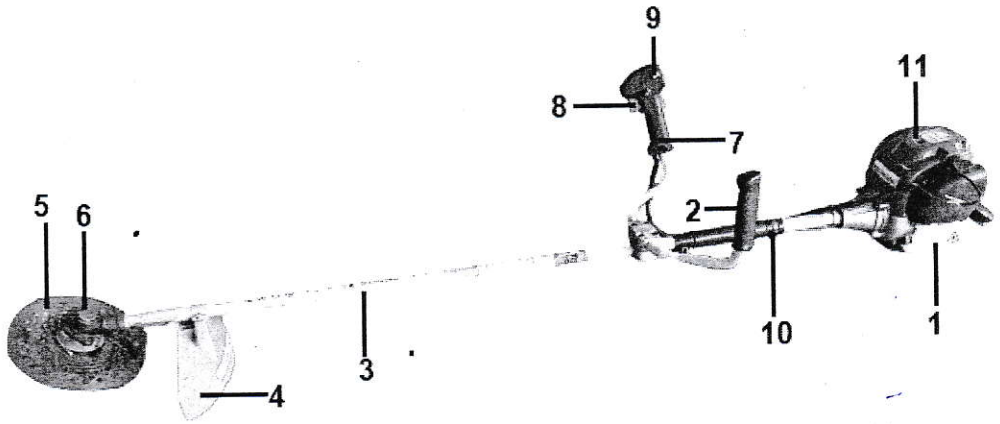

Fig. 1: SECHANAM BRUSH CUTTER, MODEL: AIBC-40

Keywords:

1. Fuel tank
2. Handle grip (LHS)
3. Transmission cover pipe
4. Grass deflector
5. Circular blade cutting attachment
6. Gear case
7. Handle grip (RHS)
8. Throttle cum clutch trigger
9. Engine stopping switch
10. Connection for shoulder strap
11. Engine

10. HARDNESS AND CHEMICAL COMPOSITION

10.1 Hardness of Circular blade:

Sl. No.	Hardness as per IS: 6025 – 1982 (HRC)	Hardness as measured (HRC)	Remarks
1	48 to 58	29.9	**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	0.463	**Does not conform**
Manganese (Mn)	0.3 to 0.5	0.506	**Does not conform**
Silicon (Si)	-----	0.208	--
Sulphur (S)	-----	0.009	--
Phosphorous (P)	-----	0.013	--

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	13.50	335.0	327.5	7.5	2.24	0.17

12. FIELD PERFORMANCE TEST

Field tests were conducted for total of 26.17 hours duration. Grass/weeds cutting with nylon rope and Bush cutting using Circular blade attachments were carried out for 12.67 hours and 13.50 hours, respectively. A total of five test trials were conducted at rated speed of 6500 rpm. Detailed results of field tests are shown in ANNEXURE-I & II and summarized in the ensuing table.

SUMMARY OF FIELD PERFORMANCE TESTS

Sl. No.	Parameters	Grass/weeds cutting	Bush cutting
1	2	3	4
1	Field Condition	Level	
2	Thickness of stem of Grasses/Bush at cutting height (mm)	2.13 to 2.43	23.0 to 25.8
3	Average number of Grass/Bush in 1m²	308 to 420	21 to 24

1	2	3	4
4	Average height of Grasses/Bush (mm)	238.3 to 266.6	1286.7 to 1745.0
5	Mass of Grass/Bush cut (kg/h)	83.15 to 109.2	1209.9 to 1606.3
6	Mass of Grass/Bush cut (kg/ha)	3080 to 4200	41020 to 47240
7	Rate of work (ha/h)	0.026 to 0.027	0.029 to 0.038
8	Time required for one hectare (h)	37.04 to 38.46	26.32 to 34.48
9	Fuel consumption		
	-l/h	0.67 to 0.82	0.69 to 0.76
	-l/ha	25.96 to 30.26	20.00 to 23.62

12.1 Weeds cutting using nylon rope

12.1.1 Rate of work

- The area of cut was recorded as 0.026 to 0.027 ha/h.
- Time required for one hectare was recorded as 37.04 to 38.46 h.
- Mass of weeds cut was 83.15 to 109.2 kg/h.

12.1.2 Fuel consumption

- Fuel consumption was observed as 0.67 to 0.82 l/h and 25.96 to 30.26 l/ha.

12.2 Bush cutting using Circular blade

12.2.1 Rate of work

- The area of cut was recorded as 0.029 to 0.038 ha/h.
- Time required for one hectare was recorded as 26.32 to 34.48 h.
- Mass of bush cut was 1209.9 to 1606.3 kg/h.

12.2.2 Fuel consumption

- Fuel consumption was observed as 0.69 to 0.76 l/h and 20.00 to 23.62 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

No noticeable defect or breakdown was observed during test.

15. COMPONENTS/ASSEMBLY INSPECTION

The Engine was dismantled after 35.67 hours of operation.

15.1.6 Big end bearing:

Bearing No.	Clearance, mm		Max. permissible clearance limit, mm	
	Diametrical	Axial	Diametrical	Axial
1	Needle bearing	--	NA	NA

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

15.2 Valve, guide and timing gear:-

Any marked sign of overheating of valves	:	None
Pitting of seat/faces of valves	:	None
Any visual damage of teeth of timing gears	:	None
Condition of ignition coil & magneto	:	Normal

15.3 Transmission system:

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

16. COMMENTS & RECOMMENDATIONS

16.1 The average rated power in rating test of engine was observed as 0.56 kW against declared value of 1.8 kW by the applicant/manufacturer. This should be looked into for corrective action.

16.2 The specific fuel consumption (SFC) in rating test of engine was observed as 610.4 g/kWh against declared value of 280 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.

16.3 Fuel priming bulb in the carburettor assembly was found cracked and fuel leakage was observed after completion of field tests. On request of the applicant fuel priming bulb was changed. This should be looked into for improvement in quality.

16.4 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 2011). This may be looked into.

16.5 It was observed that during engine performance test, at full load, engine speed was not stable at rated speed. This shall be looked into for corrective action.

16.6 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 of the operator.

16.7 The Hardness & Chemical composition of circular blade does not conform to Indian Standard IS 6025:1982. This should be looked into for improvement.

16.8 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 machine components.

16.9 As a safety wear, only helmet, Safety shoe, hand gloves and goggles (safety glass) were provided with the machine. The applicant is strictly advised to provide the entire safety kit including ear plug, mask, protective cloth etc. along with each machine for the safety of operator.

16.10 The applicant is advised to provide metallic labelling plate instead of sticker at suitable place on the machine. It should be looked into.

16.11 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)
AGRICULTURAL ENGINEER

(Dr. P.P. RAO)
DIRECTOR

17. APPLICANT'S COMMENTS

Sr. No.	Clause No.	Applicant's Comments
17.1	16.1 to 16.11	As per comments and recommendations necessary precautionary measures will be taken during future products.