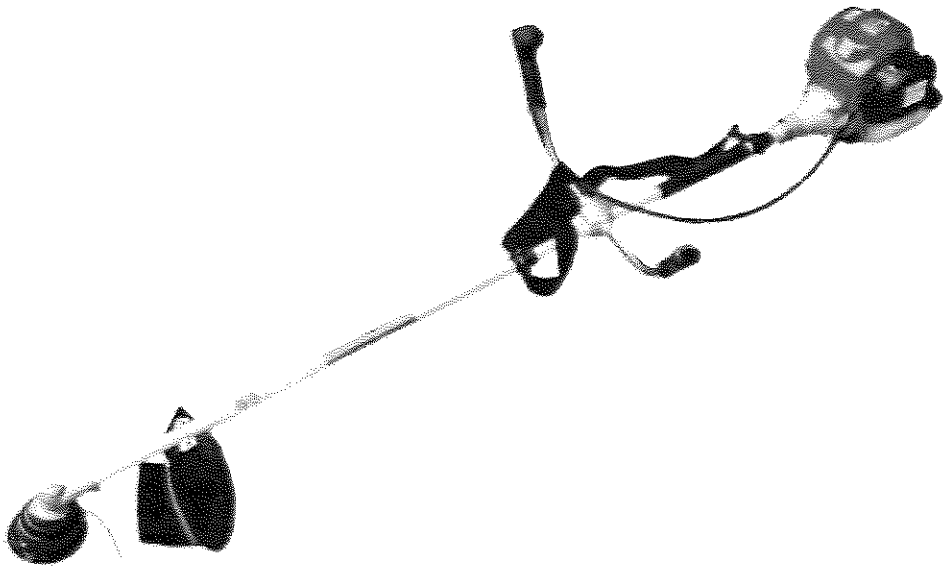
व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT (Initial)

संख्या/No.: Machine 145/519
माह / Month: February 2025

THIS TEST REPORT IS VALID UPTO 29.02.2032



SAMSON, SAM-435BC, BRUSH CUTTER

सत्यमेव जयते

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)
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[AN ISO 9001:2015 CERTIFIED INSTITUTION]

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Name and Address of Applicant	:	M/s Green Field Material Handling Pvt. Ltd., Plot No. N-49/1, MIDC, ADDL. Ambernath Indl. Area, Anand Nagar, Ambernath (E) – 421 506
Make	:	SAMSON
Model	:	SAM-435BC
Serial No.	:	3559
Type	:	Engine operated
Type of cutting attachment	:	Nylon rope and circular blade
Year of manufacture	:	2024
Country of origin	:	**CHINA**
Type of crops/bush recommended	:	All kinds of weeds/bushes

4.2 Constructional details:

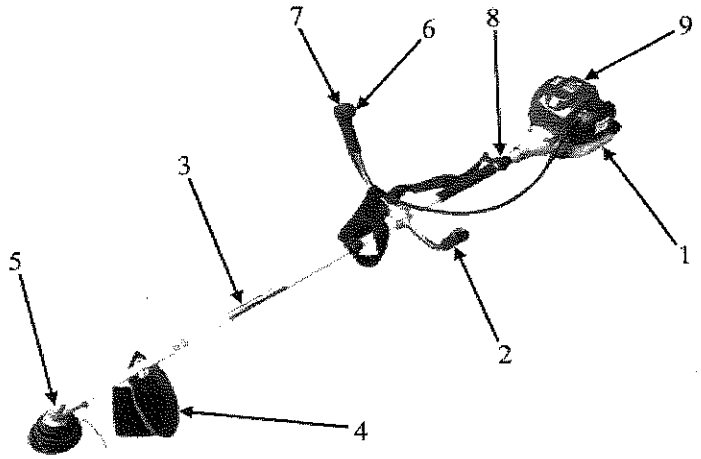

Fig. 1: BRUSH CUTTER, MODEL:SM-435BC

Keywords:

1. Fuel tank
2. LHS handle
3. Transmission cover pipe
4. Deflector
5. Gear case
6. Engine stopping switch
7. RHS handle
8. Connection for shoulder strap
9. Engine

SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameters	Grass/weeds cutting with nylon rope	Bush cutting with circular blade
1	Field Condition	Level	
2	Thickness of stem of Grasses/Bush at cutting height (mm)	2.3 to 3.8	6.9 to 12.6
3	Number of Grass/Bush per m²	346 to 418	19 to 23
4	Height of Grasses/Bush (mm)	490 to 660	1338 to 1516
5	Mass of Grass/Bush cut (kg/h)	561.6 to 619.5	753.0 to 1649.3
6	Mass of Grass/Bush cut (kg/ha)	8840 to 10120	17800 to 38000
7	Rate of work (ha/h)	0.056 to 0.070	0.042 to 0.043
8	Time required for one hectare (h)	14.3 to 18.0	23.0 to 23.6
9	Fuel consumption:		
	-l/h	0.58 to 0.64	0.60 to 0.68
	-l/ha	8.28 to 11.53	14.18 to 15.82

12.1 Grass/Weeds cutting using nylon rope:

12.1.1 Rate of work:

The area of cut was recorded as 0.056 to 0.070 ha/h.
Time required for one hectare was recorded as 14.3 to 18.0 hours.
Mass of weeds cut was 561.6 to 619.5 kg/h.

12.1.2 Fuel consumption:

Fuel consumption was observed as 0.58 to 0.64 l/h and 8.28 to 11.53 l/ha.

12.2 Bush cutting using circular blade:

12.2.1 Rate of work:

The area of cut was recorded as 0.042 to 0.043 ha/h.
Time required for one hectare was recorded as 23.0 to 23.6 hours.
Mass of weeds cut was 753.0 to 1649.3 kg/h.

12.2.2 Fuel consumption:

Fuel consumption was observed as 0.60 to 0.68 l/h and 14.18 to 15.82 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 of the brush cutter.

12.4 Adequacy of prime mover power:

The power of the prime mover was found adequate.

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13. EASE OF OPERATION AND ADJUSTMENTS

No 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 35.7 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	
39.02	39.00	39.02	39.00	39.01	39.00	39.30

Piston:

Piston dia., mm				Max. Permissible wear limit at skirt (mm)	Clearance between piston & cylinder liner at the skirt of the piston, mm	
Top (above top compression ring)		At skirt				
Thrust side	Non-thrust side	Thrust side	Non-thrust side		As observed	Max. permissible limit, (mm)
38.65	38.69	38.96	*	Not specified	0.05	38.30

*Not recorded due to piston design constraints

Ring end gap:

Rings	Ring end gap, mm			Max. permissible end gap limit, mm
	Top	Middle	Bottom	
1st comp. ring	0.20	0.20	0.15	1.0
2nd comp. ring	0.20	0.20	0.20	
Oil ring	NA	NA	NA	

Ring side clearance:

Rings	Ring side clearance, mm	Max. permissible clearance limit, mm
1st comp. ring	0.02	0.30
2nd comp. ring	0.08	
Oil ring	*	

*Not recorded due to ring design constraints

Main bearings: 6202-1No & 6201 - 1No.

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	0.04	NA	0.2 (adjustable with gasket)
2	Ball bearing	NA			

Big end bearing:

Bearing No.	Clearance, mm		Max. permissible clearance limit, mm	
	Diametrical	Axial	Diametrical	Axial
1	Needle bearing	NR	0.15	0.70

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

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)

Sl. 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	254	Conforms
6	Thickness of disc (mm)	1.5 Min.	1.27	**Does not conform**

1	2	3	4	5
7	Teeth thickness (mm)	2.0 Min.	2.2	Conforms
8	Hardness of blade, HRC	68 - 70	41	**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	2000	Conforms
13	Diameter of nylon rope(mm)	2.5 to 4.0	3.3	Conforms
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.)	0.7	**Does not conform**
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

1	2	3	4	5
27	Provision for safety kit (helmet, earplug, mask, hand gloves, safety protective cloth, safety shoes)	Must be provided	Only hand gloves were 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, Year of manufacture, Engine number, rated rpm & SFC were not provided on the labeling sticker. 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

17. COMMENTS AND RECOMMENDATIONS

17.1 The average rated power in rating test of engine was observed as 0.53 kW against declared value of 1.20 kW by the applicant/manufacturer. This should be looked into for corrective action.

17.2 The specific fuel consumption (SFC) in rating test of engine was observed as 795 g/kWh against declared value of 750 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 2021). 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 should be looked into.

17.4 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.

17.5 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.

17.6 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 operator.

17.7 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.

17.8 As a safety wear, only hand gloves were provided with the machine. The applicant is strictly advised to provide the entire safety kit including helmet, earplug, safety shoes, mask, protective cloth etc. along with each machine for the safety of operator.

17.9 Discard limit of clearance between piston & cylinder liner at the skirt of the piston was wrongly declared as 38.30 mm. This should be looked into.

17.10 **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: 8132-2023.

TESTING AUTHORITY

(M.R. PATIL)
SENIOR AGRICULTURAL ENGINEER

(P. KAMALABAI)
DIRECTOR

Draft test report compiled by - **Sh. Vithato Keyho, Sr. Technical Assistant**

18. APPLICANT'S COMMENTS

Applicant's Comments
We have gone through your comments and recommendation we will do the corrective action in future lot.

ANNEXURE-I

FIELD PERFORMANCE TEST

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

Sl. No.	Parameters	Test trial	
		I	II
1	Date of test	04.02.2025	05.02.2025
2	Net test duration (h)	6.00	4.55
3	Avg. height of weeds (mm)	490	660
4	Thickness of stem of weeds at cutting height (mm)	2.3	3.8
5	Avg. No. of weeds per m^2	346	418
6	Avg. mass of weeds cut per m^2 (g)	884	1012
7	Actual area cut (ha/h)	0.070	0.056
8	Time required for one ha (h/ha)	14.3	18.0
9	Mass of weeds cut		
	kg/h	619.5	561.6
	kg/ha	8840	10120
10	Fuel consumption		
	l/h	0.58	0.64
	l/ha	8.28	11.53

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ANNEXURE-II

FIELD PERFORMANCE TEST

Cutting attachment : Circular Blade
Place of test : NERFMTTI field, Biswanath Chariali, Assam
Usage : Bush cutting

Sl. No.	Parameters	Test trial		
		I	II	III
1	Date of test	05.02.2025	06.02.2025	07.02.2025
2	Net test duration (h)	2.17	6.15	7.02
3	Avg. height of bush (mm)	1338	1516	1356
4	Thickness of stem of bush at cutting height (mm)	12.6	7.4	6.9
5	Avg. No. of bush per m^2	19	23	19
6	Avg. mass of bush cut per m^2 (g)	1780	3800	1966
7	Actual area cut (ha/h)	0.042	0.043	0.043
8	Time required for one ha (h/ha)	23.6	23.0	23.3
9	Mass of bush cut			
	kg/h	753.0	1649.3	845.2
	kg/ha	17800	38000	19660
10	Fuel consumption			
	l/h	0.60	0.62	0.68
	l/ha	14.18	14.28	15.82

ANNEXURE-III

DETAILS OF OPERATORS

Operator	:	I	II	III	IV	V
Age, years	:	44	20	20	36	40
Height, cm	:	174	165	168	168	165
Weight, kg	:	60	58	62	65	55