



THIS TEST REPORT IS VALID UPTO 31.08.2028



e-AGROCARE BG-35 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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[AN ISO 9001:2015 CERTIFIED INSTITUTION]

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Machine 97/468	e-AGROCARE BG-35 BRUSH CUTTER	COMMERCIAL (INITIAL)
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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	Remarks
1	EAC-202203-0429	Out of 5 samples Sr. No. 05 sample has been randomly selected.
2	EAC-202203-0453	
3	EAC-202203-0111	
4	EAC-202203-0134	
5	EAC-202203-0278	

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 : **Zhejiang Green Power Machinery Mfg. Co. Ltd., Sanmen City, Zhejiang China.**



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Name & Address of Applicant : e-AgroCare Machineries and Equipments Pvt. Ltd., D-45, 5-Star Industrial Area, Shendra, Aurangabad, Maharashtra, 431154

Make : e-AgroCare

Model : BG-35

Serial No. : EAC-202203-0278

Type : Shoulder Mounted Engine operated

Type of cutting attachment : Nylon rope & Circular blade

Year of manufacture : 2022

Country of origin : CHINA

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

4.2 Constructional details :

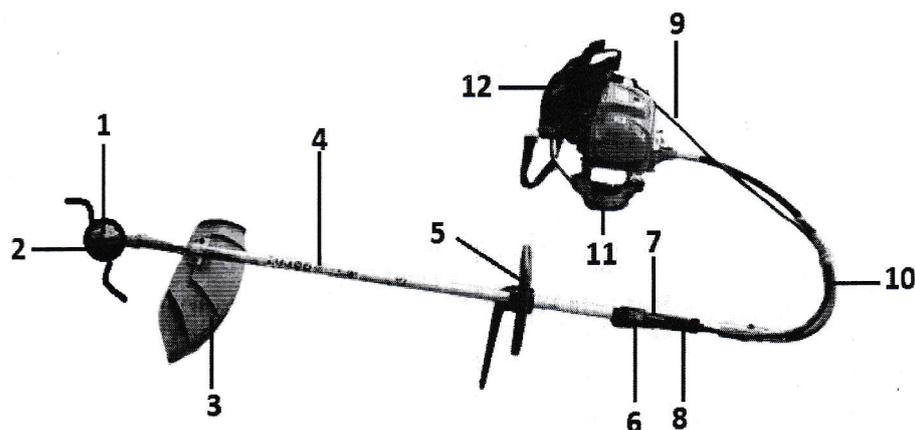


Fig. 1: e-AGROCARE BRUSH CUTTER, MODEL: BG-35

Keywords:

- | | |
|----------------------------------|---------------------------------|
| 1. Gear case | 7. Throttle cum clutch trigger |
| 2. Nylon rope cutting attachment | 8. Handle grip |
| 3. Deflector | 9. Accelerator cable |
| 4. Transmission cover pipe | 10. Flexible drive shaft cover |
| 5. Handle grip | 11. Engine mounting stand |
| 6. Engine stopping switch | 12. Cushion for operator's back |

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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	29.7	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	0.589	Does not conform
Manganese (Mn)	0.3 to 0.5	0.735	Does not conform
Silicon (Si)	-----	0.278	N.A.
Sulphur (S)	-----	0.013	N.A.
Phosphorous (P)	-----	0.010	N.A.

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	14.55	320.0	312.0	8.0	2.5	0.17

12. FIELD PERFORMANCE TEST

Field tests were conducted for total of 27.3 hours duration. Bush cutting using Circular blade and Grass/weeds cutting with nylon rope attachments were carried out for 14.55 hours and 12.75 hours, respectively. A total of five test trials were conducted at rated speed of 7000 rpm. Detailed results of field tests are shown in ANNEXURE-I & II and summarized in the ensuing table. Details of the operator have been given in ANNEXURE-III.

SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameters	Bush cutting	Grass/weeds cutting
1	2	3	4
1	Field Condition	Level	
2	Thickness of stem of Grasses/Bush at cutting height (mm)	14.66 to 25.59	1.26 to 1.74
3	Average number of Grass/Bush in 1m ²	22 to 46	392 to 457

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1	2	3	4
4	Average height of Grasses/Bush (mm)	2194 to 2324	274 to 298
5	Mass of Grass/Bush cut (kg/h)	1764.6 to 2392.4	67.19 to 71.76
6	Mass of Grass/Bush cut (kg/ha)	86510 to 119620	2800 to 3120
7	Rate of work (ha/h)	0.020 to 0.023	0.023 to 0.024
8	Time required for one hectare (h)	43.48 to 50.0	41.67 to 43.48
9	Fuel consumption		
	-l/h	0.826 to 0.900	0.891 to 0.897
	-l/ha	39.13 to 42.85	37.38 to 38.74

12.1 Bush cutting using Circular blade

12.1.1 Rate of work

- The area of cut was recorded as 0.020 to 0.023 ha/h.
- Time required for one hectare was recorded as 43.48 to 50.0 h.
- Mass of bush cut was 1764.6 to 2392.4 kg/h.

12.1.2 Fuel consumption

- Fuel consumption was observed as 0.826 to 0.900 l/h and 39.13 to 42.85 l/ha.

12.2 Weeds cutting using nylon rope

12.2.1 Rate of work

- The area of cut was recorded as 0.023 to 0.024 ha/h.
- Time required for one hectare was recorded as 41.67 to 43.48 h.
- Mass of weeds cut was 67.19 to 71.76 kg/h.

12.2.2 Fuel consumption

- Fuel consumption was observed as 0.891 to 0.897 l/h and 37.38 to 38.74 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 36.3 hours of operation.

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Big end bearing:

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

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

16.2 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 0.46 kW against declared value of 1.0 kW by the manufacturer. This should be looked into for corrective action.
- 16.2** The specific fuel consumption (SFC) in rating test of engine was observed as 954 g/kWh against declared value of 450 g/kWh by the 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** 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.
- 16.4** It was observed that during engine performance test, at full Load, engine rpm was not stable at rated speed. This shall be looked into for corrective action.
- 16.5** 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.
- 16.6** 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.
- 16.7** The Hardness & Chemical composition of Circular blade does not conform to Indian Standard IS 6025:1982. This should be looked into for corrective action.
- 16.8** As a safety wear, only hand gloves & goggles (safety glass) were provided with the machine. The applicant is strictly advised to provide the entire safety kit including helmet, Safety shoe, ear plug, mask etc. along with each machine for the safety of operator.

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

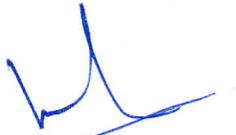
16.10 Adequacy of Literature

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: 8132-1999.

TESTING AUTHORITY



(M.R. PATIL)
AGRICULTURAL ENGINEER



(Dr. P.P. RAO)
DIRECTOR

Draft test report compiled by - **Shri Khagendra Bora**
Sr. Technical Assistant

17. APPLICANT'S COMMENTS

Sr. No.	Clause No.	Applicant's Comments
17.1	16.1 to 16.4	We will put up this issue with engine manufacturer.
17.2	16.5	We will work on it to reduce the noise of machine in future production.
17.3	16.6	We will work on it to reduce the vibration of machine in future production.
17.4	16.7	We will improve the treatment on heat treatment of blade in future production to confirm as per IS Standard.
17.5	16.8	We will provide safety kit as per your recommendations.
17.6	16.9	We will provide labelling as per your recommendation.
17.7	16.10	We will bring out the literature as per your recommendation.