



THIS TEST REPORT IS VALID UPTO 31.10.2027



FAI-300 FORTUNEAGRO BRUSH CUTTER



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

विश्वनाथ चारिआलि, जिला-विश्वनाथ (असम)

BISWANATH CHARIALI: BISWANATH: ASSAM, PIN - 784 176

[AN ISO 9001:2015 CERTIFIED INSTITUTION]

Ph. No. 03715-222094

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

Fax No: 03715-230358

E-Mail: fmti-ner@nic.in

1. SCOPE OF TEST

1.1 LABORATORY TEST

- Checking of specifications
- Mechanical vibration measurement
- Noise measurement
- Wear assessment of critical components
- Engine performance test

1.2 FIELD TEST

- Rate of work
- Quality of work
- Labour requirement
- Adequacy of prime mover power
- Ease of operation, adjustment & safety provisions
- Defects, breakdowns and repairs



2. METHOD OF SELECTION

As per Govt. of India, OM No. 13-1/2021-M&T (I&P), dated 03.02.2022, the selection of sample for test was exempted. Hence, the machine was directly submitted by the applicant at this Institute for test.

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 (Amended 2011) was referred.

4. SPECIFICATIONS

4.1 General

Name of the Machine	: Brush Cutter
Name and address of the manufacturer	: Changzhou Machinery & Equipment Imp. & Exp. Co., Ltd. No.62, Xinggang Road., Changzhou, Jiangsu, China
Name & Address of Applicant	: FORTUNE AGRO IMPEX, Fortune House, #343, 9 th Block, Sir M Visvesvaraya Layout, Kengunte first Main Road, Mallathahalli Lake Road, Bangalore-560056

Machine 78/449	FAI-300 FORTUNEAGRO BRUSH CUTTER	COMMERCIAL (INITIAL)
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Model : FAI-300

Make : FORTUNEAGRO

Serial No. : FAI2021BC05242

Type : Engine operated

Type of cutting attachment : Nylon rope and straight blade

Year of manufacture : 2021

Country of origin : CHINA

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

4.2 Constructional details :

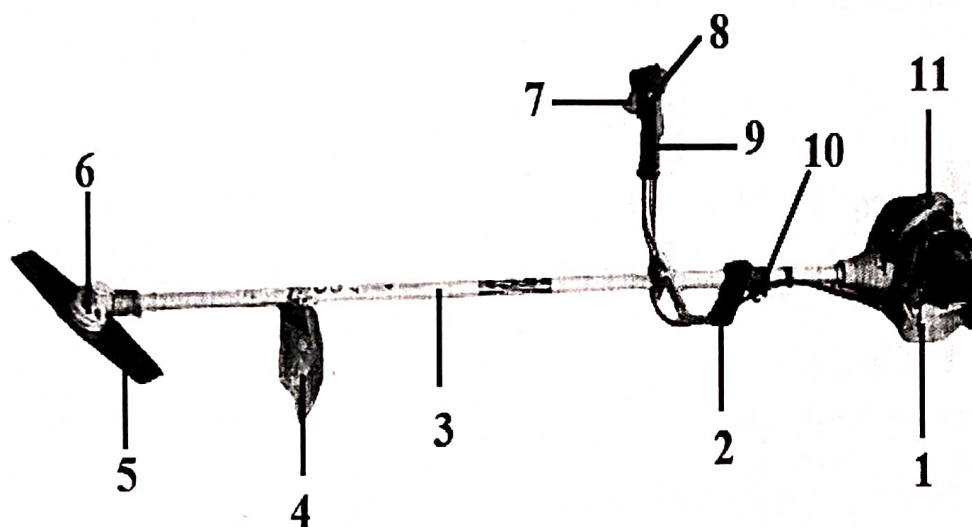


Fig. 1 : FORTUNEAGRO BRUSH CUTTER, MODEL: FAI-300

Keywords:

- | | |
|----------------------------|--------------------------------|
| 1. Fuel tank | 7. RHS handle |
| 2. LHS handle | 8. Throttle cum clutch trigger |
| 3. Transmission cover pipe | 9. Engine stopping switch |
| 4. Deflector | 10. Shoulder strap |
| 5. Straight blade | 11. Engine |
| 6. Gear case | |

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10. HARDNESS AND CHEMICAL COMPOSITION

10.1 Hardness of Straight blade

Sl. No.	Hardness as per IS: 6025 – 1982 (HRC)	Hardness as measured (HRC)	Remarks
1	48 to 58	44.0	Does not Conform

10.2 Chemical composition of Straight Blade:

The results of chemical analysis test of straight blade were as under.

Constituent	As per IS: 6025 – 1982 (%)	Composition As observed (% by weight)	Remarks
Carbon (C)	0.70 to 0.95	0.411	Does not Conform
Manganese (Mn)	0.3 to 0.5	0.621	Does not Conform
Silicon (Si)	---	0.252	---
Sulphur (S)	---	0.004	---
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
Straight blade	12.74	427.8	422.8	5.0	1.17	0.09

12. FIELD PERFORMANCE TEST

Field tests were conducted for total of 26.75 hours duration. Grass/weeds cutting with nylon rope and bush cutting using straight blade attachments were carried out for 14.01 hours and 12.74 hours, respectively. A total of six 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	Grass/weeds cutting	Bush cutting
1	2	3	4
1	Field Condition	Level	
2	Thickness of Grasses/Bush (mm)	1.14 to 1.27	10.63 to 11.18
3	Average number of Grass/Bush in 1m ²	316 to 355	29.8 to 34.0

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1	2	3	4	
4	Average height of Grasses/Bush (mm)	323.3 to 365.0	1350 to 1600	
5	Mass of Grass/Bush cut (kg/h)	272.77 to 326.18	2303.0 to 2428.8	
6	Mass of Grass/Bush cut (kg/ha)	6220 to 7264	30320 to 31210	
7	Rate of work (ha/h)	0.044 to 0.050	0.074 to 0.078	
8	Time required for one hectare (h)	20.12 to 22.73	12.85 to 13.55	
9	Fuel consumption			
	-l/h	1.27 to 1.34	1.47 to 1.49	
	-l/ha	25.55 to 29.84	18.89 to 20.05	

12.1 Grass/Weeds cutting using nylon rope

12.1.1 Rate of work

- The area of cut was recorded as 0.044 to 0.050 ha/h.
- Time required for one hectare was recorded as 20.12 to 22.73 hours.
- Mass of weeds cut was 272.77 to 326.18 kg/h.

12.1.2 Fuel consumption

- Fuel consumption was observed as 1.27 to 1.34 l/h and 25.55 to 29.84 l/ha.

12.2 Bush cutting using straight blade

12.2.1 Rate of work

- The area of cut was recorded as 0.074 to 0.078 ha/h.
- Time required for one hectare was recorded as 12.85 to 13.55 hours.
- Mass of bush cut was 2303.0 to 2428.8 kg/h.

12.2.2 Fuel consumption

- Fuel consumption was observed as 1.47 to 1.49 l/h and 18.89 to 20.05 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 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.

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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 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 0.61 kW against declared value of 1.88 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 1523.2 g/kWh against declared value of 580 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 straight blade does not conform to Indian Standard IS 6025:1982. This should be looked into for corrective action.

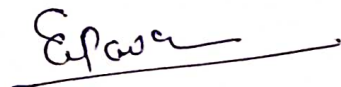
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- 16.8 The mentioned value of power of engine on the labeling sticker of the machine was not matching with the observed value during engine test. This may be looked into.
- 16.9 Make, Model and Serial no was not specified on the engine. This shall be looked into.
- 16.10 As a safety wear only safety shoes & goggles (safety glass) were provided with the machine. The applicant has strictly advised to provide the safety kit viz. helmet, hand gloves, ear plug, mask etc. along with each machine for the safety of operator.
- 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



(S.G. PAWAR)
AGRICULTURAL ENGINEER



(Dr. P.P. RAO)
DIRECTOR

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