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

स्वच्छ भारत
एक कदम स्वच्छता की ओर

संख्या/No.: Machine 106/477
माह / Month: January 2024

THIS TEST REPORT IS VALID UPTO 31.01.2031

TOSFL TFGC35 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

As per Govt. of India, OM No. 13-1/2021-M&T (I&P), dated 03.02.2022, the random 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	:	**Yongkang Tosfl Technology Co., Ltd,, No.83 Xita 3rd Road, Yongkang, Zhejiang CHINA**
Name & Address of Applicant	:	**Bahar Agrotech, 557, Dapoli-Dabhol Road, Dapoli, District-Ratnagiri-415712, Maharashtra**
Make	:	TOSFL
Model	:	TFGC35

Serial No.	:	352021080316
Type	:	Engine operated machine
Type of cutting attachment	:	Nylon rope, Circular blade and 2T Blade
Year of manufacture	:	2021
Country of origin	:	**CHINA**
Type of crops/bush recommended	:	All kinds of weeds/Bushes.

4.2 Constructional details :

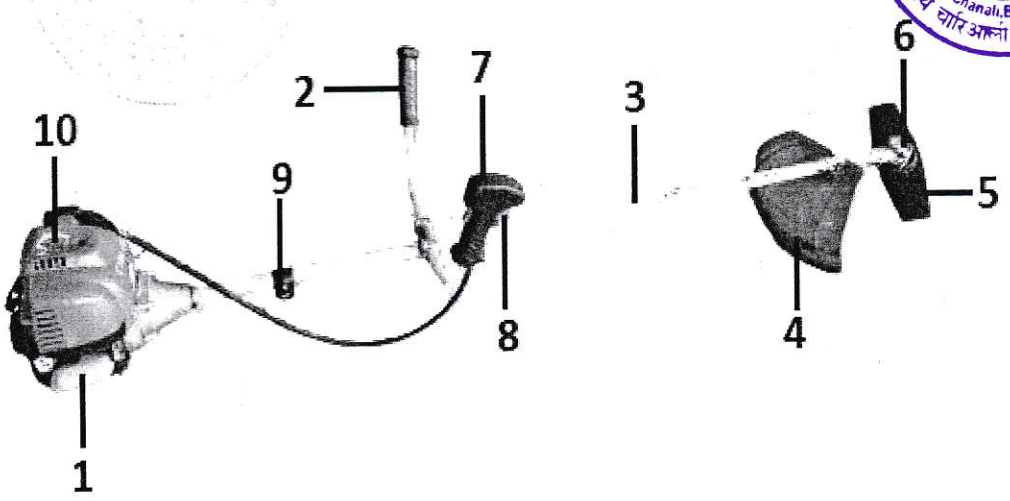

Fig. 1 : TOSFL BRUSH CUTTER, MODEL: TFGC35

Keywords:

1. Fuel tank
2. LHS handle
3. Transmission cover pipe
4. Grass deflector
5. 2T Blade
6. Gear case
7. RHS handle
8. Throttle cum clutch trigger
9. Connection for Shoulder strap
10. Engine

10.4 Chemical composition of 2T Blade:

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

Constituent	As per IS: 6025 – 1982 (%)	Composition As observed (% by weight)	Remarks
Carbon (C)	0.70 to 0.95	0.048	**Does not Conform**
Manganese (Mn)	0.3 to 0.5	0.192	**Does not Conform**
Silicon (Si)	---	0.013	---
Sulphur (S)	---	0.012	---
Phosphorous (P)	---	0.007	---

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	8.52	388.0	385.5	2.5	0.64	0.08
2T Blade	8.13	195.0	193.0	2.0	1.03	0.13

12. FIELD PERFORMANCE TEST

Field tests were conducted for total of 26.98 hours duration. Grass/weeds cutting with nylon rope and bush cutting using Circular blade and 2T blade attachments were carried out for 10.33 hours, 8.52 hours and 8.13 hours, respectively. A total of seven test trials were conducted at rated speed of 6000 rpm. Detailed results of field tests are shown in ANNEXURE-I to III and summarized in the ensuing table. Details of the operator have been given in ANNEXURE-IV.

SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameters	Grass/weeds cutting	Bush cutting	
			2T blade	Circular blade
1	2	3	4	5
1	Field Condition	Level		
2	Thickness of stem of Grasses/Bush at cutting height (mm)	1.5 to 2.3	11.9 to 18.1	12.2 to 12.3
3	Average number of Grass/Bush in 1m²	409 to 519	20 to 23	18
4	Average height of Grasses/Bush (mm)	265.0 to 318.8	1217.6 to 1467.7	1161.0 to1161.4
5	Mass of Grass/Bush cut (kg/h)	113.9 to 130.0	892.3 to 1025.2	738.2 to 772.1
6	Mass of Grass/Bush cut (kg/ha)	4220 to 5000	35350 to 35692	33571 to 35151

1	2	3	4	5
7	Rate of work (ha/h)	0.026 to 0.030	0.025 to 0.029	0.021 to 0.023
8	Time required for one hectare (h)	33.33 to 38.46	34.48 to 40.0	43.48 to 47.62
9	Fuel consumption			
	-l/h	0.46 to 0.55	0.45 to 0.46	0.43 to 0.47
	-l/ha	15.23 to 20.96	15.52 to 18.32	18.65 to 22.29

12.1 Grass/Weeds cutting using nylon rope

12.1.1 Rate of work

- The area of cut was recorded as 0.026 to 0.030 ha/h.
- Time required for one hectare was recorded as 33.33 to 38.46 hours.
- Mass of weeds cut was 113.9 to 130.0 kg/h.

12.1.2 Fuel consumption

- Fuel consumption was observed as 0.46 to 0.55 l/h and 15.23 to 20.96 l/ha.

12.2 Bush cutting using 2T blade

12.2.1 Rate of work

- The area of cut was recorded as 0.025 to 0.029 ha/h.
- Time required for one hectare was recorded as 34.48 to 40.0 hours.
- Mass of bush cut was 892.3 to 1025.2 kg/h.

12.2.2 Fuel consumption

- Fuel consumption was observed as 0.45 to 0.46 l/h and 15.52 to 18.32 l/ha.

12.3 Bush cutting using Circular blade

12.3.1 Rate of work

- The area of cut was recorded as 0.021 to 0.023 ha/h.
- Time required for one hectare was recorded as 43.48 to 47.62 hours.
- Mass of bush cut was 738.2 to 772.1 kg/h.

12.3.2 Fuel consumption

- Fuel consumption was observed as 0.43 to 0.47 l/h and 18.65 to 22.29 l/ha.

12.4 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.

12.5 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.

Big end bearing:

Bearing No.	Clearance, mm		Max. permissible clearance limit, mm	
	Diametrical	Axial	Diametrical	Axial
1	Needle bearing	--	0.10	0.25

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. COMMENTS & RECOMMENDATIONS

16.1 The average rated power in rating test of engine was observed as 0.55 kW against declared value of 0.90 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 558.7 g/kWh against declared value of 480 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 and type of fuel used which does not fulfill the requirement of IS 7347-1974 (Amended 2011). Also, labeling plate should be provided on machine with details such as name of machine, engine rated speed & power, machine serial number, Make & Model etc. This may be looked into.

16.4 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.

16.5 It was observed that piston ring end gap exceeded the maximum permissible end gap limit declared by the applicant/manufacturer. This should be looked into for improvement.

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.

16.7 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

16.8 The Hardness & Chemical composition of circular and 2T blade does not conform to Indian Standard IS 6025:1982. This should be looked into for improvement.

16.9 **The applicant/manufacturer is strictly advised to provide the safety kit viz. safety shoes, goggles (safety glass), helmet, hand gloves, ear plug and mask etc. along with each machine for the safety of operator.**

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 16.10	We will take necessary action with our future production in respect of comments and recommendations mentioned at Sr. No. 16.1 to 16.10 as stated in test report.