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

संख्या/No.: Machine 128/499
माह / Month: July, 2024

THIS TEST REPORT IS VALID UPTO 31.7.2031

TOSFL, BGC520SP, 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
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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 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	:	BGC520SP
Serial No.	:	522021080477

Type	:	Engine operated machine
Type of cutting attachment	:	Nylon rope, circular blade 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 :

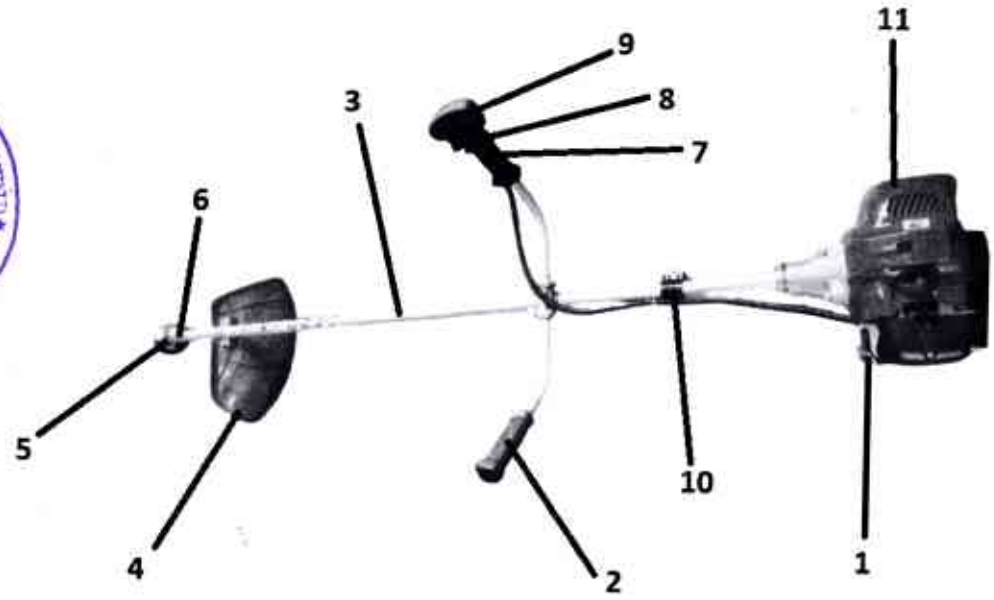

Fig. 1: BRUSH CUTTER, MODEL: BGC520SP

Keywords:

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

4.3 Details of Prime Mover:

Name and address of Manufacturer (apa) : **Yongkang Tosfl Technology Co., Ltd,**

10.4 Chemical composition of Circular Blade:

Constituent	As per IS: 6025 – 1982 (%)	Composition As observed (% by weight)	Remarks
Carbon (C)	0.70 to 0.95	0.431	**Does not conform**
Manganese (Mn)	0.3 to 0.5	0.833	**Does not conform**
Silicon (Si)	---	0.253	---
Sulphur (S)	---	0.005	---
Phosphorous (P)	---	0.015	---

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	7.4	195.50	194.37	1.13	0.58	0.08
Circular blade	8.23	388.50	378.85	9.65	2.48	0.30

12. FIELD PERFORMANCE TEST

Field tests were conducted for total 25.75 hours of operation. Grass/weeds cutting with nylon rope, bush cutting with straight blade and circular blade attachments were carried out for 10.12, 7.40 and 8.23 hours, respectively. A total of seven test trials were conducted at rated speed of 7000 rpm. Detailed results of field tests are shown in ANNEXURE-I, II and III and summarized in the ensuing Table. Details of operators have been given in ANNEXURE-IV.

SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameters	Grass/weeds cutting (Nylon rope)	Bush cutting (Straight blade)	Bush cutting (Circular blade)
1	2	3	4	5
1	Field Condition	Level		
2	Thickness of stem of Grasses/Bush at cutting height (mm)	1.57 to 1.82	12.54 to 22.07	15.60 to 16.27
3	Average number of Grass/Bush per m^2	505 to 574	21	19 to 20

1	2	3	4	5
4	Average height of Grasses/Bush (mm)	280 to 287	1437 to 1566	1837 to 1898
5	Mass of Grass/Bush cut (kg/h)	111.6 to 138.9	655.84 to 686.47	776.06 to 827.93
6	Mass of Grass/Bush cut (kg/ha)	3850 to 4630	22880 to 23420	34500 to 35272
7	Rate of work (ha/h)	0.026 to 0.030	0.028 to 0.030	0.022 to 0.024
8	Time required for one hectare (h)	33.33 to 38.46	33.33 to 35.71	41.67 to 45.45
9	Fuel consumption			
	-l/h	1.31 to 1.42	1.27 to 1.33	1.37 to 1.42
	-l/ha	44.66 to 54.15	44.33 to 45.35	59.17 to 62.27

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 111.6 to 138.9 kg/h.

12.1.2 Fuel consumption

- Fuel consumption was observed as 1.31 to 1.42 l/h and 44.66 to 54.15 l/ha.

12.2 Bush cutting using Straight blade

12.2.1 Rate of work

- The area of cut was recorded as 0.028 to 0.030 ha/h.
- Time required for one hectare was recorded as 33.33 to 35.71 hours.
- Mass of bush cut was 655.84 to 686.47 kg/h.

12.2.2 Fuel consumption

- Fuel consumption was observed as 1.27 to 1.33 l/h and 44.33 to 45.35 l/ha.

12.3 Bush cutting using Circular blade

12.3.1 Rate of work

- The area of cut was recorded as 0.022 to 0.024 ha/h.
- Time required for one hectare was recorded as 41.67 to 45.45 hours.
- Mass of bush cut was 776.06 to 827.93 kg/h.

12.3.2 Fuel consumption

- Fuel consumption was observed as 1.37 to 1.42 l/h and 59.17 to 62.27 l/ha.

Ring side clearance:

Rings	Ring side clearance, mm	Max. permissible clearance limit, mm
1st comp. ring	0.04	0.10
2nd comp. ring	0.05	
Oil ring	*	

*not recorded due to ring design constraint

Main bearings: Ball bearing 6202-2Nos.

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 6202	NA	0.10	NA	0.25
2	Ball bearing 6202	NA			

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 AND RECOMMENDATIONS

16.1 The average rated power in rating test of engine was observed as 0.80 kW against declared value of 1.2 kW by the manufacturer. This should be looked into for correetive action.

16.2 The specific fuel consumption (SFC) in rating test of engine was observed as 1599.8 g/kWh against declared value of 420 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 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.

16.4 After 14.1 hours of field test, it was observed that engine was not getting started. On request of the applicant and approval of competent authority spark plug was replaced with new one. This should be looked into.

16.5 The engine was not marked with Manufacturer's 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.

16.6 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.

16.7 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 operator's comfort and safety.**

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 machine components.

16.9 The Hardness and Chemical composition of straight blade and circular blade does not conform to Indian Standard IS 6025:1982. This should be looked into for corrective action.

16.10 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.

16.11 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

(P. KAMLABAI)
DIRECTOR

Draft test report compiled by - **Shri J.Bhon Singh**
Sr.Technical Assistant

17. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's Comments
17.1	16.1 to 16.11	We will take necessary action with our future production in respect of comments and recommendations mentioned at Sr. No. 16.1 to 16.11 as stated in test report.