



THIS TEST REPORT IS VALID UPTO 30.09.2027



YCM-430 ICS 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

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## 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 | : | M/s Yung Chi Y. C. Industrial Co.,<br>No. 169, Sec 3, Chung San Road,<br>Shetou Hsiang, Changhua Hsien-<br>511, TAIWAN.                               |
| Name & Address of Applicant          | : | M/s ICS MERCHANDISE<br>PRIVATE LIMITED, # 31, Rudra's<br>Arcade, 60 Feet, Mallathahalli Lake<br>Road, NGEF Layout, Mallathahalli,<br>Bangalore-560056 |

Model	: YCM-430
Make	: ICS
Serial No.	: 2021051937
Type	: Engine operated
Type of cutting attachment	: Nylon rope and straight blade
Year of manufacture	: 2021
Country of origin	: TAIWAN
Type of crops/bush recommended	: All kinds of weeds

#### 4.2 Constructional details :

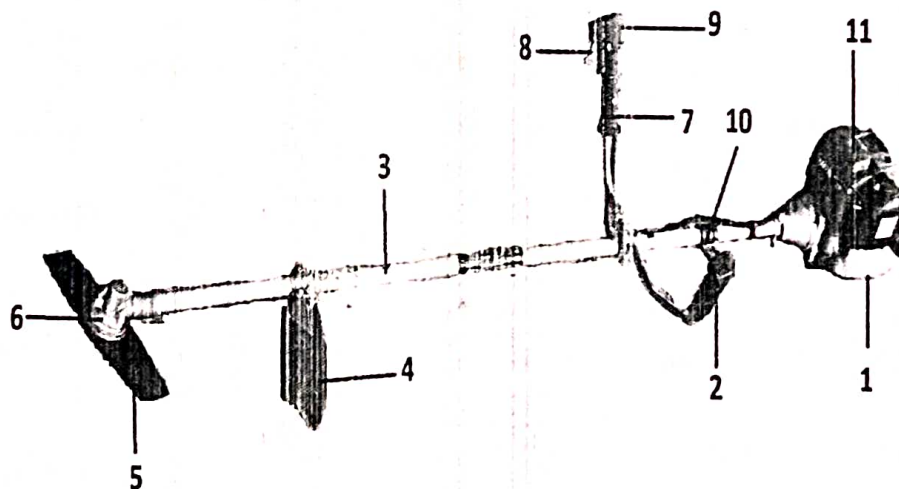


Fig. 1 : ICS BRUSH CUTTER, MODEL: YCM-430

#### 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	43	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	0.537	Does not Conform
Manganese (Mn)	0.3 to 0.5	0.633	Does not Conform
Silicon (Si)	---	0.240	---
Sulphur (S)	---	0.006	---
Phosphorous (P)	---	0.017	---

## 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	12.27	427.2	417.2	10	2.34	0.19

## 12. FIELD PERFORMANCE TEST

Field tests were conducted for total of 27.08 hours duration. Grass/weeds cutting with nylon rope and bush cutting using straight blade attachments were carried out for 14.81 hours and 12.27 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)	1.28 to 1.39	11.26 to 12.74
3	Average number of Grass/Bush in 1m <sup>2</sup>	314 to 337	31 to 32

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1	2	3	4
4	Average height of Grasses/Bush (mm)	289 to 322	1530 to 1760
5	Mass of Grass/Bush cut (kg/h)	326.82 to 330.19	2056.11 to 2478.19
6	Mass of Grass/Bush cut (kg/ha)	6650 to 7010	30636 to 30754
7	Rate of work (ha/h)	0.047 to 0.050	0.067 to 0.081
8	Time required for one hectare (h)	20.16 to 21.23	12.38 to 14.90
9	Fuel consumption		
	-l/h	0.764 to 0.858	0.883 to 0.893
	-l/ha	15.56 to 18.22	11.06 to 13.16

## 12.1 Grass/Weeds cutting using nylon rope

### 12.1.1 Rate of work

- The area of cut was recorded as 0.047 to 0.050 ha/h.
- Time required for one hectare was recorded as 20.16 to 21.23 hours.
- Mass of weeds cut was 326.82 to 330.19 kg/h.

### 12.1.2 Fuel consumption

- Fuel consumption was observed as 0.764 to 0.858 l/h and 15.56 to 18.22 l/ha.

## 12.2 Bush cutting using straight blade

### 12.2.1 Rate of work

- The area of cut was recorded as 0.067 to 0.081 ha/h.
- Time required for one hectare was recorded as 12.38 to 14.9 hours.
- Mass of bush cut was 2056.11 to 2478.19 kg/h.

### 12.2.2 Fuel consumption

- Fuel consumption was observed as 0.883 to 0.893 l/h and 11.06 to 13.16 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.

**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 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 0.43 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 821.4 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, 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** Noise at operator's ear level was observed on higher side against danger limit of 90 dB(A) as specified by ILO for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve the operational comfort and safety.
- 16.5** 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.

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

16.7 The mentioned value of rated 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.

16.8 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.

16.9 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

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