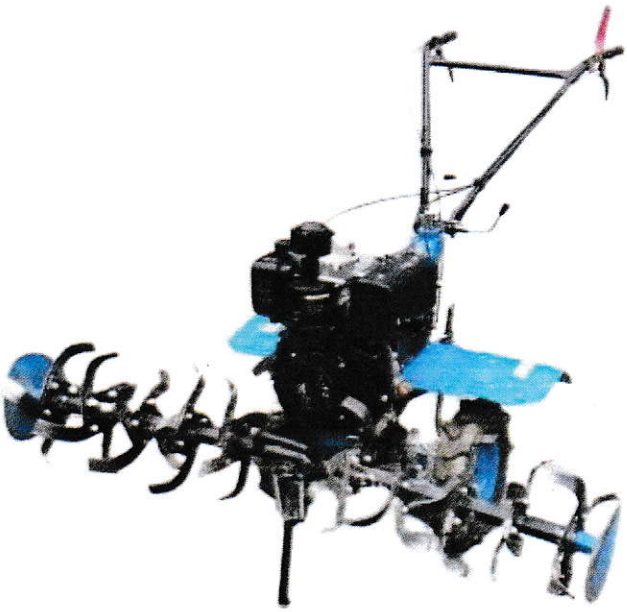
व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT (Initial)

संख्या/No.: Machine 116/487
माह / Month: March 2024

THIS TEST REPORT IS VALID UPTO 31.03.2031



e-AGROCARE D-105 POWER WEEDER

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
विश्वनाथ चारिआलि, जिला-विश्वनाथ (असम)
BISWANATH CHARIALI: BISWANATH: ASSAM, PIN - 784 176
[AN ISO 9001:2015 CERTIFIED INSTITUTION]

Ph. No. 03715-222094 Website: https://nerfmtti.nic.in E-Mail: fmti-ner@nic.in

4. SPECIFICATIONS

4.1 General:

Make	:	e-AgroCare
Model	:	D-105
Name and address of manufacturer	:	**Chongqing Meiqi Industry Co. Ltd., Chongqing P.R.C , China**
Name and address of applicant	:	**e-AgroCare Machineries and Equipments Pvt. Ltd.,** D-45, 5-Star Industrial Area, Shendra, Aurangabad- 431154, Maharashtra
Name of machine	:	Power Weeder
Type of machine	:	Self propelled, Walk behind
Working size of machine (mm)	:	1445
Year of manufacture	:	2022
Serial no. of machine	:	EAC042307074

4.2 Details of prime mover:

Make	:	KAIAO
Model	:	178F
Type	:	4 stroke, Single cylinder, Air cooled, Diesel Engine
Year of manufacture	:	2022
Serial Number	:	EAC042307074
Country of origin	:	**CHINA**
Recommended high idle speed (rpm)	:	3700±50
Recommended low idle speed (rpm)	:	1400±50
Recommended rated speed (rpm)	:	3600
Maximum power observed (kW)	:	**4.46**
Maximum power declared (apa) (kW)	:	4.40

10. AIR CLEANER OIL PULL OVER TEST

Date of test : 04.12.2023

Range of atmospheric conditions :

Temperature (°C) : 26.2 to 28.5

Pressure (kPa) : 100.2 to 100.4

Relative humidity (%) : 47.9 to 50.5

Mass of oil before test (g) : 222.05

Sl. No.	Position of Power Weeder	Loss of oil (g)	Oil pullover (%)
1	Parked on level ground	0.00	Nil
2	Tilted to 15° laterally with RHS up	0.20	0.09
3	Tilted to 15° laterally with LHS up	0.00	Nil
4	Tilted to 15° longitudinally with front end up	0.10	0.05
5	Tilted to 15° longitudinally with rear end up	0.00	Nil

11. HARDNESS AND CHEMICAL COMPOSITION OF ROTOR BLADE

11.1 Hardness of rotor blades :

The surface hardness of blade was recorded as under :

	As per IS 6690:1981 (Reaffirmed 2012)	As observed (HRC)	Remarks
At edge portion	56 ±3 HRC	46.6	**Does not conform**
At shank portion	37 to 45 HRC	46.3	**Does not conform**

11.2 Chemical composition of rotor blades :

Constituents	As per IS 6690:1981 (Reaffirmed 2012)		Composition as observed (% by weight)	Remarks
	Carbon Steel (%)	Silicon Manganese Steel (%)		
Carbon (C)	0.70 -0.85	0.50-0.60	0.764	Conforms
Silicon (Si)	0.10 -0.40	1.50-2.00	0.621	**Does not conform**
Manganese (Mn)	0.50 -1.0	0.50-1.00	0.882	Conforms
Sulphur (S)	0.05(max)	0.05(max)	0.002	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.017	Conforms

12. FIELD PERFORMANCE TEST

The field tests were conducted for 25.47 hours of field operation for testing the said Power Weeder. The field tests were conducted at rated speed of 3600 rpm. The detailed test results are represented in the Annexure and summarized in the ensuing table:

Sl .No.	Parameters		Observations
1	Type of soil	:	Light
2	Soil moisture (%)	:	9.93 to 10.73
3	Bulk density of soil (g/cc)	:	1.57 to 1.63
4	Forward Speed of operation (kmph)	:	0.97 to 1.22
5	Depth of cut (cm)	:	5.90 to 6.33
6	Width of cut (m)	:	1.43 to 1.44
7	Area covered (ha/h)	:	0.105 to 0.126
8	Time required for one ha (h)	:	7.94 to 9.52
9	Field efficiency (%)	:	71.59 to 78.62
10	Weeding efficiency (%)	:	75.56 to 77.53
11	Fuel consumption		
	l/h	:	0.72 to 0.78
	l/ha	:	6.54 to 7.38

12.1 Rate of work:

- Rate of work was recorded as 0.105 to 0.126 ha/h and the forward speed of operation was recorded from 0.97 to 1.22 kmph.
- Time required to cover one hectare was recorded as 7.94 to 9.52 h.

12.2 Quality of work:

- Depth of cut was recorded as 5.90 to 6.33 cm.
- Working width was observed as 1.43 to 1.44 m.
- Field efficiency was found as 71.59 to 78.62 %.
- Weeding efficiency was found as 75.56 to 77.53 %.

12.3 Adequacy of power of prime mover:

The power of prime mover was found adequate.

12.4 Wear Analysis of rotor blades:

Blade No.	Initial mass(g)	Final mass (g)	Loss of mass (g)	Percentage wear of rotor blades	
				After 25.47 h	Per hour
L-1	345.5	342.5	3.0	0.87	0.03
L-2	343.5	341.0	2.5	0.73	0.03
L-3	345.0	343.5	1.5	0.43	0.02
L-4	344.0	341.5	2.5	0.73	0.03
L-5	344.5	342.0	2.5	0.73	0.03
R-1	349.0	347.5	1.5	0.43	0.02
R-2	346.5	344.0	2.5	0.72	0.03
R-3	354.0	352.5	1.5	0.42	0.02
R-4	337.0	335.5	1.5	0.45	0.02
R-5	358.5	356.5	2.0	0.56	0.02

The hourly rate of wear of blade on mass basis after field operations was recorded as 0.02 to 0.03%.

15.1.5 Big end bearing

Bearing no.	Dia of bearing (mm)	Dia of Crank pin (mm)	Clearance (mm)		Max. Permissible wear limit (mm)	
			Dimetrical	Axial	Dimetrical	Axial
1	38.08	38.01	0.07	0.25	0.25	0.80

Condition of bearing: Normal

15.1.6 Main bearing: One No. of ball bearing 6307 was used.

Bearing No.	Diametrical clearance, (mm)	Crankshaft end float, (mm)	Max. permissible clearance limit,(mm)	
			Diametrical clearance	Crankshaft end float
Bush bearing	0.05	0.08	0.50	0.30

15.1.7 Valve guide clearance

Valve guide diameter (mm)		Valve stem diameter (mm)		Valve guide clearance (mm)		Max. Permissible wear limit (mm)	
Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust
6.00	6.00	5.96	5.94	0.04	0.06	Not specified	Not specified

Valve, guide and timing gear:-

Any marked sign of overheating of valves	:	None
Pitting of seat/faces of valves	:	Normal
Any visual damage to teeth of timing gears	:	None
Condition of ignition coil & magneto	:	Normal

15.2 Clutch: No noticeable defect was observed.

15.3 Transmission gears: No noticeable defect was observed.

15.4 Rotary drive unit:
The rotary drive unit was dismantled and all the components were found in normal condition.

16. COMMENTS & RECOMMENDATIONS

16.1 Rated power of the engine was observed as 3.41 kW against declared value of 4.0 kW by the manufacturer. This shall be looked into for corrective action.

16.2 It was observed during field test that welding of the bracket of depth control bar was broken. It should be looked into for quality improvement.

16.3 Welding of pre-cleaner fitted on air cleaner was broken during field performance test. This shall be looked into for quality improvement.

16.4 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 & safety.**

16.5 The amplitude of mechanical vibration marked as (*) is on drastically higher side and is directly concerned with operator's health, safety and comfort. Besides, it is also adversely affect the useful life of the component in view of above this deserves to be given top priority for corrective action.

16.6 The hardness and chemical composition of rotary blades does not conform to the requirement of IS 6690:1981 (Reaffirmed 2012). This may be looked into for corrective action.

16.7 Machine maneuverability while taking turns during field operation was not comfortable. It shall be looked into for ease of operation for the operator.

16.8 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