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

संख्या/No.: ICE/NERFMTTI, B. Chariali/
15/15/571
माह / Month: March 2026

THIS TEST REPORT IS VALID UPTO – NA (INCOMPLETE REPORT)

BALIRAJA AGROTECH, BALI-H-50, POWER HOE

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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4. SPECIFICATIONS

4.1 General:

Make	:	BALIRAJA AGROTECH
Model	:	BALI-H-50
Name and address of manufacturer	:	M/s. BALIRAJA AGROTECH, A/P Dingore, Nagar Kalyan Highway, Tal., Junnar, Pune, Maharashtra – 412409
Name and address of applicant	:	M/s. BALIRAJA AGROTECH, A/P Dingore, Nagar Kalyan Highway, Tal., Junnar, Pune, Maharashtra – 412409
Name of machine	:	Power hoe
Type of machine	:	Self-propelled, Walk behind
Working size of machine (mm)	:	304
Year of manufacture	:	2025
Serial no. of machine	:	2025003

4.2 Details of prime mover:

Make	:	Honda India Power Products Ltd.
Model	:	GX50
Type	:	Four stroke, single cylinder, air cooled, spark ignition engine
Year of manufacture	:	2024
Serial number	:	GCCFT-1225043
Country of origin	:	INDIA
Recommended high idle speed (rpm)	:	9000±1000
Recommended low idle speed (rpm)	:	2800 ±200
Recommended rated speed (rpm)	:	7000
Rated power observed (kW)	:	**Due to breakdown, engine test could not be completed.**
Rated power declared (apa) (kW)	:	1.47

10.2 Chemical composition of rotor blades:

Constituents	As per IS 6690:1981 (Reaffirmed 2022)		Composition as observed (% by weight)	Remarks
	Carbon Steel (%)	Silicon Manganese Steel (%)		
Carbon (C)	0.70 -0.85	0.50-0.60	0.237	**Does not conform**
Silicon (Si)	0.10 -0.40	1.50-2.00	0.140	Conforms
Manganese (Mn)	0.50 -1.0	0.50-1.00	0.505	Conforms
Sulphur (S)	0.05(max)	0.05(max)	0.028	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.036	Conforms

11. FIELD PERFORMANCE TEST

The field tests were conducted for total 25.58 hours of field operation for testing the said power hoe. The field tests were conducted at rated speed of 7000 rpm. The detailed test results are represented in the Annexure and summarized in the ensuing Table:

Sr.No.	Parameters		Observations
1	Type of soil	:	Medium
2	Soil moisture (%)	:	9.5 to 9.9
3	Bulk density of soil (g/cc)	:	1.80 to 1.86
4	Forward speed of operation (kmph)	:	1.08 to 1.20
5	Depth of cut (cm)	:	1.52 to 1.64
6	Width of cut (m)	:	0.30 to 0.31
7	Area covered (ha/h)	:	0.025 to 0.029
8	Time required for one ha (h)	:	34.48 to 40.00
9	Field efficiency (%)	:	75.76 to 82.35
10	Weeding efficiency (%)	:	76.48 to 78.90
11	Fuel consumption		
	l/h	:	0.39 to 0.40
	l/ha	:	13.79 to 15.60

11.1 Rate of work

- Rate of work was recorded as 0.025 to 0.029 ha/h and the forward speed of operation varied from 1.08 to 1.20 kmph.

Time required to cover one hectare was recorded as 34.48 to 40.00 h.

11.2 Quality of work:

- Depth of cut was recorded as 1.52 to 1.64 cm.
- Working width was observed as 0.30 to 0.31 m.
- Field efficiency was found as 75.76 to 82.35 %.
- Weeding efficiency was recorded as 76.48 to 78.90%.

11.3 Adequacy of power of prime mover:

The power of prime mover was found adequate.

11.4 Wear Analysis of rotor blades:

Sr. No.	Initial mass (g)	Final mass (g)	Loss of mass (g)	Percentage wear of rotor blades	
				After 25.58 h	Per hour
1	253.38	247.42	5.39	2.13	0.08

The hourly rate of wear of blade on mass basis after field operations was recorded as 0.08 %.

12. EASE OF OPERATION AND ADJUSTMENTS

No difficulties were observed in operation and adjustment during the field test.

13. DEFECTS, BREAKDOWNS AND REPAIRS

During engine performance test, it was observed that engine suddenly stopped working. Several attempts were made to start the engine, however the engine was not started. After inspecting the engine, it was observed that the engine crank shaft was broken.

14. COMPONENTS / ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR

Not recorded as engine test was not completed due to breakdown.

15. CRITICAL TECHNICAL SPECIFICATIONS
(Vide Ministry's letter No. 13-9/2019-(M&T) (I&P)-Part dated 26.04.2019)

Not applicable

16. COMMENTS AND RECOMMENDATIONS

16.1 During engine performance test, it was observed that engine suddenly stopped working. Several attempts were made to start the engine, however the engine was not started. After inspecting the engine, it was observed that the engine crank shaft was broken. This should be looked into for quality improvement.

16.2 Country of origin was not provided on the labeling plate of the machine. This should be looked into for corrective action.

16.3 The engine was not marked with rated power, rated speed and type of fuel used which does not fulfill the requirement of IS 7347-1974 (Amended 2021). This may be looked into.

16.4 The hardness and chemical composition of hoe blade did not conform to the requirement of IS 6690:1981 (Reaffirmed 2022). This may be looked into for corrective action.

16.5 Noise at operator's ear level was observed on higher side against warning limit of 85 dB(A) as specified by the International Labor 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.

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

16.7 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: 8132-2023.

TESTING AUTHORITY

(M.R. PATIL)
SENIOR AGRICULTURAL ENGINEER

(P. KAMALABAI)
DIRECTOR

Draft test report compiled by - Sh. Rahul, Senior Technical Assistant

17. APPLICANT'S COMMENTS

No comments offered by the applicant.

ANNEXURE

FIELD PERFORMANCE RESULTS

Place of Test: NERFMTTI Farm, Biswanath Chariali, Biswanath, Assam

Sr. No.	Parameters	I	II	III	IV
1	Date of test	04.09.2025	05.09.2025	08.09.2025	09.09.2025
2	Net test duration (h)	6.50	5.00	7.08	7.00
3	Field length (m)	23	21	21	24
4	Type of soil	Medium			
5	Bulk density (g/cc)	1.86	1.85	1.80	1.82
6	Soil moisture (%)	9.9	9.7	9.5	9.6
7	Previous treatment	Nil			
8	Forward speed (kmph)	1.10	1.11	1.20	1.08
9	Av. depth of cut (cm)	1.52	1.60	1.58	1.64
10	Av. width of cut (m)	0.31	0.30	0.30	0.30
11	Area covered (ha/h)	0.028	0.025	0.029	0.027
12	Time required for one ha (h)	35.71	40.00	34.48	37.04
13	Field efficiency (%)	82.35	75.76	78.38	81.82
14	Av. height of weeds (cm)	109	157	164	203
15	Av. number of weeds per m^2 (before operation)	183	193	194	196
16	Av. number of weeds per m^2 (after operation)	43	41	45	46
17	Weeding efficiency (%)	76.48	78.90	76.73	76.61
18	Fuel Consumption				
	l/h	0.39	0.39	0.40	0.40
	l/ha	13.93	15.6	13.79	14.82