



THIS TEST REPORT IS VALID UPTO 28.02.2031



**MHASWADKAR BAM120RP
SELF PROPELLED REAPER**



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]

Machine 111/482	MHASWADKAR BAM120RP SELF PROPELLED REAPER	COMMERCIAL (Initial)
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1. SCOPE OF TEST

The scope of test was limited to check and assess the following:

- 1.1 Specifications and other data furnished by the applicant.
- 1.2 Engine Performance test
- 1.3 Vibration measurement
- 1.4 Noise measurement
- 1.5 Air cleaner oil pull over test
- 1.6 Tuning Ability
- 1.7 Wear analysis of critical components (Cutter Bar knife section)
- 1.8 Hardness and chemical analysis (Cutter Bar knife section)
- 1.9 Field performance
- 1.10 Ease of operation and adjustments
- 1.11 Defects, breakdowns and repair

2. METHOD OF SELECTION

The test sample was selected by the testing authority through random selection. The following test samples were presented by the applicant during the random selection at Applicant site.

Sl. No	Serial no of test sample	Remarks
1	12R23034	Out of 5 samples, S. No. 3 has been randomly selected.
2	12R23025	
3	12R23042	
4	12R23037	
5	12R23008	

3. TEST CODE/PROCEDURE

There is no Indian Standard Test Code available for testing of self-propelled vertical conveyor reaper as such. The guidelines, however, have been taken from the following:

- 1 IS: 11467:1985 (Reaffirmed 2012) : Test code for cereal harvesting machines.
- 2 IS: 6025:1982 (Reaffirmed 1999) : Specification for knife sections for harvesting machine.
- 3 IS: 10378:1982 (Reaffirmed 2001) : Specification for knife back for harvesting machine.
- 4 IS: 7347:1974 (Reaffirmed 2006) : Specification for Performance of Small Size Spark Ignition Engines.

4. SPECIFICATIONS

4.1 General:

Name and address of the manufacturer : M/s Chongqing Dinking Power Machinery Co., Ltd., Caojie Development Area, Industrial Park, Hechuan, Chongqing, China



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Name & Address of Applicant : **Mhaswadkar Autolines Pvt., Ltd.,
283/3/1B, Karanje, New Radhika Road,
Satara-415001, Maharashtra**

Name of machine : Reaper

Type : Self-Propelled, Walk behind Reaper

Make : Mhaswadkar

Model : BAM120RP

Year of manufacture : 2022

Serial Number : 12R23042

Country of origin : **China**

Size of reaper (mm) : 1240

Name of crop recommended (apa) : Paddy

Name of crop in which the test was conducted : Paddy



4.2 Details of Prime Mover Used:

Name and address of the manufacturer : **M/s Chongqing Dinking Power
Machinery Co., Ltd., Caojie Development
Area, Industrial Park, Hechuan,
Chongqing, China**

Make : Not specified

Model : BM212P

Type : 4 stroke Petrol Engine, Single cylinder, Air cooled

Year of manufacture : 2022

Serial Number : 2301024064

Country of origin : **China**

Recommended high idle speed (rpm) : 3600 ± 100

Recommended low idle speed (rpm) : 1400 ± 100

Recommended rated speed (rpm) : 3300

Recommended speed for field test (rpm) : 3300

Rated power observed (kW) : 2.49

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13. FIELD PERFORMANCE TEST

The machine was tested for total of 25.14 hours for harvesting Paddy. The performance of the machine was assessed with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction. The detailed test results have been given in Annexure-I & II and summarized in Table 1 & 2 below.

SUMMARY OF CROP PARAMETERS

Table-1

S. No.	Parameters	Range
1	Variety of crop	Paddy (<i>Ranjeet</i>)
2	Straw moisture content (%)	30.1 to 37.5
3	Grain moisture content (%)	13.0 to 17.3
4	Plant height (cm)	88.6 to 128.0
5	Length of ear head (mm)	164 to 196
6	Number of grains per ear head	89 to 142
7	Number of hills per square meter	21 to 31
8	Number of tillers per hill	11 to 17
9	Straw-grain ratio	1.18:1 to 2.71:1



SUMMARY OF FIELD PERFORMANCE

Table-2

S. No.	Parameters/operations	Range
1	Forward speed (kmph)	3.28 to 3.34
2	Width of cut (cm)	116 to 118
3	Stubble height (mm)	106.1 to 195.5
4	Losses (Percentage of total grain yield)	
	-Pre-harvest loss	0.000 to 0.001
	-Post harvest loss (Cutter bar)	0.01 to 0.12
	-Conveyor loss/shattering loss	0.03 to 0.05
5	Area harvested (ha/h)	0.273 to 0.296
6	Field efficiency (%)	72.11 to 75.51
7	Time required for one hectare (h)	3.38 to 3.66
8	Fuel consumption	
	- l/h	0.78 to 0.82
	- l/ha	2.76 to 2.94

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13.1 Paddy Harvesting

13.1.1 Rate of work

- The forward speed of machine was observed as 3.28 to 3.34 kmph.
- The area harvested by the machine was recorded as 0.273 to 0.296 ha/h.

13.1.2 Quality of work

- Field efficiency was observed as 72.11 to 75.51 %.
- The post-harvest loss (cutter bar) was observed as 0.01 to 0.12 % of total grain yield.
- The conveyor loss/shattering loss was observed as 0.03 to 0.05 % of total grain yield.
- The stubble height was recorded as 106.1 to 195.5 mm.
- Machine leaves the harvested crop in windrows.

13.2 Labour requirement

- One unskilled labour is required for cutting the crop manually at corner and side of each field.
- Two skilled labours are required for operating the machine continuously.

13.3 Operator's comfort, safety and ease of operation

- All the controls were within the easy reach of the operator.
- The machine was provided with main clutch for stopping forward motion of the machine and cutter bar operation at same time.

14. EASE OF OPERATION AND ADJUSTMENT

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

15. DEFECTS, BREAKDOWNS AND REPAIRS

No noticeable defect or breakdown was observed during test.

16. COMPONENTS / ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR

16.1 Engine:

The Engine and other assemblies were dismantled after 39.63 hours of operation.

16.1.1 Cylinder:

Cylinder	Cylinder bore dia (mm)						Max. Permissible wear limit (mm)
	Top position		Middle position		Bottom position		
	Thrust side	Non Thrust side	Thrust side	Non Thrust side	Thrust side	Non Thrust side	
1	70.02	70.02	70.01	70.02	70.01	70.01	70.125

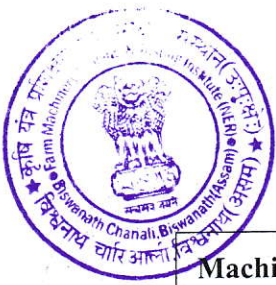
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Valve, guide and timing gear:-
Any marked sign of overheating of valves : None
Pitting of seat/faces of valves : None
Any visual damage of teeth of timing gears : None
Condition of ignition coil & magneto : Normal



17. COMMENTS AND RECOMMENDATIONS

- 17.1 Rated power of the engine was observed as 2.49 kW against declared value of 4.1 kW by the applicant/manufacturer. This shall be looked into for corrective action.
- 17.2 The specific fuel consumption (SFC) in rating test of engine was observed as 529 g/kWh against declared value of 358 g/kWh by the applicant/manufacturer which exceeded by more than 5 percent of that declared by the manufacture and does not fulfill the requirement of IS 7347-1974 (reaffirmed 2006). This should be looked into for corrective action.
- 17.3 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.
- 17.4 The amplitude of mechanical vibration marked as (*) was 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 machine components. In view of above, this deserves to be given top priority for corrective action.
- 17.5 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.**
- 17.6 Specification of knife sections of the cutter bar does not conform to IS 6025:1982 (Reaffirmed 1999) and it should be looked into for corrective action.
- 17.7 Specification of knife section back of the machine does not conform to IS 10378-1982 (Reaffirmed 2001) and it should be looked into for corrective action.
- 17.8 The hardness and chemical composition of knife sections (both movable and stationary) does not conform to the requirement of IS 6025-1982 (Reaffirmed 1999). It should be looked into for improvement.
- 17.9 The mentioned value of power i.e. 7.1 hp of engine on the labeling plate of the machine was not matching with the observed value during engine test. This may be looked into.
- 17.10 Model number of the machine has been wrongly mentioned on the labeling plate. It should be looked into corrective action.



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17.11 Provision for checking oil level of main gearbox was not provided. It should be looked into for corrective action.

17.12 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

18. APPLICANT'S COMMENTS

Sr. No.	Clause No.	Applicant's Comments
18.1	17.1	We will take corrective improvements in future products.
18.2	17.2	We will take corrective improvements in future products.
18.3	17.3	We will take corrective improvements in future products.
18.4	17.4	The suggestion is noted & company would work on the same to bring down the amplitude of mechanical vibration.
18.5	17.5	The suggestion is noted & company would work on the same to bring down the noise level at operator's ear level.
18.6	17.6	We will take corrective improvements in future products.
18.7	17.7	We will take corrective improvements in future products.
18.8	17.8	We will take corrective improvements in future products for blade improvements.
18.9	17.9	We will make necessary changes in labeling plate.
18.10	17.10	We will make necessary changes in labeling plate.
18.11	17.11	We will take corrective improvements in future products.
18.12	17.12	We will be brought the manual as per IS: 8132-1999 and also will provide in hindi & other vernacular languages.