



THIS TEST REPORT IS VALID UPTO 28.02.2031



**MHASWADKAR BAM120DPWR
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)

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[AN ISO 9001:2015 CERTIFIED INSTITUTION]

Machine 112/483	MHASWADKAR BAM120DPWR 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 Specification and other data furnished by the applicant
- 1.2 Engine Performance
- 1.3 Vibration measurement
- 1.4 Noise measurement
- 1.5 Air cleaner oil pull over
- 1.6 Wear analysis of critical components (Cutter Bar knife section)
- 1.7 Hardness and chemical analysis (Cutter Bar knife section)
- 1.8 Field performance
- 1.9 Ease of operation and adjustments
- 1.10 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 random selection at Applicant's site.

Sl. No	Serial no of test sample	Remarks
1	105023090	Out of 5 samples, S. No. 3 sample was randomly selected.
2	105023053	
3	105023081	
4	105023109	
5	105023098	

3. TEST CODE/PROCEDURE

There is no Indian Standard Test Code available for testing of self-propelled 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

Make : Mhaswadkar

Model : BAM120DPWR

Year of manufacture : 2022

Serial Number : 105023081

Country of origin : **China**

Size of reaper (mm) : 980

Name of the crops recommended by the applicant : Paddy, Wheat, Soybean

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 : 178F

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

Year of manufacture : 2022

Serial Number : BAM296F 2307500016

Country of origin : CHINA

Recommended high idle speed (rpm) : 3250 ± 100

Recommended low idle speed (rpm) : 1800 ± 100

Recommended rated speed (rpm) : 3000

Maximum power observed (kW) : 3.90

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11.4 Chemical composition of Knife Blade (Stationery):

The material of reaper knife blade was got analyzed for chemical composition. The results of chemical analysis test are as under:-

Constituents	As per IS: 6025-1982	Composition as observed (% by weight)	Remarks
Carbon (C)	0.70 -0.95	0.704	Conforms
Silicon (Si)	--	0.335	--
Manganese (Mn)	0.3 – 0.50	0.728	Does not Conform
Sulphur (S)	--	0.005	--
Phosphorous (P)	--	0.011	--

12. FIELD PERFORMANCE TEST

The machine was operated for total of 25.05 hours for harvesting of paddy crop to assess the performance of machine with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction. The crop parameters and field performance test results are given in Annexure-I &II and summarized in table 1 & 2 below.

SUMMARY OF CROP PARAMETERS

Table-1

Sr. No.	Parameters	Observations
1	Variety of crop	<i>Ranjeet and Joha</i>
2	Straw moisture content (wb) (%)	26.5 to 33.2
3	Grain moisture content (wb) (%)	12.1 to 18.1
4	Plant height (cm)	109.6 to 200.0
5	Length of ear head (mm)	148.0 to 196.0
6	Number of grains per ear head	99 to 158
7	Number of hills per m ²	15 to 31
8	Number of tillers per hill	12 to 23
9	Straw-grain ratio	2.09:1 to 3.21:1



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SUMMARY OF FIELD PERFORMANCE RESULTS

Table-2

S. No.	Parameters/operations	Range
1	Forward speed (kmph)	3.26 to 3.56
2	Width of cut (cm)	94.2 to 97.0
3	Stubble height (mm)	105.4 to 122.3
4	Losses (Percentage of total grain yield)	
	-Pre-harvested loss	0.00 to 0.002
	-Post harvest loss (Cutter bar)	0.02 to 0.13
	-Conveyor loss/shattering loss	0.03 to 0.07
5	Area harvested (ha/h)	0.225 to 0.248
6	Field efficiency (%)	71.9 to 73.59
7	Time required for one hectare (h)	4.03 to 4.44
8	Fuel consumption	
	- l/h	0.460 to 0.502
	- l/ha	1.97 to 2.05

12.1 Rate of work

- The forward speed of machine was observed between 3.26 to 3.56 kmph.
- The area harvested by the machine was recorded as 0.225 to 0.248 ha/h.

12.2 Quality of work

- Field efficiency was observed as 71.9 to 73.59 %.
- Post-harvest loss (cutter bar) was observed as 0.02 to 0.13 %.
- The conveyor loss/shattering loss was observed as 0.03 to 0.07 %.
- The stubble height was recorded as 105.4 to 122.3 mm.
- Machine leaves the harvested crop in windrows.



12.3 Labour requirement

- Two unskilled labours were required for cutting the crop manually at corner and side of each plot.
- Two skilled labours were required for operating the machine continuously.

12.4 Operator's comfort, safety and ease of operation

- All the controls were within the easy reach of the operator.
- The machine was provided with the main clutch for stopping forward motion and cutter bar operation.
- There was no safety provision in case of overloading of cutter bar. However, suitable safety covers were provided on all moving parts.

13. EASE OF OPERATION AND ADJUSTMENT

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

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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	0.13	Not specified	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
6.0	6.0	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



16. COMMENTS AND RECOMMENDATIONS

- 16.1 The maximum power was observed as 3.90 kW against the declared value of 4.3 kW. This shall be looked into for corrective action.
- 16.2 The maximum torque was observed as 12.67 N-m against the declared value of 14.06 N-m. This shall be looked into for corrective action.
- 16.3 During engine test, after obtaining maximum power, with further loading engine did not sustained and stopped thereafter hence no back up torque was observed. This should be looked into for improvement.
- 16.4 Specific fuel consumption of engine was observed as 316 g/kWh against 234 g/kWh of that declared by the applicant/manufacturer. This shall be looked into for corrective action.
- 16.5 Air cleaner oil pull over was observed on higher side. This should be looked into for improvement.
- 16.6 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.
- 16.7 Noise at operator's ear level was observed on higher side against danger limit of 90 dB (A) as specified by International Labour Organisation (ILO) for continuous exposure of 8 hours per day. **This calls for reduction in noise level to improve the operator's comfort & safety.**



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- 16.8 The hardness and chemical composition of (Movable & Stationary) knife blades does not conform to the requirement of IS 6025-1982. It should be looked into for corrective action.
- 16.9 Provision for safety of cutter bar may be provided to take care of overloading of cutter bar. This may be looked into.
- 16.10 Specifications of knife sections of the machine does not conform to IS 6025:1982 and it should be looked into for corrective action.
- 16.11 Specification of knife section back of the machine dose not conform to IS 10378-1982 and it should be looked into corrective action.
- 16.12 Maximum Power (hp) has been mentioned as 6.5 on the labeling plate of the machine. However, during engine performance tests maximum power (hp) was observed as 5.23 hp. This may be looked into for corrective action
- 16.13 **Technical literature:**
Operator cum Service Manual & Parts Catalogue was provided along with the machine during the course of testing. It is further recommended to bring out these manuals 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

17. APPLICANTS COMMENTS

Para No	Our Reference	Applicants Comments
1	2	3
17.1	16.1	We will take corrective improvements in future products.
17.2	16.2	We will take corrective improvements in future products.
17.3	16.3	We will take corrective improvements in future products.
17.4	16.4	We will take corrective improvements in future products.