

THIS TEST REPORT IS VALID UPTO 31.10.2028



**GOLD HARVEST INDUSTRIES GHI-1200 (MULTI CROP)
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

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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
- 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 the random selection at Applicant's site.

Sl. No	Serial No. of test sample	Remarks
1	007	Out of 05 samples Sr. No. 02 sample has been randomly selected.
2	008	
3	003	
4	006	
5	002	

3. TEST CODE/PROCEDURE

There is no Indian Standard Test Code available for testing of 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 (Amended 2011) : Specification for Performance of Small Size Spark Ignition Engines.

4. SPECIFICATIONS**4.1 General:**

Name and address of the manufacturer

: **GOLD HARVEST INDUSTRIES**
Flat no 1, Harshwardhan-5, Makhmalabad
naka, Panchavati, Nashik- 422003,
Maharashtra

Name & address of applicant

: **GOLD HARVEST INDUSTRIES**
Flat no 1, Harshwardhan-5, Makhmalabad
naka, Panchavati, Nashik- 422003,
Maharashtra

Machine 102/473	GOLD HARVEST INDUSTRIES GHI-1200 (MULTI CROP) SELF PROPELLED REAPER	COMMERCIAL (INITIAL)
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Name of machine : Reaper
 Type : Self Propelled, Walk behind
 Make : GOLD HARVEST INDUSTRIES
 Model : GHI-1200 (MULTI CROP)
 Year of manufacture : 2023
 Serial Number : 008
 Country of origin : **INDIA**
 Size of reaper (mm) : 1170

Name of crop recommended by applicant : Wheat & Chickpea (*chana*)
 Name of crop in which the test was conducted : Wheat & Chickpea (*chana*)

2 Details of Prime Mover Used:

Name and address of the manufacturer : **Honda India Power Limited**
 Plot no. 5, Sector 41, Kansa Greater District-
 Noida-201306, Uttar Pradesh
 Make : Honda
 Model : GX 160
 Type : 4 stroke, Single cylinder, Air cooled,
 Spark ignition
 Year of manufacture : **Not Specified**
 Serial Number : GCAED-1111062
 Country of origin : **INDIA**
 Recommended high idle speed (rpm) : 3900 ± 100
 Recommended low idle speed (rpm) : 1400 ± 100
 Recommended rated speed (rpm) : 3600
 Recommended speed for field test : 3600
 (rpm)
 Rated power observed (kW) : **2.59**
 Rated power declared (apa) (kW) : 2.90

11.3 Chemical composition of Knife section (Movable):

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

Constituents	As per IS: 6025-1982	Composition as observed (% of weight)	Remarks
Carbon (C)	0.70 -0.95	0.591	Does not Conform
Manganese (Mn)	0.3 – 0.50	0.805	Does not Conform

11.4 Chemical composition of Knife section (Stationery):

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

Constituents	As per IS: 6025-1982	Composition as observed (% of weight)	Remarks
Carbon (C)	0.70 -0.95	0.800	Conforms
Manganese (Mn)	0.3 – 0.50	0.725	Does not Conform

12. FIELD PERFORMANCE TEST

The machine was tested for 26.5 hours during harvesting wheat & chickpea (*chana*) crop. 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	
		Wheat	Chickpea (<i>chana</i>)
1	Variety of crop	Ajit 102 & Mahindra 9823	Local
2	Straw moisture content (%)	NR	NR
3	Grain moisture content (%)	7.7 to 10.6	7.1 to 7.5
4	Plant height (cm)	60.6 to 77.0	42.2 to 44.2
5	Length of ear head (mm)	64.0 to 74.4	NA
6	Number of grains per ear head	22 to 37	NA
7	Number of plants per square meter	583 to 646	50 to 60
8	Number of Branches per Plant	NA	6.0
9	Straw-grain ratio	2.09:1 to 4.16:1	NA

SUMMARY OF FIELD PERFORMANCE TEST

Table-2

S. No.	Parameters/operations	Range	
		Wheat	Chick pea
1	Forward speed (kmph)	3.73 to 3.79	3.36 to 3.44
2	Width of cut (cm)	115 to 119	116 to 118
3	Stubble height (mm)	78.3 to 96.0	55.0 to 57.3
4	Losses (Percentage of total grain yield)		
	-Pre-harvest loss	Nil	Nil
	-Post harvest loss (Cutter bar)	0.02 to 0.03	0.02 to 0.05
	-Conveyor loss/shattering loss	0.05 to 0.10	0.12 to 0.17
5	Area harvested (ha/h)	0.293 to 0.376	0.271 to 0.283
6	Field efficiency (%)	68.10 to 83.37	68.43 to 70.93
7	Time required for one hectare (h)	2.66 to 3.41	3.53 to 3.69
8	Fuel consumption		
	- l/h	1.05 to 1.14	0.91 to 0.92
	- l/ha	2.93 to 3.73	3.21 to 3.38

12.1 For Wheat harvesting

12.1.1 Rate of work

- The forward speed of machine was observed as 3.73 to 3.79 kmph.
- The area harvested by the machine was recorded as 0.293 to 0.376 ha/h.

12.1.2 Quality of work

- Field efficiency was observed as 68.10 to 83.37 %.
- The post-harvest loss (cutter bar) was observed as 0.02 to 0.03 % of total grain yield.
- The conveyor loss/shattering loss was observed as 0.05 to 0.10 % of total grain yield.
- The stubble height was recorded as 78.3 to 96.0 mm.
- Machine leaves the harvested crop in windrows.

12.2 For Chickpea (*chana*) harvesting

12.2.1 Rate of work

- The forward speed of machine was observed as 3.36 to 3.44 kmph.
- The area harvested by the machine was recorded as 0.271 to 0.283 ha/h.

12.2.2 Quality of work

- Field efficiency was observed as 68.43 to 70.93 %.
- The post-harvest loss (cutter bar) was observed as 0.02 to 0.05 % of total yield.
- The conveyor loss/shattering loss was observed as 0.12 to 0.17 % of total yield.
- The stubble height was recorded as 55.0 to 57.3 mm.
- Machine leaves the harvested crop in windrows.

12.3 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.

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15.1.5 Big end bearing

Bearing no.	Dia of bearing (mm)	Dia of Crank pin (mm)	Clearance (mm)		Max. Permissible wear limit (mm)	
			Dimentrical	Axial	Dimentrical	Axial
1	30.03	29.97	0.06	0.06	0.12	1.10

Condition of bearing: Normal

15.1.6 Main bearing: Two Nos. of ball bearing 6205 were used

Bearing No.	Diametrical clearance, (mm)	Crankshaft end float, (mm)	Max. permissible clearance limit, (mm)	
			Diametrical clearance	Crankshaft end float
1.	Ball bearing	0.10	NA	Not specified
2.	Ball bearing			

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
5.48	5.46	5.46	5.43	0.02	0.03	Not specified	Not specified

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


16. COMMENTS AND RECOMMENDATIONS

- 16.1** Rated power of the engine was observed as 2.59 kW against declared value of 2.90 kW by the manufacturer. This shall be looked into for corrective action.
- 16.2** 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.
- 16.3** It was observed that wheel drive chain link was broken during the field performance test. This should be looked into for quality improvement.
- 16.4** 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.
- 16.5** 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.**

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- 16.6 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.
- 16.7 Specification of knife section back of the machine does not conform to IS 10378-1999 (Reaffirmed 2001) and it should be looked into for corrective action.
- 16.8 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.
- 16.9 The mentioned value of rated power 4.1 kW of engine on the labeling plate of the machine was not matching with the observed value of 2.59 kW during engine test. This should be looked into for corrective action.
- 16.10 Instead of nut & bolt, shear pin may be provided as safety measure at cutter bar conveyor.
- 16.11 Working width of the machine & manufacturer's address should be provided on the labeling plate of the machine.
- 16.12 **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**
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