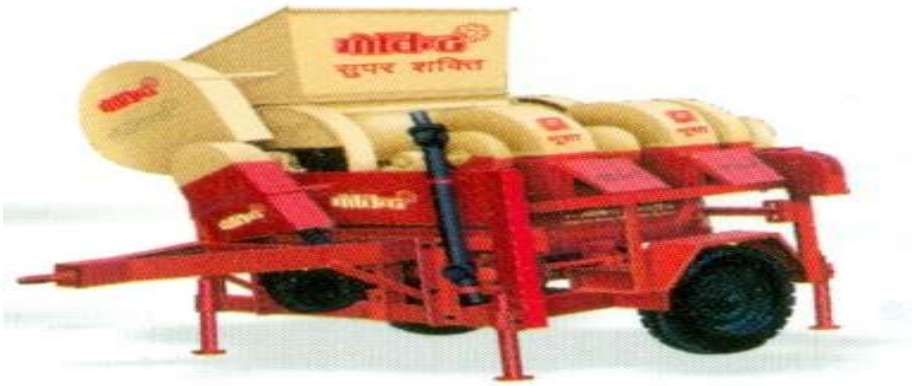
COMMERCIAL TEST REPORT

REPORT NO.: IMP- 2011/385
MONTH: NOVEMBER 2022



सत्यमेव जयते

WHEAT THREASHER
GOBIND- SUPER SHAKTI

TESTED AT

STATE LEVEL FARM MACHINERY TRAINING AND TESTING INSTITUTE,
RAHMANKHERA, HARDOI ROAD
LUCKNOW, U.P. – 226101

Telephone: 0522- 2841021 E-mail: fmtcsima@gmail.com

(The Institute is approved Testing Centre by Department of Agriculture & Cooperation, Ministry of Agriculture, GOI vide letter no. 8-1/2004-My (I&P) dated September 14,2010 and subsequent letters)

THIS TEST REPORT IS VALID FROM 22.11.2022 TO 21.11.2029

TEST REPORT NO.	NAME OF THE MACHINE/IMPLEMENT, MODEL NO.	MONTH	YEAR
IMP- 2011/385	WHEAT THREASHER GOBIND- SUPER SHAKTI	NOVEMBER	2022

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Type of test	:	COMMERCIAL
Name of machine	:	WHEAT THREASHER GOBIND- SUPER SHAKTI
Test Code referred	:	IS: 6284 – 2004 (Test Code for Power Thresher for Cereals) & IS: 9020 - 2002 (Power Thresher Safety Requirements) were followed for testing the Wheat Thresher.
Test requested by	:	GOBIND ALLOYS LIMITED, DASHAHRA BAGH, HAIDERGARH ROAD, BARABANKI, U.P.– 225001
Testing Authority	:	STATE LEVEL FARM MACHINERY TRAINING AND TESTING INSTITUTE, RAHMANKHERA, HARDOI ROAD LUCKNOW, U.P. – 226101
Period of test	:	DECEMBER 2021 TO NOVEMBER 2022

Selected Conversions

S. No	Units	Conversion Factor
1	**Force**	
	1 kgf	9.80665 N
		2.20462 lbf
2	**Power**	
	1 hp	1.01387 metric hp (Ps)
		745.7 W
	1 Ps	735W
	1 kW	1.35962 Ps
3	**Pressure**	
	1 psi	6.895 kPa
	1 kgf/cm^2	98.067 kPa = 735.56 mm of Hg
	1 bar	100 kPa = 10 N/cm^2
	1 mm of Hg	1.3332 m-bar

CONTENTS

1 SCOPE OF TEST

The purpose of test was to check and assess the following as per IS: 6284 – 2004 and IS: 9020 - 2002

- Checking of specifications
- Checking of material, visual observation and provision for adjustment
- Rate and quality of work
- Labour requirement and power consumption
- Ease of operation and adjustment
- Safety provisions.
- Nature of breakdown, etc.

2 METHOD OF SELECTION

The machine was randomly selected by the representative of the testing authority out of five machines made available for selection from their periodical production line at manufacturer's site.

3 TEST PROCEDURE

IS: 6284 – 2004 (Test Code for Power Thresher for Cereals) & IS: 9020 - 2002 (Power Thresher Safety Requirements) were followed for testing the Wheat Thresher.

4 SPECIFICATIONS

1 General:

Name & address of manufacturer/ applicant	:	M/s Gobind alloys Limited (Branch : Gobind Industries) Dasharabagh, Haidergarh road, Barabanki, U.P. - 225001
a) Make	:	Gobind
b) Serial no.	:	20762
c) Model	:	Super Shakti
d) Type	:	Wheat thresher
e) Year of manufacture	:	2021

2 Power Unit:

a) Type of Prime mover	:	Tractor
b) Recommended power, hp	:	35 & above
-As used during test	:	Sonalika DI-745 III
c) Type of Drive	:	Through tractor pto shaft

3 Crops to be Threshed:

a) Main crop	:	Wheat
b) Other crops	:	Nil

4 Main frame : **Refer Fig.1**

Constructional details:

It is fabricated construction of MS sheet size and MS channel size (1640 x 125 x 5.5; 1000 x 120 x 5.0) mm in rectangular box shape. All the assemblies such as feeding unit, thrashing unit and cleaning unit are mounted on this frame. The complete frame is welded on the transporting unit of MS U-clamps.

Dimension, mm : 1640×1725×1000

5 Main Drive:

a) Type : Tractor pto power & belt pully arrangement by propeller shaft.

b) Size of belt : 04, C-100

c) Size of pulley (mm) : 380

d) Diameter of main shaft (mm) : 58.5

e) Recommended speed of main drive, (rpm) and bearing No. : 02, ball bearing (6210,6308)

6 Threshing Unit:

a) Type : Spike Tooth

b) Size of cylinder, mm : 1025 x 63.5 Ø

c) No. & size of pegs on each beater/ cutter : 90; 175 x 18.5

d) Material & size of cylinder shaft, mm : M.S.; 2032 x 63.5Ø

e) No. of oil seals for each bearing on the shaft : 02; ball bearing (6312)

f) Cylinder speed (rpm) @540 rpm of tractor pto : 900

g) Peripheral speed (m/s) : 32

7 Concave:

a) Type : Semi circular

b) No. & spacing of longitudinal flat, mm : 60,12

c) No. & spacing of cross bar, mm : 50.8

d) total length, mm 1052

e) Effective length, mm : 880

f) Peripheral length, mm : 920

g) Effective width, mm : 1050

h) Concavity, mm : 300

i) Method of fixing : Bolted through four bolt (33.5 x 10 x 1.5)

j) Provision for concave clearance adjustment : Sliding adjustment provided (range 30 mm)

8 Sieve:

a) No. of sieves : Three

b) Construction details : The sieves are placed in rectangular box fabricated from 1.5 mm G.I. sheet. The complete sieve box reciprocating on the shaking mechanism.

c) Specification of sieves:

Sl. No.	Parameter	Upper sieves	Middle sieves	Lower sieves
1.	Type	Punched elliptical holes	Punched elliptical holes	Punched elliptical holes
2.	Material & size, mm	GI sheet; 1.5	GI sheet; 1.2	GI sheet; 0.5
3.	Dia. of holes, mm	5.7	3	2.3
4.	Density of holes in 100 cm^2	145	160	530

5.	Size of sieve, mm	1030 x 980	1131 x 1075	1150 x 1085
6.	Effective size, mm	1030 x 875	1100 x 901	1162 x 830
7.	Effective area, cm^2	1032 x 221	1032 x 232	1065 x 141
8.	Method of fixing	The upper and middle sieve is fixed while lower sieve is inserted and locked in the sieve box.		

9 Shaking Mechanism

Constructional details: The mechanism consists of a pitman shaft supported by two bearing and connected to the sieves box. The rotational motion of pitman shaft is converted into to and fro motion of sieve box. The sieve box is mounted on two connecting arms (with ball bearing) at it is front end and two connecting arms at it is rear end.

9.1 Pitman shaft

Material	:	MS rod
Size, mm	:	1051 x 50.5 Ø
Number and type of bearing	:	Two, ball bearing (6308)
Provision of lubrication	:	One grease nipple is provide on each bearing cover

9.2 Hangers:

Number	:	Four (two each in front & rear of sieve unit)
Length of hanger, mm	:	
-Total	:	214 (front) & 252 (rear)
-Center to center	:	150 (front) & 192 (rear)
Stroke length, mm	:	72 (fixed)
No. of oscillation, stroke/min	:	70
Number and type of bearing	:	Two in each, ball bearing (6204)
Provision of lubrication	:	One grease cup is provide on each bearing

10 Aspirator blower:

Number	:	One
Type	:	Suction type

10.1 Main Blower:

a) Number	:	Two
b) Type	:	Main/ bhusa outlet blower.
c) Size of blower, mm	:	542 x 200
d) Number of blades	:	Eight; four on each blower
e) Size of blades (mm)	:	205 x 215 x 1
f) No. & type of bearing on shaft	:	04 ball bearing (6311), 01 (6310)
g) Provision of lubrication	:	Block (on one grease nipple) is provided
h) Provision of changing speed	:	Through prime mover
i) Provision for air inflow adjustment	:	Step pulley are provided
j) Location	:	One on each side of blower
k) Dia. of drive pulley, mm	:	254
l) Dia. of drive pulley, mm	:	172 outer, 205 inner

m) Speed of blower, rpm : 1045
n) length of shaft & dia. : 1882 x 64 ø

Construction details: The blower is fabricated from 1.6 mm GI sheet and the MS rod size 1285x65x64 Ø mm as an axle of the blower. Two square MS flange of size 195x172 x1.5 mm are locked to the shaft at a spacing 462 mm. four pieces of MS angles of size 220x1 mm are bolted to each flange by two nuts and bolts. Blades are riveted to the angle iron pieces bolted to the flange.

11 Feeding plate form:

Construction details : A rectangular platform is fabricated from a G.I sheet of 1.5 mm thickness. Two chains are fitted for fold the platform can be folded up during transpiration.

Size of plate form : 1850 x1075x1.5
Height of plate form from GL, mm : 675

12 Crop feeding system

Numbers : One
Type : Hopper type

12.1 Hopper :

Method of feeding : Manual

Construction details: A square box shape feeding hopper is fabricated from 1.5 mm thick GI sheet M.S. angle iron 2.5 mm thickness. The hopper is fitted to the drum with 20 nut 13.5x8.0x1.5 mm.

Size of feeding hopper opening, mm : 1038x582
Height of feeding hopper from GL, mm : 2290

Specification of feeding hopper (refer IS: 9020-2002) fig:3

Sl. No.	Notation	As per IS: 9020-2002, mm	As measured, mm	Remark
1	**A**	760±400	1115	Conforms
2	**B**	950 (min)	890	**Does not conform**
3	**C**	240 (min)	241	Conforms
4	**D**	430 (min)	610	Conforms
6	**F**	280	148	**Does not conform**
7	**G**	45	20	**Does not conform**
8	**H**	20	20	Conforms
9	**K**	220	132	**Does not conform**
10	**L**	350	460	**Does not conform**
11	**M**	450	162	**Does not conform**
12	**α**	45-55	25	**Does not conform**
13	**Sheet thickness**	1.6 (min)	1.6	Conforms

14	**Other requirements:**	The hopper shall be attached on the top of the threshing cylinder or on the side.	Attachment on the top of thrashing cylinder	Conforms

13 Lubrication points

Sl. No.	Location	No. of lubricating points	Recommended Lubricant	Schedule
1	Cylinder shaft bearing	Four grease nipple	MP grease	After every 2 days
2	Main blower	Two grease nipple	MP grease	After every 2 days
3	Auxiliary blower	Two grease nipple	MP grease	After every 2 days
4	Shaker unit shaft bearings	Two grease nipple	MP grease	After every 2 days
5	Shaker unit hangers	Eight grease nipple	MP grease	After every 2 days
6	Transporting wheels	Two grease cup	MP grease	After every 2 days

14 Transport:

a) Type : Towing
b) Dimension, mm : 1230 x 880
b) Number of Wheels : Two; pneumatic type
c) Size of Wheels : 600-16-10 PR
d) Wheel bearing : 04; tapper bearing two in each hub
e) Inflation pressure, kg/cm^2 : 32

15 Straw outlet: :

Location : At the rear ends of the machine.
Material : G.I. sheet of 1.5 mm thickness
Size, mm : 254x182
Inclination , degree : 75°
Height of outlets from ground level, mm : 998

16 Power transmission:

Type : Belt & pulley

17 Prime mover to input shaft: :

Mode of power transmission : Through flexible propeller shaft to input shaft , in two segments
Length of propeller shaft, mm : 1225
Specification of shaft insert on machine side, mm :
Inner dia. : 241
Outer dia. 210
Depth 102
Locking provision : Two hexagonal head bolt are provided to lock the input shaft in the slot provided

17.1 Specification of shaft insert on tractor PTO side:

Sl.No.	Notations	Dimension in, mm		Conformity
		As per IS:4931	As observed	
1	D	34.93±03	42.90	**Does not conform**
2	d	29.7±0.1	30.0	**Does not conform**
3	W	8.69	6.35	**Does not conform**
4	B	55 (min)	56.0	Conform

17.2 Input shaft to threshing cylinder:

Size of drive pulley, mm : 221
Size of driven pulley, mm : 400
Reduction ratio : 1: 0.55
Type, material & size of belt : 4 V-belt and no. C- 100
Provision for tensioning : Adjustable provided
Provision of safety guards : Cover provided

18 Fly wheel

Number : 02
Material & size, dia. : Cast iron, **30ø**
Location : Fly wheel are fitted on both side of threshing cylinder shaft
Mass, kg : 103

19 Hitch hook:

Size of hook(OD/ID), mm : 111/39
Height of hook from ground level, mm : 752

20 Overall Dimensions (mm):

a) Length : 3022
b) Width : 3000
c) Height : 2380
d) Ground clearance : 241
e) Total mass (kg) : 1525

21 Color of the machine: : Signal red & golden yellow

MATERIAL OF CONSTRUCTION OF DIFFERENT COMPONENT

Table: 1

SL. No.	Name of the part	Material	Ref. to Indian Standards	As observed	Conformity to IS
1	Frame	Mild Steel	IS 2062 or IS 1977	MS angle & GI sheet	Conforms
2	Shaft	Mild Steel	IS 2062 or IS 1977	MS rod	Conforms
3	Concave	Mild Steel	IS 2062 or IS 1977	MS flate & MS angle	Conforms

4	Feeding hopper	Mild Steel	IS 2062 or IS 1977	GI sheet	**Does not conform**
5	Aspirator	Mild Steel	IS 2062 or IS 1977	MS plate	Conforms
6	Flywheel	Cast iron	IS 210	Cast iron	Conforms
7	Pulley	Cast Iron	IS 210	Cast iron	Conforms
8	Transport wheel	Mild steel Cast iron Pneumatic wheels	IS 2062 or IS 1977 IS 210 --	Pneumatic wheels	Conforms

5 RUNNING-IN AND PRELIMINARY ADJUSTMENTS

The machine was run-in at no-load and on load for 1.0 and 0.5 h respectively at recommended threshing cylinder speed and following observations were recorded: -

(a) It was noticed that there was no undue knocking or rattling sound.
(b) No slippage of drive belts was noticed.
(c) No significant vibrations were noticed in the blower.
(d) The shaking mechanism was reciprocating smoothly, and
(e) No unusual vibration of the thresher was noticed.

After running in, the following adjustments were made and maintained throughout the test: -

S. No.	Parameters	Adjustments
		Wheat
1	**2**	**3**
1	No-load threshing cylinder speed (rpm)	700-760
2	Concave clearance (mm)	15-20
5	No-load speed of main blower (rpm)	1015-1185
6	No-load shaker unit speed (rpm)	130-150
7	Inclination of top sieve (deg)	12.5

6 PERFORMANCE TEST

6.1 General: The tests were conducted for Wheat crops only. The assessment of quality of work, capacity of machine and labour requirement, handling characteristics was made after best setting of the thresher by the applicant's representative.

For each test trial, three samples at regular intervals were taken for analysis. The detailed crop parameters and machine parameters are given in **Annexure-I & II** and are summarized as under: -

Crop Parameters: -

S. No	Parameter	Range
1	**2**	**3**
1	Name of crop	Wheat
2	Variety of crop	PBW-502
3	Grain- straw ratio	0.480-0.580
4	Length of cob/earhead (cm)	8.5-11.03

6.2 Quality of work:
The results obtained during the test are given in **Annexure-I to Annexure-II** and are summarized in **Table-2.**

6.2 Rated input capacity of thresher:
Short run test trials in respect of Wheat crops were conducted at different feeding rates at the recommended cylinder speed.

The rated input capacity of thresher was observed as 2580-2895 kg/h in Wheat crops by maintaining the average cylinder speed (on load) of 695-740 rpm in Wheat crops respectively. The rated crop input per unit of fuel consumption was observed as 565-671 kg/l in Wheat.

6.3 Rated output capacity of thresher:
The output capacity of thresher was observed as 1090-1290 kg/h in Wheat crop. The crop output per unit of fuel consumption was observed as 565-671 kg/l in Wheat crop.

6.4 Power Requirement:
The on load engine speeds of the prime mover at rated input capacity of thresher were recorded as 1550-1885 rpm for threshing of Wheat crop. The hourly fuel consumption was recorded as 4.00-4.60 l/h in Wheat crop.

6.5 Long run test:
Long Run Test of the thresher was carried out for 25.0 hours in Wheat crop. During long run test, no breakdowns and abnormal sounds in the machine were noticed.

Table-2

SUMMARY OF PERFORMANCE RESULTS

Tests	Threshing Drum Speed -On load (rpm)	Feeding rate (kg/h)	Grain output (kg/h)	Fuel consu-mption (l/h)	Capacity (kg/l)		Losses on the basis of Total grain input (%)				Efficiency (%)	
					Input	Output	Broken	Sieve over flow	Blown	Un threshed	Cleaning	Threshing
1	2	3	4	5	6	7	8	9	10	11	12	13
Wheat:-												
A	**Short Run Test: -**											
	715-730	2530-2750	242-285	3.550	573-671	242-285	0.85-1.25	3.52-3.85	2.850-6.082	1.120-1.800	97.90-98.71	98.18-98.88
B	**At 50 % of maximum input capacity: -**											
	725-735	2600	278	4.500	565	278	0.62	1.25	2.012	0.810	97.79	99.19
C	**At Varying Speed: -**											
(i)	**At 15% more than specified speed: -**											
	685-725	2895	1290	4.600	621	280	3.120	6.321	2.950	1.827	97.40	98.17
(ii)	**At 15% less than specified speed: -**											
	617-632	2880	1285	4.600	640	285	1.210	2.150	2.235	1.800	98.31	98.20

6.8 Chemical analysis: Chemical composition of cutter blade and better rod is given as under:-

Table- 3: Chemical analysis of critical component

S. No.	Component	Primary element				
		Carbon	Manganese	Silicon	Phosphorous	Sulphur
1.	Cutter blade	0.50	1.16	0.22	0.025	0.019
2.	Stud	0.17	0.43	0.14	0.048	0.042

6.6 Wear analysis: The wear on beater/cutter blade of thrashing cylinder/drum was measured after completion of 27.0 hours. Percentage wear on mass basis was computed and the results are given in table 4.

Table 4:Wear Measurement of Thrashing Cylinder/Drum

S. No.	Initial mass, g	Final mass, g	Total loss, g	Wear, %
1.	480	460	0.20	0.04
2.	540	510	0.30	0.05
3.	470	430	0.40	0.08
4.	480	445	0.35	0.07
5.	475	435	0.40	0.08
6.	480	445	0.35	0.07
7.	510	460	0.50	0.09
8.	490	450	0.40	0.08
9.	400	435	0.45	0.09
10.	475	430	0.45	0.09
11.	480	44	0.40	0.08
12	490	385	0.65	0.13
13	510	470	0.40	0.07
14	475	440	0.35	0.07
15	480	460	0.20	0.04
16	490	465	0.25	0.05
17	460	430	0.30	0.06
18	515	490	0.25	0.04
19	490	400	0.30	0.06

6.10 Labour requirement: -

The Labour requirements for the machine were assessed when crop is available at the threshing floor and are as given below: -

S. No.	Nature of work	Wheat
1.	Crop handling	06
2.	Continuous feeding of crop	02
3.	Straw handling	01
4.	Grain handling (main outlet)	02
	Total	11

7. EASE OF OPERATION AND SAFETY PROVISIONS

Conformity of Indian Standard

Observations on general and safety requirements as per IS: 9020 - 2002: -			
S. No.	**Requirements**	**Observations**	**Conformity**
1	**2**	**3**	**4**
1	**MATERIALS:**		
1.1	The material for construction of different components shall be selected from those given Table-1.		
2	**GENERAL REQUIREMENTS:**		
2.1	Fastening connections between different components shall be made in such a way that they will not get loosened due to vibration or such other forces as may occur during normal operation.	No such defect was noticed	Conforms
2.2	The thresher shall be so designed that general maintenance including cleaning, replacement of parts can be done without damage to the components or danger to the operator	Provided	Conforms
2.3	Proper arrangement for lubrication of moving components shall be provided. All points requiring frequent lubrication shall easily be accessible. In case of bearings, where these are in accessible or in a hazardous position and require frequent lubrication, the means of lubrication shall be located in an accessible position and the lubricant piped into the bearing.	Grease nipple /block are provided	Conforms
2.4	Bearing shall be adequately protected against the ingress of dust	Protected against ingress of dust	Conforms
2.5	In case the prime-mover is to be mounted on the thresher, a protective cover shall be provided to prevent it from dust or straw falling on it and to ensure operator's safety	Not applicable	**Does not conform**
2.6	Provisions shall be made for tightening of the belts	Provided	Conforms
2.7	Threshing drum shall be statically balanced	Balanced	Conforms
2.8	Provision for easy adjustments of concave clearance, airflow rate, screen pitch, sieve speed, eccentricity of shaking mechanism, sieve clearance, etc., should be made	Not provided	**Does not conform**
2.9	Provision for easy transportation of the thresher and towing with the tractor shall be provided	Transport wheel & towing hook for towing by tractor is provided.	Conforms
2.10	Each thresher shall be provided with an operators manual (Refer IS: 8132 & 9019) in Hindi or English or any other vernacular language.	Provided	Conforms
2.11	All the required tools for operation, maintenance and adjustment of various components of the thresher shall be supplied by the manufacturer.	Provided	Conforms

2.12	The thresher shall be run idle (without load) for at least 5 minutes at the specified speed of threshing cylinder to check the following: -		
	a) There shall not be any undue knocking or rattling sound	Refer chapter 5 of this report	Conforms
	b) Drive belts shall not slip frequently		
	c) Fan shall run without any significant vibrations		
	d) Sieve shall oscillate smooth. And		
	e) Thresher shall not vibrate unusually		
3	**GUARDING OF TRANSMISSION SYSTEM: -**		
3.1	Guards shall be provided on all moving parts of the thresher to prevent accidental contact of persons or parts of clothing being caught.	Guards are provided for transmission belts	Conforms
3.2	The guards shall be made of blind sheets of MS having a minimum thickness of 1.8 mm	Provided	Conforms
3.3	The guards shall be so designed as not to hinder in easy adjustment, servicing and operation of the thresher.	Provided	Conforms
3.4	All guards shall be either permanently attached or firmly secured to prevent their removal without the aid of tools. The servicing and adjustment should be possible without complete removal of the guard.	Provided	Conforms
4	**FEEDING SYSTEM: -**		
4.1	Type	Hopper & cute	Conforms
4.2	Specification of chute/hopper	Refer Para 12.1 of this report	**Does not conform**
5	**WORKMANSHIP AND FINISH:**		
5.1	Welding used for joining different components should be done in accordance with IS816	Satisfactory	Conforms
5.2	The components shall be free from rust and shall have protective coating to prevent corrosion and surface deterioration in transit and storage.	Protective coat of paint is provided	Conforms
5.3	The components should be free from pits, burrows and other defects that may be detrimental for their use.	Satisfactory	Conforms
6	**Marking: -**Each thresher shall be marked with the following particulars:		
(a)	Manufacturer's name and recognized trade-mark, if any:	Provided	Conforms
(b)	Model number	Provided	Conforms
(c)	Batch or code number, or Sl. No. if any	Provided	Conforms
(d)	Power rating, kW;	Not provided	**Does not conform**
(e)	Revolutions per minute of the threshing drum and its direction of rotation	Provided	Conforms
6.1	**Minimum cautionary notices: –** Each thresher shall be fitted with a label/plate containing following cautionary notices written in vernacular language and their pictorial representation. The size of the pictures and the typography of the letters shall be selected according to the size of the label or poster and the distance at which these have to be seen or read. The minimum size for picture shall be 40 mm. The colour of symbols should be **black** for "**pictorial representation"** and **red** for "**Not to Do**":(**Annex-B**)		

(a)	Do not put or take-off belt while pulley is running	Provided	Conforms
(d)	Do not feed ear-heads by hand	Provided	Conforms
(e)	Children and aged persons should be discouraged for feeding the crop	Provided	Conforms
(f)	Do not cross over the belts	Provided	Conforms
(g)	Do not wear loose dress, bangle, watch, etc. while working	Provided	Conforms
(h)	Don't work under the influence of intoxicants like liquor, opium, etc. while working	Provided	Conforms
(i)	Do not work while tired	Provided	Conforms
(j)	Do not make adjustment when thresher is working	Provided	Conforms

8. DEFECTS, BREAKDOWNS AND REPAIRS

No breakdown occurred during 25.0 h of performance test of the machine.

9. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

9.1 The machine submitted for test was stated to be a wheat crop thresher & as such it was required to be tested for threshing of wheat crop. However, test could only be conducted with wheat.

9.2 Arrangement should be made to permanently display the quality and parameters obtained in the test in all commercially manufactured (agriculture machines by putting engraved seals or plates) on the machines, so that the farmers can get proper information about the quality of the equipment.

9.3 Wheat threshing: -

9.3.1 Quality of work

- The percentage of broken grain was recorded as 0.62 to 3.120
- The percentage of sieve overflow losses was recorded as 1.25 to 6.32 %.
- The percentage of blown grain losses was recorded as 2.012 to 2.850 %, which is considered normal.
- The threshing efficiency of the machine was recorded 98.17 to 99.19 %, which is considered normal.
- The cleaning efficiency was recorded as 97.40 to 98.71 %, which is considered normal.

9.3.2 The overall performance of the thresher in wheat crop is considered to be satisfactory.

9.3.3 No major effect on performance of thresher was observed at 15% lower speed than the recommended cylinder speed. However the broken losses increased to 1.2 %, at 15% higher speed than the recommended cylinder speed.

9.4.4 On load fuel consumption: -

The on load engine speeds of the prime mover at rated input capacity of thresher were recorded as 1600 to 1715 rpm for threshing of Wheat crop. The hourly fuel consumption was recorded as 3.500 to 4.600 l/h in Wheat crop.

9.5 Labour requirement: -

9.5.1 The thresher can be installed in harvested field itself, which reduces labour requirement and transporting losses.

9.5.2 The labour requirement for threshing of Wheat crop assessed as 10-12 numbers. However, labour requirement can be reduced if feeding conveyor is provided.

9.6 Long Run Test of the thresher was carried out for 20.0 hours in Wheat crop. During long run test, no major breakdowns and abnormal sound in the machine were noticed.

9.7 The specification of feeding hopper does not conform to the IS: 9020-2002. It should be provided as per the specification laid down in the said code.

9.8 All pulleys & belt drives used on the thresher are well protected by providing the suitable guards.

9.9 The thresher is tractor PTO operated, tractors are available with different PTO speeds and the PTO speed varies according to make, model and its throttle settings. Therefore it is strongly recommended that a rotational speed counter should be provided on thresher for indication of threshing cylinder speed along with a chart of crop wise recommended revolutions per minute of the threshing drum with its direction of rotation and settings of various systems.

9.10 The thresher should be provided with reflectors of suitable size and slow moving emblem at rear side.

9.11 An etched plate with following information should be provided on the machine**.**

- Recommended lubricants and lubricating schedule.
- Crop wise recommended speeds and settings of various systems
- Suitability of different types of crops and its capacity.

However, each thresher shall be marked with Make; Model; Batch or code number, or Serial No. if any; Power rating, kW; and Revolutions per minute of the threshing drum and its direction of rotation.

9.12 Adequacy of literature: -

No literature has been supplied with the machine. The Operators' Manual in vernacular language should be brought out. The Operator Manual must contain the information as per IS: 8132-1976 including the information on following points: -

- The optimum range of recommended cylinder speeds for each crop.
- Illustration of safety norms to be followed by operator during work.
- Installation and operation of machine.
- Preventive and periodical maintenance of machine.
- List of recommended lubricants and its schedule.
- List of standard fitments and accessories with the machine.

10 APPLICANT'S COMMENTS

This test report is satisfactory & We will supply the good quality products to customer as per Indian standards.
This implement is the latest Design of Gobind Alloys Ltd (Brand Gobind).During the production of Super Shakti Model Flexi we ensure that, 'We will modify/update the design at regular production Level as per Indian standards.Kindly mentioned our Comments in the final test report.

This report is being issued with the condition that the tested implement will be rectified as per recommendation and comments given by the Institute and applicant respectively and after rectification the implement should be manufactured on commercial basis.

TESTING AUTHORITY

(UPENDRA KUMAR) -SENIOR TECHNICAL ASSISTANT-	
(ANAND CHAUDHARI) -TEST ENGINEER-	
(DIGVIJAY SINGH) -TEST ENGINEER-	
(VIJAY KUMAR SINGH) -ASSOCIATE PROFESSOR – ENGG.	
(DR. PRAMOD KUMAR GUPTA) -ADDITIONAL DIRECTOR-	
(DR. PANKAJ TRIPATHI) - DIRECTOR-	

THIS TEST REPORT IS VALID FROM 22.11.2022 TO 21.11.2029

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ANNEXURE-I

CROP AND MACHINE PARAMETERS (WHEAT)

Place of test: Barabanki

Sl. No	Duration of test (h)	Crop Parameters						Prime-mover parameters			Machine Parameters							
		Variety of crop	Size of ear head (cm)		Grain-straw ratio	Moisture content (%)		Fuel consumption (l/h)	Engine speed (rpm)		Cylinder speed (rpm)		Aspirator speed (rpm)				Shaker speed (rpm)	
													Main blower		Auxiliary blower			
			Length	Dia.		Grain	Straw		No-load	On-load	No-load	On-load	No-load	On-load	No-load	On-load	No-load	On-load
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A	**Short Run Test: -**																	
1	1.0	PBW-502	10.0	-	0.510	-	-	4.25	1690	1600	730	715	1020	100	-	-	150	142
2	1.0	PBW-502	10.0	-	0.52	-	-	4.50	1650	1600	735	725	1050	7042	-	-	142	137
3	1.0	PBW-502	8.0	-	0.48	-	-	4.00	1685	1620	725	720	1030	1000	-	-	165	158
4	1.0	PBW-502	9.0	-	0.48	-	-	4.20	1650	1610	732	717	1032	1022	-	-	137	130
B	**At 50 % of maximum input capacity: -**																	
5	1.0	PBW-502	10.0	-	0.580	-	-	4.60	1692	1685	715	705	1005	915	-	-	155	146
C	**Varying speed Test: -**																	
(i)	**At 15% more than specified speed: -**																	
6	1.0	PBW-502	10.6	-	0.49	-	-	4.60	160	1550	700	670	1015	1000	-	-	131	120
ii)	**At 15% less than specified speed: -**																	
7	1.0	PBW-502	9.3	-	0.550	-	-	4.60	1910	1885	740	725	1015	985	-	-	160	132
D	**Long Run Test: 20 h**																	

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ANNEXURE-II

Place of test: Barabanki

PERFORMANCE DATA ANALYSIS (WHEAT)

Test No	Feeding Rate (kg/h)	Output from Main outlet (kg/h)	Capacity (kg/l)		Losses in Main Grain Outlet (%)			Total losses (%)				Total machine losses (%)	Efficiency (%)	
			Input	Output	Broken	Un threshed	Total	Broken	Blown	Un threshed	Sieve		Cleaning	Threshing
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A.	**Short Run Test**													
1	2750	1210	647	285	0.627	0.661	1.288	1.250	6.082	1.630	3.80	12.760	98.71	98.37
2	2685	1170	671	292	0.630	1.056	1.716	0.850	5.827	1.800	3.85	12.347	98.28	98.18
3	2600	1110	591	253	1.150	0.840	1.990	0.850	3.150	1.120	3.52	8.640	98.01	98.88
4	2580	1090	573	242	1.000	1.020	2.100	0.900	2.850	1.220	3.82	6.790	97.90	98.78
B.	**At 50 % of maximum input capacity: -**													
5	2600	1280	565	278	0.890	1.300	2.210	0.620	2.012	0.810	1.25	4.692	97.79	99.19
C	**Varying speed test**													
(i)	**At 15% more than specified speed: -**													
6	2895	1290	629	280	0.915	1.682	2.597	3.120	2.950	1.827	6.32	14.220	97.40	98.17
(ii)	**At 15% less than specified speed: -**													
7	2880	1285	640	285	1.100	0.585	1.689	1.210	2.235	1.800	2.15	7.395	98.31	98.20
D	**Long run test: 20 h**													

*** Feed rate at rated input capacity**

ANNEXURE -III

SYMBOL AND ABBREVIATIONS

SYMBOLS:

I-	**SYMBOLS ASSIGNED TO BASIC SI UNITS**		
S.N.	**PHYSICAL QUANTITY**	**NAME OF SI UNIT**	**SYMBOL**
1	Length	Meter	m
		Millimeter	mm
2	Mass	Kilogram	kg
		Gram	g
		Tone	t
3	Time	Second	s

II-	**SYMBOLS ASSIGNED TO SOME DERIVED UNITS**		
S.N.	**PHYSICALQUANTITY**	**NAME OF SI UNIT**	**SYMBOL**
1.	Area	Square centimeter	cm^2
		Square meter	m^2
		Hectare	ha
2	Speed/Velocity	Meter per second	m/s
		Kilometer per hour	kmph
3	Pressure	Newton per square millimeter	N/mm^2
4	Time	Minute	min
		Hour	h
5	Volume	Cubic centimeter	cm^3
		Milliliter	ml
		Liter	l

ABBREVIATIONS:

As per applicant	:	apa	Clause	:	Cl
Degree	:	deg	Figure	:	Fig
Indian Standard	:	IS	Kilowatt	:	kW
Number	:	No.	Not available	:	N.A.
Not Recorded	:	N.R.	Percent	:	%
Reference	:	Ref.	Revolution	:	rpm