

व्यावसायिक परीक्षण रिपोर्ट  
COMMERCIAL TEST REPORT

संख्या/ No.: COMB – 301/2971/2023

माह/Month: February, 2023

**THIS TEST REPORT VALID UP TO : 28<sup>th</sup> February, 2030**



## VISHAL, 408 SUPREME SELF PROPELLED COMBINE HARVESTER



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**

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

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4.	Crop throughput, tonne/h	5.45 to 8.66	7.34 to 9.46
5.	Grain breakage in main grain outlet, %	1.10 to 1.59	0.70 to 1.13
6.	Header losses, %	0.09 to 0.38	0.10 to 0.53
7.	Total non-collectable losses, %	0.21 to 0.60	0.16 to 0.50
8.	Total collectable losses, % (un threshed + broken from main outlet)	2.00 to 2.46	1.87 to 2.36
9.	Total processing losses, %	2.13 to 2.72	1.93 to 2.46
10.	Threshing efficiency, %	98.7 to 99.4	98.6 to 98.8
11.	Cleaning efficiency, %	96.8 to 97.2	96.5 to 96.8

### 17.3 Conformity to Indian Standard

- (i) IS: 6025-1982 (Reaffirmed 2014)-Specification for : **Does not conform in toto**  
knife section for harvesting machine.
- (ii) IS: 6024-1983 (Reaffirmed 2014)-Specification for : **Does not conform in toto**  
guards for harvesting machines.
- (iii) IS: 10378-1982 (Reaffirmed 2016)-Specification of : **Does not conform in toto**  
knife back for harvesting machine.
- (iv) IS: 6283 (Part I & Part II)-2007(Reaffirmed 2014)- : **Conforms**  
Tractors and machinery for agriculture and forestry-  
symbol for operator controls and other displays.
- (v) IS: 8133-1983 (Reaffirmed 2014)-Guidelines for : **Does not conform in toto**  
location & operation of operator controls on agricultural  
tractors and machinery.
- (vi) IS: 15806-2018 (Combine Harvester recommendation : **Conforms**  
on selected performance and other characteristics

### 18. SELECTED PERFORMANCE AND OTHER CHARACTERISTICS

18.1 Acceptance criteria for performance characteristics as per clause. 4.1 of IS:15806-2018						
S. No	Characteristics	Category (Evaluative /Non evaluative)	Requirement Declaration	Tolerance	Observed	Remarks
1	2	3	4	5	6	7
<b>I. Prime mover performance</b>						
a)	Max. power (absolute) - average max. power observed during 2 hrs. max. power test in natural ambient condition, kW	Evaluative	74.3 (D)	±5% of declared value	73.8	Conforms
b)	Max. power observed during test after adjusting the no load engine speed as per recommendation of the manufacturer for field work, kW	Evaluative	70 (D)	±5% of declared value	68.8	Conforms

c)	Power at rated engine speed, kW (under natural ambient condition)	Non-evaluative	74.3 (D)	±5% of declared value	73.1	Conforms
d)	Specific fuel consumption corresponding to average maximum power under 2 h maximum power test, g/kWh.	Evaluative	250 (D)	+5% of declared value	245	Conforms
e)	Max. smoke density (Bosch no) at 80% load between the speed at max. power and 55% of speed at max. power or 1000 rpm whichever is higher	Evaluative	As per CMV rules, light absorption coefficient 3.25 m <sup>-1</sup> / Hartridge units 75 (R)	Nil	2.18 m <sup>-1</sup>	Conforms
f)	Max. crank shaft torque, (Nm) observed during the test after no load engine speed is adjusted as per manufacture's recommendation for field work	Evaluative	440 (D)	±8%	429.2	Conforms
g)	Back up torque, % (Natural Ambient)	Evaluative	7 % min. (R)	Nil	42.3	Conforms
h)	Max. operating temperature, C° i) Engine oil ii) Coolant	Evaluative	i) 120 (D) ii) 105 (D)	Nil	i) 115 ii) 98	Conforms
i)	Lubrication oil consumption, g/kWh	Evaluative	Not exceeding 1 % of SFC at maximum power (high ambient condition) (R)	Nil	0.387	Conforms

**II. Brake performance at 24 km/h or maximum speed whichever is less**

a)	Max. stopping distance at a force equal to or less than 600 N on brake pedal (m)- (cold brake and hot brake)	Evaluative	As per requirement of CMVR (R)	Nil	Cold: 2.6 Hot: 2.7	Conforms
b)	Max. force exert on brake pedal to achieve a declaration of 2.5 m/sec <sup>2</sup> (N)	Evaluative	≤ 600 N (R)	Nil	Cold: 423 Hot: 435	Conforms
c)	Effectiveness of parking brake at a force of 600 N at foot pedal or 400 N at hand lever	Evaluative	As per requirement of CMVR (R)	Nil	Effective	Conforms

**III. Mechanical vibration**

a)	Operator's platform	Non-evaluative	120 μm max. (R)	Nil	283	<b>Does not conform</b>
b)	Steering control wheel	Non - evaluative	150 μm max. (R)	Nil	267	<b>Does not conform</b>
c)	Seat with driver seated	Non - evaluative	120 μm max. (R)	Nil	277	<b>Does not conform</b>

**IV. Air cleaner oil pull over**

a)	Air cleaner oil pull over in % when tested in accordance with IS 8122 part (II) 2000	Evaluative	0.20 max. (R)	Nil	Dry type air cleaner provided hence test is not applicable	Not applicable
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**V. Noise measurement**

a)	Max. ambient noise emitted by combine at by standers position dB (A)	Evaluative	88 dB (A) as per CMV rules (R)	Nil	87.2	Conforms
b)	Max. noise at operator's ear level dB (A)	Evaluative	98 dB (A) as per CMV rules (R)	Nil	96.6	Conforms

**VI. Header lifting Test**

a)	Satisfactory completion of header lifting test	Evaluative	-	Nil	Satisfactory completed	Conforms
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**VII. Discard limit**

a)	Thickness of brake lining, mm	Evaluative	Up to rivet head (D)	Nil	10.9	Conforms
b)	Thickness of clutch plate, mm	Evaluative	Up to rivet head (D)	Nil	3.20 to 4.25 mm above the rivet head	Conforms

<b>VIII. Field performance</b>						
	<b>a)</b>	Suitability for crops	Evaluative	Wheat & paddy (Wheel type) Paddy (Track type)	Nil	Wheat and paddy (Wheel type) Conforms
	<b>b)</b>	Processing losses (%)	Evaluative	Max (of average)	Nil	Wheat max. 2.72 % Rice max. 2.46 % Conforms
			Wheat	3%		
			Rice	4% <b>(R)</b>		Conforms
	<b>c)</b>	Threshing efficiency	Evaluative	≥98 percent for wheat & Paddy <b>(R)</b>	Nil	Min. 98.7 % for wheat 98.6 % for paddy Conforms
	<b>d)</b>	Cleaning efficiency	Evaluative	≥96 percent for wheat & Paddy <b>(R)</b>	Nil	Min. 96.8 % for wheat 96.5 % for paddy Conforms
	<b>e)</b>	Grain breakage in main grain tank	Evaluative	≤2.5 percent <b>(R)</b>	Nil	Max. 1.59 % for wheat max. 1.13 % for paddy Conforms
	<b>f)</b>	Non collectable losses	Evaluative	≤2.5 percent for wheat, Paddy & gram ≤4.0 percent for Soybean <b>(R)</b>	Nil	Max. 0.60 % for wheat max. 0.50 % for paddy Conforms
<b>IX</b>	<b>Safety requirement</b>					
	<b>a)</b>	Guards against all moving parts/drives and hot part	Evaluative	Belt and chain drives, pulleys hydraulic pipes (around operators work place) <b>(R)</b>	--	Provided Conforms
	<b>b)</b>	Lighting arrangement	Evaluative	Essential as per CMVR <b>(R)</b>	-	Provided Conforms
	<b>c)</b>	Grain tank cover	Evaluative	Essential <b>(R)</b>	-	Provided Conforms
	<b>d)</b>	Spark arrester in engine's exhaust in case naturally aspirated engine	Evaluative	Essential <b>(R)</b>	-	Turbo charger provided in exhaust system Not Applicable
	<b>e)</b>	Stone trap before concave bars	Evaluative	Essential <b>(R)</b>	-	Provided Conforms

f)	Rear view mirror	Evaluative	Essential (R)	-	Provided	Conforms
g)	Fire extinguisher	Evaluative	Essential (R)	-	Provided	Conforms
h)	Slip clutch at following drives –					
	i) Cutting platform	Evaluative	Essential (R)		Provided	Conforms
	ii) Undershot conveyor drive	Non - evaluative	Optional (R)	-	Provided	Conforms
	iii) Grain & tailing elevator	Non - evaluative	Optional (R)		Provided	Conforms
i)	Anti-slip surfaces at operator platform and ladder and proper gripping for the control levers.	Evaluative	Essential (R)	-	Provided	Conforms
j)	Working clearance around the controls	Evaluative	Essential 70 mm (Min.) (R)	-	Provided	Conforms
k)	Labelling of control and gauges and all operating controls	Evaluative	Essential (R)	-	Provided	Conforms

<b>X</b>	<b>Material of construction :</b>						
i)	Knife guard should conform to IS: 6024 - 1983	Non evaluative	Should have maximum hardness 163 HB (R)	-	525 (Average)	<b>Does not conform</b>	
ii)	Knife blade As per IS :6025 -1982	Non evaluative	It must have Chemical composition as C=0.70-0.95 %  Mn= 0.30-0.50% (R)	-	C=0.68  Mn= 0.57	<b>Does not conform</b>  <b>Does not conform</b>	

iii)	Knife back should meet the requirement of IS:10378-1982	Non evaluative	The knife back shall be manufactured from Carbon Steel having minimum carbon content of 0.35 % (R)	--	C=0.15	Does not conform
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### 18.2 Acceptance Criteria in case of Breakdown/Defects as per clause 4.2 of IS:15806-2018

#### XI. Break down (critical, major & minor)

Sr. No.	Category of breakdowns	Category (Evaluative/ Non evaluative)	Requirements as per IS 15806:2018	As observed	Whether meets the requirements (Yes/No)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature	None	Yes
3.	Minor	Evaluative	Not more than five and frequency of each should not be more than two	None	Yes
4.	Total breakdown	Evaluative	In no case total no of (major + minor) breakdowns exceed five	None	Yes

### 19. COMMENTS AND RECOMMENDATIONS

#### 19.1 Mechanical vibration

The amplitude of mechanical vibration of components marked as (\*) in chapter 12 of this report are observed on higher side. This calls for providing suitable remedial measures to dampen the vibration in order to improve the operational comfort and service life of various components & sub-assemblies.

**19.2** Provision for varying oscillation of sieve is not provided. It **MUST** be provided.

**19.3** There is no drive safety for grain unloading auger. It should be provided

**19.4** Safety against the accidental start of engine is not provided on combine harvester. It **MUST** be provided.

#### 19.5 Field performance test

No noticeable defect observed during the field test

#### 19.6 Ease of operation and safety provision

i) No noticeable difficulty observed during operation of combine harvester

**19.7 Hardness and chemical composition**

**Hardness of knife guard & chemical composition of knife blade and knife back is not within the limits specified in their respective IS: 6025-1982. It should be looked into for corrective action at regular production level.**



**19.10 Literature supplied with the machine**

No literature was supplied with the combine harvester.

The following literature MUST be developed as per IS:8132-1999 and supplied for the guidance of user.

- i) Operator's manual of combine harvester
- ii) Service manual
- ii) Parts catalogue
- iv) Operator's manual of engine

**TESTING AUTHORITY**

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 08-02-2023

The test report is compiled by: Er. Aman Garg

**20. APPLICANT'S COMMENTS**

No specific comments received from the applicant.