

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: Comb- 283/2924/2022
माह/Month: October, 2022

THIS TEST REPORT VALID UP TO : 31st October, 2029



**KAIRA, LC08K, SELF PROPELLED
COMBINE HARVESTER (TRACK TYPE)**



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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Page 1 of 55

15. FIELD TEST

15.1 The combine harvester was operated in field for 51.32 hours (excluding run-in 2.50 h) for paddy harvesting. During the test, available varieties of crop were harvested to assess the field performance of combine with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction etc. The crop and atmospheric conditions during field test are given in **Appendix - II**

The crop parameters recorded during the test for paddy crops is as under:-

Crop Parameters

Sl. No.	Parameters		Observations
			Paddy
1.	Plant height, cm	:	96 to 132
2.	Number of tillers/m ²	:	230 to 352
3.	Length of ear head, cm	:	11 to 22
4.	Straw/grain ratio	:	1.4 to 2.2
5.	Moisture, %		
	- Grain	:	13.9 to 16.2
	- Straw	:	50.4 to 63.0

The summary of losses and efficiencies observed during field performance test with paddy crop is summarised in Table 4 and presented in detail in **Appendix – III**

TABLE-4: SUMMARY OF LOSSES & EFFICIENCIES OBSERVED IN FIELD PERFORMANCE TEST

Crop variety	Collectable losses (Max.) (%)	Non-collectable losses (Max.) (%)	Total processing losses (Max.) (%)	Threshing efficiency (Min.) (%)	Cleaning efficiency (Min.) (%)	Grain breakage in main tank (Max) (%)	Forward speed (kmph)	Area covered (ha/h)	Fuel consumption		Grain output (kg/h)	Crop through-put (t/h)
									(l/h)	(l/ha)		
LLR	1.8	1.1	1.9	98.8	97.2	1.03	2.18 to 2.59	0.286 to 0.374	6.00 to 7.40	16.06 to 23.93	2058 to 2907	6.48 to 9.06

15.2 Unloading of grains

The time to unload the grain tank ranged from 110 to 150 seconds in paddy operation.

15.3 Time required for daily maintenance

The average labour required for daily maintenance was approximately two man hours.

15.4 Harvesting of any other crop

Not done, as not recommended.

16. DEFECTS, ADJUSTMENTS, BREAKDOWNS AND REPAIRS

No noticeable defect or breakdown was observed during the test.

- (iv) IS: 6283 (Part-I)-2006 & IS: 6283 (Part-II) (Reaffirmed 2014)-Tractor and machinery for agriculture and forestry, powered lawn and garden equipment-symbol for operator controls and other displays. : Conforms
- (v) IS: 8133-1983 (Reaffirmed 2014)-Guidelines for location & operation of operator controls on agricultural tractors and machinery. : Conforms
- (vi) IS: 15806-2018-Combine Harvester- Recommendations on Selected Performance and Other Characteristics. : Conforms

19. SELECTED PERFORMANCE AND OTHER CHARACTERISTICS

19.1 Acceptance criteria for performance characteristics as per clause 4.1 of IS 15806:2018						
S. No	Characteristics	Category (Evaluative/Non evaluative)	Requirement (R)/ Declaration (D)	Tolerance	Observed	Remarks
1	2	3	4	5	6	7
I.	Prime mover performance					
	a) Max. power (absolute) average max. power observed during 2 h. Max. power test in natural ambient condition, kW	Evaluative	73.0 (D)	±5% of declared value	71.7	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	73.0 (D)	±5% of declared value	71.7	Conforms
	c) Power at rated engine speed, kW (under natural ambient condition)	Non-evaluative	72.0 (D)	±5% of declared value	70.5	Conforms
	d) Specific fuel consumption corresponding to average maximum power under 2 h maximum power test, g/kWh.	Evaluative	256 (D)	+5% of declared value	244	Conforms
NORTHERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE, HISAR [THIS REPORT VALID UP TO : 31 st October, 2029]						45 of 55

	e)	Max. Smoke density (Bosch no.) at 80% load between the speed at max. Power & 55% of speed at max. power or 1000 rpm whichever is higher	Evaluative	As per central motor vehicles (CMV) rules (R)	Nil	2.01 m ⁻¹	Conforms
	f)	Max. Crank shaft torque, (Nm) observed during the test after no load engine speed is adjusted as per manufacturer's recommendation for field work	Evaluative	319 (D)	±8% of declared value	319	Conforms
	g)	Back up torque, %	Evaluative	7 % min. (R)	Nil	12.92	Conforms
	h)	Max. operating temperature, ° C i) Engine oil ii) Coolant	Evaluative	i) 125 (D) ii) 120 (D)	Should not exceed the declared value	i) 104.0 ii) 86.0	Conforms
	i)	Lubrication oil consumption, g/kWh	Evaluative	1 % of SFC at maximum power (high ambient) (R)	Nil	0.226	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)	--	Not applicable as hydrostatic transmission does not require any separate/ regular conventional brake system.	--
	b)	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)	--	Effective	Conforms

III. Mechanical vibration							
	a)	Operator's platform	Non evaluative	120 µm max. (R)	Nil	205	Does not conform
	b)	Steering control wheel	Non evaluative	150 µm max (R).	Nil	450	Does not conform
	c)	Seat with driver seated	Non evaluative	120 µm max. (R)	Nil	230	Does not conform
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
V. Noise measurement							
	a)	Max. ambient noise emitted by combine at by-standers position dB(A)	Evaluative	88 dB(A) as per CMVR (R)	Nil	82.2	Conforms
	b)	Max. noise at operator's ear level dB(A)	Evaluative	98 dB(A) as per CMVR (R)	Nil	97.6	Conforms
VI. Header lifting Test							
	a)	Satisfactory completion of header lifting test	Evaluative	-	Nil	Satisfactorily completed	Conforms
	b)	Thickness of brake lining, mm	Evaluative	--	-do-	Not applicable	--
	i)	Thickness of clutch plate, mm	Evaluative	--	-do-	Not applicable	--
VII. Field performance							
	a)	Suitability for crops	Evaluative	Wheat & paddy (Wheel type) Paddy (Track type)	Nil	Applicant recommended to test in paddy crop only	Conforms
	b)	Average processing losses (%)	Evaluative Rice	Average 4% (R)	Nil	1.9 % (Max.)	Conforms
	c)	Threshing efficiency	Evaluative	≥ 98 percent (R)	Nil	98.8 % (Min.)	Conforms
	d)	Cleaning efficiency	Evaluative	≥ 96 percent (R)	Nil	97.2 % (Min.)	Conforms

COMB-283/2924/2022	KAIRA, LC08K, SELF PROPELLED COMBINE HARVESTER (TRACK TYPE) (COMMERCIAL)
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	e)	Grain breakage in main grain tank	Evaluative	≤ 2.5 percent (R)	Nil	1.03 % (Max.)	Conforms
	f)	Non collectable losses	Evaluative	≤ 2.5 percent (R)	Nil	1.1 % (Max.)	Conforms
VIII. Safety requirement							
	a)	Guards against all moving parts/ drives and hot parts	Evaluative	Belt and chain drives, pulleys hydraulic pipes (Around operators work place) (R)	--	Provided	Conforms
	b)	Lighting arrangement	Evaluative	As per CMVR (R)	-	Provided	Conforms
	c)	Grain tank cover	Evaluative	Essential (R)	-	Provided	Conforms
	d)	Spark arrester in engine's exhaust in case naturally aspirated engine	Evaluative	Essential (R)	-	Provided	Conforms
	e)	Stone trap before concave bars	Evaluative	Essential (R)	-	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	-	Provided	Conforms
		iii) Grain & tailing elevator	Non evaluative	Optional		Sensor provided	Conforms
	i)	Anti slip surfaces at operator platform & ladder & proper gripping for the control levers.	Evaluative	Essential (R)	-	Provided	Conforms

	j)	Working clearance around the controls	Non evaluative	Essential 70 mm, min (R)	-	Provided	Conforms
	k)	Labelling of control and gauges	Evaluative	Essential	-	Provided	Conforms
IX	Material of construction						
	i)	Knife guard should conform to IS: 6024 - 1983	Non evaluative	Should have maximum hardness 163 HB	-	88	Conforms
	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%	-	C= 0.75 Mn= 0.39	Conforms Conforms
	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 %	--	C=0.42	Conforms



19.2 Acceptance criteria in case of Breakdowns/Defects as per clause 4.2 of IS:15806-2018					
XVII. Break down (critical, major & minor)					
Sr. No.	Category of breakdowns	Category (Evaluative/ Non evaluative)	Requirements as per OM	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

20. COMMENTS AND RECOMMENDATIONS

- 20.1 **Mechanical vibration**
The amplitude of mechanical vibration of components marked as (*) in chapter 13 of this test report are observed to be 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.
- 20.2 **Field performance test**
No noticeable defect and breakdown observed during operation of combine harvester.
- 20.3 **Ease of operation and safety provisions**
No noticeable difficulties observed during operation of combine harvester.
- 20.4 **Literature supplied with the machine.**
The following literatures were provided by the applicant during the test.
 - i) Operators manual
 - ii) Spare parts catalogue
 - iii) Service manual
 - iv) Engine operator manual
 - v) Engine service manual
 - vi) Engine spare parts catalogue

However, the manual needs to be updated as per IS: 8132-1999

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 10.10.2022

Draft test report compiled by: Er. Dharmendra Kumar, Technical Assistant

21. **APPLICANT'S COMMENTS**

No specific comments received from the applicant.