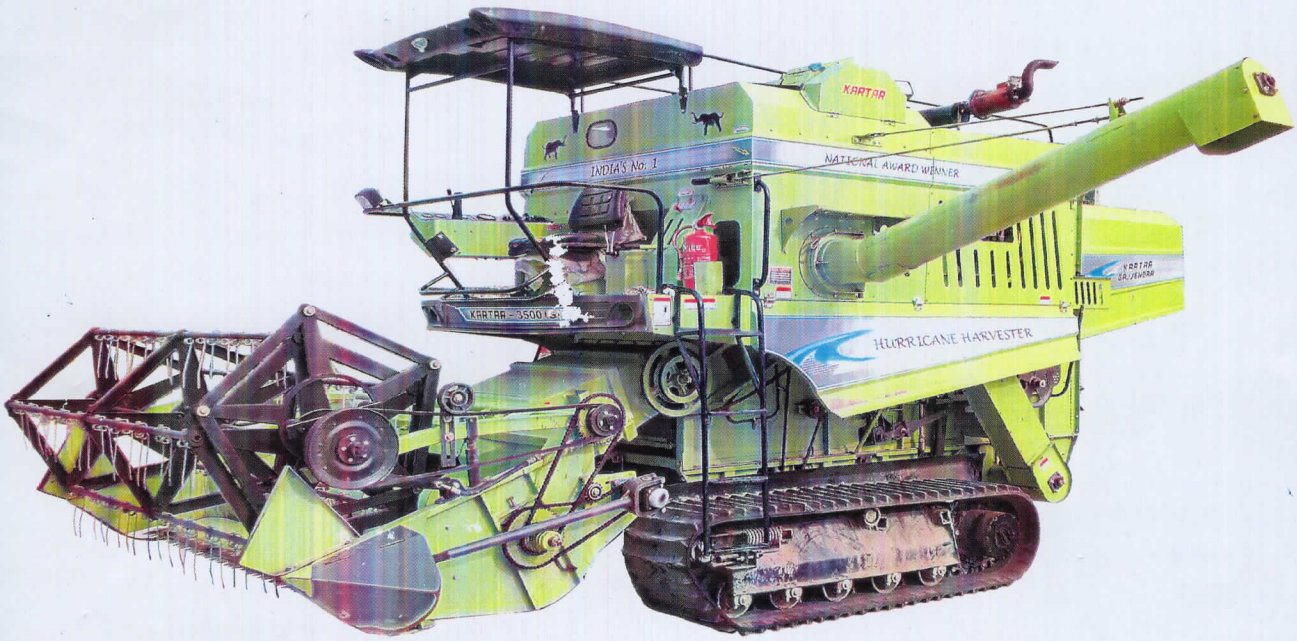
व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ **No.: COMB-202/2346/2019**
माह/**Month: August, 2019**

THIS TEST REPORT VALID UP TO : 31st August, 2026



KARTAR 3500G, SELF PROPELLED PADDY COMBINE HARVESTER (TRACK TYPE)

सत्यमेव जयते

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Government of India
कृषि एवं किसान कल्याण मंत्रालय
Ministry of Agriculture and Farmers Welfare
कृषि, सहकारिता एवं किसान कल्याण विभाग
Department of Agriculture, Cooperation and Farmers Welfare
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16.4 Wear of the peg teeth

The wear of the peg teeth of the threshing cylinder and concave was measured. The percentage wear on mass basis was computed and the results are given below:

Sl. No.	Original mass before test (g)	Mass after 52.43 h of test (g)	Percent wear by weight (%)
a)	**Peg teeth of threshing cylinder**		
1.	213.1	211.5	0.75
2.	211.3	209.7	0.76
3	214.2	212.3	0.89
4	219.7	217.7	0.91
5	219.0	217.4	0.73
6	213.7	212.0	0.80
7.	221.6	219.0	1.17
8.	204.9	203.4	0.73
b)	**Peg teeth of concave**		
1	199.2	198.1	0.55
2	204.1	203.1	0.49
3	202.6	201.3	0.64
4	206.8	205.9	0.44
5	192.1	191.2	0.47
6	195.0	193.4	0.82

17. SUMMARY OF OBSERVATIONS

17.1 ENGINE PERFORMANCE TEST

Table-1 : ENGINE PERFORMANCE TEST (NATURAL AMBIENT)

Brake Power kW	Engine speed (rpm)	Fuel consumption			Specific energy, kWh/l
		l/h	kg/h	Specific, kg/ kWh	
(1)	(2)	(3)	(4)	(5)	(6)
a) Maximum power – 2 hours test					
53.2	2174	16.06	13.31	0.250	3.31
b) Power at rated engine speed: (2200 rpm)					
52.5	2200	16.07	13.26	0.252	3.27

Table-2 : ENGINE TEST (HIGH AMBIENT)

Brake power (kW)	Engine speed (rpm)	Fuel consumption			Specific energy, kWh/l
		l/h	kg/h	Specific, kg/kWh	
(1)	(2)	(3)	(4)	(5)	(6)
a) Maximum power -					
51.7	2125	16.20	13.25	0.257	3.19
b) Power at rated engine speed (2200 rpm)					
49.6	2199	15.89	13.01	0.263	3.12

17.2 Field test

17.2.1 Summary of field tests

The results of the field test are summarized below:-

S. No	Parameters	Observed range
		Paddy harvesting
1.	Range of average speed of operation (kmph)	3.01 to 3.74
2.	Range of average area covered (ha/h)	0.408 to 0.561
3.	Maximum average fuel consumption: - (l/h) - (l/ha)	 10.92 23.34
4.	Range of average crop throughput (tonne/h)	7.04 to 9.31
5.	Reported average grain breakage in main grain outlet (%)	0.93
6.	Reported average header losses (%)	0.64
7.	Reported average total non-collectable losses (%)	1.0
8.	Reported average total collectable losses (%) (Unthreshed + broken from main outlet)	1.2
9.	Reported average total processing losses (%)	1.8
10.	Reported average threshing efficiency (%)	99.2
11.	Reported average cleaning efficiency (%)	97.5

18. SELECTED PERFORMANCE AND OTHER CHARACTERISTICS AS PER 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 hrs. Max. Power test in natural ambient condition, kW	Evaluative	55.0	±5% of declared value	53.2	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	55.0	±5% of declared value	53.2	Conforms
	c)	Power at rated engine speed, kW (under natural ambient condition)	Evaluative	55.0	±5% of declared value	52.5	Conforms

1		2	3	4	5	6	7
	d)	Specific fuel consumption corresponding to average maximum power under 2h maximum power test, g/kWh.	Evaluative	245	+5% of declared value	250	Conforms
	e)	Max. Smoke density at 80% load between the speed at max. Power & 55% of speed at max. Or 1000 rpm whichever is higher	Evaluative	As pre CMV rules. Maximum smoke density Light absorption coefficient 3.25 per meter /Hartridge units 75	Nil	1.6 m^{-1}	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	340	±8% of declared value	336	Conforms
	g)	Back up torque, %	Evaluative	7 % min.	Nil	43.8	Conforms
	h)	Max. Operating temperature, 0C i) Engine oil ii) Coolant	Evaluative	i) 130 (Max)(D) ii) 120 (Max)(D)	Should not exceeds the declared value	i) 111 ii) 94	Conforms
	i)	Lubrication oil consumption, g/kWh	Evaluative	Not exceeding 1 % of SFC at maximum power (high ambient)	Nil	0.172	Conforms

	1	2	3	4	5	6	7
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	--	Not applicable, as Hydro static transmission does not require any separate/ conventional brake system	Conforms
	b)	Max. Force exert on brake pedal to achieve declaration of 2.5 m/sec^2(N)	Evaluative	As per requirement of CMVR	--		
	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	--		
III. Mechanical vibration							
	a)	Operator's platform	Non evaluative	120 µm max.	Nil	3200	**Does not conform**
	b)	Steering control wheel	Non evaluative	150 µm max.	Nil	No steering control wheel is there	**NA**
	c)	Seat with driver seated	Non evaluative	120 µm max.	Nil	2000	**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.	Nil	Dry type air cleaner provided hence test is not applicable	--
V. Noise measurement							
	a)	Max. ambient noise emitted by combine at by slander's position dB (A)	Evaluative	88 dB (A) as per CMVR	Nil	86	Conforms
	b)	Max. noise at operator's ear level dB (A)	Evaluative	98 dB (A) as per CMVR	Nil	93	Conforms
VI. Header lifting Test							
	a)	Satisfactory completion of header lifting test	Evaluative	-	Nil	Satisfactory completed	Conforms

	1	2	3	4	5	6	7
VII. Discard limit							
	a)	Cylinder bore diameter, mm	Evaluative	104.15	Should not exceed the values declared by the manufacture	104.06	Conforms
	b)	Piston diameter, mm	Evaluative	103.784	-do-	103.92	Conforms
	c)	Piston to cylinder liner clearance at skirt	Evaluative	0.15	-do-	0.12	Conforms
	d)	Ring end gap, mm i) Top compression ring ii) 2nd compression ring iii) Oil ring	Evaluative	 1.2 1.2 1.2	-do-	 0.45 0.50 0.40	Conforms
	e)	Ring groove clearance, mm 1. Top compression ring 2. 2nd compression ring 3. Oil ring	Evaluative	 Tapered 0.2 0.1	-do-	 Tapered 0.07 0.06	Conforms
	f)	Diametrical and axial clearance of big end bearing, mm Diametrical Axial	Evaluative	 0.30 0.50	-do-	 0.08 0.40	Conforms
	g)	Diametrical and axial clearance of main bearings, mm Diametrical Axial/crank shaft end float	Evaluative	 0.30 0.60	-do-	 0.13 0.10	Conforms
	h)	Thickness of brake lining, mm	Evaluative	NA	-do-	--	--
	i)	Thickness of clutch plate, mm	Evaluative	NA	-do-	--	--
VIII. Field performance							
	a)	Suitability for crops	Evaluative	Wheat & paddy (Wheel type) Paddy (Track type)		Nil	Paddy	Conforms
	b)	Average processing losses (%)	Evaluative	Wheat : Max 3% Barley : Max 4% Rice : Max 4% Sorgum : Max 3% Maize : Max 5% Oilseed rape : Max 4% Soya Beans : Max 5%		Nil	1.8%	Conforms

1		2	3	4	5	6	7
	i)	Anti slip surfaces at operator platform & ladder & proper gripping for the control levers.	Evaluative	Essential	-	Provided	Conforms
	j)	Working clearance around the controls	Non evaluative	Essential 70mm,min	-	Provided	Conforms
	k)	Labelling of control and gauges	Evaluative	Essential	-	**Not provided fully**	**Does not conform in toto**
XI	**Material of construction :**						
	i)	Knife guard should conforms to IS: 6024 - 1983	Non evaluative	Should have maximum hardness 163HB	-	NA	--
	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=0.8236 Mn= 0.9511	**Does not conform** **Does not conform**
	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=0.1027	**Does not conform**

XII. 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 Field performance test

No noticeable defect observed during field test.

19.3 Ease of operation and safety provision

i) No noticeable difficulties observed during operation of combine harvester.

ii) Slip clutch at undershot conveyor drive and Gain and tailing elevator drive is not provided. It **MUST** be provided as per the requirement of IS 15806 : 2018

iii) **It is recommended that the symbols as per the requirements of IS 6283 (Part I)-2006 & (Part II)-2007 MUST be provided**

iv) The first aid box is not provided on machine. It may be provided.

v) **The function of control levers for combine harvester operations is not clearly marked. It should be marked.**

vi) **Safety guards on header assembly drive chain & belt is not provided. It MUST be provided.**

19.4 Hardness and Chemical composition

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

19.5 Literature supplied with the machine

The following literature was submitted by applicant during testing.

i) Operator's manual.

ii) Service booklet

iii) Spare part's catalogue.

The operator manual should be updated as per IS: 8132-1999.

TESTING AUTHORITY

R. K. NEMA SENIOR AGRICULTURAL ENGINEER	
P. K. PANDEY **DIRECTOR**	

Draft test report compiled by: V.S. Shinde, Senior Technical Assistant

20. APPLICANT'S COMMENTS

No comments received from applicant.