

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: Comb- 289/2934/2022

माह/Month: October, 2022

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



**MINI NS29
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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18. SELECTED PERFORMANCE AND OTHER CHARACTERISTICS

18.1	Acceptance criteria for performance characteristics as per clause 4.1 of IS 15806:2018						
Sr. No	Characteristics	Category (Evaluative /Non evaluative)	Requirement (R)/ Declaration (D)	Tolerance	Observed	Remarks	
I.	Prime mover performance						
	a)	Max. power (absolute) - Average max. power observed during 2 hrs. max. power test in natural ambient condition, kW	Evaluative	56.0 (D)	±5% of declared value	54.01	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	50.0 (D)	±5% of declared value	48.47	Conforms
	c)	Power at rated engine speed, kW (under natural ambient condition)	Evaluative	56.0 (D)	±5% of declared value	53.2	Conforms
	d)	Specific fuel consumption corresponding to average maximum power under 2h maximum power test, g/kWh.	Evaluative	250 (D)	±5% of declared value	258	Conforms
	e)	Max. smoke density at 80% load between the speed at max. power & 55% of speed at max. power or 1000 rpm whichever is higher	Evaluative	As pre CMV rules. Maximum smoke density Light absorption coefficient is 5.2 units (R)	Nil	0.38	Conforms

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	f)	Max. crank shaft torque, (N–m) observed during the test after no load engine speed is adjusted as per manufacture’s recommendation for field work	Evaluative	290 (D)	±8% of declared value	311.8	Conforms
	g)	Back up torque, % (Natural ambient)	Evaluative	7 % min. (R)	Nil	13.25	Conforms
	h)	Max. operating temperature, °C i) Engine oil ii) Coolant	Evaluative	130 (D) 110 (D)	Should not exceed the declared value	112 98.0	Conforms Conforms
	i)	Lubrication oil consumption, g/kWh	Evaluative	1 % of SFC at maximum power (high ambient) (R)	Nil	0.350	Conforms
II. Brake performance							
	i)	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: 6.10 Hot: 6.17	Conforms
	i)	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	Yes	Conforms
III. Mechanical vibration							
	i)	Steering wheel	Non evaluative	150 µm max (R) .	Nil	229	Does not conform
	ii)	Seat with driver seated	Non evaluative	120 µm max. (R)	Nil	240	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

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V. Noise measurement							
	i)	Max. ambient noise emitted by combine at by-standers position, dB(A)	Evaluative	88 dB(A) as per CMVR (R)	Nil	86.0	Conforms
	ii)	Max. noise at operator's ear level dB(A)	Evaluative	98 dB(A) as per CMVR (R)	Nil	96.1	Conforms
VI. Header lifting Test							
	i)	Satisfactory completion of header lifting test	Evaluative	-	Nil	Satisfactorily completed	Conforms
VII. Discard limit							
	a)	Cylinder bore diameter, mm	Evaluative	97.05 (D)	Should not exceed the values declared by the manufacturer	96.94	Conforms
	b)	Piston diameter, mm	Evaluative	97.00 (D)	-do-	96.88	Conforms
	c)	Piston to cylinder liner clearance at skirt	Evaluative	0.15 (D)	-do-	0.09	Conforms
	d)	Ring end gap, mm i) Top compression ring ii) 2 nd compression ring iii) Oil ring	Evaluative	1.2 (D) 1.2 (D) 1.2 (D)	-do-	0.25 0.55 0.40	Conforms Conforms Conforms
	e)	Ring groove clearance, mm 1. Top compression ring 2. 2 nd compression ring 3. Oil ring	Evaluative	-- 0.30 (D) 0.20 (D)	-do-	Tapered 0.05 0.04	-- Conforms Conforms
	f)	Diametrical and axial clearance of big end bearing, mm Diametrical Axial	Evaluative	 0.30 (D) 0.40 (D)	-do-	 0.16 0.30	 Conforms Conforms

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	g)	Diametrical and axial clearance of main bearings, mm	Evaluative	0.30 (D)	-do-	0.11	Conforms
		Diametrical Axial/crank shaft end float		0.40 (D)		1.0	Conforms
	h)	Thickness of brake lining	Evaluative	Up to rivet head (D)	-do-	1.8 to 2.0 mm above rivet head	Conforms
	i)	Thickness of clutch plate	Evaluative	Up to rivet head (D)	-do-	1.8 to 2.1 mm above rivet head	Conforms

VIII. Field performance

	a)	Suitability for crops	Evaluative	Wheat & paddy (Wheel type) Paddy (Track type)	Nil	Wheat and Paddy	Conforms
	b)	Average processing losses (%)	Evaluative	Max. (of average)	Nil	Wheat Max.	Conforms
			Wheat	3%		1.89%	Paddy Max.
			Rice/ Paddy	4% (R)		2.35%	
	c)	Threshing efficiency	Evaluative	≥98 percent for wheat & Paddy (R)	Nil	99% (Min.) for both Wheat and Paddy	Conforms
	d)	Cleaning efficiency	Evaluative	≥96 percent for wheat & Paddy (R)	Nil	Min. 97.1% for Wheat Min. 96.70% for Paddy	Conforms
	e)	Grain breakage in main grain tank	Evaluative	≤ 2.5 percent (R)	Nil	Max. 0.92% for Wheat Max. 1.60% for Paddy	Conforms
	f)	Non collectable losses	Evaluative	≤ 2.5 percent for wheat & paddy & grain ≤ 4.0 percent for Soybean (R)	Nil	Max. 0.82% for Wheat Max. 0.55% for Paddy	Conforms

IX. Safety requirement							
	a)	Guards against all moving parts	Evaluative	Belt and chain drives, pulleys, hydraulic pipes (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	Evaluative	Essential (R)	-	Provided	Conforms
	f)	Rear view mirror	Evaluative	Essential (R)	-	Provided	Conforms
	g)	Fire extinguisher	Evaluative	Essential (R)	-	Provided	Provided
	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		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 70mm,min (R)	-	Provided	Conforms
	k)	Labelling of control and gauges	Evaluative	Essential (R)	-	Provided	Conforms

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X Material of construction :							
	i)	Knife guard should conform to IS: 6024 -1983	Non evaluative	Should have maximum hardness 163HB(R)	-	590 (Average)	Does not conform
	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= 0.39 Mn= 0.85	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 % (R)	-	0.23	Does not conform
	viii)	Safety Requirements for Straw Management system, (if fitted)					
		a) Guards against all moving parts/ drives and hot parts	Evaluative	Essential (R)	-	Provided	Conforms
		b) RPM indicator for rotor	Evaluative	Desirable	-	Provided	Conforms

18.2 Acceptance criteria in case of Breakdowns/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 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

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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 The amplitude of mechanical vibration of components marked as (*) in chapter 13 of this test 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

19.2.1 No noticeable defect observed during field test.

19.3 Ease of operation and safety provision

No noticeable difficulties observed during operation of combine harvester.

19.4 Hardness and chemical composition

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

19.4.2 Hardness of the knife guard does not conform to their relevant IS code. It should be looked into for improvement.

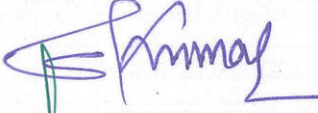
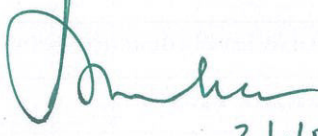
19.6 Literature supplied with the machine

The following literatures were supplied by the applicant

1. Operator & Service manual for combine harvester
2. Operator manual engine
3. Spare parts catalogue for combine harvester

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

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 31.10.2022

The test report is compiled by Er. Ajay Kumar Sharma

20. APPLICANT'S COMMENTS

No specific comments received from the applicant