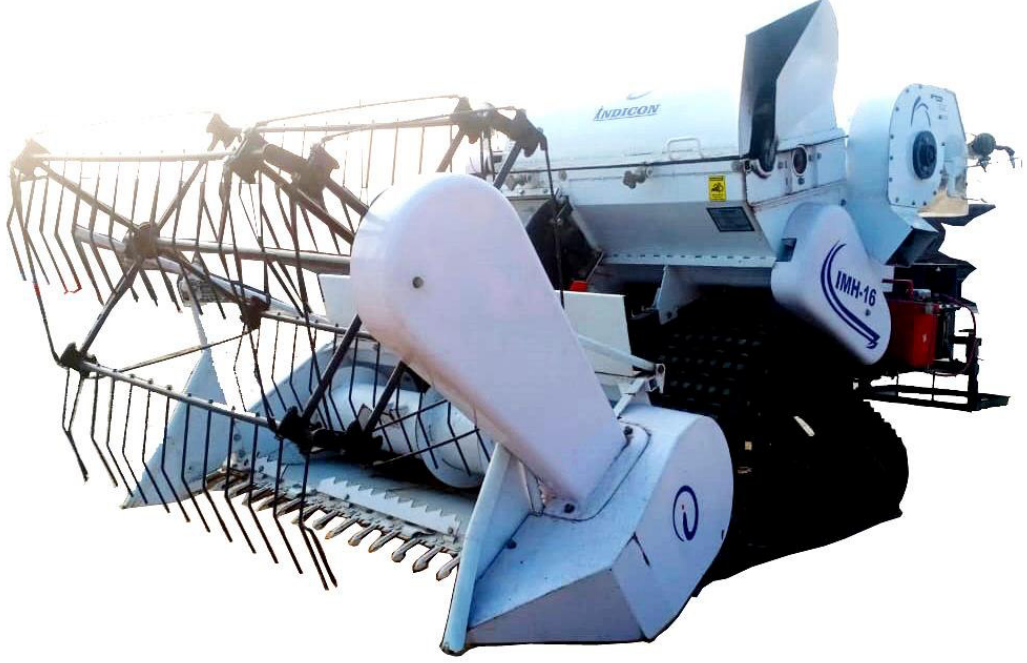


व्यावसायिक परीक्षण रिपोर्ट  
COMMERCIAL TEST REPORT

संख्या/ No.: COMB – 302/2974/2023

माह/Month: March, 2023

**THIS TEST REPORT VALID UP TO : 31<sup>st</sup> March, 2030**



**INDICON IMH-16,  
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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## 19. SELECTED PERFORMANCE AND OTHER CHARACTERISTICS

19.1 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
<b>I. Prime mover performance</b>						
	a) Max. power (absolute)- Average max. power observed during 2 h. Max. power test in natural ambient condition, kW	Evaluative	10.00 (D)	±5% of declared value	9.70	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	8.90 (D)	±5% of declared value	8.65	Conforms
	c) Power at rated engine speed, kW (under natural ambient condition)	Non-evaluative	10.00 (D)	±5% of declared value	9.70	Conforms
	d) Specific fuel consumption corresponding to average maximum power under 2 h maximum power test, g/kWh.	Evaluative	235 (D)	+5% of declared value	245.0	Conforms
	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 rules (CMV) rules (R)	Nil	0.43 m <sup>-1</sup>	Conforms

	<b>f)</b>	Max. crank shaft torque, (Nm) observed during the test after no load engine speed is adjusted as per manufacturers recommendation for field work	Evaluative	223.5 <b>(D)</b>	±8% of declared value	206.9	Conforms
	<b>g)</b>	Back up torque, % Natural ambient	Evaluative	7 % min. <b>(R)</b>	Nil	23.6	Conforms
	<b>h)</b>	Max. operating temperature, °C i) Engine oil ii) Coolant	Evaluative	i) 130 <b>(D)</b> ii) 110 <b>(D)</b>	Should not exceed the declared value	i) 130.0 ii) 110.0	Conforms
	<b>i)</b>	Lubrication oil consumption, g/kWh	Evaluative	1 % of SFC at maximum power (high ambient) <b>(R)</b>	Nil	0.89	Conforms

**II. Brake performance at 2.80 km/h or maximum speed whichever is less**

	<b>a)</b>	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 <b>(R)</b>	--	Not applicable as hydrostatic transmission does not require any separate/regular conventional brake system.	--
	<b>b)</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 <b>(R)</b>	--	Not applicable	-

**III. Mechanical vibration**

	<b>a)</b>	Operator's platform	Non evaluative	120 µm max. <b>(R)</b>	Nil	Not applicable	-
	<b>b)</b>	Steering control wheel	Non evaluative	150 µm max <b>(R)</b> .	Nil	Not applicable	-

	<b>c)</b>	Seat with driver seated	Non evaluative	120 µm max. <b>(R)</b>	Nil	195	<b>Does not conform</b>
<b>IV. Air cleaner oil pull over</b>							
	<b>a)</b>	Air cleaner oil pull over in % when tested in accordance with IS 8122 part (II) 2000	Evaluative	0.20 max. <b>(R)</b>	Nil	0.06	Conforms
<b>V. Noise measurement</b>							
	<b>a)</b>	Max. ambient noise emitted by combine at by standers position dB(A)	Evaluative	As per CMV rules <b>(R)</b>	Nil	85.6	Conforms
	<b>b)</b>	Max. noise at operator's ear level dB(A)	Evaluative	As per CMV rules <b>(R)</b>	Nil	94.7	Conforms
<b>VI. Header lifting Test</b>							
	<b>a)</b>	Satisfactory completion of header lifting test	Evaluative	-	Nil	Satisfactory completed	Conforms
<b>VII. Discard limit</b>							
	<b>a)</b>	Thickness of brake lining, mm	Evaluative	--	--	<b>Not applicable</b>	--
	<b>b)</b>	Thickness of clutch plate, mm	Evaluative	--	3.22 mm to 3.38 mm	3.22 to 3.28 mm	Conforms
<b>VIII. Field performance</b>							
	<b>a)</b>	Suitability for crops	Evaluative	Wheat and paddy (Wheel type) Paddy (Track type)	Nil	Paddy (Track type)	Conforms
	<b>b)</b>	Average processing losses (%)	Evaluative	Wheat Rice	Max (of Average 3% Average 4% <b>(R)</b>	Paddy (max) 3.30 %	Conforms
	<b>c)</b>	Threshing efficiency	Evaluative	≥98 percent for wheat & Paddy <b>(R)</b>	Nil	98.1 % for Paddy	Conforms
	<b>d)</b>	Cleaning efficiency	Evaluative	≥96 percent for wheat & Paddy <b>(R)</b>	Nil	96.7 % for Paddy	Conforms

	<b>e)</b>	Grain breakage in main grain tank	Evaluative	$\leq 2.5$ percent <b>(R)</b>	Nil	0.20 % for Paddy	Conforms
	<b>f)</b>	Non collectable losses	Evaluative	<b>i) <math>\leq 2.5</math></b> percent for wheat & Paddy & grain <b>(R)</b>	Nil	2.40 % For Paddy	Conforms
<b>IX. Safety requirement</b>							
	<b>a)</b>	Guards against all moving parts/ drives and hot parts	Evaluative	Belt and chain drives, pulleys hydraulic pipes (Around operators work place) <b>(R)</b>	--	Provided	Conforms
	<b>b)</b>	Lighting arrangement	Evaluative	As per CMVR <b>(R)</b>	-	Provided	Conforms
	<b>c)</b>	Grain tank cover	Evaluative	Essential <b>(R)</b>	-	<b>Not applicable</b>	-
	<b>d)</b>	Spark arrester in engine's exhaust in case naturally aspirated engine	Evaluative	Essential <b>(R)</b>	-	Provided	Conforms
	<b>e)</b>	Stone trap before concave bars	Evaluative	Essential <b>(R)</b>	-	Provided	Conforms
	<b>f)</b>	Rear view mirror	Evaluative	Essential <b>(R)</b>	-	Provided	Conforms
	<b>g)</b>	Fire extinguisher	Evaluative	Essential <b>(R)</b>	-	Provided	Conforms
	<b>h)</b>	Slip clutch at following drives – i) Cutting platform auger ii) Undershot conveyor drive iii) Grain & tailing elevator	Evaluative  Non evaluative  Non evaluative	Essential <b>(R)</b>  Optional  Optional	  -	<b>Not provided</b>  <b>Not provided</b>  <b>Not applicable</b>	<b>Does not conform</b>  <b>Does not conform</b>  -

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	<b>i)</b>	Anti slip surfaces at operator platform & ladder & proper gripping for the control levers.	Evaluative	Essential (R)	-	Provided (operator platform & ladder is not provided)	Conforms
	<b>j)</b>	Working clearance around the controls	Non evaluative	Essential 70 mm, min (R)	-	Provided	Conforms
	<b>k)</b>	Labelling of control and gauges	Evaluative	Essential (R)	-	Provided	Conforms
<b>X.</b>	<b>Material of construction</b>						
	<b>i)</b>	Knife guard should conform to IS: 6024 -1983	Non evaluative	Should have maximum hardness 163 HB (R)	-	216 (Average)	<b>Does not conform</b>
	<b>ii)</b>	Knife blade As per IS: 6025 -1982	Non evaluative	It must have Chemical composition as C=0.70-0.95 % Mn=0.30-.50 % (R)	-	C=0.73 Mn= 1.03	Conforms <b>Does not conform</b>
	<b>iii)</b>	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=0.08	<b>Does not conform</b>

<b>18.2 Acceptance criteria in case of breakdowns/Defects as per clause 4.2 of IS:15806-2018</b>					
<b>XVII. Break down (critical, major &amp; minor)</b>					
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 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**

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

**20.4 Hardness and chemical composition**

**Hardness & chemical composition of knife blade and knife guard are not within the limit specified in relevant standards. It should be looked into for corrective action at regular production level.**

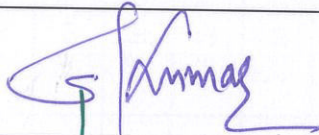
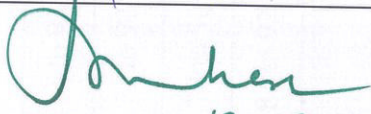
**20.5 Literature supplied with the machine.**

The following literatures are provided by the applicant during the test.

- i) Operator manual
- ii) Spare part catalogue
- iii) Service manual

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

**TESTING AUTHORITY**

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 13.03.2023

Draft test report is compiled by: Er. Sunil Kumar Patil, Senior Technical Assistant

**21. APPLICANT'S COMMENTS**

No specific comments received from the applicant

