

व्यावसायिक परीक्षण रिपोर्ट

COMMERCIAL TEST REPORT

संख्या/ No.: Comb- 279/2911/2022

माह/Month: September, 2022

**THIS TEST REPORT VALID UP TO : 30<sup>th</sup> September, 2029**



**AJAY 102  
SELF PROPELLED COMBINE HARVESTER (TRACK TYPE)**



सत्यमेव जयते

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

**Northern Region Farm Machinery Training and Testing Institute**

ट्रैक्टर नगर, सिरसा रोड, हिसार, (हरियाणा) - 125 001

**Tractor Nagar, Sirsa Road, HISAR (Haryana)-125 001**

**[ISO 9001:2015 CERTIFIED]**

Website: <http://nrfmtti.gov.in/>

E-mail: [fmti-nr@nic.in](mailto:fmti-nr@nic.in)

Tele./FAX: 01662-276984

**Page 1 of 62**

## 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
<b>I.</b>	<b>Prime mover performance</b>					
a)	Max. power (absolute) average max. power observed during 2 h. Max. power test in natural ambient condition, kW	Evaluative	74.8 (D)	±5% of declared value	75.3	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	66.7 (D)	±5% of declared value	66.6	Conforms
c)	Power at rated engine speed, kW (under natural ambient condition)	Non-evaluative	74.8 (D)	±5% of declared value	73.0	Conforms
d)	Specific fuel consumption corresponding to average maximum power under 2 h maximum power test, g/kWh.	Evaluative	227 (D)	+5% of declared value	228.3	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	1.49 m <sup>-1</sup>	Conforms

1	2	3	4	5	6	7
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	3322 (D)	±8% of declared value	334.2	Conforms
g)	Back up torque, % Natural ambient	Evaluative	7 % min.(R)	Nil	7.20	Conforms
h)	Max. operating temperature, °C i) Engine oil ii) Coolant	Evaluative	i) 125 (D) ii) 115 (D)	Should not exceed the declared value	i) 113.5 ii) 914.3	Conforms
i)	Lubrication oil consumption, g/kWh	Evaluative	1 % of SFC at maximum power (high ambient) (R)	Nil	0.178	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	290	Does not conform
----	---------------------	----------------	-----------------	-----	-----	------------------

1	2	3	4	5	6	7
	<b>b)</b> Steering control wheel	Non evaluative	150 µm max <b>(R)</b> .	Nil	420	<b>Does not conform</b>
	<b>c)</b> Seat with driver seated	Non evaluative	120 µm max. <b>(R)</b>	Nil	350	<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	Dry type air cleaner provided hence test is not applicable	Not applicable
<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	87.2	Conforms
	<b>b)</b> Max. noise at operator's ear level dB (A)	Evaluative	As per CMV rules <b>(R)</b>	Nil	96.6	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> Cylinder bore diameter, mm	Evaluative	98.15 <b>(D)</b>	Should not exceed the values declared by the manufacture	98.07	Conforms
	<b>b)</b> Piston diameter, mm	Evaluative	97.55 <b>(D)</b>	-do-	97.93	Conforms
	<b>c)</b> Piston to cylinder liner clearance at skirt, mm	Evaluative	0.25 <b>(D)</b>	-do-	0.16	Conforms
	<b>d)</b> Ring end gap, mm i) Top compression ring ii) 2 <sup>nd</sup> compression ring iii) Oil ring	Evaluative	i) 1.20 <b>(D)</b> ii) 1.20 <b>(D)</b> ii) 1.20 <b>(D)</b>	-do-	i) 0.45 ii) 0.50 ii) 0.50	Conforms
	<b>e)</b> Ring groove clearance, mm 1. Top compression ring 2. 2 <sup>nd</sup> compression ring	Evaluative	i) 0.30 <b>(D)</b> ii) 0.30 <b>(D)</b>	-do-	i) Tapered ii) 0.06	Conforms

		3. Oil ring		ii) 0.30(D)		ii) 0.05	
<b>1</b>		<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
	<b>f)</b>	Diametrical and axial clearance of big end bearing, mm  Diametrical Axial	Evaluative	0.40 (D) 0.80 (D)	-do-	0.09 0.30	Conforms
	<b>g)</b>	Diametrical and axial clearance of main bearings, mm Diametrical Crank shaft end float	Evaluative	0.40 (D) 0.80 (D)	-do-	0.07 0.09	Conforms
	<b>h)</b>	Thickness of brake lining, mm	Evaluative	--	-do-	<b>Not applicable</b>	--
	<b>i)</b>	Thickness of clutch plate, mm	Evaluative	--	-do-	<b>Not applicable</b>	--

**VIII. Field performance**

	<b>a)</b>	Suitability for crops	Evaluative	Wheat and paddy (Wheel type) Paddy (Track type)	Nil	Wheat and paddy	Conforms
	<b>b)</b>	Average processing losses (%)	Evaluative	Wheat Rice Max (of Average 3% Average 4% <b>(R)</b>	Nil	Wheat (max) 2.16 % Paddy (max) 2.25 %	Conforms Conforms
	<b>c)</b>	Threshing efficiency	Evaluative	≥98 percent for wheat & Paddy <b>(R)</b>	Nil	98.4 % for Wheat 98.8 % for Paddy	Conforms
	<b>d)</b>	Cleaning efficiency	Evaluative	≥96 percent for wheat & Paddy <b>(R)</b>	Nil	97.9 % for Wheat 97.1 % for Paddy	Conforms
	<b>e)</b>	Grain breakage in main grain tank	Evaluative	≤ 2.5 percent <b>(R)</b>	Nil	0.48 % for Wheat 1.01 % for Paddy	Conforms
	<b>f)</b>	Non collectable losses	Evaluative	i) ≤ 2.5 percent for wheat & Paddy &	Nil	1.68 % For Wheat 0.91 % For Paddy	Conforms

1	2	3	4	5	6	7	
<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>	-	Provided	Conforms
	<b>d)</b>	Spark arrester in engine's exhaust in case naturally aspirated engine	Evaluative	Essential <b>(R)</b>	-	Turbo charger provided at exhaust system	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 –	Evaluative	Essential <b>(R)</b>		Provided	Conforms
		i) Cutting platform auger	Non evaluative	Optional	-	Provided	Conforms
		ii) Undershot conveyor drive	Non evaluative	Optional		<b>Not provided</b>	<b>Does not conform</b>
		iii) Grain & tailing elevator	Non evaluative	Optional			
	<b>i)</b>	Anti slip surfaces at operator platform & ladder & proper gripping for the control levers.	Evaluative	Essential <b>(R)</b>	-	Provided	Conforms
	<b>j)</b>	Working clearance around the controls	Non evaluative	Essential 70 mm, min <b>(R)</b>	-	Provided	Conforms
	<b>k)</b>	Labelling of control and gauges	Evaluative	Essential <b>(R)</b>	-	Provided	Conforms
<b>X</b>	<b>Material of construction :</b>						
	<b>i)</b>	Knife guard should conforms to IS: 6024 -1983	Non evaluative	Should have maximum hardness 163 HB <b>(R)</b>	-	191 (Average)	Conforms

1	2	3	4	5	6	7
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=0.45 Mn= 0.81	<b>Does not conform 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	<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.

**Ease of operation and safety provisions**

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

**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.**


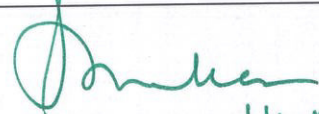
**Literature supplied with the machine.**

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	 14.09.2022

Draft test report compiled by: E Bhaskar, Senior Technician

**21. APPLICANT'S COMMENTS**

We will take care in production regarding hardness of knife blade & knife guard for improvement.