व्यावसायिक परीक्षण रिपोर्ट

COMMERCIAL TEST REPORT

संख्या/ **No.: Comb- 278/2909/2022**

माह/**Month: September, 2022**

THIS TEST REPORT VALID UP TO : 30th September, 2029

VISHAL T.M.C,
TRACTOR MOUNTED COMBINE HARVESTER

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

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18. SELECTED PERFORMANCE AND OTHER CHARACTERISTICS

John Deere 5310 V3 tractor was fitted as Prime mover. This John Deere 5310 V3 tractor is reported to have been tested by CFMTTI, Budni, vide their test report No. T-1082/1607/2017, April, 2017. PTO performance of John Deere 5310 V3 tractor (prime mover of this combine) to the extent it is reported in the CFMTTI Test report No. T-1082/1607/2017, April, 2017, is reproduced for readers' information. Readers are advised to refer to T-1082/1607/2017, April, 2017 in respect of John Deere 5310 V3 tractor, issued by CFMTTI, Budni, for detailed information.

S. No	Characteristics		Category (Evaluative/ Non evaluative)	Requirement /Declaration	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	36.4	±5% of declared value	36.5	Conforms
	b)	Power at rated engine speed, kW	Non-evaluative	36.4	±5% of declared value	35.3	Conforms
	c)	Specific fuel consumption corresponding to average maximum power under 2h maximum power test, g/kWh.	Evaluative	325	+5% of declared value	308	Conforms
	d)	Max. smoke density (Bosch no.) at 80% load between the speed at max. power and 55% of speed at max power or 1000 rpm whichever is higher	Evaluative	As per Central Motor Vehicles (CMV)Rules.	Nil	0.54	Conforms
	e)	Back up torque, %	Evaluative	10 % min.	Nil	34.3	Conforms
	f)	Max. operating temperature, °C i) Engine oil ii) Coolant	Evaluative	 135 118	Should not exceed the declared value	 117 100	Conforms

1		2	3	4	5	6	7
	g)	Lubrication oil consumption, g/kWh	Evaluative	Not exceeding 1 % of SFC at maximum power high ambient	Nil	0.61	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) **CMVR does not prescribe hot brake test.**	Evaluative	As per requirement of CMVR	--	Cold 6.9 m	Conforms
	b)	Max. force exerted on brake pedal to achieve declaration of 2.5 m/sec^2	Evaluative	≤ 600 N	--	Cold 190N	Conforms
	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	--	Effective	Conforms
III. Mechanical vibration							
	a)	Operator's platform	Non evaluative	120 µm max.	Nil	229	**Does not conform**
	b)	Steering control wheel	Non evaluative	150 µm max.	Nil	239	**Does not conform**
	c)	Seat with driver seated	Non evaluative	120 µm max.	Nil	231	**Does not conform**
IV. Air cleaner oil pull over							
	a)	Air cleaner oil pull over in % when tested in accordance with IS 8122 (part 2)	Evaluative	0.20 percent max.	Nil	Dry type air cleaner is 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	As per CMV Rules	Nil	83.6	Conforms

1		2	3	4	5	6	7
	b)	Max. noise at operator's ear level dB (A)	Evaluative	As per CMV Rules	Nil	93.2	Conforms
VI. Header lifting Test							
	a)	Satisfactory completion of header lifting test	Evaluative	-	Nil	Satisfactorily completed	Conforms
VII. Relevant discard limit of John Deere 5310 V3 tractor as reported in the Budni test report No. T- 1082/1607/2017, April, 2017 is reproduced hereunder							
	a)	Cylinder bore diameter, mm	Evaluative	106.77	Nil	106.48 to 106.50	Conforms
	b)	Piston diameter, mm	Evaluative	Not mention in test report	Nil	Not mention in test report	Conforms
	c)	Piston to cylinder liner clearance at skirt	Evaluative		Nil	0.10 to 0.11	Conforms
	d)	Ring end gap, mm i) Top compression ring ii) 2nd compression ring iii) Oil ring	Evaluative	 0.75 2.00 0.75	Nil	 0.45 0.74 0.40	Conforms
	e)	Ring groove clearance, mm 1. Top compression ring 2. 2nd compression ring 3. Oil ring	Evaluative	 Tapered 0.25 0.92	Nil	 Tapered 0.038 to 0.046 0.041 to 0.057	Conforms
	f)	Diametrical and axial clearance of big end bearing, mm Diametrical Axial	Evaluative	 0.65 0.85	Nil	 0.087 to 0.121 0.20	Conforms
	g)	Diametrical and axial clearance of main bearings, mm Diametrical Axial/crank shaft end float	Evaluative	 0.65 0.85	Nil	 0.069 to 0.179 0.35	Conforms
	h)	Thickness of brake lining, mm	Evaluative	Wear up to oil groove depth	Nil	Left: 1.15 to 1.43 Right: 1.24 to 1.52	Conforms
	i)	Thickness of clutch plate, mm	Evaluative	Wear up to rivet head	Nil	Transmission: 1.09 to 1.40 PTO: 0.52 to 1.16	Conforms

1		2	3	4	5	6	7
VIII. Field performance							
	a)	Suitability for crops	Evaluative	Wheat and paddy (Wheel type) Paddy (Track type)	Nil	Wheat and paddy	Conforms
	b)	Average processing losses (%)	Evaluative Wheat Rice	Max (of Average 3% Average 4% (R)	Nil	Wheat (max.) 1.63 % Paddy (max.) 2.08 %	Conforms Conforms
	c)	Threshing efficiency	Evaluative	≥98 percent for wheat & Paddy (R)	Nil	99.4 % for Wheat 99.0 % for Paddy	Conforms
	d)	Cleaning efficiency	Evaluative	≥96 percent for wheat & Paddy (R)	Nil	97.2 % for Wheat 96.7 % for Paddy	Conforms
	e)	Grain breakage in main grain tank	Evaluative	$\leq \mathbf{2.5}$ percent (R)	Nil	0.97 % for Wheat 0.99 % for Paddy	Conforms
	f)	Non collectable losses	Evaluative	$\boldsymbol{i}) \leq \mathbf{2.5}$ percent for wheat & Paddy & grain (R)	Nil	0.36 % For Wheat 0.36 % For Paddy	Conforms
IX. 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)	-	Turbo charger is provided in exhaust system	Not applicable
	e)	Stone trap before concave bars	Evaluative	Essential (R)	-	Provided	Conforms
	f)	Rear view mirror	Evaluative	Essential (R)	-	Provided	Conforms

1		2	3	4	5	6	7
	g)	Fire extinguisher	Evaluative	Essential (R)	-	Provided	Conforms
	h)	Slip clutch at following drives –					
		i) Cutting platform auger	Evaluative	Essential (R)		Provided	Conforms
		ii) Undershot conveyor drive	Non evaluative	Optional	-	Provided	Conforms
		iii) Grain & tailing elevator	Non evaluative	Optional		Not provided	**Does not conform**
	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 (R)	-	Provided	Conforms
X	**Material of construction:**						
	i)	Knife guard should conform to IS: 6024 -1983	Non evaluative	Should have maximum hardness 163 HB (R)	-	281 (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= 0.61 Mn= 0.54	**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)	--	C=0.16	**Does not conform**

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

19.4 There is no provision for varying oscillation of sieve. It should be looked into.

19.5 Hardness and chemical composition

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

19.6 Literature supplied with the machine

Operator cum service manual cum parts catalogue is supplied with the machine. However, the same need to be updated as per IS: 8132 – 1999.

Ashok Leyland HA6ETI service manual is provided.

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN **DIRECTOR**	27.09.2022

The test report is compiled by Sh. Sunil kumar Patil, Senior Technical Assistant

20. APPLICANT'S COMMENTS

No specific comments received from the applicant.