व्यावसायिक परीक्षण रिपोर्ट (प्रथम बैच परीक्षण)
COMMERCIAL TEST REPORT (First Batch Test)

संख्या / **No.** : **T- 1567/2095/2021**

माह / **Month** : **July, 2021**

(यह परीक्षण रिपोर्ट31/07/2026 तक वैध है। / THIS TEST REPORT IS VALID UPTO : 31/07/2026)

JOHN DEERE 5310 V3 TRACTOR

भारत सरकार
कृषि एवं किसान कल्याण मंत्रालय
(कृषि, सहकारिता एवं किसान कल्याण विभाग)
GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
(Department of Agriculture, Cooperation & Farmer's Welfare)
केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
ट्रैक्टर नगर, बुदनी (म.प्र.)466 445
CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
(An ISO 9001: 2015 Certified Institute)
TRACTOR NAGAR, BUDNI (M.P.) 466 445

E-mail: fmti-mp@nic.in **Web site:** http://www.fmttibudni.gov.in

Telephone: 07564-234729, 234743

The **"JOHN DEERE 5310 V3"** tractor had undergone **"Initial Commercial Test"** at this Institute, bearing report No.**T-1082/1607/2017** released in **April, 2017** and **Commercial Administrative Extension** test report **No. T-1340/1867/2020 (March, 2020).** Now the applicant has submitted an application vide letter no. Nil dated 11/08/2020 for batch testing of "**JOHN DEERE 5310 V3" TRACTOR**.

All the necessary tests as per table-1 of clause 6.0. of IS: 5994 -1998 (Reaffirmed in 2014) were carried out and test report released as under:

Manufacturer	:	**M/s. John Deere India Pvt. Ltd. Gat No. 166 - 167 & 271 - 291, Off Pune - Nagar Road, Sanaswadi, Pune– 412 208 (M.S.)**
Location of plant	:	**M/s. John Deere India Pvt. Ltd. Survey No. 501, Village – Khatamba Jamgod, Dewas Bhopal Highway, Dewas (Madhya Pradesh) 455115**
Test requested by (applicant)	:	The manufacturer
Selected for test by	:	The applicant
Place of running-in	:	At manufacturer's works
Duration of said running-in (h):		
- Engine	:	12
- Transmission	:	12
Method of Selection	:	Due to Covid-19 Pandemic, it was not possible to conduct the random selection. Nor was possible for applicant to facilitate the random selection. As a last resort, applicant requested to allow the direct submission of test sample, which was allowed.

1. SPECIFICATIONS

1.1 Tractor:

Make	:	John Deere
Model	:	5310 V3
Variants, if any **:**		

S. No.	Variant model	Variant features
1.	5310 V1	Change in B range selection speeds. {tested vide test report no. T-1141/1667/2018 (March,2018)}

Type	:	Four wheeled, Rear wheel driven, General Purpose, Agricultural Tractor.
Month & Year of manufacture	:	10 & 2020
Chassis number	:	1PY5310ETLA052262
Country of Origin	:	India

1.2 Engine:

Make	:	John Deere
Model	:	3029 HPY 60
Type	:	Four stroke, turbo charged, liquid cooled, direct injection, diesel engine.
Serial number	:	PY3029H150666

14. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

14.1 On the basis of tests conducted the performance results have been summarized as evaluative (mandatory) and non-evaluative (not-mandatory) parameter applicable for qualifying Minimum Performance Criteria as per Clause-4 (Table-1) of **IS: 12207-2019** for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

S. No.	Characteristic	Category (Evaluative /Non Evaluative)	Requirements as per IS: 12207-2019	Values declared by the applicant (D) / Requirement (R)	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
14.1.1	**PTO Performance :**					
a)	Max. power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: ± 5% for PTO power or engine power >26 kW, ± 10% for PTO power or Engine power ≤ 26 kW.	36.4 (D)	36.6	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	36.4 (D)	35.3	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% Max.	325 (D)	301	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	229 (D)	215	Yes
e)	Back-up torque, percent	Evaluative	12 percent, min.	12 (D) 12 (R)	53.0	Yes
f)	Maximum operating temperature(^{O}C)					
	1) Engine oil	Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under high ambient condition should not exceed the declaration.	135 (D)	125	Yes
	2) Coolant (liquid)	Evaluative	The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration.	120 (D)	114	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	3.01 (R) Maximum	0.24	Yes
h)	Smoke level, (m^{-1})	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hat ridge value (**As per CMVR**)	3.25 (R)	0.51	Yes

1	2	3	4	5	6	7
14.1.2	**Drawbar performance:**					
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 70% of static mass with ballast	21.92 (D) 20.46 (R) Minimum	24.03	Yes
b)	Maximum drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 70% of static mass of tractor without/ standard ballast	15.44 (D) 14.42 (R) Minimum	18.75	Yes
c)	Maximum drawbar power without ballast, or with standard ballast as the case may be, kW	Evaluative	Minimum 80 % of PTO power as referred in Sl No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg Minimum 75 % of PTO power as referred in Sl No. i) a) of PTO performance in case of light weight tractors having 1500 kg total static mass of tractor Minimum 75 % of the engine power as referred in Sl No. i) a) of engine performance in case of tractors which do not have a PTO shaft.	29.1 (D) 29.3 (R) Minimum	30.8	Yes
d)	Maximum transmission oil temperature (^{o}C)	Evaluative	The declared value should not exceed the maximum value specified by oil company.	110 (D)	80	Yes
14.1.3	**Power lift and hydraulic pump performance :**					
a)	Maximum lifting capacity throughout the range of lift, (kN):					
	1) At hitch points	Evaluative	±10 percent	17.50 (D)	18.85	Yes
	2) With the standard frame	Evaluative	The lift capacity should at least be 24 kg/PTO kW. and it should be 21.5 kg/engine kW where the tractor is not provided with a PTO shaft	12.9 (D) 8.6 (R) Minimum	14.12	Yes
b)	Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 minute, (mm)	Non Evaluative	The observed value should not exceed 50 mm	50 (D) 50 (R) Maximum	05	Yes
14.1.4	**Brake performance at 25 kmph:**					
a)	Maximum stopping distance at a force equal to or less than 600 N on brake pedal with road ballast, (m):					
	1) Cold brake	Evaluative	10	10 (R)	7.64	Yes
	2) Hot brake	Evaluative	10	10 (R)	7.73	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s^{2} (N)	Evaluative	600	600 (R)	211 to 232	Yes

1	2	3	4	5	6	7
c)	Whether parking brake is effective at a force of 600 N at foot pedal(s) or 400 N at hand lever, N	Evaluative	Yes / No	Yes (R)	289	Yes
14.1.5	**Noise measurement :**					
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88 (R)	81	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	96 (R)	94	Yes
14.1.6	**Amplitude of mechanical vibrations at :**					
	1) Left foot rest	Non Evaluative	100 microns (max)	100 (R)	274	**No**
	2) Right foot rest		-do-		458	**No**
	3) Seat (with driver seated)		-do-		53	Yes
	4) Steering wheel		do-		168	**No**
14.1.7	**Air cleaner oil pull over :**					
	Maximum air cleaner oil pull over	Evaluative	0.25 % (max.)	Dry type air cleaner is provided		Yes
14.1.8	**Haulage requirements :**					
a)	**Gross mass of the trailers, (tonne):**					
	1) Two wheel	Non Evaluative	As specified by the manufacturer	5.0 (D)	5.0	Yes
	2) Four wheel			7.0 (D)	7.0	Yes
b)	**Distance travelled / litre of fuel consumption, (km/l):**					
	1) Two wheel	Non Evaluative	As specified by the manufacturer	4 to 6 (D)	3.68 to 3.87	**No**
	2) Four wheel			4 to 6 (D)	3.31 to 3.39	**No**
c)	**Fuel consumption (ml/km/tonne):**					
	1) Two wheel	Non Evaluative	As specified by the manufacturer	30 to 40 (D)	51.74 to 54.40	**No**
	2) Four wheel			30 to 40 (D)	42.14 to 43.17	**No**
14.1.9	**Wetland cultivation :**					
	Sealing for the following assemblies:	Evaluative	The identified assemblies should essentially meet the requirement of IS: 11082. No water ingress in the identified assembly given in column-2. If tractor does not meet the requirements of wetland cultivation, it may be recommended for dry land operation only.	There should be no ingress of water and / or mud (R)	No ingress of mud and / or water was observed during ICT vide test report no. **T-1082/1607/2017 (April, 2017)**	Yes
	1) Clutch assembly	-do-				
	2) Brake housings	-do-				
	3) Front axle hubs	-do-				
	4) Engine Oil	-do-				
	5) Transmission Oil	-do-				

14.1.10	**Safety features :**					
a)	Guards against moving and hot parts		Evaluative	Belt drives, pulleys, silencer, hydraulics pipes(as per IS-12239 Part 2)	Meet the requirements	Yes
b)	Lighting arrangement		Evaluative	As per CMVR	Meet the requirements	Yes
c)	Seating requirements (Tractors having more than 1150 mm rear track width)		Non Evaluative	Should meet the requirements of IS: 12343 (As amended from time to time)	**Does not meet the requirements**	**No**
d)	Technical requirements for PTO shaft		Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	Meet the requirements	Yes
e)	Dimensions of three point linkage		Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)	Meet the requirements	Yes
f)	Specifications of linkage drawbar		Evaluative	Should meet the requirements of IS 12953 (As amended from time to time)	Meet the requirements	Yes
g)	Specifications of Swinging drawbar (wherever fitted)		Evaluative	Should meet the requirements of IS 12362 (Part 3) (As amended from time to time)	**Not provided**	**Not appli-cable**
h)	1)	Maximum travelling speed at rated engine speed in reverse gears, kmph	Evaluative	Should not exceed 20 Kmph	(24.32 kmph) Meet the requirements	Yes
	2)	Audible warning signal on tractor.	Evaluative	As soon as the travelling speed in reverse gear reaches to 20 kmph, an audible warring signal on tractor be activated, The safety aspects about the operation of shuttle technology shall be brought in operation and manufacturer / dealer shall ensure the training on this aspect to operator before the delivery of tractor.	Audible warning signal is activated when reverse gear travel speed in CR gear reaches to 20.00 kmph.	Yes
14.1.11	**Labelling of tractors (Provision of labelling plate):**					
	1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO in kW and year of manufacture in numerical MM YY Digit 01-12 in box No.1 for MM will represent the month and next two digit in the box No.2 for YY will represent the year of manufacturing	JOHN DEERE	Yes
	2)	Model	Evaluative		5310 V3	Yes
	3)	Month & Year of manufacture	Evaluative		10 & 2020	Yes
	4)	Engine number	Evaluative		PY3029H150666	Yes
	5)	Chassis number	Evaluative		1PY5310ETLA052262	Yes
	6)	Declaration of PTO power, kW (hp)	Evaluative		36.4 (49.5)	Yes

1	2	3	4	5	6	7
14.1.12	**Discard limit for:**					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by Manufacturer	106.77	106.49 to106.51	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.32	0.117 to 0.122	Yes
(c)	Piston diameter at skirt, mm	Non Evaluative		106.30	106.40	Yes
(d)	**Ring end gap (mm):**					
	- Top comp. ring.	Evaluative	-do-	0.75	0.45 to 0.50	Yes
	- 2nd comp. ring.		-do-	2.00	0.75	Yes
	- Oil ring.		-do-	0.75	0.55	Yes
(e)	**Ring groove clearance (mm):**					
	- Top comp. ring.	Evaluative	-do-	NA	Tappered	Yes
	- 2nd comp. ring.	-do-	-do-	0.25	0.040 to 0.044	Yes
	- Oil ring.	-do-	-do-	0.92	0.047 to 0.048	Yes
(f)	**Clearance of main end bearings, (mm):**					
	- Diametrical	Evaluative	-do-	0.65	0.097 to 0.108	Yes
	- Crank shaft end float	Evaluative	-do-	0.85	0.18	Yes
(g)	**Clearance of big end bearings, (mm):**					
	- Diametrical	Evaluative	-do-	0.65	0.108 to 0.129	Yes
	- Axial	Evaluative	-do-	0.85	0.25	Yes
(h)	Clearance between king pin and bush,(mm)	Non Evaluative	-do-	0.80	0.12 to 0.13	Yes
(i)	Clearance between center pin and bush,(mm)	Non Evaluative	-do-	0.80	0.10 to 0.12	Yes
14.1.13	**Literature (Submission to test agency):**					
(a)	Operator manual	Evaluative	Provided / Not Provided	Provided	Provided	Yes
(b)	Parts Catalogue	Evaluative	Provided / Not Provided	Provided	Provided	Yes
(c)	Workshop/ Service manual	Evaluative	Provided / Not Provided	Provided	Provided	Yes
14.1.14	Fitment of Roll Over Protective Structure (ROPS): for tractors having more than 1150 mm rear track width	Evaluative	ROPS should meet the requirement of IS:11821 or OECD code or equivalent International Standard	Not Provided	Not fitted	Not appli-cable
14.1.15	Standard accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Provided	Yes
14.1.16	Accessories (Optional)	Non Evaluative	Ballast weights if fitted should meet the requirement of CMVR.	Provided	Provided	Yes

14.2	CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS-12207-2019):				
S. No.	Category of Breakdown	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the requirement (Yes/No.)
1.	Critical breakdown	Evaluative	There is no 'critical breakdown' during the course of testing	None	Yes
2.	Major breakdowns	Evaluative	There are not more than 1 major breakdowns and neither of them is of repetitive nature.	None	Yes
3.	Minor breakdowns	Evaluative	There are not more than 3 minor defects during the test and the frequency of each is not be more than two.	None	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed four that is, (1 major + 3 minor) or 4 minor breakdowns.	None	Yes

14.4 Salient Observations:

14.4.1 Laboratory tests:

14.4.1.1 PTO performance:

i) The maximum PTO power was recorded as **36.6 kW** against the declaration of **36.4 kW**, which meets the evaluative requirement of IS: 12207-2019 with regard to tolerance limit.

ii) The specific fuel consumption corresponding to maximum power was measured as **301 g/kWh** against the declaration of **325g /kWh**, which meets the evaluative requirement of IS: 12207-2019 with regard to tolerance limit.

iii) The maximum equivalent crankshaft torque was recorded as **215 Nm** against the declaration of **229 Nm**, which is within the permissible limit as specified in IS: 12207-2019.

iv) The backup torque was observed **53.0** %, which meets the evaluative requirement of IS: 12207-2019 with regard to tolerance.

14.4.1.2 Drawbar performance test:

During ten hours drawbar performance test, creeping of LHS rear tyre over the rims was recorded as **15 mm**. This should be looked into for necessary corrective action.

14.4.1.3 Hydraulic performance test:

The moment about rear axle with standard frame was calculated as **22.59 kN-m**. Whereas, the moment about front axle was calculated as **14.49 kN-m** under unballasted condition. The moment about rear axle is on higher side as compared to the moment about front axle. It is, therefore, recommended that the lifting capacity of the hydraulic system may be reduced suitably or standard ballast recommendation may be reviewed to avoid the front lifting of the tractor.

14.4.1.4 Mechanical Vibration:

The amplitude of mechanical vibration on various assemblies marked as (*) in **Chapter - 8** of this test report is on higher side. This calls for dampening down of vibrations especially on steering control wheel to improve the operational comfort and service life of components.

14.4.1.5 Three point linkage:

Some of the parameters conform to Cat. I and some of them conform to Cat. II. Keeping in view the spirit of standardization, necessary improvement may be incorporated.

14.4.1.6 Linkage drawbar:

Some of the parameters of the drawbar linkage conform to Cat.-I and some of them conform to Cat.-II. Keeping in view of the spirit of standardization, the necessary improvements may be incorporated.

14.4.1.7 Operator's Seat

The Longitudinal distance from centre of differential lock pedal to Seat Index Point does not meet the requirement of the IS: 12343 -1998 (Re-affirmed in 2014). This should be looked into for necessary corrective action.

14.4.1.8 Operator's work place:

Operator's work place meets the requirements of IS:12239(Part-1)1996 (Reaffirmed Oct., 2017), **except the following**:

i) Provision of vertical retainness at inner side of clutch pedal.

ii) Provision of spark arresting device in the exhaust system.

14.4.1.9 Constructional requirement with regard to safety:

Constructional requirement with regard to safety meets the requirements of IS: 12239 (Part-2)-1999 (Reaffirmed in 2014), except the provision of working clearance between the mudguard and position control lever.

14.4.1.10 Labelling Plate:

i) The **specific fuel consumption** was not declared on labeling plate and does not meet the requirement of IS: 10273-1987 and therefore, should be looked into for necessary corrective action.

ii) The maximum PTO power has been specified as 36.4 kW (49.5 hp) vide labelling plate of the tractor. As per the conversion, the power of 36.4 kW is equals to 48.8 hp and not equals to 49.5 hp. This needs to be looked into for necessary corrective action.

14.4.1.11 Running-in Schedule:

The engine running-in schedule has been specified as "20 hours" vide para 3.0 of application format no.3. However, the same has been specified as "12 hours" vide Annexure II. This needs to be looked into for necessary corrective action.

14.4.2 Field performance test:

14.4.2.1 Haulage performance:

i) The distance travel per litre of fuel consumption in case of two wheel and four wheel trailer was observed as **3.68 to 3.87** km/l & **3.31 to 3.39** km/l against the declaration of **4 to 6** km/l. The observed value is on lower side and does not meet the non-evaluative requirement of IS: 12207-2019 with regard to tolerance. This should be looked into for necessary corrective action.

ii) The specific fuel consumption (ml/km/ton) in case of two wheel and four wheel trailer was recorded as **51.74 to 54.40** ml/km/ton & **42.14 to 43.17** ml/km/ton, against the declaration of **30 to 40** ml/km/ton. The observed value was on higher side and does not meet the non - evaluative requirement of IS: 12207-2019 with regard to tolerance. This should be looked into for necessary corrective action.

14.4.2.2 Wetland cultivation (Puddling operation):

No ingress of mud and / or water was observed during initial commercial test, tested vide test report No.T**-1082/1607/2017, (April).**

14.5 Maintenance / Service Problems:

No noticeable maintenance/ service problem was observed during the test.

14.6 Recommendation with regard to safety on tractor:

The following requirements, inter alia, may be considered for incorporation on the tractor:

i) Provision of spark arresting device in exhaust system.

ii) The working clearance between position lever and mudguard does not meet the requirement of IS: 12239 (part-2)-1999.

iii) Longitudinal distance from centre of differential lock pedal to Seat Index Point does not meet the requirement. It should be provided as per IS: 12343-1998, (Re-affirmed in 2014).

iv) Vertical retainers at inner side of clutch pedal should be provided as per relevant standard.

14.7 Adequacy of Literature supplied with machine:

14.7.1 The following literatures were supplied with the test tractor for reference during the test:-

i) Operator's Manual (For 5310V1, 5310 V3, 5310 V4, 5310V5, 5310 V6, 5050E, 5120, 5055E, 5060E, 5065E 5075E & 5405 tractor models).

ii) Workshop Service / Technical manual Part 1, 2 & 3 (For 5310V1, 5310 V3, 5310 V4, 5310 V5, 5310 V6, 5050E, 5120, 5055E, 5060E, 5065E 5075E & 5405 tractor models).

iii) Parts Catalogue (For 5310 V1, 5310 V3, 5310 V4, 5310 V5 & 5310 V6 tractor models).

14.7.2 The literatures should also be brought out in national as well as other regional languages for the guidance of users and service personnel.

TESTING AUTHORITY:

TESTING AUTHORITY:

C.V. CHIMOTE TEST ENGINEER	
Y.K.RAO SENIOR AGRICULTURAL ENGINEER	
P. K. PANDEY DIRECTOR	

Draft test report is compiled by: Shwetabh Singh, Agricultural Engineer.

15. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
15.1	14.4.1.2, 14.4.1.3, 14.4.1.4, 14.4.1.7 & 14.4.1.10	Your valuable comments and suggestion for improvement are well taken. Under our policy of continuous product improvement these aspects are further being looked into and will try to eliminate these deviation soon wherever necessary.

ANNEXURE- I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running-in	24.0
2.	PTO performance test	9.4
3.	Drawbar performance test	18.7
4.	Power lift and hydraulic pump performance test	3.0
5.	Brake test	1.8
6.	Noise measurement	1.4
7.	Mechanical vibration test	1.0
8.	Nominal speed test	0.9
B.	**HAULAGE TEST**	5.0
C.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test.	7.8
	TOTAL:	**73.0**