व्यावसायिक परीक्षण रिपोर्ट (प्रथम बैच परीक्षण) संख्या / No. : T- 1608/2139/2021 COMMERCIAL TEST REPORT (First Batch Test) माह / Month : December, 2021

#### [ONLINE TESTING]

(यह परीक्षण रिपोर्ट 31/12/2021 तक वैध है। ∕ THIS TEST REPORT IS VALID UPTO : 31/12/2021)



# **JOHN DEERE 5036D 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

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"JOHN DEERE 5036D" tractor had undergone "Initial Commercial Test" at this Institute and Test report No.T-1133/1659/2018 was released in February, 2018 and Administrative Extension test report no. T- 1319/1846/2020 released in March, 2020 and T-1468/1995/2020 released in August, 2020. Now, the applicant has submitted an online application, 28/2020-21/50 dated 20.01.2021 for 1<sup>st</sup> batch testing of "JOHN DEERE 5036D" 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 & Location of plant(s)	:	M/s. John Deere India Pvt. Ltd. Gat No. 166 - 167 & 271 - 291, Off Pune - Nagar Road, Sanaswadi, Pune– 412 208 (M.S.) 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 manufacturer
Place of running-in	:	At manufacturer's works
Duration of said running-in (h):		
- Engine	:	12
- Transmission	:	18
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. SPE	CI	FICATIONS
Tractor:		
Make	:	John Deere
Model	:	5036D
Туре	:	Four wheeled, Rear wheel driven,
		General Purpose, Agricultural Tractor.

Month & Year of manufacture : 02/21 Chassis number : 1PY5036DVMA008645 Country of Origin

1.1

: India

#### JOHN DEERE 5036D TRACTOR – COMMERCIAL T-1608/2139/2021 (FIRST BATCH TEST) (THIS TEST REPORT IS VALID UPTO: 31/12/2021)

#### Previous Sample

#### 13.4.1.2 **Drawbar Performance Test:**

During drawbar performance i) ten hour test, creeping of LHS & RHS rear tyre over the rims was observed as 20 mm & 45 mm respectively.

#### 13.5 Adequacy of literature:

Following literatures of "JOHN DEERE 5036D" tractor has been supplied for reference during the test:

- Operator's manual a)
- b) Parts catalogue
- Workshop manual C)
- Operator's manual a)
- Parts catalogue b)
- Workshop manual C)

#### **14. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS**

On the basis of tests conducted the performance results have been 14.1 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 (Evalua- tive /Non Evalua- tive)	Requirements as per IS: 12207-2019	Values declared by the applicant (D) / Require- ments (R)	As obser ved	Whether meets the require ments (Yes/No)
1	2 3 4 5		6	7		
14.1.1	PTO Performance	e :	1			
a)	Max. power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: $\pm$ 5% for PTO power or engine power >26 kW, $\pm$ 10% for PTO power or Engine power $\leq$ 26 kW.	23 (D)	21.8	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	23 (D)	21.8	Yes

## **Present Sample**

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1		2	3	4	5	6	7
C)	cor cor ma	ecific fuel nsumption responding to ximum wer, (g/kWh)	Evaluative	+ 10% Max.	258 (D)	267	Yes
d)	equ cra	ximum uivalent nkshaft que, (Nm)	Non Evaluative	± 8%	146 (D)	128	No
e)	Back-up torque, percent		Evaluative	12 percent, min.	Above 12 (D) 12 (R)	29.0	Yes
f)	Ma	ximum operatir	ng temperatu	re( <sup>o</sup> 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)	115	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)	97	Yes
g)	Engine oil consumption, (g/kWh)		Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.67 (R) Maximum	0.57	Yes
h)	Smoke level, (m <sup>-1</sup> )		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)	0.20	Yes

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1		2	3	4	5	6	7
14.1.2	Drav	wbar perform	nance:				
a)	Max draw with corre to	imum	Non Evaluative	Minimum 70% of static mass with ballast	17.16 (D) 17.02 (R)	19.98	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	12.01 (D) 11.88 (R)	14.50	Yes
c)	draw with or w	imum vbar power out ballast, rith standard ast as the e may be,	Evaluative	Minimum 80 % of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg Minimum 75 % of PTO power as referred in SI 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 SI No. i) a) of engine performance in case of tractors which do not have a PTO shaft.	18.4 (D) 17.4 (R)	17.8	Yes
d)	trans	imum smission oil perature	Evaluative	The declared value should not exceed the maximum value specified by oil company.	110 (D)	83	Yes
14.1.3				pperformance :	<b></b>		
a)				ghout the range of lift, (			
	1)	At hitch points	Evaluative	±10 percent	14.0 (D)	14.63	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	12.20 (D) 5.13 Mini- mum (R)	12.84	Yes
				shaft			

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1	2	3	4	5	6	7
b)	Maximum drop in th height of th point of application	ne tive of	The observed value should not exceed 50 mm	50 (D)	20	Yes
	the force after each minutes interval for total duratice of 30 minute (mm)	se 5 a on e,		50 (R) Maxi- mum		
14.1.4		ormance at 25	•			
a)		opping distanc bad ballast, (m)	e at a force equal to or l ):	ess thar	n 600 N o	n brake
	1) Cold	Evalua-	10	10	7.43	Yes
	brake	tive		(R)		
	2) Hot brake	Evalua- tive	10	10 (R)	7.75	Yes
b)	1	te a Evaluative	600	600 (R)	168 to 238	Yes
c)	effective at force of 60 N at for pedal(s)	0 Evaluative ot or at	Yes / No	Yes (R)	Yes	Yes
14.1.5	Noise meas	surement :	1			
a)	Maximum ambient noise emitte by the tracto dB(A)		As per CMVR	88 (R)	79	Yes
b)	Maximum noise a operator's ear lev dB(A)	at Evaluative el	As per CMVR	96 (R)	90	Yes

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1		2	3	4	5	6	7
14.1.6	Am	plitude of	mechanic	al vibrations	at :		
	1)	Left foot rest		100 microns (max)	100 (Maxi-	124	No
	2)	Right foot rest	Non Evalua-	-do-	mum)	140	No
	3)	Seat (with driver seated)	tive	-do-		43	Yes
	4)	Steerin g wheel		do-		91	Yes
14.1.7			il pull over	:	-		Not
	air	ximum cleaner oull over	Evaluative	0.25 % (max.)		ry type air cleaner is provided	
14.1.8	На	ulage requ	uirements :				
a)	Gro	oss mass	of the trail	ers, (tonne):			
	1)	Two wheel	Non Evalua- tive	As specified by the	5.0 (D)	5.0	Yes
	2)	Four wheel	Non Evalua- tive	manufac- turer	7.0 (D)	7.0	Yes
b)	Dis	tance trav	/elled / litre	of fuel cons	sumption, (	km/l):	
	1)	Two wheel	Non Evalua-	As specified	4 to 6 (D)	5.59 to 5.91	Yes
	2)	Four wheel	tive	by the manufac- turer	4 to 6 (D)	4.87 to 4.92	Yes
c)	Fue	el consum	ption (ml/k	(m/tonne):			
	1)	Two wheel	Non	As specified	40 to 45 (D)	33.9 to 35.8	No
	2)	Four wheel	Evalua- tive	by the manufac- turer	40 to 45 (D)	29.0 to 29.4	No

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1		2	3	4	5	6	7
14.1.9	Wet	tland cultivation	on :				
	follo	aling for the owing emblies:	Evalua- tive	The identified assemblies should essentially	There should be no	No ingress of water and / or mud was	
	1)	Clutch assembly	-do-	-do- requirement of IS: 11082. No Of V		reported during Initial	
	2)	Brake housings	-do-	water ingress in the identified	and / or mud	commercial testing of this	
	3)	Front axle hubs	-do-	assembly given in column-2.	(R)	tractor model tested vide	Yes
	4)	Engine Oil	-do-	If tractor does not meet the requirements		test report no. report	
	5)	Transmiss ion Oil	-do-	of wetland cultivation, it may be recommended for dry land operation only.		No. T- 1133/1659 /2018 released in February, 2018	
14.1.10		ety features	1	•			
a)	Guards against E moving and hot parts		Evalua- tive	Belt drives, pulleys, silencer, hydraulics pipes(as per IS-12239 Part 2)		Meet the require- ments	Yes
b)	arra	nting angement	Evalua- tive	As per CM∖	/R	Meet the require- ments	Yes
с)	Seating requirements (Tractors having more than 1150 mm rear track width)		Non Evalua- tive	Should n requirement 12343 (As from time to	amended	LINES NOT	No
d)	req	chnical uirements PTO shaft	Evalua- tive	Should meet the requirements of IS: 4931 (As amended from time to time)		requirements	Yes
e)	thre	nensions of ee point age	Non Evalua- tive	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)		requirements	Yes
f)	of	ecifications linkage wbar	Evalua- tive	Should n requirement 12953 (As from time to	amended		Yes

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1		2	3	4	5	6	7
g)	of dra	ecifications Swinging wbar herever ed)	Evalua- tive	requirements	meet the of IS 12362 amended from	Not provi- ded	Not appli- cable
h)	1)	Maximum travelling speed at rated engine speed in reverse gears, kmph	Evalua- tive	Should not exceed 20 Kmph		(14.87 kmph) Meet the require ments	Yes
	2)	Audible warning signal on tractor.	Evalua- tive	speed in reaches to audible warri tractor be a safety aspect operation technology sh in opera manufacturer ensure the tr aspect to op the delivery of	ing signal on activated, The ots about the of shuttle hall be brought ation and / dealer shall raining on this perator before f tractor.	Not appli- cable	Not appli- cable
14.1.11				ision of labelli		1	
	1)	Make	Evalua- tive	requirements		JOHN DEERE	Yes
	2)	Model	Evalua- tive	PTO in kW	clared value of and year of	5036D	Yes
	3)	Month & Year of manufac- ture	Evalua- tive	MM Digit 01-12 i	MM YY will represent the month	02/21	Yes
	4)	Engine number	Evalua- tive	and next two digit in the box No.2 for YY will represent the year of manufacturing		PY302 9D618 929	Yes
	5)	Chassis number	Evalua- tive			1PY5036 DVMA00 8645	Yes
	6)	Declaration of maximum PTO power, kW	Evalua- tive			23	Yes

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1	2	3	4	5	6	7
14.1.12						
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by Manufac-	106.62 (D)	106.50 to 106.51	Yes
(b)	Piston to cylinder liner clearance at skirt, (mm)	Non Evaluative	turer	0.32	0.107 to 0.110	Yes
(c)	Piston diameter at skirt, mm	Non Evaluative		106.30	106.40 to 106.41	Yes
(d)	Ring end ga	p (mm):	1			
	Top comp. ring.	Evaluative	-do-	0.75	0.30 to 0.40	Yes
	2 <sup>nd</sup> comp. ring.	Evaluative	-do-	2.00	0.65 to 0.70	Yes
	Oil ring. Evaluative		-do-	0.75	0.35 to 0.40	Yes
(e)		e clearance (I				
	Top comp. ring.	Evaluative	-do-	NA	Tappered	Yes
	2 <sup>nd</sup> comp. ring.	-do-	-do-	0.25	0.058 to 0.059	Yes
	Oil ring.	-do-	-do-	0.92	0.066 to 0.070	Yes
(f)	Clearance o	f main end b	earings, (mm)	:		
	Diametrical	Evaluative	-do-	0.65	0.084 to 0.087	Yes
	Crank shaft end float	Evaluative	-do-	0.85	0.20	Yes
(g)	Clearance o	f big end bea	arings, (mm):			
	Diametrical	Evaluative	-do-	0.65	0.052 to 0.054	Yes
	Axial	Evaluative	-do-	0.85	0.30 to 0.35	Yes
(h)	Clearance					
	between king pin and bush,(mm)	Non Evaluative	-do-	0.80	0.094 to 0.096	Yes
(i)	Clearance between center pin and bush,(mm)	Non Evaluative	-do-	0.80	0.048 to 0.053	Yes

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1	2	3	4	5	6	7
14.1.13	Literature (S	ubmission t	o test agency):			
(a)	Operator manual	Evaluative	The printed literature in	Provided	Provided	Yes
(b)	Parts Catalogue	Evaluative	booklet form should be	Provided	Provided	Yes
(c)	Workshop/ Service manual	Evaluative	provided as per IS 8132 and should submit along with the test sample	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

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14.2	CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS-12207-2019):				
S. No.	Category of Breakdown	Category (Evaluative / Non Evalua- tive)	Requirements as per IS: 12207-2019	As obser- ved	Whether meets the require- ment (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

#### 14.3 Salient Observations:

14.3.1 Laboratory tests:

## 14.3.1.1 PTO performance:

 The maximum equivalent crankshaft torque was recorded as 128 Nm against the declaration of 146 Nm, which is not within the permissible limit as specified in IS: 12207-2019. This calls for necessary corrective action.

## 14.3.1.2 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.

## 14.3.1.3 Three point linkage:

All the dimensions of three point linkage do not conform to the requirement of a particular category (Cat. I or Cat. II), in toto, of IS: 4468-1997 (Part I). This should be looked into for corrective action.

#### 14.3.1.4 Operator's Seat

 Vertical distance of centre of brake pedal from Seat Index Point does not meet the requirement of the IS: 12343 -1998 (Re-affirmed in 2014).

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- 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).
- iii) The Longitudinal distance of centre of steering control wheel to Seat Index Point does not meet the requirement of the IS: 12343 -1998 (Re-affirmed in 2014).

#### 14.4 Recommendation with regard to safety on tractor:

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

- i) The direction of motion of hand operated engine speed control lever (throttle) should be as per requirement of the relevant code.
- ii) Provision of spark arresting device in exhaust system.
- iii) Engine revolution gauge identifiable with color codes as per the relevant code.
- iv) Working clearance between the mudguard and range selection lever is less than the minimum requirement. This calls for corrective action.

#### 14.5 Adequacy of Literature supplied with machine:

- **14.5.1** The following literatures were supplied with the test tractor for reference during the test:-
  - i) Operator's Manual (For 5036D, 5038D, 5039D, 5042D V3, 5045D V2, 5045D 4WD V2, 5050D, 5050D V1, 5105, 5205 & 5005 tractor models).
  - Workshop/repair Technical manual Part 1, 2 & 3 (For 5036D, 5038D, 5039D, 5042D, 5045D, 5050D, 5050D V8, 5105, 5105 4WD V2, 5205 & 5005 tractor models).
  - iii) Parts Catalogue (For 5036D and 5036D V2 tractor models).
- **14.5.2** The literatures submitted by the applicant are found adequate as per IS: 8133-1999 (Reaffirmed in 2019), except following:
  - i) Image quality of photographs in Workshop/repair Technical manuals may be improved.

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## TESTING AUTHORITY:

C.V. CHIMOTE TEST ENGINEER	Aummunat
Y.K.RAO SENIOR AGRICULTURAL ENGINEER	leeg
P. K. PANDEY DIRECTOR	UEn-mosy

# Draft test report is compiled by: Nitesh Kumar Verma, Agricultural Engineer.

## 15. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
15.1	14.3.1.2	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.

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#### ANNEXURE- I

#### TRACTOR RUN HOURS DURING TEST

Α.	LABORATORY AND TRACK TESTS	HOURS
1.	Running-in	-
2.	PTO performance test	13.52
3.	Drawbar performance test	18.45
4.	Power lift and hydraulic pump performance test	3.75
5.	Brake test	2.25
6.	Noise measurement	1.50
7.	Mechanical vibration test	1.00
8.	Nominal speed test	0.66
В.	HAULAGE TEST	5.70
C.	Miscellaneous test and other run hours including idle run,	6.57
	transportation, trials and preparation for test.	
	TOTAL:	53.40