



JOHN DEERE 5045D 4WD TRACTOR



भारत सरकार

GOVERNMENT OF INDIA

कृषि मंत्रालय (कृषि एवं सहकारिता विभाग, मशीनीकरण एवं प्रोद्योगिकी प्रभाग)
Ministry of Agriculture (Deptt. of Agri. & Co-op, Mechanization & Technology Division)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO : 9001-2008 Certified Institute)

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Manufacturer : M/s. John Deere India Pvt. Ltd.
Gat No. 166 - 167 & 271 - 291,
Off Pune-Nagar Road, Sanaswadi,
Pune- 412 208 (M.S.)

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 : 10
Method of Selection : The tractor was submitted directly by the applicant for test. Hence, method of selection is not known.

1. SPECIFICATIONS

- 1.1 Tractor:**
 Make : John Deere
 Model : 5045D 4WD
 Variants, if any : None
 Type : Four wheeled, 4 WD Agricultural Tractor
 Year of manufacture : BJ-C (September, 2012)
 Chassis number : 1PY5045DACA008393
 Country of Origin : India
- 1.2 Engine:**
 Make : John Deere
 Model : 3029DPY211
 Type : Four stroke, naturally aspirated , liquid cooled, direct injection, diesel engine.
 Serial number : PY3029D316493
Engine speed (Manufacturer's recommended production setting), (rpm):
 - Maximum speed at no load, : 2475 to 2550
 - Low idle speed : 800 to 875
 - Speed at maximum torque : 1200 to 1600
Rated speed, (rpm):
 - For PTO use : 2300
 - For drawbar use : 2300
- 1.3 Cylinder & Cylinder Head:**
 Number : Three
 Disposition : Vertical, inline
 Bore/stroke, (mm) : 106.5 / 110
 Capacity as specified by the applicant, (cc) : 2940
 Compression ratio : 18.5 ± 0.39 : 1
 Type of cylinder head : Monoblock
 Type of cylinder liners : Wet, replaceable
 Type of combustion chamber : Direct injection



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Clearance between king pins and bushes, (mm) : Ball bearings provided
 Condition of thrust bearings : Normal
 Condition of bearings for stub axles : Normal
 Condition of seals for stub axles and king pins : Normal
 Clearance between centre pin and bush, (mm) : 0.10 to 0.22 | Against discard limit of 1.0 mm

14.6 **Steering system:**
 Visual condition of the components of complete steering assembly : Normal

14.7 **Starter motor & Alternator:**
 Presence of soil/oil in housing : None
 Condition of bearings and other Components : Normal

15. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

S. No.	Adjustments/Defects/Breakdowns/Repairs	Tractor run hours
i)	NONE	

16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

16.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2008 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: 12207-2008	Values declared by the applicant (D) / Requirement (R)	As observed	Whether meets the requirements (Yes/No.)
1	2	3	4	5	6	7
16.1.1	PTO Performance :					
a)	Max. power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -5 / +10% for PTO power > 35hp. -7.5/+10% for PTO power ≤ 35 hp	28.1(D) 29.019	27.1 27.7	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	27.8(D) 29.019	27.1 27.7	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	270(D) 190(D)	279 258	Yes



1	2	3	4	5	6	7
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	145(D) 173(D)	138.5 166.3	Yes
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	10(D) ³³ (D)	24.40 38.50	Yes
f)	Maximum operating temperature (°C)					
1)	Engine oil	Non 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) 130(D)	124 109	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.	118(D) 112(D)	103 90	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions.	2.65 (R) 2.83 (R)	0.72 0.171	Yes
h)	Smoke level	Evaluative	Maximum light absorption coefficient of 3.25 per metre or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR)	60 Hatridge 3.25 per metre (R)	0.20 0.37	Yes
16.1.2	Drawbar performance:					
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	17.85 (R) ^{16.80} 21.00 (D) 16.80 (D)	19.16 [*] 25.57	Yes
b)	Maximum drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast	12.81 (R) 11.86 15.20 (D) 12.04 (D)	13.13 [*] 18.67	Yes
c)	Maximum drawbar power without ballast, (kW).	Evaluative	Min. 80% of PTO power as referred in 16.1.1 (a) of PTO performance	21.7 (R) ^{22.16} 22.5 (D)	23.3 23.2 (D)	Yes
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	110 (D) 110 (D)	78 75	Yes

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1	2	3	4	5	6	7	
16.1.3 Power lift and hydraulic pump performance :							
a)	Maximum lifting capacity throughout the range of lift, (kN):			13.5 (D)	13.38	Yes	
	1)	At hitch points	Non Evaluative	[Tolerance of minus 10%] 14.0			
	2)	With the standard frame	Evaluative	The lift capacity should at least be 18 kg/PTO hp. and it should be 16 kg/engine hp where the tractor is not provided with a PTO shaft 12.2 (D) 6.82 6.50 (R)	10.34	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	[Tolerance of plus 5 mm]	50 (D)	0	Yes	
16.1.4 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):			10	10 (R)	7.23 to* 8.19	Yes
	1)	Cold brake	Evaluative	10	10 (R)	8.59*	Yes
	2)	Hot brake	Evaluative	10	10 (R)	8.59*	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600 (R)	180 to 188*	Yes	
c)	Whether parking brake is effective at a force of 600 N at foot pedal(s) or 400 N at hand lever	Evaluative	Yes / No	Yes (R)	Yes*	Yes	
16.1.5 Noise measurement :							
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88 (R)	84 82	Yes	
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	98 (R)	93 91	Yes	
16.1.6 Amplitude of mechanical vibrations at :							
1)	Left foot rest	Non Evaluative	100 microns (max)	100 (R)	100 200*	Yes	
			-do-		90 210*	Yes	
			-do-		100 70*	Yes	
			-do-		120 60*	No	
			-do-				
2)	Right foot rest						
3)	Seat (with driver seated)						
4)	Steering wheel						

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1	2	3	4	5	6	7	
16.1.7	Haulage requirements :						
a)	Gross mass of the trailers, (tonnes):						
1)	Two wheel	Non Evaluative	--	5.0 (D) 5.0	5.0 5.0	Yes	
2)	Four wheel		--	7.0 (D) 5.0	7.0 5.0	Yes	
b)	Distance travelled / litre of fuel consumption, (km/l):						
1)	Two wheel	Non Evaluative	--	4 to 6 (D) 4.2	4.38 to 4.44 5.82 to 5.95	Yes	
2)	Four wheel		--	4 to 6 (D) 6.0	3.72 to 3.78 5.91 to 5.94	No	
c)	Fuel consumption (ml/km/tonne):						
1)	Two wheel	Non Evaluative	--	40 to 45 (D) 35.16	45.0 to 45.6 33.61 to 34.35	No	
2)	Four wheel		--	40 to 45 (D) 25.45	37.8 to 38.4 33.66 to 33.85	Yes	
16.1.8	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	Yes	
1)	Clutch assembly	-do-					
2)	Brake housings	-do-					
3)	Front axle hubs	-do-					
16.1.9	Safety features :						
a)	Guards against moving and hot parts	Evaluative	As per CMVR	At present no requirements	---	--	
b)	Lighting arrangement	Evaluative	As per CMVR	--	Provided	Yes	
16.1.10	Labelling of tractors (Provision of labelling plate):						
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	--	John Deere Gromax	Yes	
2)	Model	Evaluative		--	5045D 4WD	Yes	
3)	Year of manufacture	Evaluative		--	BJ-C (September, 2012)	Yes	
4)	Engine serial number	Evaluative		--	PY3029D 316493	Yes	
5)	Chassis serial number	Evaluative		--	1PY5045DA CA008393	Yes	
6)	Declaration of PTO power, kW (hp)	Evaluative		--	28.1 (38.2)	Yes	

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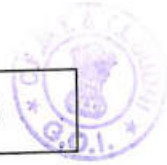


1	2	3	4	5	6	7	
16.1.11	Discard limit for:						
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified	106.62 89.13	106.50 to 106.52	Yes	
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative	by Manufacturer	0.32 0.2	0.116 to 0.137 0.120 to 0.144	Yes	
(c)	Ring end gap (mm):						
	- Top comp. ring.	Evaluative	-do-	0.75 ^{2.5}	0.45 to 0.50	Yes	
	- 2 nd comp. ring.		-do-	2.00 ^{2.5}	1.15 to 1.25	Yes	
	- Oil ring.		-do-	0.75 ^{2.0}	0.40 to 0.45	Yes	
(d)	Ring groove clearance (mm):				Taper Rings	--	
	- Top comp. ring.		-do-	0.25	0.054 to 0.066	Yes	
	- 2 nd comp. ring.		-do-	0.92	0.056 to 0.068	Yes	
	- Oil ring.		-do-		0.055 to 0.058	Yes	
(e)	Clearance of main bearings (mm):						
	- Diametrical clearance	Evaluative	-do-	0.32 0.2	0.077 to 0.105	Yes	
	- Crankshaft end float	Evaluative		0.38 ^{0.6}	0.25 0.20	Yes	
(f)	Clearance of big end bearings, (mm):						
	- Diametrical	Evaluative	-do-	0.32 ^{0.2}	0.096 to 0.117	Yes	
	- Axial	Evaluative	-do-	0.38 ^{0.25}	0.30 to 0.35	Yes	
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	---	Ball bearing	---	
(h)	Clearance between center pin and bush, (mm)	Non Evaluative	-do-	1.0 0.2	0.102 to 0.215 0.122 to 0.210	Yes	

16.1.12		CATEGORY OF BREAKDOWNS / DEFECTS :			As observed	Whether meets the requirement (Yes/No.)
S. No.	Category of Breakdown	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	None	Yes	
1.	Critical breakdown	Evaluative	No critical breakdown	None	Yes	
2.	Major breakdowns	Evaluative	Not more than two and neither of them should be repetitive in nature.	None	Yes	
3.	Minor breakdowns	Evaluative	Not more than five and frequency of each should not be more than two.	None	Yes	
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed five, that is, (2 major + 3 minor) or 5 minor breakdowns	None	Yes	

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16.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2008:				
S. No.	Characteristic	Requirements as per IS: 12207-2008	As observed	Whether meets the requirement (Yes/No.)
1	2	3	4	5
1	Air cleaner oil pull over, max. oil pull over (%)	0.25% (max.)	Dry type air cleaner provided	Not applicable
2.	Seating requirements	Should meet the requirements of IS: 12343-1998.	Does not meet the requirement	No
3.	Fitment of ROPS	With a provision for fitment of ROPS.	No Provision	No
		If ROPS fitted it should meet the requirement of IS: 11821-1992.	ROPS not fitted	Not applicable
4.	Technical requirements for PTO shaft	Should meet the requirements of IS: 4931 -1995.	Meets the requirement	Yes
5.	Dimensions of three point linkage	Should meet the requirements of IS: 4468 (Part-I)-1997.	Does not meet the requirement	No
6.	Specifications of linkage drawbar	Should meet the requirements of IS: 12953-1990.	Meets the requirement	Yes
7.	Specification of swinging drawbars	Should meet the requirements of IS: 12362 (Part 3) -1994.	Not provided	Not applicable
8.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Front towing hitch not provided	No

16.3 Conformity with following IS:

- i) Guide lines for declaration of power and specific fuel consumption and labelling of agricultural tractors (First revision) [IS 10273:1987 (Reaffirmed in March, 2009)] : Conforms
- ii) Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3 (third revision)[IS: 4931-1995 (Reaffirmed in March, 2009)] : Conforms
- iii) Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS 4468 (Part-I):1997/ISO 730-1:1994 (Reaffirmed in March, 2007)] : Does not conform
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in March, 2007)] : Conforms
- v) Agricultural tractors - Operator's seat technical requirement [IS 12343 -1998 (Reaffirmed in March, 2009)] : Does not conform



- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision) : [IS 12239(PT-1) 1996/ISO 4254-1:1989 (Reaffirmed in March, 2007)] : Does not conform
- vii) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1)-2006 (Reaffirmed in March, 2009) and IS: 6283 (Part 2)-2007 (Reaffirmed in March, 2009)] : Conforms
- viii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) [(IS 12239 (PT-2) 1999) (Reaffirmed in March, 2009)] : Does not conform
- ix) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) [(IS: 8133 – 1983) (Reaffirmed in March, 2009)] : Conforms
- x) Agricultural Tractor & Machinery Lighting device for travel on public roads [(IS: 14683-1999) (Reaffirmed in March, 2009)] : Conforms

16.4 Salient Observations:

16.4.1 Laboratory tests:

16.4.1.1 PTO Performance:

- i) The backup torque is 24.38 %.
- ii) The specific fuel consumption corresponding to maximum Power was measured as 279 g/kWh against the declaration of 270 g/kWh and meets the requirements of IS: 12207-2008 with regard to tolerance.
- iii) The percentage drop in maximum power during natural ambient and high ambient condition was observed as 5.9 %, which was considered on higher side. This should be looked into for necessary corrective action.

16.4.1.3 Three Point Linkage:

- i) Diameter of hole for lower hitch point meets the requirements of Cat-II whereas the width of ball has been provided as per Cat-I. This should be looked into for necessary corrective action.
- ii) 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.

16.4.1.4 Linkage Drawbar:

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

**16.4.1.5 Operator's seat:**

- i) The width of seat does not meet the requirement of IS: 12343-1988. This should be looked into for necessary corrective action.

16.4.1.6 Location and operation of operator's control:

Working clearance around the gear shifting lever and mudguard(RHS) does not meet the requirement of the of the IS: 12239 (Part-2)-1996. This should be looked into for necessary corrective action.

16.4.2 Field performance:**16.4.2.1 Wetland operation:**

- i) No ingress of mud/or water was noticed during puddling operation of the tractor. Hence, It meets the requirements of IS: 11082-1984 (Technical requirements of agricultural tractors for wetland operation). The tractor is suitable for wetland operation (Puddling).

16.4.2.2 Haulage performance:

- (i) The distance travelled / litre of fuel consumption with four wheel trailer was observed as 3.72 to 3.78 km/l against the declaration of 4.00 to 6.00 km/l. This does not meet the requirement of IS: 12207-2008 and therefore, should be looked into for necessary corrective action.
- (ii) The fuel consumption with two wheel trailer was observed as 45.0 to 45.7 ml/km/tonne against the declaration of 40 to 45 ml/km/tonne. This does not meet the requirement of IS: 12207-2008 and therefore, should be looked into for necessary corrective action.

16.5 Maintenance / Service problems:

No noticeable maintenance and service problems was observed during the test..

16.6 Recommendation with regard to safety on tractor:

The following requirements, inter-alia, may be considered for incorporation on the tractor as per relevant Indian Standards:

- i) Provision of spark arresting device in exhaust system.
- ii) The working clearance between the gear shifting lever and mudguard does not meet the requirement of IS: 12239 (part-2)-1999.
- iii) Provision of front tow hook.

16.7 Adequacy of Literature:

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

- a) Operator's manual 5038D, 5042D, 5045D, and 5050D
- b) Technical manual 5038D, 5042D, 5045D, and 5047D and 5050D
- c) Part's catalogue Part I 5045D,
- d) Part's catalogue Part I 5045D,
- e) Repair manual 5038D, 5042D, 5045D, and 5047D and 5050D

16.7.2 The supplied literature was found adequate; however, this literature should be brought out in national as well as other regional languages of India for guidance of users.



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17.0 Citizen charter

Duration of Test	Test duration under citizen charter	Whether the report released within time frame given in the citizen charter	Remark
November 2012 to April 2013 6 Months	10 Months	Yes	--

TESTING AUTHORITY:


R.K.NEMA
AGRICULTURAL ENGINEER


P.K.VERMA
SENIOR AGRICULTURAL ENGINEER


C.R.LOHI
DIRECTOR

18. Applicant's Comments

Para No.	Our Reference	Applicant's comments
18.1	16.4.1.1 (iii)	We will take necessary action to identify the root cause.
18.2	16.4.1.3 & 16.4.4	Most of the Indian customers use implements fitted with pins of bigger size. Hence, we have to provide with balls suiting the pins (Cat-II) though the other parameters call for conformity with Cat-I.
18.3	16.4.1.5	Shall be taken up.
18.4	16.4.2.2	We will take necessary action to identify the root cause.