



JOHN DEERE, 5050E TRACTOR



सत्यमेव जयते

भारत सरकार

GOVERNMENT OF INDIA

कृषि मंत्रालय (कृषि एवं सहकारिता विभाग, मशीनीकरण एवं प्रौद्योगिकी 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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T-925/1442/2014

JOHN DEERE, 5050E TRACTOR – Commercial (Initial)

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 applicant
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 : 5050E
Variants, if any

S. No.	Variant models (*)	Variant features
1.	5050E V5	With 16.9-28 & 7.5-16 size tyre
2.	5050E V4	Lower speed version

*The variant models have not been tested at this Institute yet.

Type : Four wheeled, 2 WD, general purpose, Agricultural Tractor
Year of manufacture : BA-D (January, 2013)
Chassis number : 1PY5050EKDE000868
Country of Origin : India

1.2 Engine:

Make : John Deere
Model : 3029TPY54
Type : Four stroke, turbo charged, liquid cooled, direct injection, diesel engine.
Serial number : PY3029T186904

Engine speed (Manufacturer's recommended production setting), (rpm):

- Maximum speed at no load, : 2550 to 2650
- Low idle speed : 800 to 900
- Speed at maximum torque : 1200 to 1500

Rated speed, (rpm):

- For PTO use : 2400
- For drawbar use : 2400



15. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

S. No.	Adjustments, Defects, Breakdowns and Repairs	Tractor run hours
	-None-	

16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

16.1 Evaluative (mandatory) / Non-evaluative (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 >35 hp (26.1kW). -7.5/+10% for PTO power ≤ 35 hp (26.1kW).	31.3 (D)	31.9	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	31.3 (D)	31.9	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	270 (D)	280	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	190 (D)	176.7	Yes
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	10 (D)	39.2	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	123	Yes
2)	Coolant	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	98	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.86	0.22	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)	3.25 per metre	0.33 per metre	Yes



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1	2	3	4	5	6	7	
16.1.2 Drawbar performance :							
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	19.2 (D)	23.30	Yes	
				18.58 (R)			
b)	Max. drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast/ with standard ballast	13.61 (D)	18.51	Yes	
				12.94 (R)			
c)	Maximum drawbar power without ballast, (kW).	Evaluative	Minimum 80% of PTO power as referred in column No.6 of 11.1.1(a).	25.04 (D)	27.7	Yes	
				25.5 (R)			
d)	Max. transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	110 (D)	63	Yes	
16.1.3 Power lift and hydraulic pump performance :							
a) Maximum lifting capacity throughout the range of lift, (kN):							
	1)	At hitch points	Non Evaluative	[Tolerance of minus 10%]	17.50 (D)	17.1	Yes
	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	12.90 (D) 7.66 (R)	14.7	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)	05	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):						
	1)	Cold brake	Evaluative	10	10	7.02	Yes
	2)	Hot brake	Evaluative	10	10	7.07	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600	166 to 181	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	Yes	Yes	



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1	2	3	4	5	6	7
16.1.5 Noise measurement :						
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88	82	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	98	95	Yes
16.1.6 Amplitude of mechanical vibrations at :						
1)	Left foot rest	Non Evaluative	100 microns (max)	100 microns (max)	100	Yes
	Right foot rest				90	Yes
	2) Seat (with driver seated)				90	Yes
	3) Steering wheel				100	Yes
16.1.7 Haulage requirements :						
a)	Gross mass of the trailers, (tones):		--			
1)	Two wheel	Non	--	5.0	5.0	Yes
	Four wheel	Evaluative	--	7.0	7.0	Yes
b)	Distance travelled per litre of fuel consumption, (km):					
1)	Two wheel	Non	--	4.0 to 6.0	4.35 to 4.47	Yes
	Four wheel	Evaluative	--	4.0 to 6.0	3.7 to 3.8	No
c)	Fuel consumption (ml/km/tonne):					
1)	Two wheel	Non	--	30.0 to 40.0	44.7 to 45.9	No
	Four wheel	Evaluative	--	30.0 to 40.0	37.8 to 38.6	Yes
16.1.8 Wetland Cultivation (Puddling Operation):						
	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.			
1)	Clutch assembly	-do-		There should be no ingress of water and/or mud	No ingress of water was observed during water proof test	Yes
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	Yes
2)	Model	Evaluative			5050 E	Yes
3)	Year of manufacture	Evaluative			BA-D, (January, 2013)	Yes
4)	Engine serial number	Evaluative			PY 3029 T 186904	Yes
5)	Chassis serial number	Evaluative			1PY5050E KDE000868	Yes
6)	Declaration of PTO power, (kW/hp)	Evaluative			--	31.3 (42.6)



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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 declared by the manufacturer	106.62	106.50 to 106.51	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.32	0.10 to 0.11	Yes
(c)	Ring end gap (mm):					
	- 1 st comp. ring.	Evaluative	-do-	0.75	0.40 to 0.43	Yes
	- 2 nd comp. ring.		-do-	2.00	1.30	Yes
	- Oil ring.		-do-	0.75	0.40	Yes
(d)	Ring groove clearance (mm):					
	- 1 st comp. ring.	Evaluative	-do-	0.25	Taper rings	--
	- 2 nd comp. ring.		-do-	0.25	0.026 to 0.039	Yes
	- Oil ring.		-do-	0.92	0.047 to 0.059	Yes
(e)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	-do-	0.32	0.082 to 0.185	Yes
	- Crankshaft end float	Evaluative		0.38	0.15	Yes
(f)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.32	0.072 to 0.105	Yes
	- Axial	Evaluative	-do-	0.38	0.35	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.80	0.164 to 0.206	Yes
(h)	Clearance between center pin and bush, (mm)	Non Evaluative	-do-	0.80	0.035 to 0.039	Yes

16.1.1 CATEGORY OF BREAKDOWNS / DEFECTS :					
S. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	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 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



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 requirements (Yes/No.)
1	2	3	4	5
1	Air cleaner oil pull over, max. oil pull over (%)	0.25% (max.)	Dry type air cleaner	Not applicable
2	Sealing requirements	Should meet the requirements of IS: 12343-1998	Does not meet the requirements	No
3	Fitment of ROPS	With a provision for fitment of ROPS. 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 requirements	Yes
5	Dimensions of three point linkage	Should meet the requirements of IS: 4468 (Part-I)-1997	Does not meet the requirements	No
6	Specifications of linkage drawbar	Should meet the requirements of IS: 12953-1990.	Meets the requirements	Yes
7	Specifications of swinging drawbar	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, 2009)] : **Does not conform**
- (iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in March, 2007)] : Conforms
- (v) 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**



- vi) 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)] : **Does not conform**
- vii) 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**
- viii) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) [(IS: 8133 – 1983) (Reaffirmed in March, 2009)] : **Conforms**
- ix) 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 39.2 %.
- ii) The maximum power was observed as 31.9 kW against the declaration of 31.3 kW, which meet the requirement of IS: 12207-2008 with regard to tolerance.
- iii) The specific fuel consumption corresponding to maximum power was measured as **280 g/kWh** against the declaration of **270 g/kWh**, which meets the requirement of IS:12207-2008.
- iv) The power drop of 6.27 % was recorded in high ambient condition as compared to natural ambient condition. It is considered on higher side and calls for necessary corrective action.

16.4.1.2 Drawbar performance:

During drawbar performance the tyre creeping over rim of LHS & RHS tyre were observed 57 & 31 mm respectively, it is on higher side and should be looked into.

16.4.1.3 Hydraulic performance:

The lifting capacity at standard frame was recorded as 14.70 kN and the moment about rear axle was computed as 23.45 kN-m, which is on higher side in compare to the moment about front axle i.e. 14.0 kN-m. Therefore, it is recommended that the lifting capacity should be reduced suitably or standard mass at front axle may be provided to avoid front lifting of tractor.

16.4.1.4 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 to improve the operational comfort and service life of components.

16.4.1.5 Three Point Linkage:

- i) Dia of hole for upper 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) Dia 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.
- iii) 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.

16.4.1.6 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.

16.4.1.7 Operator's seat:

- i) Width of seat does not meet the requirement of IS: 12343-1988. This should be looked into for necessary corrective action.
- ii) Longitudinal distance from seat index point to the centre of steering control wheel does not meet the requirement of IS: 12343-1988. This should be looked into for necessary corrective action.

16.4.1.8 Symbols of operator's controls and other displays:

- i) All controls are identifiable with the symbols as per IS: 6283 (Part 1&2)-1998 except the color zones for the engine revolution gauge & coolant temperature gauge was not provided. This needs to be looked into for necessary corrective action.
- ii) The oil lubricant type & frequency, grease lubricant frequency & cautionary notice are not identifiable with the symbols as per IS: 6283 (Part-1&2)-1998. This needs to be looked into.

16.4.1.9 Location and operation of operator's control:

The working clearance around the position control lever was observed as 40 mm against the minimum requirement of 70 mm as per per IS: 12239 (Part 2)-1996 This should be looked into for necessary corrective action.

16.4.2 Field performance:**16.4.2.1 Dry land operation:**

No any operational difficulty was observed during dry land field operation.

16.4.2.2 Wetland cultivation (Puddling operation):

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).

16.5 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 for spark arresting device in exhaust system.
- ii) The working clearance around hydraulic position control lever does not meet the requirement of IS: 12239 (part-2)-1999.
- iii) Provision of front towing hook
- iv) Provision of "Minimum cautionary notice" as per clause 11.2 of IS:12239 (part-2)-1999
- v) Provision of suitable guard at exhaust silencer.



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16.7 Adequacy of Literature:

16.7.1 Operator's manual, Parts catalogue were supplied with the test tractor for reference during the test.

16.7.2 The literature should be developed in regional language for user's guidance.

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
October 2013 to May 2014 8 Months	10 Months	Yes	--

TESTING AUTHORITY:

P.K. Verma

P. K. VERMA
SENIOR AGRICULTURAL ENGINEER

C.R. Lohi

C.R.LOHI
DIRECTOR

Test Report compiled by **Nitesh Kumar Verma**, Asst. Agricultural Engineer



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	16.4.1.1 (iv)	We will take necessary action to identify the root cause.
18.3	16.4.1.3	We will certainly look into your recommendation and secondly we would like to state that the tractor is recommended with certain front weight which will take care of the front lift during transport and haulage applications.
18.4	16.4.1.5 & 16.4.1.6	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) through the other parameters call for conformity with Cat-I.
18.5	16.4.1.7	Shall be taken up with operator station changes.
18.6	16.4.1.8	All lubricants & coolant used in our model are specially developed for our tractors. They are available with our dealers at Competitive prices. Customers are advised not to purchase from local markets.

ANNEXURE- I**BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST**

S. No.	Item	Disc Plough	Rotavator	Paddy puddler
1.	Make	Field King	Howard	5
2.	Type	Mounted	Mounted	NA
3.	No. of discs / blades	Three	36, in 7 flange	Mounted
4.	Type of discs / blades	Plain concave	Hatchet	10 (5x5)
5.	Size of discs / blades, (mm)	525	225x 50 x 10	Notched concave
6.	Spacing of discs / flanges, (mm)	520	250	460
7.	Lower hitch point span, (mm)	855	720	165
8.	Ward height, (mm)	440	481	680
9.	Overall dimensions, (mm):			
	- Length	2030	1750	1190
	- Width	1750	1000	2425
	- Height	1070	980	1335
10.	Gross mass, (kg)	365	345	245



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ANNEXURE-II**BRIEF SPECIFICATION OF HALF CAGE WHEEL**

S No.	Items	Specification
1.	Type	Half cage wheel
2.	Outer dia, (mm)	1230
3.	Width, (mm)	420
4.	No. and types of lugs	19, Straight lugs made of M.S. angle section welded to angle iron frame
5.	Size of angle section, (mm)	50 x 50 x 5
6.	Length of lug, (mm)	410
7.	Spacing of lug, (mm)	900
8.	Weight of each cage wheels, (kg)	90

ANNEXURE -III**TRACTOR RUN HOURS DURING TEST**

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	12.7
3.	Drawbar performance test	14.9
4.	Power lift and hydraulic pump performance test	3.2
5.	Turning ability	0.2
6.	Location of centre of gravity	0.2
7.	Operator's field of vision	0.1
8.	Brake test	2.6
9.	Noise measurement	1.5
10.	Mechanical vibration test	1.0
11.	Nominal speed test	0.5
B.	FIELD TEST:	
1.	Disc Ploughing	10.3
2.	Rotavation	11.1
3.	Puddling (Including five hours water proof test)	15.2
C.	HAULAGE TEST	10.2
D.	Miscellaneous test and other run hours including idle run, transportation, preparation for test and trial runs.	7.3
	TOTAL:	91.0