



NEW HOLLAND 6010 - TRACTOR



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- 939/1457/2014

NEW HOLLAND 6010- TRACTOR Commercial (Initial)

Manufacturer : M/s. New Holland Fiat (India) Pvt. Ltd.,
Plot NO.-3, Udyog Kendra,
Greater Noida – 201 306,
Distt. Gautam Budh Nagar,
(Uttar Pradesh)

Test requested by : The manufacturer
Selected for test by : The manufacturer
Place of running-in : At manufacturer's works
Duration of said running-in, (h):
- Engine : 50
- Transmission : 50
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 : New Holland
Model : 6010
Brand name : New Holland
Variants. If any:

S.No.	Variants Model	Variant Feature
1	New Holland 6010 2WD	12+12 Transmission,2WD
2	New Holland 6010 8+8	8+8 Transmission,2WD
3	New Holland 6010 4WD	24+24 Transmission,4WD
4	New Holland 6010 12+12	12+12 Transmission,4WD

Type : Four wheeled, Rear-wheel driven,
Standard Agricultural Tractor.
Year of manufacture : August, 2013 (L308)
Chassis number : PD004
Country of origin : India

1.2 Engine:

Make : IVECO (apa)
Model : 8035.45.723
Type : Four stroke, water cooled, turbocharged,
intercooled, direct injection, diesel engine.
Serial number : 538709
Year of manufacture : L308 (Aug.2013)
Country of origin : India

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

- Maximum speed at no load : 2450 to 2600
- Low idle speed : 600 to 700
- Speed at maximum torque : 1100 to 1500

Rated speed, (rpm):

- For PTO use : 2300
- For drawbar use : 2300

16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

16.1 Evaluative (mandatory) / Non-evaluative (Non-mandatory) parameters applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2014 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	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)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >26 kW. -7.5/+10% for PTO power ≤ 26 kW or -5 / +10% for Engine power >26 kW. -7.5/+10% for Engine power ≤ 26 kW	39.0 (D)	37.8	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	39.0 (D)	36.9	No
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	265 (D)	266	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	235 (D)	236.9	Yes

1	2	3	4	5	6	7
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	30.0 (D)	30.7	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.	132(D)	134	No
	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.	119 (D)	112	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient	2.66 Maximum (R)	0.43	Yes

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			conditions				
h)	Smoke level	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR)	3.25 per meter Maximum (R)	0.5	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	25.0 (D) 23.08 (R) Minimum	29.90	Yes	
b)	Max. drawbar pull with standard ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor with standard ballast	18.0 (D) 16.45 (R) Minimum	22.73	Yes	
c)	Maximum drawbar power with standard ballast, (kW).	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.	33.0 (D) 30.24(R) Minimum	32.6	Yes	
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	132 (D)	103	Yes	
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):						
	1)	At hitch points	Non Evaluative	[Tolerance of minus 10%]	24.50 (D)	22.91	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	18.10 (D) 8.90 (R) Minimum	18.8	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 Minutes, (mm)		Non Evaluative	[Tolerance of plus 5 [mm]	50 (D) Maximum	60	No
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 (R)	9.65	Yes
	2)	Hot brake	Evaluative	10	10 (R)	9.65	Yes

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b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600 (R) Maximum	174 to 248	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
16.1.5	Noise measurement :					
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88(R)	85	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	98(R)	98	Yes
16.1.6	Amplitude of mechanical vibrations at:					
	1) Left foot rest	Non Evaluative	100 microns (max)	100(R)	80	Yes
	2) Right foot rest				100	Yes
	3) Seat (with driver seated)				120	No
	4) Steering wheel				80	Yes
16.1.7	Haulage requirements :					
a)	Gross mass of the trailers, (tones):					
	1) Two wheel	Non Evaluative	--	6.0 (D)	6.0	Yes
	2) Four wheel		--	8.0 (D)	8.0	Yes
b)	Distance travelled / liter of fuel consumption, (km/l):					
	1) Two wheel	Non Evaluative	--	3.0 to 6.0(D)	3.83 to 3.97	Yes
	2) Four wheel		--	3.0 to 6.0(D)	3.45 to 3.59	Yes
1	2	3	4	5	6	7
c)	Fuel consumption (ml/km/tonne):					
	1) Two wheel	Non Evaluative	--	25 to 50(D)	41.91 to 43.52	Yes
	2) Four wheel		--	25 to 50(D)	34.75 to 36.27	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	Manufacture has not recommended the tractor for puddling operation. Hence the puddling test was not conducted	Not applicable
	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	Provided	Yes
b)	Lighting	Evaluative	As per CMVR	--	Provided	Yes

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	arrangement						
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	--	New Holland	Yes
	2)	Model	Evaluative		--	6010	Yes
	3)	Unit No.	Evaluative		--	L308	Yes
	4)	Engine number	Evaluative		--	538709	Yes
	5)	Chassis number	Evaluative		--	PD004	Yes
	6)	Declaration of PTO power, (kW) (Ps)	Evaluative		--	39.0/52.3	Yes
16.1.11	Discard limit for:						
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer	104.2 (D)	104.0 to 104.04	Yes	
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.50 (D)	0.148 to .0172	Yes	
(c)	Ring end gap (mm):						
	-	Top comp. ring.	Evaluative	-do-	1.50(D)	0.25 to 0.35	Yes
	-	2 nd comp. ring.		-do-	1.50(D)	0.65 to 0.70	Yes
	-	Oil ring.		-do-	1.80(D)	0.25 to 0.40	Yes
(d)	Ring groove clearance (mm):						
	-	Top comp. ring.	Evaluative	-do-	--	Taper rings	--
	-	2 nd comp. ring.		-do-	0.40 (D)	0.080 to 0.16	Yes
	-	Oil ring.		-do-	0.40 (D)	0.06	Yes
(e)	Clearance of main bearings (mm):						
	-	Diametrical clearance	Evaluative	To be specified by the manufacturer	0.50 (D)	0.100 to 0.137	Yes
	-	Crankshaft end float	Evaluative		0.50 (D)	0.10	Yes

1	2	3	4	5	6	7	
(f)	Clearance of big end bearings, (mm):						
	-	Diametrical	Evaluative	-do-	0.50 (D)	0.068 to 0.096	Yes
	-	Axial	Evaluative	-do-	0.75 (D)	0.10	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.40 (D)	0.12 to 0.19	Yes	
(h)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	0.50 (D)	0.19 to 0.20	Yes	

16.1.12	Literature (Submission to test agency)					
(a)	Operator manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
(b)	Parts Catalogue	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
(c)	Workshop/Service manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Not provided	No

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16.1.13 CATEGORY OF BREAKDOWNS / DEFECTS :					
Sl. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	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	One	Yes
3.	Minor	Evaluative	Not more than five and frequency of each should not be more than two.	Three	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.	Four	Yes

16.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2014:				
S.No.	Characteristic	Requirements as per IS: 12207-2014	As observed	Remarks
1	2	3	4	5
1	Air cleaner oil pull over, max. Oil pull over (%)	0.25% (max.)	Not applicable	--
2.	Seating 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.	Not provided	--
		If ROPS fitted it should meet the requirement of IS: 11821-1992	ROPS not fitted	--
4.	Technical requirements for PTO shaft	Should meet the requirements of IS: 4931 -1995	Meet the requirements	Yes
5.	Dimensions of three point linkage	Should meet the requirements of IS: 4468 (Part-I)-1997	Meet the requirements	Yes
6.	Specifications of linkage drawbar	Should meet the requirements of IS: 12953-1990.	Meets the requirements	Yes
	Specification of swing-ing drawbar	Should meet the requirements of IS: 12362 Part 3-1994.	Not provided	--
7.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Provided	Yes

16.3 Conformity with following IS:

- i) Guidelines for declaration of power and specific fuel consumption and labeling 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 (Reaffirmed in March, 2007)/ISO 730-1:1994] : Conforms
- 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 (First revision) (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 (Reaffirmed in March, 2009)/ISO 4254-1:1989]. | : 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)]. | : Conforms |
| viii) | Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1 & Part-2) –2006 & 2007(Reaffirmed in March, 2009)/ ISO 3767-2:1991)]. | : Conforms |
| 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 30.7%.
- ii) The Power corresponding to rated engine speed was recorded as 36.9 kW against the declaration of 39.0 kW, which does not meet the requirements of IS: 12207-2014 with regard to tolerance. This should be looked into for necessary corrective action.
- iii) The maximum engine oil operating temperature was observed as 134 degree Celsius against the declaration of 132 degree Celsius and which does not meet the requirement of IS: 12207-2014 with regard to tolerance. This should be looked into for necessary corrective action.
- iv) During the PTO performance test leakage of engine oil was observed from the engine timing cover and turbo unit lubricating pipeline. The parts replaced are a) connecter metallic part no. 5801733773-01 no. b)flexible pipe part no.5801791693-01 no. c) flange bolt M8x1.25x80, part no.16592624-01 no. d) sealing washer part no. 4716734-01 no. e) adopter turbo part no. 11212611-01 no. f) washer M16x22x1-01 no. g) timing cover gasket, is categorized as minor defect which does not meet the requirement of IS: 12207-2014 with regard to tolerance. This should be looked into for necessary corrective action.

16.4.1.2 Hydraulic performance:

- i) During the hydraulic performance test at maintenance of lift load, the oil was leaked at the outlet of pump, so 'O-ring' - 01no's was replaced with new one. The leakage from 'O-ring' of is categorized as minor (Mn-14) defect as per IS: 12207-2014. This should be looked into for necessary corrective action.
- ii) Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 Minutes, (mm) was recorded as 60mm against the declaration of 50mm which does not meet the requirements of IS: 12207-2014 with regard to tolerance. This should be looked into for necessary corrective action.

16.4.1.3 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.

16.4.1.4 Location and operation of operator's control:

Working clearance between Draft & Position lever does not meet the requirement of the IS: 12279 (Part-2)-1999. This should be looked into for necessary corrective action.

16.4.2 Field performance:

During the field performance test preparation the problem for engagement and disengagement of PTO observed and after opening the cover the PTO fork found broken .The Fork was replaced with new one part no. 84496544. And is categorized as major defect which does not meet the requirement of IS: 12207-2014 with regard to tolerance This should be looked into for necessary corrective action.

16.4.2.1 Wetland cultivation (Puddling operation):

The manufacturer has recommended that the tractor is not suitable for wetland cultivation (puddling operation) and therefore, the wetland cultivation (puddling operation) was not conducted. It is recommended that in all the literature this fact that the tractor is not suitable for wetland (puddling) operation should be mentioned clearly & boldly in all the relevant literature of the tractor & also a cautionary notice regarding non-suitability of tractor for puddling operation may be displayed on the bonnet of the tractor.

16.5 The seating requirements does not meet the requirements of IS: 12343-1998 and Optional requirements as per Clause-4 (Table-2) of IS: 12207-2014: This should be looked into for necessary corrective action.

16.6 The text provided with year code is unit no. instead of year of manufacture on the label plate of the tractor. This does not fulfill Labelling of tractors (Provision of labelling plate). This should be looked into for necessary corrective action.

16.7 Maintenance / Service Problems:

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

16.8 Recommendation with regard to safety on tractor:

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

- i) Provision for spark arresting device in exhaust system.
- ii) Provision of PTO shaft master shield.

16.9 Adequacy of Literature:

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

- a) Operator's manual (For 7510,6510 & 6010 excel series model tractors)
- b) Service Parts catalogue (For 7510,6510 & 6010 excel series tractor models)
- c) Service Manual (For 7510,6510 & 6010 excel series tractor models)

- 16.9.2**
- i) Information on variant models & their feature at a glance shall also be included in the operator's manual
 - ii) The manufacturer has recommended that the tractor is not suitable for wetland cultivation (puddling operation) and therefore, the wetland cultivation (puddling operation) was not conducted. It is recommended that in all the literature this fact that the tractor is not suitable for wetland (puddling) operation should be mentioned clearly & boldly in all the relevant literature of the tractor & also a cautionary notice regarding non-suitability of tractor for puddling operation may be displayed on the bonnet of the tractor.
- 16.9.3** The literature should be brought out in national as well as other regional languages of India for guidance of users.

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
11 Months (October, 2013 to August,2014)	10 Months	No	The delay is due to the other tractors, which were under wetland test at the farm before paddy transplanting and most of staff was engaged during the period.

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TESTING AUTHORITY:

Rakesh Paliwal
Agricultural Engineer

H.L.Yadav
Senior Agricultural Engineer

C.R.Lohi
Director

18. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
18.1	16.4.1.1 (i,ii & iv), 16.4.1.3 (i,ii), 16.4.1.4, 16.4.1.5, 16.4.2, 16.4.2.1, 16.5, 16.6, 16.9, 16.10.2 & 16.10.3	Your valuable comments & suggestions for improvements are well taken. Under our policy of continuous product improvement these aspects are further being looked into & will take appropriate actions to eliminate these deviations soon wherever necessary.

ANNEXURE – I

BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST

S. No.	Item	Disc Plough	Rotavator
1.	Make	Field King	Shaktimaan
2.	Type	Mounted	Mounted
3.	No. of bottoms/blades	Three	48, in 9 flanges
4.	Type of bottoms/blades	Plain Concave	Hatchet
5.	Size of bottoms/blades,(mm)	525	130 x 70 x 5
6.	Spacing of bottoms/flanges,(mm)	520	245
7.	Lower hitch point span,(mm)	855	835
8.	Mast height (mm)	440	610
9.	Overall dimensions,(mm):		
	- Length	2030	1115
	- Width	1750	2040
	- Height	1070	1130
10	Gross mass, (kg)	365	525

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

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	14.8
3.	Power lift and hydraulic pump performance test	2.8
4.	Drawbar performance test	28.5
5.	Turning ability	0.3
6.	Location of centre of gravity	0.3
7.	Safety ,comfort &Operator's field of vision	0.3
8.	Brake test	1.5
9.	Noise measurement	2.2
10.	Mechanical vibration test	1.0
11.	Theoretical speed test	3.1
B.	FIELD TEST:	
1.	Disc ploughing	21.6
2.	Rotavation	16.4
C	HAULAGE TEST	7.2
D.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	3.6
	TOTAL:	103.6