



NEW HOLLAND 6510 - 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)

ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५ TRACTOR NAGAR, BUDNI (M.P.) 466445

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Manufacturer : M/s. New Holland Fiat (India) Pvt. Ltd.,
 Plot N0.-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 : 6510
Brand name : New Holland
***Variants. If any:**

S.No.	Variants Model	Variant Feature
1	New Holland 6510 2WD	24+24 Transmission, 2WD
2	New Holland 6510 8+8	8+8 Transmission, 2WD
3	New Holland 6510 4WD	24+24 Transmission, 4WD
4	New Holland 6510 12+12	12+12 Transmission, 4WD

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

Type : Four wheeled, Rear-wheel driven,
 Standard Agricultural Tractor.
Year of manufacture : September , 2013 (L309)
Chassis number : NH8259603
Country of origin : India

1.2 Engine:
Make : IVECO (apa)
Model : 8035.45.724
Type : Four stroke, water cooled, turbocharged,
 intercooled, direct injection, diesel engine.
Serial number : 117786DT
Year of manufacture : 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	42.5 (D)	42.4	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	42.5 (D)	41.7	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	260 (D)	270	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	255 (D)	246.7	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	31.0 (D)	43.2	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.	132(D)	122	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.	119 (D)	101	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.80 Maximum (R)	0.216	Yes
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)	0.59	Yes
1	2	3	4	5	6	7

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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)	24.85	Yes	
				23.14 (R) Minimum			
b)	Max. drawbar pull with standard ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast or with standard ballast, as the case may be	18.0 (D)	18.83	Yes	
				16.38 (R) Minimum			
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.	34.0 (D)	34.2	Yes	
				33.9(R) Minimum			
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	132 (D)	102	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%]	24.52 (D)	23.82	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	18.50 (D) 10.04 (R) Minimum	21.88	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	The observed value should not exceed 50 mm	50 (D) Maximum	35	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 (R)	6.76	Yes
	2)	Hot brake	Evaluative	10	10 (R)	7.18	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600 (R) Maximum	289 to 328	Yes	
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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)	84	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	98(R)	94	Yes
16.1.6 Amplitude of mechanical vibrations at:						
	1) Left foot rest	Non Evaluative	100 microns (max)	100(R)	30	Yes
	2) Right foot rest				40	Yes
	3) Seat (with driver seated)				100	Yes
	4) Steering wheel				250	No
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)	4.09 to 4.17	Yes
	2) Four wheel		--	3.0 to 6.0(D)	3.69 to 3.73	Yes
c)	Fuel consumption (ml/km/tonne):					
	1) Two wheel	Non Evaluative	--	25 to 50(D)	33.89 to 40.69	Yes
	2) Four wheel		--	25 to 50(D)	33.54 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	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-				
	4) Engine Oil	-do-				
	5) Transmission Oil	-do-				
16.1.9 Safety features :						
a)	Guards against moving and hot parts	Evaluative	Belt drives, pullies, silencer, hydraulic pipes (As per IS 12239 (Part2)	At present no requirements	Provided	Yes
b)	Lighting arrangement	Evaluative	As per CMVR	--	Provided	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)	--	Meets the requirements	Yes
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d)	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	--	Does not Meet the requirements	No
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	Non Evaluative	Should meet the requirements of IS 12953 and IS 12362 (Part 3) (As amended from time to time)	--	Meet the requirements	Yes
	Swinging drawbar			--	Not Provided	Not applicable
16.1.10	Labelling of tractors (Provision of labelling plate):					
	1) Make	Evaluative	Should conform to the requirements of CMVR	--	New Holland	Yes
	2) Model	Evaluative		--	6510	Yes
	3) Unit No.	Evaluative		--	L309	Yes
	4) Engine number	Evaluative		--	117786DT	Yes
	5) Chassis number	Evaluative		--	NH8259603	Yes
	6) Declaration of PTO power, (kW) (Ps)	Evaluative		--	42.5 (57.0)	Yes
16.1.11	Discard limit for:					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer and supported by the printed literature	104.2 (D)	104.02	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.50 (D)	0.132 to 0.150	Yes
(c)	Ring end gap (mm):					
	- Top comp. ring.	Evaluative	-do-	1.50(D)	0.35 to 0.50	Yes
	- 2 nd comp. ring.		-do-	1.50(D)	0.60 to 0.70	Yes
	- Oil ring.		-do-	1.80(D)	0.40 to 0.70	Yes
(d)	Ring groove clearance (mm):					
	- Top comp. ring.	Evaluative	-do-	--	Taper rings	--
	- 2 nd comp. ring.		-do-	0.40 (D)	0.050 to 0.39	Yes
	- Oil ring.		-do-	0.40 (D)	0.063 to 0.09	Yes
(e)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	-do-	0.50 (D)	0.133 to 0.149	Yes
	- Crankshaft end float	Evaluative		0.50 (D)	0.10	Yes
(f)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.50 (D)	0.070 to 0.099	Yes
	- Axial	Evaluative	-do-	0.75 (D)	0.26	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.40 (D)	0.063 to 0.108	Yes
(h)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	0.50 (D)	0.07 to 0.13	Yes
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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)	Provided	Yes

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	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:12207-2014:				
S.No.	Characteristic	Requirements as per IS: 12207-2014	As observed	Remarks
1.	Fitment of ROPS	With a provision for fitment of ROPS. If ROPS fitted it should meet the requirement of IS: 11821 (As amended from time to time) or equivalent International Standards	Not provided ROPS not provided	Not applicable Not applicable
2.	Accessories	Trailer hitch, front tow hook, 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)] : Does not conform
- 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)]. : Conforms
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision) : Does not conform
[IS 12239 (PT-1)-1996 (Reaffirmed in March, 2009)/ISO 4254-1:1989].
- 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) 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 43.2%.
- ii) The power at rated engine speed as 41.7 kW against the declaration of 42.5kW, which is within the tolerance limit of IS: 12207-2014.
- iii) The specific fuel consumption corresponding to maximum power was measured as **270** g/kWh against the declaration of 260 g/kWh, which is within the tolerance limit of IS: 12207-2014.

16.4.1.2 Drawbar performance test:

- i) During the 10 hour drawbar test at the 15 % wheel slip, the RHS rear tyre got puncture due to creeping of tyre over the rim. So, the RHS rear wheel tube was replaced with new one.
- ii) During ten hours drawbar test, creeping of LHS & RHS rear tyre over the rims was observed as 25 mm & 95 mm respectively. This should be looked into for necessary corrective action.

16.4.1.3 Hydraulic performance:

- i) The moment about rear axle with standard frame was calculated as **36.10 kN-m**. Whereas, the moment about front axle was calculated as **19.64 kN-m** under standard ballasted condition and **26.43 kN-m** under ballasted condition. The moment about rear axle is on higher side as compared to the moment about front axle even under ballasted condition. It is, therefore, recommended that the lifting capacity of the hydraulic system may be reduced suitably or ballast recommendation may be reviewed to avoid the front lifting of the 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 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.

16.4.2.1 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 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.

16.6 Maintenance / Service Problems:

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

16.7 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.

16.8 Adequacy of Literature:

16.8.1 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)

16.8.2 Information on variant models & their feature at a glance shall also be included in the operator's manual

16.8.3 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
Months (February, 2014 to November ,2014)	10 Months	Yes	Yes

TESTING AUTHORITY:

A.K .SINGH

SENIOR AGRICULTURAL ENGINEER

C.R.LOHI

DIRECTOR

Test Report compiled by **Shri. Chanchlesh Singh Raghuwanshi**, Senior Technical Assistant.

18. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
18.1	16.4.1.2), 16.4.1.4, 16.4.2.1, 16.5, 16.7, 16.8.2 & 16.8.3	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.