

व्यावसायिक परीक्षण रिपोर्ट

COMMERCIAL TEST REPORT (Initial)

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**NEW HOLLAND 4510 A TRACTOR**



सत्यमेव जयते

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, CO-OPERATION AND FARMERS WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

**CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE**

(An ISO : 9001 - 2008 Certified Institute)

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NEW HOLLAND 4510 A 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 : 4510 A  
Brand name : NA  
\*Variants. If any: : None  
New Holland 4510 A

S.No.	Variants Model	Variant Feature
1	New Holland 4510 A1	8+8 Transmission

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

Type : Four wheeled, Rear-wheel driven,  
Standard Agricultural Tractor.  
Chassis number : NHN45100ZEJ302633  
Year of manufacture : JE (As per coding detail i.e. it means  
September,2014)  
Country of origin : India

### 1.2 Engine:

Make : SIMPSON  
Model : T-III A S325/NH-F2.1  
Type : Four stroke, water cooled, direct injection,  
diesel engine.  
Serial number : G05820  
Country of origin : India

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

- Maximum speed at no load : 2170 to 2230  
- Low idle speed : 600 to 800  
- Speed at maximum torque : 1200 to 1400  
**Rated speed, (rpm):**  
- For PTO use : 2000  
- For drawbar use : 2000





### 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 observ- ed	Whether meets the require- ments (Yes/No)
1	2	3	4	5	6	7
<b>16.1.1 PTO Performance :</b>						
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	28 (D)	28.2	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	28 (D)	28.2	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	265 (D)	276	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	160 (D)	160.7	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	20 (D)	19.1	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)	133	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)	100	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.76 Maximum (R)	0.34	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)	0.31	Yes



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1	2	3	4	5	6	7
<b>16.1.2 Drawbar performance :</b>						
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	19.0 (D) 17.27 (R) Minimum	20.44	Yes
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	13.5 (D) 12.17 (R) Minimum	15.12	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.	22.5(D) 22.6(R) Minimum	26.4	Yes
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	130 (D)	81	Yes
<b>16.1.3 Power lift and hydraulic pump performance :</b>						
<b>a) Maximum lifting capacity throughout the range of lift, (kN):</b>						
	1) At hitch points	Non Evaluative	[Tolerance of minus 10%]	14.75 (D)	17.93	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	12.0 (D) 6.64 (R) Minimum	15.12	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	31	Yes





1	2	3	4	5	6	7
<b>16.1.4</b>	<b>Brake performance at 25 kmph:</b>					
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)	7.52	Yes
	2) Hot brake	Evaluative	10	10 (R)	7.66	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s <sup>2</sup> (N)	Evaluative	600	600 (R) Maximum	204 to 247	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
<b>16.1.5</b>	<b>Noise measurement :</b>					
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88(R)	80	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	96 (R)	94	Yes
<b>16.1.6</b>	<b>Amplitude of mechanical vibrations at:</b>					
	1) Left foot rest	Non Evaluative	100 microns (max)	100(R)	130	No
	2) Right foot rest				120	No
	3) Seat (with driver seated)				40	Yes
	4) Steering wheel				110	No
<b>16.1.7</b>	<b>Haulage requirements :</b>					
a)	Gross mass of the trailers, (tones):					
	1) Two wheel	Non	--	4.5 (D)	4.5	Yes
	2) Four wheel	Evaluative	--	6.5 (D)	6.5	Yes
b)	Distance travelled / liter of fuel consumption, (km/l):					
	1) Two wheel	Non Evaluative	--	4.0 to 6.0(D)	4.65 to 4.86	Yes
	2) Four wheel		--	4.0 to 6.0(D)	4.30 to 4.59	Yes
c)	Fuel consumption (ml/km/tonne):					
	1) Two wheel	Non Evaluative	--	25 to 50(D)	45.67 to 47.82	Yes
	2) Four wheel		--	25 to 50(D)	33.47 to 35.70	Yes
<b>16.1.8</b>	<b>Wetland cultivation :</b>					
	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	No ingress of mud and / or water was observed	Yes
	1) Clutch assembly	-do-				
	2) Brake housings	-do-				
	3) Front axle hubs	-do-				
	4) Engine Oil	-do-				
	5) Transmission Oil	-do-				



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1	2	3	4	5	6	7
<b>16.1.9 Safety features :</b>						
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes (As per IS 12239 (Part2))	--	Meets the requirements	Yes
b)	Lighting arrangement	Evaluative	As per CMVR	--	Meets the requirements	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
d)	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	--	Meets the requirements	Yes
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)	--	Does not Meet the requirements	No
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

<b>16.1.10 Labelling of tractors (Provision of labelling plate):</b>						
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	--	New Holland	Yes
2)	Model	Evaluative		--	4510 A	Yes
3)	Year of manufacture	Evaluative		--	JE (As per coding detail given in chassis number: i.e. it means September,2014)	Yes
4)	Chassis number	Evaluative		--	NHN45100ZEJ302633	Yes
5)	Engine number	Evaluative		--	Not Provided on labeling plate	Yes
6)	Declaration of PTO power, (kW)	Evaluative		--	28.0	Yes

<b>16.1.11 Discard limit for:</b>						
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer and supported by the printed literature	91.68 (D)	91.48 to 91.49	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.50 (D)	0.140 to 0.144	Yes
(c)	<b>Ring end gap (mm):</b>		Evaluative	-do-	1.50(D)	0.43
	- Top comp. ring.	-do-		1.50(D)	0.33 to 0.40	Yes
	- 2 <sup>nd</sup> comp. ring.	-do-		1.50(D)	0.33 to 0.35	Yes
(d)	<b>Ring groove clearance (mm):</b>		Evaluative	-do-	0.40 (D)	0.071 to 0.074
	- Top comp. ring.	-do-		0.40 (D)	0.062 to 0.066	Yes
	- 2 <sup>nd</sup> comp. ring.	-do-		0.40 (D)	0.060 to 0.063	Yes
	- Oil ring.					



<b>(e) Clearance of main bearings (mm):</b>						
	- Diametrical clearance	Evaluative	-do-	0.60 (D)	0.095 to 0.127	Yes
	- Crankshaft end float	Evaluative		0.50 (D)	0.19	Yes
<b>(f) Clearance of big end bearings, (mm):</b>						
	- Diametrical	Evaluative	-do-	0.60 (D)	0.085 to 0.163	Yes
	- Axial	Evaluative	-do-	0.75 (D)	0.25	Yes
<b>(g)</b>	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.50 (D)	0.050 to 0.143	Yes
<b>(h)</b>	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	0.50 (D)	0.159 to 0.182	Yes
<b>16.1.12 Literature (Submission to test agency)</b>						
<b>(a)</b>	Operator manual	Evaluative	Provided/ Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
<b>(b)</b>	Parts Catalogue	Evaluative	Provided/ Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
<b>(c)</b>	Workshop/ Service manual	Evaluative	Provided/ Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes

<b>16.1.13 CATEGORY OF BREAKDOWNS / DEFECTS :</b>					
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

<b>16.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2014:</b>				
S.No.	Characteristic	Requirements as per IS: 12207-2014	As observed	Remarks
1.	Maximum oil pull over, (%)	0.25% (max.)	0.15	Yes
2.	Fitment of ROPS	With a provision for fitment of ROPS.	Not provided	Not applicable
		If ROPS fitted it should meet the requirement of IS: 11821 (As amended from time to time) or equivalent International Standards	ROPS not provided	Not applicable
3.	Accessories	Trailer hitch, front tow hook, may be provided.	Provided	Yes



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**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)]. : Conforms
- 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)]. : **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]]. : **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)]. : **Does not conform**
- 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 19.1%.
- ii) During the high ambient test engine oil temp was reaching to 133 ° C in two hour max power test, against the declaration of max engine oil temp 132 °C, which was considered on higher side. This should be looked into for necessary corrective action



**16.4.1.2 Drawbar performance test:**

- i) During ten hours drawbar test, creeping of LHS & RHS rear tyre over the rims was observed as 30 mm & 40 mm respectively. 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:**

The working clearance around the position control lever & mudguard does not meet the requirement of the IS: 12279 (Part-2)-1999. This should be looked into for necessary corrective action.

**16.4.1.5 Three point linkage:**

- i) The lateral distance from lower hitch point to center line of tractor does not meet the requirements of IS: 4468 (Part I)-1997. This should be looked into for necessary corrective action.
- ii) Some of the parameters of the three point linkage conform to Cat. I and some of them conform to Cat.II. Keeping in view of the spirit of standardization, the necessary improvements may be incorporated.

**16.4.1.5 Labeling plate:**

The labeling plate provided by applicant as per guidelines of GSR 291 (E), in rule 122 (1A) and as per CMVR requirement had been not provided the Specific fuel consumption, power in hp and year of manufacturer in numerical form as per IS:10273-1987 (reaffirmed in March,2009) for better understanding of the users. Hence it is recommended to provided the same at manufacturing level.

**16.4.2.1 Wetland cultivation (Puddling operation):**

No ingress of mud and / or water was noticed during puddling operation of the tractor and meet the requirements of IS: 11082-1984 (Technical requirements of agricultural tractors for wetland operation). Therefore, the tractor is recommended as suitable for wetland operation (Puddling).

**16.5 Maintenance / Service Problems:**

No noticeable maintenance or service problem 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:

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

**16.7 Symbols of operator's control and other displays [Conformity with IS: 6283 (Part 1 & 2)-1998]:**

The symbols for following controls were not provided as per the requirements of Indian Standard and calls necessary improvement.

- i) Oil lubricant, type and frequency has been not provided.
- ii) Grease lubricant frequency has been not provided.

**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 3210,3510 4010 4510 & 4710 series model tractors)
- b) Service Parts catalogue (For 3210,3510 4010 4510 & 4710 series model tractors)
- c) Service Manual (For 3210,3510 4010 4510 & 4710 series model tractors)



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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
8 Months (March ,2015 to October , 2015)	10 Months	Yes	Yes

**TESTING AUTHORITY:****P. C MESHAM**

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	16.3 (vi), 16.3(vii), 16.4.4.4, 16.6	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	2	30, in 6 flanges
4.	Type of bottoms/blades	Plain concave	Hatchet
5.	Size of bottoms/blades,(mm)	650	110 x 50 x 5
6.	Spacing of bottoms/flanges,(mm)	560	235
7.	Lower hitch point span,(mm)	860	770
8.	Mast height (mm)	615	545
9.	Overall dimensions,(mm):		
	- Length	1850	1040
	- Width	855	1130
	- Height	1200	1000
10	Gross mass, (kg)	295	320