

SAE (T)

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL (VARIANT) TEST REPORT

संख्या / No. : T-1052/1577/2016
माह / Month : December, 2016



NEW HOLLAND, 6010 (12+12) 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

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

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 : 50
- Transmission : 50

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

1. SCOPE OF TEST

The “**New Holland, 6010**” tractor had undergone “Initial Commercial Test” at this Institute and a test report **No.T-939/1457/2014**, was released in October, 2014. Now the applicant has submitted an application vide letter No. PD-L11610 dated 23.07.2015 for testing of “**New Holland, 6010 (12+12)**” tractor as a Variant of “**New Holland, 6010**” tractor.

The applicant having enclosed a list of following differences in the technical specifications between the tractor base model “**New Holland, 6010**” and variant model “**New Holland, 6010 (12+12)**” and requested to test the “**New Holland, 6010 (12+12)**” as a variant of “**New Holland, 6010**” tractor :-

The major features of Base model and Variant model are listed below:

S. No.	Parameters	Base Model	Variant Model
1	2	3	4
1.	Make & Model of Tractor	New Holland & 6010	New Holland & 6010 (12+12)
2.	Type of tractor	Four wheeled, Rear wheel driven, General Purpose, Agricultural Tractor	Four wheeled, Four wheel drive (4WD), General Purpose, Agricultural Tractor
3.	Type of drive	2WD	4WD
4.	Number of speed (Forward / Reverse)	24+24	12+12
5.	Front differential unit:		
	Type	Not applicable	Crown wheel & bevel pinion with differential unit accommodated inside the centre of front axle housing.
	Reduction through crown wheel and bevel pinion	Not applicable	3.22:1 (29/9T)
6.	Front axle & front final drive:		
	Type	Not applicable	Planetary reduction unit
	Reduction through final drive	Not applicable	6.0 : 1 (12T Sun, 23T Planets & 60T for Ring)
7.	Number of front wheel revolutions for one revolution of rear wheel	Not applicable	1.37

1	2	3	4
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7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

7.1 On the basis of test conducted the performance results have been summarized as evaluative (mandatory) and non – evaluative (not mandatory) parameters applicable for qualifying Minimum Performance Criteria as per clause-4 table-1 of Indian Standard **12207: 2014** for acceptance of tractor for the purpose of subsidies/NABARD financing for the applicable features for this tractor model.

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	Values declared by the applicant/ requirement		As observed		Whether Variant model meets the requirements (Yes/ No.)
				Base model	Variant Model	Base model	Variant model	
1	2	3	4	5 a	5 b	6 a	6 b	7
7.1.1	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 >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	39.0	37.8	38.0	Yes
b)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	265	265	266	257	Yes
7.1.2	Drawbar performance :							
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	25.00 (D) 23.08 (R) Minimum	27.00 (D) 22.44 (R) Minimum	29.90	31.70	Yes
b)	Maximum drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast	18.00 (D) 16.45 (R) Minimum	20.00 (D) 17.34 (R) Minimum	22.73	23.43	Yes
c)	Maximum drawbar power without 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.	33.0 (D) 30.2 (R) Minimum	33.0 (D) 30.4 (R) Minimum	32.6	31.5	Yes
d)	Max. transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	132	132	103	108	Yes

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1	2	3	4	5 a	5 b	6 a	6 b	7
7.1.3	Noise measurement:							
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88 (R)	88 (R)	85	82	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	98 (R)	96 (R)	98	96	Yes
7.1.4	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.	The manufacturer has recommended that the tractor is not suitable for wetland cultivation (Puddling operation)	Variant model Recommended for wetland cultivation (puddling operation)	Base Model was Not recommended for wetland cultivation (Puddling operation).	In variant model No ingress of mud/or water was noticed	Yes
	1) Clutch assembly	-do-						
	2) Brake housing	-do-						
	3) Front axle hubs	-do-						
	4) Engine oil	-do-						
	5) Transmission oil	-do-						
7.1.5	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 Fiat (India) Pvt. Limited.				Yes
	2) Model	Evaluative		6010	6010 (12+12)			Yes
	3) Year of manufacture	Evaluative		L308	L409			Yes
	4) Engine serial number	Evaluative		538709	149665DT			Yes
	5) Chassis serial number	Evaluative		PD004	NH8303003			Yes
	6) Declaration of PTO power, kW	Evaluative		39.0 (52.3)	39.0 (52.3)			Yes
7.1.6	Literature (Submission to test agency):							
(a)	Operator manual	Evaluative	Provided/ Not Provided	Provided		Provided		Yes
(b)	Parts Catalogue	Evaluative	Provided/Not Provided	Provided		Provided		Yes
(c)	Workshop/ Service manual	Evaluative	Provided/Not Provided	Provided		Provided		Yes

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7.1.7 CATEGORY OF BREAKDOWNS / DEFECTS :

S. 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.	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.	Three (Mn-01, Mn-07 & Mn-20)	Yes

7.2 Salient Observations:

7.2.1 Laboratory tests:

7.2.1.1 PTO Performance:

- i) The maximum PTO power in case of base and variant models were observed as **37.8 & 38.0 kW** against the declaration of **39.0 kW** respectively, which meets the requirement of IS: 12207-2014 with regard to tolerance limit.
- ii) The specific fuel consumption in case of base and variant models corresponding to maximum power were observed as **266 & 257 g/kWh** against the declaration of **265 g/kWh** respectively, which meets the requirement of IS:12207-2014 with regard to tolerance.
- iii) During the PTO performance test leakage of exhaust gas from turbo charger assembly was observed. To rectify the problem, the gasket of exhaust manifold [pt no. 98489690 (Number-03)] & gasket of turbo charger assembly [pt no. 4834948 (Number-01)] was replaced with new one. This breakdown/defect has been categorized in minor (**Mn-07**) breakdown as per IS: 12207-2014. This should be looked into for necessary corrective action.

7.2.1.2 Drawbar performance:

- i) During ten hour drawbar test creeping of LHS and RHS rear tyre over the rims was observed as **25 & 25 mm**, which was considered on higher side. This should be looked into for necessary corrective action.
- ii) During the preparation of drawbar test the self starter of tractor was not working. On inspection it was observed that solenoid switch was burned out and it was replaced with new one. **This breakdown/defect has been categorized in minor (Mn-01) breakdown as per IS: 12207-2014 and calls for stringent quality control measures at production level.**
- iii) During drawbar performance test leakage of oil from bottom side of LHS brake housing was noticed. On inspection it was observed that oil seal of brake rod assembly [pt no. 82037652 (Number-01)] was damaged and it was replaced with new one. This breakdown/defect has been categorized in minor (**Mn-20**) breakdown as per IS: 12207-2014. This should be looked into for necessary corrective action.

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- 7.2.1.3 Nominal speed:**
The nominal speed of the tractor recorded as **38.52 kmph** in high reverse gear (RH4), which is even higher than the maximum forward speed recorded as 32.46 kmph in H4 gear. The speed recorded in reverse gear RH4 is not safe as far as the reversing of tractor is concerned. This should be looked into for necessary corrective action.
- 7.4.1.4 Linkage drawbar:**
Some of the parameters of the drawbar 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.
- 7.4.1.5 Operator's Seat:**
The length of seat does not meet the requirement of IS: 12343-1998 (Re-affirmed in March, 2009) and calls for necessary corrective action.
- 7.4.1.6 Wet land 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 found as suitable for wetland operation (Puddling).
- 7.5 Maintenance / Service Problems:**
No noticeable maintenance/ service problem was observed during the test.
- 7.6 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) The working clearance around the range selector lever & mudguard.
 - iii) Provision of PTO shaft master shield.
- 7.7 Adequacy of Literature supplied with machine:**
- 7.7.1** The following literature was supplied with the tractor for reference during the test.
- i) Operator's manual [For New Holland 6010(12+12), New Holland 6510 (12+12) & New Holland 7510 (12+12) tractors model]
 - ii) Service Parts catalogue [For New Holland 6010/6010 (12+12), New Holland 6510/6510 (12+12) & New Holland 7510/7510 (12+12) tractor models]
 - iii) Service Manual [For 6010 (12+12), 6510 (12+12) & 7510 (12+12) tractor models]
- 7.7.2** Information related to PTO , Drawbar and hydraulic performance of the tractor such as, maximum engine power, rated engine power, maximum torque, backup torque, specific fuel consumption, maximum drawbar power & pull, hydraulic pump discharge rate, hydraulic power & lifting capacities etc, should be included in the technical specification of the tractor for the guidance of the user's.
- 7.7.3** The literatures should also be brought out in national as well as other regional languages for the guidance of users and service personnel.

The results of the tests carried out on variant model “**New Holland 6010 (12+12) Tractor**” have been compared with those on base model “**New Holland 6010 Tractor**” and found within the limit, as specified in Indian Standard: 12207-2014.


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(Variant)

8. Citizen Charter

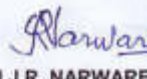
Duration of Test	Test duration under citizen charter	Whether the report released within time frame given citizen charter	Remark, if any
10 Months	06 Month (June, 2016 to December, 2016)	Yes	Nil

TESTING AUTHORITY:-


PRAMOD YADAV
AGRICULTURAL ENGINEER


C.V. CHIMOTE
TEST ENGINEER


Y.K. RAO
SENIOR AGRICULTURAL
ENGINEER

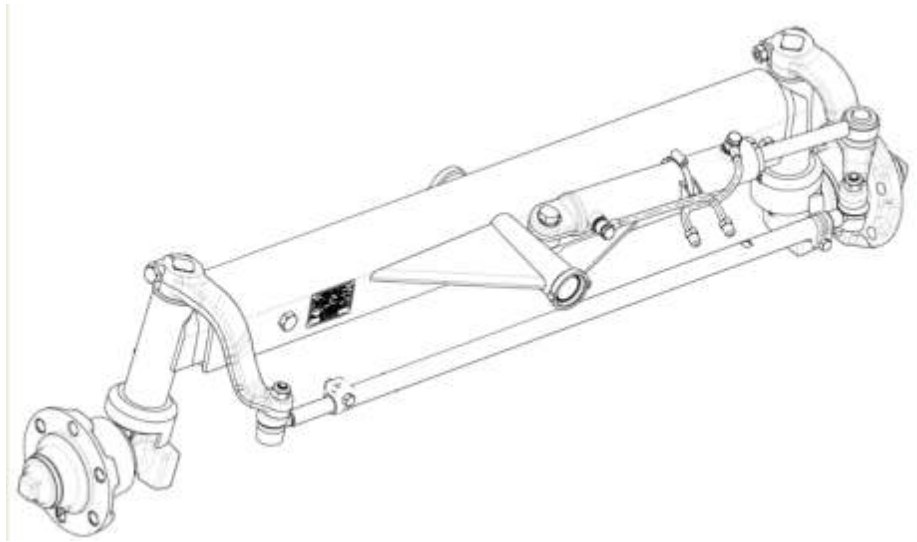

J.J.R. NARWARE
DIRECTOR

9. APPLICANT'S COMMENTS

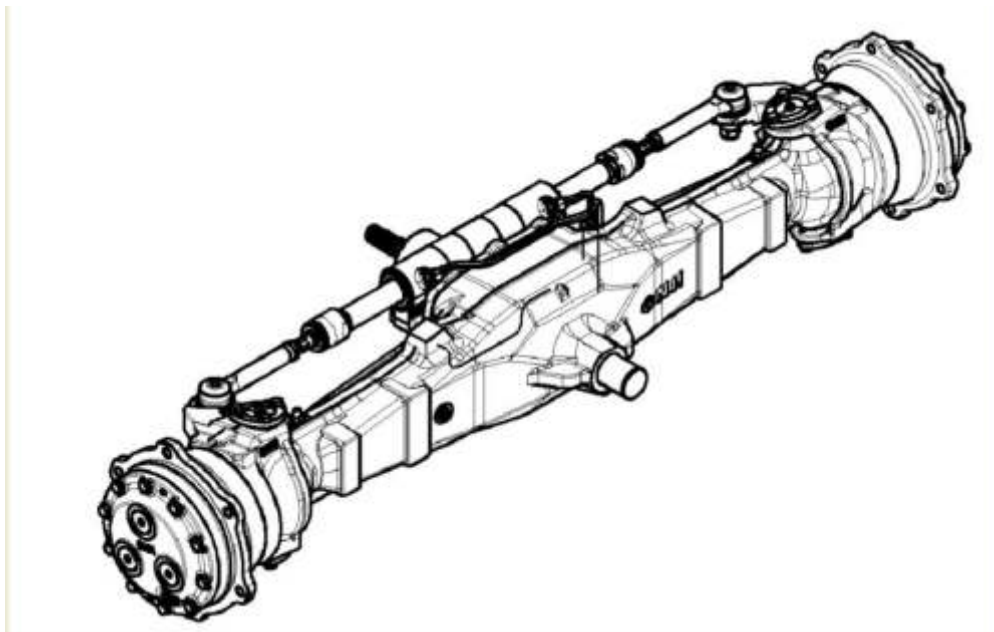
Para No.	Our Reference	Applicant's comments
9.1	7.2.1.1(iii), 7.2.1.2(i,ii,iii), 7.4.1.4, 7.4.1.5, 7.6, 7.7.2 & 7.7.3	Your valuable comments & suggestions for improvements are well taken. Under our policy of continuous product improvement these aspects are further being looked into & will take appropriate actions to eliminate these deviations soon wherever necessary.

ANNEXURE -I

FRONT AXLE DESIGN ON BASE MODEL NEW HOLLAND 6010



FRONT AXLE DESIGN ON VARIANT MODEL NEW HOLLAND 6010 (12+12)



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ANNEXURE- II

BRIEF SPECIFICATION OF FULL CAGE WHEEL

S. No.	Items	Specifications
1.	Type	Full cage wheel
2.	Dia, (mm)	1210
3.	Width, (mm)	900
4.	No. and types of lugs	24, straight lugs made up of MS-angle section welded to angle iron frame.
5.	Size of angle section, (mm)	40 x 40 x 5
6.	Length of lugs, (mm)	444
7.	Spacing of lugs, (mm)	290
8.	Weight of each cage wheels (kg)	120

ANNEXURE – III

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running –in	--
2.	PTO Performance Test	5.2
3.	Drawbar performance test	22.3
4.	Noise measurement	2.5
5.	Location of centre of gravity	0.2
6.	Turning ability	0.2
7.	Nominal speed test	3.0
8.	Puddling (including five hours water proof test)	15.3
B.	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.	0.3
Total		49.0