प्रारंभिक व्यावसायिक परीक्षण रिपोर्ट संख्या/No. : T-1783/2314/2023 INITIAL COMMERCIAL TEST REPORT माह/Month : October, 2023

Application Reference No. 28/2022-23/134 (यह परीक्षण रिपोर्ट 31/10/2028 तक वैध है / THIS TEST REPORT IS VALID UPTO 31/10/2028)



Make of Agricultural Tractor: MAHINDRA

Model : NOVO 605 DI 4WD V1

Manufactured by : Mahindra & Mahindra Limited

(Farm Equipment Sector)

Mahindra Research Valley, Mahindra World City, Plot no. 41/1, Anjur P.O.,

District Chengalpattu - 603004.



भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय (कृषि एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS' WELFARE

(DEPARTMENT OF AGRICULTURE & FARMERS' WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) 466 445

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

TRACTOR NAGAR, BUDNI (M.P.) 466 445 (An ISO 9001:2015 Certified Institute)

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IMPORTANT INFORMATION

The Government of India, Ministry of Agriculture and Farmers' Welfare has directed, vide a OM No. 13-17/2021-M&T (I&P) dated 28.07.2022, that since 15th August, 2022, only mandatory tests will be carried out on a tractor unless applicant has expressly requested for optional tests as well, mentioned in the above captioned OM.

In the instant case, there is no request from the applicant to carry out the optional tests hence only Mandatory Tests, as given below, have been conducted and reported in this report:-

- 1. PTO performance
- 2. Hydraulic performance
- 3. Drawbar performance
- 4. Brake performance

Month: October Test Report No.: T-1783/2314/2023 Year: 2023



GOVERNMENT OF INDIA CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE TRACTOR NAGAR, BUDNI (MADHYA PRADESH) 466445, INDIA

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There is apparently a "Three Power Modes" in the tractor. The applicant has christened the different mode as "Diesel Saver, Normal and Power Mode". However, the applicant vide letter no. FD/BVH/ICT/NOVO605DI4WDVI/23-24/02 dated 23.08.2023 requested to conduct the test only on so called Power mode. Therefore, this report contains the observation on the so called "Power Mode" only.

[C] Tractor manufacturer's name and

address

Mahindra & Mahindra Limited

(Farm Equipment Sector)

Mahindra Research Valley, Mahindra World City, Plot no. 41/1, Anjur P.O.,

District Chengalpattu - 603004.

Location of other manufacturing plants

Mahindra & Mahindra Limited (Farm Equipment Sector)

(i) Akurli Road, Kandivli (E), MUMBAI - 400 101.

(ii) MIDC, Hingna Road, Nagpur - 440 028

(iii) Khatima Panipat Highway, Rudrapur, Udham Singh Nagar - 263 153

(iv) Jaipur Ajmer Road, Jaipur - 303 007

(v) Near Bidar "T" Junction , Mahindra Nagar, Zaheerabad- 502 220

(vi) Mahindra Research Valley Mahindra World City, Plot no. 41/1, Anjur P.O., District Chengalpattu - 603004.

[C] Submitted for test by (Applicant)

The Manufacturer

[C] Selected for test by

The Ministry vide OM No. 13-17/2021 - M&T (I&P) dated 28.07.2022, has allowed the applicant to submit the test sample directly to the Institute without requiring any random selection for Initial Commercial Testing. Thus, the applicant directly submitted the test sample to the Institute for test.

At manufacturer's works

[D] Place of running-in

Duration of running-in:

-Engine : 30 -Transmission : 32

[C] Location of test : Government of India,

Central Farm Machinery Training and Testing

Institute, P.O. - Tractor Nagar, BUDNI – 466445 (M.P.), INDIA

1. SPECIFICATIONS OF TRACTOR

1.1 Identification:1.1.1 Denomination

[D]

[C] Make of tractor : Mahindra

[C] Model : NOVO 605 DI 4WD V1

[C] Type : Four Wheel Drive, Standard Agricultural

Tractor.

[C] Month & year of manufacture : 02/23 [D] Country of origin : India

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1.1.2 Numbers:

[D] 1st Serial No. or prototype : MBNWEBD9FPNL00001 [C] Serial No. : MBNWEBD9FPNL00001

1.2 Engine:

[D] Manufacturer's address : Mahindra & Mahindra Limited

(Farm Equipment Sector)

i) Akurli Road, Kandivli (E), MUMBAI - 400 101

ii) MIDC, Hingna Road, Nagpur - 440 028

iii) Khatima Panipat Highway, Udham Singh Nagar,

Rudrapur - 263 153

iv) Jaipur Ajmer Road, Jaipur - 303 007

v) Near Bidar "T" Junction , Mahindra Nagar,

Zaheerabad- 502 220

vi) Mahindra Research Valley, Mahindra World City,

Plot no. 41/1, Anjur P.O., District Chengalpattu -

603004.

[C] Make : Mahindra

[C] Model : MTMSC35NA055TR4

[C] Type : Four stroke, liquid cooled, naturally aspirated,

common rail, direct injection, diesel engine.

[C] Serial No. : NPL5SCE0002

1.2.1 Cylinders:

[C] Number/disposition : Four, vertical, in-line

[D] Bore / Stroke, (mm)
 [D] Capacity, cm³
 [D] Compression ratio
 [D] Arrangement of valves
 [D] Cylinder liners
 96/122
 3532
 17.2 (±1): 1
 Overhead, inline
 Wet, replaceable

[D] Type of combustion chamber : Re-entrant bowl (hemispherical)

1.2.2 Supercharging : Not Available

1.2.3 Fuel system:

[C] Fuel feed system : Gravity and force feed

 Filter(s)
 :
 Primary
 Secondary

 [C]
 Make
 :
 Bosch
 UFI

 [C]
 Model
 :
 F002H25037
 2424830

[C] Type : Aluminum bowl with Spin on with primer replaceable element. | and replaceable bowl.

[C] Number(s) : One One

[D] Capacity of fuel tank, (I) : 60.0

Injection pump:

[C] Make : Bosch

[C] Model : CB18 0445 025 14B

[C] Type : Mechanical - High Pressure Pump

[C] Serial Number : A000503995

Manufacturer's production setting of injection pump:

[C] Flow rate (rated engine speed & full : 9.31

load), (kg/h)

[D] Timing : Dynamic Injection timing

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6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

On the basis of test conducted the performance results have been summarized as evaluative (mandatory) / Non-evaluative (Non-mandatory) parameters applicable for Qualifying Minimum Performance criteria as per Clause-4 (Table-1) of **IS: 12207-2022** for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

SI. No.	Cha	aracteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2022	Values declared by the applicant/ (D) Requirement (R)	As observed	ments (Yes/No)
1		2	3	4	5	6	7
		DATORY TES I 28 th of July,		Ministry's Office Memorandun	n No. 13-17	/2021-M8	kT (I&P)
6.1.1	PTO	Performance:					
a)	Maxir under (kW) ambie condi	(Natural ent	Evaluative	Declared value to be achieved with a tolerance of: ±5% for PTO power and or engine power >26 kW. ±10% for PTO power and or engine ≤ 26 kW.	36.4 (D)	35.5	Yes
b)	Powe engin (kW)		Non Evaluative	-do-	36.4 (D)	35.5	Yes
c)	corre	umption sponding to num power,	Evaluative	+ 10% max.	264 (D)	262	Yes
d)	Maxir equiv crank (Nm)		Non Evaluative	± 8%	217 (D)	209.2	Yes
е)	Back- perce		Evaluative	12 percent	21 (D) 12 (R) Minimum	29.6	Yes
f)	Maxir	num operating	temperature,				
	1)	Engine oil	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 (D)	129	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.	112 (D)	107	Yes
g)	Engin consu (g/kW	ımption,	Evaluative	Not exceeding 1% of SFC at max. power under natural ambient conditions.	2.62 Maximum (R)	0.23	Yes
h)		xe level, m ⁻¹	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)	0.29	Yes

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1	2		3	4	5	6	7
6.1.2	Drawbar p	erformar	nce:		I.		
a)	Max. draw with correspond 15 percen slip, (kN)	bar pull ballast ding to t wheel	Non Evaluative	Minimum 70% of static mass of tractor with ballast.	23.70 (D)	*	*
b)	Max. draw without correspond 15 percen slip, (kN)	ballast ding to t wheel	Evaluative	Minimum 70% of static mass of tractor without ballast or with standard ballast, as the case may be.	19.70 (D) 19.94 (R) Minimum	26.49	Yes
с)	Maximum power ballast/ standard (kW).	drawbar without with ballast,	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.	29.1 (D) 28.4 (R) Minimum	31.9	Yes
d)	Maximum transmission temperatur		Evaluative	The declared value should not exceed the maximum value specified by oil company	120 (D)	102	Yes
6.1.3	requested vide OM N performan	to cond lo. 13-32/ ice test u	uct the testin 2023-M&T (I&	/H/ICT/NOVO605DI4WDVI/23 g as per the additional guid P) (FTS-125476) dated 16.05. sted condition was conducte erformance:	eline for tes 2023. Accor	sting of t	ractors
a)				ut the range of lift, (kN):			
۵,	1) At hite points	ch	Evaluative	Should not be less than 90% of declared value.	26.5 (D) 23.85 (R) Minimum	27.03	Yes
	2) With stand	lard	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.	19.1 (D) 8.36 (R) Minimum	19.47	Yes
b)	Maximum d height of the application force after minutes inte total duration Minutes, (m	e point of of the each 5 erval for a on of 30 m)	Non Evaluative	The observed value should not exceed 50 mm	50 (D) Maximum	00	Yes
6.1.4	Brake per	formance	at 25 kmph:				
a)	ballast, (m)):		orce, equal to or less than 600			
		d brake	Evaluative	10	10 (R)	7.31	Yes
b)	Whether brake is efferore of 600 pedal (s) or hand lever	N at foot	Evaluative Evaluative	Yes / No	10 (R) Yes	7.44 Yes	Yes Yes

MAHINDRA, NOVO 605 DI 4WD V1 TRACTOR - INITIAL COMMERCIAL TEST THIS TEST REPORT IS VALID UPTO: 31/10/2028

			Т				
1 6 4 5	0.0	2 PTIONAL TESTS:	3	4	5	6	7
6.1.5	As the applicant has not applied for any optional tests, therefore no optional tests was conducted.						
6.1.6		fety features :					
a)		ards against ving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes [As per IS 12239 (Part2)]	Meets require		Yes
b)	Lig	hting arrangement	Evaluative	As per CMVR	Meets require		Yes
c)	(Tr mo	ating requirements actors having are than 1150 mm ar track width)	Non Evaluative	Should meet the requirements of IS: 12343 (As amended from time to time)	Does meet require	the	No
d)	rec PT	chnical Juirements for O shaft	Non Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	Meets require		Yes
е)	poi	nensions of three nt linkage	Non Evaluative	Should meet the requirements of IS :17231-2019.	Does meet require	the	No
f)		ecifications of cage drawbar	Non Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	Meets require		Yes
g)	Swinging drawbar (wherever fitted)		Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)	Not pro	vided	Not appli- cable
h)	Audible warning signal on tractor		Evaluative	If tractor travel speed in reverse gear exceeds 20 kmph, an audible warning signal on tractor shall get activated. A sticker to the effect that "operating the tractor beyond 20 kmph speed in reverse gear is not safe" should be prominently displayed.	Provi (23.89 k RH4 & kmph ir gea	mph in 31.96 n RH5	Yes
6.1.7	La	belling of tractors	(Provision of	labelling plate):			•
	1)	Make	Evaluative	Should conform to the	Mahir		Yes
	2)	Model	Evaluative	requirements of CMVR along with maximum PTO Power in kW, specific fuel consumption	NOVO 6 4WD		Yes
	Year of manufacture		Evaluative	(SFC) corresponding to maximum power in g/kWh and year of manufacture in	02/		Yes
	4)	Engine number	Evaluative	numerical form.	NPL5SC		Yes
	5)	Chassis number	Evaluative	MM YY	MBNWEE	01	Yes
	6)	Maximum PTO power, (kW)	Evaluative	Digit 01 – 12 in box No.1for MM will represent the months	36.		Yes
	7)	Specific fuel consumption, (g/kWh)	Evaluative	and next two digits in box No.2 for YY will represent the year of Manufacturing.			Yes

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1	2	3	4	5	6	7
6.1.8	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
6.1.9	Fitment of Roll Ov	er Protective	Structures (ROPS):			
	For tractor having more than 1150 mm rear track width	Evaluative	ROPS should meet the requirement of IS:1182 or OECD code or equivalent International Standard	Not fitted Not		Not applicable
6.1.10	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided Ves		Yes
6.1.11	Accessories (optional)	Non Evaluative	Ballast weight, if fitted, should meet the requirement of CMVR	Not	fitted	Not applicable

6.2	CATEGORY O	CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS:12207-2022):					
S. No.	Category of break-downs	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the Requiremen- ts (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 neither of them should be repetitive in nature.	None	Yes		
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed five, that is, (2 major + 3 minor) or (1 major + 4 minor) or 5 minor breakdowns.	None	Yes		

6.3 Conformity with following IS:

Guidelines for declaration of power and specific fuel consumption and : Conforms labeling of agricultural tractors (First revision) [IS:10273 -1987 (Reaffirmed Year 2019)]

Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 : Conforms (third revision) [IS:4931-1995 (Reaffirmed Year 2019)]

Agricultural wheeled tractors – Rear mounted three-point linkage: Part 1 : Does not Categories 1N, 1, 2N, 2, 3N, 3, 4N & 4 IS :17231-2019 conform iv)

Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed : Conforms

iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed : Year 2022)]

v) Agricultural tractors- Operator's seat technical requirement [IS12343 - : Does not conform

vi) Guide for safety & comfort of operator of agricultural tractors:Part 1: General requirements (first revision):[IS 12239 (Part 1) - 2018]

General requirements (first revision):[IS 12239 (Part 1) - 2018]

Vii)

Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (Part 2) 1999)

conform

(Reaffirmed Year 2019)]

Does not

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viii) Guide lines for location and operation of operator controls on agricultural : tractors and machinery [IS: 8133 - 2021]

Does not conform

Tractors and machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays Part-2 Symbols for agricultural tractors and machinery [IS: 6283(Part-1) - 2006 (Reaffirmed Year 2019) and IS: 6283 (Part-2) - 2007 (Reaffirmed Year 2019)]

Does not conform

x) Agricultural Tractors and Machinery-Lighting device for travel on public : Conforms roads (IS:14683-1999) (Reaffirmed Year 2019)]

6.4 Salient Observations:

6.4.1 PTO performance:

Applicant vide letter no. FD/BVH/ICT/NOVO605DI4WDV1/23-24/05 dated 11.09.2023 has recommended that tractor operating range is from 1000 rpm to rated engine rpm under full load condition. Hence during PTO performance test, varying speed test was conducted upto 1000 rpm of engine only under natural and high ambient condition.

6.4.2 Drawbar performance test:

Applicant vide letter no. FD/BVH/ICT/NOVO605DI4WDV1/23-24/05 dated 11.09.2023 has recommended that tractor operating range is from 1000 rpm to rated engine rpm under full load condition. Hence Drawbar performance test was conducted upto 1000 rpm of engine only.

6.4.3 Operator's seat:

The following parameters does not meet the requirement of IS: 12343-2021.

- Provision for adjustment of driver's mass has been specified as 50 to 130 kg against the requirement of 40 to 100 kg.
- ii) Vertical adjustment upward and downward from the mid position has been measured ± 23 mm against the minimum requirement of ± 30 mm.
- iii) Inclination of seat towards rear direction is been measured 1.5 ° against the requirement of 3 to 12°.
- iv) Position of silencer outlet with respect to SIP has been measured 765 mm (upward) against the minimum requirement of 800 mm.

Therefore, all of the above should be looked into for necessary corrective action.

6.4.4 Operator's work place:

The following parameters does not meet the requirement of IS: 12239 (Part-I) 2018.

- i) Vertical retainers on inner side of clutch pedal is not provided.
- ii) Spark arresting device has not been provided in the exhaust system.

Therefore, all of the above should be looked into for necessary corrective action.

6.4.5 Three point linkage:

The dimensions viz. diameter of hitch pin hole & width of ball of upper hitch points, diameter of hitch pin hole & width of ball of lower hitch points & lateral distance from lower hitch point to centre line of tractor does not meet the requirements of IS 17231: 2019. This should be looked into for corrective action.

6.4.6 PTO master shield:

PTO master shield has not been provided on tractor. This should be looked into for necessary corrective action.

6.5 Maintenance / Service Problems:

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

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6.6 Recommendation with regard to safety on tractor:

- i) Identification of engine speed control, transmission control, differential lock, 4WD disengage/engage & PTO engaging lever by colour has not been provided as per the requirement as laid down in Table - 5 of IS: 8133-2021.
- Colour codes on illuminated display has not been provided as per the requirement as laid down in IS: 6283 (Part 2): 2007
- iii) The hand accelerator lever, when moved away from the operator (i.e. forward) decreases the engine speed, which does not meet the requirement as laid down in Table 1 of IS 8133-2021
- iv) The working clearance between draft control lever and position control lever has been measured as 30 mm against the minimum requirement of 70 mm.
- v) Identification with symbol for operator's control has not been provided as per IS: 6283 (part -1)-2006 & IS: 6283 (part-2) = 2007.

Above parameters should be looked into for necessary corrective action.

- 6.7 Adequacy of Literature supplied with machine:
- 6.7.1 The following literatures were supplied with the test tractor for reference during the test: -
 - a) Operator Manual for "Mahindra Novo 605 DI 4WD V1" tractor model.
 - b) Parts catalogue for "Mahindra Novo 605 DI 4WD V1" tractor model.
 - Service manual for "Mahindra Novo 605 DI 4WD V1" tractor model.
- 6.7.2 The operator manual may be brought out for the guidance of users and service personnel as per IS: 8132-1999 incorporating, inter alia, the following:
 - Engine to PTO speed ratio.
 - ii) Recommended gross mass of trailer for haulage operation

TEST CARRIED OUT AT C.F.M.T. & T.I., BUDNI (M.P.), INDIA TESTING AUTHORITY

C.K. TIJARE AGRICULTURAL ENGINEER	THE STATE OF THE S
R.P. PANDEY SENIOR INSTRUMENTATION ENGINEER	Randon
A. K. UPADHYAY DIRECTOR (I/C)	, Au

Draft Test Report compiled by Vithato Keyho. Senior Technical Assistant.

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7. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's comments
7.1	6.7.2	Parameters in Product Literature will be studied & necessary
		action will be initiated.

ANNEXURE-I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	Applicant has declared it to be conducted on their work place.
2.	PTO performance test	13.1
3.	Power lift and hydraulic pump performance test	1.0
4.	Drawbar performance test	5.1
5.	Brake performance test	2.0
6.	Nominal speed test	3.4
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	5.3
	TOTAL:	29.9