



Make of Agricultural Tractor : Mahindra
Model : NOVO 755 DI PP 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 – 603 004.



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)

T-1798/2329/2023	MAHINDRA, NOVO 755 DI PP 4WD V1 - INITIAL COMMERCIAL TEST
	THIS TEST REPORT IS VALID UPTO: 30/11/2028

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: November	Test Report No.: T-1798/2329/2023	Year: 2023
-----------------	-----------------------------------	------------



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

E-mail: fmti-mp@nic.in

Web site: <http://www.fmttibudni.gov.in>

Telephone: 07564-299003

CENTRAL FARM MACHINERY TRAINING AND TESTING INSTITUTE – BUDNI	Page 2 of 35
---	--------------

T-1798/2329/2023	MAHINDRA, NOVO 755 DI PP 4WD V1 - INITIAL COMMERCIAL TEST
	THIS TEST REPORT IS VALID UPTO: 30/11/2028

1. SPECIFICATIONS OF TRACTOR

1.1 Identification:

1.1.1 Denomination

[C]	Make of tractor	:	Mahindra
[C]	Model (trade name)	:	NOVO 755 DI PP 4WD V1
[C]	Type	:	4WD, Standard Agricultural Tractor.
[C]	Month & year of manufacture	:	12 & 22
[D]	Country of origin	:	India

1.1.2 Numbers:

[D]	1 st Serial No. of prototype	:	MBNWHBG9VNNNG00001
[C]	Serial No.	:	MBNWHBG9V NNJ00003

1.2 Engine:

[D]	Manufacturer's address	:	Mahindra & Mahindra Limited (Farm Equipment Sector), i) Akurli Road, Kandivali (E), Mumbai – 400 101 ii) MIDC, Hingna Road, Nagpur – 440 028 iii) Jaipur Ajmer Road, Jaipur – 303 007 iv) Khatima Panipat Highway, Rudrapur, Udhamasinghnagar, 263 153 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 – 603 004
[C]	Make	:	Mahindra
[C]	Model	:	MTMSC38TC074TR4
[C]	Type	:	Four stroke, common rail direct injection, turbo charged, liquid cooled, diesel engine
[C]	Serial No.	:	NNJ6GDE0022

1.2.1 Cylinders:

[C]	Number/disposition	:	Four, vertical, in-line
[D]	Bore / Stroke, (mm)	:	96 / 132
[D]	Capacity, cm ³	:	3822
[D]	Compression ratio	:	18.5 (±1): 1
[D]	Arrangement of valves	:	Overhead, inline
[D]	Cylinder liners	:	Wet, replaceable
[D]	Type of combustion chamber	:	Re-entrant bowl

1.2.2 Supercharging : **Not available**

1.2.3 Fuel system:

[C]	Fuel feed system	:	Gravity and force feed
-----	------------------	---	------------------------

Filter(s):

Primary (Pre filter):

[C]	Make	:	Bosch
[C]	Model	:	F 002 H25 037
[C]	Type	:	Alluminium bowl with replaceable element
[C]	Number(s)	:	One

T-1798/2329/2023	MAHINDRA, NOVO 755 DI PP 4WD V1 - INITIAL COMMERCIAL TEST
	THIS TEST REPORT IS VALID UPTO: 30/11/2028

6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

6.1 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:

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2022	Values declared by the applicant/ (D) Requirement (R)	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
MANDATORY TESTS: (As per Ministry's Office Memorandum No. 13-17/2021-M&T (I&P) dated 28th of July, 2022).						
6.1.1	PTO Performance:					
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: $\pm 5\%$ for PTO power and or engine power > 26 kW. $\pm 10\%$ for PTO power and or engine ≤ 26 kW.	48.0 (Power mode) (D)	48.0	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	48.0 (Power mode) (D)	48.0	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	Should not be more than 10% of declared value.	268 (D)	278.0	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	320 (D)	283.6	No
e)	Back-up torque, percent	Evaluative	Should be min. 12%	33 (D) 12 (R)	30.1	Yes
f)	Maximum operating temperature, ($^{\circ}$ C):					
	1) Engine oil	Evaluative	The declared value should not exceed the Max value specified by the oil company and the observed value under natural ambient/high ambient condition should not exceed the declaration.	135 (D)	126	Yes
	2) Coolant	Evaluative	Observed value should not exceed the declared value or boiling point of coolant at radiator cap pressure whichever is lower. The boiling point of the coolant at radiator pressure shall be provided by the applicant.	110 (D)	109	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at Max power under natural ambient condition. The value would be based on the test conducted under natural ambient condition	2.78 Maximum (R)	0.47	Yes
h)	Smoke 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). Max Smoke level shall be reported out of 6 readings tested as per IS 12062 and observed value should be well within the required limits.	3.25 per meter Maximum (R)	0.09	Yes

T-1798/2329/2023	MAHINDRA, NOVO 755 DI PP 4WD V1 - INITIAL COMMERCIAL TEST
	THIS TEST REPORT IS VALID UPTO: 30/11/2028

1	2	3	4	5	6	7
6.1.2	Drawbar performance:					
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 70% of static mass of tractor with ballast.	*	*	*
b)	Max. drawbar pull with standard ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	In case of tractors having total static mass \geq 1500 kg, Min 70% of static mass of tractor without ballast or with standard ballast, as the case may be. In case of light weight tractors having \leq 1500 kg total static mass of tractor, Min. 65% of static mass of tractor without ballast or with standard ballast, as the case may be.	23.9 (D) 23.99 (R) Minimum	33.79	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 Minimum 75% of PTO power as referred in SI No. i) a) of PTO performance in case of light weight tractors having \leq 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.	38.4 (D) 38.4 (R) Minimum	41.8	Yes
d)	Maximum transmission oil temperature, ($^{\circ}$ C)	Evaluative	The declared value should not exceed the recommendation by the oil manufacturer. The observed value should not exceed the declared value throughout the drawbar test.	120 (D)	113	Yes
Remark: *Applicant vide letter no. FD/BVH/ICT/NOVO 755PP4WDVI/22-23/05 dated 11.09.2023 has requested to conduct the testing as per the additional guideline for testing of tractors vide OM No. 13-32/2023-M&T (I&P) (FTS-125476) dated 16.05.2023. Accordingly, drawbar performance test under unballasted condition was conducted only.						
6.1.3	Power lift and hydraulic pump performance:					
a)	Maximum lifting capacity throughout the range of lift, (kN):					
	1) At hitch points	Evaluative	Should not be less than 90% of declared value.	28.4 (D) 25.56 (R) Minimum	29.44	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.	20.6 (D) 11.30 (R) Minimum	21.84	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	05	Yes

T-1798/2329/2023	MAHINDRA, NOVO 755 DI PP 4WD V1 - INITIAL COMMERCIAL TEST
	THIS TEST REPORT IS VALID UPTO: 30/11/2028

1	2	3	4	5	6	7	
6.1.4	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)	7.78	Yes
	2)	Hot brake	Evaluative	10	10 (R)	7.91	Yes
b)	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	
6.1.5	OPTIONAL TESTS: As the applicant has not applied for any optional tests, therefore no optional tests was conducted.						
6.1.6	Safety features :						
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes [As per IS 12239 (Part2)]	Meets the requirement	Yes		
b)	Lighting arrangement	Evaluative	As per CMVR	Conforms	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)	Does not meet the requirement	No		
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 requirement	No		
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS: 17231-2019 (As amended from time to time)	Does not meet the requirement	No		
f)	Specifications of linkage drawbar	Non Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	Meets the requirement	Yes		
g)	Swinging drawbar (wherever fitted)	Non Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)	Not provided	Not applicable		
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.	Provided (The audible warning signal on tractor is activated when the speed in reverse gear reaches to 20 kmph i.e. HR3-19.63 kmph HR4-25.59 kmph HR5-34.42 kmph) & a sticker is pasted.	Yes		

T-1798/2329/2023	MAHINDRA, NOVO 755 DI PP 4WD V1 - INITIAL COMMERCIAL TEST
	THIS TEST REPORT IS VALID UPTO: 30/11/2028

1	2	3	4	5	6	7		
6.1.7	Labelling of tractors (Provision of labelling plate):							
	1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO in kW, Specific fuel consumption (SFC) corresponding to maximum power in g/kWh and year of manufacture in numerical form <table border="1" style="margin-left: 20px;"><tr><td>MM</td><td>YY</td></tr></table> Digit 01-12 in box No. 1 for MM will represent the month and next two digit in the box No. 2 for YY will represent the year of manufacturing.	MM	YY	Mahindra	Yes
	MM	YY						
	2)	Model	Evaluative		NOVO 755 DI PP 4WD V1	Yes		
	3)	Month & Year of manufacture	Evaluative		12 & 22	Yes		
	4)	Engine number	Evaluative		NNJ6GDE0022	Yes		
	5)	Chassis number	Evaluative		MBNWHBFG9 VNNJ00003	Yes		
6)	Maximum PTO power, (kW)	Evaluative	48.0		Yes			
7)	Specific fuel consumption, (g/kWh)	Evaluative	268	Yes				
6.1.8	Literature (Submission to test agency):							
(a)	Operator manual	Evaluative	The printed literature in booklet form should be provided as per IS 8132 and should submit along with the test sample.	Provided	Yes			
(b)	Parts Catalogue	Evaluative		Provided	Yes			
(c)	Workshop/ Service manual	Evaluative		Provided	Yes			
6.1.9	Fitment of Roll Over Protective Structures (ROPS):							
	For tractor having more than 1150 mm rear track width	Evaluative (if fitted)	ROPS should meet the requirement of IS:11821 or OECD code or equivalent International Standard.	ROPS fitted [Meets the requirement of IS: 1182 (Part-2) as per test report No. ETA/IS:11821/21-22/SO-300002065 2/361/M&M/ROPS /Ext-I	Yes			
6.1.10	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Yes			
6.1.11	Accessories (optional)	Non Evaluative	Ballast weight, if fitted, should meet the requirement of CMVR	Provided	Yes			

6.2 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: 12207-2022	As observed	Whether meets the Requirement (Yes/No)
1.	Critical	Evaluative	There is no 'critical breakdown' during the course of testing.	None	Yes
2.	Major	Evaluative	There are not more than 2 major breakdowns and neither of them should be of repetitive nature.	None	Yes
3.	Minor	Evaluative	There are not more than 5 minor defects during the test and neither of them should of repetitive nature.	Mn-8	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.	One	Yes

T-1798/2329/2023	MAHINDRA, NOVO 755 DI PP 4WD V1 - INITIAL COMMERCIAL TEST
	THIS TEST REPORT IS VALID UPTO: 30/11/2028

6.3 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 Year 2019)] | : | Conforms |
| ii) | Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS:4931-1995 (Reaffirmed Year 2019)] | : | Does not conform |
| iii) | Agricultural wheeled tractors – Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS:17231- 2019] | : | Does not conform |
| iv) | Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed Year 2022)] | : | Conforms |
| v) | Agricultural tractors- Operator’s seat technical requirement [IS12343 - 2021] | : | Does not conform |
| vi) | Guide for safety & comfort of operator of agricultural tractors:Part 1 General requirements (first revision):[IS 12239 (Part 1) - 2018] | : | Does not conform |
| vii) | Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (Part 2) 1999) (Reaffirmed Year 2019)] | : | Does not conform |
| viii) | Guide lines for location and operation of operator controls on agricultural tractors and machinery [IS: 8133 - 2021] | : | Does not conform |
| ix) | Tractors and machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays Part2 Symbols for agricultural tractors and machinery [IS: 6283(Part-1) - 2006 (Reaffirmed Year 2019) and IS: 6283 (Part-2) – 2007 (Reaffirmed Year 2019)] | : | Conforms |
| x) | Agricultural Tractors and Machinery-Lighting device for travel on public roads (IS:14683-1999) (Reaffirmed Year 2019)] | : | Conforms |

6.4 Salient Observations:

6.4.1 PTO Performance Test:

- i) The maximum equivalent crankshaft torque was observed as 283.6 Nm against the declaration of 320 Nm, which does not meet the non evaluative requirement of IS: 12207-2022.
- ii) During PTO performance full load at varying speed test under high ambient conditions the maximum coolant temperature was recorded as 112°C against the declaration of 110 °C, which does not meet the evaluative requirement of IS:12207-2022 and hence the test was suspended. Upon which applicant vide letter No. FD/BVH/ICT/NOVO755PP4WDV1/22-23/05 dated 27.10.2023 has requested the for calibration of coolant temperature sensor, checkings & adjustments of the following parameters and which were allowed by the competent authority.
 - i) Fan belt tension was checked and found correct.
 - ii) Radiator sealing was checked and on one side of radiator top side sealing (Part Number 007636990U1) at RHS was not found and the same was fitted having the same specifications and part No. This defect categorized as **Minor defect (Mn-8)** as per IS 12207: 2022.
 - iii) Engine system was checked by connecting INCA software and found correct.
 - iv) Thermostat valve opening & closing temperature was checked and found correct
 - v) Coolant temperature sensor was checked, it showed 0.8°C more than the observation, hence the sensor ws calibrated. Thereafter, PTO performance full load at varying speed test under high ambient conditions was re-conducted. This should be looked into for necessary corrective action.

6.4.2 Specification of Power take off shaft

The dimension of “h” of PTO shaft has been measured 735 mm against the non evaluative requirement of 450 to 675 mm, which does not meet the non evaluative requirement of IS: 4931-1995 (Type-1) . This should be looked into for necessary corrective action.

T-1798/2329/2023	MAHINDRA, NOVO 755 DI PP 4WD V1 - INITIAL COMMERCIAL TEST
	THIS TEST REPORT IS VALID UPTO: 30/11/2028

6.4.3 Three point linkage:

The following parameters does not meet the requirements of IS: 17321-2019 and needs to be looked into for necessary corrective actions:

- i) 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 and does not meet the requirements of IS: 17321-2019.
- ii) The lateral distance from lower hitch point to centre line of tractor has been measured as 435 mm against the requirement of 359 mm.

6.4.4 Operator's seat:

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

- i) 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 distance from SIP centre of steering control wheel has been measured as 200 mm against the requirement of 265 to 385 mm.

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

6.4.5 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 are 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.

6.4.6 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.

6.6 Recommendation with regard to safety on tractor:

- i) Identification of hand controls by colour has not been provided as per the requirement as laid down in Table – 5 of IS: 8133-2021.
- ii) 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.

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: -


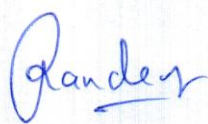
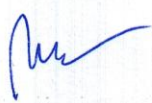
- a) Operator Manual for "Mahindra Novo 755 DI PP 4WD V1" tractor model.
- b) Parts catalogue for "Mahindra Novo 755 DI PP 4WD V1" tractor model.
- c) Service manual for "Mahindra Novo 755 DI PP 4WD V1" tractor model.

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:

- i) Safe hitch height for trailer.

T-1798/2329/2023	MAHINDRA, NOVO 755 DI PP 4WD V1 - INITIAL COMMERCIAL TEST
	THIS TEST REPORT IS VALID UPTO: 30/11/2028

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

C. S. RAGHUWANSHI AGRICULTURAL ENGINEER	
R.P. PANDEY SENIOR INSTRUMENTATION ENGINEER	
A. K. UPADHYAY DIRECTOR (I/C)	

Draft Test Report compiled by **Poonam Khurasia**, Senior Technical Assistant

7. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's comments
7.1	6.4.1	Issue will be studied in detail after receipt of test sample and necessary corrective action will be initiated.
7.2	6.7.2	Parameter in product literature will be studied and 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	13.3
3.	Power lift and hydraulic pump performance test	4.3
4.	Drawbar performance test	7.2
5.	Brake performance test	1.5
6.	Nominal speed test	7.2
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	0.6
	TOTAL:	34.1