प्रारंभिक व्यावसायिक परीक्षण रिपोर्ट संख्या/No. : T-1704/2235/2023 INITIAL COMMERCIAL TEST REPORT माह/Month : January, 2023

Application Reference No. 28/2022-23/53

(यह परीक्षण रिपोर्ट 31/01/2028 तक वैध है / THIS TEST REPORT IS VALID UPTO 31/01/2028)



Make of Agricultural Tractor: Mahindra

Model : 275 DI SP Plus

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

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: January	Test Report No.: T-1704/2235/2023	Year: 2023
Month: January	Test Report No.: T-1704/2235/2023	Year: 2023



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

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MAHINDRA, 275 DI SP PLUS TRACTOR - INITIAL COMMERCIAL TEST

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[C] Tractor manufacturer's name and

Location of tractor assembly

address

[D]

M/s. Mahindra & Mahindra Limited

(Farm Equipment Sector)

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

Chengalpattu – 603004.

Mahindra & Mahindra Limited
(Farm Equipment Sector)

(i) Hingna Road, Hingna MIDC, Nagpur– 440016.

(ii) Agri Business Development Center, Khatima Panipat Highway, Udham Singh Nagar, Vil. Lalpur, Tehsil-Kichha, Rudrapur – 263 153

(iii) Agri Development Center, Vil-Mehla Tehsil - Dudu Jaipur- Ajmer Road, Jaipur- 303 007

(iv) Near Bidar "T" Junction, Mahindra Nagar, Zaheerabad- 502 220 Medak District, Andhra Pradesh

(v) Akurli Road, Kandivli (E), MUMBAI – 400 101

The Manufacturer

[C] Submitted for test by (Applicant)

[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.

[D] Place of running-in : At manufacturer's works

[D] Duration of running-in (h):

-Engine : 30 -Transmission : 30

[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

[C] Make of tractor : Mahindra [C] Model (trade name) : 275 DI SP PLUS

[C] Type : Rear Wheel Drive, Standard Agricultural

Tractor.

[C] Month & year of manufacture : 08/22 [D] Country of origin : India

1.1.2 Numbers:

[D] 1st Serial No. or prototype : MBNTFAEBBLNB00001 [C] Serial No. : MBNTFAEBBNNE01101

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7	٠,	- Ln	aina:
	- –		gine:

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

(Farm Equipment Sector),

(i) Akurli Road, Kandivali (E), Mumbai - 400101

(ii) MIDC, Hingna Road, Nagpur – 440028 (iii) Khatima Panipat Highway, Rudrapur,

Udhamsinghnagar, 263153

(iv)Jaipur Ajmer Road, Jaipur – 303007 (v) Near Bidar "t" junction, Mahindra Nagar,

Zaheerabad - 502220

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

603004

[C] Make : Mahindra

[C] Model : MTDHI22NA037B3A

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

direct injection, diesel engine.

[C] Serial No. : NNE7EBE0123

1.2.1 Cylinders:

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

[D] Bore / Stroke, (mm) 88.9 / 120 : Capacity, cm3 2235 [D] Compression ratio 20.0 (±1): 1 [D] [D] Arrangement of valves : Overhead, inline Cylinder liners [D] : Wet, replaceable

[D] Type of combustion chamber : Re-entrant cavity on piston crown

1.2.2 Supercharging : Not Available

1.2.3 Fuel system:

[C] Fuel feed system : Gravity and force feed

Filter(s):

[C] Make : Bosch

[C] Model : F 002 H25 037

[C]Type: One[C]Number(s): Paper[D]Capacity of fuel tank, (I): 53.4

Injection pump:

[C] Make : Bosch

[C] Model : F 002 A2Z A68, PES3A85D320RS2000

[C] Type : Inline, plunger [C] Serial Number : 27624637

Manufacturer's production setting of injection pump:

[C] Flow rate (rated engine speed & full : 6.13

load), (kg/h)

[D] Timing : 5 ± 1 degree before TDC

Injectors:

 [D]
 Make
 : Bosch, India

 [D]
 Model/Group combination No.
 : F 002 C7Z 153

 [D]
 Holder no.
 : F 002 C70 007

 [D]
 Nozzle no.
 : DSLA 144P 2141

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4. OPTIONAL TEST RESULTS

As the applicant has not applied for any optional tests, therefore no optional tests was conducted.

5. REPAIRS

--None--

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: 12207-2019** 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: 12207-2019	Values declared by the applicant/ (D) Requirement (R)	As observed	Whether meets the require-m ents (Yes/No)
1		2	3	4	5	6	7
	dated	d 28 th of July,	<u>2022).</u>	Ministry's Office Memorandur	n No. 13-17	7/2021-M8	RT (I&P)
6.1.1		Performance:			Т		ı
a)	under (kW)	num power r 2 h test, (Natural ent condition)	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.	24.5 (D)	25.4	Yes
b)		er at rated e speed, (kW)	Non Evaluative	-do-	24.5 (D)	25.4	Yes
c)	Specionsuccorrection (g/kW	ific fuel umption sponding to mum power, /h)	Evaluative	+ 10% max.	256 (D)	241	Yes
d)	Maxir equiv crank (Nm)		Non- Evaluative	± 8%	146 (D)	137.1	Yes
e)	Back- perce	-up torque, ent	Evaluative	12 percent	12 (D) 12 (R)	18.8	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.	130(D)	111	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.	110(D)	104	Yes
g)	Engir const (g/kW	umption,	Evaluative	Not exceeding 1% of SFC at max. Power under High ambient conditions.	2.44 Maximum (R)	0.18	Yes
h)	Smok	ke 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)	0.22	Yes

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1		2	3	4	5	6	7
6.1.2	Dra	wbar performar					
a)	Max with corr 15	. drawbar pull	Non- Evaluative	Minimum 70% of static mass of tractor with ballast.	17.5 (D) 17.01 (R) Minimum	21.13	Yes
b)	with balla corr 15		Evaluative	Minimum 70% of static mass of tractor without ballast or with standard ballast, as the case may be.	13.00 (D) 12.66 (R) Minimum	15.88	Yes
c)	Max pow balla	timum drawbar ver without ast/ with adard 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.	19.6 (D) 20.3 (R) Minimum	23.4	Yes
d)	tran tem	rimum smission oil perature, (°C)	Evaluative	The declared value should not exceed the maximum value specified by oil company	120 (D)	80	Yes
6.1.3		ver lift and hydr					
a)	Max		acity throughou	t the range of lift, (kN):	T		
	1)	At hitch points	Evaluative	Tolerance of ± 10%	14.60 (D)	13.43	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.	10.20 (D) 5.95(R) Minimum	9.89	Yes
b)	heig appl force minu total Minu	imum drop in the ht of the point of ication of the e after each 5 utes interval for a duration of 30 utes, (mm)	Non Evaluative	The observed value should not exceed 50 mm	50 (D) Maximum	210	No
a)	Brake performance at 25 kmph: Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with road				ith road		
	ballast, (m):						
	1)	Cold brake	Evaluative	10	10 (R)	6.64	Yes
b)	exer peda dece m/s ²		Evaluative Evaluative	600	10 (R) 600 (R) Maximum	6.72 291 to 325	Yes Yes
c)	force peda	other parking e is effective at a e of 600 N at foot al (s) or 400 N at d lever	Evaluative	Yes / No	Yes	Yes	Yes

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1		2	3	4	5 6	7
6.1.5	OPI	TIONAL TESTS:	3	4	5 6	
0.1.0	Ast		not applied f	or any optional tests, therefo	ore no optional tes	ts was
6.1.6	Safe	ety features:				
a)	Gua	ords against ring and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes [As per IS 12239 (Part2)]	Meets the requirement	Yes
b)	Ligh	ting arrangement	Evaluative	As per CMVR	Meets the requirement	Yes
c)	(Tra	ting requirements actors having e than 1150 mm track width)	Non Evaluative	Should meet the requirements of IS: 12343 (As amended from time to time)	Does not meet the requirement	No
d)	Tec	hnical uirements for PTO	Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	Meets the requirement	Yes
е)	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 requirement	No
f)		cifications of age drawbar	Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	Meets the requirement	Yes
g)		nging drawbar erever fitted)	Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)	Not provided	Not appli- cable
h)	1)	Maximum travelling speed at rated engine speed in reverse gears, Kmph	Evaluative	Should not exceed 20 Kmph	11.26 (Meets the requirement)	Yes
2) Audible warning signal on tractor		Evaluative	As soon as the travelling speed in reverse gear reaches to 20 kmph, an audible warning signal on tractor shall be activated. The safety aspects about the operation of shuttle technology shall be brought in operation and manufacturer /dealer shall ensure the training on this aspect to operator before the delivery of tractor.	Not fitted	Not appli- cable	
6.1.7		elling of tractors				1
	1)	Make	Evaluative	Should conform to the	Mahindra	Yes
	3)	Model Month & Year of	Evaluative Evaluative	requirements of CMVR along with maximum PTO Power in kW and year of manufacture in numerical form.	275 DI SP PLUS 08/22	Yes Yes
	4)	manufacture Engine number	Evaluative	MM YY	NNE7EBE0123	Yes
	5)	Chassis number	Evaluative	Digit 01 – 12 in box No.1for	MBNTFAEBBNN E01101	Yes
	6)	Maximum PTO power, (kW)	Evaluative	MM will represent the months and next two digits in box No.2 for YY	24.5	Yes
	7)	Specific fuel consumption, (g/kWh)	Evaluative	will represent the year of Manufacturing.	256	Yes

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

6.2	CATEGORY OF B	REAKDOWN	S / DEFECTS (As per clause 5.0	of IS:12207-2	2019):
S. No.	Category of break-downs	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	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 (1 major + 4 minor) or 5 minor breakdowns.	None	Yes

6.3 Conformity with following IS:

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

(Reaffirmed Year 2019)]

ii) Agricultural tractors - Rear mounted power take-off - Types 1, 2 and : Conforms

3 (third revision) [IS:4931-1995 (Reaffirmed Year 2019)]

iii) Agricultural wheeled tractors – Rear mounted three-point linkage: :

Does not conform

Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS:4468(Part-I) – 1997 (Reaffirmed in 2022)]

iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 : Conforms

(Reaffirmed Year 2022)]

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

- 2021]

vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 : Does not conform General requirements (first revision):[IS 12239 (Part 1) - 2018]

vii) Tractors and machinery for agriculture and forestry - Technical:

Does not conform

means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (Part 2) 1999) (Reaffirmed Year 2019)]

ix)

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viii) Guide lines for location and operation of operator controls on : Does not conform

agricultural tractors and machinery [IS: 8133 - 2021]

Tractors and machinery for agriculture and forestry, powered lawn : Does not conform

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)]

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

6.4 Salient Observations:

6.4.1 Laboratory tests:

6.4.1.1 Hydraulic performance test:

The maximum cumulative drop in the height of hydraulic lift during maintenance of lift load test for total duration of 30 minute has been recorded as **210 mm** against the requirement of **50 mm** maximum as per IS:12207-2019. This does not meet the requirement of IS: 12207-2019. Even though this parameter is categorized as 'non-Evaluative', as per IS:12207-2019, yet for the sake of improvement it would be advisable to look into the matter to make it conforming to the requirement.

6.4.1.2 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 120 kg against the requirement of 40 to 100 kg.
- ii) Longitudinal distance from SIP centre of brake pedal has been measured as 740 mm against the requirement of 410 to 720 mm.
- iii) Vertical distance from SIP to centre of steering control wheel has been measured as 190 mm against the requirement of 265 to 385 mm.
- iv) Vertical distance of SIP from foot rest has been measured as 530 mm against the requirement of 450 to 520 mm.
- v) Position of silencer outlet with respect to SIP has been measured as 780 mm against the requirement of 800 mm minimum (upward).

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

6.4.1.3 Operator's work place:

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

- i) Vertical retainers on both sides of clutch pedal are not provided.
- ii) Width of foot step has been measured as 165 mm against the requirement of 200 mm.
- iii) Spark arresting device has not been provided in the exhaust system.

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

6.4.1.4 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 and lateral movement of lower hitch points does not meet the requirements of IS:4468 (Part-I) – 1997. This should be looked into for necessary corrective action.

6.4.1.5 PTO master shield:

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

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6.5 Specification of Tractor:

Discrepancies in the specification between the Specification sheet and Operator's manual are as under:

S. No.	Description	As per Specification Sheet	As per Operator's manual
a)	Transmission oil capacity, (liter)	42.0	41.0
b)	Coolant as recommended	M/s. BIL MT-92	Mahindra M-Star Coolz or coolant conforming to JIS K-2234 (P. No. 19-1)
c)	Transmission oil	TRAC ELF MM/IOCL	M-Star genuine OIB oil or Servo MTRAC 30 (P. No. 19-1)

6.6 Maintenance / Service Problems:

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

6.7 Recommendation with regard to safety on tractor:

- i) Fuel shutoff knob does not remain in stop position as per the requirement of IS: 8133-2021.
- ii) Identification of hand controls by colour has not been provided as per the requirement as laid down in Table 5 of IS: 8133-2021.
- 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 RHS fender has been measured as 50 mm against the minimum requirement of 70 mm.

Above parameters should be looked into for necessary corrective action.

6.8 Adequacy of Literature supplied with machine:

- **6.8.1** The following literatures were supplied with the test tractor for reference during the test:
 - a) Operator Manual for "Mahindra 275 DI SP Plus" tractor model.
 - b) Parts catalogue for "Mahindra 275 DI SP Plus" tractor model.
 - c) Service manual for "Mahindra 275 DI SP Plus" tractor model.
- 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) Recommended ballast masses for different operations.
 - ii) Coolant water ratio.

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

TESTING AUTHORITY

C. V. CHIMOTE TEST ENGINEER	Allungareum 1
P.K. PANDEY DIRECTOR	USn-msy

Draft test report compiled by Chanchlesh Singh Raghuwanshi, Agricultural Engineer.

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7. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's comments
7.1	6.4.1.1 & 6.7 (iv)	Parameters will be studied and necessary action will
		be initiated.
7.2	6.5 & 6.8.2	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	11.2
3.	Power lift and hydraulic pump	1.8
	performance test	
4.	Drawbar performance test	16.6
5.	Brake performance test	1.8
6.	Nominal speed test	1.0
B.	Miscellaneous test and other run hours	5.3
	including idle run, transportation, trials	
	and preparation for test	
	TOTAL:	37.7