



MAHINDRA 595 DI SUPER TURBO MKM TRACTOR
(Brand Name : Bhoomiputra)



भारत सरकार

GOVERNMENT OF INDIA

कृषि मंत्रालय (कृषि एवं सहकारिता विभाग, मशीनीकरण एवं प्रौद्योगिकी प्रभाग)

Ministry of Agriculture (Deptt. of Agri. & Co-op, Mechanization & Technology Division)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO : 9001-2008 Certified Institute)

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3. ESSENTIAL TESTS

3.1. SPECIFICATIONS

	<u>Base Model</u>	<u>Variant Model</u>
3.1.1 Tractor:		
Make	: Mahindra	Mahindra
Model	: 595 DI Super Turbo	595 DI Super Turbo MKM
Brand name	: Sarpanch	Bhoomiputra
Type	: Four wheeled, two wheel drive unit construction general purpose Agricultural Tractor.	
Year of manufacture	: GB (October, 2011)	2012
Chassis Serial number	: NLT 282	NLB0101
Country of Origin	: India	INDIA
3.1.2 Engine:		
Make	: Mahindra	Mahindra
Model	: MDI 3000TC 3A	MDI 3000TC 3A
Type	: Four stroke, turbo charged , liquid cooled, direct injection, diesel engine.	
Serial number	: NLT 282	NLB0101
Engine speed (Manufacturer's recommended production setting)(rpm):		
- Maximum speed at no load	: 2250 to 2350	2250 to 2350
- Low idle speed	: 700 to 800	700 to 800
- Speed at maximum torque	: 1200 to 1400	1200 to 1400
Rated speed, (rpm):		
- For PTO use	: 2100	2100
- For drawbar use	: 2100	2100
3.1.3 Cylinder & Cylinder Head:		
Number	: Four	Four
Disposition	: Vertical, Inline	Vertical, inline
Bore/stroke, (mm) (apa)	: 88.9/101.6	88.9/101.6
Capacity as specified by the applicant, (cc)	: 2523	2523
Compression ratio, (apa)	: 18.75 : 1	18.75 : 1
Type of cylinder head	: Monoblock	Monoblock
Type of cylinder liners	: Wet, replaceable	Wet, replaceable
Type of combustion chamber	: Re-entrant bowl cavity on piston top	
Arrangement of valves	: Overhead, inline	Overhead, inline
Valve clearance :	Cold/ Hot	
- Inlet valve, (mm)	: 0.30/0.40	0.30/0.40
- Exhaust valve, (mm)	: 0.40/0.50	0.40/0.50
3.1.4 Fuel System:		
Type of fuel feed system	: Gravity and force feed	Gravity and forced feed
3.1.4.1 Fuel tank:	Base Model	Variant Model


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
PTO Performance :								
1	Max. power under 2 hrs. 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	32.5 (D)	32.5 (D)	32.0	32.2	Yes
2	Power at rated engine speed, (kW)	Non Evaluative	-do-	32.5 (D)	32.5 (D)	31.5	31.6	Yes
3	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	251 (D)	251 (D)	237	241	Yes
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.	129 (D)	129 (D)	115	109	Yes
2)	Coolant (water)	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)	112 (D)	98	83	Yes



7.11.2 Brake performance at 25 kmph:						
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)	7.33	6.91	Yes
2) Hot brake	Evaluative	10	10 (R)	7.18	7.07	Yes
3) Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600 (R) Maximum	358 to 418	186 to 200	Yes
4) 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	Yes
7.11.3 Safety features :						
1) Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 (part 2))	--	Provided		
2) Lighting arrangement (Tractor having more than 1150 mm rear track width)	Evaluative	As per CMVR	--	Provided		
3) Seating equipment (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		
4) 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		
5) Dimension of three point linkage	Non-Evaluative	Should meet the requirements of IS 4468 (part 1) (as amended from time to time)	--	Provided		
6) Specification of linkage and winging structures	Non-Evaluative	Should meet the requirements of IS 12953 and IS 12362 (part 3) (as amended from time to time)	--	-do-		

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Labelling of tractors (Provision of labelling plate):						
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	Mahindra	MAHINDRA	Yes
2)	Model	Evaluative		595 DI SUPER TURBO	595 DI SUPER TURBO MKM	Yes
3)	Year of manufacture	Evaluative		2011	2012 (CC)	Yes
4)	Engine serial number	Evaluative		NLT 282	NLB0101	Yes
5)	Chassis serial number	Evaluative		NLT 282	NLB0101	Yes
6)	Declaration of PTO power, kW	Evaluative		32.5	32.5	Yes
Literature (Submission to test agency)						
ii)	Operator manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
iii)	Parts Catalogue	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
iv)	Workshop/Service manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes

Salient Observations:

Laboratory tests:

PTO Performance:

- i) The maximum PTO power in case of base and variant models were observed as 32.0 & 32.2 kW respectively against the declaration of 32.5 kW which is within the specified limit.
- ii) The specific fuel consumption in case of base and variant models corresponding to maximum power were observed as 237 & 241 g/kWh respectively against the declaration of 251 g/kWh. Which is within the tolerance limit.

7.2.1.2 Provision for safety and comfort of operator, (Conformity with IS: 12343-1998):

The operator's seat provided on the tractor does not meet the following requirements and calls for necessary improvement in respect of following.

- i) Width of seat from SIP.

7.2.1.3 Operator's work place: IS :12239 (Part-I& II)

The operator's work place provided on the tractor does not meet the following requirements and calls for necessary improvement in respect of following.

- i) The provision for the spark arrester on silencer is not provided

7.2.1.4 Labelling of tractor: -

Labelling plate of tractor meets the requirements.



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- 7.12 **Maintenance / Service Problems:**
No noticeable maintenance or service problem was observed during the test..
- 7.14 **Recommendation with regard to safety on tractor:**
The following requirements, inter alia, may be considered for incorporation on the tractor:
 - i) Engine safety start switch may be provided to avoid the accidental chances
 - ii) Vertical retainers should be provided on both side of brake & clutch pedals.
- 7.15 **Adequacy of Literature supplied with machine:**
- 7.15.1 The following literatures were supplied by the manufacturer for reference during the test.
 - a) Common Operator's manuals for DI Tractors
 - b) Part's catalogue Mahindra tractors
 - c) Service manual for Mahindra tractors
- 7.15.2 The revised literature submitted by the firm was found adequate. However, these literatures may also be brought out in national as well as other regional languages.

8. CITIZEN CHARTER

Time frame for Testing & Evaluation as per Citizen Charter	Duration of Test	Whether the Test Report is released within the time frame given in Citizen Charter	Remarks
18 Months	03 Months (May 2014 to July 2014)	Yes	None

9. APPLICANT'S COMMENTS

Sl. No.	Our Reference	Applicant's comments
01	6.2.1.2, 6.2.1.3(i), 6.4,	Observation will be studied and necessary action will be incorporated

TESTING AUTHORITY:

**R.W. TIWARI
SENIOR AGRICULTURAL ENGINEER**

**C.R. LOHI
DIRECTOR**

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