



**MAHINDRA 265 DI MKM
(BRAND NAME : BHOOMIPUTRA) 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

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18. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

18.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameters applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2014 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

S. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	Values declared by the applicant (D)/ Requirement (R)	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
18.1.1	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.	22.8 (D)	22.8	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	22.8 (D)	22.8	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	252 (D)	239	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	132 (D)	126.1	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	11.0 (D)	9.9	No
f)	Maximum operating temperature (^oC):					
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.	130 (D)	126	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)	103	Yes



T-1120/1646/2017		MAHINDRA , 265 DI MKM (BRAND NAME: BHOOMIPUTRA) TRACTOR - Commercial (First Batch Test)				
1	2	3	4	5	6	7
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions.	1% of SFC	1.22	Yes
h)	Smoke level	Evaluative	Maximum light absorption coefficient of 3.25 per metre or equivalent BOSCH No. 5.2 or 75 Hartridge value (As per CMVR)	60 Hartridge	0.19	Yes
18.1.2 Drawbar performance :						
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	17.68 (D) 13.70 (R)	16.89	Yes
b)	Max. drawbar pull with standard ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor with standard ballast	11.99 (D) 11.09 (R) Minimum	14.46	Yes
c)	Maximum drawbar power without ballast/ with standard 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 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.	18.2 (D) 18.3 (R) Minimum	21.4	Yes
d)	Max. transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	110 (D)	77	Yes
18.1.3 Power lift and hydraulic pump performance :						
a)	Maximum lifting capacity throughout the range of lift, (kN):					
	1) At hitch points	Non Evaluative	[Tolerance of minus 10%]	11.7 (D)	13.28	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	7.8 (D) 5.47(R)	8.37	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 minute, (mm)	Non Evaluative	[Tolerance of plus 5 mm]	120	25	Yes

T-1120/1646/2017

**MAHINDRA , 265 DI MKM (BRAND NAME: BHOOMIPUTRA)
TRACTOR - Commercial (First Batch Test)**


1	2	3	4	5	6	7	
18.1.4	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)	7.25	Yes	
2)	Hot brake	Evaluative	10	10 (R)	7.75	Yes	
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600 (R)	417 to 435	Yes	
c)	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	
18.1.5	Noise measurement :						
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	86 (R)	81	Yes	
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	96 (R)	93	Yes	
18.1.6	Amplitude of mechanical vibrations at :						
	1)	Left foot rest	Non Evaluative	100 microns (max)	100 (R)	240	No
		Right foot rest			100 (R)	180	No
	2)	Seat (with driver seated)		-do-	100 (R)	30	Yes
	3)	Steering wheel		-do-	100 (R)	130	No
18.1.7	Haulage requirements :						
a)	Gross mass of the trailers, (tones):						
1)	Two wheel	Non	--	5.0 (D)	5.0	Yes	
2)	Four wheel	Evaluative	--	6.0 (D)	6.0	Yes	
b)	Distance travelled / litre of fuel consumption, (km/l):						
1)	Two wheel	Non	--	6 to 7 (D)	7.23 to 7.43	Yes	
2)	Four wheel	Evaluative	--	6 to 7 (D)	6.90 to 7.38	Yes	
c)	Fuel consumption (ml/km/tonne):						
1)	Two wheel	Non	--	35 to 45 (D)	26.93 to 27.66	No	
2)	Four wheel	Evaluative	--	35 to 45 (D)	22.56 to 24.18	No	
18.1.8	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.	There should be no ingress of water and/or mud (R)	No ingress of mud and / or water was observed during test.	Yes	
1)	Clutch assembly	-do-					
2)	Brake housings	-do-					
3)	Front axle hubs	-do-					
4)	Engine Oil	-do-					
5)	Transmission Oil	-do-					



1	2	3	4	5	6	7
18.1.9	Safety features :					
a)	Guards against moving and hot parts	Evaluative	As per CMVR	--	Meet the requirements	--
b)	Lighting arrangement	Evaluative	As per CMVR	--	Meet the requirements	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 requirements	No
d)	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	-	Meet the requirements	Yes
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)	-	Meet the requirements	Yes
f)	Specifications of linkage	Non Evaluative	Should meet the requirements of IS 12953 and IS 12362 (Part 3) (As amended from time to time)	-	Meet the requirements	Yes
	Swinging drawbar			-	Not Provided	Yes
18.1.10	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	Yes
2)	Model	Evaluative		--	265 DI MKM	Yes
3)	Year of manufacture	Evaluative		--	GG (i.e.October,2016)	Yes
4)	Engine number	Evaluative		--	NEBT00078	Yes
5)	Chassis number	Evaluative		--	NEBT00078	Yes
6)	Declaration of PTO power, (kW)	Evaluative		--	22.8 (30.6)	Yes
18.1.11	Discard limit for:					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer-	89.13	88.953 to 88.960	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.20	0.140 to 0.145	Yes
(c)	Ring end gap (mm):					
-	Top comp. ring.	Evaluative	-do-	2.5	0.25	Yes
-	2 nd comp. ring.		-do-	2.5	0.55	Yes
-	Oil ring.		-do-	2.0	0.35	Yes
(d)	Ring groove clearance (mm):					
-	Top comp. ring.	Evaluative	-do-	-TAPERED-		Yes
-	2 nd comp. ring.		-do-	0.30	0.070 to 0.072	Yes
-	Oil ring.		-do-	0.20	0.038 to 0.044	Yes
(e)	Clearance of main bearings (mm):					
-	Diametrical clearance	Evaluative	-do-	0.20	0.112 to 0.118	Yes
-	Crankshaft end float	Evaluative	-do-	0.60	0.18	Yes

T-1120/1646/2017

**MAHINDRA , 265 DI MKM (BRAND NAME: BHOOMIPUTRA)
TRACTOR - Commercial (First Batch Test)**


1	2	3	4	5	6	7
(f)	Clearance of big end bearings, (mm):					
-	Diametrical	Evaluative	-do-	0.20	0.109 to 0.114	Yes
-	Axial	Evaluative	-do-	0.75	0.25	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.30	0.112 to 0.124	Yes
(h)	Clearance between center pin and bush, (mm)	Non Evaluative	-do-	0.30	0.147 to 0.155	Yes

18.1.12 CATEGORY OF BREAKDOWNS / DEFECTS :

S. No.	Characteristic	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.	None	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.	None	Yes

18.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2014:

	Characteristic	Requirements as per IS: 12207-2014	As observed	Whether meets the requirements (Yes/No.)
1.	Fitment of ROPS	With a provision for fitment of ROPS.	Not provided	Not applicable
		If ROPS fitted it should meet the requirement of IS: 11821-1992	ROPS not fitted	Not applicable
2.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Front tow hook are not provided	No

18.3 Conformity with following IS:

- i) Guide lines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS 10273:1987 (Reaffirmed in March, 2009)] : Conforms
- ii) Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3(third revision)[IS: 4931-1995 (Reaffirmed in March, 2009)] : Conforms
- iii) Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS 4468(Part-I):1997/ISO 730-1:1994 (Reaffirmed in March, 2009)] : Conforms
- iv) Drawbar for agricultural tractors – Link type [IS : Conforms 12953:1990 (Reaffirmed in March, 2007)]



- v) Agricultural tractors - Operator's seat technical requirement [IS 12343 -1998 (First revision) (Reaffirmed in March, 2009)] : Does not conform
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision) : [IS 12239 (PT-1) 1996/ISO 4254-1:1989 (Reaffirmed in (Reaffirmed in March, 2007))] : Conforms
- vii) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1 & Part-2) -2006 & 2007 (Reaffirmed in March, 2009)]/ ISO 3767-2:1991] : Conforms
- viii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (PT-2) 1999) (Reaffirmed in March, 2009) : Does not conform
- ix) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983) (Reaffirmed in March, 2009)] : Does not conform
- x) Agricultural Tractor & Machinery Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed in March, 2009)] : Conforms

18.4 Salient Observations:

18.4.1 Laboratory tests:

18.4.1.1 PTO Performance:

- i) The backup torque is 9.9% only & does not meet the requirement of IS: 12207-2014.
- ii) The maximum power was recorded as 22.2 & 22.8 kW in case of previous & present sample respectively against the declaration of 22.8 kW, which meets the requirement of IS: 12207-2014 with regard to tolerance.
- iii) The specific fuel consumption corresponding to maximum power was measured as 236 & 239 g/kWh in case of previous & present sample respectively against the declaration of 252 g/kWh, which is within the tolerance limit of IS: 12207-2014.

18.4.1.2 Hydraulic Performance: -

- i) The lifting capacity at standard frame was recorded as 8.37 kN and the moment about the rear axle was computed as 12.54 kN-m. The moment about rear axle is on higher side as compared to the moment about front axle. It is therefore, recommended that the lifting capacity of the hydraulic system may be reduced suitably or standard ballast mass at front axle may be provided to avoid front lifting of the tractor.

18.4.1.3 Mechanical Vibration:

The amplitude of mechanical vibration on various assemblies marked as (*) in Chapter-9 of this test report is on higher side, especially at the steering control wheel, foot rest and operator seat. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

18.4.1.4 Three point linkage:

Some of the parameters of three point linkage conforms to Cat.I and some of them conforms to Cat.II. Keeping in view the spirit of standardization, necessary improvement may be incorporated.

18.4.1.5 Operator's Seat:

Longitudinal distance from SIP to centre of steering control wheel does not meet the requirements of IS: 12343:1998 (Re-affirmed in March, 2009) and calls for necessary corrective action.



T-1120/1646/2017

**MAHINDRA , 265 DI MKM (BRAND NAME: BHOOMIPUTRA)
TRACTOR - Commercial (First Batch Test)**

- 18.4.1.6 Location and operation of operator's control:**
Safety against start of engine doesnot meets the requirements of IS: 8133-1983. This may be looked into.
- 18.4.2 Field performance test:**
Dry land operation:
The average area covered in M .B. ploughing operation with recommended size of plough was recorded in the range of 0.122 to 0.124 ha/h. Keeping in view the PTO power of the tractor, the area coverage is considered to be less, hence the recommended size of the plough may be reviewed.
- 18.4.2.1 Wet land cultivation (Puddling operation):**
No ingress of mud and / or water was observed during the test
- 18.4.2.2 Labeling of tractor: -**
The engine and chassis serial number of the tractor were embossed/ punched same **NEBT00078** at engine housing & labeling plate. For noteworthy identification of engine and chassis (Transmission) the serial number of these assemblies should be different. The brand name of the tractor must also be mentioned on the labeling plate.
- 18.5 Maintenance / Service Problems:**
No noticeable maintenance or service problem was observed during the test. However, servicing schedule for dry filter element has not been specified.
- 18.6 Recommendation with regard to safety on tractor:**
The following requirements, inter alia, may be considered for incorporation on the tractor:
- i) Provision of safety against accidental start of engine.
 - ii) Provision for spark arresting device in exhaust system.
 - iii) The working clearance around the draft control lever may be provided as per IS: 12239 (Part-2) – 1999.
 - iv) Provision of Front tow hook.
- 18.7 Adequacy of Literature supplied with machine:**
Literature has been supplied by the firm for this model of tractor. It is therefore, recommended that, the Operator's manual, workshop manual & parts catalogue for this model of tractor may be brought out as per IS: 8132-1999 (Reaffirmed in 2004) for the guidance of users and service personnel in national as well as other regional languages.

T-1120/1646/2017

MAHINDRA , 265 DI MKM (BRAND NAME: BHOOMIPUTRA)
TRACTOR - Commercial (First Batch Test)



19. 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
10 Months	10 Months (December,2016 to October ,2017)	No	None

TESTING AUTHORITY:

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AGRICULTURAL ENGINEER

C. V. CHIMOTE
TEST ENGINEER

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20. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
20.1	18.4.1.1(i),18.4.1.2,18.4.1.3,18.4.1.4,18.4.1.5,18.4.1.6,18.4.2, & 18.6 & 18.7	Observations will be studied and necessary action will be incorporated
20.2	18.4.2.2	The 17 digits chassis & 11 digits engine serial numbering identification for subject tractor already implemented on production from November 2016 across all plants. The subject tractor model was produced in year of October, 2016.