



**TAFE, MF 7250 DI V1.1 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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### 17. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

17.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter 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
17.1.1	<b>PTO Performance:</b>					
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >26kW. -7.5/+10% for PTO power ≤ 26kW	31.8 (D)	31.6	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	31.8 (D)	31.6	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	265 (D)	248	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	161.5 (D)	163.2	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	10 percent, min (R)	16.5	Yes
f)	<b>Maximum operating temperature (°C):</b>					
	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.	132 (D)	112	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)	91	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under high ambient conditions	2.61 (R) 1% of SFC, max. (D)	0.22	Yes



1	2	3	4	5	6	7	
h)	Smoke level	Evaluative	Maximum light absorption coefficient of 3.25 per metre or equivalent BOSCH No. 5.2 or 75 Haltridge value (As per CMVR)	3.25 per metre (R)	0.16 per meter	Yes	
<b>17.1.2 Drawbar performance:</b>							
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN).	Non Evaluative	Minimum 65% of static mass of tractor with ballast	18.5(D)	22.43	Yes	
				18.42 (R) Minimum			
b)	Maximum drawbar pull with Std. ballast corresponding to 15 percent wheel slip, (kN).	Evaluative	Minimum 65% of static mass of tractor without ballast	13.0(D)	16.86	Yes	
				13.13(R) Minimum			
c)	Maximum drawbar power without ballast (kW).	Evaluative	Minimum 80% of PTO power as referred in Sl. No. i) a) of PTO performance in case of tractors having total static mass >1500 kg. Minimum 75% of PTO power as referred in Sl. No. i) a) of PTO performance in case of light weight tractors. Minimum 75% of the engine power as referred in Sl. No. i) a) of PTO performance in case of tractors which do not have a PTO shaft.	25.4 (D)	28.4	Yes	
				25.2 (R) Minimum			
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company.	122 (D)	84	Yes	
<b>17.1.3 Power lift and hydraulic pump performance:</b>							
a)	Maximum lifting capacity throughout the range of lift, (kN):						
	1)	At hitch points	Non Evaluative	[Tolerance of minus 10%]	15.0 (D)	15.71	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	11.5 (D)	13.55	Yes
7.4 (R) Minimum							



1	2	3	4	5	6	7
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	The observed value should not exceed 50 mm	50 (D)  50 (R)	127	No
<b>17.1.4</b>	<b>Brake performance at 25 kmph:</b>					
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)	7.76	Yes
	2) Hot brake	Evaluative	10	10 (R)	7.91	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s <sup>2</sup> , (N)	Evaluative	600	600 (R)	280 to 359	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 (R)	Yes	Yes
<b>17.1.5</b>	<b>Noise measurement:</b>					
a)	Maximum ambient noise emitted by the tractor, dB(A)	Evaluative	As per CMVR	88 (R)	83	Yes
b)	Maximum noise at operator's ear level, dB(A)	Evaluative	As per CMVR	96 (R)	95	Yes
<b>17.1.6</b>	<b>Amplitude of mechanical vibrations at:</b>					
	1) Left foot rest	Non Evaluative	100 microns (max)	100 (R)	180	No
	2) Right foot rest			100 (R)	180	No
	3) Seat (with driver seated)			100 (R)	130	No
	4) Steering wheel			100 (R)	100	Yes
<b>17.1.7</b>	<b>Air cleaner:</b>					
	Air cleaner oil pull over, (%)	Non Evaluative	0.25 % (maximum)	0.25 % (maximum)	11.0	No
<b>17.1.8</b>	<b>Haulage requirements:</b>					
a)	Gross mass of the trailers, (tones):					
	1) Two wheel	Non	--	5.0 (D)	5.0	Yes
	2) Four wheel	Evaluative	--	5.0 (D)	5.0	Yes
b)	Distance travelled / litre of fuel consumption, (km/l):					
	1) Two wheel	Non Evaluative	--	4.8 to 6.5 (D)	6.10 to 6.33	Yes
	2) Four wheel		--	4.8 to 6.5 (D)	4.53 to 4.66	Yes



1	2	3	4	5	6	7	
c)	<b>Fuel consumption, (ml/km/tonne):</b>						
	1)	Two wheel	Non Evaluative	--	36.0 to 45.0 (D)	29.5 to 30.6	No
	2)	Four wheel		--	35.0 to 40.0 (D)	32.2 to 32.4	No
17.1.9	<b>Wetland cultivation (Puddling Operation):</b>						
	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	No ingress of water and/or mud was observed	Yes
	1)	Clutch assembly	-do-				
	2)	Brake housings	-do-				
	3)	Front axle hubs	-do-				
	4)	Engine oil	-do-				
	5)	Transmission oil	-do-				
17.1.10	<b>Safety features:</b>						
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes (As per IS 12239 Part 2)	--	Meets the requirement	Yes	
b)	Lighting arrangement	Evaluative	As per CMVR	--	Meets the requirements	Yes	
c)	Sealing requirements (Tractors having more 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)	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS 4931 (as amended from time to time)	--	Meets the requirements	Yes	
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS 4468 (Part 1) (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 requirements	Yes	
	Specifications of swinging drawbar	Non Evaluative	Should meet the requirements of IS 12362 (Part 3) (as amended from time to time)	--	Not provided	NA	



1	2	3	4	5	6	7
<b>17.1.11</b>	<b>Labeling of tractors (Provision of labeling plate):</b>					
	1) Make	Evaluative	Should conform to the requirements of CMVR	--	TAFE	Yes
	2) Model	Evaluative		--	MF 7250 DI V1.1	Yes
	3) Year of manufacture	Evaluative		--	HE (I.e. August, 2014)	Yes
	4) Engine serial number	Evaluative		--	SJ32752831	Yes
	5) Chassis number	Evaluative		--	MEA831DDHE300 0034	Yes
	6) Declaration of PTO power, (kW)	Evaluative		--	31.80	Yes
<b>17.1.12</b>	<b>Discard limit for:</b>					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer and supported by printed literature.	95.18	95.01 to 95.03	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.180	0.167 to 0.188	Yes
(c)	<b>Ring end gap (mm):</b>					
	- Top comp. ring.	Evaluative	-do-	1.50	0.45 to 0.50	Yes
	- 2 <sup>nd</sup> comp. ring.		-do-	1.50	0.95 to 1.00	Yes
	- Oil ring.		-do-	1.50	0.45	Yes
(d)	<b>Ring groove clearance (mm):</b>					
	- Top comp. ring.	Evaluative	-do-	0.25	Tapper face	--
	- 2 <sup>nd</sup> comp. ring.		-do-	0.25	0.071 to 0.088	Yes
	- Oil ring.		-do-	0.25	0.056 to 0.069	Yes
(e)	<b>Clearance of main bearings (mm):</b>					
	- Diametrical clearance	Evaluative	-do-	0.50	0.099 to 0.118	Yes
	- Crankshaft end float	Evaluative	-do-	0.50	0.12	Yes
(f)	<b>Clearance of big end bearings, (mm):</b>					
	- Diametrical	Evaluative	-do-	0.50	0.082 to 0.104	Yes
	- Axial	Evaluative	-do-	0.75	0.25	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.35	0.112 to 0.139	Yes
(h)	Clearance between center pin and bush, (mm)	Non Evaluative	-- do--	1.25	0.078 to 0.091	Yes
<b>17.1.13</b>	<b>Literature (Submission to test agency):</b>					
(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



1	2	3	4	5	6	7
<b>17.1.14 CATEGORY OF BREAKDOWNS / DEFECTS :</b>						
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	
<b>17.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2014:</b>						
S. No.	Characteristic	Requirements as per IS: 12207-2014	As observed	Whether meets the requirements (Yes/No.)		
1	2	3	4	5		
1.	Fitment of ROPS	With a provision for fitment of ROPS.	Provided	Yes		
		If ROPS fitted it should meet the requirement of IS: 11821-1992.	ROPS not fitted	Not applicable		
2.	Accessories	Trailer hitch, front tow hook may be provided.	Trailer hitch is provided	Yes		
			Front tow hook is provided	Yes		

**17.3 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 - Three-point linkage: Part 1 Categories 1, 2, 3 & 4 (Fourth Revision) [IS 4468 (Part-1):1997/ ISO 730-1:1994 (Reaffirmed in March, 2009)] : Does not conform
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in March, 2007)] : Conforms
- v) Agricultural tractors - Operator's seat technical requirement [IS 12343 –1998 (First revision) (Re-affirmed 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 (Reaffirmed in February, 2012)/ISO 4254-1:1989] : Does not conform



- |       |  |   |                  |
|-------|--|---|------------------|
| vii)  | Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1) – 2006 (Reaffirmed in March, 2009) and IS: 6283 (Part-2)-2007 (Reaffirmed in March, 2009)]/ISO 3767-2:1991] | : | Does not conform |
| viii) | Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) [(IS 12239 (PT-2) 1999) (Re-affirmed 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) (Re-affirmed in March, 2009)   | : | Conforms         |
| x)    | Agricultural Tractor & Machinery Lighting device for travel on public roads (IS: 14683-1999) (Re-affirmed in March, 2009)  | : | Conforms         |

#### 17.4 Salient Observations:

##### 17.4.1 Laboratory tests:

##### 17.4.1.1 PTO Performance:

- i) The maximum PTO power was observed as 31.6 kW against the declaration of 31.8 kW which meets the requirement of IS: 12207-2014 with regard to tolerance limit.
- ii) The specific fuel consumption corresponding to maximum power was recorded as 248 g/kWh against the declaration of 265 g/kWh, which is within the tolerance limit of IS: 12207-2014.
- iii) The backup torque is 16.5 %.

##### 17.4.1.2 Hydraulic Performance:

- i) The lifting capacity on standard frame was recorded as 13.55 kN respectively. The moment about rear axle was computed as 20.05 kN-m respectively, which is on higher side in compare to the moment about front axle i.e. 15.71 kN-m. Therefore, it is recommended that the lifting capacity should be reduced suitably or standard mass at front axle may be provided to avoid front lifting of tractor.
- ii) 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) was recorded as 127 mm against the declaration of 50 mm which does not meet the requirements of IS: 12207-2014 with regard to tolerance. This should be looked into for necessary corrective action.

##### 17.4.1.3 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 foot rests. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

##### 17.4.1.4 Air cleaner oil pull over test:

The Air cleaner oil pull over was recorded as 84.9 % against the maximum limit of 0.25 % which calls for the necessary improvement in the air intake system of the tractor.

##### 17.4.1.5 Three point linkage:

The lateral distance from lower hitch point to centre line of tractor does not meet the requirement of IS: 4468 (Part-1) -1997. This should be looked into for necessary corrective action.

##### 17.4.1.6 Technical Requirements for Power Take Off Shaft:

The master shield for Power take off shaft has not been provided as per the requirement of IS: 12953-1995. This should be looked into for necessary corrective action.



**17.4.1.7 Operator's Seat:**

- i) Width of seat from seat index point.
- ii) Vertical distance from seat index point to centre of clutch & accelerator pedal.

**17.4.2 Field performance test:****17.4.2.1 Wet land cultivation (Puddling operation):**

No ingress of water/or mud in various assemblies/components was noticed during wetland cultivation of tractor. Hence, it meets the requirements of IS: 11082-1984 (technical requirements of agricultural tractors for wetland operation). The tractor is found suitable for wetland operation (Puddling).

**17.4.3 Component assembly inspection**

The spring index of valve clearance was recorded as 15.50 to 16.87 N/mm against the declaration of 19.61 N/mm for inlet and exhaust valves respectively. The initial specified declared limit is not corrected in the applicant specified document. This should be looked into for necessary corrective action.

**17.4.4 Maintenance / Service Problems:**

No maintenance or service problems observed during the test.

**17.5 Recommendation with regard to safety on tractor:**

The following requirements, inter-alia, may be considered for incorporation on the tractor:

- i) Provision for spark arresting device in exhaust system.
- ii) Provision of PTO shaft master shield.

**17.6 Adequacy of Literature supplied with machine:****17.6.1** The following literature was supplied with the tractor for reference:

- i) Operator's Instruction Book
- ii) Parts Book
- iii) Workshop Service Manual

**17.6.2** The printed literature supplied with the test sample is in English. The literature may be brought out as per IS: 8132-1999 (Reaffirmed in March, 2009) for the guidance of user and service personnel in national as well as other regional languages.

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## 18. CITIZEN CHARTER

Time frame for Testing & Evaluation as per Citizen Charter	Duration of test	Whether the report is released within the time frame given in the Citizen Charter	Remark
10 Months	14 Months (May, 2016 to June, 2017)	No	Due to pre occupied PTO test bed & Drawbar test.

TESTING AUTHORITY:

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## 19. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
19.1	1.20, 17.3(iii), (v), (vi), (vii) & (viii)	We shall study and initiate to incorporate in production