



TAFE, MF 5245 DI PLANETARY PLUS V1 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

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO : 9001 - 2008 Certified Institute)

Tractor Nagar, Budni (M.P.) 466 445

E-mail fmti-mp@nic.in

Website : <http://cfmtti.dacnet.nic.in>

Telephone : 07564 - 234729

Fax : 07564 - 234743



T-998/1522/2015

TAFE, MF 5245 DI PLANETARY PLUS V1
TRACTOR – Commercial (Initial)

Manufacturer

: M/s. Tractors and Farm Equipment
Limited, P.O. Box No.3302
35, Mahatma Gandhi Road,
Nungambakkam, Chennai- 600 034

Test requested by
Place of running-in
Duration of said running-in, (h):
- Engine
- Transmission
Method of Selection

: The manufacturer
: At applicant's works.
: 12
: 24
: The tractor was submitted directly by the
applicant for test. Hence, method of selection
is not known.

1.1 Tractor:

Make
Model
Type

Year of manufacture
Chassis number
Country of origin
Variants, if any *

1. SPECIFICATIONS

: TAFE LTD.
: MF 5245 DI Planetary Plus V1
: Four wheeled, rear-wheel driven, Standard
Agricultural Tractor.
: EE (May 2014)
: MEA4A6D7EE3000027
: India
: None

1.2 Engine:

Make
Model
Type

Serial number

: SIMPSON & Co. Limited
: T III A SJ 327 -F3
: Four stroke, naturally aspirated, water cooled,
direct injection, diesel engine.
: SJ 327 30991

1.2.1 Engine speed(Manufacturer's recommended production setting), (rpm):

- Maximum speed at no load : 2300 to 2475
- Low idle speed : 600 to 800
- Speed at maximum torque : 1200 to 1500

Rated speed, (rpm):

- For PTO use : 2250
- For drawbar use : 2250

1.3 Cylinder & Cylinder Head:

Number
Disposition
Bore/stroke, (mm)
Capacity as specified by the applicant,
(cc)
Compression ratio
Type of cylinder head
Type of cylinder liners
Type of combustion chamber
Arrangement of valves

: Three
: Vertical, Inline
: 95/127 (apa)
: 2700 (apa)
: 18.3 : 1
: Monoblock
: Dry, replaceable
: Re-entrant cavity on piston crown
: Overhead, inline



T-998/1522/2015	TAFE, MF 5245 DI PLANETARY PLUS V1 TRACTOR – Commercial (Initial)
-----------------	--

16. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

Sl. No.	Adjustments/Defects/Breakdowns and Repairs	Tractor run hours
	None	

17. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

17.1 Evaluative (mandatory) / Non-evaluative (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:

Sl. 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 PTO Performance :						
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 >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	31.8 (D)	31.2	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	31.8 (D)	31.2	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	265 (D)	238	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	155 (D)	154.3	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	10 percent, min (R)	16.5	Yes
f) 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.	132 (D)	120	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.	110 (D)	91	Yes



T-998/1522/2015	TAFE, MF 5245 DI PLANETARY PLUS V1 TRACTOR – Commercial (Initial)
-----------------	--

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	2.38 (R) Not specified (D)	0.32	Yes
h)	Smoke level	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 (R)	0.17	Yes

17.1.2 Drawbar performance :

a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	17.22 (D) 19.06 (R) Minimum	25.18	Yes
b)	Maximum drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast	12.74 (D) 12.75 (R) Minimum	16.96	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 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.	25.4 (D) 25.0 (R) Minimum	28.7	Yes
d)	Max. transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	120 (D)	86	Yes

17.1.3. 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%]	8.83 (D)	15.38	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	8.55 (D) 7.34 (R) (Minimum)	14.59	Yes



T-998/1522/2015

**TAFE, MF 5245 DI PLANETARY PLUS V1
TRACTOR – Commercial (Initial)**

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	Observed value should not exceed 50 mm.	50 (D) 50 (R)	55	No
17.1.4	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)	5.74	Yes
	2) Hot brake	Evaluative	10	10 (R)	6.65	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600 (R)	213 to 241	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
17.1.5	Noise measurement:					
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88 (R)	79	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	98 (R)	94	Yes
17.1.6	Amplitude of mechanical vibrations at :					
	1) Left foot rest	Non Evaluative	100 microns (max)	100 (R)	120	No
	2) Right foot rest				140	No
	3) Seat (with driver seated)				130	No
	4) Steering Wheel				150	No
17.1.7	Air cleaner pull over:	Non Evaluative	0.25% (Max)	0.25%	0.16 to 6.17 %	No
17.1.8	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	--	5.35 to 5.75 (D)	5.58 to 5.61	Yes
	2) Four wheel	Evaluative	--	5.20 to 5.60 (D)	5.20 to 5.33	Yes
c)	Fuel consumption (ml/km/tonne):					
	1) Two wheel	Non	--	36 to 45 (D)	35.63 to 35.78	No
	2) Four wheel	Evaluative	--	35 to 40 (D)	31.22 to 32.03	No



1	2	3	4	5	6	7
17.1.9 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	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 Safety features :						
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 part 2)	--	Provided	Yes
b)	Lighting arrangement (Tractor having more than 1150 mm rear track width)	Evaluative	As per CMVR	--	Provided	Yes
c)	Seating requirement (Tractors having more than 1150 mm rear track width)	Non-Evaluative	Should meet the requirements of IS 12343 (as amended from time to time)	--	Conforms	Yes
d)	Technical requirements for PTO shaft	Non-Evaluative	Should meet the requirements of IS 4931 (as amended from time to time)	--	Conforms	Yes
e)	Dimension 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)	Specification of linkage and swinging drawbars	Non-Evaluative	Should meet the requirements of IS 12953 and IS 12362 (part 3) (as amended from time to time)	--	Conforms	Yes
17.1.11 Labelling of tractors (Provision of labelling plate):						
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	--	TAFE	Yes
2)	Model	Evaluative		--	MF 5245 DI PLANETARY PLUS V1	Yes
3)	Year of manufacture	Evaluative		--	EE (May, 2014)	Yes
4)	Engine number	Evaluative		--	SJ 32730991	Yes
5)	Chassis number	Evaluative		--	MEA4A6D7EE3000027	Yes
6)	Declaration of PTO power, (kW)	Evaluative		--	31.8	Yes



T-998/1522/2015

**TAFE, MF 5245 DI PLANETARY PLUS V1
TRACTOR – Commercial (Initial)**

1	2	3	4	5	6	7
17.1.12	Discard limit for:					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer	95.180 (D)	95.01 to 95.03	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.180 (D)	0.132 to 0.154	Yes
(c)	Ring end gap (mm):					
	- Top comp. ring	Evaluative	-do-	1.50	0.30 to 0.45	Yes
	- 2 nd comp. ring		-do-	1.50	1.05	Yes
	- Oil ring		-do-	1.50	0.65 to 0.70	Yes
(d)	Ring groove clearance (mm):					
	- Top comp. ring	Evaluative	-do-	0.25	Tapered ring	--
	- 2 nd comp. ring		-do-	0.25	0.048 to 0.068	Yes
	- Oil ring		-do-	0.25	0.045 to 0.051	Yes
(e)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	-do-	0.75	0.094 to 0.139	Yes
	- Crankshaft end float	Evaluative		0.75	0.12	Yes
(f)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.75	0.073 to 0.100	Yes
	- Axial	Evaluative	-do-	0.75	0.20 to 0.25	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.35	0.084 to 0.141	Yes
(h)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	1.25	0.147 to 0.216	Yes
17.1.13	Literature (Submission to test agency)					
(a)	Operator manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
(b)	Parts Catalogue	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
(c)	Workshop/ Service manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes



T-998/1522/2015

**TAFE, MF 5245 DI PLANETARY PLUS V1
TRACTOR – Commercial (Initial)**

17.1.14 CATEGORY OF BREAKDOWNS / DEFECTS :					
S. No.	Category of breakdowns	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

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

S. No.	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	Not provided	Not applicable
2.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Provided	Yes

17.3 Conformity with following IS:

- i) Guide lines for declaration of power and specific fuel consumption and labelling of agricultural tractors (First revision) [IS10273: 1987 (Reaffirmed 2009)] : **Conforms**
- ii) Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS:4931-1995 (Reaffirmed 2009)] : **Conforms**
- iii) Agricultural wheeled tractors - Three-point linkage: Part 2 Category 1N (Narrow Hitch) (Third Revision) [IS 4468 (Part-2):1993/ ISO 730-2:1979 (Reaffirmed 2009)] : **Does not conform**



T-998/1522/2015

TAFE, MF 5245 DI PLANETARY PLUS V1
TRACTOR – Commercial (Initial)

- iv) Drawbar for agricultural tractors – Link type [IS : Conforms
12953:1990 (Reaffirmed 2007)]
- v) Agricultural tractors - Operator's seat technical : Conforms
requirement [IS 12343 -1998 (First revision)
(Reaffirmed 2009)]
- vi) Guide for safety & comport of operator of agricultural : **Does not conform**
tractors: Part 1 General requirements (first revision):
[IS 12239 (PT-1) 1996/ISO 4254-1:1989 (Reaffirmed
2009)]
- vii) Tractors and machinery for agriculture and forestry – : **Does not conform**
Technical means for ensuring safety Part 2: Tractors
(first revision) (IS 12239 (PT-2) 1999) (Reaffirmed
2009)]
- viii) Guide lines for location and operation of operator : Conforms
controls on agricultural tractors and machinery (first
revision) IS: 8133-1983 (Reaffirmed 2009)]
- ix) Tractors and machinery for agriculture and forestry, : Conforms
powered lawn and garden equipment - Symbols for
operator controls and other displays Part 2 Symbols for
agricultural tractors and machinery [IS:6283 (Part-1)-
2006 and IS: 6283 (Part-2)-2007 (Reaffirmed 2009)]
- x) Agricultural Tractors and Machinery - Lighting device : Conforms
for travel on public roads (IS: 14683-1999) (Reaffirmed
2009)]

17.4 Salient Observations:

17.4.1 Laboratory tests:

17.4.1.1 PTO Performance:

- i) The backup torque is **16.5 %**.
- ii) The specific fuel consumption corresponding to maximum power was measured as **238 g/kWh** against the declaration of **265 g/kWh**, which is within the tolerance limit of IS: 12207-2014.

17.4.1.2 Drawbar performance:

During 10 hour drawbar test, creeping of RHS rear tyre over the rims was observed as 30 mm respectively, which was considered on higher side. This should be looked into for necessary corrective action.

17.4.1.3 Hydraulic Performance:

The maximum Cumulative drop in height of lift during load maintenance test was observed as 55 mm which does not meet the limit of 50 mm of IS-12207-2014, this should be looked into for necessary corrective action.

17.4.1.4 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 rest, seat & steering control wheel. This calls for dampening down of vibrations to improve the operational comfort and service life of components.



T-998/1522/2015

**TAFE, MF 5245 DI PLANETARY PLUS V1
TRACTOR – Commercial (Initial)**

17.4.1.5 Three point linkage:

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

17.4.1.6 Air cleaner oil pull over test:

The oil pull over (%) was observed as **3.48 to 6.17 %** which exceeds the limit of **0.25 %** as per IS: 12207-2014. This does not meet the requirement of IS: 12207-2014 and therefore, should be looked into for necessary corrective action.

17.4.2 Field performance test:

17.4.2.1 Wetland cultivation (Puddling operation):

No ingress of mud and / or water was noticed during puddling operation of the tractor and meet the requirements of IS: 11082-1984 (Technical requirements of agricultural tractors for wetland operation). Therefore, the tractor is recommended as suitable for wetland operation (Puddling).

17.4.2.2 Haulage performance:

The fuel consumption with two wheel trailer & four wheel trailer was observed as 35.63 to 35.78 ml/km/tonne & 31.22 to 32.03 ml/km/tonne respectively against the declaration of 36 to 45 ml/km/tonne & 35 to 40 ml/km/tonne. This does not meet the requirement of IS: 12207-2014 and therefore, should be looked into for necessary corrective action.

17.5 Wear assessment and final inspection:

During wear assessment and final inspection scratches found on the RHS Lower king pin bush. This should be looked into for necessary corrective action.

17.6 Maintenance / Service Problems:

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

17.7 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) The working clearance around the hydraulic draft and position control levers may be provided as per IS: 12239 (Part-2) – 1999.
- iii) Fuel shut-off knob does not remain in "STOP" position.
- iv) Provision of PTO shaft master shield.
- v) Differential lock may be provided.

17.8 Adequacy of Literature supplied with machine:

17.8.1 The following literature was supplied with the tractor for reference during the testing.

- i) Operator's Manual in respect of MF 5245 DI PLANETARY PLUS V1 tractor.
- ii) Tractor Parts Catalogue in respect of MF 5245 DI PLANETARY PLUS V1 tractor.
- iii) Combined Workshop Service Manual in respect of MF 1035, MF 1035 MAHASHAKTI, MF 1035 DI V3, MF 241 DI, MF 241 DI PLANETARY PLUS V1, MF 241 DI 4WD, MF 245 DI, MF 5245 DI PLANETARY PLUS V1 and MF 5245 DI 4WD tractors.



T-998/1522/2015

**TAFE, MF 5245 DI PLANETARY PLUS V1
TRACTOR – Commercial (Initial)**

- 17.8.2** The supplied literature was not found adequate as it does not covers the following information. Therefore, it is recommended that relevant literature may be updated by incorporating the following information:
- Information related to Drawbar and hydraulic performance of the tractor such as maximum drawbar power & pull, hydraulic pump discharge rate, hydraulic power & lifting capacities etc should be included in the technical specification of the tractor for the guidance of the user's.
 - Safe hitch height while using trailer.
 - Information on variant models & their feature at a glance shall also be included in the operator's manual.
- 17.8.3** The literatures should also be brought out in national as well as other regional languages for the guidance of users and service personnel.

18. Citizen charter

Duration of Test	Test duration under citizen charter	Whether the report released within time frame given citizen charter	Remark, if any
10 Months	9 Months (March, 2015 to December, 2015)	Yes	None

TESTING AUTHORITY:**PRAMOD YADAV**
AGRICULTURAL ENGINEER**H.L.YADAV**
SENIOR AGRICULTURAL ENGINEER**C.R.LOHI**
DIRECTOR**19. APPLICANT'S COMMENTS**

Para No.	Our Reference	Applicant's comments
19.1	17.1.3 (b), 17.1.6 (1) (2) (3) & (4), 17.1.7 and 17.1.8 (c)	We will look into for corrective action.
19.2	17.1.10 (e), 17.3 (iii) (vi) & (vii)	We will lock into for implementation of these safety features.