

Application Reference No. 28/2022-23/73

(यह परीक्षण रिपोर्ट 31/05/2028 तक वैध है / THIS TEST REPORT IS VALID UPTO 31/05/2028)



Make of Agricultural Tractor : TAFE
Model : MF 30 DI Orchard Plus V1
Manufactured by : Tractors & Farm Equipment Ltd.,
Box No. 3302, Old – 35 (New – 77)
Mahatma Gandhi Road, Nungambakkam,
Chennai – 600 034



भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय
(कृषि एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE
(DEPARTMENT OF AGRICULTURE & FARMERS WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
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CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
TRACTOR NAGAR, BUDNI (M.P.) 466 445
(An ISO 9001:2015 Certified Institute)

T-1738/2269/2023	TAFE, MF 30 DI ORCHARD PLUS V1 - INITIAL COMMERCIAL TEST
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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: May	Test Report No.: T-1738/2269/2023	Year: 2023
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[C]	Tractor manufacturer's name and address	:	Tractors & Farm Equipment Ltd., Box No. 3302, Old – 35 (New – 77) Mahatma Gandhi Road, Nungambakkam, Chennai – 600 034
[D]	Location of other manufacturing plants	:	i) Tractors And Farm Equipment Limited, Kalladipatti Plant, 10/205, Kalladipatti (PO) Pin code – 624 201 Dindigul dist, Tamil Nadu ii) Tractors And Farm Equipment Limited, Doddapallapur Plant, Plot No. 1, Kiadb Industrial Estate, Doddapallapur, Bangalore – 5610203
[C]	Submitted for test by (Applicant)	:	The Manufacturer
[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	:	12
	-Transmission	:	24
[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	:	TAFE
[C]	Model (trade name)	:	MF 30 DI Orchard Plus V1
[C]	Type	:	Rear Wheel Drive, Standard Agricultural Tractor.
[C]	Month & year of manufacture	:	03/23
[D]	Country of origin	:	India

1.1.2 Numbers:

[D]	1 st Serial No. of prototype	:	MEA88957HN3000776
[C]	Serial No.	:	MEA88957CP2470991

1.2 Engine:

[D]	Manufacturer's address	:	i) No. 861, 862, Anna Salai, Bordar thottam, Triplicane, Chennai – 600002 ii) No. 1 Kalia Pillai street, Mathulam Pettai Road, Kumbakonam, Tamil Nadu – 612001 iii) Simpson & Co Ltd., Sembiam Estate, Perambur, Chennai - 600011
[C]	Make	:	Simpson & Co.
[C]	Model	:	TIII A S217-F6
[C]	Type	:	Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.
[C]	Serial No.	:	S21751696

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6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

6.1 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: 12207-2022 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: 12207-2022	Values declared by the applicant/ (D) Requirement (R)	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
MANDATORY TESTS: (As per Ministry's Office Memorandum No. 13-17/2021-M&T (I&P) dated 28th of July, 2022).						
6.1.1 PTO Performance:						
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: $\pm 5\%$ for PTO power and or engine power > 26 kW. $\pm 10\%$ for PTO power and or engine ≤ 26 kW.	15.5 (D)	15.2	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	15.5 (D)	6.5	No
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% max.	265 (D)	264	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non-Evaluative	$\pm 8\%$	100 (D)	89.9	No
e)	Back-up torque, percent	Evaluative	12 percent, Min	12 (D) 12 Min. (R)	188.1	Yes
f)	Maximum operating temperature, ($^{\circ}$ C):					
	1) Engine oil	Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under natural ambient/high ambient condition should not exceed the declaration.	132 (D)	94	Yes
	2) Coolant	Evaluative	Observed value should not exceed the declared value or boiling point of coolant at radiator cap pressure whichever is lower. The boiling point of the coolant at radiator pressure shall be provided by the applicant.	110(D)	80	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. Power under natural ambient conditions.	2.64 Max.(R)	0.87	Yes
h)	Smoke 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 Max.(R)	0.09	Yes
6.1.2 Drawbar performance:						
a)	Max. drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	In case of tractors having total static mass ≥ 1500 kg, Min 70% of static mass of tractor without ballast or with standard ballast, as the case may be. In case of light weight tractors having ≤ 1500 kg total static mass of tractor, Min. 65% of static mass of tractor without ballast or with standard ballast, as the case may be.	11.00 (D) 10.61 (R) Min.	11.44	Yes

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1	2	3	4	5	6	7
b)	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.	13.0 (D) 12.2 (R) Minimum	13.0	Yes
c)	Maximum transmission oil temperature, (°C)	Evaluative	The declared value should not exceed the recommendation by the oil manufacturer. The observed value should not exceed the declared value throughout the drawbar test.	132 (D)	84	Yes
6.1.3 Power lift and hydraulic pump performance:						
a)	Maximum lifting capacity throughout the range of lift, (kN):					
	1) At hitch points	Evaluative	Should not be less than 90% of declared value.	10.0 (D)	11.51	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.	8.50 (D) 3.58 (R) Minimum	11.51	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 Minutes, (mm)	Non Evaluative	The observed value should not exceed 50 mm	50 (D) Maximum	70	No
6.1.4 Brake performance at 25 kmph:						
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal without ballast, (m):					
	1) Cold brake	Evaluative	10	10 (R)	6.66	Yes
	2) Hot brake	Evaluative	10	10 (R)	6.90	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² , (N)	Evaluative	600	600 (R) Maximum	239 to 271	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
6.1.5 OPTIONAL TESTS: As the applicant has not applied for any optional tests, therefore no optional tests was conducted.						
6.1.6 Safety features:						
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes [As per IS 12239 (Part2)]	Meets the requirement		Yes
b)	Lighting arrangement	Evaluative	As per CMVR	Meets the requirement		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 requirement		No

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1	2	3	4	5	6	7	
d)	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		No	
e)	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)	Specifications of linkage drawbar	Non Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	Meets the requirement		Yes	
g)	Swinging drawbar (wherever fitted)	Non Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)	Not provided		Not applicable	
h)	Audible warning signal on tractor	Evaluative	If tractor travel speed in reverse gear exceeds 20 kmph, an audible warning signal on tractor shall get activated. A sticker to the effect that "operating the tractor beyond 20 kmph speed in reverse gear is not safe" should be prominently displayed.	11.10 kmph		Not applicable	
6.1.7	Labelling of tractors (Provision of labelling plate):						
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO in kW, Specific fuel consumption (SFC) corresponding to maximum power in g/kWh and year of manufacture in numerical form <table border="1" style="margin: 5px auto;"><tr><td>MM</td><td>YY</td></tr></table> Digit 01 – 12 in box No.1 for MM will represent the months and next two digits in box No.2 for YY will represent the year of Manufacturing.	MM	YY	TAFE	Yes
MM	YY						
2)	Model	Evaluative		MF 30 DI Orchard Plus V1	Yes		
3)	Month & Year of manufacture	Evaluative		03/23	Yes		
4)	Engine number	Evaluative		S21751696	Yes		
5)	Chassis number	Evaluative		MEA88957CP247 0991	Yes		
6)	Maximum PTO power, (kW)	Evaluative		15.5	Yes		
7)	Specific fuel consumption, (g/kWh)	Evaluative	265	Yes			
6.1.8	Literature (Submission 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/ Service manual	Evaluative	Provided /Not Provided	Provided	Provided	Yes	
6.1.9	Fitment of Roll Over Protective Structures (ROPS):						
	For tractor having more than 1150 mm rear track width	Evaluative	ROPS should meet the requirement of IS:1182 or OECD code or equivalent International Standard	Not fitted		Not applicable	
6.1.10	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided		Yes	
6.1.11	Accessories (optional)	Non Evaluative	Ballast weight, if fitted, should meet the requirement of CMVR	Not fitted		Not applicable	

6.2 CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS:12207-2019):					
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 and labeling of agricultural tractors (First revision) [IS:10273 -1987 (Reaffirmed Year 2019)] : Conforms
- ii) Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS:4931-1995 (Reaffirmed Year 2019)] : **Does not conform**
- iii) Agricultural wheeled tractors – Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS:4468(Part-I) – 1997 (Reaffirmed in 2022)] : **Does not conform**
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed Year 2022)] : Conforms
- v) Agricultural tractors- Operator’s seat technical requirement [IS12343 - 2021] : **Does not conform**
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision):[IS 12239 (Part 1) - 2018] : **Does not conform**
- vii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (Part 2) 1999) (Reaffirmed Year 2019)] : **Does not conform**
- viii) Guide lines for location and operation of operator controls on agricultural tractors and machinery [IS: 8133 - 2021] : **Does not conform**
- ix) Tractors and machinery for agriculture and forestry, powered lawn 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)] : **Does not conform**
- x) Agricultural Tractors and Machinery-Lighting device for travel on public roads [(IS:14683-1999) (Reaffirmed Year 2019)] : Conforms

6.4 Salient Observations:

6.4.1 Laboratory tests:

6.4.1.1 PTO performance test:

- i) The term “Rated Power” is derived from the expression “Availability of power at rated rpm”. Further the rated rpm is defined as “the engine speed specified by the tractor manufacturer for continuous operation at full load”. The existing vast difference between declared rated power & observed rated power, therefore, needs to be reduced to the reasonable limit.
- ii) Maximum equivalent crankshaft torque has been recorded as 89.9 Nm against the declaration of 100 Nm, which does not meet the non-evaluative requirement of IS: 12207 – 2022. This should be looked into for necessary corrective action.

- iii) The back-up torque was calculate as 188.1%. This value is considerably more as the torque at rated engine speed was observed as 31.2 Nm only. This needs to be looked into for necessary corrective action.

6.4.1.2 Power Lift and Hydraulic Performance Test:

- i) The angle of rotation of mass over the full range of lift was observed as 4.1°, against the minimum requirement of 10° as per IS: 12224 – 1987. This should be looked into for necessary corrective action.
- ii) During the lift load maintenance test maximum drop in the height of the point of application of the force was recorded as 70 mm, against the maximum requirement of 50 mm, which does not meet the non-evaluative requirement of IS: 12207 – 2022. This should be looked into for necessary corrective action.

6.4.1.3 Operator's seat:

The following parameters do not meet the requirement of IS: 12343-2021.

- i) The width of seat was measured as 400 mm against the minimum requirement of 450mm.
- ii) Provision for adjustment of driver's mass has been specified as 50 to 120 kg against the requirement of 40 to 100 kg.
- iii) Vertical distance from SIP to centre of brake pedal has been measured as 470 mm against the requirement of 230 to 460 mm.
- iv) Vertical distance from SIP to centre of steering control wheel has been measured as 210 mm against the requirement of 265 to 385 mm.
- v) Vertical distance of SIP from foot rest has been measured as 370 mm against the requirement of 450 to 520 mm.

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

6.4.1.4 Operator's work place:

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

- i) Vertical retainers on inner side of clutch pedal and brake pedal are not provided.
- ii) Spark arresting device has not been provided in the exhaust system.

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

6.4.1.5 Three-point linkage:

The dimensions viz. diameter of hitch pin hole of upper hitch point and width of ball of lower points and lateral distance from lower hitch point to centre line of tractor does not meet the requirements of IS: 4468 (Part-I) – 1997.This should be looked into for necessary corrective action.

6.4.1.6 PTO master shield:

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

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)	Cubic capacity of engine, (cm ³)	1667	1670 (P. No. 55)
b)	Injector opening pressure	250+8 MPa	240±8 bar (P. No. 262 & 263 of Workshop Service Manual)
c)	Engine oil sump, (l)	5.0	5.5 (P. No. 122)
d)	Size of steered wheels	5.50 x 16, 6 PR	5.50 x 16 (P. No. 56) 5.50 x 16, 8 PR (on tractor)

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) Identification of hand controls by colour has not been provided as per the requirement as laid down in Table – 5 of IS: 8133-2021.
- ii) Stop control is located 280 mm from the engine start control against the minimum requirement of 150 mm, which does not meet the requirement as laid down in Table – 1 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 PTO engaging lever & LHS mudguard; draft control lever and RHS mudguard; between parking lever & gear box housing and Hand throttle lever & dash board have been measured as 50 mm; 50 mm; 20 mm & 35 mm, respectively against the minimum requirement of 70 mm as per the requirement of IS: 12239 (Part II) - 2019. Above parameters should be looked into for necessary corrective action.

6.8 Adequacy of Literature supplied with machine:

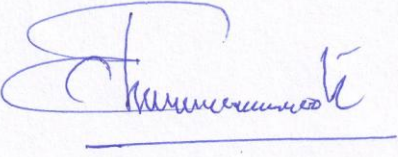

6.8.1 The following literatures were supplied with the test tractor for reference during the test: -

- a) Operator Instruction Book for "MF 30 DI ORCHARD PLUS V1" tractor model.
- b) Parts Book for "MF 30 DI ORCHARD PLUS V1" tractor model.
- c) Workshop Service Manual for "MF 30 DI ORCHARD PLUS V1" tractor model.

6.8.2 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.

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

C. V. CHIMOTE TEST ENGINEER	
A. K. UPADHYAY DIRECTOR (I/C)	

Draft test report compiled by C. K. Tijare, Agricultural Engineer.

8. APPLICANT'S COMMENTS

Para no.	Our reference	Comments
8.1	6.4.1, 6.4.1.2, 6.4.1.3, 6.4.1.4, 6.4.1.5, 6.5, 6.7 & 6.8.2	We will study and take appropriate corrective actions.

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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	15.3
3.	Power lift and hydraulic pump performance test	0.8
4.	Drawbar performance test	14.0
5.	Brake performance test	1.0
6.	Nominal speed test	0.9
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	5.8
	TOTAL:	37.8