



TAFE, MF 2630 4WD TRACTOR



भारत सरकार

GOVERNMENT OF INDIA

कृषि मंत्रालय (कृषि एवं सहकारिता विभाग, मशीनीकरण एवं प्रोद्योगिकी 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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Manufacturer : M/s. Tractors and Farm Equipment Limited,
P.O. Box No.3302
35, Mahatma Gandhi Road,
Nungambakkam, Chennai- 600 034

Test requested by (applicant) : The manufacturer
Selected for test by : Applicant
Place of running-in : At applicant's works

Duration of said running-in (h):

- Engine : 12
- Transmission : 16

Method of Selection : The tractor was submitted directly by the applicant for test. Hence method of selection is not known.

1. SPECIFICATIONS**1.1 Tractor:**

Make : TAFE LTD.
Model : MF 2630 4WD
Variants, if any :

S.NO	Variant models (*)	Variant features
1.	MF 2630	2WD, with 12 x 4 Speed gear box
2.	MF 2630 8 x 2	2WD, with 8 x 2 Speed gear box

*The variant models have not been tested at this Institute yet.

Brand name : None
Type : Four wheel driven, unit construction general purpose agricultural tractor.
Year of manufacture : KH AB (November 2012)
Chassis number : 733360
Country of Origin : India

1.2 Engine:

Make : SIMPSON & Co. Limited
Model : T III A TSJ 436 -F10
Type : Four stroke, turbo charged, water cooled, direct injection, diesel engine.
Serial number : TSJ 436 05254
Engine speed (Manufacturer's recommended production setting)(rpm):
- Maximum speed at no load : 2250 to 2420
- Low idle speed : 700 to 800
- Speed at maximum torque : 1300 to 1500
Rated speed, (rpm):
- For PTO use : 2200
- For drawbar use : 2200



16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

16.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2008 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: 12207-2008	Values declared by the applicant(D)/ Requirement (R)	As observed	Whether meets the requirements (Yes/No.)
1	2	3	4	5	6	7
16.1.1 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 >35hp. -7.5/+10% for PTO power ≤ 35 hp	39.7 (D)	41.9	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	39.7 (D)	41.9	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	265 (D)	255	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	220(D)	208.34	Yes
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	Above 7% (D)	14.67	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)	134	No
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)	107	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.55 Maximum (R)	0.44	Yes



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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 Hatridge value (As per CMVR)	3.25 per meter Maximum (R)	0.66	Yes
16.1.2 Drawbar performance :						
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	26.0(D) 23.68 (R)	30.77	Yes
b)	Maximum drawbar pull with Unballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor with standard ballast	19.0 (D) 17.42 (R)	23.54	Yes
c)	Maximum drawbar power with Unballast, (kW).	Evaluative	Min. 80% of PTO power as referred in 17.1.2(a) of PTO performance	35.0(D) 33.5 (R)	36.1	Yes
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	132(D)	108	Yes
16.1.3 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%]	20.5 (D)	17.44	No
2)	With the standard frame	Evaluative	The lift capacity should at least be 18 kg/PTO hp. And it should be 16 kg/engine hp where the tractor is not provided with a PTO shaft	19.0 (D) 9.92 Minimum (R)	15.0	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]	50 (D) 50 Maximum (R)	75	No
16.1.4 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)	7.26	Yes
2)	Hot brake	Evaluative	10	10(R)	6.81	Yes

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1	2	3	4	5	6	7
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s^2 (N)	Evaluative	600	600(R)	189	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
16.1.5	Noise measurement :					
a)	Maximum ambient noise emitted by the tractor at by-standard's position dB(A)	Evaluative	As per CMVR	88(R)	83	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	98(R)	93	Yes
16.1.6	Amplitude of mechanical vibrations at :					
			100 microns (max)	100(R)	90	Yes
			-do-	100(R)	180	No
1)	Left foot rest	Non Evaluative		100(R)	40	Yes
	Right foot rest					
2)	Seat (with driver seated)		-do-	100(R)	40	Yes
3)	Steering wheel		-do-			
16.1.7	Haulage requirements :					
a)	Gross mass of the trailers, (tones):		To be specified by the manufacturer	6.0 (D)	6.0	Yes
				7.0 (D)	7.0	Yes
	1) Two wheel	Non Evaluative				
	2) Four wheel					
b)	Distance travelled / litre of fuel consumption, (km/l):		-do-	3.15 to 3.5 (D)	3.96 to 4.08	Yes
	1) Two wheel	Non Evaluative	-do-	3.0 to 3.2(D)	3.66 to 3.72	Yes
	2) Four wheel					
c)	Fuel consumption (ml/km/tonne):		-do-	35.0 to 47.0(D)	40.8 to 42.1	Yes
	1) Two wheel	Non Evaluative	-do-	35.0 to 42.0(D)	38.43 to 39.1	Yes
	2) Four wheel					



1	2	3	4	5	6	7
16.1.8	Wetland cultivation :		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	Manufacturer has not recommended the tractor for puddling operation. Hence, the puddling test was not conducted.	Not applicable
	Sealing for the following assemblies:	Evaluative				
	1) Clutch assembly					
	2) Brake housings					
	3) Front axle hubs					
16.1.9	Safety features :					
a)	Guards against moving and hot parts	Evaluative	As per CMVR	As per CMVR	Provided	Yes
b)	Lighting arrangement	Evaluative	As per CMVR		Provided	Yes
16.1.10	Labelling of tractors (Provision of labelling plate):				TAFE	Yes
	1) Make	Evaluative	Should conform to the requirements of CMVR along with declared value of PTO HP	--	MF 2630 4 WD	Yes
	2) Model	Evaluative		--	KH AB (Nov. 2012)	Yes
	3) Year of manufacture	Evaluative		--	TS J43605254	Yes
	4) Engine number	Evaluative		--	733360	Yes
	5) Chassis number	Evaluative		--	39.7	Yes
	6) Declaration of PTO power, (kW)	Evaluative				
16.1.11	Discard limit for:-		To be specified by the manufacturer	95.202	95.00 to 95.03	Yes
a)	Cylinder bore diameter, (mm)	Evaluative		0.25 (with new rings)	0.115 to 0.125	Yes
b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative				
c)	Ring end gap (mm):		-do-	1.50	0.40 to 0.50	Yes
	- Top comp. ring.	Evaluative		1.50	0.45 to 1.05	Yes
	- 2 nd comp. ring.			1.50	0.35 to 0.45	Yes
	- Oil ring.					
d)	Ring groove clearance (mm):		-do-	-	Tapered ring	-
	- Top comp. ring.	Evaluative	-do-	0.25	0.065 to 0.077	Yes
	- 2 nd comp. ring.		-do-	0.25	0.040 to 0.05	Yes
	- Oil ring.		-do-			
e)	Clearance of main bearings (mm):		-do-	0.50	0.095 to 0.116	Yes
	- Diametrical clearance	Evaluative	-do-	0.50	0.20	Yes
	- Crankshaft end float	Evaluative				



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1	2	3	4	5	6	7
(f)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.50	0.079 to 0.09	Yes
	- Axial	Evaluative	-do-	0.25	0.25 to 0.30	No
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.35	0.024 to 0.089	Yes
(h)	Clearance between center pin and bush, (mm)	Non Evaluative	-do-	1.25	0.10 to 0.14	Yes

16.1.12 CATEGORY OF BREAKDOWNS / DEFECTS :

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	As observed	Whether meets the requirements (Yes/No.)
				4	5
1	2	3	4	5	
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

16.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2008:

Sl. No.	Characteristic	Requirements as per IS: 12207-2008	As observed	Remarks
1	Air cleaner oil pull over, max. oil pull over (%)	0.25% (max.)	Dry type air cleaner provided	Not applicable
2	Seating requirements	Should meet the requirements of IS: 12343-1998	Does not meet the requirements	No
3	Fitment of ROPS	With a provision for fitment of ROPS. If ROPS fitted, it should meet the requirement of IS: 11821-1992	Provided	Yes
4	Technical requirements for PTO shaft	Should meet the requirements of IS: 4931 -1995	NA	NA
5	Dimensions of three point linkage	Should meet the requirements of IS: 4468 (Part-I)-1997	Does not meet the requirements	No
6	Specifications of linkage drawbar	Should meet the requirements of IS: 12953-1990	Meet the requirements	Yes
7	Specifications of swinging drawbar	Should meet the requirements of IS: 12362 Part 3-1994	Meets the requirements	Yes
8	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Not provided	Not applicable
			Provided	Yes

16.3 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 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)] : 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 March, 2007)/ISO 730-1:1994] : Conforms
- 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) (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(Reaffirmed in March, 2009)/ISO 4254-1:1989]. : Does not conform
- vii) 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
- viii) 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
- ix) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983) (Reaffirmed in March, 2009)]. : Conforms
- x) Agricultural Tractor & Machinery Lighting device for travel on public roads (IS: 14683-1999)(Reaffirmed in March, 2009)] : Conforms

16.4 Salient Observations:

16.4.1 Laboratory tests:

16.4.1.1 PTO Performance:

- i) The backup torque is 14.67 %.
- ii) The specific fuel consumption corresponding to maximum power was measured as 0.255 g/kWh against the declaration of 265 g/kWh, which meets the requirements of IS: 12207-2008.
- iii) The drop in maximum power in high ambient condition in comparison to natural ambient condition was recorded as 8.35 % which is considered on higher side. This should be looked into.
- iv) The maximum engine oil temperature was recorded as 134 °C against the declared maximum engine oil temperature as 132 °C which is on higher side, this should be looked into for the corrective action.



- 16.4.1.2 Drawbar Performance:**
i) During drawbar performance test, the tyre creeping over rim of LHS & RHS tyre were observed as 15 & 5 mm respectively, this should be looked into.
- 16.4.1.3 Hydraulic Performance:**
i) Maximum lifting capacity throughout the range of lift (kN), at hitch points was observed as 17.44 kN against the declaration of 20.5 kN which is on lower side hence necessary improvements may be incorporated.
ii) The total drop in the height was observed as 75 mm during maintenance of lift load test within 05.hr. which is on very higher side and does not meets the requirements of IS:12207-2008.
- 16.4.1.4 Mechanical Vibration:**
The amplitude of mechanical vibration on various assemblies marked as (*) in Chapter-9 of this test report is on higher side. This calls for dampening down of vibrations to improve the operational comfort and service life of components.
- 16.4.1.5 Three point linkage:**
i) All parameters regards to the three point linkage meets the requirement as per IS: 4468 (Part I) 1997
- 16.4.1.6 Operator's Seat:**
i) The length of seat does not meet the requirement of IS: 12343-1998. This should be looked into for necessary corrective action.
ii) Longitudinal & vertical distance from SIP to center of steering control wheel does not meet the requirement of IS: 12343-1998. This should be looked into for necessary corrective action
- 16.4.1.7 Labelling Plate**
i) The various parameters concerning to Labelling Plate, meets the requirements of IS:10273-1987 (reaffirmed in March, 2009)
- 16.4.2 Field performance:**
- 16.4.2.1 Dry land Operation:**
i) The average area covered in disc ploughing operation with recommended size of implements was recorded in the range of 0.368 to 0.387 ha/h. Keeping in view the PTO power of the tractor, the area coverage is considered less, hence the recommended size of the implement may be reviewed.
- 16.4.2.2 Wetland cultivation (Puddling operation):**
The manufacturer has recommended that **the tractor is not suitable for wetland cultivation (puddling operation)** and therefore, the wetland cultivation (puddling operation) was not conducted. It is recommended that the fact that **" the tractor is not suitable for wetland (puddling) operation"** should be mentioned clearly & boldly in all the relevant literature of the tractor & also a cautionary notice regarding non-suitability of tractor for puddling operation may be displayed on the bonnet of the tractor.
- 16.4.2.3 Component Assembly Inspection / Wear assessment**
The axial clearance of big end bearings were observed as 0.25 to 0.30 mm against the discard limit of 0.25 mm, which doesn't fulfill the requirements of IS: 12207 - 2008.this should be strictly looked into for necessary corrections.
- 16.5 Maintenance / Service Problems:**
No noticeable maintenance or service problem was observed during the test however suitable draining system should be provided for draning sediment/water.
- 16.6 Recommendation with regard to safety on tractor:**
The following requirements, inter alia, may be considered for incorporation on the tractor:



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- i) Provision of spark arresting device in exhaust system.
- ii) Provision of silencer guard should be provided to avoid harm while working around/on tractor
- iii) Provision of Power take-off master shield.
- iv) Hydraulic pipe lines should be fully guarded to avoid harm during normal working on or around the tractor.

Adequacy of Literature supplied with machine:

- 16.7
16.7.1 No literature was supplied with test sample for reference, and only operator manual was provided just before releasing of draft test report , so it is strictly recommend that all relevant literature should be provided at the time of submission of the machine .
- 16.7.2 The supplied literature was not found adequate and sufficient for this model of tractor. It is therefore recommended that, the literature may be updated for modified specifications and the following technical data should also be incorporated.
 - i) Fuel saving tips should be included in the operator's manual.
 - ii) Information on the components / assemblies such as Fuel cooler etc.
 - iii) Information on PTO performance such as specific fuel consumption corresponding to the maximum power and backup torque has not been specified in the operator's manual.
 - iv) Safe hitch height while using trailer.
 - v) All variants along with their features may be provided at a glance.
 - vi) It is recommended that the fact that "the tractor is not suitable for wetland (puddling) operation " should be mentioned clearly & boldly in all the relevant literature of the tractor & also a cautionary notice regarding non-suitability of tractor for puddling operation may be displayed on the bonnet of the tractor.
- 16.7.3 Literatures may also be brought out in national & other regional languages for the guidance of user's and service personnel.

17. 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	6 Months (February, 2013 to July , 2013)	Yes	None

TESTING AUTHORITY:

P.K. Verma

P.K. VERMA
SENIOR AGRICULTURAL ENGINEER

C.R. Lohi
C.R. LOHI
DIRECTOR

Test report compiled by Shri. Nitesh Kumar Verma, Senior Technical Assistant.