

S-A E (KR)

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT (Initial Test)

संख्या / No. : T-1046/1571/2016
माह / Month : November, 2016



TAFE MF 1035 DI V2 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)

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Page 1 of 52

Manufacturer	:	M/s. Tractors and Farm Equipment Ltd. Post Box No. 3302 35, Mahatma Gandhi Road, Nungambakkam, Chennai – 600 034 (Tamil Nadu)
Location of plant (s)	:	i)Tractors and farm Equipment Ltd., Kalladipatti Plant, 10/205, Kalladipatti (P.O.) – 624 201, Dindigul District (Tamil Nadu) ii)Tractors and farm Equipment Ltd., Doddapallapur Plant, Plot No. 1, Kiadb Industrial Estate, Doddapallapur, Bangalore – 561 203 (Karnataka)
Test requested by (applicant)	:	The manufacturer
Selected for test by	:	Applicant
Place of running-in	:	At manufacturer's works
Duration of said running-in (h):		
- Engine	:	12
- Transmission	:	24
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 1035 DI V2
Variants, if any	: None
Brand name	: None
Type	: Four wheeled, rear wheel driven, General Purpose Agricultural Tractor.
Year of manufacture	: 2014 (EE)
Chassis number	: MEA2F221EE3000035
Country of Origin	: INDIA
1.2 Engine:	
Make	: SIMPSON & Co. Ltd.
Model	: T III A S324-F1.1
Type	: Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.
Serial number	: S324 D44352
Engine speed (Manufacturer's recommended production setting), (rpm) :	
- Maximum speed at no load,(rpm)	: 2100 to 2200
- Low idle speed, (rpm)	: 600 to 800
- Speed at max. torque, (rpm)	: 1200 to 1600

	gasket (Part No. SIMPSON 49530127) was replaced with new.																										
4.	<p>To rectify the overheating tendency of the engine, the applicant has requested for replacement of radiator with new one having following modified specifications:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 5px;"> <thead> <tr> <th style="text-align: center;">Parameters</th> <th style="text-align: center;">Old radiator</th> <th style="text-align: center;">New radiator</th> </tr> </thead> <tbody> <tr> <td>Outer dimensions, (mm)</td> <td style="text-align: center;">455x420x70</td> <td style="text-align: center;">455x420x70</td> </tr> <tr> <td>No. of fins per inch</td> <td style="text-align: center;">8</td> <td style="text-align: center;">12</td> </tr> <tr> <td>No. of tubes</td> <td style="text-align: center;">39</td> <td style="text-align: center;">39</td> </tr> <tr> <td>Bare radiator capacity, (l)</td> <td style="text-align: center;">2.70</td> <td style="text-align: center;">2.50</td> </tr> <tr> <td>Liquid used</td> <td style="text-align: center;">Water</td> <td style="text-align: center;">Coolant</td> </tr> <tr> <td>Name & brand name of the coolant</td> <td style="text-align: center;">Water</td> <td style="text-align: center;">Total ELF Auto Supra</td> </tr> <tr> <td>Coolant water ratio</td> <td style="text-align: center;">N. A.</td> <td style="text-align: center;">0.94 : 0.06</td> </tr> </tbody> </table> <p>Thereafter, supplementary PTO performance test as per clause 3.2.4 (a) of IS: 12207-2014 was conducted successfully and coolant temperature was recorded within the specified limit.</p>	Parameters	Old radiator	New radiator	Outer dimensions, (mm)	455x420x70	455x420x70	No. of fins per inch	8	12	No. of tubes	39	39	Bare radiator capacity, (l)	2.70	2.50	Liquid used	Water	Coolant	Name & brand name of the coolant	Water	Total ELF Auto Supra	Coolant water ratio	N. A.	0.94 : 0.06	--	18.1
Parameters	Old radiator	New radiator																									
Outer dimensions, (mm)	455x420x70	455x420x70																									
No. of fins per inch	8	12																									
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Name & brand name of the coolant	Water	Total ELF Auto Supra																									
Coolant water ratio	N. A.	0.94 : 0.06																									
5.	During drawbar performance ten hours test, the rear LHS tyre got punctured due to excessive tyre creeping over rim. The rear LHS tube was replaced with new one and RHS tube was refitted to its original position.	--	54.0																								

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	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 >26kW. -7.5/+10% for PTO power ≤ 26kW	23.9 (D)	25.6	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	23.9 (D)	25.6	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	265 (D)	259	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	137.3 (D)	142.6	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	10 percent, min (R)	17.75	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)	128	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)	105	Yes (Meets only after supplementary test)
g)	Engine oil consumption, (g/kWh)		Evaluative	Not exceeding 1% of SFC at max. power under high ambient conditions	2.63 (R) 1% of SFC, max. (D)	1.107	Yes
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 metre (R)	0.21 per meter	Yes
1	2	3	4	5	6	7	
17.1.2	Drawbar performance:						
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN).		Non Evaluative	Minimum 65% of static mass of tractor with ballast	15.60 (D) 13.70 (R) Minimum	18.95	Yes
b)	Maximum drawbar pull without ballast corresponding to 15 percent wheel slip, (kN).		Evaluative	Minimum 65% of static mass of tractor without ballast	11.00 (D) 10.58 (R) Minimum	13.76	Yes
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.	19.1 (D) 20.5 (R) Minimum	24.2	Yes
d)	Maximum transmission oil temperature (°C)		Non Evaluative	The declared value should not exceed the maximum value specified by oil company.	132 (D)	80	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%]	12.20 (D)	7.83	No
	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	10.80 (D) 6.03 (R) Minimum	7.55	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	The observed value should not exceed 50 mm	50 (D) 50 (R)	25	Yes
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)	9.65	Yes
	2)	Hot brake	Evaluative	10	10 (R)	9.65	Yes
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)	363 to 396	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)	81	Yes
b)	Maximum noise at operator's ear level, dB(A)		Evaluative	As per CMVR	96 (R)	94	Yes
17.1.6	Amplitude of mechanical vibrations at:						
	1)	Left foot rest	Non Evaluative	100 microns (max)	100 (R)	140	No
	2)	Right foot rest			100 (R)	90	Yes
	3)	Seat (with driver seated)			100 (R)	40	Yes
	4)	Steering wheel			100 (R)	130	No
17.1.7	Air cleaner:						
	Air cleaner oil pull over, (%)		Non Evaluative	0.25 % (maximum)	0.25 % (maximum)	0.05	Yes

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	--	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)	7.13 to 7.26	Yes
	2)	Four wheel		--	4.8 to 6.5 (D)	7.07 to 7.13	Yes
c)	Fuel consumption, (ml/km/tonne):						
	1)	Two wheel	Non Evaluative	--	25.0 to 30.0 (D)	27.56 to 28.05	Yes
	2)	Four wheel		--	25.0 to 30.0 (D)	28.05 to 28.29	Yes
1	2	3	4	5	6	7	
17.1.9	Wetland cultivation (Puddling Operation):						
	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, 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)	Seating 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)	--	Does not meet the requirement	No	
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	Non	Should meet the	--			

	swinging drawbar	Evaluative	requirements of IS 12362 (Part 3) (as amended from time to time)		Not provided	NA
17.1.11	Labeling of tractors (Provision of labeling plate):					
	1) Make	Evaluative	Should conform to the requirements of CMVR	--	TAFE	Yes
	2) Model	Evaluative		--	MF 1035 DI V2	Yes
	3) Year of manufacture	Evaluative		--	EE (May, 2014)	Yes
	4) Engine serial number	Evaluative		--	S324D443 52	Yes
	5) Chassis number	Evaluative		--	MEA2F221 EE3000035	Yes
	6) Declaration of PTO power, (kW)	Evaluative		--	23.87	Yes
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 and supported by printed literature.	89.21	88.94 to 88.96	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.25	0.141 to 0.149	Yes
(c)	Ring end gap (mm):					
	- Top comp. ring.	Evaluative	-do-	1.50	0.35	Yes
	- 2 nd comp. ring.		-do-	1.50	0.35 to 0.40	Yes
	- Oil ring.		-do-	1.50	0.40	Yes
(d)	Ring groove clearance (mm):					
	- Top comp. ring.	Evaluative	-do-	0.25	0.078 to 0.082	Yes
	- 2 nd comp. ring.		-do-	0.25	0.048 to 0.062	Yes
	- Oil ring.		-do-	0.25	0.041 to 0.053	Yes
(e)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	-do-	0.75	0.085 to 0.119	Yes
	- Crankshaft end float	Evaluative	-do-	0.50	0.10	Yes
(f)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.75	0.040 to 0.130	Yes
	- Axial	Evaluative	-do-	0.75	0.35	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.50	0.17 to 0.37	Yes
(h)	Clearance between center pin and bush, (mm)	Non Evaluative	-- do--	1.25	0.18 to 0.20	Yes
17.1.13	Literature (Submission to test agency):					
(a)	Operator manual	Evaluative	Provided/ Not provided	Provided	Provided	Yes

T-1046/1571/2016	TAFE MF 1035 DI V2 – Commercial (Initial)
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(b)	Parts Catalogue	Evaluative	Provided/ Not provided	Provided	Provided	Yes
(c)	Workshop/ Service manual	Evaluative	Provided/ Not provided	Provided	Provided	Yes

17.1.14 CATEGORY OF BREAKDOWNS / DEFECTS :					
1	2	3	4	5	6
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.	Two (Mn7 & Mn8)	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.	Two (Mn7 & Mn8)	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	2	3	4	5
1.	Fitment of ROPS	With a provision for fitment of ROPS.	Not provided	No
		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 not provided	No

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)] : **Does not conform**
- 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)] : **Conforms**
- 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) During PTO performance test under high ambient condition, the engine water temperature was recorded as 113°C & 114°C against the maximum permissible limit of 112°C specified by the applicant and does not meet the evaluative requirement of IS:12207-2014.

To rectify the overheating tendency of the engine, the applicant has requested for replacement of radiator with new one having following modified specifications:

Parameters	Old radiator	New radiator
Outer dimensions, (mm)	455 x 420 x 70	455 x 420 x 70
No. of fins per inch	8	12
No. of tubes	39	39
Bare radiator capacity, (l)	2.70	2.50
Liquid used	Water	Coolant
Name & brand name of the coolant	Water	Total ELF Auto Supra
Coolant water ratio	N. A.	0.94 : 0.06

Thereafter, supplementary PTO performance test as per clause 3.2.4 (a) of IS: 12207-2014 was conducted successfully. The overheating tendency of the engine was not observed and the coolant temperature was recorded within the specified limit meeting the evaluative requirement of IS: 12207-2014.

Therefore, it is recommended that, the modified cooling system should be permanently incorporated in the commercial production of this tractor model.

- ii) The maximum PTO power was observed as 25.6 kW against the declaration of 23.9 kW which meets the requirement of IS: 12207-2014 with regard to tolerance limit.
- iii) The specific fuel consumption corresponding to maximum power was recorded as **259 g/kWh** against the declaration of **265 g/kWh**, which is within the tolerance limit of IS: 12207-2014.

iv) The backup torque is **17.75 %**.

17.4.1.2 Drawbar performance:

- i) During drawbar performance ten hours test, the rear LHS tyre got punctured due to excessive tyre creeping over rim. The rear LHS tube was replaced with new one and RHS tube was refitted to its original position.
- ii) The creeping of LHS tyre and RHS tyre over rim was recorded as 65 mm for 6.50 h & 40 mm for 5.00 h and 70 mm for 6.50 h & 90 mm for 5.00 h, respectively during 10 hours drawbar performance test. This should be looked into for necessary corrective action.

17.4.1.3 Hydraulic Performance:

The maximum lifting capacity throughout the range of lift at hitch points was recorded as **7.83 kN** against the declaration of **12.20 kN**. 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 steering control wheel and foot rests. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

17.4.1.5 Three point linkage:

The width of ball of lower hitch points and 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:

Dimension "D \emptyset ", "B \emptyset " and "A \emptyset " [Refer Fig.2] of power take off shaft does not meet the requirement of IS: 12953-1995. This should be looked into for necessary corrective action.

17.4.1.7 Operator's Seat:

- i) The length of seat from seat index point.
- ii) The width of seat.
- iii) Longitudinal distance from seat index point to centre of steering control wheel.
- iv) Vertical distance of seat index point from foot rest.
- v) Lateral distance of seat index point from inner brake pedal.

The above i) to v) parameters does not meet the requirement of IS: 12343-1998. This should be looked into for necessary corrective action.

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).

17.5 Maintenance / Service Problems:

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

**17.6****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.
- iii) The length of seat from seat index point, the width of seat, longitudinal distance from seat index point to centre of steering control wheel, vertical distance of seat index point from foot rest, lateral distance of seat index point from inner brake pedal should be within the limit of easy handling of tractor.

17.7**Adequacy of Literature supplied with machine:****17.7.1**

The following literature was supplied with the tractor for reference:

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

17.7.2

The operator's manual may be revised as per IS: 8132-1999 with the inclusion of, inter alia, the following:

- i) High idling speed of engine as "2100 – 2200 rpm" instead of "2200 rpm."
- ii) Low idling speed of engine as "600 – 800 rpm" instead of "700 – 750 rpm."
- iii) Cubic capacity of engine as "2365 cc" instead of "2400 cc".
- iv) Overall dimensions and minimum ground clearance shall be corrected as given in Cl. 1.24 of this test report.

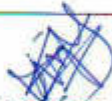

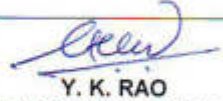
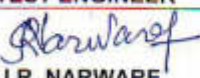
17.7.3

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.

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	16 Months (July, 2015 to October, 2016)	No	Due to occurrence of repeat and supplementary PTO performance test.

TESTING AUTHORITY:

 C. K. TIJARE AGRICULTURAL ENGINEER	 C. V. CHIMOTE TEST ENGINEER	 Y. K. RAO SENIOR AGRICULTURAL ENGINEER
 J.J.R. NARWARE DIRECTOR		
CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE - BUDNI		Page 49 of 52

T-1046/1571/2016	TAFE MF 1035 DI V2 – Commercial (Initial)
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19. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
19.1	17.4.1.2(i)(ii), 17.4.1.3, 17.4.1.4, 17.4.1.5, 17.4.1.6, 17.4.1.7, 17.6 (i) (ii) (iii)	We will look into for corrective action and implementation of these safety features.
19.2	17.7.2 (i,ii,iii,iv)	We will look into corrective action.

ANNEXURE - I**BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST**

Sl. No.	Item	Disc Plough	Rotavator
1.	Make	Field King	Shaktiman
2.	Type	Mounted	Mounted
3.	No. of bottom / blades/discs	2	30 (in 6 flanges)
4.	Type of bottom / blades/discs	Plain concave	Hatchet
5.	Size of bottom / blade/disc, (mm)	650	110 x 50 x 5
6.	Spacing of bottom/blade/disc, (mm)	560	235
7.	Lower hitch point span, (mm)	860	770
8.	Mast height, (mm)	615	545
9.	Overall dimensions, (mm):		
	- Length	1850	1040
	- Width	855	1130
	- Height	1200	1000
10.	Gross mass, (kg)	295	320

ANNEXURE -II**BRIEF SPECIFICATION OF HALF CAGE WHEELS**

SI No.	Items	Specification
1.	Type	Full cage wheel
2.	Outer dia, (mm)	1280
3.	Width, (mm)	850
4.	No. and types of lugs	24, Straight lugs made of M.S. angle section welded to angle iron frame
5.	Size of angle section, (mm)	50 x 50 x 6
6.	Length of lug, (mm)	425
7.	Spacing of lug, (mm)	160
8.	Weight of each cage wheels, (kg)	145

ANNEXURE-III**TRACTOR RUN HOURS DURING TEST**

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	24.13
3.	Power lift and hydraulic pump performance test	3.78
4.	Drawbar performance test	22.50
5.	Turning ability	0.20
6.	Location of centre of gravity	0.20
7.	Operator's field of vision	0.20
8.	Brake test	2.33
9.	Noise measurement	1.50
10.	Mechanical vibration test	0.50
11.	Theoretical speed test	2.17
B.	FIELD TEST:	
1.	Disc ploughing	10.67
2.	Rotavation	10.57
3.	Wetland cultivation (including water proof)	15.25
C.	HAULAGE TEST:	5.50
D.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	6.00
	TOTAL:	105.50