



TAFE, MF 1035 DI V13 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@gov.in

Website : <http://www.fmttibudni.gov.in>

Telephone : 07564 - 234729

Fax : 07564 - 234743



T-1090/1615/2017

TAFE ,MF 1035 DI V13 TRACTOR - Commercial (Variant)

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

Month: May	Test Report No. T- 1090/1615/2017	Year : 2017
------------	-----------------------------------	-------------

GOVERNMENT OF INDIA
CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
TRACTOR NAGAR, BUDNI (MADHYA PRADESH) 466445, INDIA
Email: fnti-mp@gov.in
Web site: fntt|budni.gov.in

Téléphone: 07564-234729

FAX: 07564-234743

Type of Test : **COMMERCIAL (Variant)**
 Test code/Procedure : IS: 5994-1998 (Reaffirmed in March, 2009),
 and IS: 12207-2014
 Period of Test : January, 2017 to April, 2017
 Test Report No. : **T- 1090/1615/2017**
 Month/Year : **May, 2017**

- i) The results reported in this report are observed values and no corrections have been applied for atmospheric and site conditions.
- ii) The data given in this report pertain to the particular machine submitted by the applicant for test.
- iii) The results presented in this report do not in any way attribute to the durability of the machine.
- iv) This report should not be reproduced in part or full without prior permission of the Director, Central Farm Machinery Training and Testing Institute, Budni (M.P.).
- v) This is a Variant test report and therefore, should be read in conjunction with the Test Report of base model i.e. "TAFE, MF 1035 DI V2" tractor bearing No. T- 1046/1571/2016 (November, 2016).

SELECTED CONVERSIONS			ABBREVIATIONS	
Sl. No	Units	Conversion Factor		
1	Force:		apa	As per applicant
	1 kgf	9.80665 N	TDC	Top Dead Centre
		2.20462 lbf	IS	Indian Standard
2	Power:		LHS/RHS	Left Hand Side/ Right Hand Side
	1 hp	1.01387metric hp (Ps)	Hg.	Mercury
		745.7 W	Temp.	Temperature
	1 Ps	735.5 W	N.R.	Not recorded
	1 kW	1.35962 Ps	rpm	Revolutions per minute
3	Pressure:		O.D/I.D	Outer diameter/ Inner diameter
	1 psi	6.895 kPa	N.A.	Not available/ Not applicable
	1 kgf/cm ²	98.067 kPa = 735.56 mm of Hg	PTO	Power take-off
	1 bar	100 kPa = 10 N/cm ²	R.H.	Relative Humidity
	1 mm of Hg	1.3332 m-bar		



	<u>C O N T E N T S</u>	<u>P A G E</u>
1.	Scope of Test	05
2.	Fuel & Lubricants	06
3.	Essential Test	06
	3.1 Specifications	06
	3.2 Nominal Speed	20
	3.3 PTO Performance Test	20
4.	Other applicable tests	27
4.1	Visibility Test	27
5.	Adjustments, defects, breakdowns & repairs	28
6.	Comparison Between Base Model and Variant Model	28
7.	Summary of Observations, Comments & Recommendations	31
8.	Citizen Charter	36
9.	Applicant's Comments	36
	Annexure - I	36



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)	:	M/s. Tractors and Farm Equipment Limited, P.O. Box No.3302, 35 Mahatma Gandhi Road, Nungambakkam, Chennai- 600 034
Selected for test by	:	Applicant
Place of running-in	:	At manufacturer's work place
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. SCOPE OF TEST

The "TAFE, MF 1035 DI V2" tractor had undergone "Initial Commercial Testing" at this institute and a test report number T-1046/1571/2016, November, 2016. Now applicant has submitted an application vide letter No. Nil dated 09.01.2017 for testing of "TAFE, MF 1035 DI V13" as a Variant of "TAFE, MF 1035 DI V2".

The applicant having enclosed a list of following differences in the technical specifications between base model "TAFE, MF 1035 DI V2" and variant model "TAFE, MF 1035 DI V13" tractor and requested to test the "TAFE, MF 1035 DI V13" as a variant of "TAFE, MF 1035 DI V2" tractor

The major features of Base model and Variant model are listed below:

S. No.	Parameters	Base Model (T-1046/1571/2016, November, 2016)	Variant Model
1	2	3	4
1.	Make & Model of Tractor	TAFE, MF 1035 DI V2	TAFE, MF 1035 DI V13
2.	Engine model	T III A S324-F1.1	T III A S337-F1.6
3	Rated engine speed (rpm)	2000	1900
4	Model /group combination number of fuel injection pump	F 002 AOZ 771/ PES3A80D320RS2000	F 002 AOZ816/ PES3 A80D 320RS 2000
5	Governor rated engine speed, (rpm)	2000	1900
6	Fuel tank capacity, (l)	42	47
7	Position of silencer outlet with respect to seat index point, (mm):		
	-Vertical	960	1060
	-Longitudinal	1090	1115
	-Lateral	390 (on LHS)	425 (on LHS)
8	PTO speed corresponding to rated engine speed, (rpm)	654	684



T-1090/1615/2017

TAFE ,MF 1035 DI V13 TRACTOR - Commercial (Variant)

1	2	3	4
9.	Engine to PTO speed ratio	3.06:1	2.778:1
	Reduction through gearbox input shaft (constant drop gear)	3.06 : 1 (52/17)	2.78 : 1 (50/18T)
10	Sheet metal decals (Sticker)	MF-1035 DI V2	MF-1035 DI V13
11	Style of bonnet and fender	Stub bonnet & flat top fender	Square bonnet & flat top fender
9.	Declared maximum PTO, power (kW)	23.9	26.0

Subsequent to the examination of the case in light of Indian Standard IS 12207-2014, the following tests were considered to be carried out :

- Specification checking
- Nominal Speed Test
- PTO Performance Test
- Visibility Test

2. FUEL AND LUBRICANTS

2.1 Fuel : The High-speed diesel oil supplied by M/s Indian Oil Corporation Limited having density of 0.836 g/cc at 15°C was used.

2.2 Lubricants:

S. No.	Particulars	As recommended by the manufacturer	As used during the test in case of variant model
1.	Engine and Air cleaner oil	SAE 20W40	As recommended
2.	Transmission and hydraulic oil	SAE 20W40	Oil originally filled in the tractor was not changed
3.	Steering housing oil	SAE - 140	--do--
4.	Grease	Servo Grease MP	Servo Grease MP

3. ESSENTIAL TESTS

3.1. SPECIFICATIONS

	<u>Base Model</u>	<u>Variant Model</u>
3.1.1 Tractor:		
Make	: TAFE Ltd.	TAFE Ltd.
Model	: MF 1035 DI V2	MF 1035 DI V13
Brand name	: None	None
Type	: Four-wheel drive ,Rear wheel driven general Purpose, Agricultural Tractor	
Year of manufacture	: 2014	2014
Chassis serial number	: MEA2F221EE3000035	MEA8B1DDHE3000032
Country of Origin	: India	India
3.1.2 Engine:		
Make	: SIMPSON & Co. Limited	SIMPSON & Co. Limited
Model	: T III A S324 – F1.1	T III A S337-F1.6



	<u>Base Model</u>	<u>Variant Model</u>
Type	: Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.	
Serial number	: S324D44352	S337A29248
Engine speed (Manufacturer's recommended production setting) (rpm) :		
- Maximum speed at no load	: 2100 to 2200	2100 to 2200
- Low idle speed	: 600 to 800	700 to 750
- Speed at maximum torque	: 1200 to 1600	1300 to 1500
Rated speed, (rpm):		
- For PTO use	: 2000	1900
- For drawbar use	: 2000	1900
3.1.3 Cylinder & Cylinder Head:		
Number	: Three	Three
Disposition	: Vertical inline	Vertical inline
Bore/stroke, (mm)	: 88.9/127	88.9/127
Capacity as specified by the applicant, (cc)	: 2365	2365
Compression ratio, (apa)	: 18.3: 1	18.3: 1
Type of cylinder head	: Monoblock	Monoblock
Type of cylinder liners	: Dry, replaceable	Dry, replaceable
Type of combustion chamber	: Re-entrant cavity on piston crown	
Arrangement of valves	: Inline, Overhead	Inline, Overhead
Valve clearance (cold/hot):		
- Inlet valve, (mm)	: 0.30 / 0.25	0.30 / 0.25
- Exhaust valve, (mm)	: 0.30 / 0.25	0.30 / 0.25
3.1.4 Fuel System:		
Type of fuel feed system	: Gravity and force feed	Gravity and forced feed
3.1.4.1 Fuel tank:		
Capacity, (l)	: 42.0	45.90
Location	: Above engine under the bonnet	
Provision for draining of sediments/ water	: Water separator is provided.	Water separator is provided.
Material of fuel tank	: Metallic	Metallic
3.1.4.2 Water separator:		
Make	: Alert	Alert
Type	: Gravity, inverted funnel	
Location	: On LHS of engine, In between fuel tank and feed pump	
3.1.4.3 Fuel feed pump:		
Make	: Not available	Bosch, India
Type	: Plunger	Plunger
Model/Group combination No.	: Not available	FP/KSG22AD45/2, 9 440 030 030
Provision of sediment bowl	: Provided	Provided
Method of drive	: Through camshaft of fuel injection pump	



	<u>Base Model</u>	<u>Variant Model</u>
3.1.4.4 Fuel filters:		
Make	: Bosch, made in India	Bosch, made in India
Model/Group combination No.	: F 002 H20 151	F 002 H20 151
Number	: Two	Two
Type of elements :		
- Primary	: Cloth	Cloth
- Secondary	: Paper	Paper
Capacity of final stage filter, (l)	: 0.50	0.45
3.1.4.5 Fuel Injection pump:		
Make	: Bosch, made in India	Bosch, made in India
Model/Group combination No.	: F 002 A0Z 771/ PES3A80D320RS2000	F 002 AOZ816/ PES3 A80D 320RS 2000
Type	: Inline, plunger	Inline, plunger
Serial number	: 30220818	31006070
Method of drive	:	Through timing gears
3.1.4.6 Fuel injectors:		
Make	: Bosch, made in India	BOSCH, India
Holder no.	: F 002 C70 018	E08013570000
Nozzle no	: DSL A 146 P 5514+	DSL A 146 P 5514+
Type	: Multi holes (five holes)	Multi holes (five holes)
Manufacturer's production pressure setting, (MPa)	: 25.0 to 25.8	25.0 to 25.8
Injection timing (before TDC)	: 13 + 0/-2 degree before TDC	13 + 0/-2 degree before TDC
Firing order	: 1-2-3	1-2-3
3.1.4.7 Governor :		
Make	: Bosch, India	Bosch, India
Model/Group combination No.	: RSV375...	1000 A4C1410R
Type	: Mechanical, centrifugal, variable speed	
Rated engine speed, (rpm)	: 2000	1900
Governed range of engine speed, (rpm)	: 600 to 2200	600 to 2200
3.1.5 Air Intake system:		
3.1.5.1 Pre-cleaner:		
Make	: Not available	TAFE (apa)
Type	: Cyclonic with transparent dust collector	
Location	: On top of the air cleaner inlet tube, above the bonnet	
3.1.5.2 Air cleaner:		
Make	: Not available	TAFE (apa)
Type	: Oil bath	Oil bath
Location	: On RHS of engine, under the bonnet	
Oil capacity,(l)	: 0.50	0.45



	<u>Base Model</u>	<u>Variant Model</u>
Range of suction pressure at maximum power, (kPa)	: 2.9	2.4 to 2.5
Maintenance schedule	: Oil change after every 50 hours of operation during normal working condition and after every 10 hours of operation in dusty condition.	
3.1.6 Exhaust System:		
Type of silencer	: Up draft,(cylindrical)	Up draft (cylindrical)
Location	: On LHS of engine	On LHS of engine
Position of silencer outlet with respect to SIP, (mm):		
- Vertical	: 960	1060
- Longitudinal	: 1090	1115
- Lateral	: 390 (on LHS)	425 (on LHS)
Range of exhaust gas pressure at maximum power, (kPa)	: 5.1 to 5.5	2.4 to 3.5
3.1.7 Lubricating system:		
Type	: Forced feed-cum-splash	
Oil sump capacity, (l)	: 6.15	5.3
Total lub oil capacity, (l)	: 6.52	5.9
Oil change period	: First change after 50 hours and subsequently after every 200 hours of operation.	
Cooling device, (if any)	: None	None
Filters:		
Type	: Full flow, spin on, throwaway	
Number	: One	One
Pump:		
Type	: Rotary, lobe type	Rotary, lobe type
Method of drive	: Through timing gears	
Pressure release setting, (kPa)	: 343 to 448	343 to 448
Minimum permissible pressure, (kPa)	: 88	88
3.1.8 Cooling system:		
Type	: Forced circulation of coolant	
Details of pump	: Centrifugal, semi-open impeller of 69.70 mm diameter, having six number of vanes, and driven through crankshaft pulley by a cogged V-belt in common with alternator.	
Details of fan	: Suction type of 395 mm diameter, and having seven numbers polypropylene blades, mounted on water pump shaft.	
Means of temperature control	: Thermostat	Thermostat



	Base Model	Variant Model
Bare radiator capacity, (l)	2.50	2.26
Capacity of expansion flask, (l)	1.50	1.45
Total coolant capacity, (l)	7.85	7.35
Radiator cap pressure, (kPa)	88	88

3.1.9 Starting System:

Type	12V, DC, Electrical
Aid for cold starting	None
Any other device provided for easy starting.	None

3.1.10 Electrical System:

3.1.10.1 Battery:

Make & Model	AMARON & TR500D31R	AMCO & N70ZMF
Type	Lead acid	Lead acid
Capacity and rating	12V, 75 Ah at 20 h discharge rate	
Location	On the clutch housing, under the bonnet	

3.1.10.2 Starter:

Make	Autolek	Lucas-TVS/Autolek
Model	STM1103V	2SM114/STM1103V
Type	Pre-engaging, solenoid operated	
Capacity and rating	12V, 2.2 kW	12V, 2.2 kW

3.1.10.3 Generator:

Make	Autolek	Lucas-TVS/Autolek
Model	ALT4004 F	A115-36/ALT4064L
Type	Alternator	Alternator
Output rating	12V, 35 A	12V, 35 A
Method of drive	Through crankshaft pulley by a cogged V-belt common to water pump.	

3.1.10.4 Voltage regulator

: In-built in alternator

3.1.10.5 Details of lights:

Description	No. & capacity of bulbs	Height of the centre of beam above ground level,(mm)	Size of beam, (mm)	Distance between centre of the beam and outside edge of tractor at standard rear track setting, (mm)
1	2	3	4	5
A) Base Model:-				
Front Lights:				
- Head lights	2,12V, 45/40W	1130	130 Φ	510
- Parking lights	2, 12V, 5W	1295	60 x 48	230
- Turn-cum-Hazard Indicators	2, 12V,21W	1295	110 x 48	150

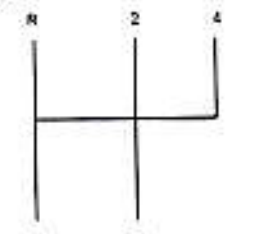
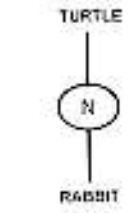
Rear lights:				
- Stop/Tail light	2, 12V, 21/5W	1295	90 x 75	210
- Turn-cum-Hazard Indicators	1, 12V, 21W	1295	90 x 75	115
- Plough light	1, 12V, 55W	1445	125 Φ	345
Registration plate Light	1, 12V, 5W	1100	85 x 20	850
Reflectors (Red)	2	1295	45 x 50	165
B) Variant Model:-				
Front Lights:				
- Head lights	2, 12V, 60/55W	970	125 Φ	460
- Parking lights	2, 12V, 5W	1290	45 x 60	180
- Turn-cum-Hazard Indicators	2, 12V, 21W	1290	45 x 110	95
1	2	3	4	5
Rear lights:				
- Brake/Tail light	2, 12V, 21W	1310	90 x 75	195
- Turn-cum-Hazard Indicators	1, 12V, 21W	1310	90 x 75	100
- Parking lights	2, 12V, 21/5W	1310	90 x 75	195
- Plough light	1, 12V, 55W	1470	120 Φ	850
- Registration plate Light	1, 12V, 5 W	1195	80 x 20	814
- Reflectors (Red)	2	1310	45 x 55	150

3.1.11 Instrument panel details:

- i) Engine rpm cum- cumulative digital run hour meter
- ii) Water temp. gauge (with colour zones)
- iii) Lubricant oil pressure gauge (with colour zones)
- iv) Main switch (Key turn type)
- v) Light switch (Rotary type)
- vi) Fuel level gauge (with colour zones)
- vii) Battery charging warning indicator
- viii) Turn indicator switch
- ix) Turn/hazard indicator
- x) Hazard light switch
- xi) Horn push button
- xii) Engine stop knob
- xiii) Hand accelerator lever
- xiv) Rear view mirror
- xv) Steering control wheel
- xvi) Battery volt meter

Base Model Variant Model

Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided
Provided	Provided

	<u>Base Model</u>	<u>Variant Model</u>
3.1.12 Transmission System:		
3.1.12.1 Clutch:		
Make	: LUK, India	: AMREP/Valeo
Type	: Single, Dry friction plate, diaphragm type	
No. of friction plate, (s)	: One	: One
Size (OD/ID), (mm):		
- Transmission	: 279.6 / 171.3 ϕ	
Method of operation:		
- Transmission	: By depressing the clutch pedal on LHS	
3.1.12.2 Gear box:		
Make	: TAFE	: TAFE
Model	: K01/2	: Not available
Type	: Mechanical Sliding mesh with epicyclical gear reduction unit for High-Low range selection	
No. of speeds:		
- Forward	: 8	: 8
- Reverse	: 2	: 2
Gear shifting pattern (for both Base & Variant)	: 	: 
	Main gear shifting lever	Range shifting lever
Location of gear shifting levers	: Centrally located	
Oil capacity, (l)	: 27.0 (common with differential and hydraulic system)	: 32.0 (common with differential and hydraulic system)
Reduction through gearbox input shaft (constant drop gear)	: 3.06 : 1 (52/17)	: 2.78 : 1 (50/18T)
Oil changing period	: First change after 200 hours and subsequently after every 750 hours of operation.	: After every 600 hours of operation.
3.1.12.3 Rear Differential unit:		
Type	: Crown wheel & pinion with differential unit accommodated inside the differential housing.	
Reduction through crown wheel and bevel pinion	: 5.571:1 (39/ 7 T)	: 5.571:1 (39/ 7 T)
Oil capacity, (l)	: 27.0 (common with gear box and hydraulic system)	: 32.0 (common with gear box and hydraulic system)
Oil changing period	: First change after 200 hours and subsequently after every 750 hours of operation.	: After every 600 hours of operation.



T-1090/1615/2017

TAFE ,MF 1035 DI V13 TRACTOR - Commercial (Variant)

		<u>Base Model</u>	<u>Variant Model</u>
Differential lock:	:	Not Provided	Not Provided
3.1.12.4 Rear axle & final drive:		Final drive not provided	
3.1.13 Power lift (Hydraulic System):			
Make	:	TAFE	TAFE
Type	:	Open center, ADDC	Open center, ADDC
No. and type of cylinder	:	One, single acting	
Type of linkage lock for transport	:	Not Provided	
3.1.13.1 Hydraulic pump:			
- Make	:	TAFE	TAFE
- Type	:	Radial piston pump(Scotch Yoke)	
- Location & drive	:	Inside the differential housing & driven through counter shaft of gear box.	
No. & type of filters	:	One wire mesh strainer accommodated inside differential housing.	
Hydraulic oil capacity, (l)	:	27.0 <small>(common with gear box and differential system)</small>	32.0 <small>(common with gear box and differential system)</small>
		<u>Base Model</u>	<u>Variant Model</u>
Oil changing period	:	First change after 200 hours and subsequently after every 750 hours of operation.	After every 600 hours of operation.
Provision for external tapping	:	Provided	Provided
Details of control levers	:		
		1) Position control lever	Position control lever
		2) Draft Control Lever	Draft Control Lever
		3) Lever locator (metallic)	Lever locator (metallic)
Method of draft sensing	:	Through top link	Through top link

3.1.13.2 Three point linkage:

Sl. No.	Observations	As per IS: 4468- (Part-1) -1997, (Cat.I / Cat.II), (mm)	As measured (mm)		Remarks in case of variant model
			Base model	Variant model	
1	2	3	4	5	6
I. Upper hitch points:					
a)	Dia of hitch pin hole	19.30 to 19.50 / 25.70 to 25.90	19.40	19.36/25.8	Conforms to Cat. I & II
b)	Width of ball	44.0 (max.) / 51.0 (max.)	42.91	44.0/39.92	Conforms to Cat. I
II. Lower hitch points:					
a)	Dia of hitch pin hole	22.40 to 22.65 / 28.70 to 29.00	22.67/28.94	22.52/28.90	Conforms to Cat. I & II
b)	Width of ball	34.8 to 35.0 / 44.8 to 45.0	44.63	44.20/44.62	Conforms to Cat. II



II.	Lateral distance from lower hitch point to centre line of tractor.	359 / 435	364	364	Does not Conform
III.	Lateral movement of lower hitch points	100 (min) / 125 (min)	155	170	Conforms to Cat. I & II
IV.	Distance from end of power take-off to centre of lower hitch point (lower links in horizontal position)	450 to 575 / 550 to 625	510	500	Conforms to Cat. I
V.	Transport height	820 (min) / 950 (min)	840	910	Conforms to Cat. I
VI.	Power range (without force)	560 (min) / 650 (min)	680	725	Conforms to Cat. I & II
VII.	Leveling adjustment	100 (min) / 100 (min)	395	300	Conforms to Cat. I & II
VIII.	Lower hitch point clearance	100 (min) / 100 (min)	215	200	Conforms to Cat. I & II
IX.	Lower hitch point height	200 (max) / 200 (max)	160	155,290	Conforms

2.1.13.3
2.1.13.3.1

Drawbar:
Linkage Drawbar [Refer Fig.1] :

Notation	As per IS: 12953-1990, (Cat.I) / (Cat.II), (mm)	As measured, (mm)		Remarks in case of variant model
		Base model	Variant model	
A	683 ± 1.5 / 825 ± 1.5	684	684	Conforms to Cat. I
B	75 (min) / 75 (min)	75	76.4	Conforms to Cat. I & II
C	30 (min) / 30 (min)	38	38	Conforms to Cat. I & II
DD	21.79 to 22.0 / 27.79 to 28.00	22.0	22.0	Conforms to Cat. I
E	39.0 (min) / 49.0 (min)	51.4	50.5	Conforms to Cat. I & II
FD	12.0 (min) / 12.0 (min)	12.1	12.0	Conforms to Cat. I & II
G	15.0 (min) / 15.0 (min)	15.7	15.2	Conforms to Cat. I & II
HO	25 ± 1 / 25 ± 1	25	25.0	Conforms to Cat. I & II
J	80 ± 1.5 / 80 ± 1.5	81.1	80.8	Conforms to Cat. I & II
No. of holes	7 / 9	07	07	Conforms to Cat. I

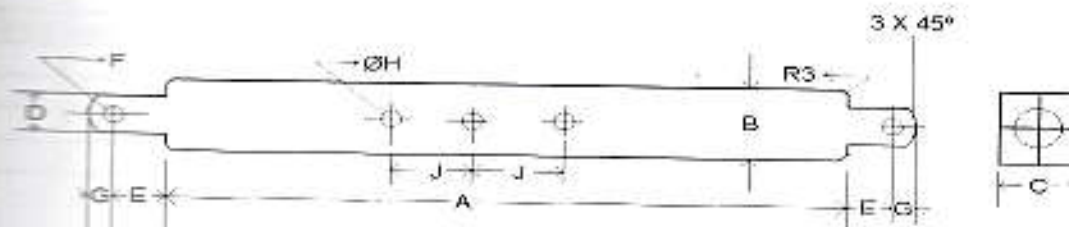


Fig. 1: DIMENSIONAL NOTATIONS FOR LINKAGE TYPE DRAWBAR



	<u>Base model</u>	<u>Variant model</u>
2.1.13.2 Swinging drawbar :	Not provided	Not provided
2.1.14 Power take-off shaft:		
Type :	Type-I, independent	Type-I, independent
Method of engaging :	By hand lever on LHS	of operator's seat
No. of shaft,(s) :	One	One
PTO speed corresponding to rated engine speed, (rpm): :	654	684
Distance behind rear axle, (mm) :	300	300
Engine to PTO speed ratio :	3.060 : 1	2.778 : 1

2.1.14.1 Specifications of Power Take-Off Shaft:

Specification	As per IS: 4931-1995 (Type-I)	As observed		Remarks in case of variant model
		Base model	Variant model	
1	2	3	4	5
Nominal speed, (rpm)	540 ± 10	540 rpm of PTO shaft corresponds to 1652 rpm of engine.	540 rpm of PTO shaft corresponds to 1500 rpm of engine.	Conforms
No. of splines	6	6	6	Conforms
Direction of rotation	Clockwise	Clockwise	Clockwise	Conforms
Location	The position of the centre of the end of PTO shaft shall be within 50mm to right or left of the centre line of the tractor.	In the centre line of the tractor		Conforms
Dimensions, (mm) [See Fig.2(a)]:				
D ₀	34.79 ± 0.06	34.86	34.76	Conforms
d ₀	28.91 ± 0.05	28.93	28.86	Conforms
B ₀	29.4 ± 0.1	29.16	29.4	Conforms
A ₀ (optional)	8.3 ± 0.1	8.1	8.4	Conforms
W	8.69 - 0.09 - 0.16	8.62	8.57	Conforms
a	7	7	7	Conforms
b (optional)	25 ± 0.5	25.1	25.5	Conforms
c	38	38	38.0	Conforms
X	30°	30°	30	Conforms
B	76 (min)	88	90	Conforms
h	450 to 675	460	460	Conforms

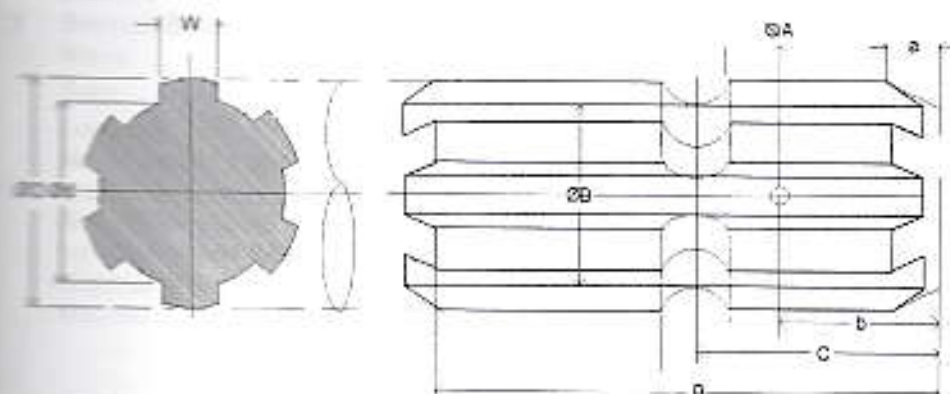


Fig.2 (a): DIMENSIONAL NOTATIONS FOR TYPE-I POWER TAKE-OFF SHAFT

	<u>Base model</u>	<u>Variant model</u>
2.1.14.2 Provision of power take-off shaft shield	Not provided	Not Provided
2.1.15 Towing hitch:		
2.1.15.1 Front	Not provided	Provided
Type	Not applicable	Clevis
Location	-do-	At front of bumper
Height above ground level,(mm):	-do-	655 (Fixed)
Dia of pin hole, (mm)	-do-	34.32
Width of clevis, (mm)	-do-	54.6
2.1.15.2 Rear		
Type	Clevis	Clevis
Location	At rear of Differential housing	
Height above ground level, (mm):		
- Minimum	300	485
- Maximum	540	620
- No. of positions	Six	02
- Type of adjustment	By changing/reversing the position of hitch on mounting bracket.	
Distance of hitch point, (mm):		
-From rear wheel centre	500	445
-From power take-off shaft end	200	145
Dia of pin hole, (mm)	31.1	34.0
Width of clevis, (mm)	68.2	89.5
2.1.16 Steering :		
Make	Rane	Rane
Type	Mechanical, Re-circulating ball & nut type	
Location	Above the clutch housing	
Dia of steering control wheel, (mm)	450	450
Method of operation	Manual, by steering control wheel	
Lubricant change period	After every 1200 hours of operation.	



T-1090/1615/2017

TAFE ,MF 1035 DI V13 TRACTOR - Commercial (Variant)

11.17 Brakes:			
11.17.1 Service Brake:			
Make	:	TVS Girling	
Type	:	Mechanical, dry discs	
Location	:	At the rear axle shaft in a separate housing	
No. of disc(s) (on each wheel brake)	:	Two (on each wheel brake)	
Area of liners, (cm ²) (on each wheel side)	:	911.4 (on each wheel side)	
Material of liners	:	Asbestos based (TVS AF 3456) (apa)	
Method of operation	:	Manual, individual/combined operation by RHS foot pedal.	
		Base model	Variant model
11.17.2 Parking Brake:			
Type	:	Paul & Ratchet arrangement	
Location & Method of operation	:	Service brake serves as parking brake when locked in position by a hand lever is provided on RHS of operator's seat.	
11.18 Wheel Equipment:			
11.18.1 Steered Wheel(s):			
Make	:	Apollo Krishak Premium	Birla Shaan
Number(s)	:	Two	Two
Type of tyre	:	Pneumatic, ribbed	Pneumatic, ribbed
Size & Ply rating	:	6.00 -16 & 8	6.00 -16 & 8
Maximum permissible loading capacity of each tyre (kgf)	:	675 (at 230 kPa pressure)	
Recommended inflation pressure, (kPa) :			
- For field work	:	200	200
- For transport	:	230	230
Standard Track width, (mm)	:	1360	1345
Method of changing track width	:	By reversing the wheel disc.	
Make & size of wheel rim	:	AMW 4.50 Ex16	AMW,4.5 E x16
11.18.2 Drive wheel (s):			
Make	:	Apollo Krishak Premium	MRF Shakti Life
Number	:	Two	Two
Type of tyre	:	Pneumatic, traction	Pneumatic, traction
Size & Ply rating	:	12.4-28 &12	12.4-28 &12
Maximum permissible loading capacity of each tyre , (kgf)	:	1650 at 110 kPa	1650 at 110 kPa
Recommended inflation pressure, (kPa):			
- For field work	:	98	98
- For transport	:	110	110
Standard Track width, (mm)	:	1350	1345
Make & size of wheel rim	:	AMW & W10x28	WIL & W11x 28
11.18.3 Wheel base, (mm)		:	1810
Method of changing wheel base, if any, and range	:	None	None



	Base model	Variant model
2.1.19 Operator's seat:		
Make :	TAFE	Harita
Type :	Cushioned seat & back rest	
Type of Suspension :	Two helical coil springs at bottom	
Type of Damping :	Hydraulic shock absorber	
Range of adjustment, (mm):		
Vertical :	Nil	Nil
Lateral :	Nil	Nil
Longitudinal :	± 30	± 25
2.1.20 Provision for safety and comfort of operator:		
2.1.20.1 Operator's Seat:		
Meets the minimum requirements of IS: 12343-1998, (Re-affirmed in March, 2009) except the following:		
	<u>Base model</u>	<u>Variant model</u>
i) The Length & width of seat from seat index point		i) Vertical distance of seat index point from accelerator pedal.
ii) The longitudinal distance from seat index point to center of steering control wheel.		
iii) Vertical distance of seat index point from foot rest.		
iv) Lateral distance of seat index point from inner brake pedal.		
2.1.20.2 Conformity with IS: 6283 (Part-1) – 2006 (Re-affirmed in March, 2009) & IS: 6283 (Part-2) – 2007 (Re-affirmed in March, 2009):		
Controls and displays are identifiable with symbols meets the requirements as per IS : 6283 (Part 1&2) – 1998 except the following:		
	<u>Base model</u>	<u>Variant model</u>
i) Colour zones are not provided for engine revolution gauge.		i) Grease lubricant frequency ii) Oil lubricant, type & frequency
2.1.20.3 Conformity with IS : 8133-1983 (Re-affirmed in March, 2009) :		
Location and movement of various controls meets the requirement of IS : 8133-1983, except the following:		
i) Differential lock is not provided in both base and variant model		
2.1.20.4 Conformity with IS:12239 (Part-1)-1996 (Re-affirmed in March,2007) :		
Meets the requirements of IS: 12239 (Part-1) – 1996, except the following:		
	<u>Base model</u>	<u>Variant model</u>
i) The spark arrester has not been provided in the exhaust system.		
2.1.20.5 Conformity with IS:12239 (Part-2)-1999 (Re-affirmed in March,2009) :		
Meets the requirements of IS:12239 (Part-2)-1999, except the following:		
	<u>Base model</u>	<u>Variant model</u>
i) PTO master shield has not been provided.		i) PTO master shield has not been provided. ii) The working clearance around the PC and DC control lever is less. ii) The rear tyre should not fully guarded.



T-10290/1615/2017

TAFE ,MF 1035 DI V13 TRACTOR - Commercial (Variant)

2.1.20.5 Conformity with IS:4468 (Part-1)-1997 :

Meets the requirements of IS:4468 (Part-1)-1997, except the following:

<u>Base model</u>	<u>Variant model</u>
i) Lateral distance from lower hitch point to center line of tractor.	i) Lateral distance from lower hitch point to center line of tractor.
ii) Width of ball for lower hitch point.	

2.1.20.6 Conformity with IS:4931-1995:-

Meets the requirements of IS:4931-1995 -1995, except the following:

<u>Base model</u>	<u>Variant model</u>
i) The dimensions D \emptyset , B \emptyset & A \emptyset are not as per the above said standard.	---

2.1.20.7 Conformity with IS:14683-1999 (Re-affirmed in March,2009) :

Lightings provided on tractor meets the requirement of IS: 14683-1999.

2.1.20.8 Rear view mirror :

Rear view mirror has been provided in both base and variant model

	<u>Base model</u>	<u>Variant model</u>
2.1.21 Mass of tractor with standard ballast, (kg):		
- Front :	640	730
- Rear :	1020	1025
- Total :	1660	1755
2.1.22 Overall dimensions (mm):		
- Length :	3040	3315
- Width :	1700	1660
- Height :	2170	2190
Minimum ground clearance, (mm) :	240 (Below rear hitch bracket)	335 (below gear box housing)

2.1.23 Labelling of tractor:

Location: The labelling plate riveted on LHS on bonnet provides the following information (**Variant Model**) :

Name of Manufacturer	:	M/s.Tractors & Farm Equipment Ltd. Chennai, India
Make	:	TAFE
Model	:	MF 1035 DI V13
Year of manufacture	:	HE (2014)
Engine Serial Number	:	5337 A29248
Chassis Serial Number	:	MEA8B1DDHE3000032
Maximum PTO Power, kW	:	26
Specific fuel consumption, g/kWh	:	265

2.1.24 Number of external lubricating points:

	<u>Base Model</u>	<u>Variant model</u>
- Oiling :	Nil	Nil
- Grease cups :	02	02



		<u>Base Model</u>	<u>Variant model</u>
	-Grease nipples	14	14
3.1.25	Colour of tractor:		
	Chassis & engine	Brown	Smoke gray
	Bonnet, Mudguard	Red	Red
	Wheel rims & discs	Silver	Silver Gray

3.2 NOMINAL SPEED TEST

Movement	Gear No.	No. of engine revolutions for one revolution of driving wheel		Nominal speed at rated engine speed when fitted with 12.4-28 size tyres 590 mm radius index, (kmph).		Variation in nominal speed (%)
		Base model	Variant model	Base model	Variant model	
Forward	L1	200.26	189.17	2.22	2.24	0.90
	L2	136.02	128.93	3.27	3.28	0.31
	L3	74.08	70.41	6.01	6.01	-
	L4	60.64	57.19	7.34	7.39	0.68
	H1	50.03	47.28	8.89	8.93	0.45
	H2	33.90	32.18	13.12	13.16	0.30
	H3	18.62	17.51	23.89	23.89	-
	H4	15.16	14.31	29.34	29.53	0.65
Reverse	LR	147.22	138.98	3.02	3.03	0.33
	HR	36.76	34.66	12.10	12.20	0.83

3.3 PTO PERFORMANCE TEST

S. No.	Particulars	Base Model	Variant Model
1.	Date(s) of test	06.11.2015, 09.11.2015 & 13.11.2015	14.02.2017, 28.02.2017 & 01.03.2017
2.	Tractor run at this Institute prior to start of PTO test, (h)	6.3	--
3.	Dynamometer test bench used	Eddy Current, SAJ-AG 250	Eddy Current, SAJ-AG 250

3.3.1 During Maximum Power Search, the maximum power observed as 23.9 kW against the declaration of 26.0 kW, which was 8.1 % less and does not meet the evaluative requirement of IS: 12207-2014.

To rectify the problem, the following checking/adjustments were carried out.

1. Engine oil and lubricating oil was changed.
2. Air cleaner oil was changed
3. Injector pressure was checked and found correct.
4. Primary and secondary fuel filters were replaced with new ones.

Thereafter, PTO performance test was conducted & the results of Power take-off performance are tabulated in Table-1 and graphically represented in Fig. 3, 4 & 5 of Variant model.



Table-1

Tractor model	Power, (kW)	Speed, (rpm)		Fuel Consumption			Specific energy, (kWh/l)
		PTO	Engine	(l/h)	(kg/h)	(kg/kWh)	
	2	3	4	5	6	7	8
a) Maximum power – 2 hours test (under natural ambient condition):							
Base model	25.7	654	2001	7.89	6.59	0.256	3.26
	24.4	654	2001	7.58	6.34	0.260	3.22*
Variant model	24.6	702	1950	7.57	6.33	0.257	3.25
	22.8	702	1950	7.13	5.96	0.261	3.20*
b) Power at rated engine speed (2000 rpm):							
Base model	25.7	654	2001	7.89	6.59	0.256	3.26
	24.4	654	2001	7.58	6.34	0.260	3.22*
Variant model	24.6	684	1900	7.56	6.32	0.257	3.25
	22.8	684	1900	7.21	6.03	0.264	3.16*
c) Power at standard power take – off speed (540 ± 10 rpm):							
Base model	22.8	540	1652	6.71	5.61	0.246	3.40
	22.3	540	1652	6.53	5.46	0.245	3.42*
Variant model	20.8	540	1500	6.14	5.13	0.247	3.39
	19.1	540	1500	5.78	4.83	0.253	3.30*
d) Working loads at rated engine speed(2000/1900 rpm):							
(i) Torque corresponding to maximum power available at rated engine speed:							
Base model	25.7	654	2001	7.89	6.59	0.256	3.26
Variant model	24.6	684	1900	7.56	6.32	0.257	3.25
(ii) 85% of the torque obtained in (i):							
Base model	22.5	675	2066	6.90	5.77	0.256	3.26
Variant model	22.0	719	1997	6.67	5.58	0.254	3.30
(iii) 75% of the torque obtained in (ii):							
Base model	17.1	682	2087	5.47	4.57	0.267	3.13
Variant model	16.7	729	2025	5.23	4.37	0.262	3.19



T-10260/1615/2017		TAFE ,MF 1035 DI V13 TRACTOR - Commercial (Variant)						
	2	3	4	5	6	7	8	
(v) 50% of the torque obtained in (ii) :								
Base model	11.5	690	2111	4.16	3.48	0.303	2.76	
Variant model	11.3	742	2061	3.92	3.28	0.290	2.88	
(vi) 25% of the torque obtained in (ii):								
Base model	5.9	702	2148	3.02	2.53	0.429	1.95	
Variant model	5.7	751	2086	2.81	2.35	0.412	2.03	
(vii) Unloaded:								
Base model	0.0	716	2191	1.95	1.63	-	-	
Variant model	0.2	757	2103	1.77	1.48	7.40	0.11	
(viii) Varying loads at standard PTO speed(540 ± 10 rpm):								
(i) Torque corresponding to maximum power available at standard PTO speed:								
Base model	22.8	540	1652	6.69	5.59	0.245	3.41	
Variant model	20.8	540	1500	6.14	5.13	0.247	3.39	
(ii) 65% of the torque obtained in (i):								
Base model	20.1	559	1711	5.74	4.80	0.239	3.50	
Variant model	17.9	549	1525	5.13	4.29	0.240	3.49	
(iii) 75% of the torque obtained in (ii):								
Base model	15.2	566	1732	4.52	3.78	0.249	3.36	
Variant model	13.7	559	1553	4.02	3.36	0.245	3.41	
(iv) 50% of the torque obtained in (ii) :								
Base model	10.3	573	1753	3.39	2.84	0.276	3.04	
Variant model	9.3	568	1578	2.98	2.49	0.268	3.12	
(v) 25% of the torque obtained in (ii):								
Base model	5.3	584	1787	2.41	2.01	0.379	2.20	
Variant model	4.7	580	1611	2.06	1.72	0.366	2.28	
(vi) Unloaded:								
Base model	0.1	599	1833	1.46	1.22	12.20	0.07	
Variant model	0.1	588	1633	1.18	0.99	9.90	0.08	

** Under High ambient conditions

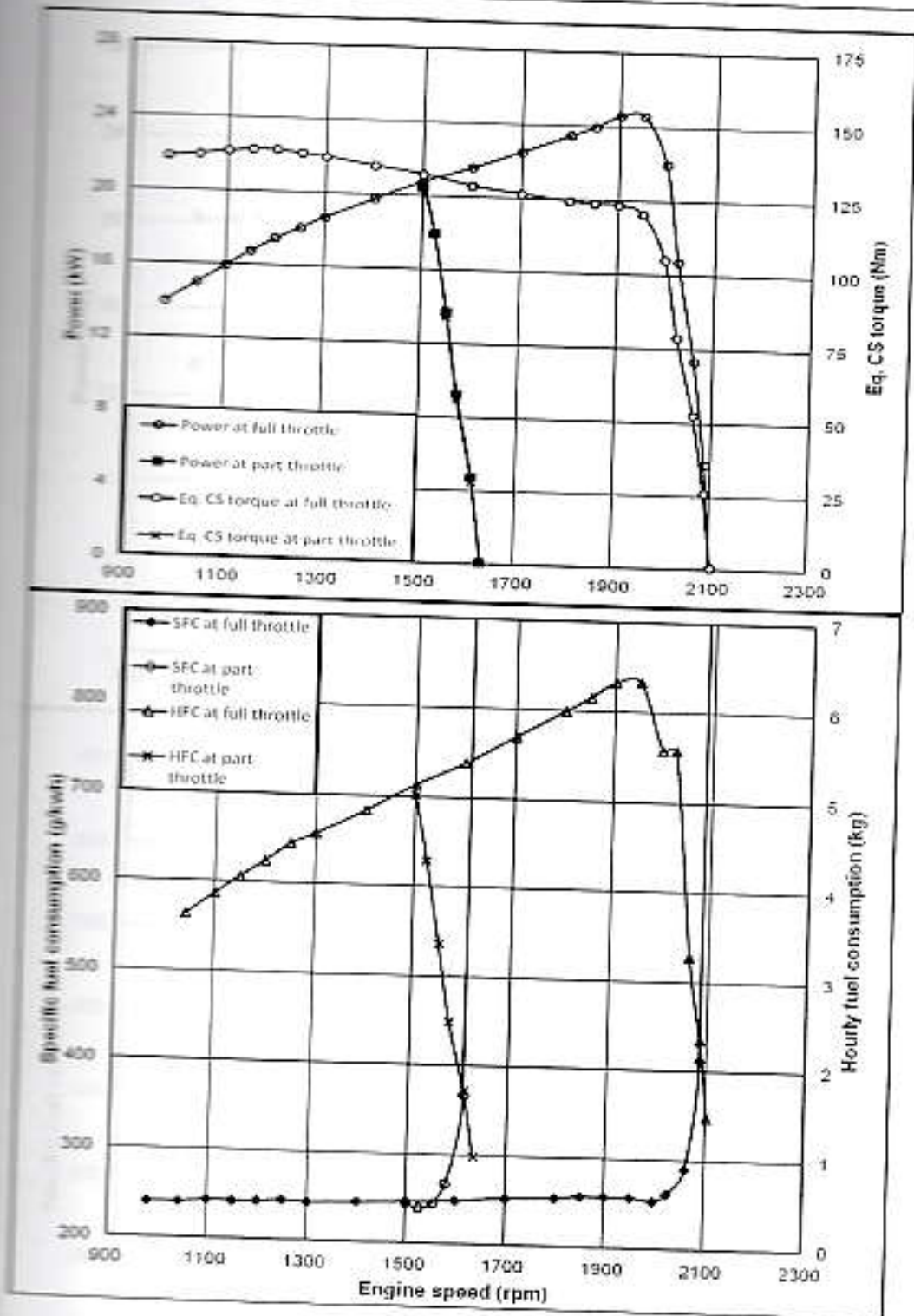


Fig.3: PTO PERFORMANCE CHARACTERISTICS (NATURAL AMBIENT)

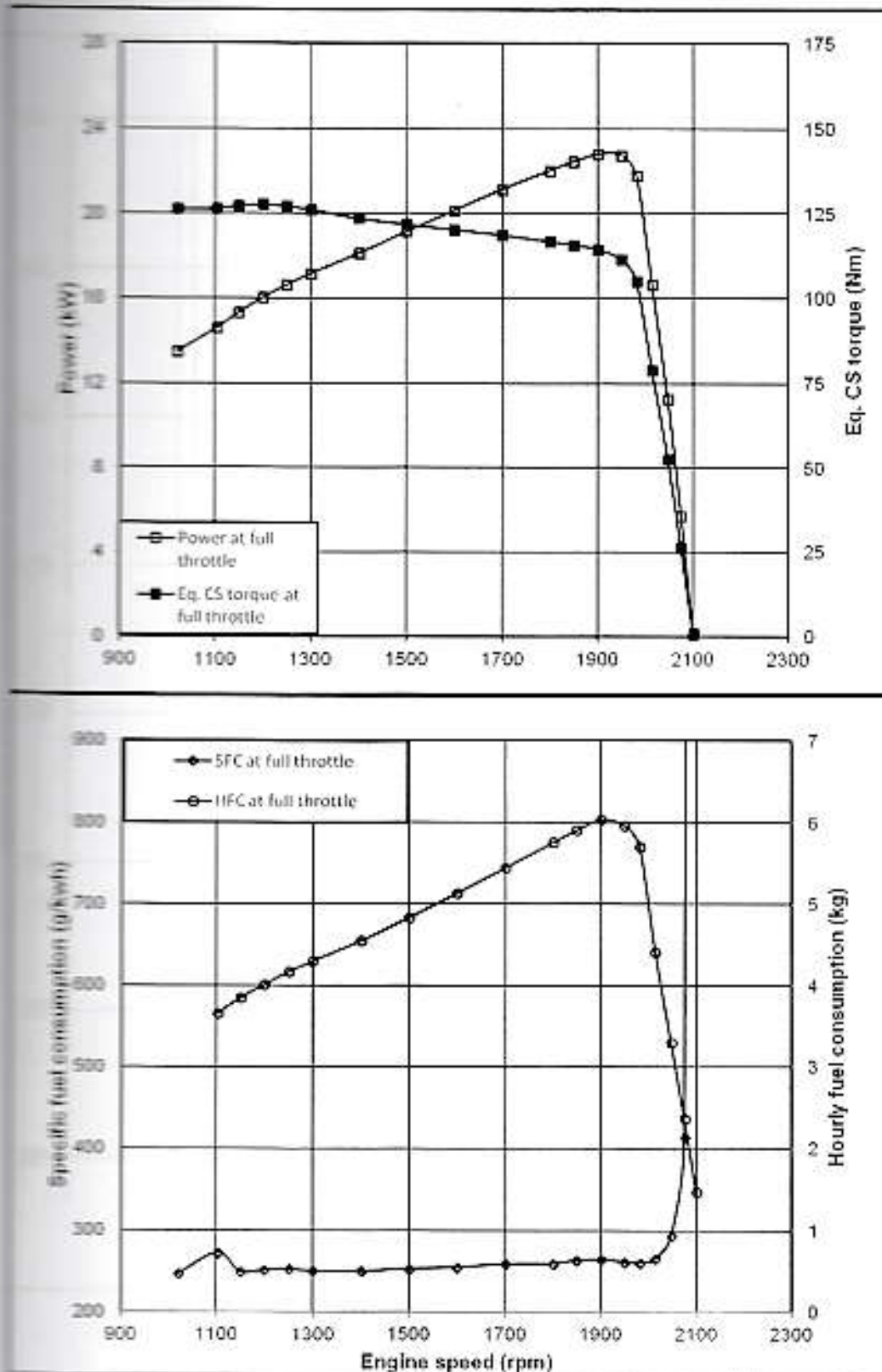


Fig.4: PTO PERFORMANCE CHARACTERISTICS (HIGH AMBIENT)

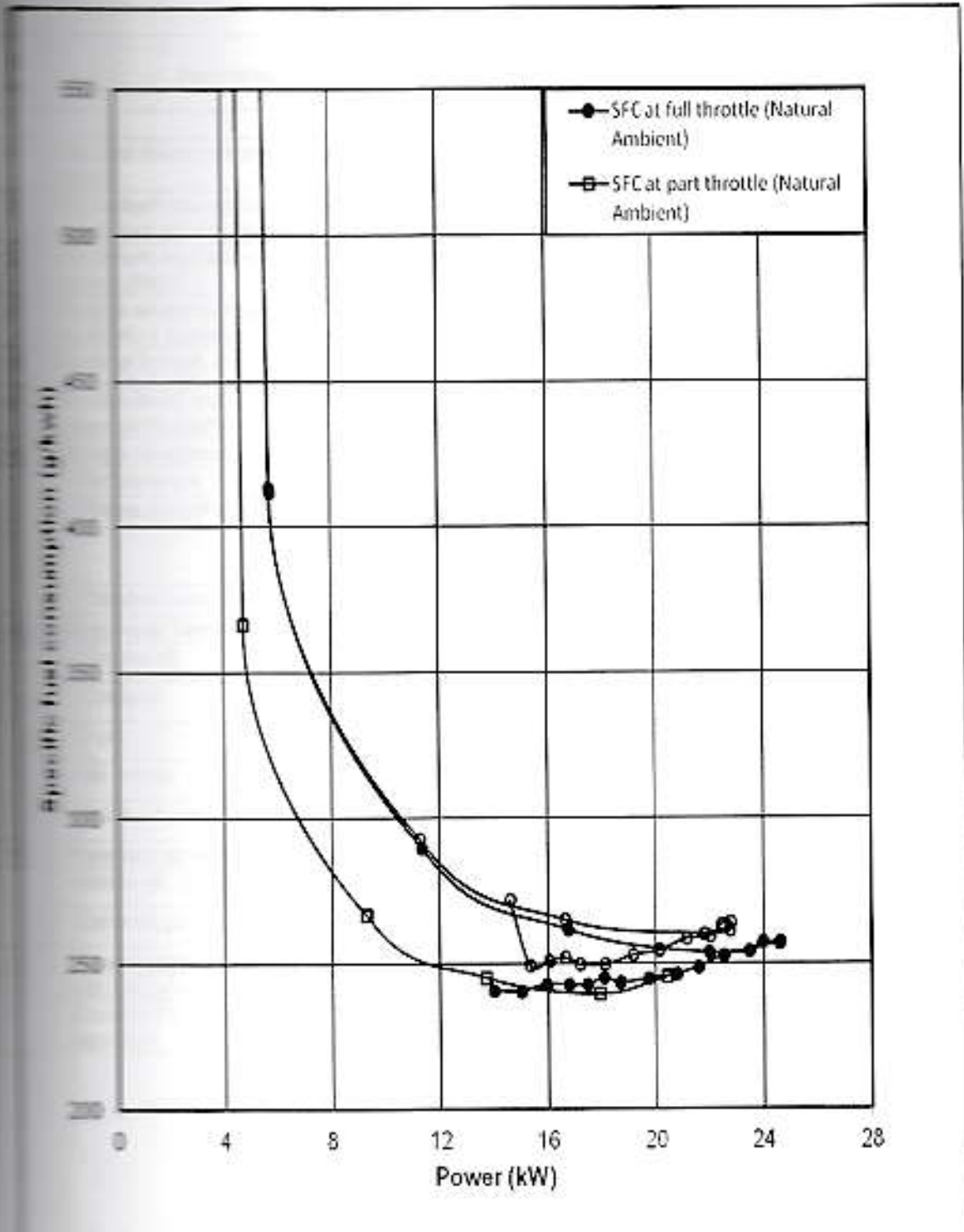


Fig.5: PTO PERFORMANCE CHARACTERISTICS



24/08/2017

TAFE ,MF 1035 DI V13 TRACTOR - Commercial (Variant)

Parameters	Base Model		Variant Model	
	Natural Ambient	High Ambient	Natural Ambient	High Ambient
2	3	4	5	6
No load maximum engine speed, (rpm)	2191	2188	2103	2100
Equivalent crankshaft torque at maximum power, (Nm)	122.4	116.4	120.5	111.4
Maximum equivalent crank shaft torque (Nm)	140.1	135.2	139.1	127.6
Engine speed at maximum equivalent crankshaft torque, (rpm)	1200	1151	1150	1200
Backup torque, (%)	14.46	-	15.44	14.54
Smoke level, maximum light absorption coefficient (per meter)	0.10	-	0.19	-
Range of atmospheric condition :				
- Temperature, (^o C)	30 to 32	41 to 44	24 to 27	41 to 44
- Pressure, (kPa)	99.1 to 99.6	100.1 to 100.4	98.9 to 99.4	99.9 to 100.4
- Relative humidity, (%)	49.4 to 56.8	25.6 to 31.6	53 to 67	17 to 27
Maximum Temperature, (^oC):				
- Engine oil	116	128	85 to 114	128
- Coolant	106	114	64 to 84	101
- Fuel	56	71	40 to 55	73
- Air intake	38	52	24 to 29	53
- Exhaust gas	564	578	123 to 561	584
Pressure at maximum power:				
- Inake air, (kPa)	2.40 to 2.67	2.40 to 2.67	2.40 to 2.50	2.60 to 2.90
- Exhaust gas, (kPa)	5.07 to 5.46	5.20 to 5.46	2.40 to 3.47	3.20 to 4.40
Consumptions:				
- Lub. Oil (g/kWh)	--	2.32	--	0.67
- Coolant (% of total coolant capacity)	--	1.24	--	1.36

4. OTHER APPLICABLE TESTS

4.1 OPERATOR'S FIELD OF VISION

The operator's field of vision to the front and rear from the operator's seat is represented in Fig. 6. The observations are as under:

- (i) The non visible space in front is 7500 mm which is 4.26 times of wheel base (i.e. 1760 mm).
- (ii) The non-visible space on LHS and RHS is 3250 mm which is 2.42 times of rear track width (i.e. 1345 mm).
- (iii) The major part creating masking effect is silencer.

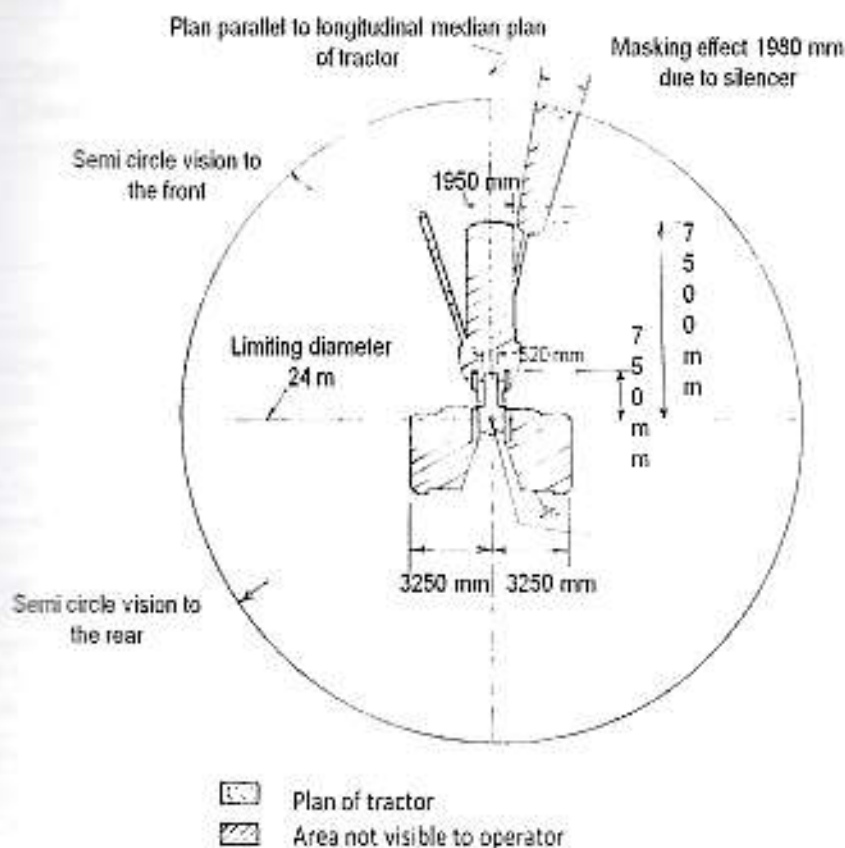


Fig.6: OPERATOR'S FIELD OF VISION



5. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

Sl. No.	Adjustments/Defects/Breakdowns and Repairs	Category of breakdowns	Tractor run hours
1.	During Maximum Power Search, the maximum power observed as 23.9 kW against the declaration of 26.0 kW, which was 8.1 % less and does not meet the evaluative requirement of IS: 12207-2014. To rectify the problem, the following checking/adjustments were carried out.	-	2.97
	1. Engine oil and lubricating oil was changed.		
	2. Air cleaner oil was changed		
	3. Injector pressure was checked and found correct.		
	4. Primary and secondary fuel filters were replaced with new ones.		

6. COMPARISON BETWEEN BASE MODEL AND VARIANT MODEL (Based on Table 3 & 4 of Indian Standard 12207: 2014)

Sl. No.	Clause No.	Features	Observation on base model (T-1046/1571/2016, November, 2016)	Observation on variant model	Remarks	
1	2	3	4	5	6	
1.	i)	Single/dual/Dry / wet/ Independent clutch/Increase in size of clutch with change in engine to PTO speed ratio	Single dry friction plate	Single dry friction plate	No changed	
2.	ii)	Air cleaner	Oil bath type	Oil bath type	No change	
		Range of suction pressure at maximum power, (kPa)	2.90	2.4 to 2.5	Similar	
3.	iii)	Exhaust system	Up draught, Cylindrical		No change	
		Range of exhaust gas Pressure at max power (kPa)	5.1 to 5.5	2.4 to 3.5	Similar	
		Position of silencer outlet with respect to SIP, (mm):				
		- Vertical	960	1060	Changed	
- Longitudinal	1090	1115	Changed			
- Lateral	390 (on LHS)	425 (on LHS)	Changed			
4.	iv)	Location and type of operating controls	Same configuration in base & variant models (refer para 3.1.12.1, 3.1.12.2, 3.1.14 3.1.17)		No change	
5.	v)	Gear Box:	Mechanical Sliding mesh with epicyclical gear reduction unit for High-Low range selection		No change	
		Reduction through gearbox input shaft (constant drop gear)	3.06 : 1 (52/17 T)	2.78 : 1 (50/18 T)	Changed	



1	2	3	4	5	6
Reduction ratio of transmission:					
	Gear	Base model	Variant model	Variation (%)	Remarks
Forward	L1	200.26	189.17	- 5.53	No change
	L2	136.02	128.93	- 5.21	... do...
	L3	74.08	70.41	- 4.95	... do...
	L4	60.64	57.19	- 5.69	... do...
	H1	50.03	47.28	- 5.50	... do...
	H2	33.90	32.18	- 5.07	... do...
	H3	18.62	17.51	- 5.96	... do...
	H4	15.16	14.31	- 5.61	... do...
Reverse	LR	147.22	138.98	- 5.60	... do...
	HR	36.76	34.06	- 5.71	... do...
Range of speed (kmph) :					
	- Forward		2.22 to 29.34	2.24 to 29.53 (0.30 to 0.90%)	Similar
	- Reverse		3.02 to 12.10	3.03 to 12.20 (0.33 to 0.83%)	Similar
16	ii)	Additional no. of speed	None	None	No Changed
Fitment of accessories:					
		- Expansion tank	Provided	Provided	No change
		-Capacity of Expansion tank	1.50	1.45	Similar
		- Additional hydraulic pump	None	None	No change
		- Bare radiator capacity, (l)	2.50	2.26	Similar
		-Total Coolant Capacity(l)	7.85	7.35	Changed
		- Air compressor	None	None	No change
		- Oil cooler	None	None	No change
18	iii)	Steering system & type	M/s Rane & Mechanical, Re-circulating ball & nut type		No change
19	iv)	Brake system:			
		Type of brake	Mechanical, dry discs	Mechanical, dry discs	No change
		No. of disc(s) on each side	Two (on each wheel side)		No change
		Area of liners, cm ² (on each wheel side)	911.4 (on each wheel side)		No change
20	v)	Type of actuation system for clutch & brake	Same configuration in base & variant models (refer para 3.1.12.1, 3.1.17.1 & 3.1.17.2)		No change
21	vi)	Provision of accessories:	Various configuration in base & variant models (refer para 3.1.13.2 & 3.1.15)		Changed
22	vii)	Type of three point linkage:	Same configuration in base & variant models (refer para 3.1.13.2)		No change



15/05/2017

TAFE ,MF 1035 DI V13 TRACTOR - Commercial (Variant)

1	2	3	4	5	6
19	a)	PTD shaft (s):			
		Location	Centrally located	Centrally located	No change
		Type	Type-I, independent	Type-I, independent	No change
		Speed corresponding to rated engine speed, (rpm)	654	684	Changed
		- Anticlockwise rotation speed, (rpm)	Not provided	Not provided	No change
Features and Location of Electrical and Instrumentation:					
20	a)	Battery, Make & Model	AMARON & TR500D31R	AMCO & N70ZMF	Changed
		Starter, Make & Model	Autolek & STM1103V	Autolek & STM1103V	No change
		Generator, Make & model	Autolek & ALT4004 F	Autolek & ALT4064L	Changed
		Instrumentation on panel	Same configuration in base & variant models (refer para 3.1.11).		No change
21	a)	Size & Ply rating of front and rear wheels	Same configuration in base & variant models (refer para 3.1.18) except:		No change
		Front ,Make	Apollo Krishak Premium	Biria Shaan	Changed
		Rear tyre Make , Size & Ply Rating	Apollo Krishak Premium	MRF Shakti Life	Changed
22	a)	Type of drive:	2WD	2WD	No change
23	a)	Sheet metal:			
		Style of bonnet & Fender	Strub bonnet & flat top fender	Square bonnet & flat top fender	Changed
		- Colour	MF Red	MF Red	No change
		-Decals (Sticker)	MF 1035 DI V2	MF 1035 DI V13	Changed
		Filment of ROPS, Cab & Canopy	ROPS not fitted ,Canopy fitted		No change
24	a)	Type of hydraulic pump, location, drive & speed :			
		Type of hydraulic pump	Radial piston pump(Scotch Yoke)		No change
		Location & drive	Inside the differential housing & driven through counter shaft of gear box.		No change
		Speed of pump corresponding to rated engine speed, (rpm)	654	684	Changed
25	a)	Positioning of Hydraulic Sensing Mechanism	Through top link	Through top link	No Change
26	a)	Change related to ergonomics, safety comfort, statutory / regulatory requirements:			
		IS: 10273	Conformed	Conforms	No change
		IS: 4931	Did not Conform	Conforms	Changed
		IS: 4468	Did not conform	Does not conform	No change
		IS: 12953	Conformed	Conforms	No change
		IS:12343	Did not conform	Does not conform	No change



15/05/2017

TAFE ,MF 1035 DI V13 TRACTOR - Commercial (Variant)

2	3	4	5	6
f)	IS:12239 (Part-I)	Did not conform	Does not conform	No change
g)	IS:12239 (Part-II)	Did not conform	Does not conform	No change
h)	IS:8133	Did not conform	Does not conform	No change
i)	IS: 6283	Did not conform	Does not conform	No change
j)	IS:14683	Conformed	Conforms	No change
20)	Final Reduction:	Final drive not provided		No change
21)	Type of fuel Injection pump:	Inline plungers	Inline plungers	No change
	Model /group combination number of fuel injection pump	F 002 AOZ 771/ PES3A80D320RS2 000	F 002 AOZ816/ PES3 A80D 320RS 2000	Changed
22)	Change related to statutory/ regulatory requirements (As per Table 4):			
a)	Engine operating principle (spark/ compression ignition, two/four stroke)	Compression Ignition, 4 stroke	Compression Ignition, 4 stroke	No change
b)	Number & arrangement of cylinders	Three, Vertical inline	Three, Vertical inline	No change
c)	PTO power (kW)	23.9	26.0	Changed
d)	Engine displacement (cc)	2365	2365	No change
e)	Rated engine speed (rpm)	2000	1900	Changed
23)	Other changes:			
a)	Engine Model	T III A S324 – F1.1	T III A S337-F1.6	Changed
b)	Wheel base, (mm)	1810	1760	Changed

7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

On the basis of test conducted the performance results have been summarized as evaluative (mandatory) and non - evaluative (not mandatory) parameters applicable for qualifying Minimum Performance Criteria as per clause-4 table-1 of Indian Standard 12207: 2014 for acceptance of tractor for the purpose of subsidies/NABARD financing for the applicable features for this tractor model.



Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	Values declared by the applicant/ requirement		As observed		Whether Variant model meets the requirements (Yes/No)
				Base model	Variant Model	Base model	Variant model	
1	2	3	4	5 a	5 b	6 a	6 b	7
PTO Performance :								
1	Max. power under 2h 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	23.9 (D)	26.0 (D)	25.6	24.6	Yes
2	Power at rated engine speed, (kW)	Non Evaluative	-do-	23.9 (D)	26.0 (D)	25.6	24.6	Yes
3	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	265 (D)	265 (D)	259	257	Yes
4	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	137.3 (D)	142.0 (D)	142.6	139.1	Yes
5	Back-up torque, percent	Non Evaluative	10 percent, min.	10 percent, min.(R)	10 percent, min.(R)	17.75	15.44	Yes
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)	132 (D)	128	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)	112 (D)	105	101	Yes



2	3	4	5 a	5 b	6 a	6 b	7
1. Specific fuel consumption, g/kwh	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.63(R) 1% of SFC (D)	2.61 (R) 1% of SFC (D)	1.107	0.67	Yes
2. Smoke level	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 9.2 or 75 Haidridge value (As per CMVR)	3.25 per meter (R)	3.25 per meter (R)	0.21	0.19	Yes

7.1.2 Labeling of tractors (Provision of labelling plate):

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	As observed	Whether meets the requirements (Yes/No.)	
1	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	TAFE	Yes	
2	Model	Evaluative		MF 1035 DI V2	MF 1035 DI V13	Yes
3	Year of manufacture	Evaluative		EE (May,2014)	HE (August, 2014)	Yes
4	Engine serial number	Evaluative		S324D44352	S337A29248	Yes
5	Chassis serial number	Evaluative		MEA2F221EE 3000035	MEA8B1DDH E3000032	Yes
6	Declaration of PTO power, kW	Evaluative		23.87	26	Yes
7	Specific fuel consumption, g/kwh			272	265	Yes

7.1.3 CATEGORY OF BREAKDOWNS / DEFECTS :

Sl. 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

7.1.4 Literature (Submission to test agency)

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	As observed	Whether meets the requirements (Yes/No.)
a	Operator manual	Evaluative	Provided/Not Provided	Provided	Yes
b	Parts Catalogue	Evaluative	Provided/Not Provided	Provided	Yes
c	Workshop/ Service manual	Evaluative	Provided/Not Provided	Provided	Yes



Additional requirements as per Clause-4 (Table-2) of IS:12207-2014:				
Sl. No.	Characteristics	Requirements as per IS: 12207-2014	As observed	Whether meets the requirements (Yes/No.)
1.	Presence 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 low hook, linkage drawbar may be provided.	Trailer hitch and linkage draw bar provided	Yes

Salient Observations:

Laboratory tests:

PTO Performance:

- i) During Maximum Power Search, the maximum power observed as 23.9 kW against the declaration of 26.0 kW, which was 8.1 % less and does not meet the exclusive requirement of IS: 12207-2014. To rectify the problem, the following checking/adjustments were carried out.
 - a) Engine lubricating oil and filter was changed.
 - b) Air cleaner oil was changed
 - c) Injector pressure was checked and found correct.
 - d) Primary and secondary fuel filters were replaced with new ones.
- ii) The maximum PTO power in case of base and variant model was observed as 25.6 and 24.6 kW respectively against the declaration of 23.9 and 26.0 kW, which is within the tolerance limit of IS: 12207-2014.
- iii) The specific fuel consumption in case of base and variant model corresponding to maximum power was model was observed as 259 and 257 g/kwh respectively against the declaration of 265 g/kWh, which is within the tolerance limit of IS 12207 - 2014.
- iv) The backup torque percentage in case of base and variant model was observed as 17.75 and 15.54 respectively against the declaration of 10%.

1221.2 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.

1221.3 Operator's Seat

The dimension vertical distance from seat index point to the centre of accelerator pedal, does not meets the minimum requirements of IS: 12343-1998 (Re-affirmed in March, 2009). This should be looked into for corrective action.

1221.4 Operator's work place:

Operator's work place meets the requirements of IS-12239(part-I)—1996, except the provision of Spark arrester.



7.2.1.5 Constructional requirement with regard to safety:

Safety Guards meets the minimum requirements of IS: 12239 (Part II) – 1999, except the following.

- i) The provision of PTO master shield.
- ii) The working clearance between draft control lever and position control lever and has not been provided as per IS: 12239 (Part-II) 1999. This should be looked into for corrective action.
- iii) The rear tyre should not be fully guarded and not meet the requirement of IS: 12239 (Part-II) 1999. This should be looked into for corrective action.

7.2.1.6 Symbols of operator's controls and other displays:

The symbols for operator's controls such as grease lubricant frequency & oil lubricant, type & frequency has been not provided and does not meet the minimum requirements of IS: 6283(Part I & Part II)-1998. This should be looked into for corrective action.

7.2.1.7 Location and movement of operator's controls:

Location and movement of operator's controls meets the requirements of IS: 8133 – 1993, except the following.

- i) Provision of differential lock

7.3 Maintenance / Service Problems:

No noticeable problem was observed in the servicing of the test sample.

7.4 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 hand control between the draft control and position control lever is less than 70 mm.
- iii) Provision of differential lock.
- iv) Provision for identifiable symbol for grease lubricant frequency & oil lubricant, type & frequency.
- v) Provision of PTO shaft master shield.
- vi) The rear tyre should be fully guarded as per IS: 12239 (Part-II) 1999, so that operator's feet may not come in contact with the wheels.

7.5 Adequacy of Literature supplied with machine:

7.5.1 The following literature was supplied with the tractor for reference during the test.

- i) Operator's Manual in respect of TAFE, MF 1035 DI V13 TRACTOR.
- ii) Tractor Parts Catalogue in respect of TAFE, MF 1035 DI V13 TRACTOR.
- iii) Service Manual in respect of TAFE, MF 1035 DI V13 TRACTOR.

The results of the tests carried out on variant model "TAFE, MF 1035 DI V13" Tractor have been compared with those on base model "TAFE, MF 1035 DI V2" Tractor and found within the limit, as specified in Indian Standard: 12207-2014.



8. Citizen charter

Duration of Test	Test duration under citizen charter	Whether the report released within time frame given citizen charter	Remark, if any
04 Month (January, 2017 to April, 2017)	10 Months	Yes	None

TESTING AUTHORITY:

C.V. CHIMOTE
TEST ENGINEER

Y.K. RAO
SENIOR AGRICULTURAL ENGINEER

J.J.R. NARWARE
DIRECTOR

Test report compiled by Shri, SHWETABH SINGH, Senior Technical Assistant

9. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's Comments
9.1	7.2.1.2, 7.2.1.3, 7.2.1.4, 7.2.1.5 (I, II, & III), 7.2.1.6 & 7.2.1.7 (i)	We shall study studied & initiate to improve in production.
9.2	7.4 (i), (ii), (iii), (iv), (v) & (vi)	We will look into for corrective action and implementation of these safely features.

TRACTOR RUN HOURS DURING TEST

ANNEXURE - I

A. LABORATORY AND TRACK TESTS		HOURS
1.	Running -in	--
2.	PTO Performance Test	15.78
3.	Nominal speed test	0.67
4.	Operator's field of vision	-
B. Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.		0.80
Total		17.25