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COMMERCIAL TEST REPORT (Supplementary)

L& [; k/No. : 1252/1779/2019
ekg/Month : July , 2019



TAFE LTD, MF 9500 TRACTOR



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GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(Deptt. of Agricultural, Cooperation & Farmer's Welfare, Mechanization & Technology Division)

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CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO 9001: 2015 Certified Institute)

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1252/1779/2019	TAFE LTD, MF 9500 TRACTOR - Commercial (Supplementary)
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Manufacturer : M/s. Tractor and Farm Equipment Limited.
Post Box No. 3302 (New 77) 35,
Mahatma Gandhi Road,
Nungambakkam, Chennai – 600 034
(Tamil Nadu), India

Month: July	Test Report No. 1252/1779/2019	Year : 2019
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1252/1779/2019	TAFE LTD, MF 9500 TRACTOR - Commercial (Supplementary)
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Type of Test : **COMMERCIAL (Supplementary)**

Test code/Procedure : IS: 5994-1998 (Reaffirmed in 2014) and IS: 12207-2014

Period of Test : September, 2018 to April, 2019

Test Report No. : **1252/1779/2019**

Month/Year : **July, 2019**

-
- 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 randomly selected from the production line by the representative of testing authority 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 supplementary test report and, should be read in conjunction with the Test Report of base model i.e. **“TAFE, MF 9500 TRACTOR”** bearing No.**T-790/1298/2011** released on **August, 2011**.
-

Sl. No	Units	Conversion Factor
1.	Force:	
	1 kgf	9.80665 N
		2.20462 lbf
2.	Power:	
	1 Mechanical power	1.01387metric horse power
		745.7 W
	1 Metric horse power	735.5 W
	1 kW	1.35962 Metric horse power
3.	Pressure:	
	1 psi	6.895 kPa
	1 kgf/cm ²	98.067 kPa = 735.56 mm of Hg
	1 bar	100 kPa = 10 N/cm ²
	1 mm of Hg	1.3332 m-bar

A B B R E V I A T I O N S	
Apa	As per applicant
TDC	Top Dead Centre
IS	Indian Standard
LHS/RHS	Left Hand Side/ Right Hand Side
Hg	Mercury
Temp.	Temperature
N.R.	Not recorded
Rpm	Revolutions per minute
O.D/I.D	Outer diameter/ Inner diameter
N.A.	Not available/ Not applicable
PTO	Power take-off
R.H.	Relative Humidity

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1. SCOPE OF TEST

The “TAFE LTD, MF 9500” tractor had undergone “Initial Commercial Test” at this Institute vide test report No. T-790/1298/2011 was released on **August, 2011**. The firm has made the following changes in the technical specifications of tractor and had requested vide letter No. Nil, dated: 18/07/2017, for **Supplementary** testing of “TAFE LTD, MF 9500” tractor.

The major features of Base model and Supplementary model are listed below :-

S. No.	Parameters	Previous Sample (T-790/1298/2011, August, 2011)	Present Sample
1.	Tractor:		
	Make	TAFE LTD.	TAFE LTD.
	Model	MF 9500	MF 9500
2.	Engine:		
	-Make	Simpson & Co. Ltd.	Simpson & Co. Ltd.
	-Model	T III A TSJ 327-F8	T III A SJ 327-F19
	High idling speed, rpm	2250 to 2420	2250 to 2500
	Low idle speed, rpm	600 to 800	600 to 800
	Speed at max. torque, rpm	1400 to 1600	1000 to 1200
	Model/Group combination No. of fuel injection pump	B460 816795 01, VE 3/12F/100LV137951	0460 423 067, VE 3/12F1100L1150
3.	Location of speed range selector	Side shift on RHS of operator's seat	Side shift on LHS of operator's seat
4.	Air intake system:		
	Pre air cleaner: Type	Centrifugal with transparent dust collector	Std fitment - Centrifugal with transparent dust collector Optional fitment – Pre cleaner at the top of main air cleaner inlet tube under the bonnet.
5.	Range of nominal speed, kmph		
	- Forward	2.33 to 30.72	2.70 to 35.70
	- Reverse	3.17 to 12.69	3.68 to 14.72
6.	Brake system:		
	Type	Oil immersed	Oil immersed
	No. of disc	03 (on each wheel side)	04 (on each wheel side)
	Area of liners, (cm ²)	1258.8 (on each wheel side)	1676.7 (on each wheel side)
7.	Battery:		
	Location	Below instrument panel	Std fitment - Below instrument panel Optional fitment - In-front of radiator under bonnet
8.	Mass of tractor with standard ballast, (kg)	800 / 1430 / 2230	950 / 1450 / 2400
9.	Sheet metal:		
	Style of bonnet & fender	Square bonnet and flat fender	Std. fitment - Square bonnet and flat fender Optional fitment - Round bonnet and flat fender

Subsequent to the examination of the case in light of clause 3.2.4 (b), 6.1 & 6.2 of Indian Standard **IS: 12207-2014**, the following tests were considered to be carried out:-

- Specification checking
- Nominal speed
- Two-hour maximum PTO power performance test under natural ambient condition

1252/1779/2019	TAFE LTD, MF 9500 TRACTOR - Commercial (Supplementary)
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Manufacturer : **M/s.** Tractor and Farm Equipment Ltd.
 Post Box No. 3302,
 35 Mahatma Gandhi Road,
 Nungambakkam, Chennai – 600 034
 (Tamil Nadu)

Test requested by (applicant) : **M/s.** Tractor and Farm Equipment Ltd.
 Post Box No. 3302,
 35 Mahatma Gandhi Road,
 Nungambakkam, Chennai – 600 034
 (Tamil Nadu)

Test requested by : The manufacturer
 Selected for test by : The representative of testing authority
 Place of running-in : At manufacturer's works
 Duration of said running-in, (h):

- Engine : 12
 - Transmission : 18

Method of Selection : The test sample was selected randomly out of five tractors from the production line by the representative of testing authority.

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
1.	Engine	20W40	As recommended
2.	Transmission , Hydraulic system	Tractelf SF3	Oil originally filled in the tractor was not changed
3.	Steering system	Castrol TQ	--do--
4.	Grease	Servo grease MP3	Servo grease MP3

3. ESSENTIAL TESTS

3.1. SPECIFICATIONS

	<u>Previous sample</u>	<u>Present sample</u>
3.1.1 Tractor:		
Make	:	TAFE LTD.
Model	:	MF 9500
Brand name	:	None
Type	:	Four wheeled, rear wheel driven, unit construction, general purpose agricultural tractor.
Year of manufacture	:	2010 AJ (January, 2018)
Chassis Serial number	:	950001 MEA8BD83A J1173391
Country of Origin	:	India
3.1.2 Engine:		
Make	:	Simpson & Co. Ltd.
Model	:	TIII A TSJ 327-F8 T III A TSJ 327 - F19
Type	:	Four stroke, turbo charged, water cooled, direct injection, diesel engine.
Serial number	:	TIII A TSJ 327 010846 TSJ 327 A 24576

		<u>Previous sample</u>	<u>Present sample</u>
Engine speed (Manufacturer's recommended production setting)(rpm):			
- Maximum speed at no load	:	2250 to 2420	2250 to 2500
- Low idle speed	:	600 to 800	600 to 800
- Speed at maximum torque	:	1400 to 1600	1000 to 1200
Rated speed, (rpm):			
- For PTO use	:		2200
- For drawbar use	:		2200
3.1.3 Cylinder & Cylinder Head:			
Number	:		Three
Disposition	:		Vertical, inline
Bore/stroke, (mm)	:		95 / 127
Capacity as specified by the applicant, (cc)	:		2700
Compression ratio, (apa)	:		18.3 : 1
Type of cylinder head	:		Monoblock
Type of cylinder liners	:		Dry, replaceable
Type of combustion chamber	:		Re-entrant cavity on piston crown
Arrangement of valves	:		Overhead, inline
Valve clearance (cold/Hot):			
- Inlet valve, (mm)	:		0.30 / 0.30
- Exhaust valve, (mm)	:		0.30 / 0.30
3.1.4 Fuel System:			
Type of fuel feed system	:		Gravity and force feed
3.1.4.1 Fuel tank:			
Capacity, (l)	:		60.0
Location	:		Above the engine, under the bonnet
Provision for draining of sediments/ water	:		Not provided
Material of fuel tank	:		Metallic
3.1.4.2 Fuel feed pump:			
Make	:		Bosch, India
Type	:		Plunger
Model/Group combination No.	:		FP/AH 3/9, 9440 037 000
Provision of sediment bowl	:		Not provided
Method of drive	:		Through engine cam shaft unit
3.1.4.3 Fuel filters:			
Make	:		BOSCH, India
Model/Group combination No.	:	F 002 H21 232	F002 H20 138
Number	:		Two
Type of elements:			
-Primary	:		Paper, spin-on
-Secondary	:		Paper, spin-on
Capacity of final stage filter, (l)	:	0.50	0.45
3.1.4.4 Fuel Injection pump:			
Make	:		BOSCH, India
Model/Group combination No.	:	B460 816795 01, VE 3/12F/100LV137951	0 460 423 067, VE3/12F1100L1150
Type	:		Rotary
Serial number	:	110447	760 00586
Method of drive	:		Through timing gear

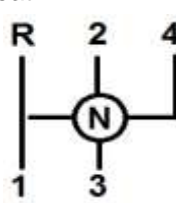
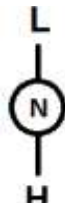
3.1.4.5	Fuel injectors:		<u>Previous sample</u>	<u>Present sample</u>
	Make	:	Bosch, India	
	Model/Group combination No.	:	F002 C80019 006	F002C80019 759
	Holder no.	:	Not available	F002C80019 759
	Nozzle no.	:	Not available	759 110094, DSLA 142P5573
	Type	:	Multi hole (seven holes)	
	Manufacturer's production pressure setting, (MPa)	:	25.0 to 25.8	
	Injection timing	:	0.25 ± 0.05 mm plunger lift before TDC	
	Firing order	:	1 – 2 – 3	
3.1.4.6	Governor:			
	Make	:	BOSCH, India	
	Model/Group combination No.	:	In built with FIP	
	Type	:	Mechanical, rotary, variable speed	
	Rated engine speed, (rpm)	:	2200	
	Governed range of engine speed (rpm)	:	600 to 2420	600 to 2500
3.1.5	Air Intake system:			
3.1.5.1	Pre-cleaner:			
	Make	:	TAFE	Not available
	Type	:	Centrifugal transparent collector	with dust --
	Location	:	On top of air cleaner inlet tube, outside the bonnet.	--
3.1.5.2	Air cleaner:			
	Make	:	Donaldson	
	Type	:	Dry	
	Location	:	In front of radiator, under the bonnet	
	Range of suction pressure at maximum power, (kPa)	:	2.3	3.9
	Detail of element:			
			<u>Primary</u>	<u>Secondary</u>
			<u>Previous</u>	<u>Present</u>
	-Size (OD/ID), mm	:	136.3/85.5	137.5/84.9
	-Length, mm	:	335.0	330
	-No. of elements	:	One	One
	-Type	:	Plastic & Fabric	Paper
	Provision of vacuum indicator	:	Provided	
	Provision of dust unloading valve	:	Provided	
	Maintenance schedule:	i)	Dry filter to be cleaned after every 10 hours in dusty condition otherwise after every 50 hours of operation in normal working condition (or) whenever the air warns indicator flashing on the dash board.	
		ii	Filter change period is	
)	400 hours of operation (or) yearly.	Filter change period is after every 500 hours of operation.
3.1.5.3	Charge Air Cooler (CAC):			
	Type	:	Tubular heat exchanger	
	Overall dimensions	:	Length – 351.7 mm, Height – 307.2 mm, Thickness – 60.9 mm. twenty numbers of heat exchange tubes are provided.	Length – 400.6 mm, Height – 390.0 mm, Thickness – 84.5 mm., twenty numbers of heat exchange tubes are provided.

	Previous sample	Present sample
Method of air cooling	: Charge air cooler is provided in front of the radiator under the bonnet. Air drawn from the secondary filter element of air cleaner supplied to turbocharger. The turbocharger forces pressurized air to charge air cooler through hose. The air flows from charge air cooler to cylinder head through hose.	
3.1.6 Exhaust System:		
Type of silencer	:	Updraft (Elliptical)
Position of silencer outlet with respect to SIP, (mm):		
- Vertical	: 775	895
- Longitudinal	: 1260	1180
- Lateral	: 355 (on RHS)	385 (on RHS)
Range of exhaust gas pressure at maximum power, (kPa)	: 63.1 to 65.9	163.2 to 164.7
Provision of spark arrestor	:	None
Provision against entry of rain water.	:	A bend is provided at the top of outlet.
3.1.6.1 Turbocharger:		
Make	:	Holset
Model	: HX20TD036T/6	HX20
Type	: Waste gate having 12 vanes in compressor unit and 6 numbers in turbine unit of outlet vanes.	
Boost pressure ratio	:	1.6 (apa)
Method of lubrication	: Force feed lubrication from main oil gallery of engine.	
Location	: R.H.S of the engine exhaust manifold	
3.1.7 Lubricating system:		
Type	:	Force feed and splash
Oil sump capacity, (l)	: 6.00	6.70
Total lub oil capacity, (l)	: 6.50	7.23
Oil change period	: First change after 50 hours and subsequently after every 200 hours of operation.	
Cooling device, (if any)	:	None
Filters:		
Type	:	Full flow throw away paper element.
Number	:	One
Pump:		
Type	:	Rotary, Lobe
Method of drive	:	Through timing gears
Pressure release setting, (kPa)	:	352 to 457
Minimum permissible pressure, (kPa)	: 148	49 (apa)
3.1.8 Cooling system:		
Type	:	Forced circulation of liquid
Coolant as recommended	: Castrol, having coolant water ratio 1:1.	WT supra, having coolant water ratio 1:1.
Details of pump	: Centrifugal, semi-open impeller of 74.5 mm diameter, having six numbers of vanes and driven through crankshaft pulley by a cogged V-belt.	
Details of fan	: Suction type having seven polypropylene blades of 393.7 mm diameter and mounted on water pump shaft.	
Means of temperature control	:	Thermostat
Bare radiator capacity, (l)	: 3.30	3.05
Capacity of expansion flask, (l)	: 2.50	2.45
Total coolant capacity, (l)	: 9.35	9.15
Radiator cap pressure, (kPa)	: 88	88

3.1.9 Starting System:		Previous sample	Present sample
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	:	AMCO & N70Z	AMCO & 105D31 RMF
Type	:		Lead acid
Capacity and rating	:	12V, 80 Ah at 20 hours discharge rate	
Location	:	Below instrument panel	In-front of radiator, under the bonnet.
3.1.10.2 Starter:			
Make	:	Lucas TVS	
Model	:	M 14	
Type	:	Pre-engaging, solenoid operated	
Capacity and rating	:	12V, 2.2 kW	
Serial Number	:	260 24 037 B-28.08	260 24 628 A
3.1.10.3 Generator:			
Make	:	Autolek	
Model	:	AL-1N-4004	ALT 4004
Type	:	Alternator	
Serial number	:	Not available	
Output rating	:	12V, 35 A	
Method of drive	:	Through crank shaft pulley by a cogged "V" belt, in common with fan pulley.	
3.1.10.4 Voltage regulator	:	In built in alternator	
3.1.10.5 Detail 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
Previous model:				
Front Lights:				
- Head lights	2, 12V, 60/55W	1175	155 x 90	773
- Parking lights	2, 12V, 21W	1430	55 x 45	220
- Turn-cum-Hazard Indicators	2, 12V, 21W	1430	110 x 45	138
Rear lights:				
- Parking-cum-Brake lights	2, 12V, 5/ 21W	1445	90 x 70	215
- Turn-cum-Hazard Indicators	2, 12V, 21W	1445	90 x 70	125
-Plough light (on RHS mudguard)	1, 12V, 55W	1585	125 φ	415
-Reflectors (Red)	2	1445	45 x 55	173
-Registration plate Light	1, 12V, 5W	1210	85 x 15	55
Present Model:				
Front Lights:				
- Head lights	2, 12V, 60/55W	1170	155 x 95	780
- Parking lights	2, 12V, 5W	1455	55 x 45	225
-Turn cum hazard light	2, 12V, 21W	1455	110 x 45	140
Rear lights:				
-Stop/Tail light	2, 12V, 21/5W	1445	75 x 90	200
-Turn-cum-hazard indicators	2, 12V, 21W	1445	75 x 90	100
- Reflectors(R)	2 Nos.	1445	45 x 55	150
-Registration plate light	1, 12V, 5W	1170	20 x 85	935
- Plough light	1, 12V, 55 W	1555	125 x 70	425

3.1.10.6	Main switch	:		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"><u>Previous sample</u></td> <td style="width: 5%; border-left: 1px solid black;"> </td> <td style="width: 45%;"><u>Present sample</u></td> </tr> <tr> <td colspan="3" style="text-align: center;">Key turn type, having three positions viz: OFF, circuit ON and START</td> </tr> </table>	<u>Previous sample</u>		<u>Present sample</u>	Key turn type, having three positions viz: OFF , circuit ON and START																										
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Key turn type, having three positions viz: OFF , circuit ON and START																																		
3.1.10.7	Light switch	:		<p>Previous sample: Rotary type having five positions viz. i) Off ii) Parking lights + dashboard lights 'ON' iii) Head lights(short beam) + (ii) iv) Head light (long beam) + (ii) v) Head light (long beam) only.</p> <p>Present sample: Rotary type having five positions viz. i) Off ii) Parking lights + dashboard lights 'ON' iii) Head lights(short beam) + (ii) iv) Head light (long beam) + (ii)</p>																														
3.1.10.8	Horn:	:		<p>Make : Addon Type : 12V, 2B, electromagnetically vibrated diaphragm Location : In-front of radiator, under the bonnet</p>																														
3.1.10.9	Fuse box	:		<p>Contains 6 numbers of fuses of following capacities :-</p> <p>Previous sample:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 25%;">Capacity</td> <td style="width: 12.5%;">5A</td> <td style="width: 12.5%;">10A</td> <td style="width: 12.5%;">15A</td> <td style="width: 12.5%;">25A</td> </tr> <tr> <td>Number</td> <td>1</td> <td>1</td> <td>3</td> <td>1</td> </tr> </table> <p>Present sample:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 25%;">Capacity</td> <td style="width: 12.5%;">10A</td> <td style="width: 12.5%;">15A</td> <td style="width: 12.5%;">25A</td> </tr> <tr> <td>Number</td> <td>1</td> <td>4</td> <td>1</td> </tr> </table>	Capacity	5A	10A	15A	25A	Number	1	1	3	1	Capacity	10A	15A	25A	Number	1	4	1												
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Number	1	1	3	1																														
Capacity	10A	15A	25A																															
Number	1	4	1																															
3.1.10.10	Details of other electrical accessories:																																	
3.1.10.10.1	Flasher Unit:	:		<p>Make : Interface BGLI Capacity: - Turn signal : 21W x 2 + 2W x 1 - Hazard signal : 21W x 4 + 2W x 2 Flashes/Min. : 85</p>																														
3.1.10.10.2	Seven pin socket for trailer lights	:		Provided																														
3.1.10.10.3	Safety against accidental start	:		Safety switch provided in high-low gear shifting lever to prevent operation of the starting motor unless the High – low gear lever is in the neutral position.																														
3.1.11	Instrument panel details:-			<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"></td> <td style="width: 20%; text-align: center;"><u>Previous sample</u></td> <td style="width: 20%; text-align: center;"><u>Present sample</u></td> </tr> <tr> <td>i) Engine speed-cum-cumulative digital run hour meter (Analog type, 0 to 30 x100)</td> <td style="text-align: center;">Provided</td> <td style="text-align: center;">Provided</td> </tr> <tr> <td>ii) Coolant temperature gauge (with color zones)</td> <td style="text-align: center;">Provided</td> <td style="text-align: center;">Provided</td> </tr> <tr> <td>iii) Fuel level gauge (with color zones)</td> <td style="text-align: center;">Provided</td> <td style="text-align: center;">Provided</td> </tr> <tr> <td>iv) Engine oil pressure gauge with color zone</td> <td style="text-align: center;">Provided</td> <td style="text-align: center;">Provided</td> </tr> <tr> <td>v) Main switch (key-turn type)</td> <td style="text-align: center;">Provided</td> <td style="text-align: center;">Provided</td> </tr> <tr> <td>vi) Engine oil pressure indicator light</td> <td style="text-align: center;">Provided</td> <td style="text-align: center;">Provided</td> </tr> <tr> <td>vii) Light switch (Rotary type)</td> <td style="text-align: center;">Provided</td> <td style="text-align: center;">Provided</td> </tr> <tr> <td>viii) Two way switch for side indicator light</td> <td style="text-align: center;">Provided</td> <td style="text-align: center;">Provided</td> </tr> <tr> <td>ix) Battery Volt meter gauge with color zone</td> <td style="text-align: center;">Provided</td> <td style="text-align: center;">Provided</td> </tr> </table>		<u>Previous sample</u>	<u>Present sample</u>	i) Engine speed-cum-cumulative digital run hour meter (Analog type, 0 to 30 x100)	Provided	Provided	ii) Coolant temperature gauge (with color zones)	Provided	Provided	iii) Fuel level gauge (with color zones)	Provided	Provided	iv) Engine oil pressure gauge with color zone	Provided	Provided	v) Main switch (key-turn type)	Provided	Provided	vi) Engine oil pressure indicator light	Provided	Provided	vii) Light switch (Rotary type)	Provided	Provided	viii) Two way switch for side indicator light	Provided	Provided	ix) Battery Volt meter gauge with color zone	Provided	Provided
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		<u>Previous sample</u>	<u>Present sample</u>
	x) Mobile phone charger plug	Provided	Provided
	xi) Air cleaner air flow restriction indicator	Provided	Provided
	xii) Hazard light switch	Provided	Provided
	xiii) Turn-cum-hazard indicator lights tell-tale	Provided	Provided
	xiv) Battery charging warning indicator lamp	Provided	Provided
	xv) Head light long beam ON indicator light	Provided	Provided
	xvi) Horn push button	Provided	Provided
	xvii) Hand accelerator lever	Provided	Provided
	xviii) Fuel shut-off control knob	Provided	Provided
)		
	xix) Rear view mirror	Provided	Provided
	xx) Steering control wheel	Provided	Provided
3.1.12	Transmission System:	<u>Previous sample</u>	<u>Present sample</u>
3.1.12.1	Clutch:		
	Make :	AMREP	Luk
	Type :	Dual dry friction pads & plate	
	No. of friction plate, (s) :	Two	
	Size, OD/ID, (mm):		
	Transmission :	280 ϕ mm outer dia and 29.18 cm ² contact area of each pad, having five pads.	305.62 ϕ mm outer dia and 22.56 cm ² contact area of each pad having five pads.
	PTO :	254.0 /172.2 ϕ	249.9/155.7 ϕ
	Method of operation :		
	- Transmission :	By pressing a pedal on LHS halfway.	
	- PTO :	By pressing the same pedal fully.	
	Material of lining:		
	Transmission :	Not available	MD519
	PTO :	Not available	F491
3.1.12.2	Gear box:		
	Make :	TAFE (apa)	
	Type :	Constant mesh gears with epicyclic reduction unit for High/low range selection.	
	No. of speeds:		
	- Forward :	08	
	- Reverse :	02	
	Location of gear shifting levers :	Side shifting, main gear shifting lever at R.H.S and speed range selector at LHS of operator's seat	
	Gear shifting pattern :		
	Oil capacity, (l) :	41.0 (Common with differential, hydraulic, final drive & brake systems).	34.10 (Common with differential, hydraulic, final drive & brake systems).
	Oil changing period :	After every 600 hours of operation.	

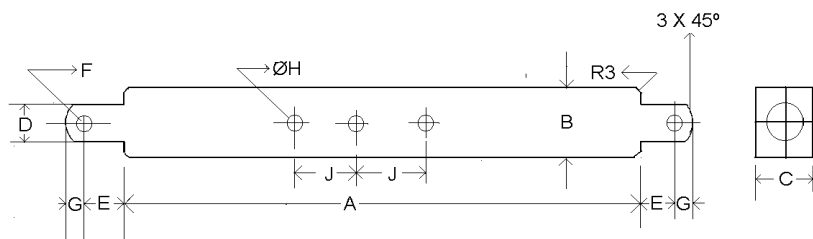
	<u>Previous sample</u>	<u>Present sample</u>
3.1.12.3 Nominal Speed:		
- Forward	: 2.33 to 30.72	2.70 to 35.70
- Reverse	: 3.17 to 12.69	3.68 to 14.72
3.1.12.4 Differential unit:		
Type	: Crown wheel and bevel pinion, with differential unit accommodated inside the differential housing.	
Reduction through crown wheel and bevel pinion	: 3.4545 : 1 (38/11T)	
Oil capacity, (l)	41.0 (Common with gearbox, hydraulic, final drive & brake system).	34.10 (Common with gear box, hydraulic, final drive & brake systems).
Oil changing period	: After every 600 hours of operation	
Differential lock:		
Type	: Dog clutch	
Location	: RHS of operator's seat	
Method of operation	: By pressing a foot pedal provided on RHS of operator seat.	
3.1.12.5 Rear axle & final drive:		
Type	: Planetary reduction at the end of rear axle	
Reduction through final drive	: 3.1429 : 1 (Sun gear -21T, Planet-18 T & Ring gear -45T)	
Oil capacity of final drive, (l)	41.0 (Common with gearbox, hydraulic, differential & brake).	34.10 (Common with Gear box, differential, hydraulic, & brake systems).
Oil change period	: After every 600 hours of operation	
3.1.13 Power lift (hydraulic system):		
Make	: TAFE (apa)	
Type	: Open centre, Live, ADDC	
No. and type of cylinder	: One, single acting	
Type of linkage lock for transport	: Not provided	Provided
3.1.13.1 Hydraulic pump:		
- Make	: TAFE (apa)	
- Type	: Scotch yoke (piston type)	
- Location & drive	: Inside the transmission housing, driven through lay shaft of gear box.	
No. & type of filters	: One, wire mesh filter	
Hydraulic oil capacity, (l)	41.0 (Common with transmission, final drive, differential & brake).	34.10 (Common with transmission, final drive, differential & brake)
Oil change period	: After every 600 hours of operation	
Provision for external tapping	: Provided	
Details of control levers:	: i) Position control lever ii) Draft control lever	
Method of draft sensing	: Through top link	

3.1.13.2 Three point linkage:

S. No	Observations		As per IS: 4468- (Part-1) -1997, (Cat.I / Cat.II), (mm)	As measured, (mm)		Remarks in case of Present sample
				Previous sample	Present sample	
I.	Upper hitch points:					
	a)	Dia of hitch pin hole	19.30 to 19.50 / 25.70 to 25.90	25.90	25.90	Conforms to cat -II
	b)	Width of ball	44.0 (max.) / 51.0 (max.)	51.0	51.0	Conforms to cat -II
II.	Lower hitch points:					
	a)	Dia of hitch pin hole	22.40 to 22.65 / 28.70 to 29.00	28.98	28.95	Conforms to cat -II
	b)	Width of ball	34.8 to 35.0 / 44.8 to 45.0	44.80	44.97	Conforms to cat -II
III.	Lateral distance from lower hitch point to centre line of tractor.		359 / 435	365	364	Does not conform
IV.	Lateral movement of lower hitch points		100 (min) / 125 (min)	220	225	Conforms
V.	Distance from end of power take-off to centre of lower hitch point (lower links in horizontal position)		450 to 575 / 550 to 625	620	620	Conforms to cat -II
VI.	Transport height		820 (min)/ 950 (min)	905	895	Conforms to cat -I
VII.	Power range (without force)		560(min)/ 650 (min)	680	650	Conforms
VIII.	Leveling adjustment		100 (min)/ 100 (min)	410	260	Conforms
IX.	Lower hitch point clearance		100 (min)/ 100 (min)	210	110	Conforms
X.	Lower hitch point height		200 (max)/ 200 (max)	200	200	Conforms

3.1.13.3 Drawbar:**3.1.13.3.1 Linkage Drawbar [Refer Fig.1]:**

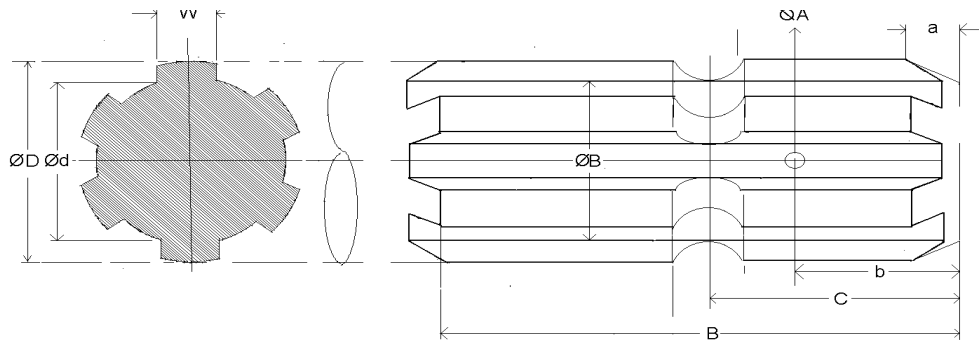
Notation	As per IS: 12953-1990, (Cat.I) / (Cat.II), (mm)	As measured, (mm)		Remarks in case of Present model
		Previous sample	Present sample	
A	$683 \pm 1.5/825 \pm 1.5$	684.0	683.0	Conform to cat -I
B	75 (min)/75 (min)	76	74	Does not conform
C	30 (min) / 30 (min)	38	30	Conforms
D \emptyset	21.79 to 22.0/27.79 to 28.0	21.99	27.95	Conform to cat -II
E	39.0 (min)/49.0 (min)	50.3	63.3	Conforms
F \emptyset	12.0 (min)/12.0 (min)	12.0	12.1	Conforms
G	15.0 (min)/15.0 (min)	15.0	23.45	Conforms
H \emptyset	$25 \pm 1/25 \pm 1$	25	26	Conforms
J	$80 \pm 1.5/80 \pm 1.5$	80.0	80.2	Conforms
No. of holes	7/9	07	7	Conform to cat -I

**Fig. 1: DIMENSIONAL NOTATIONS FOR LINKAGE TYPE DRAWBAR**

		<u>Previous sample</u> <u>Present sample</u>
3.1.13.3.2	Swinging drawbar	: Not provided
3.1.14	Power take-off shaft:	
	Type	: Type-I, Independent
	Method of engaging	: By hand lever provided at LHS of operator's seat.
	No. of shaft,(s)	: One
	PTO speed corresponding to rated engine speed, (rpm):	: 664
	Distance behind rear axle, (mm)	: 300
	Engine to PTO speed ratio	: 3.313 : 1
	Whether the PTO shaft is capable of transmitting the full power of engine	: Yes

3.1.14.1 Specifications of Power Take-Off Shaft:

Specification	As per IS: 4931-1995 (Type-I)	As observed		Remarks in case of <u>Present sample</u>
		<u>Previous sample</u>	<u>Present sample</u>	
Nominal speed, (rpm)	540 ± 10	540 rpm of PTO shaft corresponds to 1789 rpm of engine.	1789 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.	Centrally located	Centrally located	Conforms
Dimensions, (mm) [See Fig.2]:				
D \varnothing	34.79 ± 0.06	34.82	34.82	Conforms
d \varnothing	28.91 ± 0.05	28.87	28.90	Conforms
B \varnothing	29.4 ± 0.1	29.4	29.5	Conforms
A \varnothing (optional)	8.3 ± 0.1	8.55	8.50	--
W	8.69 - 0.09 - 0.16	8.63	8.57	Conforms
a	7	7.0	6	Does not conform
b (optional)	25 ± 0.5	25.5	25.30	Conforms
c	38	38	38	Conforms
X	30°	30°	30°	Conforms
B	76 (min)	84.0	79	Conforms
h	450 to 675	545	550	Conforms

**Fig. 2 : DIMENSIONAL NOTATIONS FOR TYPE-I POWER TAKE-OFF SHAFT**

3.1.14.2 Power Take-off Master Shield: : **Not provided**

		<u>Previous sample</u>	<u>Present sample</u>
3.1.15	Towing hitch:		
3.1.15.1	Front:		
	Type	:	Clevis
	Location	:	At front of engine support bracket
	Height above ground level, (mm)	:	595 (Fixed) 655 (Fixed)
	Type of adjustment	:	None None
	Dia of pin hole, (mm)	:	33.0 32.75
	Width of clevis, (mm)	:	54.0 54.70
3.1.15.2	Rear		
	Type	:	Clevis
	Location	:	At rear of transmission housing
	Height above ground level, (mm):		
	- Maximum	:	520 680
	- Minimum	:	370 565
	- No. of positions	:	06 06
	- Type of adjustment	:	By changing the position of hitch and reversing it on its mounting bracket.
	Distance of hitch point, (mm):		
	-From rear wheel centre	:	520 455
	-From power take-off shaft end	:	220 145
	Dia of pin hole, (mm)	:	30.7 36.4
	Width of clevis, (mm)	:	69.3 & 70.3 90.5
3.1.16	Steering:		
	Make	:	Danfoss
	Type	:	Open centre, Hydrostatic
	Location of control wheel	:	Above clutch housing
	Method of operation	:	Manually by a steering control wheel.
	Diameter of steering control wheel, (mm)	:	450 455
	Steering oil capacity, (l)	:	1.25 0.75
	Lubricant change period	:	First after 100 hours and subsequent after every 500 hours of operation After every 1200 hours of operation
3.1.17	Brakes:		
3.1.17.1	Service Brake:		
	Make	:	REPCO JMFT
	Type	:	Mechanical, Oil immersed disc brake
	Location	:	At the rear axle shaft before final reduction.
	No. of disc(s)	:	Three (on each wheel side) Four (on each wheel side)
	Area of liners, (cm ²)	:	1258.8 (on each wheel side) 1676.7 (on each wheel side)
	Material of liners	:	Paper base (apa)
	Method of operation	:	Independent / combined pedal operation by right foot.
3.1.17.2	Parking Brake:		
	Type	:	Pawl and ratchet arrangement for locking service brakes
	Location & method of operation	:	Hand operated lever provided on dash board.
3.1.18	Wheel Equipment:		
3.1.18.1	Steering Wheel(s):		
	Make	:	MRF, Shakti
	Number(s)	:	Two
	Type of tyre	:	Pneumatic, ribbed
	Size	:	7.50 – 16
	Ply rating	:	8

		<u>Previous sample</u>	<u>Present sample</u>
	Maximum permissible loading capacity of each tyre at 230 kPa pressure, (kgf)	550	660
	Recommended inflation pressure, (kPa) :		
	- for field work	200	
	- for transport	230	
	Track width, (mm)	1470 (std) and 1590	1420 (std) and 1540
	Method of changing track width	By reversing the wheel rim.	
	Make & size of rims	Wheels India Ltd & 5.50 F x 16	
3.1.18.2	Drive wheel (s):		
	Make	MRF, Shakti	
	Number	Two	
	Type of tyre	Pneumatic, traction	
	Size	16.9 - 28	
	Ply rating	12	
	Maximum permissible loading capacity of each tyre at 110 kPa pressure, (kgf)	1665 (apa)	
	Recommended inflation pressure, (kPa):		
	- For field work	98	
	- For transport	110	
	Track width, (mm)	1420 (std),1540, 1580,1690,1780 & 1900	1420 (std),1540, 1580,1680,1780 & 1880
	Method of changing track width	By reversing the wheel disc & changing the position of wheel disc on offset rim lugs.	
	Make & size of wheel rim	Wheels India Ltd. & W 15L x 28	
3.1.18.3	Wheel base, (mm)	1970	1965
	Method of changing wheel base, if any, and range	None	
3.1.19	Operator's seat:		
	Make	Harita Seating System Ltd.	
	Type	Cushioned with back rest	
	Type of Suspension	Two helical springs	
	Type of Damping	Hydraulic shock absorber	
	Range of adjustment, (mm):		
	Vertical	Nil	Nil
	Lateral	Nil	Nil
	Longitudinal	± 30	± 100
3.1.20	Provision for safety and comfort of operator:		
3.1.20.1	Operator's Seat:		
	Meet the minimum requirements of IS: 12343-1998, (Re-affirmed in 2014): except the following:		
	<u>Previous sample</u>	<u>Present sample</u>	
	i) Vertical distance from seat index point to center of brake pedals	i) Width of seat	
	--	ii) Vertical distance from SIP to center line of clutch pedal.	
	--	iii) Vertical distance from SIP to center line of brake pedal.	
	--	iv) Longitudinal distance from SIP to center line of differential lock pedal.	
3.1.20.2	Conformity with IS: 6283 (Part-1)-2006 & IS: 6283 (Part-2)- 2007(Re-affirmed in 2014):		
	Meet the requirements of IS: 6283 (Part-1)-2006 & IS: 6283 (Part-2)- 2007.		
3.1.20.3	Conformity with IS : 8133-1983 (Re-affirmed in 2014):		
	Location and movement of various controls meets the requirement of IS: 8133-1983.		

3.1.20.4 Conformity with IS:12239 (Part-1)-1996 (Re-affirmed in October, 2017):

Meet the requirements of IS: 12239 (Part-1) – 1996, **except the following:**

<u>Previous sample</u>	<u>Present sample</u>
i) The spark arrester is not provided in the exhaust system.	i) The spark arrester is not provided in the exhaust system.
ii) Vertical retainness at both side in foot pedal	ii) Vertical retainness at both side in foot pedal

3.1.20.5 Conformity with IS:12239 (Part-2)-1999 (Re-affirmed in 2014):

Meet the requirements of IS:12239 (Part-2)-1999, **except the following:**

<u>Previous sample</u>	<u>Present sample</u>
i) Master shield for PTO shaft is not provided.	i) Master shield for PTO shaft is not provided.
ii) Rear tyre are not fully guarded.	ii) Working clearance between draft control lever and mudguard is 40 mm.
iii) The working clearance around the high-low gear engaging lever is less than 70 mm.	--
iv) The location of battery is close to operator seat & may cause exposure of fumes and electrolyte to the operator.	--

3.1.20.6 Conformity with IS: 14683 – 1999 (Re-affirmed in 2014):

All lighting arrangements meet the requirements of IS: 14683-1999 in both previous & present model.

3.1.20.7 Rear view mirror:

Rear view mirror is provided in both previous & present model.

3.1.20.8 Slow moving emblem:

Slow moving emblem is provided in both previous & present model.

	<u>Previous sample</u>	<u>Present sample</u>
3.1.21 Mass of standard ballast tractor, (kg):		
- Front	: 800	995
- Rear	: 1430	1410
- Total	: 2230	2415

	<u>Previous sample</u>	<u>Present sample</u>
3.1.22 Over all dimensions, (mm):		
- Length	: 3675	4080
- Width	: 1865	1870
- Height (with exhaust pipe)	: 2175	2285
Minimum ground clearance	: 410	395
	(below transmission housing drain plug)	(below transmission housing drain plug)

3.1.23 Labelling of tractor as per IS: 10273-1987 (Reaffirmed in 2014):

Locations of labelling plate:- The labelling plate is riveted on RHS of fender and provides the following information:

Name of Manufacturer	:	Tractor and Farm Equipment Limited, Chennai, Tamilnadu, India
Make	:	TAFE
Model	:	MF 9500
Year of manufacture	:	AJ (January, 2018)
Engine Serial Number	:	TSJ327 A24576
Chassis Serial Number	:	MEA 8BD 83AJ1173391
Maximum PTO Power, kW	:	39.5
Specific fuel consumption, g/kWh	:	265

	<u>Previous sample</u>	<u>Present sample</u>
3.1.24	Number of external lubricating points:	
- Oiling	: Nil	Nil
- Grease cups	: 02	02
- Grease nipples	: 06	10
3.1.25	Colour of tractor:	
Chassis & engine	: Charcoal grey	Charcoal grey
Sheet metal:		
Mudguard	: Red	Red
Bonnet	: Red	Red
Rim & disc	: Silver	Silver

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 16.9-28 size tyres 670 mm radius index, (kmph).	Nominal speed at rated engine speed when fitted with 16.9-28 size tyres 670 mm radius index, (kmph).	Variation in nominal speed (%) in Present sample and Previous sample
		<u>Previous sample</u>	<u>Present sample</u>	<u>Previous sample</u>	<u>Present sample</u>	
Forward	L1	238.57	205.83	2.33	2.70	15.88
	L2	162.68	140.42	3.42	3.96	15.79
	L3	88.83	76.52	6.26	7.26	15.97
	L4	72.47	62.39	7.67	8.90	16.04
	H1	59.56	51.41	9.33	10.81	15.86
	H2	40.67	35.07	13.66	15.85	16.03
	H3	22.17	19.12	25.06	29.08	16.04
	H4	18.09	15.60	30.72	35.70	16.21
Reverse	LR	175.46	150.95	3.17	3.68	16.09
	HR	43.79	37.77	12.69	14.72	16.00

3.3 PTO PERFORMANCE TEST

S. No.	Particulars	<u>Previous sample</u>	<u>Present sample</u>
1	Date(s) of test	24.01.2011 & 25.02.2011	23.10.2018 & 24.10.2018
2	Tractor run at this Institute prior to start of PTO test, (h)	1.6	3.1
3	Dynamometer test bench used	Fuchino ESF 1000 S	Fuchino ESF 1000 S

Maximum power two hours test under natural ambient condition was conducted. The results of Power take-off performance test under natural ambient of **Previous & Present sample** are tabulated in **Table-2**.

	Power, (kW)	Speed, (rpm)		Fuel Consumption			Specific energy, (kWh/l)
		PTO	Engine	(l/h)	(kg/h)	(kg/kWh)	
a) Maximum power – 2 hours test (under natural ambient condition):							
Previous sample	40.8	619	2050	11.09	9.27	0.227	3.68
Present sample	39.0	618	2048	11.77	9.84	0.252	3.31
b) Power at rated engine speed (2200 rpm):							
Previous sample	39.2	664	2200	10.96	9.16	0.234	3.58
Present sample	37.6	664	2200	11.83	9.89	0.263	3.18

S. No.	Parameters	Previous sample		Present sample
		Natural Ambient	High Ambient	Natural Ambient (Max. power Two Hours)
	-No load maximum engine speed, (rpm)	2306	2296	2442
	-Equivalent crankshaft torque at maximum power, (Nm)	190.1	176.7	181.7
	-Maximum equivalent crankshaft torque, (Nm)	221.0	195.7	--
	-Engine speed at maximum equivalent crankshaft torque, (rpm)	1448	1650	--
	- Back up torque, (%)	16.3	10.8	--
	- Smoke level , maximum light absorption coefficient, (per meter)	1.01	--	--
	- Range of atmospheric conditions:			
	Temperature, (°C)	24 to 27	41 to 45	25 to 27
	Pressure, (kPa)	99.2 to 99.5	99.1 to 99.5	99.3 to 99.4
	Relative humidity, (%)	33 to 41	10 to 15	35 to 37
	- Maximum temperatures, (°C):			
	Engine oil	111	121	106
	Coolant	78	94	82
	Fuel	44	57	53
	Air intake	25	37	28
	Exhaust gas	582	570	604
	- Pressure at maximum power:			
	Intake air, (kPa)	2.3	2.5 to 2.7	3.9
	Exhaust gas, (kPa)	65.1 to 65.7	63.1 to 65.9	163.2 to 164.7
	- Consumptions:			
	Lub oil, (g/kwh)	--	0.37	--
	Coolant (% of total coolant capacity)	--	Nil	--

4. OTHER APPLICABLE TESTS

S. No.	-None-
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5. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

S. No.	Adjustment/Defect/Breakdown and Repairs	Tractor run hours
	-None-	

6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

- 6.1 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 present model meets the requirem ents (Yes/No.)
				Previous sample	Present sample	Previous sample	Present sample	
6.1.1	PTO Performance :							
a)	- Max. power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >26 kW. -7.5/+10% for PTO power ≤ 26 kW or- 5 / +10% for engine power >26 kW. -7.5/+10% for engine power ≤ 26 kW	39.5 (D)	39.5 (D)	40.8	39.0	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	39.5 (D)	39.5 (D)	39.2	37.5	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	265 (D)	265 (D)	227	252	Yes
6.1.2	Labeling of tractors (Provision of labeling plate):							
	1) Make	Evaluative	Should conform to the require ments of CMVR along- with declared value of PTO HP	--	TAFE			Yes
	2) Model	Evaluative		--	MF 9500			Yes
	3) Year of manufacture	Evaluative		--	AJ (January, 2018)			Yes
	4) Engine number	Evaluative		--	TSJ327 A24576			Yes
	5) Chassis number	Evaluative		--	MEA8BD83AJ1173391			Yes
	6) Declaration of PTO power, kW	Evaluative		--	39.5			Yes
	7) Specific fuel consumption, g/kWh	Evaluative		--	265			Yes
6.1.3	Literature (Submission to test agency)							
(a)	Operator manual	Evaluative	Provided/ Not Provided	Provided	Provided	Provided	Yes	
(b)	Parts Catalogue	Evaluative	Provided/Not Provided	Provided	Provided	Provided	Yes	
(c)	Workshop/ Service manual	Evaluative	Provided/Not Provided	Provided	Provided	Provided	Yes	

6.2 Conformity with following IS:

		<u>Previous sample</u>	<u>Present sample</u>
i)	Guidelines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS 10273:1987 (Reaffirmed in 2014)]	Conformed	Conforms
ii)	Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS: 4931-1995 (Reaffirmed in 2014)]	Did not conform	Does not conform
iii)	Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS 4468 (Part-2):1993 (Reaffirmed in October, 2017)/ISO 730-1:1994]	Did not conform	Does not conform

	<u>Previous sample</u>	<u>Present sample</u>
iv) Drawbar for agricultural tractors – Link type [IS : 12953:1990 (Reaffirmed in October, 2017)]	Conformed	Does not conform
v) Agricultural tractors - Operator's seat technical requirement [IS 12343 –1998 (First revision) (Reaffirmed in 2014)] Tractors having more than 1150 mm rear track width.	Did not conform	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 October, 2017)/ISO 4254-1:1989]	Did not conform	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 2014)]	Did not conform	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, 2014)/ ISO 3767-2:1991]]	Conformed	Conformed
ix) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983) (Reaffirmed in 2014)]	Conformed	Conformed
x) Agricultural Tractor & Machinery Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed in March, 2014)]	Conformed	Conforms

6.3 Salient Observations:

6.3.1 Laboratory tests:

6.3.1.1 PTO Performance:

- i) The maximum power was recorded as **40.8 & 39.0 kW** in case of previous & present sample respectively against the declaration of **39.5 kW**, which meets the requirement of IS: 12207-2014 with regard to tolerance.
- ii) The specific fuel consumption corresponding to maximum power in case of previous and present sample was measured as **227 & 252 g/kWh** respectively against the declaration of **265 g/kWh**, which meets the requirement of IS: 12207-2014 with regard to tolerance.

6.3.1.2 Three point linkage:

- i) The lateral distance from lower hitch point to center line of tractor does not meet the requirement of IS: 4468 (Part-1)-1997 (Re-affirmed in October, 2017). This should be looked into for necessary corrective action.
- ii) Some of the parameters conform to Cat. I and some of them conform to Cat. II. Keeping in view the spirit of standardization, necessary improvement may be incorporated.

6.3.1.3 Linkage drawbar:

- i) The dimension "B" of drawbar does not meet the requirement of IS: 12953-1990 (Re-affirmed in Oct. 2017). This should be looked into for necessary corrective action.
- ii) Some of the parameters of linkage drawbar conform to Cat. I and some of them conform to Cat. II In view of the spirit of standardization, necessary improvements may be incorporated.

6.3.1.4 Seating requirement:

- i) Width of seat does not meet the requirement of IS: 12343-1998 (Re-affirmed in 2014). This should be looked into for necessary corrective action.
- ii) Vertical distance from SIP to center line of clutch & brake pedal does not meet the requirement of IS: 12343-1998 (Re-affirmed in 2014). This should be looked into for necessary corrective action.

6.3.1.5 Operator's work place:

- i) Vertical retainness of foot pedal/ foot step at both sides is not provided. This should be looked into for necessary corrective action.
- ii) Provision for spark arresting device is not provided. This should be looked into for necessary corrective action.

6.3.1.6 Guards:

- i) Provision for power take-off shield is not provided. This should be looked into for necessary corrective action.
- ii) Working clearance for hand control between draft control lever and mud guard does not meet the requirement of IS: 12239 (Part-II)-1999 (Re-affirmed in 2014). This should be looked into for necessary corrective action.

6.3.1.7 Operator's control:

Colour zone for fuel level is not provided as per IS: 6283(Part I & Part II)-1998 (Re-affirmed in 2014). This should be looked into for necessary corrective action.

6.4 Maintenance / Service problems:

No noticeable maintenance or service problems, observed during the test.

6.5 Recommendation with regard to safety on tractor:

The following requirements, inter alia, may be considered for incorporation on the tractor as per relevant Indian Standards:

- i) The lateral distance from lower hitch point to center line of tractor.
- ii) Dimension "B" (width) of drawbar.
- iii) Width of operator's seat.
- iv) Vertical distance from SIP to center line of clutch & brake pedal.
- v) Vertical retainness of clutch pedal/ foot step at both side.
- vi) Provision of spark arresting device in exhaust system.
- vii) Provision of master shield in power take-off.
- viii) Colour zone for engine revolution gauge.
- ix) Working clearance around the draft control lever & Mudguard.

6.6 Adequacy of Literature supplied with machine:

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

- a) Operator's instruction book for MF 9000 & MF 9500 tractor.
- b) Combined workshop service manual for MF 9000 & MF 9500 (2WD & 4WD) tractor models.
- c) Parts Catalogue for MF 9500 tractor.

6.6.2 The supplied literature was found adequate. Except the following:

- a) Engine oil & filter, air cleaner filter element, coolant and transmission oil scheduling maintenance given in operator's manual does not match with specification submitted by applicant.
- b) The lubricants produced/ marketed by various Indian manufacturers, if deemed suitable, may be recommended for their use in the tractor, shall also be included in the Operator Instruction Book.
- c) These literatures may be brought out in national & other regional languages for the guidance of user's and service personnel.

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7. 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	08 Months (September, 2018 to April, 2019)	Yes	None

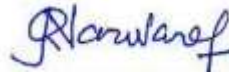
TESTING AUTHORITY:



C.K. TIJARE
AGRICULTURAL ENGINEER



C.V. CHIMOTE
TEST ENGINEER



J.J.R. NARWARE
DIRECTOR

Test report compiled by **Shri ShivKumar Sharma**, Senior Technical Assistant.

8. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
8.1	6.3.1.2 (i), (ii), 6.3.1.3 (i), (ii), 6.3.1.4 (i),(ii),6.3.1.5 (i),(ii), 6.3.1.6 (i),(ii) & 6.3.1.7	We will study & take appropriate corrective action regarding the non conformity.
8.2	6.5	We shall study & initiate to improve in production.

ANNEXURE -I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	6.3
3.	Nominal speed test	0.9
B.	Miscellaneous test and other run hours including idle run, transportation, preparation for test and trial runs.	0.3
	TOTAL:	7.5