संख्या / No. : T-1528/2056/2021
माह / Month : April, 2021

(यह परीक्षण रिपोर्ट 30/04/2024 तक वैध है। / THIS TEST REPORT IS VALID UP TO : 30/04/2024)

TAFE, MF 7250 DI E7 TRACTOR

सत्यमेव जयते

भारत सरकार
कृषि एवं किसान कल्याण मंत्रालय
कृषि, सहकारिता एवं किसान कल्याण विभाग
मशीनीकरण एवं प्रौद्योगिकी प्रभाग
GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
(Department of Agriculture, Cooperation & Farmers Welfare, Mechanization & Technology Division)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५
CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
(An ISO : 9001 - 2015 Certified Institute)
Tractor Nagar, Budni (M.P.) 466 445
E-mail fmti-mp@nic.in Website : http://www.fmttibudni.gov.in
Telephone : 07564 - 234729, 234743

Manufacturer : **M/s. Tractor and Farm Equipment Limited,**
Post Box No. 3302, (New 77), 35 Mahatma Gandhi Road, Nungambakkam,
Chennai - 600 034 (Tamil Nadu)

Month: April	Test Report No. T- 1528/2056/2021	Year: 2021

सत्यमेव जयते

GOVERNMENT OF INDIA
CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
TRACTOR NAGAR, BUDNI (MADHYA PRADESH) 466445, INDIA

E-mail: fmti-mp@nic.in Web site: http://www.fmttibudni.gov.in

Telephone : 07564-234729, 234743

Type of Test	:	**COMMERCIAL (Variant)**
Test code/Procedure	:	IS: 5994 -1998 (Reaffirmed in 2014) and IS: 12207-2019
Period of Test	:	**November,2020 to February,2021**
Test Report No	:	**T- 1528/2056/2021**
Month/Year	:	**April, 2021**

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 (1st Batch Test) i.e. **"TAFE, MF 7250 DI POWER DRIVE POWER STEERING" tractor** bearing report **No. T-1242/1769/2019** released in **May, 2019** and **Commercial Administrative Extension** test report **No. T-1326/1853/2020** released in **March, 2020**.

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

ABBREVIATIONS	
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

CONTENTS

Manufacturer	:	**M/s. Tractor and Farm Equipment Limited,** Post Box No. 3302, (New 77), 35 Mahatma Gandhi Road, Nungambakkam, Chennai - 600 034 (Tamil Nadu)
Test requested by (applicant)	:	The manufacturer
Selected for test by	:	Applicant
Place of running-in and test carried out	:	At manufacturer's works
Duration of said running-in (h):		
- Engine	:	12
- Transmission	:	24
Method of Selection	:	The tractor was submitted directly by the applicant for test as the Ministry has exempted the random selection of tractor up to 31.03.2021.

1. SCOPE OF TEST

The **"TAFE, MF 7250 DI POWER DRIVE POWER STEERING" tractor** had undergone **"First Batch Test"** at this Institute and bearing a test report **No. T-1242/1769/2019** released in **May, 2019.** Now the applicant has submitted an application vide letter No. Nil dated 04.08.2020 for testing of "**TAFE, MF 7250 DI E7**" tractor as a Variant of **"TAFE, MF 7250 DI POWER DRIVE POWER STEERING"** tractor.

The variant model derived on the basis of **Type of Fuel injection Pump (Rotary Fuel injection Pump in base model)** to **Inline Fuel injection Pump (in variant model)** as per Table 2 of Sl.No. (xiv) Of IS: 12207-2019.

The applicant having enclosed a list of following differences in the technical specifications between **"TAFE, MF 7250 DI POWER DRIVE POWER STEERING"** and "**TAFE, MF 7250 DI E7**" tractor and requested to test the "**TAFE, MF 7250 DI E7**" tractor as a variant of **"TAFE, MF 7250 DI POWER DRIVE POWER STEERING"** tractor.

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

S.No.	Parameters	Base Model (Test report no. T-1242/1769/2019, (May) & Commercial Administrative Extension test report No. T-1326/1853/2020 (March))	Variant Model
1	2	3	4
1.	Tractor:		
	Make	TAFE	TAFE
	Model	MF 7250 DI POWER DRIVE POWER STEERING	MF 7250 DI E7
2.	**Engine:**		
	Make	M/S. SIMPSONS & CO. LTD.	M/S. SIMPSONS & CO. LTD.
	Model	TIIIA S 325-F4	TIIIA S 325.5- F31
	Engine speed (Manufacturer's recommended production setting), (rpm):		
	- Maximum speed at no load	2325 to 2475	2300 to 2465
	- Low idle speed	700 to 750	600 to 800
	- Speed at maximum torque	1400 to 1600	1200 to 1400
	Engine rated speed, (rpm)	2250	2200

1	2	3	4
3.	**Cylinder & Cylinder Head:**		
	- Bore/stroke, (mm)	91.4/127	95/127
	- Capacity as specified by the applicant, (cc)	2500	2700
	- Compression ratio	18.5:1	17.5(±0.3):1
4.	**Capacity Of fuel tank, (l)**	63.5	67.0
5.	**Fuel feed pump:**		
	- Make	Devendra	Bosch, India
	- Model/Group combination no.	01222100	FP/KSG 22AD104, F002 A50 038
6.	**Fuel filters:**		
	- Make	Delphi-TVS	Bosch, India
	- Model/Group combination no.	G6248080A	F002 H20 151
7.	**Fuel Injection pump:**		
	- Make	Delphi-TVS	Bosch, India
	-Type	Rotary	Inline, plungers
	- Model/Group combination no.	S07B3A DPT G8972A450A	F002 A3ZF25
8.	**Fuel Injectors:**		
	- Make	Delphi-TVS	Bosch, India
	- Nozzle holder no.	LJBG00931A	F002 C70 018
	- Nozzle no.	L014PGBNI000085	DSLA 146P 5657
	- Injection timing	10 ±0.2 mm plunger lift before TDC	11 ±1 degree before TDC (apa)
9.	**Governor:**		
	- Make	Delphi-TVS	Bosch, India
	- Model/Group combination no.	Inbuilt with FIP	RSV375...1100A5C1845R
	- Governed range of engine speed, (rpm)	700 to 2475	600 to 2465
10.	**Location of air cleaner**	In front of radiator, under the bonnet	
11.	**Location of gear shifting levers:**		
	- Main gear shift	On-RHS of operator's seat	In-front of operator's seat
	- Range selection (high-low & medium)	On-RHS of operator's seat	In-front of operator's seat
12.	**Nominal speed :**		
	- Forward	2.71 to 33.22	2.79 to 34.06
	- Reverse	3.53 to 13.94	3.61 to 14.27
13.	**Hydraulic system**		
	Pump:		
	- Make	TAFE (apa)	TAFE (apa)
	- Rated speed of pump, (rpm)	701	685
	- Max. Hydraulic power, (kW)	4.5 (D)	4.2 (D)
	- Pump delivery rate at maximum hydraulic power, (l/min.)	17.0 (D)	16.0 (D)
14.	**Power Take-Off Shaft :**		
	-Type	Type-I, Semi Independent	Type-I, Semi Independent
	- PTO speed corresponding to rated engine speed, (rpm)	701	685
	-Engine to PTO speed ratio	3.210:1	3.210:1

1	2	3	4
15.	**Wheel equipments:**		
	Drive wheel(s):		
	- Size & PR	13.6-28 & 12 PR	14.9-28 & 12 PR
16.	**Masses, (kg) :**		
	Mass of Unballasted tractor, (kg) Front/Rear/Total	790/1230/2020	830/1220/2050
17.	**PTO Performance Test :**		
	-Declared max.PTO power, (kW)	30.5	30.5
	-Declared maximum equivalent crankshaft torque, (Nm)	150.9	180
18.	**Power lift and hydraulic pump performance :**		
	- At hitch points	17.66 (D)	14.71 (D)
	- With the standard frame	11.46 (D)	8.00 (D)
19.	**Overall dimensions , (mm)**		
	-Length, (mm)	3605	3610
	-Width, (mm)	1670	1735
	-Height, (mm)	2370 (with exhaust pipe)	2660 (with exhaust pipe)
	-Minimum ground clearance, (mm)	400 (below differential housing)	420 (below front axle)

Subsequent to the examination of the case in light of table-2 & 3 of Indian Standard IS 12207-2019, the following tests were considered to be carried out :

- Specification checking
- Nominal speed test
- Two hour maximum PTO power performance test, under natural ambient condition
- Power lift and hydraulic pump performance 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 gm/cc** at 15°C was used.

2.2 Lubricants:

S. No.	Particulars	As recommended by the manufacturer	As used during the test
1.	Air Cleaner oil & Engine oil	SAE 20W40	As recommended
2.	Transmission, Hydraulic and brake systems oil	Dynatrans SF3I	Oil originally filled in the tractor was not changed
3.	Steering oil	Dynatrans SF3I	
4.	Grease	Servo grease MP	Servo grease MP

3. ESSENTIAL TEST

3.1. SPECIFICATIONS

			Base Model	Variant Model
3.1.1	**Tractor:**			
	Make	:	TAFE	TAFE
	Model	:	MF 7250 DI POWER DRIVE POWER STEERING	MF 7250 DI E7
	Brand name, if any	:	None	
	Type	:	Four wheeled, Rear-wheels driven, Unit construction, General purpose, Agricultural Tractor.	
	Month & Year of manufacture	:	02 & 2020	09 & 2020
	Chassis number	:	MEA0AD05BL3000766	MEABAF99JL2315945
	Country of Origin	:	India	
3.1.2	**Engine:**			
	Make	:	M/s. Simpson & Co. Limited	
	Model	:	TIIIA S 325- F4	TIIIA S 325.5- F31
	Type	:	Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.	
	Serial number	:	S325J29840	S325.5L12268
	Engine speed (Manufacturer's recommended production setting), (rpm):			
	- Maximum speed at no load,	:	2325 to 2475	2300 to 2465
	- Low idle speed	:	700 to 750	600 to 800
	- Speed at maximum torque	:	1400 to 1600	1200 to 1400
	Rated speed, (rpm):			
	- For PTO use	:	2250	2200
	- For drawbar use	:	2250	2200
3.1.3	**Cylinder & Cylinder Head:**			
	Number	:	Three	
	Disposition	:	Vertical, inline	
	Bore/stroke, (mm)	:	91.4/127	95.0/127
	Capacity as specified by the applicant, (cc)	:	2500	2700
	Compression ratio	:	18.5 : 1	17.5 (±0.3) :1
	Type of cylinder head	:	Monoblock	Monoblock
	Type of cylinder liners	:	Dry, replaceable	
	Type of combustion chamber	:	Re-entrant, cavity on piston crown	
	Arrangement of valves	:	Over head, inline	
	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	
3. 1.4.1	**Fuel tank:**			
	Capacity, (l)	:	63.5	67.0
	Location	:	Above the engine, under the bonnet	
	Provision for draining of sediments/water	:	Not provided	
	Material of fuel tank	:	Metallic	

			Base Model	Variant Model
3. 1.4.2	**Water separator:**			
	Make	:	Engine tech (apa)	
	Type	:	Transparent, inverted funnel type, gravity separation	
	Location	:	Between fuel tank and primary feed pump	
3. 1.4.3	**Fuel feed pump:**			
	Make	:	Devendra	Bosch, India
	Type	:	Plunger with separate hand primer and sediment bowl	
	Model/Group combination No.	:	01222100	FP/KSG 22AD 104, F002A50038
	Provision of sediment bowl	:	Provided	
	Method of drive	:	Through engine camshaft	
	Location	:	On RHS of engine	On FIP
3. 1.4.4	**Fuel filters:**			
	Make	:	Delphi-TVS	Bosch, India
	Model/Group combination No.	:	G6248080A	F002H20151
	Number(s)	:	Two	Two
	Types of elements:			
	- Primary	:	Spin on, Throw away paper element	Cloth
	-Secondary	:	Spin on, Throw away paper element	Paper
	Capacity of final stage filter, (l)	:	0.6	0.4
3.1.4.5	**Fuel Injection pump:**			
	Make	:	Delphi-TVS	Bosch, India
	Model/Group Combination No.	:	S07B3A DPT G8972A450A	F002A3ZF25
	Type	:	Rotary	Inline, plungers
	Serial number	:	73046FNI	07798163
	Method of drive	:	Through timing gears	
	Location	:	On LHS of engine	
3.1.4.6	**Fuel injector(s):**			
	Make	:	Delphi-TVS	Bosch, India
	Nozzle holder no.	:	LJBG00931A	F002 C70 018
	Nozzle no.		L014PG BNI 000085	DSLA 146P 5657
	Type	:	Multi hole (05 holes)	Multi hole (05 holes)
	Manufacturer's production pressure setting, (MPa)	:	25.0 to 25.8	
	Injection timing	:	10 ± 2° before TDC	11 ± 1° before TDC
	Firing order	:	1-2-3	1-2-3
3.1.4.7	**Governor:**			
	Make	:	Delphi-TVS	Bosch, India
	Model/Group Combination No.	:	Inbuilt with FIP	RSV375...1100A5C1845R
	Type	:	Mechanical, centrifugal, variable speed.	
	Rated engine speed, (rpm)	:	2250	2200
	Governed range of engine speed, (rpm)	:	700 to 2475	600 to 2465

			Base Model	Variant Model
3.1.5	**Air Intake System:**			
3.1.5.1	**Pre-cleaner:**			
	Make	:	TAFE (apa)	
	Type	:	Centrifugal with transparent dust collector	
	Location	:	On top of main air cleaner inlet tube, outside the bonnet	
3.1.5.2	**Air cleaner:**			
	Make	:	TAFE (apa)	
	Type	:	Oil bath	
	Location	:	In front of radiator, under the bonnet.	
	Range of suction pressure at maximum power, (kPa)	:	2.3	2.8 to 2.9
	Air cleaner bowl oil capacity, (l)		0.9	0.8
	Oil changing period		Change after every 10 hours operation in dusty condition or after every 50 hours of operation.	
3.1.6	**Exhaust System:**			
	Type of silencer	:	Up-draught (cylindrical)	
	Position of silencer outlet with respect to SIP, (mm):			
	- Upward	:	980	905
	- Longitudinal	:	1290	1235
	- Lateral	:	450 on LHS	365 (on LHS)
	Range of exhaust gas pressure at maximum power, (kPa)	:	4.9 to 5.2	4.0 to 4.1
	Provision of spark arresting device	:	**None**	
	Provision against entry of rain water	:	A bend is provided on the outlet of silencer.	
3.1.7	**Lubricating system:**			
	Type	:	Force feed cum splash	
	Oil sump capacity, (l)	:	6.6	6.5
	Total lub oil capacity, (l)	:	7.5	7.0
	Oil change period	:	First change after 30 hours and subsequently after every 200 hours of operation.	
	Cooling device, (if any)	:	**None**	
	Filters:			
	Type	:	Full flow, throw away, canister type	
	Number	:	One	
	Pump:			
	Type	:	Rotary lobe	
	Method of drive	:	Through timing gears	
	Minimum permissible pressure, (kPa)	:	88.0	88.0
	Pressure release setting, (kPa)	:	343 to 448	343 to 412
3.1.8	**Cooling system:**			
	Type	:	Forced circulation of water & coolant.	
	Coolant as recommended	:	NA	
	Coolant and water ratio		NA	

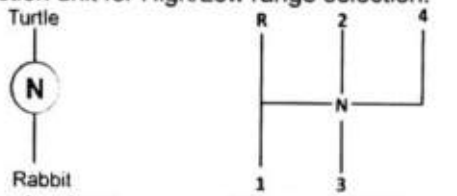
			Base Model	Variant Model
	Details of Pump	:	Centrifugal, semi-open impeller of 69.8 mm diameter having six numbers of vanes, and driven through crankshaft pulley by a cogged 'V'-belt common to alternator.	
	Details of fan	:	Suction type having seven numbers of polypropylene blades of 395 mm diameter and mounted on water pump shaft.	
	Means of temperature control	:	Thermostat	Thermostat
	Bare radiator capacity, (l)	:	3.0	3.0
	Expansion flask capacity, (l)	:	1.5	1.5
	Total coolant capacity, (l)	:	8.5	9.4
	Radiator cap pressure, (kPa)	:	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 and model	:	AMCO & 95D31RMF	
	Type	:	Lead acid	
	Capacity and rating	:	12V, 80 Ah at 20 hrs discharge rate	
	Location	:	In front of radiator, under the bonnet	
3.1.10.2	**Starter:**			
	Make	:	Lucas-TVS	Autolek
	Model	:	STM 1103 V	
	Type	:	Pre-engaging, solenoid operated	
	Power rating, (kW)	:	12V, 2.2 kW	
3.1.10.3	**Generator:**			
	Make	:	Autolek	Auto lek
	Model	:	ALT 4005	NA
	Type	:	Alternator	
	Output rating	:	12V, 35A	
	Method of drive	:	Driven through crank shaft pulley by a cogged 'V'-belt common to water pump.	
	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)	
		Base model	Variant model	Base model	Variant model	Base model	Variant model
1	2	3	4	5	6	7	8
Front Lights:							
- Head lights	2, 12V,60/55W	1190	1170	95 x 155	95 x 155	682	710
- Parking lights	2, 12V, 5W	1375	1405	45 x 55	45 x 55	230	225
- Turn Indicators-cum-Hazard lights	2, 12V, 21W	1375	1405	45 x110	45 x110	150	145
Rear lights:							
- Parking-cum-brake light	2, 12V, 21/5W	1360	1400	75 x 85	75 x 90	185	215
- Turn Indicators-cum- hazard light	2, 12V, 21W	1360	1400	75 x 85	75 x 90	95	120
Plough light	1, 12V, 55W	1475	1500	75 x 125	70 x 125	325	355
Reflectors (Red)	2	1330	1500	45 x 55	45 x 55	140	170
Registration plate Light	1, 12V, 5W	1140	1175	45 x 20	85 x 20	840	867

3.1.11 Instrument panel details:

		Base Model	Variant model
i)	Engine speed-cum-digital cumulative run-hour meter (0-30 x 100 rpm)	Provided	Provided
ii)	Coolant temperature gauge (with colour zones)	Provided	Provided
iii)	Fuel level gauge (with colour zones)	Provided	Provided
iv)	Battery charging warning indicator	Provided	Provided
v)	Battery volt meter gauge (with colour zones) (8-16V)	Provided	Provided
vi)	Lubrication oil pressure gauge (with colour zones)	Provided	Provided
vii)	Turn/hazard light	Provided	Provided
viii)	Turn indicator light switch (left, right)	Provided	Provided
ix)	Light switch (rotary type)	Provided	Provided
x)	Head light long beam ON indicator	Provided	Provided
xi)	Hazard light switch	Provided	Provided
xii)	Horn push button	Provided	Provided
xiii)	Hand accelerator lever	Provided	Provided
xiv)	Rear view mirror	Provided	Provided
xv)	Steering control wheel	Provided	Provided
xvi)	Engine stop knob	Provided	Provided

			Base Model	Variant Model
3.1.12	**Transmission System:**			
3.1.12.1	**Clutch:**			
	Make	:	Amrep	
	Type	:	Mechanical, dual, dry friction plate	
	No. of friction plate(s)	:	Two	
	Size, (OD/ID),(mm):			
	- Transmission	:	302/197 ϕ	
	- PTO	:	254/172 ϕ	
	Method of operation:			
	Main transmission clutch		By depressing clutch pedal halfway provided on LHS of operator's seat.	
	PTO clutch		By depressing clutch pedal fully provided on LHS of operator's seat.	
3.1.12.2	**Gear box:**			
	Make	:	TAFE (apa)	
	Model	:	NA	
	Type	:	Mechanical, Constant mesh gears with epicyclic reduction unit for High/Low range selection.	
	Gear shifting pattern in case of base and variant models	:		
			Range selection lever	**Main gear shift lever**
	Location of gear shifting levers		Side shifting, main gear shifting lever & and Low-High range selector lever is provided on RHS of operator's seat.	Central shifting, In-front of operator's seat
	No. of speeds:			
	- Forward	:	08	
	- Reverse	:	02	
	Oil capacity, (l)	:	58.5 (Common with differential , & hydraulic system)	59.5 (Common with differential, final drive, hydraulic and brakes system)
	Oil changing period		First change after 200 hours and subsequently after every 750 hours of operation.	
3.1.12.3	**Range of nominal Speed, (Kmph) :**			
	- Forward	:	2.71 to 33.22	2.79 to 34.06
	- Reverse	:	3.53 to 13.94	3.61 to 14.27
3.1.12.4	**Differential:**			
	Type	:	Crown wheel and bevel pinion with differential assembly accommodated inside the differential housing.	
	Reduction through crown wheel and pinion	:	3.23 : 1 (42/13T)	
	Differential lock	:	**Not Provided**	

		Base model	Variant model

3.1.12.5 Rear axle and Final Drive :

Type	:	Bull and pinion gear reduction unit accommodated inside the differential housing.	
Reduction through final drive	:	4.818 : 1 (53/11T)	
Oil capacity of final drive, (l)	:	58.5 (Common with gear box, differential and hydraulic systems)	59.5 (Common with gear box, differential hydraulic and brakes system)
Oil changing period	:	First change after 200 hours and subsequently after every 750 hours of operation.	

3.1.13 Power lift (Hydraulic System):

Make	:	TAFE (apa)
Type	:	Open centre, Non live, ADDC
No. and type of cylinder	:	One ,single acting
Type of linkage lock for transport	:	A knob is provided on transfer tube, when fully closed position acts as transport lock.

Hydraulic pump:

-Make	:	TAFE (apa)
-Type	:	Radial piston pump (Scotch yoke)
-Location & drive	:	Inside the transmission housing, through lay shaft of gear box.
No. & type of filter(s)	:	One wire mesh filter inside transmission housing.
Hydraulic oil capacity, (l)	:	58.5 (Common with gear box, differential and final drive systems) | 59.5 (Common with gear box, differential , final drive & brake systems)
Oil change period	:	First change after 200 hours and subsequently after every 750 hours of operation.
Provision for external tapping	:	Provided

Details of control levers:

Sl.No.	Control	Function
i)	Position control lever (black)	To control depth of implement.
ii)	Draft control lever (red)	To control the draft of implement.
iii)	A knob on transfer tube	To lock oil into ram cylinder.

Method of draft sensing : Through top link

3.1.13.1 Three-point linkage:

S. No.	Observations	As per IS: 4468-(Part-1) -1997 (Reaffirmed in Oct., 2017) (Cat.I / Cat.II), (mm)	As measured (mm)		Remarks in case of variant model
			Base model	Variant model	
1	2	3	4 (a)	4 (b)	5
I	**Upper hitch points:**				
	a) Dia of hitch pin hole	19.30 to 19.50/ 25.70 to 25.90	25.8	19.5/25.9	Conforms to Cat. I & II
	b) Width of ball	44.0 (max.) / 51.0 (max.)	44.0	39.9/43.9	Conforms to Cat. I & II
II	**Lower hitch points:**				
	a) Dia of hitch pin hole	22.40 to 22.65 / 28.70 to 29.00	22.6/29.0	22.65/29.0	Conforms to Cat. I & II
	b) Width of ball	34.8 to 35.0 / 44.8 to 45.0	44.1/44.4	44.5/44.10	**Does not Conform**
III	Lateral distance from lower hitch point to centre line of tractor.	359 / 435	364	363	**Does not Conform**
IV	Lateral movement of lower hitch points	100 (min)/125 (min)	125	110	Conforms to Cat. I & II
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	525	525	Conforms to Cat. I
VI	Transport height	820 (min)/950 (min)	770	860	--do--
VII	Power range(without force)	560(min)/650 (min)	630	650	Conforms to Cat.II
VIII	Leveling adjustment	100 (min)/ 100 (min)	280	280	Conforms to Cat. I & II
IX	Lower hitch point clearance	100 (min)/100 (min)	230	210	--do--
X	Lower hitch point height	200 (max)/200 (max)	140	210	**Does not Conform**

3.1.13.2 Drawbar:

3.1.13.2.1 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	
1	2	3 (a)	3 (b)	4
A	683 ± 1.5 / 825 ± 1.5	684.0	682.0	Conforms to Cat. I
B	75 (min) / 75 (min)	78.3	80.0	Conforms to Cat. I & Cat. II
C	30 (min) / 30 (min)	38.0	30.9	--do--
DØ	21.79 to 22.0 / 27.79 to 28.00	21.9	21.9	Conforms to Cat. I
E	39.0 (min) / 49.0 (min)	49.5	51.0	Conforms to Cat. I & Cat. II
FØ	12.0 (min) / 12.0 (min)	12.0	12.1	--do--
G	15.0 (min) /15.0 (min)	15.0	15.5	--do--
HØ	25 ± 1 / 25 ± 1	25.0	24.7	--do--
J	80 ± 1.5 / 80 ± 1.5	80.0	80.0	--do--
No. of holes	7 / 9	07	07	Conforms to Cat. I

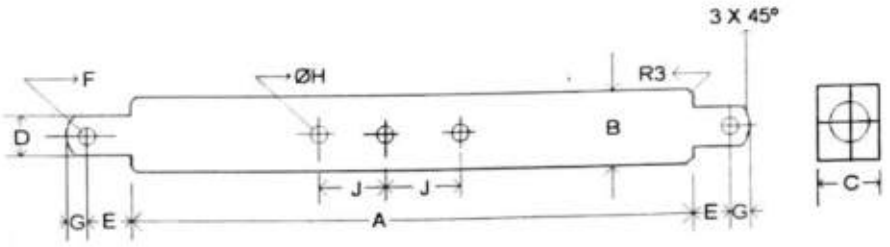


Fig. 1: DIMENSIONAL NOTATIONS FOR LINKAGE TYPE DRAWBAR

			Base Model	Variant Model
3.1.13.2.2	**Swinging drawbar**	:	Not provided	
3.1.14	**Power take-off shaft:**			
	Type	:	Type-I, Semi independent	Type-I, Semi-independent
	Method of engaging	:	By a hand lever provided on LHS of operator's seat.	
	No. of shaft(s)	:	One	
	PTO speed corresponding to rated engine speed, (rpm)	:	701	685
	Distance behind rear axle, (mm)	:	340	340
	Engine to PTO speed ratio	:	3.210: 1	3.210: 1
	Whether the PTO shaft is capable of transmitting the full power of engine	:	Yes	

3.1.14.1 Specification 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 (a)**	**3 (b)**	**4**
Nominal speed, (rpm)	540 ± 10	540 rpm of PTO corresponding to 1733 rpm of engine		Conforms
No. of splines	6	6	6	--do--
Direction of rotation	Clockwise	Clockwise	Clockwise	--do--
Location	The position of the centre of the end of PTO shaft shall be within 50 mm to right or left of the centre line of the tractor	Centrally located	Centrally located	--do--
Dimensions, (mm) [See Fig. 2]:				
DØ	34.79 ± 0.06	34.8	34.8	Conforms
dØ	28.91± 0.05	29.0	28.9	--do--
BØ	29.4 ± 0.1	29.4	29.5	--do--
AØ (Optional)	8.3± 0.1	Not provided		**Not applicable**
W	8.69 - 0.09 - 0.16	8.6	8.6	Conforms
a	7	7	7	--do--
b (optional)	25 ± 0.5	Not provided		**Not applicable**
c	38	38	38	Conforms
X	30°	30°	30°	--do--
B	76 (min)	90	80	--do--
h	450 to 675	610	650	--do--

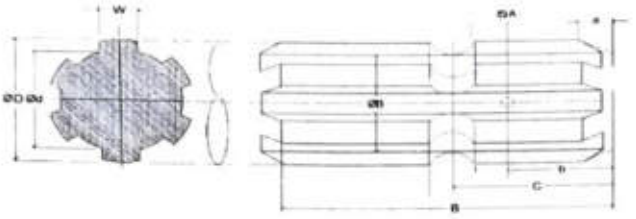


Fig. 2: DIMENSIONAL NOTATIONS FOR TYPE-I POWER TAKE-OFF SHAFT

			Base Model	Variant Model
3.1.14.2	**PTO Master Shield**	:	**Not Provided**	
3.1.15	**Towing hitch:**			
3.1.15.1	**Front:**			
	Type	:	Clevis	
	Location	:	On center of front bumper	
	Height above ground level, (mm)	:	670 (fixed)	685
	Number of positions	:	01	
	Type of adjustment	:	None	
	Dia of pin hole, (mm)	:	33.9	32.7
	Width of clevis, (mm)	:	55.0	54.0
3.1.15.2	**Rear:**			
	Type	:	Clevis	
	Location	:	At the rear of differential housing	
	Height above ground level, (mm):			
	-Maximum	:	745	835
	-Minimum	:	570	625
	Number of positions	:	03	06
	Type of adjustment	:	By changing and reversing the position of hitch on its mounting bracket	
	Distance of hitch point, (mm):			
	- From rear axle centre	:	460	460
	- From power take-off shaft end	:	120	120
	Dia of pin hole, (mm)	:	30.8	32.9
	Width of clevis, (mm)	:	84.0	84.0
3.1.16	**Steering:**			
	Make	:	Ognibene	
	Type	:	Open center, Hydrostatic	
	Location	:	Above clutch housing	
	Method of operation	:	Manually, through steering control wheel	
	Diameter of steering control wheel, (mm)	:	445	
	Make & type of pump	:	Rexroth & Gear	
	Location & method of drive	:	On LHS of engine & through timing gear	
	Make , number & type of hydraulic ram cylinder	:	NA, one, double acting	
	Capacity, (l)	:	0.8	1.6
	Oil change period	:	Change after 1200 hours of operations.	

			Base Model	Variant Model
3.1.17	**Brakes:**			
3.1.17.1	**Service Brake:**			
	Make	:	JMIL	
	Type	:	Mechanical, Oil immersed multi disc brakes.	
	Location	:	On half axle shaft	
	No. of friction disc(s)	:	Four (on each wheel side)	
	Area of liners, (cm^2)	:	949.0 (on each wheel side)	
	Material of liners	:	Paper based (apa)	
	Method of operation	:	Independent or combined pedal operation by right foot.	
3.1.17.2	**Parking Brake:**			
	Type	:	Paul & Ratchet arrangement	
	Location & method of operation	:	Service brake acts as parking brake when locked in position by a hand lever provided on LHS of operator's seat.	
3.1.18	**Wheel Equipment:**			
3.1.18.1	**Steered Wheel(s):**			
	Make	:	Good year	JK
	Number(s)	:	Two	
	Type of tyre(s)	:	Pneumatic, ribbed	
	Size	:	6.00 - 16	
	Ply rating	:	8 PR	
	Maximum permissible loading capacity of each tyre at 230 kPa pressure, (kgf)	:	450	
	Recommended inflation pressure, (kPa):			
	- for field work	:	200	
	- for transport	:	230	
	Standard track width, (mm)	:	1325 (Std.) & 1425	1335 (Std.) & 1535
	Method of changing track width	:	By reversing the wheel discs.	
	Make & size of wheel rim	:	WIL, 4.50E x 16	
3.1.18.2	**Drive wheel(s):**			
	Make	:	Good Year	JK
	Number(s)	:	Two	
	Type of tyre(s)	:	Pneumatic, traction	
	Size	:	13.6-28	14.9-28
	Ply rating	:	12 PR	
	Maximum permissible loading capacity of each tyre at inflation pressure recommended for road work, (kgf)	:	1180 @ 110 kPa (as per IITAC manual)	1410 @ 110 kPa (as per IITAC manual)
	Recommended inflation pressure, (kPa):			
	- For field work	:	98	
	- For transport	:	110	
	Track width, (mm)	:	1340 (std), 1440, 1540, 1580, 1680, 1780 & 1880	1340 (std), 1420, 1540, 1580, 1680, 1800 & 1880
	Method of changing track width	:	By reversing wheel disc and changing the position of disc on offset rim lugs	
	Make & size of wheel rim	:	WIL, W11 x 28	WIL, W13 x 28
3.1.18.3	**Wheel base, (mm)**	:	1930	1925
	Method of changing wheel base, if any, and range.	:	**None**	

3.1.19 Operator's seat:

		Base Model	Variant Model
Make	:	Harita Seating System Ltd.	TAFE
Type	:	Cushioned seat with back rest	
Type of suspension	:	Two helical coil springs	
Type of dampening	:	One, Hydraulic shock absorber	
Range of adjustment, (mm):			
- Vertical	:	Nil	
- Lateral	:	NIL	
- Longitudinal	:	± 95	± 75

3.1.20 Provision for safety and comfort of operator:

3.1.20.1 Conformity with IS: 12343 – 1998 (Reaffirmed in 2014) :

All parameters meets the minimum requirements of IS: 12343-1998, (Re-affirmed in 2014). **except the following:**

	Base model	Variant model
i)	Width of seat.	--
ii)	Vertical distance form Seat Index Point to center of clutch and brake pedal does not meet the minimum requirement.	--

3.1.20.2 Conformity with IS: 6283 (Part 1 & 2)-1998 (Re-affirmed in March 2014):

Controls are identifiable with symbols meets as per IS: 6283 (Part-1 & 2)-2006 & 2007. (Re-affirmed in 2014), **except the following:**

	Base model	Variant model
i)	Oil lubricant type & its frequency were not provided.	--
ii)	Grease lubricant frequency were not provided.	--

3.1.20.3 Conformity with IS: 8133-1983 (Reaffirmed in 2014):

Location and movement of various controls meets the requirement of IS: 8133-1983 (Reaffirmed in 2014), **except the following:**

Base model	Variant model
i) Differential lock has not been provided.	i) Differential lock has not been provided.

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

Meets the requirements of IS: 12239(Part-1)-1996, (Re-affirmed in October, 2017) **except the following:**

Base model	Variant model
i) Provision of spark arresting device in the exhaust system.	i) Provision of spark arresting device in the exhaust system.
ii) Height of first foot step from ground.	ii) Vertical retainness is not provided on outer sides of clutch pedals.
--	iii) Width of footstep.

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

Meets the requirements of IS:12239 (Part-2)-1999 (Reaffirmed in 2014), **except the following:**

Base model	Variant model
i) Working clearance around the hand parking lever is less than the minimum requirement.	i) The working clearance between draft control lever and mudguard and parking brake lever and mudguard is not provided as per minimum requirement.
ii) PTO master shield has not been provided.	ii) PTO master shield has not been provided

3.1.20.6 Conformity with IS: 14683-1999 (Reaffirmed in March 2014):

Lighting meets the requirement of IS: 14683-1999 (Reaffirmed in March 2014):

3.1.20.7 Rear view mirror:

Rear view mirror has been provided

3.1.20.7 Slow moving emblem:

Slow moving emblem has been provided.

3.1.21 Labeling of tractor as per IS:10273-1987 (Reaffirmed in 2014):

The labeling plate riveted on RHS of dashboard, provides the following information:

Name of Manufacturer	Tractors And Farm Equipment Limited, Chennai, Tamil Nadu, India
Make	TAFE
Model	MF 7250 DI E7
Month & Year of manufacture	09 & 20
Engine Serial Number	S325.5L12268
Chassis Serial Number	MEABAF99JL2315945
Maximum P.T.O Power, kW	30.5
Specific fuel consumption, g/kWh	265

3.1.22 Mass of the tractor, (kg):

Particulars		Mass of the tractor without operator but with all the liquid reservoirs full, (kg)	
		Base model	Variant model
i)	Unballast mass, (kg).(F/R/T)	790/1230/2020	830/1220/2050

3.1.22.1 Standard ballast, if any : None

3.1.23 Over all dimensions, (mm):

- Length	:	3605	3610
- Width	:	1670	1735
- Height (with exhaust pipe)	:	2370	2660
Minimum ground clearance	:	400 (below differential housing)	420 (below front axle)

3.1.24 Number of external lubricating points:

- Oiling	:	Nil
- Grease cups	:	02
- Grease nipples	:	13

3.1.25 Colour of tractor:

Chassis & engine	:	Charcoal grey
Bonnet & Mudguard	:	Red
Wheel discs & rims	:	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 **13.6-28** size tyres of **610 mm** radius index, (kmph)	Nominal speed at rated engine speed when fitted with **14.9-28** size tyres of **640** mm radius index, (kmph)	Variation in nominal speed (%) in case of **variant model**
		Base model	**Variant model**	**Base model**	**Variant model**	
1	**2**	**3 (a)**	**3 (b)**	**4 (a)**	**4 (b)**	**5**
Forward	L1	190.49	190.25	2.71	2.79	+3.0
	L2	133.60	133.74	3.88	3.97	+2.3
	L3	90.52	90.54	5.72	5.87	+2.6
	L4	61.23	60.88	8.45	8.66	+2.5
	H1	48.38	48.37	10.69	10.96	+2.5
	H2	34.00	33.95	15.22	15.64	+2.8
	H3	22.96	23.00	22.53	23.06	+2.4
	H4	15.58	15.58	33.22	34.06	+2.5
Reverse	RL	146.54	146.68	3.53	3.61	+2.3
	RH	37.23	37.24	13.94	14.27	+2.4

3.3 PTO PERFORMANCE TEST

S. No.	Particulars	**Base Model**	**Variant Model**
1.	Date(s) of test	122.03.2018 & 23.03.2018	09.12.2020
2.	Tractor run prior to start of PTO test, (h)	0.20	0.98
3.	Dynamometer test bench used	Eddy current, SAG-AG-250	Eddy current, SAG-AG-720

Maximum power two hours test under natural ambient condition was conducted. The results of Power take-off performance test under natural ambient of base & variant models are tabulated in **Table-1.**

Table – 1

Tractor	Power, (kW)	Speed, (rpm)		Fuel Consumption			Specific energy, (kWh/ l)
		PTO	Engine	(l/h)	(kg/h)	(kg/kWh)	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
a) Maximum power - 2 hours test (under natural ambient condition):							
Base model	30.0	701	2250	9.42	7.87	0.262	3.18
Variant model	29.9	685	2199	8.89	7.43	0.248	3.36
b) Power at rated engine speed :							
Base model	30.0	701	2250	9.42	7.87	0.262	3.18
Variant model	29.9	685	2199	8.89	7.43	0.248	3.36
c) Power at standard power take-off speed (540 ± 10):							
Base model	26.6	540	1733	7.69	6.43	0.242	3.46
Variant model	26.7	540	1733	7.43	6.21	0.233	3.59

Sl. No.	Parameters	Base Model		Variant Model
		Natural Ambient	High Ambient	Natural Ambient
i)	-No load maximum engine speed, (rpm)	2427	2424	2347
ii)	-Equivalent crankshaft torque at maximum power, (Nm)	127.5	122.7	130.0
iii)	-Equivalent crankshaft torque at rated power, (Nm)	127.5	122.7	130.0
iv)	-Maximum equivalent crankshaft torque, (Nm)	150.0	144.6	153.0
v)	-Engine speed at maximum equivalent crankshaft torque, (rpm)	1499	1451	1101
vi)	- Back up torque, (%)	17.6	17.8	17.7
vii)	-Smoke level, maximum light absorption coefficient (per meter)	0.11	--	--
vii)	**- Range of atmospheric conditions:**			
	Temperature, (°C)	26 to 28	42 to 44	25 to 28
	Pressure, (kPa)	98.3 to 98.6	99.8 to 100.1	99.2 to 99.5
	Relative humidity, (%)	62 to 70	20 to 28	36 to 41
viii)	**- Maximum temperatures, (°C):**			
	Engine oil	122	131	118
	Coolant	82	96	80
	Fuel	54	68	52
	Air intake	31	47	29
	Exhaust gas	464	468	567
ix)	**- Pressure at maximum power:**			
	Intake air, (kPa)	2.3	2.4 to 2.5	2.8 to 2.9
	Exhaust gas, (kPa)	4.9 to 5.2	5.3 to 5.6	4.0 to 4.1
x)	**- Consumptions:**			
	Lub oil, (g/kwh)	--	1.15	--
	Coolant (% of total coolant capacity)	--	0.95	--

4. OTHER APPLICABLE TESTS

4.1 POWER LIFT & HYDRULIC PUMP PERFORMANCE TEST

Date(s) of test : 22.12.2020 & 23.12.2020
Tractor run at the Institute prior to start of hydraulic test, (h) : 5.21
Pump speed at rated engine speed (rpm) : 685

4.1.1 Hydraulic power test:

Pump delivery rate at minimum pressure and rated engine speed, (l/min) : 18.7
Maximum hydraulic power,(kW) : 5.4
Pump delivery rate at maximum hydraulic power, (l/min) : 16.2
Pressure at maximum hydraulic power, (MPa) : 20.0
Sustained pressure of the open relief valve, (MPa) : 23.0

Tapping point:

a) Relief valve test : External circuit
b) Pump performance test : Pump outlet
Temperature of hydraulic fluid, (°C) : 60 to 62

4.1.2 Lifting capacity test :

Test	Height of lower hitch point above ground in down position, (mm)	Vertical movement with lifting forces, (mm)	Maximum corrected force exerted through full range, (kN)	Corres-ponding pressure, (MPa)	Moment about rear axle, (kN-m)	Maximum tilt angle of mast from vertical (degrees)
At hitch points	210	610	15.08	21.5	13.04	--
On the standard frame	210	615	12.25	21.5	18.07	18

4.1.3 Maintenance of lift load:

Force applied at the frame, (kN) : 11.02
Temperature of hydraulic fluid at the start of test, (°C) : 60

Test data:

Elapsed time (minute)	5	10	15	20	25	30
Cumulative drop in height of lift, (mm)	110	140	150	155	160	175

5. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

S. No.	Adjustments/Defects/Breakdowns and Repairs	Tractor run hours
	--- None ---	

6. COMPARISON BETWEEN BASE MODEL AND VARIANT MODEL
(Based on Table 2 & 3 of Indian Standard 12207: 2019)

Sl. No.	Clause No	Features	Observation on base model (Test report no. T-1342/1788/2018, (May) & Commercial Administrative Extension test report No. T-1528/1853/2020 (March))	Observation on variant model	Remarks
1	2	3	4	5	6
1.	i)	**Clutch:**			
		Single/dual/dry/ wet/ independent clutch/increase in size of clutch	Dual, Dry friction plates	Dual, Dry friction plates	No change
2.	ii)	**Air cleaner:**			
		Type	Oil bath	Oil bath	No change
		Location	In front of radiator, under the bonnet		No change
		Range of suction pressure at maximum power, (kPa)	2.3	2.8 to 2.9	**Changed**
3.	iii)	**Exhaust system**	Up-draught (cylindrical)		No change
	a)	**Position of silencer outlet w.r.t SIP, mm:**			
		-Downward	980	905	**Changed**
		-Longitudinal	1290	1235	**Changed**
		-Lateral	450 on LHS	365 (on LHS)	**Changed**
	b)	Range of exhaust gas pressure at maximum power (kPa)	4.9 to 5.2	4.0 to 4.1	**Changed**
4.	iv)	**Gear Box:**			
		- Type	Mechanical, Constant mesh gears with epicyclic reduction unit for High/Low range selection.		No change
		Location of gear shifting levers	Side shifting, main gear shifting lever & and Low-High range selector lever is provided on RHS of operator's seat.	Central shifting, In-front of operator's seat	**Changed**
5.	v)	**Reduction ratio of transmission:**			

Movement	Gear	Base model	Variant model	Variation (%)	Remarks
Forward	L1	190.49	190.25	-0.1	**Changed**
	L2	133.60	133.74	+0.1	**--do--**
	L3	90.52	90.54	+0.0	**--do--**
	L4	61.23	60.88	-0.6	**--do--**
	H1	48.38	48.37	0.0	No change
	H2	34.00	33.95	-0.1	**--do--**
	H3	22.96	23.00	+0.2	**--do--**
	H4	15.58	15.58	0.0	No change
Reverse	RL	146.54	146.68	+0.1	**--do--**
	RH	37.23	37.24	+0.0	**--do--**
Range of speeds (kmph):					
- Forward		2.71 to 33.22	2.79 to 34.06		**Changed**
- Reverse		3.53 to 13.94	3.61 to 14.27		**Changed**
- Additional no. of speed		None	None		No change

1	2	3	4	5	6
6.	vi)	**Fitment of accessories:**			
		- Expansion tank	Provided	Provided	No change
		- Air compressor	None	None	No change
		-Oil coolers	None	None	No change
		- Radiator	Provided	Provided	No change
		- Bare radiator capacity, (l)	3.0	3.0	No change
		- Total coolant capacity,(l)	8.5	9.4	**Changed**
7.	vii)	**Brake system:**			
		Type	Mechanical, Oil immersed multi disc brakes.		No change
		No of friction disc(s)	Four (on each wheel side)		No change
		Area of liners, (cm^2)	949.0 (on each wheel side)		No change
8.	viii)	**Type of three-point linkage:**			
		Type	Cat.I/Cat.II	Cat.I/Cat.II	No change
		Rear/front mounted	Rear mounted	Rear mounted	No change
9.	ix)	**PTO shafts:**			
		Location	Centrally located	Centrally located	No change
		Type	Type-I, Semi-independent	Type-I, Semi-independent	No change
		Speed corresponding to rated engine speed, (rpm)	701,Clockwise rotation	685, Clockwise rotation	**Changed**
		Anticlockwise rotation speed (rpm)	Not provided	Not provided	No change
10.	x)	**Type of drive**	2 WD	2 WD	No change
11.	xi)	**Hydraulic System:**			
		Location & type of Hydraulic pump drive	Same configuration in Base & Variant models refer para 3.1.13		No change
12.	xii)	**Positioning of Hydraulic Sensing Mechanism:**			
		Lower link, top link, etc.	Through top link	Through top link	No change
13.	xiii)	**Rear Final Reduction**	4.818 : 1 (53/11T)		No change
14.	xiv)	**Type of fuel Injection pump:**			
		Inline/Rotary/Common rail	Rotary	Inline	**Changed**
15.	xv)	**Changes related to engine parameters (as per Table-3):**			
	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)	Maximum declared PTO power, (kW)	30.5	30.5	No change
	d)	Engine displacement, (cc)	2500	2700	**Changed**
	e)	Rated engine speed,(rpm)	2250	2200	**Changed**
	f)	Naturally aspirated/turbo charged	Naturally aspirated	Naturally aspirated	No change

1	2	3	4	5	6
16.	xvi)	**Change related to ergonomics, safety comfort, and statutory / regulatory requirements:**			
	a)	IS: 10273	Conformed	Conforms	No change
	b)	IS: 4931	Conformed	Conforms	No change
	c)	IS: 4468	**Did not conform**	**Does not conform**	No change
	d)	IS: 12953	Conformed	Conforms	No change
	e)	IS:12343	**Did not conform**	Conforms	**Changed**
	f)	IS:12239 (Pt-I)	**Did not conform**	**Does not conform**	No change
	g)	IS:12239 (Pt-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**	Conforms	**Changed**
	j)	IS:14683	Conformed	Conforms	No change
17.	xvii)	**Other changes:**			
		Wheel equipments:			
		Steered Wheel(s):			
		Track width, mm	1325 (Std.) & 1425	1335 (Std.) & 1535	**Changed**
		Drive wheel(s):			
		- Size & PR	13.6-28 & 12 PR	14.9-28 & 12 PR	**Changed**
		Track width, mm	1340 (std), 1440, 1540, 1580, 1680, 1780 & 1880	1340 (std), 1420, 1540, 1580, 1680, 1800 & 1880	**Changed**
		Wheel base, (mm)	1930	1925	**Changed**
		Overall length, width & height (mm)	3605,1670 & 2370	3610, 1735 & 2660	**Changed**
		Unballast mass of tractor,(kg), Front/Rear/Total	790/1230/2020	830/1220/2050	**Changed**
		Decals (sticker)	Massey Ferguson 7250 DI Power Drive Power steering	Massey Ferguson 7250 DI E7	**Changed**
		Fuel tank capacity, (l)	63.5	67.0	**Changed**

7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

7.1 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: 2019** for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

Sl. No.	Characteristic	Category (Evaluative / Non-Evaluative)	Requirements as per IS: 12207-2019	Values declared by the applicant/ requirement		As observed		Whether Variant model meets the require-ments (Yes/No)
				Base model	**Variant Model**	**Base model**	**Variant model**	
1	2	3	4	5a	5b	6a	6b	7
7.1.1	**PTO Performance:**							
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: ±5 percent for PTO power and engine power>26kW. ±10 percent for PTO power and or engine ≤ 26 kW.	30.5 (D)	30.5 (D)	30.0	29.9	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	30.5 (D)	30.5 (D)	30.0	29.9	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+10 %	265 (D)	265 (D)	262	248	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	150.9 (D)	180 (D)	150	153	Yes
e)	Back-up torque,(%)	Evaluative	12 %, min.	12 %, min(R)	12 %, min(R)	17.6	17.7	Yes
7.1.2	**Power lift and hydraulic pump performance :**							
a)	Maximum lifting capacity throughout the range of lift, (kN):							
	1) At hitch points	Evaluative	[Tolerance of ± 10%]	17.66 (D)	14.71 (D)	18.81	15.08	Yes
	2) With the standard frame	Evaluative	The lift capacity should at least be 24 kg/PTO kW and it should be 21.5 kg/engine kW where the tractor is not provided with a PTO shaft.	11.46 (D) 7.06 (R)	8.00 (D) 7.04 (R)	19.28	12.25	Yes
b)	Maximum drop in the height of the point of application of the force after each 5 min. interval for a total duration of 30 min/ mm	Non Evaluative	The observed value should not exceed 50 mm.	50 (D)	50 (D)	144	175	**No**

1	2	3	4	5 a	5 b	6 a	6 b	7
7.1.3	**Safety features :**							
a)	Guards against moving and hot parts	Evaluative	Belt drives, pullies, silencer, hydraulic pipes (As per IS 12239 (Part2)		--	Meets the requirement		Yes
b)	Lighting arrangement	Evaluative	As per CMVR		--	Meets the requirement		Yes
c)	Seating requirements (Tractors having more than 1150 mm rear track width)	Non Evaluative	Should meet the requirements of IS: 12343 (As amended from time to time)		--	Meets the requirement		Yes
d)	Technical requirements for PTO shaft	Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)		--	Meets the requirement		Yes
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)		--	**Does not meets the requirement**		**No**
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)		--	Meets the requirement		Yes
g)	Swinging drawbar (wherever fitted)	Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)		--	**Not Provided**		**Not applicable**
h)	1) Maximum travelling speed at rated engine speed in reverse gears, Kmph	Evaluative	Should not exceed 20 Kmph		--	14.27 kmph (Meets the requirement)		Yes
	2) Audible warning signal on tractor	Evaluative	As soon as the travelling speed in reverse gear reaches to 20 kmph, an audible warning signal on tractor shall be activated. The safety aspects about the operation of shuttle technology shall be brought in operation and manufacturer/dealer shall ensure the training on this aspect to operator before the delivery of tractor.		--	**Not applicable**		**Not applicable**

7.1.4	**Labelling of tractors (Provision of labelling plate):**						
	1)	Make	Evaluative	Should conform to the requirements of CMVR along with maximum PTO Power in kW and year of manufacture in numerical form. MM YY Digit 01 – 12 in box No.1 for MM will represent the months and next two digits in box No.2 for YY will represent the year of Manufacturing.	--	TAFE	Yes
	2)	Model	Evaluative		--	MF 7250 DI E7	Yes
	3)	Month & Year of manufacture	Evaluative		--	09 & 20	Yes
	4)	Engine number	Evaluative		--	S325.5L12268	Yes
	5)	Chassis number	Evaluative		--	MEABAF99JL23 15945	Yes
	6)	Declaration of PTO power, (kW)	Evaluative		--	30.5	Yes
7.1.5	**Literature (Submission to test agency):**						
(a)	Operator manual		Evaluative	Provided/ Not Provided	Provided	Provided	Yes
(b)	Parts Catalogue		Evaluative	Provided/Not Provided	Provided	Provided	Yes
(c)	Workshop/Service manual		Evaluative	Provided/Not Provided	Provided	Provided	Yes
7.1.6	Fitment of Roll Over Protective Structure (ROPS): for tractors having more than 1150 mm rear track width		Evaluative	ROPS should meet the requirement of IS:11821 or OECD code or equivalent International Standard	Provided	**Not fitted**	**Not applicable**
7.1.7	Standard accessories		Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Provided	Yes
7.1.8	Accessories (Optional)		Non Evaluative	Ballast weights if fitted should meet the requirement of CMVR.	Provided	Provided	Yes
7.2	**CATEGORY OF BREAKDOWNS / DEFECTS :(As per clause 5.0 of IS-12207-2019):**						
Sl. No.	**Category of breakdowns**		**Category (Evaluative / Non Evaluative)**	**Requirements as per IS: 12207-2019**		**As observed**	**Whether meets the require-ment (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 three 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

7.3 Salient Observations:

7.3.1 Laboratory tests:

7.3.1.1 PTO performance:

i) The maximum PTO power was recorded as **29.9 kW** against the declaration of **30.5 kW,** which meets the evaluative requirement of IS: 12207-2019.

ii) The specific fuel consumption corresponding to maximum power was recorded as **248 g/kWh** against the declaration of **265 g/kWh,** which meets the evaluative requirement of IS: 12207-2019.

iii) The maximum equivalent crankshaft torque was recorded as **153 N-m** against the declaration of **180 N-m**, which meets the non-evaluative requirement of IS: 12207-2019.

iv) The backup torque was observed 17.7% & meets the evaluative requirement of IS: 12207-2019.

7.3.1.2 Hydraulic performance test:

i) The moment about rear axle with standard frame was calculated as **18.07 kN-m**. Whereas, the moment about front axle was calculated as **15.67 kN-m** under unballasted condition. The moment about rear axle is on higher side as compared to the moment about front axle. It is, therefore, recommended that the lifting capacity of the hydraulic system may be reduced suitably or standard ballast recommendation may be reviewed to avoid the front lifting of the tractor.

ii) During the hydraulic lift load maintenance test the cumulative drop in vertical height of the lower links was observed as **175 mm** against the maximum permissible limit of **50 mm**. It indicates an internal leakage in the hydraulic system. This may be looked into for necessary corrective action.

7.3.1.3 PTO master shield:

PTO master shield not provided on tractor as per the requirements of IS: 4931-1995(Reaffirmed in 2004). This should be looked into for necessary corrective action.

7.3.1.4 Three point linkage :

i) The lateral distance from lower hitch point to centre line of tractor and lower hitch point height does not meet the requirement of IS: 4468 (part-1):1997 (Reaffirmed in Oct., 2017). This may 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 improvements may be incorporated.

7.3.1.5 Operator's work place:

Operator's work place meets the requirements of IS: 12239 (Part-1 & Part-2) 1996, **except the following**:

i) Provision of spark arresting device in the exhaust system.

ii) Vertical retainness is not provided on inner sides of clutch pedals.

iii) The working clearance between draft control lever and mudguard and parking brake lever and mudguard is not provided as per minimum requirement.

iv) Minimum Cautionary notice as per clause 11.2 of above referred standard has not been provided.

7.3.1.6 Location of operator's controls with regard to safety:

Location of operator's controls with regard to safety meets the requirements of IS: 8133-1983(Reaffirmed 2014), **except the following**:

i) Provision of differential lock in the tractor.

7.4 Maintenance / Service problems:
No noticeable maintenance and service problems was observed during the test.

7.5 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) Vertical retainness at both sides of clutch pedals should be provided as per relevant standard.
iii) The working clearance between draft control lever and mudguard and parking brake lever and mudguard should be as per the minimum requirements of relevant Indian Standard for easy operating the lever.
iv) Provision of PTO shaft master shield on tractor to avoid the accident.
v) Differential lock may be provided

7.6 Adequacy of Literature:

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

a) Operator's manual of TAFE, MF 7250 DI E7 tractor.
b) Parts catalogue of TAFE, MF 7250 DI E7 tractor.
c) Service Manual of TAFE, MF 7250 DI E7 tractor.

The results of the tests carried out on variant model **"TAFE, MF 7250 DI E7"** Tractor have been compared with those on base model **"TAFE, MF 7250 DI POWER DRIVE POWER STEERING"** Tractor tested vide test report **No. T- 1242/1769/2019 (May)** and found within the limit, as specified in Indian Standard: 12207-2019.

8. 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	4 Months (November,2020 to February,2021)	Yes	None

TESTING AUTHORITY:

SHWETABH SINGH
AGRICULTURAL ENGINEER

C.V. CHIMOTE
TEST ENGINEER

P.K. PANDEY
DIRECTOR

9. APPLICANT COMMENT'S

Para No.	Our Reference	Applicant's comments
9.1	7.3.1.1(iii), 7.3.1.2 (i) (ii), 7.3.1.3, 7.1.3.4 (i) (ii), 7.3.1.5 (i) (ii) (iii) (iv), 7.3.1.6 (i), 7.5 (i) (ii) (iii) (iv) & (v)	We will study and take appropriate corrective actions.

ANNEXURE -I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	–
2.	PTO performance test	4.2
3.	Power lift and hydraulic pump performance test	4.0
4.	Nominal speed test	0.7
B	Miscellaneous test and other run hours including idle run, transportation, preparation for test and trial runs.	0.8
	TOTAL:	9.7