



**MAHINDRA, 595 DI SUPER TURBO  
(Brand Name: SARPANCH) TRACTOR**



**भारत सरकार**

**GOVERNMENT OF INDIA**

कृषि मंत्रालय (कृषि एवं सहकारिता विभाग, मशीनीकरण एवं प्रोद्योगिकी प्रभाग)

Ministry of Agriculture (Deptt. of Agri. & Co-op, Mechanization & Technology Division)

**केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान**

**CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE**

**(An ISO : 9001-2008 Certified Institute)**

ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५ TRACTOR NAGAR, BUDNI (M.P.) 466445

Phone : 07564-234729 Fax : 07564-234743 E-mail : fmti-mp@nic.in Website: <http://cfmtti.dacnet.nic.in>



T-908/1423/2014

**MAHINDRA, 595 DI SUPER TURBO TRACTOR**  
(Brand Name : SARPANCH) - Commercial (Initial)

Manufacturer

: M/s. Mahindra & Mahindra Limited  
(Farm Equipment Sector)  
Akurli Road, Kandivli (E)  
MUMBAI - 400 101

Location of manufacturing plants (apa)

- : (i) M/s. Mahindra & Mahindra Limited  
(Farm Equipment Sector)  
Akurli Road, Kandivli (E)  
MUMBAI - 400 101
- (ii) M/s. Mahindra & Mahindra Limited  
(Farm Equipment Sector)  
Hingna Road, Hingna MIDC  
NAGPUR - 440 016. (Maharashtra)
- (iii) M/s. Mahindra & Mahindra Limited  
(Farm Equipment Sector)  
Agri Business Development Centre,  
Khatima Panipat Highway, Udham  
Singh Nagar, Vil. Lalpur, Tehsil-Kichha,  
RUDRAPUR - 263 153, (Uttanchal)
- (iv) M/s. Mahindra & Mahindra Limited  
(Farm Equipment Sector)  
Agri Development Centre, Vil-Mehla  
Tehsil - Dudu Jaipur- Ajmer Road,  
JAIPUR - 303 007, (Rajasthan)
- (v) M/s. Mahindra & Mahindra Limited  
(Farm Equipment Sector)  
Near Bidar 'T' Junction,  
Mahindra Nagar, Zaheerabad,  
Medak district- (A.P.)- 502 220

Test requested by (applicant)

: M/s. Mahindra & Mahindra Limited  
(Farm Equipment Sector)  
Akurli Road, Kandivli (E)  
MUMBAI - 400 101

Selected for test by  
Place of running-in

: Applicant  
: At applicant's works

Duration of said running-in (h):

- Engine

: 15

- Transmission

: 30

Method of Selection

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

**1. SPECIFICATIONS**

1.1 Tractor:  
Make  
Model  
Brand Name  
Variants, if any :

: Mahindra  
: 595 DI Super turbo  
: Sarpanch



T-908/1423/2014

**MAHINDRA, 595 DI SUPER TURBO TRACTOR**  
(Brand Name : SARPANCH) - Commercial (Initial)

S. No.	Variant models*	Brand name , If any	Variant features
1.	Mahindra 595 DI SUPER TURBO MKM DLX	Sarpanch	Full Constant Mesh Gear Box, Side Shift, Power Steering, OIB, RCRPTO.

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

Type : Four wheeled, two wheel drive unit  
construction general purpose Agricultural  
Tractor.

Year of manufacture : GB (October, 2011)

Chassis serial number : NLT 282

Country of origin : India

**1.2 Engine:**

Make : Mahindra

Model : MDI 3000TC 3A

Type : Four stroke, turbo charged, liquid cooled,  
direct injection, diesel engine.

Serial number : NLT 282

**1.2.1 Engine speed (Manufacturer's recommended production setting), (rpm):**

- Maximum speed at no load : 2250 to 2350

- Low idle speed : 700 to 800

- Speed at maximum torque : 1200 to 1400

**Rated speed, (rpm):**

- For PTO use : 2100

- For drawbar use : 2100

**1.3 Cylinder & Cylinder Head:**

Number : Four

Disposition : Vertical, Inline

Bore/stroke, (mm) : 88.9/101.6 (apa)

Capacity as specified by the applicant, : 2523

(cc) : 18.75 : 1

Compression ratio : Monoblock

Type of cylinder head : Wet, replaceable

Type of cylinder liners : Re-entrant bowl cavity on piston top

Type of combustion chamber : Overhead, inline

Arrangement of valves : **Cold** **Hot**

Valve clearance : 0.30 0.40

- Inlet valve, (mm) : 0.40 0.50

- Exhaust valve, (mm) : 0.40 0.50

**1.4 Fuel System:**

Type of fuel feed system : Gravity and force feed

**1.4.1 Fuel tank:**

Capacity, (l) : 55.63

Location : Above clutch housing

Provision for draining of sediments/  
water : Yes provided

Material of fuel tank : Metallic



T-908/1423/2014

MAHINDRA, 595 DI SUPER TURBO TRACTOR  
(Brand Name : SARPANCH) - Commercial (Initial)

## 12. FIELD TEST

12.1 The field tests comprising of Disc ploughing, rotavation and puddling (including water proof test of 5.0 hours) were conducted for 10.5, 10.25 and 15.27 hours respectively.

All the field tests were conducted at the full accelerator settings, when the no load speed of the engine varied from 2220 to 2260 rpm.

12.2 The brief specifications of the implements used during field tests are given in **Annexure – I**.

12.3 The summary of field test observation with disc plough, rotavator and full cage wheel is given in **Table – 3**.

Table – 3

## SUMMARY OF FIELD PERFORMANCE TEST

S.No.	Parameter/operation	Disc Ploughing	Rotavation	Puddling
i)	Type of soil	Heavy	Heavy	Heavy
ii)	Av. Soil moisture, (%) / Av. Depth of standing water, (cm)	13 to 15	18	10 to 12
iii)	Bulk density of soil, (g/cc)	2.30 to 2.40	2.50	--
iv)	Cone index, (kgf/sq.cm) / Puddling index, (%)	7.875 to 8.507	5.785 to 8.167	85.78 to 89.4
v)	Gear used	L2	L1	L2
vi)	Av. Speed of operation, (kmph)	4.41 to 4.71	3.31 to 3.37	3.11 to 3.17
vii)	Av. Wheel slip, (%) / Av. Travel reduction, (%)	13 to 15.4	-3.43 to -5.03	2.60 to 4.53
viii)	Av. Depth of cut, (cm) / Av. Depth of puddle, (cm)	16.7 to 17.6	8.5 to 8.7	25 to 36
ix)	Av. Working width, (cm)	90 to 103	133 to 135	--
x)	Area covered, (ha/h)	0.424 to 0.456	0.447 to 0.448	--
xi)	<b>Fuel consumption:</b>			
	- (l/h)	4.73 to 5.00	5.87 to 5.88	3.30 to 3.48
	- (l/ha)	13.83 to 14.37	14.02 to 16.90	--
xii)	Av. Draft of implement, (kN)	750 to 800	--	--

**Remarks:** The average coolant & lub oil consumption during the entire field tests was observed as 5.6 ml/h & 4.16 ml/h.

## 12.4 Wet land cultivation (Puddling):

12.4.1 The tractor was fitted with full cage wheel for conducting the puddling operation. The brief specification of full cage wheel used is given in **Annexure – II**.

12.4.2 After completion of puddling test and water proof test, the tractor was partially dismantled to check effectiveness of sealing provided against ingress of water and / or mud in various assemblies / components as per requirements of IS : 11082 – 1984 (Technical requirement of Agriculture tractors for wet land cultivation). The observations recorded were as following:

S. No.	Location	Whether ingress of mud and/or water	Remarks
1.	King pin assemblies	No	None
2.	Stub axles	No	
3.	Centre pin assembly	No	
4.	Clutch housing	No	
5.	Brake housing	No	
6.	Engine sump, transmission, hydraulic, air cleaner & steering gearbox oils	No	
7.	Starter motor	No	
8.	Alternator	No	



T-908/1423/2014

MAHINDRA, 595 DI SUPER TURBO TRACTOR  
(Brand Name : SARPANCH) - Commercial (Initial)

## 13. HAULAGE TEST

Type of trailer	Two wheel (Single axle)	Four wheel (Double axle)
Gross mass of trailer, (tonne)	4.0	5.5
Height of trailer hitch above ground level, (mm)	570	600
Gear used during the test for negotiating slopes up to 8%	H-4	H-4
Average travel speed, (kmph)	25.85 to 27.35	26.26 to 26.33
<b>Average fuel consumption:</b>		
- (l/h)	3.52 to 4.13	4.38 to 4.44
- (ml/km/tonne)	34.0 to 37.78	30.22 to 30.77
Average distance traveled per litre of fuel consumption, (km)	6.62 to 7.35	5.91 to 6.02
<b>General observations:</b>		
Effectiveness of brakes	Effective	Effective
Maneuverability of tractor-trailer combination	Satisfactory	Satisfactory

## 14. COMPONENTS/ASSEMBLY INSPECTION

The engine and other assemblies were dismantled after 89.36 hours of tractor operation at this Institute.

## 14.1 Engine:

## 14.1.1 Cylinder bore:

Cylinder No.	Cylinder bore dia, (mm)				Bottom position		Maximum permissible wear limit, (mm)
	Top position		Middle position		Thrust side	Non-thrust Side	
	Thrust side	Non-thrust side	Thrust side	Non-thrust side			
1.	88.19	88.90	88.91	88.90	88.91	88.90	89.03
2.	88.90	88.90	88.91	88.90	88.90	88.90	
3.	88.91	88.90	88.90	88.90	88.90	88.90	
4.	88.91	88.90	88.91	88.90	88.90	88.90	

## 14.1.2 Piston:

Piston No.	Piston dia, (mm)				Max. permissible wear limit	Clearance between piston and cylinder liner at the skirt of the piston, (mm)	
	Top (above top compression ring)		At skirt			As observed	Maximum permissible limit
	Thrust side	Non-thrust side	Thrust side	Non-thrust side			
1.	88.287	88.287	88.830	*	88.15	0.08	0.20
2.	88.312	88.208	88.833	*		0.077	
3.	88.326	88.204	88.840	*		0.070	
4.	88.315	88.317	88.833	*		0.077	

\* Not measured due to piston design feature



T-908/1423/2014

MAHINDRA, 595 DI SUPER TURBO TRACTOR  
(Brand Name : SARPANCH) - Commercial (Initial)

**14.1.3 Ring end gap, (mm)**

Rings	Cylinder No.1			Cylinder No.2			Cylinder No. 3			Cylinder No. 4			Max. Permissible end gap limit,(mm)
	Top	Mid-dle	Bot-tom	Top	Mid-dle	Bot-tom	Top	Mid-dle	Bot-tom	Top	Mid-dle	Bot-tom	
1 <sup>st</sup> comp. ring	0.25	0.25	0.25	0.35	0.35	0.35	0.25	0.25	0.25	0.30	0.30	0.30	2.50
2 <sup>nd</sup> comp. ring	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	2.50
Oil Ring	0.40	0.40	0.40	0.40	0.40	0.40	0.35	0.35	0.35	0.35	0.35	0.35	2.00

**14.1.4 Ring side clearance:**

R I n g s	Ring side clearance, (mm)				Max. Permissible clearance Limit, (mm)
	Piston-I	Piston-II	Piston-III	Piston-IV	
1 <sup>st</sup> Compression ring	Taper Ring				--
2 <sup>nd</sup> Compression ring	0.078	0.078	0.073	0.070	0.30
Oil ring	0.034	0.038	0.031	0.039	0.20

**14.1.5 Main bearings:**

Bearing No.	Diametrical Clearance, (mm)	Crankshaft end float, (mm)	Max. permissible clearance limit, (mm)	
			Diametrical clearance	Crankshaft end float
1.	0.067 to 0.069	0.15	0.20	0.60
2.	0.099 to 0.069			
3.	0.064 to 0.067			
4.	0.097 to 0.069			
5.	0.087 to 0.087			

**14.1.6 Big end bearings:**

Bearing No.	Clearance, (mm)		Max. permissible clearance limit, (mm)	
	Diametrical	Axial	Diametrical	Axial
1.	0.076 to 0.116	0.10	0.20	0.75
2.	0.103 to 0.113	0.10		
3.	0.110 to 0.08	0.15		
4.	0.106 to 0.118	0.10		

**14.1.7 Valve, guides and timing gears:**

Any marked sign of overheating of valves : None  
 Pitting of seat/faces of valves : None  
 Any visual damage to the teeth of timing gears : None

**Spring Rate, (N/mm):**

-Intake valve : 18.33 to 19.99  
 -Exhaust valve : 17.74 to 19.60

**Clearance between valve guide and valve stem, (mm):**

Intake valve : 0.059 to 0.083  
 Exhaust valve : 0.065 to 0.073

**Observation**

Against the discard limit of 16 N/mm  
 Against the discard limit of 0.200 mm



T-908/1423/2014

MAHINDRA, 595 DI SUPER TURBO TRACTOR  
(Brand Name : SARPANCH) - Commercial (Initial)

**14.2 Clutch:**

Any marked wear on clutch friction plates : None  
 Condition of clutch release bearing : Normal  
 Condition of diaphragm & springs : Normal  
 Condition of pilot bearing : Normal  
 Presence of oil in clutch housing : None  
 Any marks on fly wheel/ pressure plate : None  
 Overall thickness of clutch plate,(mm) : 8.250 to 8.322 | Against discard limit of 5.3 mm  
 Height of lining over rivet head, (mm) : 1.44 to 1.86 | Against discard limit of 0.20 mm

**14.3 Transmission gears:**

Any visual damage, pitting & chipping of any transmission gear teeth : None  
 Backlash between crown wheel and pinion, (mm) : 0.30 | Against discard limit of 0.21 mm

**14.4 Brakes:**

Description	Initial specified thickness of brake disc, (mm)	Measured thickness of brake disc after test, (mm)	Measured height of lining over rivet head, (mm)	Minimum permissible height of brake lining over the rivet head, (mm)
Left	13.83 to 13.94	13.800 to 14.055	1.85 to 2.27	0.200
Right	13.83 to 13.94	13.810 to 14.065	1.95 to 2.24	

**14.5 Front axle:**

Any marked wear of king pins : None  
 Any marked wear of king pin bushes : None  
 Clearance between king pin and bushes, (mm) : 0.027 to 0.173 | Against the discard limit of 0.30 mm  
 Condition of bearings for stub axles : Normal  
 Condition of king pin bearings : Normal  
 Condition of seals for stub axles and king pins : Normal  
 Clearance between centre pin and bushes, (mm) : 0.052 to 0.053 | Against the discard limit of 0.30 mm

**14.6 Steering system:**

Visual condition of the components of complete steering assembly : Normal

**14.7 Starter motor & Alternator:**

Presence of soil/oil in housing : None  
 Condition of bearings and other components : Normal

**15. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS**

Sl. No.	Adjustments/Defects/Breakdowns and Repairs	Tractor run hours
i)	Cleaning of R.V	4.32



T-908/1423/2014

MAHINDRA, 595 DI SUPER TURBO TRACTOR  
(Brand Name : SARPANCH) - Commercial (Initial)

**16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS**

16.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2008 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	Values declared by the applicant (D) / Requirement I	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
<b>16.1.1 PTO Performance :</b>						
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >35hp. -7.5/+10% for PTO power ≤ 35 hp	32.5 (D)	32.0	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	32.5 (D)	31.5	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	251 (D)	237	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	207 (D)	170	No
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	13(D)	18.9	Yes
<b>f) Maximum operating temperature, (°C)</b>						
1)	Engine oil	Non Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under high ambient condition should not exceed the declaration.	129 (D)	115	Yes
2)	Coolant	Evaluative	The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration.	112 (D)	98	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	0.15% (D)	0.528	Yes
h)	Smoke level	Evaluative	Maximum light absorption coefficient of 3.25 per metre or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR)	0.2 per meter (D)	0.27	Yes



T-908/1423/2014

MAHINDRA, 595 DI SUPER TURBO TRACTOR  
(Brand Name : SARPANCH) - Commercial (Initial)

1	2	3	4	5	6	7
<b>16.1.2 Drawbar performance :</b>						
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	17.31 I 18.21 (D)	21.55	Yes
b)	Max. drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast	12.81 I 13.52 (D)	15.53	Yes
c)	Maximum drawbar power without ballast, (kW).	Evaluative	Min. 80% of PTO power as referred in 16.1.1 (a) of PTO performance	25.6 I 26.0 (D)	27.4	Yes
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	110 (D)	78	Yes
<b>16.1.3 Power lift and hydraulic pump performance :</b>						
<b>a) Maximum lifting capacity throughout the range of lift, (kN):</b>						
1)	At hitch points	Non Evaluative	[Tolerance of minus 10%]	16.08 (D)	17.46	Yes
2)	With the standard frame	Evaluative	The lift capacity should at least be 18 kg/PTO hp. And it should be 16 kg/engine hp where the tractor is not provided with a PTO shaft	10.18 (D) 7.57 I (Minimum)	11.05	Yes
b)	Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 Minutes, (mm)	Non Evaluative	[Tolerance of plus 5 mm]	250 (D)	75	Yes
<b>16.1.4 Brake performance at 25 kmph:</b>						
<b>a) Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with road ballast, (m):</b>						
1)	Cold brake	Evaluative	10	10 (R)	7.33 to 9.65	Yes
2)	Hot brake	Evaluative	10	10 (R)	7.18 to 9.65	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s <sup>2</sup> (N)	Evaluative	600	600 (R)	383 to 418	Yes
<b>16.1.5 Noise measurement :</b>						
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88 (R)	82	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	98 (R)	91	Yes



T-908/1423/2014

**MAHINDRA, 595 DI SUPER TURBO TRACTOR**  
(Brand Name : SARPANCH) - Commercial (Initial)

1	2	3	4	5	6	7
<b>16.1.6</b>	<b>Amplitude of mechanical vibrations at :</b>					
1)	Left foot rest	Non Evaluative	100 microns (max)	100 (R)	370	No
2)	Right foot rest				300	No
3)	Seat (with driver seated)				90	Yes
4)	Steering Wheel				110	No
<b>16.1.7</b>	<b>Haulage requirements :</b>					
a)	Gross mass of the trailers, (tonnes):					
1)	Two wheel	Non Evaluative	--	4.0 (D)	4.0	Yes
2)	Four wheel	Evaluative	--	5.5 (D)	5.5	Yes
b)	Distance travelled / litre of fuel consumption, (km/l):					
1)	Two wheel	Non Evaluative	--	4.0 to 5.0 (D)	6.62 to 7.35	NO
2)	Four wheel	Evaluative	--	4.0 to 5.0 (D)	5.91 to 6.02	NO
c)	Fuel consumption (ml/km/tonne):					
1)	Two wheel	Non Evaluative	--	25.00 to 30.00 (D)	34.0 to 37.78	NO
2)	Four wheel	Evaluative	--	25.00 to 30.00 (D)	30.22 to 30.77	NO
<b>16.1.8</b>	<b>Wetland cultivation :</b>					
	Sealing for the following assemblies:	Evaluative	The identified assemblies should essentially meet the requirement of IS: 11082. No water ingress in the identified assembly given in column-2. If tractor does not meet the requirements of wetland cultivation, it may be recommended for dry land operation only.	There should be no ingress of water and/or mud	No ingress of mud and / or water was observed	Yes
1)	Clutch assembly	-do-				
2)	Brake housings	-do-				
3)	Front axle hubs	-do-				
<b>16.1.9</b>	<b>Safety features :</b>					
a)	Guards against moving and hot parts	Evaluative	As per CMVR	At present no requirements	Provided	--
b)	Lighting arrangement	Evaluative	As per CMVR	--	Provided	Yes
<b>16.1.10</b>	<b>Labelling of tractors (Provision of labelling plate):</b>					
1)	Make	Evaluative	Should conform to the requirements of CMVR along with declared value of PTO HP	--	Mahindra	Yes
2)	Model	Evaluative		--	595 DI Super Turbo	Yes
3)	Year of manufacture	Evaluative		--	2011GB	Yes
4)	Engine number	Evaluative		--	NLT 282	Yes
5)	Chassis number	Evaluative		--	NLT 282	Yes
6)	Declaration of PTO power, kW (hp)	Evaluative		--	32.5 (43.6)	Yes



T-908/1423/2014

**MAHINDRA, 595 DI SUPER TURBO TRACTOR**  
(Brand Name : SARPANCH) - Commercial (Initial)

1	2	3	4	5	6	7	
<b>16.1.11</b>	<b>Discard limit for:</b>						
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer	89.06 (D)	88.90 to 88.91	Yes	
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.20 (D)	0.07 to 0.08	Yes	
(C)	<b>Ring end gap (mm):</b>						
	- Top comp	Evaluative	To be specified by the manufacturer	-do-	2.50	0.25 to 0.30	
	- 2 <sup>nd</sup> comp			-do-	2.50	0.50	Yes
	- Oil ring.			-do-	2.00	0.35 to 0.40	Yes
(d)	<b>Ring groove clearance (mm):</b>						
	- Top comp	Evaluative	To be specified by the manufacturer	-do-	Taper Ring	--	
	- 2 <sup>nd</sup> comp			-do-	0.30	0.070 to 0.078	Yes
	- Oil ring.			-do-	0.20	0.031 to 0.039	Yes
(e)	<b>Clearance of main bearings (mm):</b>						
	- Diametrical clearance	Evaluative	To be specified by the manufacturer	0.20	0.064 to 0.097	Yes	
	- Crankshaft end float	Evaluative		0.60	0.15	Yes	
(f)	<b>Clearance of big end bearings, (mm):</b>						
	- Diametrical	Evaluative		-do-	0.20	0.076 to 0.118	
	- Axial	Evaluative		-do-	0.75	0.15	
(g)	Clearance between king pin and bush, (mm)	Non Evaluative		-do-	0.30	0.027 to 0.173	
(h)	Clearance between centre pin and bush, (mm)	Non Evaluative		-do-	0.30	0.052 to 0.053	

**16.1.12 CATEGORY OF BREAKDOWNS / DEFECTS :**

S. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	As observed	Whether meets the requirements (Yes/No)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature	None	Yes
3.	Minor	Evaluative	Not more than five and frequency of each should not be more than two.	None	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed five, that is, (2 major + 3 minor) or 5 minor breakdowns.	None	Yes



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

**16.3 Conformity with following IS:**

- i) Guidelines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS 10273:1987 (Reaffirmed in March, 2009)] : **Conforms**
- ii) Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS: 4931-1995 (Reaffirmed in March, 2009)] : **Conforms**
- iii) Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS 4468 (Part-I):1997 (Reaffirmed in March, 2007)/ISO 730-1:1994] : **Does not Conforms**
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in March, 2007)] : **Conforms**
- v) Agricultural tractors - Operator's seat technical requirement [IS 12343 -1998 (First revision) (Reaffirmed in March, 2009)] : **Does not Conforms**
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision) : [IS 12239 (PT-1)-1996 (Reaffirmed in March, 2009)/ISO 4254-1:1989] : **Does not conform**
- vii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) IS 12239 (PT-2)-1999 (Reaffirmed in March, 2009)] : **Conforms**
- viii) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1 & Part-2) –2006 & 2007(Reaffirmed in March, 2009)/ ISO 3767-2:1991] : **Conforms**



- ix) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983) (Reaffirmed in March, 2009)] : **Does not conform**
  - x) Agricultural Tractor & Machinery Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed in March, 2009)] : **Conforms**
- 16.4 Salient Observations:**
- 16.4.1 Laboratory tests:**
- 16.4.1.1 PTO Performance:**
- i) The backup torque was observed as **18.9%**.
  - ii) The specific fuel consumption corresponding to maximum power was measured as **237 g/kWh** against the declaration of 251 g/kWh, which is within the tolerance limit of IS: 12207-2008.
- 16.4.1.2 Drawbar performance:**  
During ten hours drawbar test, creeping of LHS & RHS rear tyre over the rims was observed as 10 mm & 60 mm respectively. This should be looked into for necessary corrective action.
- 16.4.1.3 Mechanical Vibration:**  
The amplitude of mechanical vibration on various assemblies marked as (\*) in Chapter-8 of this test report is on higher side. This calls for dampening down of vibrations to improve the operational comfort and service life of components.
- 16.4.1.4 Labelling Plate:**
- i) The engine and chassis serial number of the tractor were embossed/ punched same (NLT 282) at engine housing & labelling plate respectively. **The engine and chassis serial number of the tractor should be given separately for its noteworthy identification.**
- 16.4.2 Field Performance:**
- 16.4.2.1 Dryland Operation:**
- i) The average area covered in disc ploughing operation with recommended size of plough was recorded in the range of 0.424 to 0.456 ha/h.
  - ii) The average fuel required to cover one hectare area was recorded in the range of 13.83 to 14.37 liters/ha; during disc ploughing operation with recommended size of plough..
- 16.4.2.2 Wetland Cultivation (Puddling Operation):**  
No ingress of mud/or water was noticed during puddling operation of the tractor. Hence, It meets the requirements of IS: 11082-1984 (Technical requirements of agricultural tractors for wetland operation). The tractor is suitable for wetland operation (Puddling).
- 16.5 Component and assembly inspection**  
The backlash between crown wheel and pinion was observed 0.35 mm against the discard limit of 0.21 mm. This should looked into corrective action.
- 16.6 Maintenance / Service Problems:**  
No noticeable maintenance or service problem was observed during the test.
- 16.7 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.



T-908/1423/2014

MAHINDRA, 595 DI SUPER TURBO TRACTOR  
(Brand Name : SARPANCH) - Commercial (Initial)

16.8 Adequacy of Literature supplied with machine:

16.8.1 The following literature has been supplied with the tractor

- i) Operator's Manual 595 DI Super Turbo
- ii) Tractor's part's catalogue – Engine, Chassis and Seat metal, transmission and hydraulic.
- iii) Service Manual Mahindra tractors

16.8.2 The literature supplied was found adequate. However, The literatures should also be brought out in national as well as other regional languages for the guidance of users and service personnel.

17.0 Citizen charter

Duration of Test	Test duration under citizen charter	Whether the report released within time frame given citizen charter	Remark, if any
11 Months (February, 2013 to January, 2013)	10 Months	No	Due to malfunctioning of hydraulic system

TESTING AUTHORITY:

H.L. YADAV  
SENIOR AGRICULTURAL ENGINEER

C.R. LOHI  
DIRECTOR

Test Report compiled by: **Pratyush Satya**, Senior Technical Assistant





T-908/1423/2014

MAHINDRA, 595 DI SUPER TURBO TRACTOR  
(Brand Name : SARPANCH) - Commercial (Initial)

- 16.8 **Adequacy of Literature supplied with machine:**
- 16.8.1 The following literature has been supplied with the tractor
- Operator's Manual 595 DI Super Turbo
  - Tractor's part's catalogue – Engine, Chassis and Seat metal, transmission and hydraulic.
  - Service Manual Mahindra tractors
- 16.8.2 The literature supplied was found adequate. However, The literatures should also be brought out in national as well as other regional languages for the guidance of users and service personnel.

17.0 Citizen charter

Duration of Test	Test duration under citizen charter	Whether the report released within time frame given citizen charter	Remark, if any
11 Months (February, 2013 to January, 2013)	10 Months	No	Due to malfunctioning of hydraulic system

TESTING AUTHORITY:

H.L. YADAV  
SENIOR AGRICULTURAL ENGINEER

C.R. LOHI  
DIRECTOR

Test Report compiled by: **Pratyush Satya**, Senior Technical Assistant