

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT
(Supplementary Test)

संख्या / No. : T-1026/1550/2016
माह / Month : May, 2016



EICHER 548 TRACTOR



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय
(कृषि, सहकारिता एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(DEPARTMENT OF AGRICULTURE, CO-OPERATION AND FARMERS WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

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3. ESSENTIAL TESTS

3.1 SPECIFICATIONS

3.1.1	Tractor:	Previous sample	Present sample
	Make	: Eicher	Eicher
	Model	: Eicher 548	Eicher 548
	Brand name	: None	None
	Type	: Four wheeled, rear wheel driven, standard agricultural tractor.	
	Year of manufacture	: 2013	2016
	Chassis number	: 921013530964	924113562296
	Country of origin	: India	India
3.1.2	Engine:		
	Make	: Eicher	Eicher
	Model	: 398E49	398E49
	Type	: Air cooled, naturally aspirated, four stroke, direct injection, diesel engine	
	Serial number	: 520827401092	524027452025
	Country of origin	: India	India
3.1.2.1	Engine speed (Manufacturer's recommended production setting) (rpm) :		
	- Maximum speed at no load	: 2300 to 2400	2300 to 2400
	- Low idle speed	: 650 to 750	650 to 750
	- Speed at maximum torque	: 1000 to 1400	1000 to 1400
	Rated speed, (rpm):		
	- For PTO use	: 2150	2150
	- For drawbar use	: 2150	2150
3.1.3	Cylinder & Cylinder Head:		
	Number	: Three	Three
	Disposition	: Vertical, Inline	Vertical, Inline
	Bore/stroke, (mm)	: 100/125 (apa)	100/125 (apa)
	Capacity as specified by the applicant, (cc)	: 2945	2945
	Compression ratio	: 17.5 ± 0.5 : 1	17.5 ± 0.5 : 1
	Type of cylinder head	: Individual	Individual
	Type of cylinder liners	: Dry, replaceable	Dry, replaceable
	Type of combustion chamber	: Direct combustion, re-entrant type	Direct combustion, re-entrant type
	Arrangement of valves	: Overhead,	Overhead
	Valve clearance (cold):		
	- Inlet valve, (mm)	: 0.10	0.10
	- Exhaust valve, (mm)	: 0.10	0.10
3.1.4	Fuel System:		
	Type of fuel feed system	: Gravity and Forced feed	



Table - 2

SUMMARY OF WET LAND CULTIVATION (Puddling Operation)

S. No.	Parameter / operation	Puddling
i)	Type of soil (refer IS: 7926-1975)	Heavy
ii)	Depth of standing water,(cm)	13
iii)	Puddling index, (%)	89
iv)	Gear used	L-1
v)	Av. Speed of operation, (kmph)	3.02 to 3.09
vi)	Av. Travel reduction, (%)	4.3 to 5.1
vii)	Depth of puddle (cm)	19
viii)	Hourly fuel consumption (l/h)	3.34 to 3.36

- 4.1.4 After completion of the puddling 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 requirements of Agricultural tractors for wet land cultivation). The observations were recorded as under:

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	Lubricating oil in the engine sump, transmission, steering housing; brake housing and hydraulic oil housing	No	
6	Starter motor	No	
7	Alternator	No	

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 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2014 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:



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S. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	Values declared by the applicant/ requirement		As observed		Whether meets the requirements (Yes/No.)	
				Previous Sample	Present sample	Previous Sample	Present sample		
1	2	3	4	5 a	5 b	6 a	6 b	7	
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	31.8	31.8	32.9	32.2	Yes	
b)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	268	268	259	245	Yes	
6.1.2 Wetland cultivation :									
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.	The manufacturer has recommended that the tractor is not suitable for wetland cultivation (Puddling operation)	Recommended for wetland cultivation (Puddling operation).	Not Recommended for wetland cultivation (puddling operation)	No ingress of mud/or water was noticed during test. Recommended for wetland cultivation (puddling operation)	Yes	
1)	Clutch assembly	-do-							
2)	Brake housings	-do-							
3)	Front axle hubs	-do-							
4)	Engine Oil	-do-							
5)	Transmission Oil	-do-							
6.1.3 Labeling of tractors:									
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	Eicher		Eicher		Yes	
	2)	Model		Evaluative	Eicher 548		Eicher 548		Yes
	3)	Year of manufacture		Evaluative	2013		2016		Yes
	4)	Engine number		Evaluative	520827401092		524027452025		Yes
	5)	Chassis number		Evaluative	92101350964		924113562296		Yes
6)	Declaration of PTO power, (kW)	Evaluative		31.8		31.8		Yes	



6.3.1 Laboratory tests:

6.2 Conformity with following IS:

		<u>Previous Sample</u>	<u>Present Sample</u>
i)	Guide lines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS 10273:1987] (Re-affirmed in March, 2009)	Conforms	Conforms
ii)	Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3 (third revision)[IS: 4931-1995] (Re-affirmed in March, 2009)	Conforms	Conforms
iii)	Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS 4468 (Part-I): 1997(Re-affirmed in March, 2007) (ISO 730-1:1994]	Does not conform	Does not conform
iv)	Drawbar for agricultural tractors – Link type [IS 12953:1990] (Reaffirmed in March, 2007)	Does not conform	Conforms
v)	Agricultural tractors - Operator's seat technical requirement [IS 12343 –1998 (First revision)] (Re-affirmed in March, 2009)	Does 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 March, 2007) /ISO 4254-1:1989]	Does 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)] (Re-affirmed in March, 2009)	Does not conform	Conform
viii)	Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) [(IS: 8133 – 1983) (Reaffirmed in March, 2009)]	Conforms	Conforms
ix)	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) –1998(Re-affirmed in March, 2009) / ISO 3767-2:1991]]	Does not Conform	Conforms
x)	Agricultural Tractor & Machinery Lighting device for travel on public roads (IS: 14683-1999) (Re-affirmed in March, 2009)	Conforms	Conforms

6.3.1.1 PTO Performance:

- The maximum power in case of previous & present sample was observed as 32.9 kW & 32.2 kW respectively against the declaration of 31.8 kW which is within the tolerance limit specified in IS: 12207-2014.
- The specific fuel consumption corresponding to maximum power in case of previous & present sample was observed as 259 g/kWh & 245 g/kWh respectively against the declaration of 268 g/kWh which is within the tolerance limit specified in IS: 12207-2014.



6.3.1.2 Three point linkage:

- i) The diameter of the hitch pin hole, does not meet the requirement of IS: 4468 (Part-1)-1997. This may be looked into for corrective action
- ii) The lateral distance from lower hitch point to centre line of tractor, does not meet the requirement of IS: 4468 (Part-1)-1997. This may be looked into for necessary corrective action.
- iii) The transport height does not meet the requirement of IS: 4468 (Part-1)-1997. This may be looked into for necessary corrective action.

6.3.2 Field Performance :

6.3.2.1 Wet land cultivation (Puddling operation) :-

There is no ingress of water and /or mud was observed after the wetland operation at specified assemblies as per IS: 11082:1982. Therefore, the tractor is considered suitable for wetland cultivation (Puddling operation).

6.4 Recommendation with regard to safety on tractor:

The following requirements, inter alia, may be considered for incorporation on the tractor:

- i) Inclination of seat towards rear direction.
- ii) Vertical distance of seat index point from foot rest.
- iii) Provision for spark arresting device in exhaust system.

6.5 Maintenance / Service Problems:

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


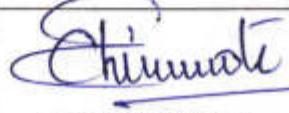
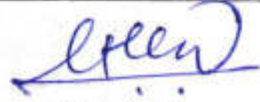
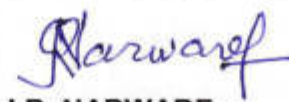
6.6 Adequacy of Literature supplied with machine:

6.6.1 The following literature was supplied with the test sample.

- a) Operator's manual
- b) Parts catalogue
- c) Service manual

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

TESTING AUTHORITY:

 C. K. TIJARE AGRICULTURAL ENGINEER	 C.V. CHIMOTE TEST ENGINEER	 Y. K. RAO SENIOR AGRICULTURAL ENGINEER
 J.J.R. NARWARE DIRECTOR		

7. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
7.1	6.2 (iii, v & vi)	These are being worked out w.r.t design & development.
7.2	6.3.1.2	These are being worked out w.r.t design & development.
7.3	6.4	These are being worked out w.r.t design & development.

**ANNEXURE- I****BRIEF SPECIFICATION OF FULL CAGE WHEELS**

S. No.	Item	Specifications
1.	Type	Full cage wheel
2.	Dia. (mm)	1210
3.	Width, (mm)	900
4.	No. and types of lugs	24, straight lugs made of MS angle section welded to angle iron frame.
5.	Size of angle section, (mm)	40 x 40 x 6
6.	Length of lugs, (mm)	444
7.	Spacing of lugs, (mm)	290
8.	Weight of each cage wheel, (kg)	130

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

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	3.0
3.	Nominal speed test	0.6
B.	WET LAND OPERATION (Including waterproof)	15.0
C.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	1.5
	TOTAL	20.1