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संख्या / No. : T-1006/1530/2016

COMMERCIAL TEST REPORT (Variant)

माह / Month : March, 2016



EICHER, EICHER 380 USJ TRACTOR

(To be read in conjunction with the test report bearing No. T-462/919/2002 (ICT) and T-1001/1525/2016 (Supplementary of "Eicher, Eicher 380 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

	<u>Base sample</u> (Base model report No. T-462/919/2002 and superseded report with supplementary report No. T-1001/1525/2016)	<u>Variant sample</u>
3.1.1 Tractor:		
Make	: Eicher	Eicher
Model	: Eicher 380	Eicher 380 USJ
Brand name	: None	None
Type	: Four wheel, Rear-wheel drive, Agricultural Tractor	General Purpose,
Year of manufacture	: 2014	2014
Chassis Serial number	: 170 131 000 02 and 922 813 118 433	922 813 118 433
Country of Origin	: India	India
3.1.2 Engine:		
Make	: Simpson	Simpson
Model	: T III A S 325/ E1-F2.5	T III A S 325/ E1-F2.5
Serial number	: S 325 G21 185	S 325 G21 185
Engine speed (Manufacturer's recommended production setting)(rpm) :		
- Maximum speed at no load	: 2400	2400
- Low idle speed	: 600 to 800	600 to 800
- Speed at maximum torque	: 1200 to 1600	1200 to 1600
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)	: 91.44 / 127	91.44/ 127
Capacity as specified by the applicant, (cc)	: 2500	2500
Compression ratio, (apa)	: 18.5 : 1± 0.3	18.5 : 1± 0.3
Type of cylinder head	: Monoblock (Integral)	Monoblock (Integral)
Type of cylinder liners	: Dry	Dry
Type of combustion chamber	: Re-entrant cavity on piston crown	
Arrangement of valves	: Overhead, inline	Overhead, 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 forced feed	Gravity and forced feed
3.1.4.1 Fuel tank:		
Capacity, (l)	: 45	45
Location	: Above clutch housing	Above clutch housing
Provision for draining of sediments/ water	: Not Provided	Not Provided
Material of fuel tank	: Plastic	Plastic



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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: 2014 for acceptance of tractor for the purpose of subsidies/NABARD financing for the applicable features for this tractor model.

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	Values declared by the applicant/ requirement		As observed		Whether present model meets the requirements (Yes/No.)
				Base sample	Variant sample	Base sample	Variant sample	
1	2	3	4	5 a	5 b	6 a	6 b	7
7.1.1 PTO Performance :								
a)	- Max. power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >26 kW, -7.5/+10% for PTO power ≤ 26 kW or -5 / +10% for engine power >26 kW, -7.5/+10% for engine power ≤ 26 kW	25.8	25.8	25.9	25.9	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	25.8	25.8	25.9	25.9	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	252	265	273	273	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	135.3 (D)	135.3 (D)	140.2	140.2	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	15.9 (D)	15.0 (D)	21.7	21.7	Yes
f) Maximum operating temperature (°C)								
1)	Engine oil	Non Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under high ambient condition should not exceed the declaration.	125	135	126	126	Yes
2)	Coolant (water)	Evaluative	The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration.	105	115	98	98	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.7 (R)	2.65 (R)	1.20	1.20	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)	3.25 per metre (R) 0.20 (D)	3.25 per metre (R) 0.20 (D)	0.26	0.26	Yes

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1	2	3	4	5 a	5 b	6 a	6 b	7
7.1.2	Safety features :							
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 (part 2))	--		Provided		Yes
b)	Lighting arrangement (Tractor having more than 1150 mm rear track width)	Evaluative	As per CMVR	--		Provided		Yes
c)	Seating requirement (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	Non-Evaluative	Should meet the requirements of IS 4931 (as amended from time to time)	--		Does not meet the requirement		No
e)	Dimension of three point linkage	Non-Evaluative	Should meet the requirements of IS 4468 (part 1) (as amended from time to time)	--		Does not meet the requirement		No
f)	Specification of linkage and swinging drawbars	Non-Evaluative	Should meet the requirements of IS 12953 and IS 12362 (part 3) (as amended from time to time)	--		Does not meet the requirement		No
7.1.3	Labeling of tractors (Provision of labeling plate):							
	1) Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	--		Eicher		Yes
	2) Model	Evaluative		--		Eicher, 380 USJ		Yes
	3) Year of manufacture	Evaluative		--		2014		Yes
	4) Engine number	Evaluative		--		S325 G 21185		Yes
	5) Chassis number	Evaluative		--		922813118433		Yes
	6) Declaration of PTO power, kW	Evaluative		--		25.8		Yes
7.1.4	Literature (Submission to test agency)							
(a)	Operator manual	Evaluative	Provided/ Not Provided	As per relevant IS Code (IS 8132)		Provided		Yes
(b)	Parts Catalogue	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)		Provided		Yes
(c)	Workshop/ Service manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)		Provided		Yes

7.2 Salient Observations:

7.2.1 Laboratory tests:

7.2.1.1 PTO Performance:

- i) The maximum backup torque was observed as 21.7 %.
- ii) The maximum power in case of previous & present sample was observed as 26.8 & 25.9 kW respectively against the declaration of 25.8 kW, which is within the tolerance limit specified in IS: 12207-2014?

7.2.1.2 Location and operation of operator's control:

- i) The fuel shut-off lever does not remain in stop position

7.2.1.3 Three point linkage:

Some of the parameters of three point linkage conform to Cat. I and some of them conform to Cat.II. Keeping in view the spirit of standardization, necessary improvement may be incorporated.

7.3 Maintenance / Service Problems:

No noticeable maintenance or service problem was observed during the test. However, suitable provision for draining the sediments/water may be provided at the fuel tank.



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- 7.4 **Recommendation with regard to safety on tractor:**
The following requirements, inter alia, may be considered for incorporation on the tractor:
- Provision for spark arresting device in exhaust system.
 - Provision of differential lock.
 - Provision of power take-off master shield.
 - The fuel shut-off lever does not remain in stop position
 - The working clearance between the position and draft control lever may be provided as per IS: 12239 (Part-2) – 1999.
- 7.5 **Adequacy of Literature supplied with machine:**
- 7.5.1 Literature was supplied with the tractor for reference during the test.
- Operator's manual
 - Parts catalogue
 - Service Manual
- 7.5.2 The supplied literature was found adequate; however, these literatures should be brought out in other vernacular languages of India for guidance of users.

8. CITIZEN CHARTER

Duration of Test	Time frame for Testing & Evaluation as per Citizen Charter	Whether the Test Report is released within the time frame given in Citizen Charter	Remarks
July, 2015 to February, 2016	10 Months	Yes	None

TESTING AUTHORITY:**P.C MESHAM
SENIOR AGRICULTURAL ENGINEER****C. R LOHI
DIRECTOR**

Test report compiled by Mr. Chanchlesh Raghuwanshi, Senior Technical Assistant

9. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
9.1	Para 7.2.1.2 & 7.2.1.5	These are being looked into and will be incorporated accordingly.
9.2	7.4	Recommendations are being looked into w.r.t. design, development & implementation.

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

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running -in	--
2.	PTO Performance Test	6.6
3.	Theoretical speed test	1.0
4.	Brake performance test	1.0
5.	Operator's field of vision	0.2
B.	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.	0.6
	Total	9.4