



EICHER, EICHER 242 USJ 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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2. FUEL AND LUBRICANTS

- 2.1 Fuel** : The High-speed diesel oil supplied by M/s Indian Oil Corporation Limited having density of 0.836 g/cc at 15°C was used.

2.2 Lubricants:

Sl. No.	Particulars	As recommended by the manufacturer	As used during the test
1.	Engine oil	20W40	20W40
2.	Air cleaner	SAE-40	20W40
3.	Transmission and Hydraulic system	EP-80	Oil originally filled in the tractor was not changed
4.	Steering housing	EP-80	-do-
5.	Grease	Multi purpose	MP Grease

3. ESSENTIAL TEST

3.1 SPECIFICATIONS

3.1.1 Tractor:		<u>Base Model</u>	<u>Variant Model</u>
Make	:	Eicher	Eicher
Model	:	242 XTRAC	Eicher 242 USJ
Brand name	:	None	None
Type	:	Four wheeled, Rear-wheel drive, General purpose, Unit construction, Agricultural Tractor	
Year of manufacture	:	2010	2014
Chassis number	:	917810205520	922710217323
Country of Origin	:	INDIA	INDIA
3.1.2 Engine:			
Make	:	Eicher	Eicher
Model	:	115 NCE	115 NCE
Type	:	Four stroke, naturally aspirated, Air cooled, direct injection, diesel engine,	
Serial number	:	517929150214	522729149941
Engine speed (Manufacturer's recommended production setting)(rpm) :			
- Maximum speed at no load	:	1730 to 1830	1730 to 1830
- Low idle speed	:	480 to 520	480 to 520
- Speed at maximum torque	:	900 to 1100	900 to 1100
Rated speed, (rpm):			
- For PTO use	:	1650	1650
- For drawbar use	:	1650	1650
3.1.3 Cylinder & Cylinder Head:			
Number	:	One	One
Disposition	:	Vertical	Vertical
Bore/stroke, (mm)	:	115/150	115/150
Capacity as specified by the applicant, (cc)	:	1557	1557
Compression ratio, (apa)	:	17.8 ± 0.5:1	17.8 ± 0.5:1
Type of cylinder head	:	Cast aluminum alloy with valve across the crank axis.	
Type of cylinder liners	:	Dry, replaceable	Dry, replaceable
Type of combustion chamber	:	Re-entrant, open cavity on piston head	
Arrangement of valves	:	Overhead	Overhead



1	2	3	4	5	6
	iii)	Fuel injectors:			
		-Make	Bosch India	Bosch India	No change
		-Model /Group combination number	F 002 C70 012 009	F 002 C70 012 009	No change
		Opening pressure Manufacturer's production setting, Mpa (kg/cm ²)	25.5+8 (260+8)	25.5+8 (260+8)	No change
	iv)	Fuel tank:			
		-Type	Metallic	Metallic	No change
		-Capacity (l)	32.50	32.50	No change
	v)	Tractor mass (kg):			
		-Front	620	610	Changed (Negligible change)
		-Rear	1100	1090	Changed (Negligible change)
		-Total	1720	1700	Changed (Negligible change)

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 Variant model meets the require- ments (Yes/No.)
				Base model	Variant Model	Base model	Variant model	
1	2	3	4	5 a	5 b	6 a	6 b	7
7.1.1	PTO Performance :							
a)	–Max. power under 2 nd 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	14.7	14.7	13.9	14.2	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	14.7	14.7	13.9	14.2	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	265	265	263	265	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	105 (D)	105 (D)	98.7	--	--
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	7 (D)	7 (D)	22.6	--	--



1	2	3	4	5 a	5 b	6 a	6 b	7
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.	130	130	99	81	Yes
	2) Cylinder wall liner	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.	225	225	140	100	--
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.63 (R)	2.65 (R)	1.22	--	--
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)	3.25 per metre (R)	0.23	--	--
7.1.2 Brake performance at 25 kmph:								
a	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with road ballast, (m):							
	1 Cold Brake	Evaluative	10	10(R)	10(R)	6.80	8.45	Yes
	2 Hot Brake	Evaluative	10	10(R)	10(R)	8.00	8.65	Yes
	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600(R)	600(R)	450 to 505	470 to 474	Yes
	Whether parking brake is effective at a force of 600 N at foot pedal(s) or 400 N at hand lever	Evaluative	Yes	Yes	Yes	Yes	Yes	Yes
7.1.3 Safety features :								
a)	Guards against moving and hot parts	Evaluative	Belt drives, pully, silencer, hydraulic pipes (As per IS 12239 (part 2))	None	None	Provided	Provided with in normal operating conditions	Yes
b)	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)	Conforms	Conforms	Meets the requirement	Does not meet the requirement	No
c)	Technical requirements for PTO shaft	Non-Evaluative	Should meet the requirements of IS 4931 (as amended from time to time)	Conforms	conforms	Meets the requirement	Meets the requirement	Yes
e)	Dimension of three point linkage	Non-Evaluative	Should meet the requirements of IS 4468 (part 1) (as amended from time to time)	Conforms	conforms	Does not meet the requirement	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)	Conforms	conforms	Meets the requirement	Meets the requirement	Yes



1	2	3	4	5 a	5 b	6 a	6 b	7
g)	Accessories	Optional	Trailer hitch, front tow hook, linkage drawbar, may be provided	Conforms	conforms	Provided	Provided	Yes
7.1.4	Labelling of tractors (Provision of labelling plate):							
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	Eicher		Eicher		Yes
2)	Model	Evaluative		242 XTRAC	EICHER 242 USJ		Yes	
3)	Year of manufacture	Evaluative		2010	2014		Yes	
4)	Engine number	Evaluative		517929150214	522729149941		Yes	
5)	Chassis number	Evaluative		917810205520	922710217323		Yes	
6)	Declaration of PTO power, kW	Evaluative		14.7	14.7		Yes	
7.1.5	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 specific fuel consumption in case of base and variant models corresponding to maximum power were observed as 263 & 265 g/kWh respectively against the declaration of 265 g/kWh. This is within the tolerance limit.
- ii) The maximum PTO power in case of base and variant models were observed as 13.9 & 14.2 kW respectively against the declaration of 14.7 kW which is within the specified limit.

7.2.1.2 Three point linkage:

- i) The lateral distance from lower hitch point to centre line of tractor does not meet the requirement of IS: 4468 (Part-1)-1997. This should be looked into for necessary corrective action.

7.2.1.3 Linkage drawbar:

Some of the parameters of linkage drawbar conform to Cat.I and some of them conform to Cat.II. In view of the spirit of standardization, necessary improvements may be incorporated.

7.2.1.4 Location and operation of operator's control:

Operations of some of the operator's control such as retaining the fuel shut-off lever in "STOP" position does not meet the requirements of IS: 8133-1983. This may be looked into.

**7.2.1.5 Operator's seat (Conformity with IS: 12343-1998):**

The operator's seat provided on the tractor does not meet the following requirements and calls necessary improvement.

- i) Length & width of seat
- iii) Longitudinal & vertical distance from SIP to centre of steering control wheel.
- ii) Vertical distance of SIP from foot rest

7.2 Maintenance / Service Problems:

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

7.3 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) Provision for retaining the fuel shut-off lever in "STOP" position.
- iii) Provision of PTO shaft master shield.
- iv) Provision of differential lock.
- v) The minimum cautionary notice as per clause 11.2 of IS: 12239 (Part-2)-1999 should be provided.

7.4 Adequacy of Literature supplied with machine:

7.4.1 The following literature has been supplied by the manufacturer for reference during the testing.

- i) Operator's manual for Eicher 242 USJ tractor model.
- ii) Spare parts catalogue (engine, hydraulics, transmission, tractor, electrical wise catalogue) for Eicher 242 USJ tractor model.
- iii) Service manual for Eicher 242 usj tractor model.

7.4.2 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
6 Month (April, 2015 to October, 2015)	10 Months	Yes	None

TESTING AUTHORITY:

C. K. TIJARE
AGRICULTURAL ENGINEER

PRADIPKUMAR MESHAM
SENIOR AGRICULTURAL ENGINEER

C. R. LOHI
DIRECTOR



9. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
9.1	Para 7.2.1, 7.2.1.4, & 7.2.1.5	This will be updated w.r.t. design
9.2	7.3	Recommendations are being looked into w.r.t. Design, Development & Implementation.

ANNEXURE-I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	<u>HOURS</u>
1.	Running –in	--
2.	PTO Performance Test	3.1
3.	Theoretical speed test	0.4
4.	Brake Performance test	1.8
5.	Turning ability test	0.2
B.	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.	0.3
	Total	5.8