

व्यावसायिक परीक्षण रिपोर्ट (द्वितीय बैच परीक्षण)

संख्या/No. : T- 1678/2209/2022

COMMERCIAL TEST REPORT (Second Batch Test)

माह/Month : September, 2022

[ONLINE TESTING]

(यह परीक्षण रिपोर्ट 30/09/2027 तक वैध है/THIS TEST REPORT IS VALID UPTO 30/09/2027)



EICHER, 242 XTRAC TRACTOR



सत्यमेव जयते

भारत सरकार

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

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE
(DEPARTMENT OF AGRICULTURE & FARMERS WELFARE)

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3. SPECIFICATIONS

- 3.1 Tractor:**
 Make : Eicher
 Model : Eicher 242 XTRAC
 Type : Rear Wheel Drive, Standard Agricultural Tractor.
 Month & Year of manufacture : 02/22
 Chassis number : 931410212255
 Country of Origin : India
- 3.2 Engine:**
 Manufacturer's address : Eicher Tractors, Engine Division (A unit of TAFE Motors & Tractors Ltd.) Itrana Road, ALWAR – 301 001, Rajasthan.
 Make : Eicher
 Model : 115 NCE
 Type : Four stroke, naturally aspirated, air cooled, direct injection, diesel engine.
 Serial number : 531429104776
Engine speed (Manufacturer's recommended production setting, (rpm)) :
 - Maximum speed at no load, (rpm) : 1730 to 1830
 - Low idle speed, (rpm) : 480 to 520
 - Speed at maximum torque, (rpm) : 900 to 1100
Rated speed, (rpm):
 - For PTO use : 1650
 - For drawbar use : 1650
- 3.3 Cylinder & Cylinder Head:**
 Number : One
 Disposition : Vertical
 Bore/stroke, (mm) : 115/150 (apa)
 Capacity as specified by the applicant, (cc) : 1557
 Compression ratio, (apa) : 17.8 ±0.5: 1
 Type of cylinder head : Monoblock
 Type of cylinder liner : Dry, replaceable
 Type of combustion chamber : Re-entrant cavity on piston crown
 Arrangement of valves : Overhead
Valve clearance (cold):
 - Inlet valve, (mm) : 0.10
 - Exhaust valve, (mm) : 0.15
- 3.4 Fuel System:**
 Type of fuel system : Gravity and forced feed
- 3.4.1 Fuel tank:**
 Capacity, (l) : 35.0
 Location : Above clutch housing
 Provision for draining of sediments /water : Provided
 Material of fuel tank : Metallic
- 3.4.2 Water separator:**
 Make : Alert (apa)
 Type : Inverted funnel, gravity separation
 Location : On RHS between fuel tank and primary fuel filter
 Capacity (l) : 0.45
- 3.4.3 Fuel feed pump : Not provided**

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17. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

17.1 On the basis of tests conducted the performance results have been summarized as evaluative (mandatory) and non-evaluative (not-mandatory) parameter applicable for qualifying Minimum Performance Criteria as per Clause-4 (Table-1) of **IS: 12207-2019** for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

S. No.	Characteristic	Category (Evaluative / Non-Evaluative)	Requirements as per IS: 12207-2019	Values declared by the applicant (D) / Requirement(R)	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
17.1.1	PTO Performance:					
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: $\pm 5\%$ for PTO power or engine power >26 kW, $\pm 10\%$ for PTO power or Engine power ≤ 26 kW.	14.7 (D)	14.7	Yes
b)	Power at rated engine speed, (kW)	Non-Evaluative	-do-	14.7 (D)	14.7	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% max.	265 (D)	254	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non-Evaluative	$\pm 8\%$	105.0 (D)	101.5	Yes
e)	Back-up torque, percent	Evaluative	12 %, min.	12 %, (R) minimum	19.4	Yes
f)	Maximum operating temperature, ($^{\circ}$C)					
	1) Engine oil	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 (D)	111	Yes
	2) Cylinder wall	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 (D)	176	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.65 (D) 2.57 (R) maximum	1.1	Yes
h)	Smoke level, (m^{-1})	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR)	3.25 per meter max.	0.08	Yes

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1	2	3	4	5	6	7
17.1.2	Drawbar performance:					
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non-Evaluative	Minimum 70% of static mass with ballast	15.04 (D) 14.77 (R) minimum	11.08 kN @ 5.5 %	No
b)	Maximum drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 70% of static mass of tractor without ballast	11.74 (D) 11.46 (R) minimum	12.07 kN @ 8.9 %	Yes
c)	Maximum drawbar power without ballast, (kW).	Evaluative	Minimum 80 % of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg Minimum 75 % of PTO power as referred in SI No. i) a) of PTO performance in case of light weight tractors having 1500 kg total static mass of tractor Minimum 75 % of the engine power as referred in SI No. i) a) of engine performance in case of tractors which do not have a PTO shaft.	13.0 (D) 11.8 (R) minimum	12.8	Yes
d)	Max. transmission oil temperature, (°C)	Evaluative	The declared value should not exceed the maximum value specified by oil company	110 (D)	77	Yes
17.1.3	Power lift and hydraulic pump performance:					
a)	Maximum lifting capacity throughout the range of lift, (kN):					
	1) At hitch points	Evaluative	±10%	10.8 (D)	11.80	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	6.4 (D) 3.46 (R) minimum	9.68	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 minute, (mm)	Non-Evaluative	Observed value should not exceed 50 mm.	50 (D) 50 (R) maximum	05	Yes
17.1.4	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	8.17	Yes
	2) Hot brake	Evaluative	10	10	8.35	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600 maximum	514 to 524	Yes

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1	2	3	4	5	6	7
c)	Whether parking brake is effective at a force of 600 N at foot pedal(s) or 400 N at hand lever, N	Evaluative	Yes / No	Yes (R)	Yes	Yes
17.1.5	Noise measurement:					
a)	Maximum ambient noise emitted by the tractor, dB(A)	Evaluative	88 dB (A) for >1.5 tonne GVW and 85 db (A) for <1.5 tonne GVW (as per CMVR)	88 (Max)	78	Yes
b)	Maximum noise at operator's ear level, dB(A)	Evaluative	96 (as per CMVR)	96 (Max)	93	Yes
17.1.6	Amplitude of mechanical vibrations at:					
	1) Left foot rest	Non-Evaluative	100 microns (max.)	100 (max.)	333	No
	2) Right foot rest				148	No
	3) Seat (with driver seated)				247	No
	4) Steering Wheel				344	No
17.1.7	Air Cleaner:					
	Max. oil pull over, (%)	Evaluative	0.25% (max.)	0.25% (max.)	0.11	Yes
17.1.8	Haulage requirements:					
a)	Gross mass of the trailers, (tones):					
	1) Two wheels	Non-Evaluative	As specified by the manufacturer	3.0 (D)	3.0	Yes
	2) Four wheels			4.0 (D)	4.0	Yes
b)	Distance travelled / litre of fuel consumption, (km/l):					
	1) Two wheels	Non-Evaluative	As specified by the manufacturer	8.0 to 9.0 (D)	8.80	Yes
	2) Four wheels			8.0 to 9.0 (D)	8.71	Yes
c)	Fuel consumption (cc/km/tonne):					
	1) Two wheels	Non-Evaluative	As specified by the manufacturer	30.0 to 40.0 (D)	37.88	Yes
	2) Four wheels			30.0 to 40.0 (D)	28.71	No
17.1.9	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.	There should be no ingress of water and/or mud	Manufacturer has not recommended for puddling test	Not applicable
	1) Clutch assembly	-do-				
	2) Brake housings	-do-				
	3) Front axle hubs	-do-				
	4) Engine oil	-do-				
	5) Transmission oil	-do-				

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1	2	3	4	5	6	7
17.1.10	Safety features:					
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 part 2)	--	Meets the requirement	Yes
b)	Lighting arrangement	Evaluative	As per CMVR	--	Meets the requirement	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)	--	Does not meet the requirement	--
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)	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 drawbar	Evaluative	Should meet the requirements of IS 12953 and IS 12362 (part 3) (as amended from time to time)	--	Meets the requirement	Yes
g)	Specifications of Swinging drawbar (wherever fitted)	Evaluative	Should meet the requirements of IS 12362 (Part 3) (As amended from time to time)	--	Not fitted	Not applicable
h)	1) Maximum travelling speed at rated engine speed in reverse gears, (kmph)	Evaluative	Should not exceed 20 Kmph	--	11.26 (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.	--	Not applicable	Not applicable
17.1.11	Labelling of tractors (Provision of labelling plate):					
	1) Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO in kW and year of manufacture in numerical MM YY Digit 01-12 in box No.1 for MM will represent the month and next two digit in the box No.2 for YY will represent the year of manufacturing		Eicher	Yes
	2) Model	Evaluative			Eicher 242 XTRAC	Yes
	3) Month & Year of manufacture	Evaluative			02/22	Yes
	4) Engine number	Evaluative			531429104776	Yes
	5) Chassis number	Evaluative			931410212255	Yes
	6) Declaration of maximum PTO power, (kW)	Evaluative			14.7	Yes
	7) Specific fuel consumption (g/kWh)	Evaluative			265	Yes

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1	2	3	4	5	6	7
17.1.12	Discard limit for:					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer	115.25	115.000 to 115.002	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non-Evaluative		0.52	0.143	Yes
(c)	Piston diameter at skirt, (mm)	Non-Evaluative		114.66	114.859	Yes
(d)	Ring end gap (mm):					
	- Top comp. ring	Evaluative	-do-	4.0	0.40 to 0.50	Yes
	- 2 nd comp. ring		-do-	4.0	0.40 to 0.60	Yes
	- Oil ring		-do-	2.50	0.45	Yes
(e)	Ring groove clearance (mm):					
	- Top comp. ring	Evaluative	-do-	0.20	0.114	Yes
	- 2 nd comp. ring		-do-	0.20	0.089	Yes
	- Oil ring		-do-	0.15	0.065	Yes
(f)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	-do-	Roller bearing provided	Not Applicable	Not Applicable
	- Crankshaft end float	Evaluative	-do-	0.50	0.14	Yes
(g)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.40	0.107 to 0.112	Yes
	- Axial	Evaluative	-do-	0.40	0.35	Yes
(h)	Clearance between king pin and bush, (mm)	Non-Evaluative	-do-	0.4	0.100 to 0.168	Yes
(i)	Clearance between centre pin and bush, (mm)	Non-Evaluative	-do-	0.4	0.136 to 0.161	Yes
17.1.13	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
17.1.14	Fittment 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	Not Provided	Not fitted	---
17.1.15	Standard accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Provided	Yes
17.1.16	Accessories (Optional)	Non Evaluative	Ballast weights if fitted should meet the requirement of CMVR.	Provided	Provided	Yes

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17.2 CATEGORY OF BREAKDOWNS / DEFECTS:					
S. No.	Category of breakdowns	Category (Evaluative / Non-Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the requirements (Yes/No)
1.	Critical	Evaluative	There is no 'critical breakdown' during the course of testing	None	Yes
2.	Major	Evaluative	There are not more than 1 major breakdowns and neither of them is of repetitive nature	None	Yes
3.	Minor	Evaluative	There are not more than 3 minor defects during the test and the frequency of each is not be more than two	Minor-08 (Mn-08) 02-numbers	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed four that is, (1 major + 3 minor) or 4 minor breakdowns	Two	Yes

17.3 Salient Observations:

17.3.1 Laboratory tests:

17.3.1.1 Transmission Running-in:

During the transmission running-in test, leakage of oil was observed from the exhaust manifold. On inspection, the "oil seal valve stem" was found not fitted properly in its seat. Upon this, the manufacturer vide letter No. TMTL/242XTRAC/BT/06/2022 dated 04.04.2022 has requested for replacement of oil seal valve stem, which was allowed. Thereafter, the 'oil seal valve stem' (Inlet & exhaust) having "Part No.1717492" (Quantity -02) was replaced with new one. This defect is categorized as Minor (Mn-08) defect as per IS:12207-2019. This should be looked into for necessary corrective action.

17.3.1.2 Drawbar performance:

- i) During the ballasted drawbar performance test, the maximum drawbar pull with ballast was observed as 11.08 kN against the minimum requirement of 14.77 kN and which does not meet the non-evaluative requirement of IS: 12207-2019. This should be looked into for necessary improve action.
- (ii) The 15%-wheel slip was not achieved in any of the gear during drawbar test under unballasted & ballasted condition.
- (iii) The maximum drawbar pull and corresponding wheel slip was observed as 12.07 kN & 8.9% under unballasted condition respectively.
- (iv) The maximum drawbar pull and corresponding wheel slip was observed as 11.08 kN & 5.5% under ballasted condition respectively.
- (v) The five hours test at pull corresponding to 15%-wheel slip was conducted at maximum pull of 11.09 kN at 5.6%-wheel slip in L1 gear as 15%-wheel slip was not achieved during the maximum power test.

All of the above shall be looked into for necessary corrective action.

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17.3.1.3 Mechanical Vibration:

The amplitude of mechanical vibration on various assemblies marked as (*) in Chapter – 11 of this test report is on higher side. This calls for dampening down of vibrations especially on left foot rests, right foot rest and steering wheel to improve the operational comfort and service life of components.

The above observations were also made in first batch test report No. T-1108/1634/2017 (September, 2017) and no improvement have been made as regards to its conformity so far.

17.3.1.4 Haulage test:

i) The fuel consumption (ml/km/tonne) in four wheel trailer was recorded as 28.71 (ml/km/tonne) against the declaration of 30.0 to 40.0 (ml/km/tonne) which does not meet the non-evaluative requirement of IS : 12207-2019 with regard to tolerance. This should be looked into for necessary corrective action.

17.3.1.5 Three-point linkage:

i) The lateral of lower hitch point lower hitch point to centre line of tractor was measured 364 mm against the requirement of 435 mm which does not meet the requirement of IS: 4468 -1997 (Part-1) Category-II. This should be looked into for necessary corrective action.

ii) Distance from end of power take-off to centre of lower hitch point (lower links in horizontal position) was measured 705 mm against the required range of 550 to 625 mm. which does not meet the requirement of IS: 4468 -1997 (Part-1) Category-II. This should be looked into for necessary corrective action.

17.4 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 as per the requirement of IS: 12239 (Part-1)-2018.
- ii) Width of foot step is less as per the requirement of as per IS: 12239 (Part-2) – 1999 (Reaffirmed in January, 2019).
- ii) PTO master shield should be provided on tractor as per IS: 4931-1995 (Reaffirmed in January, 2019).
- iv) Fuel shut off lever does not automatically remain in stop position without the application of sustained manual effort as per the requirement of IS: 8133-2021.
- v) Inclination of seat towards rear direction in degrees has not provided, as per the requirement of IS: 12343-2021.

17.5 Maintenance / Service Problems:

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

17.6 Adequacy of Literature supplied with machine:

17.6.1 The following literature was supplied with test sample for reference during the test.


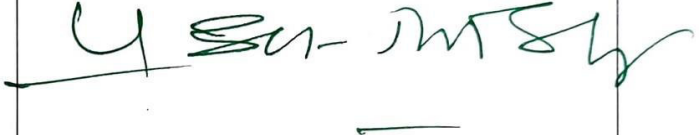
- a) Operator's manual for Eicher, 241 XTRAC, 242 XTRAC & 242 Premium tractor models.
- b) Spare parts catalogue for Eicher, 241 XTRAC, 242 XTRAC & 242 Premium tractor models.
- c) Service manual for Eicher, 242 XTRAC, 242 XTRAC & 242 Premium tractor model

17.6.2 The operator manual may be brought out for the guidance of users and service personnel as per IS:8132-1999 incorporating, inter alia, the following:

- i) Safe hitch height while using trailer.
- ii) Specification of recommended matching trailer for haulage operation.

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TESTING AUTHORITY:

C.V. CHIMOTE TEST ENGINEER	
P.K. PANDEY DIRECTOR	

Draft Test Report is compiled by C.S. Raghuwanshi, Agricultural Engineer

18. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
18.1	17.3.1.1,17.3.1.2 [(i), (ii), (iii), (iv), (v)],17.3.1.3,17.3.1.5 [(i), (ii)] & 17.6.2 [(i) & (ii)].	Observation will be studied and necessary action will be initiated.
18.2	17.4	Recommendation will be looked into with respect to design, development & implementation.

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ANNEXURE – I

BRIEF SPECIFICATION OF MATCHING TRAILER AS DECLARED BY APPLICANT

S. No.	Item	Trailer (2-Wheel)	Trailer (4-Wheel)
1.	Make	Kisan Engineering Works, MIDC, Awadhan Dhule, (M.S.)	
2.	Model	Kisan 1062	Not available
3.	Type of trailer	Semi - Trailer	Semi – Trailer
4.	Number of axles	Single	Double
5.	Un laden Weight of Trailer, kg	1670	2800
6.	Fully laden Weight of Trailer, Tons (Kg)	4000	5500
7.	Overall dimensions of Trailer, (mm):		
	Overall Width	1870	2140
	Overall Length	4180	5785
	Overall Height	2175	2110
	Wheel Base	Not applicable	2835
	Wheel Track	1600	1740(Front) &1765(Rear)
8.	Dimension of fitted Platform, (mm):		
	Length	3040	4225
	Width	1830	2135
	Height from ground	1190	1305
9.	Brakes of Trailer	Not Provided	Not Provided

ANNEXURE – II

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	53.0
2.	PTO performance test	11.5
3.	Power lift and hydraulic pump performance test	2.3
4.	Drawbar performance test	17.2
5.	Brake test	1.8
6.	Noise measurement	1.5
7.	Mechanical vibration test	0.7
8.	Nominal speed test	0.5
B.	HAULAGE TEST:	5.8
C.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	11.9
TOTAL:		105.2