

प्रारंभिक व्यावसायिक परीक्षण रिपोर्ट
INITIAL COMMERCIAL TEST REPORT

संख्या/No. : T-1882/2413/2024
माह/Month : August, 2024

Application Reference No. 28/2023-24/102

(यह परीक्षण रिपोर्ट 30/08/2029 तक वैध है / THIS TEST REPORT IS VALID UPTO 30/08/2024)



Make of Agricultural Tractor : ESCORTS KUBOTA LIMITED
Model : 434 E21 (BRAND NAME - POWERTRAC)
Manufactured by : M/s. Escorts Kubota Limited, 15/5, Corporate Centre,
Mathura Road, Faridabad- 121003, Haryana, India



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)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) 466 445

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
TRACTOR NAGAR, BUDNI (M.P.) 466 445
(An ISO 9001:2015 Certified Institute)

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IMPORTANT INFORMATION

The Government of India, Ministry of Agriculture and Farmers' Welfare has directed, vide an OM No. 13-17/2021-M&T (I&P) dated 28.07.2022, that since 15th August, 2022, only mandatory tests will be carried out on a tractor unless applicant has expressly requested for optional tests as well, mentioned in the above captioned OM.

In the instant case, there is no request from the applicant to carry out the optional tests hence only Mandatory Tests, as given below, have been conducted and reported in this report: -

1. PTO performance
2. Hydraulic performance
3. Drawbar performance
4. Brake performance

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[C]	Tractor manufacturer's name and address	: M/s. Escorts Kubota Limited, 15/5, Corporate Centre, Mathura Road, Faridabad- 121003, Haryana, India
[D]	Location of tractor assembly	i) Escorts Kubota Limited, Plot No. 2 & 3, Sector – 13 Faridabad – 121 007, Haryana, India ii) Escorts Kubota India Private Limited, 18/4, Mathura Road, Faridabad-121 007, Haryana, India iii) Escorts Kubota Limited, 18/4, Mathura Road, Faridabad-121007, Haryana, India
[C]	Submitted for test by (Applicant)	: M/s. Escorts Kubota Limited, Knowledge Management Centre, 15/5, Mathura Road, Faridabad- 121003, Haryana, India
[C]	Selected for test by	: The Ministry vide OM No. 13-17/2021 - M&T (I&P) dated 28.07.2022, has allowed the applicant to submit the test sample directly to the Institute without requiring any random selection for Initial Commercial Testing. Thus, the applicant directly submitted the test sample to the Institute for test.
[D]	Place of running-in	: At manufacturer's works
[D]	Duration of running-in (h):	
	-Engine	: 25
	-Transmission	: 15
[C]	Location of test	: Government of India, Central Farm Machinery Training and Testing Institute, P.O. - Tractor Nagar, BUDNI – 466445 (M.P.), INDIA

1. SPECIFICATIONS OF TRACTOR

1.1	Identification:	
1.1.1	Denomination	
[C]	Make of tractor	: Escorts Kubota Limited
[C]	Model (Brand name)	: 434 E21 (BRAND NAME - POWERTRAC)
[C]	Type	: Four wheeled, rear wheel driven, standard agricultural tractor
[C]	Month & year of manufacture	: 12/23
[D]	Country of origin	: India
1.1.2	Numbers:	
[D]	1 st Serial No. of prototype	: T053638784LM
[C]	Serial No.	: T053682325JM
1.2	Engine:	
[D]	Manufacturer's address	: M/s. Escorts Kubota Limited, 15/5, Corporate Centre, Mathura Road, Faridabad- 121003, Haryana, India
[C]	Make	: Escorts Kubota Limited
[C]	Model	: E3.234B – 3A
[C]	Type	: Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine
[C]	Serial No.	: E3776757
1.2.1	Cylinders:	
[C]	Number/disposition	: Three / vertical, in-line
[D]	Bore / Stroke, (mm)	: 95 / 110

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6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

6.1 On the basis of test conducted the performance results have been summarized as evaluative (mandatory) / non-evaluative (non-mandatory) parameters applicable for Qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2022 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: 12207-2022	Values declared by the applicant/ (D) Requirement (R)	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
MANDATORY TESTS: (As per Ministry's Office Memorandum No. 13-17/2021-M&T (I&P) dated 28th of July, 2022). (In the ensuing table, 'D' stands for applicant's declaration, whereas 'R' stands for requirement as per BIS test code)						
6.1.1	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 and or engine power > 26 kW. $\pm 10\%$ for PTO power and or engine ≤ 26 kW.	25.9 (D)	24.8	Yes
b)	Power at rated engine speed, (kW)	Non-Evaluative	-do-	25.9 (D)	24.8	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	Should not be more than 10% of declared value	265 (D)	255	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non-Evaluative	$\pm 8\%$	155 (D)	145.8	Yes
e)	Back-up torque, percent	Evaluative	Should be minimum 12 percent	12 (D) 12 (R)	22.9	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 natural ambient/high ambient condition should not exceed the declaration	130 (D)	97	Yes
	2) Coolant	Evaluative	Observed value should not exceed the declared value or boiling point of coolant at radiator cap pressure whichever is lower. The boiling point of the coolant at radiator pressure shall be provided by the applicant.	110 (D)	103	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at Max power under natural ambient conditions.	2.55 Maximum (R)	0.33	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 Maximum (R)	0.37	Yes

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1	2	3	4	5	6	7
6.1.2 Drawbar performance:						
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non-Evaluative	Minimum 70% of static mass of tractor with ballast.	*	*	*
b)	Max. drawbar pull without ballast/with standard ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 70% of static mass of tractor without ballast or with standard ballast, as the case may be.	12.70 (D) 12.73 (R)	14.18	Yes
c)	Maximum drawbar power without ballast/with standard 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.	20.72 (D) 19.8 (R)	21.3	Yes
d)	Maximum transmission oil temperature, (°C)	Evaluative	The declared value should not exceed the maximum value specified by oil company	130 (D)	88	Yes
Applicant vide letter no. EKL/Hom/R-137 dated 15.04.2024 has requested not to conduct the ballasted drawbar performance test & ten-hour drawbar test which was allowed as per the additional guidelines for testing of tractors as per new regime of testing of tractors vide an OM No. 13-17/2021-M&T (I&P) dated 28/07/2022 & OM No. 13-32/2023-M&T (I&P) (FTS-125476) dated 16.05.2023. Accordingly, drawbar performance test in unballasted condition was conducted only.						
6.1.3 Power lift and hydraulic pump performance:						
a)	Maximum lifting capacity throughout the range of lift, (kN):					
1)	At hitch points	Evaluative	Should not be less than 90% of declared value.	13.73 (D) 12.36 (R) Minimum	16.63	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.	6.50 (D) 5.84 (R) Minimum	12.69	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	The observed value should not exceed 50 mm	50 (D) Maximum	65	No

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1	2	3	4	5	6	7		
6.1.4	Brake performance at 25 kmph:							
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal without ballast, (m):							
	1) Cold brake	Evaluative	10	10 (R)	6.28	Yes		
	2) Hot brake	Evaluative	10	10 (R)	6.60	Yes		
b)	Whether parking brake is effective at a force of 600 N at foot pedal (s) or 400 N at hand lever	Evaluative	Yes / No	Yes	Yes	Yes		
6.1.5	OPTIONAL TESTS: As the applicant has not applied for any optional tests, therefore no optional tests were conducted.							
6.1.6	Safety features:							
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes [As per IS 12239 (Part2)]	Meets the requirement	Yes			
b)	Lighting arrangement	Evaluative	As per CMVR	Meets the requirement	Yes			
c)	Seating requirements	Non Evaluative	Should meet the requirements of IS: 12343 (As amended from time to time)	Does not meet the requirement	No			
d)	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	Meets the requirement	Yes			
e)	Dimensions of three-point linkage	Non Evaluative	Should meet the requirements of IS: 17231-2019 (As amended from time to time)	Does not meet the requirement	No			
f)	Specifications of linkage drawbar	Non Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	Meets the requirement	Yes			
g)	Specifications of Swinging drawbar (wherever fitted)	Non Evaluative	Should meet the requirement of IS: 12362 (Part-3) (As amended from time to time)	Not provided	Not applicable			
h)	Audible warning signal on tractor	Evaluative	If tractor travel speed in reverse gear exceeds 20 kmph, an audible warning signal on tractor shall get activated. A sticker to the effect that "operating the tractor beyond 20 kmph speed in reverse gear is not safe" should be prominently displayed.	Not fitted	Not applicable			
6.1.7	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, Specific fuel consumption (SFC) corresponding to maximum power in g/kWh and year of manufacture in numerical form <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>MM</td> <td>YY</td> </tr> </table> 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	MM	YY	ESCORTS KUBOTA LIMITED (FORMERLY ESCORTS LIMITED)	Yes	
MM	YY							
	2) Model	Evaluative		434 E21	Yes			
	3) Month & Year of manufacture	Evaluative		12/23	Yes			
	4) Engine number	Evaluative		E3776757	Yes			
	5) Chassis number	Evaluative		T053682325JM	Yes			
	6) Maximum PTO power, (kW)	Evaluative		25.9	Yes			
	7) Specific fuel consumption, g/kWh	Evaluative	265	Yes				

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1	2	3	4	5	6	7
6.1.8	Literature (Submission to test agency):					
(a)	Operator manual	Evaluative	The printed literature in booklet form should be provided as per IS 8132 and should submit along with the test sample.		Provided	Yes
(b)	Parts Catalogue	Evaluative			Provided	Yes
(c)	Workshop/ Service manual	Evaluative			Provided	Yes
6.1.9	Fitment of Roll Over Protective Structures (ROPS):					
	For tractor having more than 1150 mm rear track width	Evaluative	ROPS should meet the requirement of IS:1182 or OECD code or equivalent International Standard		Not fitted	Not applicable
6.1.10	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor		Provided	Yes
6.1.11	Accessories (optional)	Non Evaluative	Ballast weight, if fitted, should meet the requirement of CMVR		Not fitted	Not applicable

6.2 CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS:12207-2022):					
S. No.	Category of break-downs	Category (Evaluative / Non-Evaluative)	Requirements as per IS: 12207-2022	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 2 major break downs and neither of them should be of repetitive nature.	None	Yes
3.	Minor	Evaluative	There are not more than 5 minor defects during the test and neither of them should be of repetitive nature.	None	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of break downs should exceed five that is, (2major + 3 minor) or (1 major + 4 minor) or 5 minor breakdowns.	None	Yes

6.3 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 Year 2019)] : Conforms
- ii) Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS:4931-1995 (Reaffirmed Year 2019)] : Conforms
- iii) Agricultural wheeled tractors – Rear mounted three-point linkage: Categories 1N,1,2N, 2, 3N, 3,4N & 4 [IS: 17231:2019] : **Does not conform**
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed Year 2022)] : Conforms
- v) Agricultural tractors- Operator's seat technical requirement [IS12343 - 2021] : **Does not conform**
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision): [IS 12239 (Part 1) - 2018] : **Does not conform**
- vii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (Part 2) 1999) (Reaffirmed Year 2019)] : **Does not conform**

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- viii) Guide lines for location and operation of operator controls on agricultural tractors and machinery [IS: 8133 - 2021] : **Does not conform**
- ix) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays Part2 Symbols for agricultural tractors and machinery [IS: 6283(Part-1) - 2006 (Reaffirmed Year 2019) and IS: 6283 (Part-2) – 2007 (Reaffirmed Year 2019)] : **Conforms**
- x) Agricultural Tractors and Machinery-Lighting device for travel on public roads (IS:14683-1999) (Reaffirmed Year 2019)] : **Conforms**

6.4 Salient Observations:

6.4.1 Hydraulic Performance Test:

- i) During the hydraulic lift load maintenance test, the drop in vertical height of the lower link was observed as 65 mm against the maximum permissible limit of 50 mm. **This should be looked into for necessary corrective action.**
- ii) The angle of rotation of mast was observed 7.3 degree over the full range of lift against the minimum requirement 10 degree as per IS 12224:1987 (reaffirmed year 2019). **This should be looked into for necessary corrective action.**

6.4.2 Three-point linkage:

The following parameter does not meet the requirements of IS: 17231-2019 and needs to be looked into for necessary corrective actions:

- i) Diameter of hitch point hole and width of ball for upper hitch point have been measured as 25.72 mm and 50.79 mm against the requirement of 19.30 to 19.50 mm and 43.5 to 44.0 mm respectively.
- ii) Diameter of hitch point hole and width of ball for lower hitch point have been measured as 28.95 mm and 45.00 mm against the requirement of 22.40 to 22.65 mm and 34.5 to 35.0 mm respectively.
- iii) Lateral distance from lower hitch point to centre line of tractor has been measured as 364 mm against the requirement of 359 mm.

Therefore, all of the above should be looked into for necessary corrective action.

6.4.3 Operator's seat:

The following parameters do not meet the requirement of IS: 12343-2021.

- i) Provision for adjustment of driver's mass has been specified as 50 to 120 kg against the requirement of 40 to 100 kg.
- ii) Vertical distance from SIP to centre of accelerator pedal has been measured as 525 mm against the requirement of 230 to 460 mm.
- iii) Vertical distance from SIP to foot rest has been measured as 595 mm against the requirement of 450 to 520 mm.

Therefore, all of the above should be looked into for necessary corrective action.

6.4.4 Operator's work place:

The following parameters does not meet the requirement of IS: 12239 (Part-I) -2018:

- i) Vertical retainer has not been provided on inner side of clutch pedal.
- ii) Width of step has been measured as 160 mm against the requirement of 200 mm (min.)
- iv) Spark arresting device has not been provided in the exhaust system.

Therefore, all of the above should be looked into for necessary corrective action.

6.4.5 PTO master shield:

PTO master shield has not been provided on tractor. **This should be looked into for necessary corrective action.**

6.4.6 Specification

- i) Accessories (Optional) is not provided with tractor model. It is mentioned as provided in specification sheet. It must be looked into for corrective action.
- ii) The quality of pasted decal to identify controls and at other places like model name (e. i., E21) is poor. It should be looked into for improvement.

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6.5 Maintenance / Service Problems:

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

6.6 Recommendation with regard to safety on tractor:

- i) Identification of hand controls by colour has not been provided as per the requirement as laid down in Table – 5 of IS: 8133-2021.
- ii) Provision for starting/stopping engine shall be made to prevent the engine starter has not been provided as per the requirement as laid down in Table – 1 of IS: 8133-2021.
- iii) The working clearance between position control lever & draft control lever has been measured as 25 mm against the minimum requirement of 70 mm as per the requirement of IS: 12239 (Part II) – 2019.

Above parameters should be looked into for necessary corrective action.

6.7 Adequacy of Literature supplied with machine:

6.7.1 The following literatures were supplied with the test tractor for reference during the test: -




- i) Operator's Manual for "Escorts Kubota Limited, 434 E21 (BRAND NAME – POWERTRAC)", 434 DS POWERTRAC, 439RDX POWERTRAC tractor models.
- ii) Parts Catalogue for "Escorts Kubota Limited, 434 E21 (BRAND NAME – POWERTRAC)", tractor model.
- iii) Service manual for "Escorts Kubota Limited, 434 E21 (BRAND NAME – POWERTRAC)", tractor model.

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

- i) Safe hitch height while using trailer.
- ii) Recommended ballast masses for different operations.
- iii) Literature should be brought out in national as well as other regional languages of india for the guidance of user.

TEST CARRIED OUT AT C.F.M.T. & T.I., BUDNI (M.P.), INDIA

TESTING AUTHORITY

B.N. DIXIT AGRICULTURAL ENGINEER	
R. P. PANDEY SIE (TESTING HEAD)	
Dr. P.P. RAO DIRECTOR	

Draft Test Report compiled by **V.S. Shinde**, Senior Technical Assistant.

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7. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's Comments
7.1	6.3 (iii, v, vi, vii, viii)	Observation will be studied and we will try to take necessary corrective action.

ANNEXURE - I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	Applicant has declared that it has already been conducted at manufacture's work place.
2.	PTO performance test	10.9
3.	Power lift and hydraulic pump performance test	4.2
4.	Drawbar performance test	4.4
5.	Brake performance test	1.0
6.	Nominal speed test	0.9
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	1.2
TOTAL:		23.2