

Application Reference No. 28/2022-23/132

(यह परीक्षण रिपोर्ट 30/09/2028 तक वैध है/ THIS TEST REPORT IS VALID UPTO 30/09/2028)



Make of Agricultural Tractor : M/s ESCORTS KUBOTA LIMITED
Model : EURO 50 E21
(BRAND NAME - POWERTRAC)
Manufactured by : M/s. Escorts Kubota Limited,
Plot No. 2 & 3, Sector – 13,
Faridabad – 121 007, 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)

T-1781/2312/2023	ESCORTS KUBOTA LIMITED, EURO 50 E21 (BRAND NAME - POWERTRAC) TRACTOR- INITIAL COMMERCIAL TEST
	THIS TEST REPORT IS VALID UPTO: 30/09/2028

IMPORTANT INFORMATION

The Government of India, Ministry of Agriculture and Farmers' Welfare has directed, vide a 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

Month: September	Test Report No.: T-1781/2312/2023	Year: 2023
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**GOVERNMENT OF INDIA
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Tractor manufacturer's name and address	:	M/s. Escorts Kubota Limited, Plot No. 2 & 3, Sector - 13, Faridabad – 121 007, Haryana
Location of tractor assembly	:	i) Escorts Kubota Limited, Plot No. 2 & 3, Sector - 13, Faridabad–121 007, Haryana ii) Escorts Kubota India Private Limited, 18/4, Mathura Road, Faridabad-121007, Haryana
[C] Submitted for test by (Applicant)	:	M/s. Escorts Kubota Limited, Knowledge Management Centre 15/5, Mathura road, Faridabad – 121 003, Haryana
[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:		
-Engine	:	10
-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	:	M/s Escorts Kubota Limited
[C] Model	:	EURO 50 E21 (Brand Name - POWERTRAC)
[C] Type	:	Four Wheel Drive, Standard Agricultural Tractor.
[C] Month & year of manufacture	:	02/23
[D] Country of origin	:	India

1.1.2 Numbers:

[D] 1 st Serial No. or prototype	:	T053594286LK
[C] Serial No.	:	T053638958LM

1.2 Engine:

[D] Manufacturer's address	:	M/s. Escorts Kubota Limited, Plot No 2 & 3, Sector-13, Faridabad - 121 007, Haryana
[C] Make	:	M/s. Escorts Kubota Ltd.
[C] Model	:	AE3.293A-3A
[C] Type	:	Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.
[C] Serial No.	:	E3720868

1.2.1 Cylinders:

[C] Number/disposition	:	Three, vertical, in-line
[D] Bore / Stroke, (mm)	:	101/122
[D] Capacity, cm ³	:	2934
[D] Compression ratio	:	17.5 (±5%): 1
[D] Arrangement of valves	:	Overhead, inline
[D] Cylinder liners	:	Wet, replaceable
[D] Type of combustion chamber	:	Re-entrant

1.2.2 Supercharging	:	Not available
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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:

Sl. 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).						
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.	34.0 (D)	33.9	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	34.0 (D)	33.9	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% max.	280 (D)	260	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	203 (D)	194.9	Yes
e)	Back-up torque, percent	Evaluative	12 percent	12 (D) 12 (R)	20.4	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)	107	Yes
	2) Coolant	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.	118(D)	100	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under natural ambient conditions.	2.60 Maximum (R)	0.78	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)	0.39	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.	21.23 (D)	--	Not applicable	
b)	Max. drawbar pull 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.	18.25 (D) 18.26 (R) Minimum	24.86	Yes	
c)	Maximum drawbar power 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.	27.2 (D) 27.1 (R) Minimum	28.1	Yes	
d)	Maximum transmission oil temperature, (°C)	Evaluative	The declared value should not exceed the maximum value specified by oil company	130 (D)	89	Yes	
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.	18.14 (D) 16.33 (R)	19.24	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.	9.00 (D) 7.98 (R) Minimum	12.37	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	50	Yes	
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 with road ballast, (m):						
	1)	Cold brake	Evaluative	10	10 (R)	8.37	Yes
	2)	Hot brake	Evaluative	10	10 (R)	8.52	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	

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1	2	3	4	5	6	7	
6.1.5	OPTIONAL TESTS: As the applicant has not applied for any optional tests, therefore no optional tests was 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 (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	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 As per IS :17231-2019	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)	Swinging drawbar (wherever fitted)	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 maximum PTO Power in kW, specific fuel consumption (SFC) corresponding to maximum power in g/kWh and year of manufacture in numerical form. <table border="1" style="margin-left: auto; margin-right: auto;"><tr><td>MM</td><td>YY</td></tr></table> Digit 01 – 12 in box No.1 for MM will represent the months and next two digits in 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		EURO 50 E21 (Brand Name - POWERTRAC)	Yes		
3)	Month & Year of manufacture	Evaluative		02/23	Yes		
4)	Engine number	Evaluative		E3720868	Yes		
5)	Chassis number	Evaluative		T053638958LM	Yes		
6)	Maximum PTO power, (kW)	Evaluative		34	Yes		
7)	Specific fuel consumption, (g/kWh)	Evaluative	280	Yes			

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1	2	3	4	5	6	7
6.1.8	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
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	No critical breakdown.	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature.	None	Yes
3.	Minor	Evaluative	Not more than five and neither of them should be repetitive in nature.	One Mn-3	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed five, that is, (2 major + 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: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS:4468(Part-I) – 1997(Reaffirmed in 2022)] : **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 Part-2 Symbols for agricultural tractors and machinery [IS: 6283(Part-1)-2006 (Reaffirmed Year 2019) and IS: 6283 (Part-2) – 2007(Reaffirmed Year 2019)] : **Does not conform**
- 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 Laboratory tests:

6.4.1.1 PTO Performance Test:

During the PTO test, an abnormal sound was heard from the alternator assembly & fan belt of the tractor. Upon this, the applicant vide letter No. EKL/Hom/P-025 dated 11.09.2023 has informed that the irregular noise was originating from the alternator assembly and Belt Drive Cogged B Type (fan belt) and requested for replacement of both the fan belt and alternator with a new one of the same specification, which was allowed.

Accordingly, the following parts have been replaced with new ones of same specifications.

S.No.	Part Name	Part No.	Quantity
1.	Belt drive cogged B type	D10755760.9	01
2.	Alternator Assembly 35 Ampere (B Type Pulley)	D10198970.9	01

The replacement of alternator assembly has been categorized as **Minor (Mn-3)** breakdown and replacement of Belt Drive Cogged B Type (fan belt) has not been categorized under any category of breakdowns as per IS:12207-2022.

6.4.1.2 Operator's seat:

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

- i) Length of operator's seat has been measured as 200 mm against the requirement of 200 to 310 mm.
- ii) Width of operator's seat has been measured as 430 mm against the minimum requirement of 450 mm.
- iii) Provision for adjustment of driver's mass has been specified as 50 to 120 kg against the requirement of 40 to 100 kg.
- iv) Vertical distance from SIP to centre of accelerator pedal has been measured as 515 mm against the requirement of 230 to 460 mm.
- v) 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.

6.4.1.3 Operator's work place:

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

- i) Vertical retainers have not been provided on inner side of pedals.
- ii) Spark arresting device has not been provided in the exhaust system.

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

6.4.1.4 Three-point linkage:

The dimensions lateral distance from lower hitch point to centre line of tractor does not meet the requirements of IS :17231-2019.This should be looked into for corrective action.

6.4.1.5 PTO master shield:

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

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) The hand accelerator lever, when moved away from the operator (i.e. forward) decreases the engine speed, which does not meet the requirement as laid down in Table - 1 of IS: 8133-2021.
 - iii) Hazard warning with colour code on illuminated display has not been provided as per the requirement as laid down in IS: 6283 (Part 2): 2007.
 - iv) Differential lock has not been provided.
 - v) The working clearance between position control lever & RHS mudguard has been measured as 50 mm, against the minimum requirement of 70 mm.
- 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: -

- a) Operator's Manual for EURO 50 E21 (BRAND NAME - POWERTRAC), EURO 50 NEXT and EURO 55 NEXT tractor models.
- b) Part's Catalogue for EURO 50 E21 (BRAND NAME - POWERTRAC) tractor model.
- c) Service manual for EURO 50 E21 (BRAND NAME - POWERTRAC) tractor model.

6.7.2 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) Recommended matching implements for wet land operation.
- ii) Safe hitch height while using trailer.

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

TESTING AUTHORITY

C. V. CHIMOTE TEST ENGINEER	
A. K. UPADHYAY DIRECTOR (I/C)	

Draft Test Report compiled by **Prayush Satya**, Senior Technical Assistant.

7. APPLICANT'S COMMENTS

Para no.	Our reference	Comments
7.1	6.3 (iii, v, vi, vii, viii & ix)	Observation will be studied and will try to take necessary corrective action.

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TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	Applicant has declared it to be conducted on their work place.
2.	PTO performance test	11.4
3.	Power lift and hydraulic pump performance test	4.4
4.	Drawbar performance test	4.7
5.	Brake performance test	1.0
6.	Nominal speed test	2.8
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	0.9
TOTAL:		25.2