

व्यावसायिक परीक्षण रिपोर्ट (प्रथम बैच परीक्षण रिपोर्ट)  
COMMERCIAL TEST REPORT (1<sup>st</sup> Batch Test)

संख्या / No. : T-1480/2007/2020  
माह / Month : September, 2020

(यह परीक्षण रिपोर्ट 30/09/2025 तक वैध है। / THIS TEST REPORT IS VALID UP TO : 30/09/2025)



## KUBOTA, MU 4501 TRACTOR



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय  
कृषि, सहकारिता एवं किसान कल्याण विभाग  
मशीनीकरण एवं प्रौद्योगिकी प्रभाग

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(Department of Agriculture, Cooperation & Farmers Welfare, Mechanization & Technology Division)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान  
ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

**CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE**

(An ISO : 9001 - 2015 Certified Institute)

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**Manufacturer** : M/s. KUBOTA Corporation,  
700/867 Moo 3, Amata Nakorn  
Industrial Estate, Tambon Nonggakka,  
Amphur Panthong, Chonburi, 20160-  
Thailand

**Manufacturing location** : In India  
Escorts Kubota India Private Limited,  
18/4, Mathura Road, Faridabad –  
121 007-Haryana, India.

**Test requested by (applicant)** : M/s. Kubota Agricultural Machinery  
India Pvt. Ltd., Block No.94, Tower-  
1, 8th Floor, TVH Belicia Towers, MRC  
Nagar, Chennai-600 028 , Tamil Nadu ,  
INDIA.

**Selected for test by** : The testing authority  
**Place of running-in** : At CFMTTI , Budni  
**Duration of said running-in, (h):**  
- Engine : 50  
- Transmission : Not recommended  
**Method of Selection** : The test sample was selected randomly  
out of Five tractors from the production  
line by the representative of testing  
authority.

**Tractors chassis serial number made available for random selection:**

- i) KBTM30SNCMTL15908
- ii) KBTM30SNCMTL15888
- iii) KBTM30SNCMTL15907
- iv) KBTM30SNCMTL15909
- v) KBTM30SNCMTL15889

## 1. SPECIFICATIONS

**1.1 Tractor:**  
**Make** : Kubota  
**Model** : MU 4501  
**Brand name** : None  
**Variant, if any**

Sr. No.	Variant model name	Features	Tested vide test report No.
i)	KUBOTA, MU 4501 4WD	Four wheel driven (4WD)	T-1077/1602/2017 February, 2017

**Type** : Four wheeled, Rear wheel driven, Unit construction, General purpose, Agricultural tractor.

**Month and year of manufacture** : 11 | 19  
**Chassis number** : KBTM30SNEMTL15907  
**Country of origin** : Thailand



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**14. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS**

14. 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:

Sl. 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
<b>14.1.1 PTO Performance :</b>						
a)	Maximum power under 2 hours test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of $\pm 5\%$ for PTO power and or Engine power $>26\text{ kW} \pm 10\%$ for PTO power and or engine $\leq 26\text{ kW}$	29.2 (D)	29.1	Yes
b)	Power at rated engine speed,(kW)	Non Evaluative	-do-	29.2 (D)	29.1	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10%	249 (D)	262	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	152.8 (D)	141.7	Yes
e)	Back-up torque, percent	Evaluative	12 percent, min.	12 (R) 30 (D)	27.4	Yes
f)	<b>Maximum operating temperature (<math>^{\circ}\text{C}</math>)</b>					
	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)	120	Yes
	2) Coolant (liquid)	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.	127(D)	118	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.62 (R)	0.135	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)	0.06	Yes





1	2	3	4	5	6	7
<b>14.1.2 Drawbar performance :</b>						
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 70% of static mass with ballast	21.31 (D) 17.16 (R)	19.06	Yes
b)	Maximum drawbar pull without 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	16.85 (D) 13.04 (R)	15.39	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.	26.6 (D) 23.3 (R)	24.1	Yes
d)	Tractor fitted with air conditioned/heated cabin Maximum drawbar power with standard ballast, (kW).	Evaluative	Minimum 70 % of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg.	Not fitted	Not fitted	Not applicable
e)	Maximum transmission oil temperature (°C)	Evaluative	The declared value should not exceed the maximum value specified by oil company	120 (D)	103	Yes
<b>14.1.3 Power lift and hydraulic pump performance :</b>						
a) Maximum lifting capacity throughout the range of lift, (kN):						
	1) At hitch points	Evaluative	Tolerance of $\pm 10\%$	14.97 (D)	15.31	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	11.89 (D) 6.85 (R)	12.89	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	The observed value should not exceed 50 mm	50 ( R ) 15 (D)	20	Yes



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1	2	3	4	5	6	7
<b>14.1.4</b>	<b>Brake performance at 25 kmph:</b>					
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)	7.42	Yes
2)	Hot brake	Evaluative	10	10 (R)	7.72	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s <sup>2</sup> (N)	Evaluative	600	600 (R) Maximum	263 to 337	Yes
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	Yes	Yes
<b>14.1.5</b>	<b>Noise measurement :</b>					
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88 (R)	81	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	96 (R)	93	Yes
c)	<b>Amplitude of mechanical vibrations at:</b>					
1)	Left foot rest	Non Evaluative	100 microns (max)	100(R)	64	Yes
2)	Right foot rest				61	Yes
3)	Seat (with driver seated)				32	Yes
4)	Steering wheel				91	Yes
<b>14.1.6</b>	<b>Air cleaner:</b>					
	Max. air cleaner oil pull over, (%)	Evaluative	0.25 % (maximum)	Dry type air cleaner fitted		Not applicable
<b>14.1.7</b>	<b>Haulage requirements :</b>					
a)	Gross mass of the trailers, (tones):					
1)	Two wheel	Non	5.0 (D)	5.0		Yes
2)	Four wheel	Evaluative	7.0 (D)	7.0		Yes
b)	Distance travelled / liter of fuel consumption, (km/l):					
1)	Two wheel	Non	4.2 to 6.2 (D)	5.11 to 5.27		Yes
2)	Four wheel	Evaluative	3.5 to 5.0 (D)	4.83 to 5.04		Yes
c)	Fuel consumption (ml/km/tonne):					
1)	Two wheel	Non	34.0 to 44.0 (D)	37.96 to 39.17		Yes
2)	Four wheel	Evaluative	27.2 to 37.2 (D)	28.32 to 29.60		Yes
<b>14.1.8</b>	<b>Wetland cultivation :</b>					
	Sealing for the following assemblies:	Evaluative	The identified assemblies should essentially meet the requirement of IS: 11082-1984 (Reaffirmed in Oct,2017). 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 (R)	The major breakdowns were not observed in the field test during initial commercial testing of the tractor model having test report No.T-1034/1559/2016 (August, 2016). So, as per the provisions as laid down in clause 7.2 of 12207-2019 the field test during the batch testing of this tractor model was not conducted.	Yes
1)	Clutch assembly	-do-				
2)	Brake housings	-do-				
3)	Front axle hubs	-do-				
4)	Engine Oil	-do-				
5)	Transmission Oil	-do-				



1	2	3	4	5	6	7
14.1.9	<b>Safety features :</b>					
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 (Tractor having more than 1150 mm rear track width)	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	No
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)		Meets the requirement	Yes
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS 12953		Meet the requirements	Yes
g)	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 traveling speed at rated engine speed in reverse gear, kmph	Evaluative	Should not exceed 20 kmph		13.43 kmph Meet the requirements	Yes
	2) Audible warning signal on tractor	Evaluative	As soon as the travelling speed in reverse gear reaches to 20 kmph ,an audible warring signal on tractor be activated . The safety aspects about the operation of shuttle technology shall be brought in operation and manufacturer /dealer shall ensure the training on this aspect to operator before the delivery of tractor.		Not applicable	Not applicable

14.1.10 Labelling of tractors (Provision of labelling plate):						
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with maximum PTO power in kW and year of manufacture in numerical Form MM YY Digit 01-12 in box No..1 for MM will represent the months & next two digits in box No.2 for YY will represent the year of manufacturing.	KUBOTA		Yes
	2)	Model		MU4501		Yes
	3)	Month & Year of manufacture		11	19	Yes
	4)	Engine number		BKU2925		Yes
	5)	Chassis number		KBTM30SN EMTL15907		Yes
	6)	Declaration of PTO power, (kW)		29.2		Yes
	7)	Specific fuel consumption (g/hph)		249		Yes





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1	2	3	4	5	6	7
<b>14.1.11</b>	<b>Discard limit for:</b>					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by Manufacturer	87.150 (D)	87.006 to 87.030	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.40 (D)	0.067 to 0.081	Yes
(c)	Piston diameter	Non Evaluative		86.699 (D)	86.949 to 86.954	Yes
(d)	<b>Ring end gap (mm):</b>					
-	Top comp. ring	Evaluative	-do-	1.25(D)	0.30	Yes
-	2 <sup>nd</sup> comp. ring	Evaluative	-do-	1.25(D)	0.75	Yes
-	Oil ring	Evaluative	-do-	1.25(D)	0.30	Yes
(e)	<b>Ring groove clearance (mm):</b>					
-	Top comp. ring	Evaluative	-do-	0.20 (D)	0.063 to 0.070	Yes
-	2 <sup>nd</sup> comp. ring	Evaluative	-do-	0.20 (D)	0.067 to 0.069	Yes
-	Oil ring	Evaluative	-do-	0.15 (D)	0.045 to 0.049	Yes
(f)	<b>Clearance of main bearings (mm):</b>					
	Diametrical clearance	Evaluative	-do-	0.40 (D)	0.074 to 0.087	Yes
	Crankshaft end float	Evaluative		0.50 (D)	0.22	Yes
(g)	<b>Clearance of big end bearings, (mm):</b>					
-	Diametrical	Evaluative	-do-	0.40 (D)	0.063 to 0.091	Yes
-	Axial	Evaluative	-do-	0.50 (D)	0.40	Yes
(h)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.35 (D)	0.057 to 0.121	Yes
(i)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	0.45 (D)	0.136 to 0.157	Yes
<b>14.1.12</b>	<b>Literature (Submission to test agency)</b>					
(a)	Operator manual	Evaluative	The printed literature in booklet form should be provided as per IS 8132 & should submit along with the test sample	Provided / Not provided	Provided	Yes
(b)	Parts Catalogue	Evaluative			Provided	Yes
(c)	Workshop/ Service manual	Evaluative			Provided	Yes
<b>14.1.13</b>	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 11821 or OECD code or equivalent International standard		Not fitted	Not applicable
<b>14.1.14</b>	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with the tractor.		Provided	Yes
<b>14.1.15</b>	Accessories (optional)	Non Evaluative	Ballast weights, if fitted should meet the requirement of CMVR		Provided	Yes



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14.1.16 CATEGORY OF BREAKDOWNS / DEFECTS :					
Sl. 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 & 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	None	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	None	Yes

#### 14.3 Salient Observations:

##### 14.3.1 Laboratory tests:

- i) The maximum power in case of previous & present sample were recorded as **30.5 & 29.1 kW** respectively against the declaration of **29.2 kW** which meets the requirement of IS: 12207-2019.
- ii) The specific fuel consumption corresponding to maximum power in case of previous & present sample was recorded as **261 & 262 g/kWh** against the declaration of **249 g/kWh** respectively which meets the requirement of IS: 12207-2019 .
- iii) The maximum equivalent crankshaft torque in case of previous & present sample was recorded as **150.0 N-m & 141.7** against the declaration of **152.8 N-m** which is within the permissible limit as specified in IS: 12207-2019.
- iv) The backup torque is **27.4 %** & meets the evaluative requirement of **IS: 12207-2019**.

##### 14.3.1.2 Drawbar performance test:

- i) Maximum drawbar pull in case of previous & present sample with unballast corresponding to 15 percent wheel slip, was recorded as **16.48 kN & 15.39 kN** respectively against the minimum requirement of **13.04 kN** & which meets the requirement of IS: 12207-2019 .
- ii) Maximum drawbar power with unballast in case of previous & present sample was recorded as **25.8 kW & 24.1 kW** respectively against the minimum requirement of **23.3 kW** in case of present sample & which meet the minimum requirement of IS: 12207-2019 .
- iii) During ten hours drawbar performance test, creeping of LHS & RHS rear tyre over the rims was observed as **25 & 35 mm** respectively. This should be looked into for necessary corrective action.





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**14.3.1.3 Hydraulic performance test:**

The moment about rear axle with hitch points & standard frame was calculated as **14.54 kN-m** and **20.11 kN-m** respectively. Whereas, the moment about front axle was calculated as **12.81 kN-m** under unballast condition. The moment about rear axle at hitch point is on higher side as compared to the moment about front axle. It is, therefore, recommended that the lifting capacity of the hydraulic system may be reduced suitably or additional ballast mass may be provided at front axle to avoid the front lifting of the tractor.

**14.3.1.4 Mechanical Vibration:**

The amplitude of mechanical vibration on various assemblies marked as (\*) in **Chapter – 8** of this test report is on higher side. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

**14.4 Maintenance / Service Problems:**

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

**14.5 Recommendation with regard to safety on tractor:**

The following requirements, inter alia, may be considered for incorporation on the tractor:

- i) There should be provision for spark arresting device in exhaust system.
- ii) Longitudinal distance from SIP to center line of differential lock pedal.
- iii) There should be provision for PTO master shield.

**14.6 Adequacy of Literature supplied with machine:**

**14.6.1** Literature was supplied with the tractor for reference during the test.

- a) Operator's manual for KUBOTA MU 4501 & MU4501-4WD tractor model.
- b) Parts catalogue for KUBOTA MU 4501 & MU4501-4WD tractor model
- c) Workshop Manual for KUBOTA MU 4501 & MU4501-4WD tractor model.

**14.6.2** The supplied literature was found adequate.

**14.6.3** However, these literatures should be brought out in other vernacular languages of India for guidance of users



**15. Citizen charter**

Duration of Test	Time frame for testing & evaluation as per citizen charter	Whether the report released within time frame given in the citizen charter	Remark
07 Months (January, 2020 to July, 2020)	10 Months	Yes	--None--

**TESTING AUTHORITY:**

**C.S. RAGHUWANSHI**  
AGRICULTURAL ENGINEER

**C.V. CHIMOTE**  
TEST ENGINEER

**J.J.R. NARWARE**  
DIRECTOR

Test Report compiled by **Shri Shivkumar Sharma**, Senior Technical Assistant.

**16. APPLICANT'S COMMENTS**

--None --



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ANNEXURE - I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running-in (Engine)	50.0
2.	PTO Performance Test	25.8
3.	Power lift and hydraulic pump performance test	1.5
4.	Drawbar performance test	17.2
5.	Brake test	2.1
6.	Noise measurement	1.0
7.	Mechanical vibration test	1.0
8.	Nominal speed test	1.2
B.	HAULAGE TEST	5.2
C.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	5.1
<b>TOTAL:</b>		<b>110.1.</b>