व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT **(Initial)**

संख्या / No. : T-894/1409/2013
माह / Month : November, 2013

KUBOTA B2441 TRACTOR

सत्यमेव जयते

भारत सरकार

GOVERNMENT OF INDIA

कृषि मंत्रालय (कृषि एवं सहकारिता विभाग, मशीनीकरण एवं प्रोद्योगिकी प्रभाग)

Ministry of Agriculture (Deptt. of Agri. & Co-op, Mechanization & Technology Division

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO : 9001-2008 Certified Institute)

ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५ TRACTOR NAGAR, BUDNI (M.P.) 466445

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Manufacturer : **SIAM KUBOTA Corporation, Ltd**
Amata Nakorn Industrial Estate, Nonggaka, Panthong, Chonburi 20160-Thailand

Test requested by (applicant) : **KUBOTA Corporation, Chennai Liaison Office No.15, Medavakkam Road, Shonlinganallur, Chennai- 600 119, T. N., INDIA**

Place of running-in : At Applicant's works

Duration of said running-in, (h):
- Engine : 50
- Transmission : 50

Method of Selection : The tractor was submitted directly by the applicant for test. Hence, method of selection is not known.

1. SPECIFICATIONS

1.1 **Tractor:**
Make : Kubota
Model : B2441
Type : Four wheeled drive, agricultural tractor.
Year of manufacture : December, 2012
Chassis number : 30006ME
Country of origin : Thailand

1.2 **Engine:**
Make : Kubota, Japan
Model : D1105
Type : Four stroke, naturally aspirated, in-direct injection, liquid cool, diesel engine
Serial number : 1CU0863

1.2.1 **Engine speed(Manufacturer's recommended production setting), (rpm):**
- Maximum speed at no load : 2770 to 2820
- Low idle speed : 1050 to 1150
- Speed at maximum torque : 1600 to 1800

Rated speed, (rpm):
- For PTO use : 2600
- For drawbar use : 2600

1.3 **Cylinder & Cylinder Head:**
Number : Three
Disposition : Vertical, Inline
Bore/stroke, (mm) : 78/78.4 (apa)
Capacity as specified by the applicant, (cc) : 1123
Compression ratio : 24 : 1
Type of cylinder head : Monoblock
Type of cylinder liners : Wet, replaceable
Type of combustion chamber : In-direct combustion, Swirl chamber on piston crown
Arrangement of valves : Overhead, inline

Valve clearance (cold):
- Inlet valve, (mm) : 0.145 to 0.185
- Exhaust valve, (mm) : 0.145 to 0.185

1.4 **Fuel System:**
Type of fuel feed system : Gravity and force feed

1.4.1 **Fuel tank:**
Capacity, (l) : 24.0
Location : Above clutch housing
Provision for draining of sediments/ water : Not provided, however a water separator is provided with common to fuel filter
Material of fuel tank : Suntec-HD Compound B680 and B970 and black colouring agent of Asahi kasei chemicals corporation (apa)

1.4.2 **Water Separator:**
Make : Taiyo Giken, Thailand
Type : Gravity separation
Location : On fuel line, on RHS of engine (In combination with fuel filter)

1.4.3 **Fuel feed pump:**
Make : Kyosan-Denki, Japan (apa)
Type : Diaphragm-operated cam drive
Model/Group combination No. : None
Provision of sediment bowl : Not Provided
Method of drive : Through cam shaft of fuel injection pump

1.4.4 **Fuel filters:**
Make : Taiyo Giken, Thailand
Model/Group combination No. : Not available
Number : One
Type of element: : Paper
Capacity of final stage filter, (l) : 0.1

1.4.5 **Fuel Injection pump:**
Make : Zexel (Bosch Corporation, Japan)
Model/Group combination No. : Not Available
Type : Inline, plunger
Serial number : 63012 20925
Method of drive : Through timing gears

1.4.6 **Fuel injectors:**
Make : Zexel (Bosch Corporation, Japan)
Model : None
Type : Pintle
Manufacturer's production pressure setting, (MPa) : 13.7 to 14.7
Injection timing : 17 degree before TDC
Firing order : 1- 2 – 3

1.4.7 **Governor:**
Make : Nihon IET, Japan (apa)
Model/Group combination No. : None
Type : Mechanical, centrifugal, variable speed
Governed range of engine speed, (rpm) : 1050 to 2820
Rated engine speed, (rpm) : 2600

14.2 Clutch:

Any marked wear on clutch friction plates	:	None	
Condition of clutch release bearing	:	Normal	
Condition of release levers & springs	:	Normal	
Condition of pilot bearing	:	Normal	
Presence of oil in clutch housing	:	None	
Any marks on fly wheel/ pressure plate	:	None	
Overall thickness of clutch plate, (mm):	:	7.35 to 7.42	Against the discard limit of 0.3 mm above rivet head
Height of lining over rivet head, (mm):	:	1.43 to 1.56	

14.3 Transmission gears:

Any visual damage, pitting & chipping of any transmission gear teeth.	:	None
Backlash between crown wheel and pinion, (mm)	:	0.29

14.4 Brakes :

Description	Initial specified thickness of brake lining, (mm)	Measured overall thickness of brake disc after test, (mm)	Measured depth of oil groove, (mm)	Measured thickness of brake lining (mm)	Discard limit for thickness of brake lining (mm)
Left	3.30 to 3.5	3.36 to 3.39	0.27 to 0.31	0.79 to 0.82	2.0
Right	3.30 to 3.5	3.37 to 3.39	0.27 to 0.30	0.80 to 0.82	

Remark: **The measured thickness of brake lining is less than the discarded limit of 2.0 mm.**

14.5 Front axle:

The front axle final reduction unit case is directly connected with tie rod of steering system. Taper roller bearings are provided at bevel gear case & front axle case.

Condition of front axle seals and bearings		Normal	
Any visual damage, pitting & chipping of front axle transmition gear teeth		None	
Condition of centre pin & bushes		Normal	
Clearance between centre pin and bushes, (mm)	:	0.127 to 0.179	Against the discard limit of 0.45 mm

14.6 Steering system:

Visual condition of the components of complete steering assembly	:	Normal

14.7 Starter motor & Alternator:

Presence of soil/oil in housing	:	None
Condition of bearings and other components	:	Normal

15. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

S. No.	Adjustments/Defects/Breakdowns and repairs	Tractor run hours
1.	**- None-**	

16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

16.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2008 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: 12207:2008	Values declared by the applicant/ (D) Requirement (R)	As observed	Whether meets the require-ments (Yes/No.)
1	2	3	4	5	6	7
16.1.1	**PTO Performance :**					
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >35hp. –7.5/+10% for PTO power ≤ 35 hp	13 (D)	12.6	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	13 (D)	12.6	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	295 (D)	314	No
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	61.3 (D)	57.7	Yes
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	25 % (D)	24.89	Yes
f)	**Maximum operating temperature, (^{o}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 (D)	115	Yes
	2) Coolant (water)	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.	135 (D)	113	Yes
g)	3) Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	3.23 (R)	0.469	Yes
h)	4) 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)	0.65	Yes

1	2	3	4	5	6	7
16.1.2	**Drawbar performance :**					
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	5.04 (R) Minimum Not declared	7.53	Yes
b)	Max. drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast or with standard ballast.	4.05 (R) Minimum 5.0 (D)	6.42	Yes
c)	Maximum drawbar power without ballast, (kW).	Evaluative	Minimum 80% of PTO power as referred in 16.1.1 (a) of PTO performance	10.1 (R) Minimum 10.4 (D)	12.6	Yes
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	120 (D)	88	Yes
16.1.3	**Power lift and hydraulic pump performance :**					
a)	Maximum lifting capacity throughout the range of lift, (kN):					
	1) At hitch points	Non Evaluative	To be declared by manufacturer [Tolerance of minus 10%]	6.8 (D)	4.91	**No**
	2) With the standard frame	Evaluative	The lift capacity should at least be 18 kg/PTO hp. and it should be 16 kg/engine hp where the tractor is not provided with a PTO shaft	2.98 (R) Minimum 3.2 (D)	3.19	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	To be declared by manufacturer [Tolerance of plus 5 mm]	11 (D)	05	Yes
16.1.4	**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)	4.00	Yes
	2) Hot brake	Evaluative	10	10 (R)	4.15	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s^2 (N)	Evaluative	600	600 (R)	177 to 205	Yes
c)	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 (R)	Yes	Yes
16.1.5	**Noise measurement :**					
a)	Maximum ambient noise emitted by the tractor, dB(A)	Evaluative	As per CMVR	88 (R)	78	Yes
b)	Maximum noise at operator's ear level, dB(A)	Evaluative	As per CMVR	98 (R)	92	Yes

1	2	3	4	5	6	7
16.1.6	**Amplitude of mechanical vibrations at :**					
	1) Left foot rest	Non Evaluative	100 microns (max)	100 (R)	130	No
	2) Right foot rest				100	Yes
	3) Seat (with driver seated)				80	Yes
	4) Steering Wheel				100	Yes
16.1.7	**Haulage requirements :**					
a)	Gross mass of the trailers, (tones):					
	1) Two wheel	Non Evaluative	--	1.5 (D)	1.5	Yes
	2) Four wheel		--	Not Declared	--	--
b)	Distance travelled / litre of fuel consumption, (km/l):					
	1) Two wheel	Non Evaluative	--	7.7 to 7.9 (D)	6.89 to 6.97	Yes
c)	Fuel consumption (ml/km/tonne):					
	1) Two wheel	Non Evaluative	--	79 to 89 (D)	95.70 to 96.71	**No**
16.1.8	**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	No ingress of mud and / or water was observed	Yes
	1) Clutch assembly	-do-				
	2) Brake housings	-do-				
	3) Front axle hubs	-do-				
16.1.9	**Safety features :**					
a)	Guards against moving and hot parts	Evaluative	As per CMVR	At present no requirements	Provided	Yes
b)	Lighting arrangement	Evaluative	As per CMVR	--	Provided	Yes
16.1.10	**Labelling of tractors (Provision of labelling plate):**					
	1) Make	Evaluative	Should conform to the requirements of CMVR alongwith declared value of PTO HP	--	Kubota	Yes
	2) Model	Evaluative		--	B2441	Yes
	3) Year of manufacture	Evaluative		--	ME (i.e. December, 2012) **(coded form in chassis no.)**	Yes
	4) Engine number	Evaluative		--	1CU0863	Yes
	5) Chassis number	Evaluative		--	30006ME	Yes
	6) Declaration of PTO power, (kW)	Evaluative		--	13.0 kW @2600rpm	Yes

1	2	3	4	5	6	7
16.1.11	**Discard limit for:**					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer	78.15	78.02 to 78.03	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.30	0.069 to 0.081	Yes
(c)	**Ring end gap (mm):**					
	- Top comp. ring.	Evaluative	-do-	1.25	0.35	Yes
	- 2nd comp. ring.		-do-	1.25	0.35 to 0.40	Yes
	- Oil ring.		-do-	1.25	0.25 to 0.30	Yes
(d)	**Ring groove clearance (mm):**					
	- Top comp. ring.	Evaluative	-do-	0.20	Tapered	--
	- 2nd comp. ring.		-do-	0.20	0.097 to 0.098	Yes
	- Oil ring.		-do-	0.15	0.038 to 0.04	Yes
(e)	**Clearance of main bearings (mm):**					
	- Diametrical clearance	Evaluative	To be specified by the manufacturer	0.40	0.086 to 0.104	Yes
	- Crankshaft end float	Evaluative		0.50	0.22	Yes
(f)	**Clearance of big end bearings, (mm):**					
	- Diametrical	Evaluative	-do-	0.40	0.083 to 0.085	Yes
	- Axial	Evaluative	-do-	0.50	0.35	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	NA	NA	--
(h)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	0.45	0.127 to 0.179	Yes

16.1.12 CATEGORY OF BREAKDOWNS / DEFECTS :

S. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	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 frequency of each should not be more than two.	**None**	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed five, that is, (2 major + 3 minor) or 5 minor breakdowns.	**None**	Yes

16.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2008:

S. No.	Characteristic	Requirements as per IS: 12207-2008	As observed	Whether meets the requirements (Yes/No.)
1	2	3	4	5
1	Maximum oil pull over, (%)	0.25% (max.)	Not applicable	--
2.	Seating requirements	Should meet the requirements of IS: 12343-1998	Does not meets the requirements	**No**
3.	Fitment of ROPS	With a provision for fitment of ROPS.	Not provided	--
		If ROPS fitted it should meet the requirement of IS: 11821-1992	ROPS not fitted	--
4.	Technical requirements for PTO shaft	Should meet the requirements of IS: 4931 -1995	Does not meets the requirement	**No**
5.	Dimensions of three point linkage	Should meet the requirements of IS: 4468 (Part-I)-1997	Does not meets the requirements	**No**
6.	Specifications of linkage drawbar	Should meet the requirements of IS: 12953-1990.	Meets the requirements	Yes
	Specification of swinging drawbar	Should meet the requirements of IS: 12362 Part 3-1994.	Not provided	**Not applicable**
7.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Not provided (Front tow hook not provided)	**No**

16.3 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 in March, 2009)]	:	Conforms
ii)	Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3 (third revision)[IS: 4931-1995 (Reaffirmed in March, 2009)]	:	**Does not conform**
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 March, 2007)]	:	**Does not conform**
iv)	Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in March, 2007)]	:	Conforms
v)	Agricultural tractors - Operator's seat technical requirement (First revision) [IS 12343:1998 (Reaffirmed in March, 2009)]	:	**Does not conform**
vi)	Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision) :[IS 12239 (PT-1)-1996 (Reaffirmed in March, 2007)]/ISO 4254-1:1989]	:	**Does not conform**
vii)	Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) [(IS : 12239 (PT-2)-1999 (Reaffirmed in March, 2009)]	:	**Does not conform**
viii)	Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1)-2006 (Reaffirmed in March, 2009) and IS:6283 (Part-2)-2007 (Reaffirmed in March, 2009)]	:	Conforms
ix)	Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983 (Reaffirmed in March, 2009)]	:	Conforms
x)	Agricultural Tractor & Machinery Lighting device for travel on public roads [(IS: 14683-1999 (Reaffirmed in March, 2009)]	:	

16.4 Salient Observations:

16.4.1 Laboratory tests:

16.4.1.1 PTO Performance:

i) The backup torque is **24.89 %.**

ii) The specific fuel consumption corresponding to maximum power was measured as **314 g/kWh** against the declaration of **295 g/kWh**, which is does not meet the requirement of IS: 12207-2008.

16.4.1.2 Drawbar performance:

i) Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN) against the declared value by manufacturer is "left blank" in revised submitted document, which is not the appropriate declared value. The declaration as above is required to be given as per relevant IS. This should be looked into and correct declaration should be given in all marketing literatures, manuals for users.

16.4.1.3 Hydraulic Performance Test:

i) The maximum capacity through the range of lift at hitch point observed as 4.91 kN against declaration of 6.8 kN. Which does not meets the requirement of IS. This should be looked into.

ii) During testing it has been observed that "the three point linkage specification was "measured with narrow hitch as Cat. 1N in accordance with applicant. However, for hydraulic test the Cat.1 drawbar link chosen by applicant and 'Cat. 1N' withdrawn. During test instead of lower (rear) hole the next upper (front) hole of lift rod selected, which does not meets the preparation requirement of hydraulic test for 200 mm (max) height of lower hitch from ground level as par **clause 3.1.2 a) of IS:12224-1987** and accordingly does not meets the requirement of lower hitch point height, max as 200 mm as per IS:4468 (Part):1997.Due to not achievement of height of lower hitch from ground level the tractor is fail to give comparative performance on such achievable height. **Hence recommendation of Cat. 1N should be removed from all marketing literatures, manuals. The details of hydraulic lifting capacity on specific hole on lift rod should be recommended for this tractor to avoid any confusion of users.**

16.4.1.4 Mechanical Vibration:

The amplitude of mechanical vibration especially left foot rest and the 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.

16.4.1.5 Three point linkage:

i) Lateral movement of lower hitch point, transport height and power range of tractor does not meet the requirements of IS: 4468(Part I)-1997. This should be looked into for necessary corrective action.
The vertical movement with lifting force during hydraulic test was obtained as 425 mm only. This should be looked into.

16.4.1.6 Operator's seat:

The following points of operator's seat do not meet the requirement of IS: 12343:1998 (re-affirmed in March, 2009).

i) Length of seat
ii) Width of seat
iii) Provision for adjustment for driver's mass
iv) Vertical distance from SIP to centre of clutch pedal
v) Vertical distance from SIP to centre of brake pedal

vi) Longitudinal distance from SIP to centre of differential lock pedal.
vii) Longitudinal distance from SIP to centre of steering control wheel.
viii) Vertical distance from SIP to centre of steering control wheel.
ix) Lateral distance from SIP to centre of clutch pedal.
x) Lateral distance from SIP to centre of brake pedal

This should be looked into for necessary corrective action.

16.4.1.7 Symbols for operator controls and displays:

Grease lubricant type and frequency, oil lubricant type and frequency, colour codes for engine revolution gauge, colour codes for coolant temperature gauge, Colour codes for fuel level gauge are not identifiable with the symbols as per IS:6283 (Part-1 &2) -1998. This should be pay attention for improvement as per IS.

16.4.1.8 General:

1. The year of manufacture on labelling plate is given in the coded form in chassis no; this should be provided in the numerical form as per relevant IS for better understanding of users. The year of manufacture should be provided in specialized column on labelling plate.
2. The measured thickness of brake lining was 0.79 to 0.82 mm and overall thickness of brake disc was 3.36 to 3.39 mm against the discard limit of 2.0 mm thickness of brake lining. This should be looked into.

16.4.2 Field performance test

16.4.2.1 Dry land cultivation (Ploughing operation):

1. The draft control liver is not provided on the tractor. Hence it create difficulty for setting desired depth during rotavator operation.
2. During dry field test the primary implement as single bottom m.b. plough was not worked satisfactory even with recommended ballast. Hence as per request of applicant all the field test (dry land and wet land operation) was carried out with rotavator implement only. Hence, it is recommended that the suitable improvement to achieve the desired depth of operation of ploughing necessary improvement in design of tractor and hydraulic system should me made. Necessary information that **" Tractor is not suitable for ploughing operation"** should be given in all literature with bolded font.

16.4.2.2 Wet land cultivation (Puddling operation):

No ingress of mud and / or water was noticed during puddling operation of the tractor and meet the requirements of IS: 11082-1984 (Technical requirements of agricultural tractors for wetland operation). Therefore, the tractor is recommended as suitable for wetland operation (Puddling).

16.5 Haulage test:

i) The specific fuel consumption (ml/km/tonne) with two wheel trailer was observed as 95.70 to 96.71 ml/km/tonne against the declaration of 79 to 89 ml/km/tonne, which does not meets the requirements of IS: 12207-2008. This should look into for necessary corrective action.

16.6 Maintenance / Service Problems:

No noticeable maintenance/service problem was observed during the test. The oil change period after first change for engine sump and gear box is given as 100 hrs and 400 hrs respectively. The changeling period of oil is very short and cause costly maintenance. This should be looked into.

16.7 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 of master shield for PTO shaft.

iii) Front tow hook should be provided.
iv) Working clearance around position control lever and main shifting gear lever, 4WD engaging lever and rear wheel mudguard, PTO speed lever and High-Medium- Low speed gear lever as per relevant IS.
v) Mounting of canopy above operator's seat
vi) Cautionary notice as per para 11.2 of IS:12239 (Part-2)-1999

16.8 **Adequacy of Literature supplied with machine:**
The following literature has been supplied with the tractor
i) Operator's manual (For Kubota A211 N and Kubota B 2441 tractors models).
ii) Illustration part's list (For Kubota A211 N and Kubota B 2441 tractors models).
iii) Service manual ((For Kubota A211 N and Kubota B 2441 tractors models).
The technical details of PTO power, drawbar power, hydraulic power, haulage recommendation and specification details, fuel saving tips, ballasting details should be provided in the operator's manual.
The details of para **16.4.1.3 and 16.4.2.1** of this test report should also be provided in the manual.

16.8.1 The literatures should also be brought out in national as well as other regional languages for the guidance of users and service personnel.

17. Citizen charter

Duration of Test	Test duration under citizen charter	Whether the report released within time frame given citizen charter	Remark, if any
10 Months	7 Months (May, 2013 to November, 2013)	Yes	None

TESTING AUTHORITY:

P. C. MESHRAM
AGRICULTURAL ENGINEER

P. K. VERMA
SENIOR AGRICULTURAL ENGINEER

C.R.LOHI
DIRECTOR

18. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
18.1	16.3	We will look into all the non-conformity and will try to rectify it.
18.2	16.4.1.3(ii)	We have specified lift rod & lower link hole as per our manual, which could be specified by manufacturer. As per your concern it is not reaching the height from ground level 200 mm, in this regard we agreed the same. In regard to withdrawn of Cat 1 N, we will specify Cat. 1 to all required areas, but most of the occasion customer/farmer chooses his own decision.
18.3	16.4.1.4	We will consult with our engineering department to dampen down the vibration.
18.4	16.8.1	We are providing our leaflet to user with local language.

ANNEXURE- I

BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST

S.No	I t e m	Rotavator
1.	Make	Kubota
	Type	Mounted
3.	No. of blades	20 in 5 flanges
4.	Type of blades	Hatchet
5.	Size of blades, (mm)	235 x 60 x 5
6.	Spacing of flanges, (mm)	200
7.	Lower hitch point span, (mm)	520
8.	Mast height, (mm)	480
9.	Overall dimensions (mm)	
	- Length	1200
	- Width	925
	- Height	950
10.	Gross mass, (kg)	220