



DEUTZ-FAHR, AGROMAXX - 50 TRACTOR



भारत सरकार
कृषि मंत्रालय
(कृषि एवं सहकारिता विभाग)

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(DEPARTMENT OF AGRICULTURE & CO-OPERATION)

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

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

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T-854/1364/2012

DEUTZ-FAHR, AGROMAXX - 50 TRACTOR - Commercial (Initial)

Manufacturer : M/s. SAME DEUTZ-FAHR INDIA (P) LTD
72, SIPCOT, Industrial Complex,
Ranipet – 632 403 (Tamil Nadu)

Test requested by (applicant) : The manufacturer
Selected for test by : Applicant

Place of running-in : At applicant's works

Duration of said running-in (h):
- Engine : Nil
- Transmission : 25

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

1. SPECIFICATION

1.1 Tractor:

Make : DEUTZ-FAHR
Model : AGROMAXX 50
Variant(s) (if Any) : None
Brand name : None
Type : Four wheeled, rear wheel driven, general
purpose agricultural tractor.

Year of manufacture : 2011
Chassis number : DF10026H 11
Country of Origin : INDIA

1.2 Engine:

Make : SAME DEUTZ-FAHR INDIA (P) LTD
Model : 1000.3W-45 CV
Type : Four stroke, naturally aspirated, liquid
cooled, direct injection, diesel engine

Serial number : 3C29706H11

Engine speed (Manufacturer's recommended production setting) (rpm) :

- Maximum speed at no load : 2330 to 2430
- Low idle speed : 600 to 900
- Speed at maximum torque : 1150 to 1400

Rated speed, (rpm):

- For PTO use : 2200
- For drawbar use : 2200

1.3 Cylinder & Cylinder Head:

Number : Three
Disposition : Vertical, inline
Bore/stroke, (mm) : 105 / 115.5
Capacity as specified by the : 3000
applicant, (cc)



1	2	3	4	5	6	7
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	30.73	32.6	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	265	249	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	173	183.2	Yes
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	7	29.5	Yes
f)	Maximum operating temperature (°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.	150	127	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.	120	102	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.51	0.60	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 meter (Max.)	0.31	Yes
16.1.2	Drawbar performance :					
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	19.70	22.40	Yes
b)	Max. drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast	12.24	15.46	Yes
c)	Maximum drawbar power without ballast (kW).	Evaluative	Min. 80% of PTO power as referred in 16.1.1 (a) of PTO performance	26.1	26.6	Yes
d)	Max. transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	120	81	Yes

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:

S. No.	Characteristic	Category (Evaluative/ Non Evaluative)	Requirements as per IS: 12207-2008	Values declared by the applicant/ Requirement	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
16.1.1	PTO Performance :					
a)	- Max. 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	30.73	32.6	Yes



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1	2	3	4	5	6	7
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	[Tolerance of minus 10%]	14.0	17.02	Yes
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	7.80	15.09	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	[Tolerance of plus 5 mm]	40	04	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 ballast, (m):					
1)	Cold brake	Evaluative	10	10.0	7.34 to 7.44	Yes
2)	Hot brake	Evaluative	10	10.0	7.78	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600	264 to 325	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	Yes	Yes	Yes
16.1.5	Noise measurement :					
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88	85	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	98	94	Yes
16.1.6	Amplitude of mechanical vibrations at :					
1)	Left foot rest	Non Evaluative	100 microns (max)	100	220	No
	Right foot rest			100	160	No
2)	Seat (with driver seated)			100	80	Yes
3)	Steering wheel			100	190	No
16.1.7	Haulage requirements :					
a)	Gross mass of the trailers, (tones):					
1)	Two wheel	Non Evaluative	--	5.0	5.0	Yes
2)	Four wheel	Evaluative	--	6.0	6.0	Yes
b)	Distance travelled / litre of fuel consumption, (km):					
1)	Two wheel	Non Evaluative	--	4.5 to 5.75	5.05 to 5.09	Yes
2)	Four wheel			4.5 to 5.5	4.29 to 4.35	Yes



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1	2	3	4	5	6	7
c)	Fuel consumption (ml/km/tonne):					
1)	Two wheel	Non Evaluative	--	30 to 40	39.3 to 39.6	Yes
2)	Four wheel		--	30 to 40	38.3 to 38.8	Yes
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.	Yes	No ingress of mud and/or water observed	Yes
1)	Clutch assembly	-do-	If tractor does not meet the requirements of wetland cultivation, it may be recommended for dry land operation only.			
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	--	Yes	Yes
16.1.10	Labelling of tractors (Provision of labelling plate):					
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	DEUTZ-FAHR	Yes	
2)	Model	Evaluative		AGROMAXX 50	Yes	
3)	Year of manufacture	Evaluative		2011	Yes	
4)	Engine number	Evaluative		302970 6H11	Yes	
5)	Chassis number	Evaluative		DF 10026H11	Yes	
6)	Declaration of PTO power, kW (hp)	Evaluative		30.7(41.8)	Yes	
16.1.11	Discard limit for:					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer	105.10	105.00 to 105.01	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.42	0.141 to 0.145	Yes
(c)	Ring end gap (mm):					
-	Top comp. ring.	Evaluative	-do-	1.5	0.45 to 0.50	Yes
-	2 nd comp. ring.		-do-	1.5	0.50 to 0.55	Yes
-	Oil ring.		-do-	1.5	0.35 to 0.45	Yes
(d)	Ring groove clearance (mm):					
-	Top comp. ring.	Evaluative	-do-	0.25	0.133 to 0.135	Yes
-	2 nd comp. ring.		-do-	0.25	0.075 to 0.076	Yes
-	Oil ring.		-do-	0.15	0.052 to 0.055	Yes



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(e) Clearance of main bearings (mm):						
-	Diametrical clearance	Evaluative	-do-	0.40	0.092 to 0.103	Yes
-	Crankshaft end float	Evaluative	-do-	0.50	0.18	Yes
(f) Clearance of big end bearings, (mm):						
-	Diametrical	Evaluative	-do-	0.40	0.084 to 0.098	Yes
-	Axial	Evaluative	-do-	0.50	0.40	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.85	0.10 to 0.11	Yes
(h)	Clearance between center pin and bush, (mm)	Non Evaluative	-- do--	0.85	0.09 to 0.10	Yes

16.1.12 CATEGORY OF BREAKDOWNS / DEFECTS :					
S. No.	Characteristic	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	Air cleaner oil pull over, max. oil pull over (%)	0.25% (max.)	Not applicable	--
2.	Seating requirements	Should meet the requirements of IS: 12343-1998	Does not meet the requirement	No
3.	Fitment of ROPS	With a provision for fitment of ROPS.	Provision exist	Yes
		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 meet the requirement	No
5.	Dimensions of three point linkage	Should meet the requirements of IS: 4468 (Part-I)-1997	Conforms	Yes
6.	Specifications of linkage drawbar	Should meet the requirements of IS: 12953-1990 and IS:12362 Part 3-1994.	Conforms	Yes
	Specifications of swinging drawbar		Not provided	--
7.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Provided	Yes



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- 16.3 Conformity with following IS:**
- Guide lines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS 10273:1987 (Reaffirmed in Oct. 2004)] : Conforms
 - Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3(third revision)[IS: 4931-1995 (Reaffirmed in Oct. 2004)] : **Does not conform**
 - 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)/ISO730-1:1994] : Conforms
 - Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in March, 2007)] : Conforms
 - Agricultural tractors - Operator's seat technical requirement [IS 12343 -1998 (First revision) (Re-affirmed in Dec, 2004)] : **Does not conform**
 - 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**
 - Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1 & Part-2) –1998(Re-affirmed in Dec, 2003)/ ISO 3767-2:1991]] : Conforms
 - Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) [(IS 12239 (PT-2) 1999) (Re-affirmed in Oct. 2004)] : Conforms
 - Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983) (Re-affirmed in Oct. 2004) : Conforms
 - Agricultural Tractor & Machinery Lighting device for travel on public roads (IS: 14683-1999) (Re-affirmed in Oct. 2004) : Conforms

16.4 Salient Observations:**16.4.1 Laboratory tests:****16.4.1.1 PTO Performance:**

- The backup torque is 29.5%.
- The specific fuel consumption corresponding to maximum power was recorded as 249 g/kWh, against the declaration of 265 g/kWh.

16.4.1.2 Drawbar performance:

The maximum drawbar power and pull during unballasted condition were observed as 26.6 kW and 15.46 kN which meets the requirements of IS 12207-2008.

**16.4.1.3 Hydraulic performance :**

- i) During the lifting capacity test the hydraulic lower link got stuck in raised position.
- ii) During ploughing operation the desired depth of cut was not achieved.

The reason for the defects should be analyzed and corrected at production level

- ii) The moment about the rear axle was computed as 23.54 kN-m at standard frame, which is considered on higher side as compared to the moment from front axle i.e. 15.13 kN-m. It is therefore, recommended that the lifting capacity of the hydraulic system may be reduced suitably or standard ballast mass at front axle may be provided to avoid front lifting of the tractor.

16.4.1.4 Mechanical Vibration:

The amplitude of mechanical vibration on various assemblies marked as (*) in Chapter-8 of this test report is on higher side. Especially at the foot rest and steering control wheel. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

16.4.1.5 Three point linkage:

Distance from the end of power take-off to centre of lower hitch point (lower links in horizontal position) conforms to 'Cat-I' whereas other parameters conforms to 'Cat-II'. Keeping in the view the spirit of standardization, necessary improvements may be incorporated.

16.4.1.6 Specifications of Power Take-off Shaft:

Dimension "A \emptyset " (Refer Fig.2) of PTO shaft does not meet the requirement of IS: 4931:1995. This should be looked into for compliance.

16.4.1.7 Operator's Seat:

The width of seat does not meet the requirements of IS: 12343-1999. It should be looked into for compliance.

16.4.1.8 Labelling Plate:

The labelling plate meets the requirements of IS:10273-1987

16.4.2 Field Performance:**16.4.2.1 Wet land cultivation (Puddling Operation):**

The tractor meets the requirements of IS:11082-1984 and is found suitable for wet land cultivation (puddling operation).

16.5 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 silencer

16.6 Maintenance / Service Problems:

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

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

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


- i) Use & Maintenance Manual for Agrolux-40 , 45, 50 & 55 tractors.
- ii) Spare parts catalogue for Agromaxx series tractors
- iii) Workshop service Manual for Agromaxx series tractors


The supplied literature was found adequate. However, the literature may also be brought out in national as well as other regional languages.

16.8 Citizen Charter:

Duration of Test	Test duration under citizen charter	Whether the report released within time frame given in citizen charter	Remark
May 2012 to December 2012 – 8 Months	10 Months	Yes	--

TESTING AUTHORITY:


R. K. NEMA
AGRICULTURAL ENGINEER


P. K. VERMA
SENIOR AGRICULTURAL ENGINEER


C.R. LOHI
DIRECTOR



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17. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
17.1	16.4.1.3 & 16.4.1.4	Would be analyzed/reviewed.
17.2	16.4.1.5	Would be reviewed.
17.3	16.4.1.6	Will corrected in production.
17.4	16.4.1.7	Will be taken up for necessary corrective action.
17.5	16.7	Suggestion is considered.

APPENDIX - I

BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST

S. No.	Item	Disc Plough	Rotavator
1.	Make	NA	Shaktimaan
2.	Type	Mounted	Mounted
3.	No. of disc blades	Two	36 in 7 flanges
4.	Type of disc blades	Plain concave	Hatchet
5.	Size of disc blades, (mm)	660	160 x 85 x 7
6.	Spacing of disc /flanges, (mm)	485	235
7.	Lower hitch point span, (mm)	795	810
8.	Mast height, (mm)	520	580
9.	Overall dimensions, (mm):		
	- Length	1400	850
	- Width	950	1800
	- Height	1155	1150
10.	Gross mass, (kg)	245	280

ANNEXURE - II

BRIEF SPECIFICATION OF FULL CAGE WHEEL

S. No.	Items	Specification
1.	Type	Full cage wheel
2.	Dia. (mm)	1210
3.	Width (mm)	900
4.	No. and type of lugs	24, straight lugs made up of MS angle section welded to angle iron frame.
5.	Size of angle section, (mm)	40 x 40 x 5
6.	Length of lugs, (mm)	444
7.	Spacing lugs, (mm)	290
8.	Weight of cage wheels (kg)	120



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APPENDIX - III

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	11.7
3.	Power lift and hydraulic pump performance test	5.0
4.	Drawbar performance test	13.3
5.	Turning ability	0.3
6.	Location of centre of gravity	0.3
7.	Operator's field of vision	0.1
8.	Brake test	1.4
9.	Noise measurement	1.6
10.	Mechanical vibration test	1.0
11.	Theoretical speed test	0.8
B.	FIELD TEST:	
1.	Disc ploughing	11.9
2.	Rotavation	10.6
3.	Puddling (Including water proof test for 5.0 hrs.)	15.2
C.	HAULAGE TEST:	9.5
D.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	13.1
	TOTAL:	95.8