



DEUTZ-FAHR, AGROMAXX 55 (4WD), 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
TRACTOR NAGAR, BUDNI (M.P.) - 466 445
E-mail : fmti-mp@nic.in Web site : cfmtti.dacnet.nic.in



T-849/1359/2012

DEUTZ-FAHR, AGROMAXX 55 (4WD) 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 55 (4WD)
Type : Four wheeled, 4WD, standard agricultural tractor.
Year of manufacture : 2011
Chassis number : D*10056H11
Country of Origin : India
- 1.2 Engine:**
Make : SAME DEUTZ-FAHR INDIA (P) LTD
Model : 1000.3W-50 CV
Type : Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.
Serial number : 3A30177H11
Engine speed (Manufacturer's recommended production setting), (rpm) :
- Maximum speed at no load : 2470 to 2570
- Low idle speed : 550 to 900
- Speed at maximum torque : 1150 to 1400
Rated speed, (rpm):
- For PTO use : 2350
- For drawbar use : 2350
- 1.3 Cylinder & Cylinder Head:**
Number : Three
Disposition : Vertical, inline
Bore/stroke, (mm) : 105 / 115.5
Capacity as specified by the applicant, (cc) : 3000
Compression ratio, (apa) : 17 ± 0.3 : 1
Type of cylinder head : Individual
Type of cylinder liners : Wet, replaceable
Type of combustion chamber : Open cavity on piston crown
Arrangement of valves : Overhead



T-849/1359/2012	DEUTZ-FAHR, AGROMAXX 55 (4WD) TRACTOR- Commercial (Initial)
-----------------	--

Condition of seals for stub axles and king pins. : Normal
 Clearance between centre pin and bush, (mm) : 0.10 | Against the discard limit of 0.85 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.	During PTO performance power search test at natural ambient condition, the maximum no load engine speed was observed as 2510 rpm and 2553 rpm with the help of hand accelerator and foot accelerator respectively. Thus, there was a difference of 43 engine rpm when hand and foot accelerator was applied. So, the same was got rectified by adjusting the hand accelerator lever linkages.	4.8
2.	During the drawbar performance test maximum power was observed as 26.2 kW against the requirement of 27.9 kW as per IS: 12207-2008. On inspection, the primary and secondary fuel filters were found choked and in dirty condition. So, both primary and secondary fuel filters were replaced with new ones of same specifications.	28.4

16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

16.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameters 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 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.	33.6 (D)	34.9	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	33.48 (D)	34.9	Yes



T-849/1359/2012	DEUTZ-FAHR, AGROMAXX 55 (4WD) TRACTOR- Commercial (Initial)
-----------------	--

1	2	3	4	5	6	7
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	265 (D)	261	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	175 (D)	180.3	Yes
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	7 percent, min.(R)	27.1	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.	155 (D)	132	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 (D)	102	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	Maximum 1% of SFC (R)	0.46	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)	Max 3.25 per meter (R)	0.43	Yes
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	21.93 (D) 22.06 (R) Minimum	28.42	Yes
b)	Maximum drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast	13.96 (D) 14.09 (R) Minimum	20.47	Yes
c)	Maximum drawbar power without ballast, (kW).	Evaluative	Min. 80% of PTO power as referred in 17.1.1(a) of PTO performance	26.88 (D) 27.9 (R) Minimum	29.9	Yes
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company.	120 (D)	83	Yes



T-849/1359/2012	DEUTZ-FAHR, AGROMAXX 55 (4WD) TRACTOR- Commercial (Initial)
-----------------	--

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%]	14.00 (D)	18.17	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.	9.00(D) 8.26 (R) Minimum	17.58	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 (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 ballast* (m):						
1)	Cold brake	Evaluative	10	10 (R)	5.92	Yes
2)	Hot brake	Evaluative	10	10 (R)	6.28	Yes
b) Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s² (N)						
		Evaluative	600	600 (R)	304 to 383	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)	87	Yes
b) Maximum noise at operator's ear level dB(A)						
		Evaluative	As per CMVR	98 (R)	94	Yes
16.1.6 Amplitude of mechanical vibrations at :						
1)	Left foot rest	Non Evaluative	100 microns (max)	100 (R)	180	No
2)	Right foot rest		100 (R)	290	No	
3)	Seat (with driver seated)		-do-	100 (R)	60	Yes
4)	Steering wheel		-do-	100 (R)	160	No
16.1.7 Haulage requirements :						
a) Gross mass of the trailers, (tones):						
1)	Two wheel	Non Evaluative	--	5.0 (D)	5.0	Yes
2)	Four wheel	Evaluative	--	6.0 (D)	6.0	Yes
b) Distance travelled / litre of fuel consumption, (km/l):						
1)	Two wheel	Non Evaluative	--	4.25 to 6.50 (D)	4.66	Yes



T-849/1359/2012	DEUTZ-FAHR, AGROMAXX 55 (4WD) TRACTOR- Commercial (Initial)
-----------------	--

1	2	3	4	5	6	7
	2) Four wheel	Non Evaluative	--	4.25 to 6.50 (D)	3.72	No
c) Fuel consumption (ml/km/tonne):						
1)	Two wheel	Non Evaluative	--	30 to 50 (D)	45.63	Yes
2)	Four wheel		--	25 to 40 (D)	46.84	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	--	DEUTZ- FAHR	Yes	
2)	Model	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	AGROMAXX 55 (4WD)	Yes	
3)	Year of manufacture	Evaluative	--	2011	Yes	
4)	Engine number	Evaluative	--	3A30177H11	Yes	
5)	Chassis number	Evaluative	--	D*10056H11	Yes	
6)	Declaration of PTO power, (kW)	Evaluative	--	33.6	Yes	
16.1.11 Discard limit for:						
(a) Cylinder bore diameter, (mm)						
		Evaluative	To be specified by the manufacturer	105.1	105.00 to 105.01	Yes
(b) Clearance between piston & cylinder liner at skirt, (mm)						
		Non Evaluative		0.42	0.130 to 0.132	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	0.50 to 0.55	Yes



1	2	3	4	5	6	7
(d)	Ring groove clearance (mm):					
	- Top comp. ring.	Evaluative	To be specified by the manufacturer	0.25	0.138 to 0.147	Yes
	- 2 nd comp. ring.		-do-	0.22	0.065 to 0.071	Yes
- Oil ring.	-do-		0.15	0.051 to 0.056	Yes	
(e)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	-do-	0.40	0.074 to 0.106	Yes
	- Crankshaft end float	Evaluative	-do-	0.50	0.13	Yes
(f)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.40	0.058 to 0.069	Yes
	- Axial	Evaluative	-do-	0.50	0.50	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.85	0.11	Yes
(h)	Clearance between center pin and bush, (mm)	Non Evaluative	-do-	0.85	0.10	Yes

16.1.12 CATEGORY OF BREAKDOWNS / DEFECTS :

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	As observed	Whether meets the requirements (Yes/No.)
1.	Critical	Evaluative	There should be no 'critical breakdown' during its validation after all tests including Repeat / Supplementary tests.	None	Yes
2.	Major	Evaluative	There should not be more than two 'major breakdowns' and neither of them is of repetitive nature.	None	Yes
3.	Minor	Evaluative	There should not be more than five 'minor defects' during the test 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	Remarks
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.	Not provided	No
		If ROPS fitted it should meet the requirement of IS: 11821-1992	Not provided	--
4.	Technical requirements for PTO shaft	Should meet the requirements of IS: 4931 -1995	Meets the requirements	Yes



1	2	3	4	5
5.	Dimensions of three point linkage	Should meet the requirements of IS: 4468 (Part-I)-1997	Meets the requirements	Yes
6.	Specifications of linkage drawbar	Should meet the requirements of IS: 12953-1990.	Meets the requirements	Yes
	Specifications of swinging drawbar	Should meet the requirements of IS: 12362 Part 3-1994.	Not provided	--
7.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Provided	Yes

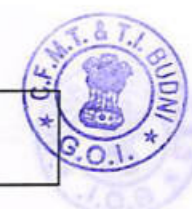
- 16.3 Conformity with following IS:**
- i) Guidelines for declaration of power and specific fuel consumption and labelling of agricultural tractors (First revision) [IS10273: 1987 (Reaffirmed in March, 2009)] : Conforms
 - ii) Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS:4931-1995 (Reaffirmed in March, 2009)] : 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) / ISO 730-1:1994] : Conform
 - iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed March, 2007)] : Conforms
 - v) Agricultural tractors - Operator's seat technical requirement [IS: 12343 -1998 (First revision) (Reaffirmed in March, 2009)] : **Does not conform**
 - vi) Guide for safety & comport of operator of agricultural tractors: Part 1 General requirements (first revision): [IS: 12239 (Part-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 (Part-2) 1999) (Reaffirmed in March, 2009)] : **Does not conform**
 - viii) Guidelines for location and operation of operator controls on agricultural tractors and machinery (first revision) IS: 8133-1983 (Reaffirmed in March, 2009)] : Conform
 - ix) 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
 - x) Agricultural Tractors and Machinery - Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed in March, 2009)] : Conforms



T-849/1359/2012

DEUTZ-FAHR, AGROMAXX 55 (4WD) TRACTOR-
Commercial (Initial)

- 16.4 Salient Observations:**
- 16.4.1 Laboratory tests:**
- 16.4.1.1 PTO Performance:**
- The backup torque is observed as 27.1%.
 - The specific fuel consumption corresponding to maximum power was observed as 261 g/kWh against the declaration of 265 g/kWh, which meet the requirement of IS: 12207-2008 with regard to tolerance.
- 16.4.1.2 Drawbar performance:**
During drawbar performance ten hour test, creeping of LHS & RHS rear tyre over the rims was observed as 35 mm & 60 mm respectively, which was considered on higher side. This should be looked into for necessary corrective action.
- 16.4.1.3 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 left foot rest, right foot rest and steering wheel. This calls for dampening down of vibrations to improve the operational comfort and service life of components.
- 16.4.1.4 Linkage drawbar:**
Some of the parameters of linkage drawbar conform to Cat.I and some of them conform to Cat.II. In view of the spirit of standardization, necessary improvement may be incorporated.
- 16.4.1.5 Operator's seat:**
The Length of seat, Inclination of seat towards rear direction and Vertical distance from seat index point to the center of steering wheel does not meet the requirements of IS: 12343-1998. This should be looked into for necessary corrective action.
- 16.4.1.6 Location and operation of operator's control:**
Working clearance between position control lever and the mudguard does not meet the requirement of the IS: 12239 (Part-2)-1996. This should be looked into for necessary corrective action.
- 16.4.2 Field performance test:**
- 16.4.2.1 Wetland 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).
- 16.4.2.2 Haulage test:**
- The distance travelled per litre of fuel consumption with four wheel trailer was observed as 3.72 km/l against the declaration 4.25 to 6.5 km/l. This does not meet the requirement of IS: 12207-2008 and therefore, should be looked into for necessary corrective action.
 - The fuel consumption with four wheel trailer was observed as 46.84 ml/km/tonne against the declaration 25 to 40 ml/km/tonne. This does not meet the requirement of IS: 12207-2008 and therefore, should be looked into for necessary corrective action.
- 16.4.3 Wear assessment and final inspection:**
During wear assessment and final inspection, the axial clearance of big end bearings was observed as 0.50 mm and which approaches to the discard limit of 0.50 mm, that too, in 99.7 hours of tractor operation. This should be looked into for necessary corrective action.



T-849/1359/2012

DEUTZ-FAHR, AGROMAXX 55 (4WD) TRACTOR-
Commercial (Initial)

- 16.5 Maintenance / Service Problems:**
No noticeable maintenance or service problem was observed during the test.
- 16.6 Recommendation with regard to safety on tractor:**
The following requirements, inter-alia, may be considered for incorporation on the tractor:
- Provision of spark arresting device in exhaust system.
 - The working clearance between the position control and the mudguard may be provided as per IS: 12239 (Part-2) – 1999.
- 16.7 Adequacy of Literature supplied with machine:**
- 16.7.1** The following literature was supplied with the tractor for reference during the testing.
- Use and Maintenance manual in respect of Agromaxx 40, Agromaxx 45 Agromaxx 50, Agromaxx 55 and Agromaxx 60 tractor models.
 - Workshop service manual for Agromaxx series tractors.
 - Spare Parts Catalogue for Agromaxx series tractors.
- 16.7.2** Information related to PTO , Drawbar and hydraulic performance of the tractor such as, maximum engine power, rated engine power, maximum torque, backup torque, specific fuel consumption, maximum drawbar power & pull, hydraulic pump discharge rate, hydraulic power & lifting capacities etc should be included in the technical specification of the tractor for the guidance of the user's.
- 16.7.3** The literatures should also be brought out in national as well as other regional languages for the guidance of users and service personnel.

TESTING AUTHORITY:C. V. CHIMOTE
TEST ENGINEERP. K. VERMA
SENIOR AGRICULTURAL ENGINEER
C. R. LOHI
DIRECTORTest Report compiled by: **Sh. Pramod Yadav and Sh. P. Rishi Prakash**, Senior Technical Assistants.



T-849/1359/2012

DEUTZ-FAHR, AGROMAXX 55 (4WD) TRACTOR-
Commercial (Initial)**17. APPLICANT'S COMMENTS**

Para No.	Our Reference	Applicant's comments
17.1	16.4.1.2, 16.4.1.3, 16.4.1.4, 16.4.1.6, 16.4.2.2 & 16.4.3	Would be reviewed.
17.2	16.4.1.5	Will be taken up for necessary correction.
17.3	16.7.2	Necessary information will be provided.
17.4	16.7.3	Suggestion is considered.

ANNEXURE- I**BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST**

S. No	Item	Disc Plough	Rotavator
1.	Make	Field king	Shaktimaan
2.	Type	Mounted	Mounted
3.	No. of bottoms/blades	Three	36
4.	Type of bottoms/blades	Plain concave	Hatchet
5.	Size of bottoms/blades, (mm)	600	160 x 85 x7
6.	Spacing of bottoms/flanges, (mm)	490	235
7.	Lower hitch point span, (mm)	770	810
8.	Mast height, (mm)	500	580
9.	Overall dimensions, (mm):		
	- Length	1840	850
	- Width	950	1800
	- Height	1155	1150
10.	Gross mass, (kg)	285	280

ANNEXURE- II**BRIEF SPECIFICATION OF FULL CAGE WHEEL**

S. No.	Items	Specifications
1.	Type	full cage wheel
2.	Dia, (mm)	1210
3.	Width, (mm)	900
4.	No. and types 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 of lugs, (mm)	290
8.	Weight of each cage wheels (kg)	120



T-849/1359/2012

DEUTZ-FAHR, AGROMAXX 55 (4WD) TRACTOR-
Commercial (Initial)**ANNEXURE- III****TRACTOR RUN HOURS DURING TEST**

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	14.6
3.	Power lift and hydraulic pump performance test	4.0
4.	Drawbar performance test	19.5
5.	Turning ability	0.5
6.	Location of centre of gravity	0.5
7.	Operator's field of vision	--
8.	Brake test	1.3
9.	Noise measurement	2.7
10.	Air cleaner oil-pull over test	--
11.	Mechanical vibration test	1.0
12.	Theoretical speed test	1.0
	B. FIELD TEST:	
1.	Disc plough	10.3
2.	Rotavation	10.2
3.	Puddling (including five hours water proof test)	15.0
	C. HAULAGE TEST:	10.9
D.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	8.2
	TOTAL:	99.7