



DEUTZ-FAHR, AGROMAXX 45 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, CO-OPERATION & 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

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2. ESSENTIAL TEST

2.1. SPECIFICATION OF VARIANT MODEL "DEUTZ-FAHR, AGROMAXX 45" TRACTOR

The following are the brief specifications of the tractor. However, for detail specifications, the test report No. T-855/1365/2012 released in December, 2012 should be referred.

- 2.1.1 Tractor:**
- | | |
|-----------------------------|--|
| Make | : DEUTZ-FAHR |
| Model | : AGROMAXX 45 |
| Brand name | : None |
| Type | : Four wheeled, rear-wheel driven, General purpose, Unit construction, Agricultural Tractor. |
| Month & Year of manufacture | : 08 19 |
| Chassis Serial number | : M1TAE91RDHE000546 |
| Country of Origin | : India |
- 2.1.2 Engine:**
- | | |
|--|---|
| Make | : SAME DEUTZ-FAHR INDIA (P) LTD |
| Model | : 1000.3W-40 CV (apa) |
| Type | : Four stroke, naturally aspirated, water, cooled, direct injection, diesel engine. |
| Serial number | : 3B51562H19 |
| 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 |
- 2.1.3 Cylinder & Cylinder Head:**
- | | |
|--|--------------------|
| Number | : Three |
| Disposition | : Vertical, inline |
| Bore/stroke, (mm) | : 105 / 115.5 |
| Capacity as specified by the applicant, (cc) | : 3000 |
- 2.1.4 Fuel System:**
- | | |
|--------------------------|---------------------------|
| Type of fuel feed system | : Gravity and forced feed |
|--------------------------|---------------------------|
- 2.1.4.1 Fuel feed pump:**
- | | |
|-----------------------------|-------------|
| Make | : TVS |
| Type | : Diaphragm |
| Model/Group combination No. | : None |
- 2.1.4.2 Fuel Injection pump:**
- | | |
|-----------------------------|-----------------------|
| Make | : Bosch |
| Model/Group combination No. | : 0414 191 012 |
| Type | : Individual, plunger |
| Serial number | : 95953544 |
- 2.1.4.3 Fuel injectors:**
- | | |
|------------------------------|-------------------------------|
| Make | : Bosch, India |
| Model/Group combination No.: | |
| Holder number | : KBEL 98P 278 |
| Nozzle no. | : DSLA 153P5558 |
| Type | : Multi hole (four holes) |
| Injection timing | : 8 ± 1 degree before TDC |



3. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

3.1 The performance results have been reproduced from test report No. T-855/1365/2012 released in **December, 2012.** / On the basis of test conducted the performance results have been summarized as evaluative (mandatory) and non – evaluative (not mandatory) parameters applicable for Qualifying Minimum Performance Criteria as per clause-4 Table-1 of Indian Standard **12207: 2019** for acceptance of 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
3.1.1 PTO Performance :						
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: ± 5 % for PTO power and or Engine power >26 kW. -10% for PTO power and or engine < 26 kW	26.5 (D)	27.7	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	26.5 (D)	27.7	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10%	265 (D)	262	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	+ 8%	147(D)	167.4	No
e)	Back-up torque, percent	Evaluative	12 percent, min.	12 % (D) 12 % (R)	39.4	Yes
f) Maximum operating temperature, (°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.	150 (D)	129	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.	120 (D)	93	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.53 (R) Minimum	0.11	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.	3.25 per metre (R)	0.34	Yes



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1	2	3	4	5	6	7
3.1.2 Drawbar performance (*) :						
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip or 7 percent track slip, (kN)	Non Evaluative	Minimum 70% of static mass with ballast	21.39(D) 20.18 (R) Minimum	21.18	Yes
b)	Max. drawbar pull without ballast corresponding to 15 percent wheel slip or 7 percent track slip, (kN)	Evaluative	Minimum 70% of static mass of tractor without ballast or with standard ballast, as the case may be	13.52 (D) 12.77 Minimum	13.75	Yes
c)	Maximum drawbar power without ballast, ballast as in case may be, (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.) 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.	21.2 (D) 22.2 (R) Minimum	26.4	Yes
d)	Maximum transmission oil temperature (°C)	Evaluative	To be declared by the manufacturer.	120 (D)	78	Yes
3.1.3 Power lift and hydraulic pump performance (*) :						
a) Maximum lifting capacity throughout the range of lift, (kN):						
	1) At hitch points	Evaluative	Tolerance of ± 10%	17.0 (D)	18.65	Yes
	2) With the standard frame	Evaluative	The lift capacity should at least be 21 kg/PTO kW, and it should be 21.5 kg/engine kW where the tractor is not provided with a PTO shaft	7.0(D) 6.74 (R) Minimum	16.00	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	00	Yes
3.1.4 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 m	10 (R)	6.97	Yes
	2) Hot brake	Evaluative	10 m	10 (R)	7.14	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600 N	600 (R) Maximum	261 to 275	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



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6	7
21.18	Yes
13.75	Yes
26.4	Yes
78	Yes
18.65	Yes
16.00	Yes
00	Yes
6.97	Yes
7.14	Yes
261 to 275	Yes
Yes	Yes

1	2	3	4	5	6	7
3.1.5	Noise measurement (*):					
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	88 dB (A) for >1.5 tonne GVW and 85 dB (A) for <1.5 tonne GVW (as per CMVR)		82	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	96 (as per CMVR)		93	Yes
3.1.6	Amplitude of mechanical vibrations at(*):					
1)	Left foot rest	Non Evaluative	100 microns (max)		80	Yes
2)	Right foot rest				100	Yes
3)	Seat (with driver seated)				60	Yes
4)	Steering wheel				210	No
3.1.7	Air cleaner oil pull over test (*):					
	Maximum air cleaner oil pull over, (%)	Evaluative	0.25% (Max)		Dry type air cleaner fitted	Not applicable
3.1.8	Haulage requirements (*):					
a)	Gross mass of the trailers, (tones):					
	Two wheel	Non Evaluative	To be specified by manufacturer	5.0 (D)	5.0	Yes
	Four wheel	Evaluative		6.0 (D)	6.0	Yes
b)	Distance travelled / liter of fuel consumption, (km/l):					
	Two wheel	Non Evaluative	-do-	5.5 to 7.5 (D)	5.34 to 5.35	No
	Four wheel	Evaluative		4.5 to 6.5 (D)	3.96 to 4.06	No
c)	Fuel consumption (ml/km/tonne):					
	Two wheel	Non Evaluative	-do-	30 to 35 (D)	37.32 to 37.47	No
	Four wheel			28 to 35 (D)	41.05 to 42.06	No
3.1.9	Wetland cultivation (Puddling Operation) (*):					
	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 (R)	No ingress of water was observed during water proof test vide test report no .T-855/1365/2012 (December ,2012)	Yes
	1) Clutch assembly	-do-				
	2) Brake housings	-do-				
	3) Front axle hubs	-do-				
	4) Engine oil	-do-				
	5) Transmission oil	-do-				
3.1.10	Safety features :					
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes (As per IS: 12239 (Part-2)		Meet the requirements	Yes
b)	Lighting arrangement	Evaluative	As per CMVR		Meet the requirements	Yes



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1	2	3	4	5	6
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 requirements
d)	Technical requirements for PTO shaft	Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)		Meet the requirements
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)		Meet the requirements
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS 12953 (As amended from time to time)		Meet the requirements
(g)	Swinging drawbar (wherever fitted)	Evaluative	Should meet the requirements of IS 12362 (Part 3) (As amended from time to time)		Not provided
(h)	1) Maximum traveling speed at rated engine speed in reverse gear, kmph	Evaluative	Should not exceed 20 kmph		12.80 kmph (Meets the requirement)
	2) Audible warning signal on tractor	Evaluative	As soon as the travelling speed in reverse gear reaches to 20 kmph, an audible warning 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

3.1.11 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.	DEUTZ- FAHR		Yes
2)	Model	Evaluative		AGROMAXX 45		Yes
3)	Month & Year of manufacture	Evaluative		08	19	Yes
4)	Engine number	Evaluative		3B51562H19		Yes
5)	Chassis number	Evaluative		M1TAE91RDHE000546		Yes
6)	Declaration of PTO power, (kW)	Evaluative		26.47		Yes
7)	Specific Fuel Consumption g/kWh	Evaluative		265		Yes

3.1.12 Discard limit for, (mm) (*):

(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer and supported by the printed literature	105.1 (D)	105.02	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.42 (D)	0.109 to 0.127	Yes
(c)	Piston diameter at skirt, (mm)	Non Evaluative		104.680	104.893 to 104.901	Yes



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6	7	1	2	3	4	5	6	7
Does not meet the requirements	No	(d)	Ring end gap (mm):					
			- Top comp. ring.	Evaluative	-do-	1.5 (D)	0.50 to 0.55	Yes
			- 2 nd comp. ring.			1.5 (D)	0.55 to 0.65	Yes
			- Oil ring.			1.5 (D)	0.45 to 0.55	Yes
Meet the requirements	Yes	(e)	Ring groove clearance (mm):					
			- Top comp. ring.	Evaluative	-do-	0.25 (D)	0.139 to 0.159	Yes
			- 2 nd comp. ring.			0.25 (D)	0.056 to 0.074	Yes
			- Oil ring.			0.15 (D)	0.044 to 0.07	Yes
Meet the requirements	Yes	(f)	Clearance of main bearings (mm):					
			- Diametrical clearance	Evaluative	-do-	0.40 (D)	0.104 to 0.122	Yes
			- Crankshaft end float	Evaluative		0.50(D)	0.12	Yes
Meet the requirements	Yes	(g)	Clearance of big end bearings, (mm):					
			- Diametrical	Evaluative	-do-	0.40 (D)	0.089 to 0.108	Yes
			- Axial	Evaluative	-do-	0.50 (D)	0.45	Yes
Not provided	No	(h)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.85 (D)	0.037 to 0.169	Yes
12.80 kmph (Meets the requirement)	Yes	(i)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	0.85 (D)	0.112 to 0.163	Yes
		3.1.13	Literature (Submission to test agency) (*)					
		(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	Yes
		(b)	Parts Catalogue	Evaluative			Provided	Yes
		(c)	Workshop / Service manual	Evaluative			Provided	Yes
Not Applicable	No	3.1.14	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
		3.1.15	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage, crawler should be provided with the tractor.		Provided	Yes
		3.1.16	Accessories (optional)	Non Evaluative	Ballast weights, if fitted, should meet the requirement of CMVR		Provided	Yes
		3.2	CATEGORY OF BREAKDOWNS / DEFECTS (As per Clause 5.0 of IS:12207-2019) :					
		S. 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 2 major breakdowns and neither of them is of repetitive nature.	None	Yes	
		3.	Minor	Evaluative	There are not more than 5 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 five that is, (2 major + 3minor) or (1 major + 4 minor) or 5 minor breakdown.	None	Yes	

Remark :- (*) Data taken from test report no.T-855/1365/2012, (December,2012).



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**DEUTZ-FAHR, AGROMAXX 45 TRACTOR-
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- i) The maximum power was observed as **27.7 kW** against the declaration of **26.5 kW** which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- ii) The specific fuel consumption corresponding to maximum power was measured as **265 g/kWh** against the declaration of **265 g/kWh**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit
- iii) The maximum equivalent crankshaft torque was recorded as **167.4 Nm** against the declaration of **147.0 Nm**, which does meets the non evaluative requirement of IS: 12207-2019.
- iv) The backup torque was observed as **39.4 %**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit

This tractor model meets the evaluative requirements of IS: 12207-2019.

4. CITIZEN CHARTER

Time frame for Testing & Evaluation as per Citizen Charter	Duration of Test	Whether the Test Report is released within the time frame given in Citizen Charter	Remarks
10 Months	02 Month (May, 2020 to June,2020)	Yes	--None--

TESTING AUTHORITY:

C.S. RAGHUWANSHI
AGRICULTURAL ENGINEER

C.V. CHIMOTE
TEST ENGINEER

J.J.R. NARWARE
DIRECTOR

The report compiled by: **Shri Pratyush Satya**, Senior Technical Assistant

5. APPLICANT'S COMMENTS

--None--



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ANNEXURE - I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running-in	--
2.	Nominal speed test	1.3
3.	PTO performance test	4.3
B	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	0.5
	TOTAL:	6.1

Remarks

--None--