

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

संख्या / No. : T-1018/1542/2016
माह / Month : March, 2016



ESCORTS LIMITED, FARMTRAC 6050 F1 UM



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय
(कृषि, सहकारिता एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(DEPARTMENT OF AGRICULTURE, CO-OPERATION AND FARMERS WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO : 9001 - 2008 Certified Institute)

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ESCORTS LIMITED, FARMTRAC 6050 F1 UM - Commercial (Initial)

Manufacturer : ESCORTS LIMITED
Plot No. 2 & 3, Sector – 13
Faridabad – 121007
Haryana

Test requested by (applicant) : Escorts R&D Centre
15/5, Mathura Road,
Faridabad – 121003
Haryana

Selected for test by : Applicant

Place of running-in : At applicant's works

Duration of said running-in (h):

- Engine : 20

- Transmission : 30

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 : ESCORTS LIMITED
- Model : FARMTRAC 6050 F1 UM
- Variants, if any : None
- Brand name : FARMTRAC
- Type : Four wheeled, Four wheel drive, General Purpose, Agricultural Tractor
- Year of manufacture : 2014
- Chassis number : T05-2327819
- Country of Origin : INDIA
- 1.2 Engine:**
- Make : ESCORTS LIMITED
- Model : AF 3.344F-3A(apa)
- Type : Four stroke, liquid cooled, direct injection, diesel engine.
- Serial number : E-2332288
- Engine speed (Manufacturer's recommended production setting) (rpm) :**
- Maximum speed at no load : 2150 to 2250
- Low idle speed : 600 to 700
- Speed at maximum torque : 1000 to 1200
- Rated speed, (rpm):**
- For PTO use : 1850
- For drawbar use : 1850
- 1.3 Cylinder & Cylinder Head:**
- Number : Three
- Disposition : Vertical, inline
- Bore/stroke, (mm) : 111.76/117
- Capacity as specified by the applicant, (cc) : 3440



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: 12207-2014 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: 12207-2014	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)	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 >26 kW, -7.5/+10% for PTO power ≤ 26 kW or -5 / +10% for Engine power >26 kW, -7.5/+10% for Engine power ≤ 26 kW	32.3 (D)	32.1	Yes	
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	32.3 (D)	31.5	Yes	
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	260 (D)	261	Yes	
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	215 (D)	194	No	
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	10 %, Minimum (R)	23.5	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.	130 (D)	106	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.	110 (D)	81	Yes	
g)		Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at maximum power under High ambient conditions.	2.60 (D)	0.40	Yes
					2.63 (R)		
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	0.22 per meter	Yes	



REQUIREMENTS

Requirements applicable for IS 12207-2014 for tractors are summarized as follows:

As observed Whether meets the requirements (Yes/No.)

6 7

32.1 Yes

31.5 Yes

261 Yes

194 No

23.5 Yes

106 Yes

81 Yes

0.40 Yes

22 per meter 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	--	--	--
b)	Maximum drawbar pull with standard ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast or with standard ballast as the case may be.	14.0 (D) 18.26 (R)	26.42	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.	25.80 (D) 25.68 (R)	27.7	Yes
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	125 (D)	109	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%]	13.70(D)	14.08	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 and it should be 16 kg/engine hp where the tractor is not provided with a PTO shaft	9.80 (D) 9.77 (R)	13.34	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]	Observed value should not exceed 50 mm.	99	No
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)	8.08	Yes
2)	Hot brake	Evaluative	10	10 (R)	8.14	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (g)	Evaluative	600	600 (R)	266 to 338	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	Yes	Yes



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1	2	3	4	5	6	7	
16.1.5	Noise measurement :						
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88 (R)	84	Yes	
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	96 (R)	96	Yes	
16.1.6	Amplitude of mechanical vibrations at :						
	1) Left foot rest	Non Evaluative	100 microns (max)	100 (R)	90	Yes	
	2) Right foot rest			100 (R)	30	Yes	
	3) Seat (with driver seated)			-do-	100 (R)	50	Yes
	4) Steering wheel			-do-	100 (R)	160	No
16.1.7	Air cleaner oil pull over (%).	Non Evaluative	0.25% (maximum)	Nil	Dry type air cleaner is provided	----	
16.1.8	Haulage requirements :						
a)	Gross mass of the trailers, (tones):						
	1) Two wheel	Non Evaluative	--	5.0 (D)	5.0	Yes	
	2) Four wheel		--	6.0 (D)	6.0	Yes	
b)	Distance travelled / litre of fuel consumption, (km/l):						
	1) Two wheel	Non Evaluative	--	5.0 to 7.5 (D)	3.13 to 4.16	Yes	
	2) Four wheel		--	5.0 to 7.5 (D)	4.19 to 4.72	Yes	
c)	Fuel consumption (ml/km/tonne):						
	1) Two wheel	Non Evaluative	--	27.0 to 35.0 (D)	48.11 to 50.77	No	
	2) Four wheel		--	27.0 to 35.0 (D)	35.25 to 39.69	No	
16.1.9	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 (R)	No ingress of water and/or mud found	Yes	
	1) Clutch assembly	-do-					
	2) Brake housings	-do-					
	3) Front axle hubs	-do-					



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6	7
84	Yes
96	Yes
90	Yes
80	Yes
50	Yes
60	No
Type air liner is provided	---
60	Yes
60	Yes
to 4.16	Yes
to 4.72	Yes
11 to 0.77	No
25 to 9.69	No
Progress of air and/or found	Yes

1	2	3	4	5	6	7
16.1.10 Safety features :						
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 (part 2))	Conforms		Yes
b)	Lighting arrangement	Evaluative	As per CMVR	Conforms		Yes
c)	Seating requirements	Non Evaluative	Should meet the requirements of IS 12343 (as amended from time to time)	Conforms		Yes
d)	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS 4931 (as amended from time to time)	Conforms		Yes
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS 4468 (part 1) (as amended from time to time)	Does not conform		No
f)	Specifications of linkage drawbar	Non Evaluative	Should meet the requirements of IS 12953 and IS 12362 (part 3) (as amended from time to time)	Conforms		Yes
	Specifications of swinging drawbar	Non Evaluative		Not provided		No
16.1.11 Labelling of tractors (Provision of labeling plate):						
1)	Make	Evaluative	Should conform to the requirements of CMVR	--	ESCORTS LIMITED	Yes
2)	Model	Evaluative		--	FARMTRAC 6050 F1 UM	Yes
3)	Year of manufacture	Evaluative		--	14-K-17	Yes
4)	Engine serial number	Evaluative		--	E-2332288	Yes
5)	Chassis serial number	Evaluative		--	T05-2327819	Yes
6)	Declaration of PTO power, (kW)	Evaluative		--	32.3	Yes
16.1.11 Discard limit for:						
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer and supported by printed literature	112.323	111.019 to 111.632	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.550	0.150 to 0.165	Yes
(c)	Piston diameter	Non Evaluative		When the ring and groove clearance exceeds 0.2 for compression & 0.3 for oil ring	111.625 to 111.632	Yes
(d)	Ring end gap (mm):					
	- Top comp. ring.	Evaluative	To be specified by the manufacturer and supported by printed literature	2.0	0.40 to 0.45	Yes
	- 2 nd comp. ring.		-do-	2.0	0.40 to 0.45	Yes
	- Oil ring.		-do-	2.0	0.48 to 0.50	Yes
(e)	Ring groove clearance (mm):					
	- Top comp. ring.	Evaluative	-do-	0.2	0.138 to 0.142	Yes
	- 2 nd comp. ring.		-do-	0.2	0.119 to 0.136	Yes
	- Oil ring.		-do-	0.3	0.085 to 0.095	Yes



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1	2	3	4	5	6	7
(f)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	-do-	0.5	0.125 to 0.178	Yes
	- Crankshaft end float	Evaluative	-do-	0.8	0.15	Yes
(g)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.8	0.121 to 0.149	Yes
	- Axial	Evaluative	-do-	0.9	0.38	Yes
(h)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.50	NA (4WD)	--
(i)	Clearance between center pin and bush, (mm)	Non Evaluative	-do-	0.50	0.10 to 0.15	Yes

17.1.13 Literature (Submission to test agency)

(a)	Operator manual	Evaluative	Provided/Not Provided	As relevant IS Code (IS 8132)	per IS (IS 8132)	Provided	Yes
(b)	Parts Catalogue	Evaluative	Provided/Not Provided	As relevant IS Code (IS 8132)	per IS (IS 8132)	Provided	Yes
(c)	Workshop/Service manual	Evaluative	Provided/Not Provided	As relevant IS Code (IS 8132)	per IS (IS 8132)	Provided	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.	One	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.	One	Yes

16.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2014:

S. No.	Characteristic	Requirements as per IS: 12207-2014	As observed	Whether meets the requirements (Yes/No.)
1.	Fitment of ROPS	With a provision for fitment of ROPS. If ROPS fitted it should meet the requirement of IS: 11821-1992.	ROPS not fitted	No
2.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Meets the requirements	Yes



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	7
178	Yes
	Yes
0.149	Yes
	Yes
D)	--
0.15	Yes
ed	Yes
ed	Yes
ed	Yes
ed	Whether meets the requirements (Yes/No.)
	Yes
	Yes
e	Yes
e	Yes
d	Whether meets the requirements (Yes/No.)
ed	No
ts	Yes

16.3 Conformity with following IS:

- i) Guide lines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS 10273:1987 (Reaffirmed in March, 2009)] : Conform
- 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/ISO 730-1:1994 (Reaffirmed in March, 2009)] : Conform
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in March, 2007)] : Conform
- v) Agricultural tractors - Operator's seat technical requirement [IS 12343 -1998 (First revision) (Reaffirmed in March, 2009)] : Conform
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision) : [IS 12239 (PT-1) 1996/ISO 4254-1:1989 (Reaffirmed in (Reaffirmed in March, 2007))] : **Does not conform**
- vii) 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) -2006 & 2007 (Reaffirmed in March, 2009)]/ ISO 3767-2:1991] : Conform
- viii) 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**
- 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)] : Conforms

16.4 Salient Observations:
 16.4.1 Laboratory tests:
 16.4.1.1 PTO Performance:
 i) The backup torque is. **23.52%**.



- 16.4.1.2 Noise Level**
Maximum noise at operator's ear level dB (A) is observed as 96 dB(A), which approaches the limit. 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-7 of this test report is on higher side, especially at the steering control wheel, mud guard (RHS), tail light, plough light and accelerator lever (hand & foot). This calls for dampening down of vibrations to improve the operational comfort and service life of components.
- 16.4.1.4 Three point linkage And Linkage drawbar:**
Some of the parameters of three point linkages and linkage drawbar meet to the Cat.I and some are to Cat. II. This should be looked into for necessary corrective action.
- 16.5 Hydraulic system:**
During load maintenance of lift load the three point lift drop beyond the limit mentioned in IS 12207: 2014 i.e. 50mm This should be looked into for necessary corrective action.
- 16.6 Wet land cultivation (Puddling operation):**
No ingress of mud/or water was noticed during puddling operation of the tractor. Hence, It meets the requirements of IS: 11082-1984 (Technical requirements of agricultural tractors for wetland operation). The tractor is suitable for wetland operation (Puddling).
- 16.7 Maintenance / Service Problems:**
No noticeable maintenance or service problem was observed during the test.
- 16.8 Recommendation with regard to safety on tractor:**
The following requirements, inter alia, may be considered for incorporation on the tractor:
i) Provision of spark arrester in the exhaust system.
iii) Provision of PTO master shield.
- 16.9 Adequacy of Literature supplied with machine:**
- 16.9.1** The following literature was been supplied with the tractor for reference during the testing.
i) Operator's manual
ii) Spare part's catalogue
iii) Service manual
- 16.9.2** The supplied literature was found adequate, however, full illustration of labeling plate and list of accessories supplied with the tractor should also be included in the Owner's service manual Book-I. The service/workshop manual should also be brought for the guidance of service personnel.
- 16.9.3** These literatures may also be brought out in national & other regional languages for the guidance of user's and service personnel.



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17.0 Citizen charter

Duration of Test	Test duration under citizen charter (including supplementary test)	Whether the report released within time frame given citizen charter	Remark, if any
9 Months (July, 2015 to March, 2016)	10 Months	Yes	---

TESTING AUTHORITY:


RAKESH PALIWAL
 AGRICULTURAL ENGINEER


P. C. MESHAM
 SENIOR AGRICULTURAL ENGINEER


C. R. LOHI
 DIRECTOR

18. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
18.1	18.4.1.3,16.4.1.4,16.5,16.8,16.9.3	Your valuable comments & suggestions for improvements are well taken. Under our policy of continuous product improvement these aspects are further being looked into and will try to eliminate these deviations soon wherever necessary

ANNEXURE- I

BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST

S. No.	Particular	Disc Plough	Rotavator	Rotopuddler
1	Make	Field king	Maschio Italy	Escorts
2	Type	Mounted	Mounted	Mounted
3	No. of Bottoms/Blades	Three	42, in 8 flanges	46
4	Type of Bottom/Blades	General purpose	Hatchet	Hatchet
5	Size of Bottoms/Blades (mm)	385	245x75x6	255x45x6.6
6	Spacing of bottoms/Flanges, (mm)	280	245	NA
7	Lower hitch point span, (mm)	785	735	755
8	Wast height, (mm)	510	470 & 610	660
9	Overall Dimensions (mm):			
	Length	1920	1020	2045
	Width	1040	1985	940
	Height	1180	1045	1215
10	Gross Mass, (Kg)	345	440	385



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ANNEXURE-II**TRACTOR RUN HOURS DURING TEST**

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	11.3
3.	Power lift and hydraulic pump performance test	3.6
4.	Drawbar performance test	13.4
5.	Turning ability	0.2
6.	Location of centre of gravity	0.2
7.	Operator's field of vision	0.1
8.	Brake test	1.5
9.	Noise measurement	1.83
10.	Mechanical vibration test	1.0
11.	Theoretical speed test	1.0
B.	FIELD TEST:	
1.	Disc ploughing	10.74
2.	Rotavation	10.25
3.	Puddling	10.33
C.	HAULAGE TEST:	6.05
D.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	7.47
	TOTAL:	78.97