



**ESCORTS LIMITED, FARMTRAC 6045 TRACTOR**



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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T-993/1517/2015

**ESCORTS LIMITED, FARMTRAC 6045 TRACTOR –  
Commercial (Initial)**

**Manufacturer** : M/s. Escorts Limited,  
Plot No 2 & 3, Sector-13,  
Faridabad – 121007 (Haryana)

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

**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 6045  
**Brand name** : Farmtrac  
**Type** : Four wheeled, rear-wheel driven, Standard Agricultural Tractor.  
**Year of manufacture** : 2014  
**Chassis number** : T052326347  
**Country of origin** : India  
**Variants, if any \*** : None

**1.2 Engine:**

**Make** : Escorts Limited  
**Model** : AF3.315H-3A  
**Type** : Four stroke, naturally aspirated, water cooled, direct injection, diesel engine.  
**Serial number** : E2330874

**1.2.1 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)** : 111.76/106.68  
**Capacity as specified by the applicant, (cc)** : 3140  
**Compression ratio** : 18.4 ± 5% : 1





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**15.7 Starter motor & Alternator:**

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

**16. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS**

Sl. No.	Adjustments/Defects/Breakdowns and Repairs	Tractor run hour
1.	The tyre tube valve of RHS wheel was broken during Ten hour test of drawbar.	30.76

**17. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS**

**17.1** Evaluative (mandatory) / Non-evaluative (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:

Sl. 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
<b>17.1.1</b>	<b>PTO Performance :</b>					
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	28.7 (D)	28.8	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	28.7 (D)	28.3	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	256 (D)	274	No
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	181.4 (D)	169.19	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	18% Min (D)	23.03	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.	130D)	114	Yes



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1	2	3	4	5	6	7
	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.	110(D)	89	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.56 (D) 2.74 (R)	0.258	Yes
h)	Smoke level	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR)	3.25 per meter (R)	0.25 per meter	Yes
<b>17.1.2 Drawbar performance :</b>						
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	17.30 Minimum (D) 17.89 Minimum (R)	21.90	Yes
b)	Max. drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast	Minimum 13.6 (D) Minimum 14.32 (R)	16.84	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.	23.0 Minimum (D) Minimum (R) 23.0	27.8	Yes
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	125 (D)	106	Yes
<b>17.1.3 Power lift and hydraulic pump performance :</b>						
a)	Maximum lifting capacity throughout the range of lift, (kN):					
	1) At hitch points	Non Evaluative	[Tolerance of minus 10%]	14.7 (D)	15.0	Yes





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1	2	3	4	5	6	7
	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	9.80 (D) 6.78(R) (Minimum)	12.92	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	Observed value should not exceed 50 mm.	50 (D)	50	Yes
<b>17.1.4 Brake performance at 25 kmph:</b>						
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with U ballast* (m):					
	1) Cold brake	Evaluative	10	10 (R)	8.08	Yes
	2) Hot brake	Evaluative	10	10 (R)	8.30	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s <sup>2</sup> (N)	Evaluative	600	600 (R)	327 to 400	Yes
<b>17.1.5 Noise measurement:</b>						
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	86 (R)	83	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	96 (R)	89	Yes
<b>17.1.6 Amplitude of mechanical vibrations at :</b>						
	1) Left foot rest	Non Evaluative	100 microns (max)	100 (R)	100	Yes
	2) Right foot rest				100	Yes
	3) Seat (with driver seated)				130	No
	4) Steering Wheel				160	No
<b>17.1.7 Air Cleaner Oil pull Over:</b>						
	Maximum percentage of oil pull over	Non Evaluative	0.25% (Max)	0.25%	0.0 to 0.07	Yes
<b>17.1.8 Haulage requirements :</b>						
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	--	4.5 to 7.5 D)	4.87 to 5.30	Yes



1	2	3	4	5	6	7
	2) Four wheel		--	4.5 to 7.5 D)	4.87 to 4.98	Yes
c)	Fuel consumption (ml/km/tonne):					
	1) Two wheel	Non Evaluative	--	30 to 35 (D)	37.72 to 41.10	No

	2) Four wheel		--	30 to 35 (D)	33.45 to 34.25	Yes
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17.1.9 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	No ingress of water and/or mud was observed	Yes
	1) Clutch assembly	-do-				
	2) Brake housings	-do-				
	3) Front axle hubs	-do-				
	4) Engine oil	-do-				
	5) Transmissi on oil	-do-				

17.1.9 Safety features :						
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 (part 2)	Conforms	Conforms	Yes
b)	Lighting arrangement (Tractor having more than 1150 mm rear track width)	Evaluative	As per CMVR	--	Provided	Yes
c)	Seating requirement (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 requirement	No
d)	Technical requirements for PTO shaft	Non-Evaluative	Should meet the requirements of IS 4931 (as amended from time to time)	--	Does not meet the requirement	No
e)	Dimension of three point linkage	Non-Evaluative	Should meet the requirements of IS 4468 (part 1) (as amended from time to time)	--	Does not meet the requirement	No
f)	Specification of linkage and swinging drawbars	Non-Evaluative	Should meet the requirements of IS 12953 and IS 12362 (part 3) (as amended from time to time)	--	Conforms	Yes





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1	2	3	4	5	6	7	
<b>17.1.10</b>	<b>Labelling of tractors (Provision of labelling plate):</b>						
	1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	--	Escorts limited	Ye
	2)	Model	Evaluative		--	Farmtrac 6045	Ye
	3)	Year of manufacture	Evaluative		--	2014	Ye
	4)	Engine number	Evaluative		--	E2330874	Ye
	5)	Chassis number	Evaluative		--	TO5-2326347	Ye
	6)	Declaration of PTO power, (kW)	Evaluative		--	28.7	Ye
<b>17.1.11</b>	<b>Discard limit for:</b>						
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer	+0.50 (D)	111.775 to 111.780	Ye	
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.550 (D)	0.174 to 0.183	Ye	
(c)	<b>Ring end gap (mm):</b>						
	- Top comp. ring	Evaluative	-do-	2.0 mm for all	0.50 to 0.55	Ye	
	- 2 <sup>nd</sup> comp. ring		-do-		0.55 to 0.70	Ye	
	- Oil ring		-do-		0.65 to 0.70	Ye	
(d)	<b>Ring groove clearance (mm):</b>						
	- Top comp. ring	Evaluative	-do-	0.70	0.133 to 0.136	Ye	
	- 2 <sup>nd</sup> comp. ring		-do-	0.70	0.130 to 0.137	Ye	
	- Oil ring		-do-	0.40	0.099 to 0.102	Ye	
(e)	<b>Clearance of main bearings (mm):</b>						
	- Diametrical clearance	Evaluative	To be specified by the manufacturer	0.50	0.168 to 0.184	Ye	
	- Crankshaft end float	Evaluative		0.80	0.25	Ye	
(f)	<b>Clearance of big end bearings, (mm):</b>						
	- Diametrical	Evaluative	-do-	0.60	0.162 to 0.171	Ye	
	- Axial	Evaluative	-do-	0.80	0.30 to 0.35	Ye	
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.40	0.200 to 0.273	Ye	
(h)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	0.50	0.259 to 0.272	Ye	
<b>17.1.12</b>	<b>Literature (Submission to test agency)</b>						
(a)	Operator manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Ye	
(b)	Parts Catalogue	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Ye	
(c)	Workshop/Service manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Ye	



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1	2	3	4	5	6
<b>17.1.13 CATEGORY OF BREAKDOWNS / DEFECTS :</b>					
S. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	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

<b>17.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2014:</b>				
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.	Not provided	Not applicable
		If ROPS fitted it should meet the requirement of IS:11821-1992	Not provided	Not applicable
2.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Provided	Yes

**17.3 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)]/ISO 730-1:1994] : **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 [IS 12343 -1998 (First revision) (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 February, 2012)]/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, : Conforms  
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]]
- ix) Guide lines for location and operation of operator : **Does not conform**  
controls on agricultural tractors and machinery (first  
revision) (IS: 8133 – 1983) (Reaffirmed in March,  
2009)]
- x) Agricultural Tractor & Machinery Lighting device for : Conforms  
travel on public roads (IS: 14683-1999) (Reaffirmed in  
March, 2009)]

**17.4 Salient Observations:****17.4.1 Laboratory tests:****17.4.1.1 PTO Performance:**

- i) The backup torque is 23.03%
- ii) The specific fuel consumption corresponding to maximum power was measured as 274 g/kWh against the declaration of 256 g/kWh, which is not within the tolerance limit of IS: 12207-2014. This may be looked into for necessary corrective action

**17.4.1.2 Drawbar performance test:**

- i) During 10 hour drawbar test, the creeping of LHS & RHS rear tyre over the rim was observed as 75 mm & 170 mm respectively, which was considered on higher side. This may be looked into for necessary corrective action.
- ii) During Ten hour test due to excess creeping on RHS tyre tube valve was broken. This may be looked into for necessary corrective action.

**17.4.1.3 Hydraulic Performance:**

- i) The lifting capacity of lower hitch point & standard frame was recorded as 15.0 kN & 12.92 kN & the moment about rear axle 13.5 kN-m & 11.63 kN-m respectively. The moment about rear axle is on lower side as compare to the moment about front axle i.e. 18.31 kN-m. So there is no chance of front lifting.

**17.4.1.4 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 steering control wheel & driver's seat. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

**17.4.1.5 Operator's seat:**

Vertical distance from SIP to foot rest has been not provided as per the requirement IS:12343-1998 (Reaffirmed in march, 2009)

**17.4.1.6 Technical requirements for PTO shaft**

The parameter 'dø' & 'k' does not meet the requirement of IS:4931:1995.

**17.4.1.7 Three point linkage:**

The lateral distance from lower hitch point to center line of tractor does not meet the requirements of IS-4468-(Part I)-1997. This should be looked into for necessary corrective action.

**17.4.1.8 Location and movement of various controls**

The control lever does not remain in "STOP" position. So it does not meet the requirements of IS: 8133-1983.

**17.4.1.9 Field performance test:****Wet land cultivation:**

- i) 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).

**17.4.1.10 Haulage performance:**

- (i) The Specific Fuel consumption (ml/km/tonne) with two wheel trailers was observed as 37.72 to 41.10 against the declaration 30 to 35 ml/km/tonne. This does not meet the requirement of IS: 12207-2014 and therefore, should be looked into for necessary corrective action.

**17.5 Maintenance / Service Problems:**

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

**17.6 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) The working clearance between the position & draft control levers may be provided as per IS: 12279 (Part II – 1999).
- iii) The control lever does not remain in "STOP" position.

**17.7 Adequacy of Literature supplied with machine:****16.7.1** The following literature has been supplied with the tractor

- a) Service Manual for Farmtrac 6045 tractor.
- b) Parts Catalogue for Farmtrac 6045 tractor.
- c) Operator's manual Farmtrac 6045 tractor.

**17.7.1** The literatures supplied by applicant should also in national as well as other regional languages for the guidance of users and service personnel.





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**ESCORTS LIMITED, FARMTRAC 6045 TRACTOR –  
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Duration of Test	Test duration under citizen charter	Whether the report released within time frame given in the citizen charter	Remark
09, Months (February, 2015 to October, 2015)	10 Months	Yes	--

**TESTING AUTHORITY:****H.L. YADAV**  
SENIOR AGRICULTURAL ENGINEER**C.R. LOHI**  
DIRECTORTest Report compiled by **Shri. Shwetabh Singh**, Senior Tech. Assistant**19. APPLICANT'S COMMENTS**

Para No.	Our Reference	Applicant's comments
19.1	17.3 (ii), (iii), (v), (vi), (vii), (ix), 17.4.1.1 (ii), 17.4.1.2 (i),(ii), & 17.4.1.10	We will look into for corrective action.
19.2	17.4.1.4, 17.4.1.5, 17.4.1.6, 17.4.1.7, 17.4.1.8 & 17.6	Under our policy of continuous product improvement these aspects are further being looked in to & try to eliminate these deviations wherever necessary.

**ANNEXURE**

S.No.	Item	M.B.Plough	Rotavator
1.	Make	Escort	Maschio Itali
2.	Type	Mounted	Mounted
3.	No. of bottom/blades	03	36, in 7 flanges
4.	Type of bottom /blades	General Purpose	Hatchet
5.	Size of bottom/blades, (mm)	310	245 x 75 x 6
6.	Spacing between bottom /flanges, (mm)	210	245
7.	Lower hitch point span, (mm)	760	735
8.	Mast height, (mm)	510	470 & 610
9.	<b>Overall dimensions, (mm):</b>		
	- Length	1920	1020
	- Width	1015	1985
	- Height	1070	1045
10.	Gross mass, (kg)	340	440



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

S. No.	Items	Specifications
1.	Type	Full cage wheel
2.	Dia, (mm)	1250
3.	Width, (mm)	1010
4.	No. and types of lugs	32, straight lugs made up of MS-angle section welded to angle iron frame.
5.	Size of angle section, (mm)	40 x 40 x 6
6.	Length of lugs, (mm)	500
7.	Spacing of lugs, (mm)	180
8.	Weight of each cage wheels (kg)	170

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

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	12.50
3.	Power lift and hydraulic pump performance test	2.78
4.	Drawbar performance test	15.76
5.	Turning ability	0.20
6.	Location of centre of gravity	
7.	Operator's field of vision	
8.	Brake test	1.25
9.	Noise measurement	1.42
10.	Air cleaner oil-pull over test	3.5
11.	Mechanical vibration test	1.0
12.	Nominal speed test	0.5
<b>B.</b>	<b>FIELD TEST:</b>	
1.	Mould Board ploughing	10.65
2.	Rotavation	10.0
3.	Puddling (including 5 hrs water proof test)	15.40
<b>C.</b>	<b>HAULAGE TEST:</b>	6.32
<b>D.</b>	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	4.60
	<b>TOTAL:</b>	<b>85.88</b>