



ESCORTS LIMITED, FARMTRAC 6065 TRACTOR



सत्यमेव जयते

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

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T-839/1348/2012

ESCORTS LIMITED, FARMTRAC 6065 TRACTOR -
Commercial (Initial)

Manufacturer : M/s. Escorts Limited,
Plot No 2 & 3, Sector-13,
Faridabad – 121 007 (Haryana)

Test requested by : M/s. Escorts R & D Centre,
15/5, Mathura Road,
Faridabad – 121 003 (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 6065
Brand name : Farmtrac
Type : Four wheeled, rear-wheel driven, Standard Agricultural Tractor.

Year of manufacture : 2011
Chassis number : T-2196639
Country of origin : India
Variants, if any * :

S No.	Variant model *	Variant Features
1.	Farmtrac 6065 UM	With 4WD front axle
2.	Farmtrac 6065 IM	With single clutch

*The variant models are yet to be tested at this Institute.

1.2 Engine:

Make : Escorts Limited
Model : AE4.286F-3A
Type : Four stroke, turbo charged, water cooled, direct injection, diesel engine.
Serial number : E - 3152392

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

- Maximum speed at no load : 2475 to 2525
- Low idle speed : 600 to 700
- Speed at maximum torque : 1300 to 1400

Rated speed, (rpm):

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



15. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

Sl. No.	Adjustments/Defects/Breakdowns and Repairs	Tractor run hours
1.	Prior to start of PTO performance test, the primary and secondary diesel filters were found in rusty condition. So, the same were replaced with new ones.	0.2
2.	During haulage test with two wheel trailer, the latch provided on the brake pedals for combined pedal operation was got unlocked itself.	55.8

16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

16.1 Evaluative (mandatory) / Non-evaluative (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)	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 >35hp. - 7.5/+10% for PTO power ≤ 35 hp	41.17 (D)	42.5	Yes
b)	Power at rated engine speed (kW)	Non Evaluative	-do-	41.17 (D)	42.5	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	258 (D)	255	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	275.0 (D)	257.6	Yes
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	7% Min (D)	39.5	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)	115	Yes



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)	97	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.57 (R)	0.45	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 metre (R)	0.76 per metre	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	Minimum 20.72 (R)	27.00	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 14.50 (R)	19.15	Yes
c)	Maximum drawbar power without ballast, (kW).	Evaluative	Min. 80% of PTO power as referred in 16.1.1 (a) of PTO performance	Minimum 34.0 (R)	37.0	Yes
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	125 (D)	61	Yes
16.1.3.3 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%]	23.54 (D)	24.05	No
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	10.06 (R) (Minimum)	18.18	Yes
				18.18 (D)		



1	2	3	4	5	6	7
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	[Tolerance of plus 5 mm]	50 (D)	03	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 road ballast, (m):					
	1) Cold brake	Evaluative	10	10 (R)	7.12	Yes
	2) Hot brake	Evaluative	10	10 (R)	7.00	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600 (R)	391 to 400	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)	95	Yes
16.1.6	Amplitude of mechanical vibrations at :					
	1) Left foot rest	Non Evaluative	100 microns (max)	100 (R)	50	Yes
	2) Right foot rest				70	Yes
	3) Seat (with driver seated)				90	Yes
	4) Steering Wheel				120	No
16.1.7	Haulage requirements :					
a)	Gross mass of the trailers, (tonnes):					
	1) Two wheel	Non Evaluative	--	6.0 (D)	6.0	Yes
	2) Four wheel	Evaluative	--	7.0 (D)	7.0	Yes
b)	Distance travelled / litre of fuel consumption, (km/l):					
	1) Two wheel	Non Evaluative	--	5.0 to 6.0 (D)	3.66 to 3.68	No
	2) Four wheel	Evaluative	--	5.0 to 6.0 (D)	3.57 to 3.59	No
c)	Fuel consumption (ml/km/tonne):					
	1) Two wheel	Non Evaluative	--	35 to 40 (D)	45.3 to 45.6	Yes
	2) Four wheel	Evaluative	--	35 to 40 (D)	39.7 to 39.9	Yes



1	2	3	4	5	6	7
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	Manufacturer has not recommended the tractor for puddling operation. Hence, the puddling test was not conducted.	Not applicable
	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	Should conform to the requirements of CMVR along-with declared value of PTO HP	--	Escorts limited	Yes
	2) Model	Evaluative		--	Farmtrac 6065	Yes
	3) Year of manufacture	Evaluative		--	2011 (11 J 16)	Yes
	4) Engine number	Evaluative		--	E-3152392	Yes
	5) Chassis number	Evaluative		--	T-2196639	Yes
	6) Declaration of PTO power, (kW)	Evaluative		--	41.17 (56.0)	Yes
16.1.11	Discard limit for:					
a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer	91.3 (D)	91.00 to 91.02	Yes
b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.45 (D)	0.109 to 0.122	Yes



T-839/1348/2012

ESCORTS LIMITED, FARMTRAC 6065 TRACTOR – Commercial (Initial)

1	2	3	4	5	6	7
(c)	Ring end gap (mm):					
	- Top comp. ring	Evaluative	-do-	2.00	0.65	Yes
	- 2 nd comp. ring		-do-	2.00	0.60 to 0.65	Yes
	- Oil ring		-do-	2.00	0.55	Yes
(d)	Ring groove clearance (mm):					
	- Top comp. ring	Evaluative	-do-	0.20	0.15 to 0.18	Yes
	- 2 nd comp. ring		-do-	0.20	0.10 to 0.12	Yes
	- Oil ring		-do-	0.15	0.07 to 0.08	Yes
(e)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	To be specified by the manufacturer	0.40	0.042 to 0.048	Yes
	- Crankshaft end float	Evaluative		0.67	0.26	Yes
(f)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.40	0.036 to 0.067	Yes
	- Axial	Evaluative	-do-	0.60	0.21 to 0.25	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.40	0.09 to 0.19	Yes
(h)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	0.40	0.08 to 0.14	Yes

16.1.12 CATEGORY OF BREAKDOWNS / DEFECTS :					
S. No.	Category of breakdowns	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



T-839/1348/2012

ESCORTS LIMITED, FARMTRAC 6065 TRACTOR – Commercial (Initial)

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	Maximum oil pull over, (%)	0.25% (max.)	Dry type air cleaner provided	Not applicable
2.	Seating requirements	Should meet the requirements of IS: 12343-1998	Meets the requirements	Yes
3.	Fitment of ROPS	With a provision for fitment of ROPS. If ROPS fitted it should meet the requirement of IS: 11821-1992	Not provided ROPS not fitted	No Not applicable
4.	Technical requirements for PTO shaft	Should meet the requirements of IS: 4931 -1995	Does not meet the requirements	No
5.	Dimensions of three point linkage	Should meet the requirements of IS: 4468 (Part-I)-1997	Does not meet the requirements	No
6.	Specifications of linkage drawbar	Should meet the requirements of IS: 12953-1990.	Meets the requirements	Yes
	Specification of swinging drawbar	Should meet the requirements of IS: 12362 Part 3-1994.	Not provided	Not applicable
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 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)] : **Conforms**
- 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, 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] : **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) : **Does not conform**
- 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 39.5%.
- ii) The specific fuel consumption corresponding to maximum power was measured as 255 g/kWh against the declaration of 258 g/kWh, which is within the tolerance limit of IS: 12207-2008.

16.4.1.2 Hydraulic Performance:

The maximum lifting capacity throughout the range of lift at lower hitch points was observed as 24.05 kN against the declaration of 23.54 kN and which does not meet the requirements of IS: 12207-2008 with regard to tolerance. 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 the steering wheel. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

16.4.1.4 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.

16.4.1.5 Specifications of Power Take-off Shaft:

The dimension "d Φ " [Refer Fig. 2(a)] of PTO shaft does not meet the requirement of IS: 4931-1995. This should be looked into for necessary corrective action.

16.4.1.6 Symbols of operator's control and other displays:

The oil lubricant, type & frequency has not been provided as per IS: 6283 (Part-1&2)-1998. This should be looked into for necessary corrective action.



16.4.1.7 Haulage performance:

- (i) The distance travelled per litre of fuel consumption with two wheel trailer was observed as 3.66 to 3.68 km/l against the declaration 5.0 to 6.0 km/l. This does not meet the requirement of IS: 12207-2008 and therefore, should be looked into for necessary corrective action.
- (ii) The distance travelled per litre of fuel consumption with four wheel trailer was observed as 3.57 to 3.59 km/l against the declaration 5.0 to 6.0 km/l. This does not meet the requirement of IS: 12207-2008 and therefore, should be looked into for necessary corrective action.

16.4.2 Field performance test:

16.4.2.1 Wet land cultivation (Puddling operation):

The manufacturer has recommended that the tractor is not suitable for wetland cultivation (puddling operation) and therefore, the wetland cultivation (puddling operation) was not conducted.

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:

- i) Provision for spark arresting device in exhaust system.
- ii) The working clearance around the hydraulic draft and position control levers may be provided as per IS: 12239 (Part-2) – 1999.
- iii) Fuel shut-off knob does not remain in "STOP" position.

16.7 Adequacy of Literature supplied with machine:

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

- i) Operator's Manual in respect of Farmtrac – 6065 tractor.
- ii) Tractor parts catalogue in respect of Farmtrac – 6065 tractor.
- iii) Tractor Repair Manual (Draft copy) in respect of Farmtrac – 6065 tractor.

16.7.2 Also, it is recommended that relevant literature may be updated by incorporating the following information:

- i) Information on the components / assemblies such as hydraulic oil cooler etc.



T-839/1348/2012

ESCORTS LIMITED, FARMTRAC 6065 TRACTOR –
Commercial (Initial)

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 ENGINEERV.N. KALE
DIRECTOR

Test Report compiled by Shri Chanchlesh Singh Raghuwanshi, Senior Technical Assistant.

17.0 APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
17.1	1.13.2(III),1.14.2,1.20.2,1.20.3,1.20.4,1.20.5,16.1.6(4),16.1.7(b),16.3(ii)(iii)(vi)(vii)(viii) &(ix)	These aspects are further being looked into & will try to eliminate these deviations soon wherever necessary.
17.2	15.0 (1 & 2)	Corrective action would be taken in near future.
17.3	16.1.6 & 16.4.1.3	We would be looking into possibility to reduce vibration levels further.



T-839/1348/2012

ESCORTS LIMITED, FARMTRAC 6065 TRACTOR –
Commercial (Initial)**ANNEXURE-I****BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST**

S. No	Item	M.B. Plough	Rotavator
1.	Make	Field King	Maschio Itali
2.	Type	Mounted	Mounted
3.	No. of Disc/blades	Three	42, in 8 flanges
4.	Type of Disc/blades	General purpose	Hatchet
5.	Size of bottoms/blades, (mm)	385	245 x 75 x 6
6.	Spacing of bottoms/flanges, (mm)	280	245
7.	Lower hitch point span, (mm)	785	735
8.	Mast height, (mm)	510	470 & 610
9.	Overall dimensions, (mm):		
	- Length	1920	1020
	- Width	1040	1985
	- Height	1180	1045
10.	Gross mass, (kg)	345	440

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

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	14.0
3.	Power lift and hydraulic pump performance test	2.9
4.	Drawbar performance test	19.8
5.	Turning ability	0.2
6.	Location of centre of gravity	0.2
7.	Operator's field of vision	--
8.	Brake test	2.0
9.	Noise measurement	1.5
10.	Mechanical vibration test	0.8
11.	Nominal speed test	1.7
B.	FIELD TEST:	
1.	Disc ploughing	25.5
2.	Rotavation	10.1
C.	HAULAGE TEST:	9.3
D.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	11.7
	TOTAL:	99.7