

व्यावसायिक तकनीकी विस्तार परीक्षण रिपोर्ट  
COMMERCIAL TECHNICAL EXTENSION  
(Test Report)

संख्या / No. : T-1493/2020/2020  
माह / Month : November, 2020



**ESCORTS LIMITED  
FARMTRAC CHAMPION F2 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**

(An ISO : 9001 - 2015 Certified Institute)

Tractor Nagar, Budni (M.P.) 466 445

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<b>T-1493/2020/2020</b>	<b>ESCORTS LIMITED, FARMTRAC CHAMPION F2 TRACTOR - Commercial (Technical Extension)</b>
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**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)

Selected for test by : The testing authority  
Place of running-in : At manufacturer's works  
Duration of said running-in, (h):

- Engine : 20  
- Transmission : 30  
Method of Selection : The test sample was selected randomly out of Five tractors from the production line by the representative of testing authority.

**Details of tractors made available for random selection :**

Sr. No.	Chassis Number
i)	T052465457EH
ii)	T052465307EH
iii)	T052465615EH
iv)	T052465616EH
v)	T052465739EH

**2. FUEL AND LUBRICANTS**

**2.1 Fuel** : The High-speed diesel oil supplied by M/s Indian Oil Corporation Limited having density of 0.836 g/cc at 15°C was used.

**2.2 Lubricants:**

S. No.	Particulars	As recommended by the manufacturer	As used during the test
1.	Air Cleaner Oil	SAE 15W40/SAE20W40	As recommended
2.	Engine oil	SAE 20 W40	As recommended
3.	Gearbox	Gear oil XP 80W/80W90	Oil originally filled in the tractor was not changed
4.	Differential, rear axle, brakes and hydraulic system oil	Oil SG Transmission (AGLP)/UTTO	
5	Steering gear box oil	SAE 90	
6.	Grease	Servo Grease MP	Servo Grease MP

**3. ESSENTIAL TESTS**

**3.1. SPECIFICATIONS**

		<u>Previous sample</u>	<u>Present sample</u>
<b>3.1.1 Tractor:</b>			
Make	:	Escorts Limited	
Model	:	Farmtrac Champion F2	
Brand name	:	Farmtrac	
Type	:	Four wheeled, rear wheel driven, unit construction, general purpose, agricultural tractor	
Month & Year of manufacture	:	2014	08/19
Chassis number	:	T05 2315691	T052465615EH
Country of origin	:	India	

### 6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

**6.1** 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 for the applicable features for this tractor model.

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	Values declared by the applicant/ requirement		As observed		Whether present model meets the requirements (Yes/No.)
				Previous sample	Present sample	Previous sample	Present sample	
1	2	3	4	5 a	5 b	6 a	6 b	7
<b>6.1.1 PTO Performance :</b>								
a)	Max. power under 2 h test, (kW ) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: ± 5% for PTO power or engine power >26 kW, ± 10% for PTO power or Engine power ≤ 26 kW.	27.8 (D)	27.8 (D)	28.1	27.3	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	27.8 (D)	27.8 (D)	28.1	26.7	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% Max.	250 (D)	250 (D)	249	264	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	143 (D)	143 (D)	147.1	143.5	Yes
e)	Back-up torque, percent	Evaluative	12 percent, min.	10 (min.) (D)	12 (D) / (R) min	20.6	24.4	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.	125 (D)	125 (D)	108	100	Yes
	2) Coolant (liquid)	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.	118 (D)	118 (D)	97	99	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.52 (R)	2.67 (R)	0.23	0.46	Yes
h)	Smoke level, (m <sup>-1</sup> )	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 (Max.)	3.25 (R)	0.32	0.29	Yes

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1	2	3	4	5	6	7		
<b>6.1.2</b>	<b>Safety features :</b>							
a)	Guards against moving and hot parts	Evaluative	Belt drives, pullies, silencer, hydraulics pipes(as per IS-12239 Part 2)		Meet the requirements	Yes		
b)	Lighting arrangement	Evaluative	As per CMVR		Meet the requirements	Yes		
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)		<b>Does not meet the requirements</b>	<b>No</b>		
d)	Technical requirements for PTO shaft	Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)		Meet the requirements	Yes		
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)		<b>Does not meet the requirements</b>	<b>No</b>		
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS 12953 (As amended from time to time)		Meet the requirements	Yes		
g)	Specifications of Swinging drawbar (wherever fitted)	Evaluative	Should meet the requirements of IS 12362 (Part 3) (As amended from time to time)		Not provided	Not applicable		
h)	1) Maximum travelling speed at rated engine speed in reverse gears, kmph	Evaluative	Should not exceed 20 Kmph		14.48 kmph (Meet the requirements)	Yes		
	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 shall be activated.		Not fitted	Not applicable		
<b>6.1.3</b>	<b>Labeling of tractors (Provision of labeling plate):</b>							
	1) Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO in kW and year of manufacture in numerical <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>MM</td><td>YY</td></tr></table> Digit 01-12 in box No.1 for MM will represent the month and next two digit in the box No.2 for YY will represent the year of manufacturing	MM	YY		Escorts limited	Yes
MM	YY							
	2) Model	Evaluative			Farmtrac Champion F2	Yes		
	3) Month & Year of manufacture	Evaluative			08 / 19	Yes		
	4) Engine number	Evaluative			E2471303	Yes		
	5) Chassis number	Evaluative			T052465615EH	Yes		
	6) Declaration of PTO power, kW	Evaluative		27.8	Yes			
<b>6.1.4</b>	<b>Literature (Submission to test agency)</b>							
(a)	Operator manual	Evaluative	Provided / Not Provided	Provided	Provided	Yes		
(b)	Parts Catalogue	Evaluative	Provided / Not Provided	Provided	Provided	Yes		
(c)	Workshop/ Service manual	Evaluative	Provided / Not Provided	Provided	Provided	Yes		

		<u>Previous sample</u>	<u>Present sample</u>
<b>6.2</b>	<b>Conformity with following IS:</b>		
i)	Guide lines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS10273: 1987 (Reaffirmed 2014)]	Conformed	Conforms
ii)	Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS:4931-1995 (Reaffirmed 2014)]	Conformed	Conforms
iii)	Agricultural wheeled tractors - Three-point linkage: Part 2 Category 1N (Narrow Hitch) (Third Revision) [IS 4468 (Part-2):1993/ ISO 730-2:1979 (Reaffirmed 2014)]	<b>Did not conform</b>	<b>Does not conform</b>
iv)	Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed October, 2017)]	Conformed	Conforms
v)	Agricultural tractors - Operator's seat technical requirement [IS 12343 –1998 (First revision) (Reaffirmed 2014)]	Conformed	<b>Does not conform</b>
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 October, 2017)]	<b>Did not conform</b>	<b>Does not conform</b>
vii)	Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (Pt-2) 1999) (Reaffirmed 2014)]	<b>Did not conform</b>	<b>Does not conform</b>
viii)	Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) IS: 8133-1983 (Reaffirmed 2014)]	<b>Did not conform</b>	<b>Does not conform</b>
ix)	Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays Part 2 Symbols for agricultural tractors and machinery [IS:6283 (Part-1)- 2006 and IS: 6283 (Part-2)-2007 (Reaffirmed 2014)]	Conformed	<b>Does not conform</b>
x)	Agricultural Tractors and Machinery – Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed 2014)]	Conformed	Conforms

**6.3 Salient Observations:**

**6.3.1 Laboratory tests:**

**6.3.1.1 PTO Performance Test:**

- i) The maximum PTO power was recorded as **27.3 kW** against the declaration of **27.8 kW**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- ii) The rated PTO power was recorded as **26.7 kW** against the declaration of **27.8 kW**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- iii) The specific fuel consumption corresponding to maximum power was recorded as **264 g/kWh** against the declaration of **250 g/kWh**, which is within the tolerance limit of IS: 12207-2019.
- iv) The maximum equivalent crankshaft torque was recorded as **143.5 N-m** against the declaration of **143.0 N-m**, which is within the permissible limit as specified in IS: 12207-2019.
- v) The backup torque is **24.4 %** and meets the requirement of IS:12207-2019.
- vi) Power drop of **6.2%** was recorded between natural and high ambient condition. Which is considered on higher side. This should be looked into for necessary corrective action.

**6.3.1.2 Specifications of three point linkage:**

- i) The parameter Lateral distance from lower hitch point to centre line of tractor does not meet the requirement of IS: 4468 (Part-1) -1979 (Reaffirmed 2014). This should be looked into for necessary corrective action.
- ii) Some of the parameters of three point linkage conform to Cat. I and some of them conform to Cat.II. Keeping in view the spirit of standardization, necessary improvement may be incorporated.

**6.3.2 Maintenance / Service Problems:**

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

**6.3.3 Recommendation with regard to safety on tractor:**

The following requirements, inter alia, may be considered for incorporation on the tractor:

- i) The spark arrester should be provided in the exhaust system
- ii) PTO master shield should be provided around the PTO shaft.
- iii) Working clearance between the Position & Draft control lever of hydraulic system should be as per requirement of relevant test code.
- iv) Differential lock should be not been provided.
- v) Width of foot step should be as per requirement of relevant test code.
- vi) Steering wheel angle should be as per requirement of relevant test code.
- vii) Fuel shut-off knob should remain in "Stop" position
- viii) There should be provision to attach trailer brake valve.

**6.3.4 Adequacy of Literature supplied with machine:**

Following literatures of tractor models was supplied with the test sample for reference during the test.

- i) Operator's Manual of ESCORTS, FARMTRAC CHAMPION F2 tractor model
- ii) Parts Catalogue of ESCORTS, FARMTRAC CHAMPION F2 tractor model
- iii) Workshop Service / Repair Manual of ESCORTS, FARMTRAC CHAMPION F2 tractor model

**6.3.5 The supplied literatures were found adequate; except the following**


- a) Technical specifications of drawbar performance are not provided into operator's manual.

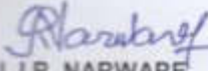
**6.3.6** However, these literatures should be brought out in other vernacular languages of India for guidance of users

## 7. 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	13 Months (October, 2019 to, October, 2020)	No	To rectify the problem persist in the air cleaner system, manufacturer has taken the time of 04 months to rectify the problem.

TESTING AUTHORITY:

  
**RAJNEESH PATEL**  
 AGRICULTURAL ENGINEER

  
**J.J.R. NARWARE**  
 DIRECTOR

  
**C.V. CHIMOTE**  
 TEST ENGINEER

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

## 8. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
8.1	6.1.2 (c & e), 6.2 (iii, v, vi, vii, viii & ix), 6.3.1.2	These are being studied and corrective action would be taken in near future
8.2	6.3.1.1 (vi)	Your valuable comments & suggestions for improvements are well taken under our policy of continuous product improvement. These aspects are further being looked into & will try to eliminate these deviations soon wherever necessary.

**ANNEXURE-I**

**TRACTOR RUN HOURS DURING TEST**

<b>A.</b>	<b>LABORATORY AND TRACK TESTS</b>	<b><u>HOURS</u></b>
<b>1.</b>	Running –in	50.00
<b>2.</b>	Nominal speed test	0.67
<b>3.</b>	PTO Performance Test	12.25
<b>B.</b>	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.	--
<b>Total</b>		<b>63.19</b>