



ESCORTS LIMITED, FARMTRAC - HERO F1 TRACTOR



भारत सरकार

GOVERNMENT OF INDIA

कृषि मंत्रालय (कृषि एवं सहकारिता विभाग, मशीनीकरण एवं प्रौद्योगिकी प्रभाग)

Ministry of Agriculture (Deptt. of Agri. & Co-op, Mechanization & Technology Division)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO : 9001-2008 Certified Institute)

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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.	Engine oil	SAE 15 W40 (API4) / SAE 20W40 (APICD/SF-IS:13656-EP-DL-2)	As recommended
2.	Air cleaner oil	SAE 15W40(API 4)/SAE20W40 (API CD/SF-IS:13656-EP-DL-2)	SAE 15W40(API 4)/SAE20W40 (API CD/SF-IS:13656-EP-DL-2)
3.	Transmission, differential, final drive and hydraulic system oil	Oil SG Transmission /UTTO	Oil originally filled in the tractor was not changed
4.	Steering housing oil	SAE 90(API GL-4,IS :1118-EP,Type GL-4	-do-
5.	Grease	Servo Grease MP	Servo Grease MP

3. ESSENTIAL TESTS

3.1 SPECIFICATION

3.1.1	Tractor:	Base Model	Variant Model
	Make	: Escorts Limited	Escorts Limited
	Model	: Farmtrac Champion – F1	Farmtrac Hero-F1
	Type	: Four wheeled, rear-wheel driven, general purpose Standard Agricultural Tractor	Four wheeled, rear-wheel driven, general purpose Standard Agricultural Tractor
	Year of manufacture	: 2013	2013
	Chassis number	: T-2275148	T-2275148
	Country of origin	: India	India
3.1.2	Engine:		
	Make	: Escorts Limited (apa)	Escorts Limited (apa)
	Model	: E3.215D-3A	E3.215D-3A
	Type	: Four stroke, water cooled, naturally aspirated, direct injection, diesel engine.	Four stroke, water cooled, naturally aspirated, direct injection, diesel engine.
	Serial number	: E-2278927	E 2278927
	Engine speed(Manufacturer's recommended production setting), (rpm):		
	- Maximum speed at no load	: 2475 to 2525	2475 to 2525
	- Low idle speed	: 600 to 700	600 to 700
	- Speed at maximum torque	: 1200 to 1300	1200 to 1300
	Rated speed, (rpm):		
	- For PTO use	: 2200	2200
	- For drawbar use	: 2200	2200



1	2	3	4	5	6
	e)	Governor:			
		Make	Bosch, India	Bosch, India	No change
		Model/Group combination No.	RSV 325... 1100 A4C 1725L		-do-
		Rated engine speed, (rpm)	2200	2200	-do-
		Governed range of engine speed (rpm)	600 to 2525	600 to 2525	-do-
	f)	Location of gear shifting levers	In front of operator's Seat		-do-
	g)	Overall length (mm)	3315	3315	-do-
	h)	Mass of tractor (unballasted) (kg),(front/rear/total)	650/1230/1880	650/1190/1840	Changed

7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

- 7.1 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: 2014 for acceptance of tractor for the purpose of subsidies/NABARD financing for the applicable features for this tractor model.

S. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	Values declared by the applicant (D)/ Requirement (R)	As observed	Whether Variant model meets the requirements (Yes/ No.)
				Base & Variant	Base & Variant	
1	2	3	4	5	6	7
7.1.1	PTO Performance :					
a)	- Max. 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	25.0 (D)	25.4	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	25.0 (D)	25.4	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	258 (D)	262	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	140 (D)	135	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	15 % (D)/ 10% (R)	22.4	Yes



1	2	3	4	5	6	7
f)	Maximum operating temperature ($^{\circ}\text{C}$)					
	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.	125 (D)	108	Yes
	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.	118 (D)	111	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.62 (R)	0.46	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)	Max 3.25 per meter (R)	0.18	Yes
7.1.2	Safety features :					
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 (part 2)	At present no requirements	Provided	--
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)	--	Provided	Yes
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)	--	-do-	No



1	2	3	4	5	6	
7.1.3	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(Agri machinery group)	Escorts Limited	Yes
	2) Model	Evaluative		Farmtrac champion F1	Farmtrac –Hero F1	Yes
	3) Year of manufacture	Evaluative		(2013)	13-F-18 (2013, June 18 th)	Yes
	4) Engine serial number	Evaluative		E-2278927	E-2278927	Yes
	5) Chassis serial number	Evaluative		T-2275148	T-2275148	Yes
	6) Declaration of PTO power, kW	Evaluative		25	25	Yes
	7) Specific Fuel Consumption (gm/kWh)/ (gm/hph)	Evaluative		258(192.5)	258(192.5)	Yes
7.1.4	Literature (Submission to test agency)					
(a)	Operator manual	Evaluative	Provided/ Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
(b)	Parts Catalogue	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
(c)	Workshop/Service manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes

7.2 Salient Observations:**7.2.1 Laboratory tests:****7.2.1.1 PTO Performance:**

- i) The backup torque is. **22.4%**.
- ii) The specific fuel consumption corresponding to maximum power was measured as **262 g/kWh** against the declaration of 258 g/kWh, which is within the tolerance limit of IS: 12207-2008.
- iii) During the test at full load & varying speed the maximum coolant temperature was observed as 111 °C which is closed to the declaration of 118 °C . This should be looked into for necessary corrective action.
- iv) During test at full load and varying speed 160 ml water has come out from the coolant overflow bottle. This should be looked into for necessary corrective action.

7.2.1.2 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.

7.2.1.3 Specifications of Power Take-off Shaft:

The dimensions of PTO master shield do not meet the requirements. This should be looked into for necessary corrective action.

7.3 Maintenance / Service Problems:

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



- 7.4 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.
- 7.5 Adequacy of Literature supplied with machine:**
The following literature has been supplied with the tractor
- i) Operator's Manual
 - ii) Tractor's part's catalogue
 - iii) Service Manual
- 7.5.1** The literatures should also be brought out in national as well as other regional languages for the guidance of users and service personnel.

8. 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	2 Months (August, 2014 to September, 2014)	Yes	None

TESTING AUTHORITY:

A.K. SINGH
SENIOR AGRICULTURAL ENGINEER

C.R. LOHI
DIRECTOR

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