



ESCORTS LIMITED, FARMTRAC - 40 TRACTOR



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-847/1357/2012

ESCORTS LIMITED, FARMTRAC- 40 TRACTOR –
Commercial (Variant)

3. ESSENTIAL TESTS

3.1 SPECIFICATIONS

3.1.1 Tractor:		<u>Base model</u>	<u>Variant model</u>
Make	:	Escorts Limited	Escorts Limited
Model	:	Farmtrac Champion	Farmtrac – 40
Type	:	Four wheeled, Rear-wheel driven, Standard Agricultural Tractor.	
Year of manufacture	:	2007	2012
Chassis serial number	:	T-2093369	T- 3455501
Country of origin	:	India	India
3.1.2 Engine:			
Make	:	Escorts Limited	Escorts Limited
Model	:	E3.215 D	AF 3.287A-3A
Type	:	Four stroke, naturally aspirated, water cooled, direct injection, diesel engine.	
Serial number	:	E2095815	E3833355
Country of origin	:	India	India
Engine speed (rpm), (Manufacturer's recommended production setting),:			
- Maximum speed at no load	:	2500 ± 25	2150 to 2250
- Low idle speed	:	600 to 650	600 to 700
- Speed at maximum torque	:	1200 to 1300	1000 to 1200
Rated speed, (rpm):			
- For PTO use	:	2200	2000
- For drawbar use	:	2200	2000
3.1.3 Cylinder & Cylinder Head:			
Number	:	Three	Three
Disposition	:	Vertical	Vertical, Inline
Bore/stroke, (mm)	:	91.0 / 110	106.68 / 106.68
Capacity as specified by the applicant, (cc)	:	2146	2861
Compression ratio	:	18.0 ± 5% : 1	18.4 ± 5% : 1
Type of cylinder head	:	Monoblock	Monoblock
Type of cylinder liners	:	Wet , replaceable	Wet, replaceable
Type of combustion chamber	:	Direct injection, Open chamber in piston crown.	Direct injection, open chamber in piston crown.
Arrangement of valves	:	Overhead	Overhead, inline
Valve clearance (cold):			
- Inlet valve, (mm)	:	0.30	0.40
- Exhaust valve, (mm)	:	0.40	0.60
3.1.4 Fuel System:			
Type of fuel feed system	:	Gravity and force feed	
3.1.4.1 Fuel tank:			
Capacity, (l)	:	49.0	49.0
Location	:	On flywheel housing	
Provision for draining of sediments/ water	:	None , however a water separator is provided between fuel tank and feed pump	Not provided, however water separator is provided between fuel tank and feed pump.
Material of fuel tank	:	Metallic	Metallic



T-847/1357/2012

ESCORTS LIMITED, FARMTRAC- 40 TRACTOR – Commercial (Variant)

1	2	3	4	5	6	
20.	xx)	Change related to ergonomics, safety comfort, statutory / regulatory requirements:				
	a)	IS: 10273	Conformed	Conforms	No change	
	b)	IS: 4931	Did not conform	Does not conform	No change	
	c)	IS: 4468	Did not conform	Does not conform	No change	
	d)	IS: 12953	Conformed	Conforms	No change	
	e)	IS:12343	Conformed	Does not conform	Changed	
	f)	IS:12239 (Pt-I)	Did not conform	Does not conform	No change	
	g)	IS:12239 (Pt-II)	Did not conform	Does not conform	No change	
	h)	IS:8133	Did not conform	Conforms	Changed	
	i)	IS: 6283	Conformed	Does not conform	Changed	
	j)	IS:14683	Conformed	Conforms	No Change	
21.	xxi)	Rear Final Drive:	Same configuration in base & variant models (refer para 3.1.12.5).		No Change	
22.	xxii)	Type of fuel Injection pump:	Same configuration in base & variant models (refer para 3.1.4.5).		No change	
23.	Change related to statutory/ regulatory requirements (As per Table 4):					
	a)	Engine operating principle (spark/ compression ignition, two/four stroke)	Compression Ignition, 4 stroke	Compression Ignition, 4 stroke	No change	
	b)	Number & arrangement of cylinders	Three, vertical inline	Three, vertical inline	No change	
	c)	Maximum PTO power (kW)	25.0	27.9	Changed	
	d)	Engine displacement (cc)	2146	2861	Changed	
	e)	Rated engine speed (rpm)	2200	2000	Changed	
24.	Other changes					
		Engine model	E3.215 D	AF 3.287A-3A	Changed	

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: 2008 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: 12207-2008	Values declared by the applicant(D)/ Requirement (R)		As observed		Whether Variant model meets the requirements (Yes/No)
				Base model	Variant Model	Base model	Variant model	
1	2	3	4	5 a	5 b	6 a	6 b	7
6.1.1	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 >35hp. -7.5/+10% for PTO power ≤ 35 hp	25.0 (D)	27.9 (D)	24.9	29.0	Yes



T-847/1357/2012

ESCORTS LIMITED, FARMTRAC- 40 TRACTOR – Commercial (Variant)

1	2	3	4	5 a	5 b	6 a	6 b	7
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	25.0 (D)	27.9 (D)	24.3	27.7	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	252 (D)	251 (D)	250	261	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	126.9	160.7	130.33	164.6	Yes
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	--	--	24.1	26.2	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.	125	125	113	119	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.	110	118	110	103	Yes
6.1.2	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-40		Yes	
	3) Year of manufacture	Evaluative		--	12-B-10		Yes	
	4) Engine serial number	Evaluative		--	E3833355		Yes	
	5) Chassis number	Evaluative		--	T3455501		Yes	
	6) Declaration of PTO power, kW (HP)	Evaluative		--	27.9 (37.4)		Yes	



T-847/1357/2012

ESCORTS LIMITED, FARMTRAC- 40 TRACTOR –
Commercial (Variant)**6.2 Salient Observations:****6.2.1 Laboratory tests:****6.2.1.1 PTO Performance:**

- i) The maximum PTO power in case of base and variant models were observed as 24.9 & 29.0 kW respectively against the declaration of 25.0 & 27.9 kW respectively and which meets the requirement of IS: 12207-2008 with regard to tolerance.
- ii) The specific fuel consumption in case of base and variant models corresponding to maximum power were observed as 250 & 261 g/kWh respectively against the declaration of 252 & 251 g/kWh respectively and which meets the requirement of IS: 12207-2008 with regard to tolerance.

6.2.1.2 Three point linkage:

- i) The diameter of hitch pin hole of upper hitch points does not meet the requirements of IS: 4468 (Part-I)-1997. This may be looked into.
- ii) The diameter of hitch pin hole of lower hitch points does not meet the requirements of IS: 4468 (Part-I)-1997. This may be looked into.
- iii) The lateral distance from the lower hitch point to centre line of tractor does not meet the requirements of IS: 4468 (Part-I)-1997. This may be looked into.
- iv) Some of the parameters of three point linkage conforms to Cat.I and some of them conforms to Cat.II. In view the spirit of standardization necessary improvement may be incorporated.

6.2.1.3 Linkage drawbar:

Some of the parameters of linkage drawbar conform to Cat. I and some of them conform to Cat. II. Keeping in view the spirit of standardization, the necessary improvements may be incorporated.

6.2.1.4 PTO Shaft:

The dimension "d ϕ " of the power take-off shaft does not meet the requirements of IS: 4931-1995. This should be looked into for necessary corrective action.

6.3 Maintenance / Service Problems:

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

6.4 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) Provision of differential lock.
- iii) The working clearance between the position control lever and draft control lever may be provided as per IS: 12239 (Part-2) - 1999.
- iv) "Minimum cautionary notice" as per clause 11.2 of IS:12239 (part-2)-1999

6.5 Adequacy of Literature supplied with machine:**6.5.1** The following literature was supplied with the test sample for reference during the test

- a) Operator's manual for Farmtrac-40 Tractor
- b) Supplementary repair manual for Farmtrac-40 Tractor
- c) Part's catalogue for Farmtrac-40 Tractor



T-847/1357/2012

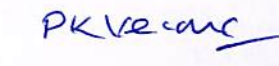
ESCORTS LIMITED, FARMTRAC- 40 TRACTOR –
Commercial (Variant)

6.5.2 The supplied literature was found adequate. However, these literatures should be brought out in national as well as other regional languages of India for guidance of users.

The results of the tests carried out on variant model "Farmtrac-40" have been compared with those on base model "Farmtrac Champion" and found within the limit, as specified in Indian Standard: 12207-2008.

TESTING AUTHORITY:


C. V. CHIMOTE
TEST ENGINEER


P. K. VERMA
SENIOR AGRICULTURAL ENGINEER


V. N. KALE
DIRECTOR

Test Report compiled by: Shri. Pramod Yadav, Senior Technical Assistant.

7. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
7.1	3.1.13.2, 3.1.14.1, 3.1.14.2, 3.1.20.1, 3.1.20.2, 3.1.20.3, 3.1.20.5, 6.2.1.2, 6.2.1.3, 6.2.1.4 & 6.4	These aspects are further being looked into & will try to eliminate these deviations soon wherever necessary.

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

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	11.6
3.	Theoretical speed test	0.5
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	0.3
	TOTAL:	12.4