

8व्यावसायिक वैरिएंट परीक्षण रिपोर्ट (प्रथम बैच)
COMMERCIAL VARIANT TEST REPORT (1st Batch)

संख्या/ No. : T-1571/2099/2021
माह/ Month : August, 2021

[ONLINE TESTING]

(यह परीक्षण रिपोर्ट 31/08/2026 तक वैध है। / THIS TEST REPORT IS VALID UPTO: 31/08/2026)



**ESCORTS LIMITED, 45 F9
(Brand Name: FARMTRAC) 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.)-466 445

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(An ISO 9001: 2015 Certified Institute)

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3. ESSENTIAL TESTS

3.1 SPECIFICATIONS

3.1.1	Tractor:	
	Make	: Escorts Limited
	Model	: 45 F9
	Brand name	: Farmtrac
	Type	: Four Wheeled, Rear wheel driven (2WD), Unit construction, Standard Agricultural Tractor
	Month & Year of manufacture	: 01/21
	Chassis number	: T052531035KK
	Country of origin	: India
3.1.2	Engine:	
	Make	: Escorts Limited
	Model	: AE3.276B-3A
	Type	: Four stroke, Liquid cooled, Naturally aspirated, Direct injection, Diesel engine.
	Serial number	: E2530752
	Country of origin	: India
3.1.2.1	Engine speed (rpm), (Manufacturer's recommended production settings):	
	- Maximum speed at no load	: 2305 to 2455
	- Low idle speed	: 700 to 800
	- Speed at maximum torque	: 900 to 1100
	Rated speed, (rpm):	
	- For PTO use	: 2200
	- For drawbar use	: 2200
3.1.3	Cylinder & Cylinder Head:	
	Number	: Three
	Disposition	: Vertical, Inline
	Bore/stroke, (mm)	: 98/122 (apa)
	Capacity as specified by the applicant, (cc)	: 2761 (apa)
	Compression ratio	: 17.5 ± 5% : 1
	Type of cylinder head	: Monoblock
	Type of cylinder liners	: Wet, Replaceable
	Type of combustion chamber	: Direct injection, open chamber in piston crown
	Arrangement of valves	: Overhead, Inline
	Valve clearance (cold):	
	- Inlet valve, (mm)	: 0.30
	- Exhaust valve, (mm)	: 0.40
3.1.4	Fuel System:	
	Type of fuel feed system	: Gravity and force feed
3.1.4.1	Fuel tank:	
	Capacity, (l)	: 46.0
	Location	: Above clutch housing
	Provision for draining of sediments/ water	: Not provided, however a water separator is provided
	Material of fuel tank	: Metallic (Steel sheet)

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7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

7.1 On the basis of tests conducted the performance results have been summarized as evaluative (mandatory) and non-evaluative (not-mandatory) parameter applicable for qualifying Minimum Performance Criteria as per Clause-4 (Table-1) of IS: 12207-2019 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:-

S. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	Values declared by the applicant (D) / Requirement (R)	As observed	Whether meets the requirements (Yes/No)
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: $\pm 5\%$ for PTO power or engine power >26 kW, $\pm 10\%$ for PTO power or Engine power ≤ 26 kW.	32.3 (D)	31.8	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	32.3 (D)	31.4	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% Max.	250 (D)	247	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	193 (D)	189.2	Yes
e)	Back-up torque, percent	Evaluative	10 percent, min.	12	38.6	Yes
f)	Maximum operating temperature, ($^{\circ}$ C)					
	i) 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)	113	Yes
	ii) 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)	100	Yes
g)	Engine oil consumption,(g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.50 (R) Maximum	0.45	Yes
h)	Smoke level, (m^{-1})	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hat ridge value (As per CMVR)	3.25 (R)	0.37	Yes

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1	2	3	4	5	6	7
7.1.2	Safety features :					
a)	Guards against moving and hot parts	Evaluative	Belt drives, pullies, silencer, hydraulics pipes(as per IS-12239 Part 2)	Meets the requirement		Yes
b)	Lighting arrangement	Evaluative	As per CMVR	Meets the requirement		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)	Does not meet the requirement		No
d)	Technical requirements for PTO shaft	Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	Meets the requirement		Yes
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)	Does not meet the requirement		No
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS 12953 (As amended from time to time)	Meets the requirement		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	15.32 kmph (Meets the requirement)		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
7.1.3	Labelling of tractors (Provision of labelling plate):					
1)	Make	Evaluative	Should conform to the requirements of CMVR along with maximum declared value of PTO power in kW and for month & year of manufacture in numerical MM YY 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	ESCORTS LIMITED		Yes
2)	Model	Evaluative		45 F9		Yes
3)	Month & Year of manufacture	Evaluative		01/21		Yes
4)	Engine number	Evaluative		E2530752		Yes
5)	Chassis number	Evaluative		T052531035KK		Yes
6)	Declaration of PTO power, kW	Evaluative		32.3		Yes

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1	2	3	4	5	6	7
7.1.4	Literature (Submission to test agency):					
(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
7.1.5	Fitment of Roll Over Protective Structure (ROPS): for tractors having more than 1150 mm rear track width	Evaluative	ROPS should meet the requirement of IS:11821 or OECD code or equivalent International Standard	Not Provided	Not Fitted	Not applicable
7.1.6	Standard accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Provided	Yes
7.1.7	Accessories (Optional)	Non Evaluative	Ballast weights if fitted should meet the requirement of CMVR.	Provided	Provided	Yes

7.2 CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS:12207- 2019) :					
S. No.	Category of Breakdown	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the requirement (Yes/No)
1.	Critical breakdown	Evaluative	There is no 'critical breakdown' during the course of testing	None	Yes
2.	Major breakdowns	Evaluative	There are not more than 1 major breakdowns and neither of them is of repetitive nature	None	Yes
3.	Minor breakdowns	Evaluative	There are not more than 3 minor defects during the test and the frequency of each is not be more than two	None	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed four that is, (1 major + 3 minor) or 4 minor breakdowns	None	Yes

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7.3 Salient Observations:

7.3.1 Laboratory tests:

7.3.1.1 PTO Performance:

- i) The maximum PTO power is recorded as **31.8 kW** against the declaration of **32.3 kW**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- ii) The rated PTO power is recorded as **31.4 kW** against the declaration of **32.3 kW**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- iii) The specific fuel consumption corresponding to maximum power is recorded as **247 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 is recorded as **189.2 N-m** against the declaration of **193 N-m**, which is within the permissible limit as specified in IS: 12207-2019.
- v) The backup torque is **38.6 %** and meets the requirement of IS: 12207-2019.

7.3.1.2 Three point linkage:

- i) Lateral distance from lower hitch point to centre line of tractor does not meet the requirements of IS: 4468- (Part-1) -1997 (Reaffirmed in Oct., 2017). This should be looked into for necessary corrective action.
- ii) Some of the parameters conform to Cat. I and some of them conform to Cat. II. Keeping in view the spirit of standardization, necessary improvements may be incorporated.

7.4 Maintenance / Service Problems:

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

7.5 Recommendation with regard to safety on tractor:

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

- i) Vertical distance from seat index point to centre of clutch has been observed as 345 mm. It should be within 380 to 620 as per IS: 12343-1998 (Re-affirmed in January, 2019).
- ii) Width of foot step has been observed as 150 mm. It should be 200 mm (min) as per IS: 12239 (Part-1) - 2018.
- ii) Spark arrester should be provided in the exhaust system as per the requirement of IS: 12239 (Part-2)-1999 (Re-affirmed in January, 2019).
- iii) Master shield around the PTO shaft should be provided as per the requirement of IS: 4931-1995 (Re-affirmed in January, 2019).
- iv) Vertical retainers at both sides of clutch pedal should be provided as per IS: 12239 (Part-1) – 2018.
- vi) There should be provision of differential lock as per IS: 12239 (Part-2) – 1999 (Reaffirmed in January, 2019).
- vii) The working clearance between position and draft control lever of hydraulic system was observed as 40 mm against the minimum requirement 70 mm as per IS: 12239 (Part-2)-1999 (Re-affirmed in January, 2019).

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7.6 Adequacy of Literature:

7.6.1 The following literatures were supplied with the test tractor for reference during the test:-

- a) Service Manual of Escorts Limited, 45 F9 & 60 F2 tractor models.
- b) Parts Catalogue of Escorts Limited, 45 F9 tractor model.
- c) Operator's manual of Escorts Limited, 45 F9 & 60 F2 tractor models.

7.6.2 The literature should be brought out in national as well as other regional languages of India for guidance of users.

TESTING AUTHORITY:

C.V. CHIMOTE TEST ENGINEER	
Y.K.RAO SENIOR AGRICULTURAL ENGINEER	
P.K. PANDEY DIRECTOR	

Draft test report is compiled by: **Poonam Khurasia**, Senior Technical Assistant

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8. APPLICANT COMMENTS

Para No.	Our Reference	Applicant's comments
8.1	6.1.8 (iii, v, vi, vii), 7.3.1.2, 7.5 & 7.6.2	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, whenever necessary.

ANNEXURE – I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running-in	50.0
2.	PTO performance test	13.5
3.	Nominal speed test	0.8
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	0.5
TOTAL:		64.8