

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT (Variant)

संख्या / No. : T-1014/1538/2016
माह / Month : March, 2016



ESCORTS LIMITED, POWERTRAC 439 DS PLUS ALT 4000 TRACTOR

(To be read in conjunction with the test report bearing No. T-793/1301/2011
(1st batch) and T-1009/1533/2016 (Supplementary) on "ESCORTS, POWERTRAC 439 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.) ४६६ ४४५

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**ESCORTS LIMITED , POWERTRAC 439 DS PLUS ALT 4000
TRACTOR - Commercial (Variant)**

- Location of Centre of gravity
- Turning Ability
- Operator's field of vision

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 and Air cleaner oil	20W40 (API CD –IS: 13656-E-DL-2)	Servo super 20W40
2.	Transmission and hydraulic oil	20W40 (API GL-4 IS: 1118-EP-Type)	Oil originally filled in the tractor was not changed
3.	Steering housing oil	SAE 90 (API GL-4 IS: 1118-EP-Type-GL-4)	--do--
4.	Grease	Servo Grease MP	Servo Grease MP

3. ESSENTIAL TESTS**3.1. SPECIFICATIONS****3.1.1 Tractor:**

	<u>Base model</u>	<u>Variant model</u>
Make	: Escorts limited	Escorts limited
Model	: POWERTRAC 439	POWERTRAC 439 DS PLUS ALT 4000
Brand name	: None	None
Type	: Four wheel, Rear-wheel Agricultural Tractor	drive, General Purpose,
Year of manufacture	: 15-B-1 (i.e.1 st February,2015)	15-B-1 (i.e 1 st February,2015)
Chassis Serial number	: T05-3263648	T05-3263750
Country of Origin	: India	India

3.1.2 Engine:

Make	: Escorts Limited	Escorts Limited
Model	: E3.215D-3A	E3.234-3A
Type	: Four stroke, naturally aspirated, water, cooled, direct injection, diesel engine.	
Serial number	: E-3292514	E-3292649

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

- Maximum speed at no load	: 2475 to 2525	2475 to 2525
- Low idle speed	: 600 to 650	600 to 650
- Speed at maximum torque	: 1200 to 1300	1200 to 1300

Rated speed, (rpm):

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



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**ESCORTS LIMITED , POWERTRAC 439 DS PLUS ALT 4000
TRACTOR - Commercial (Variant)****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: 2014 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: 12207-2014	Values declared by the applicant/ requirement		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 >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)	27.8 (D)	25.4	28.6	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	25.0 (D)	27.8 (D)	25.4	27.5	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	252 (D)	234 (D)	235	242	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	-	146 (D)	140.3	149.2	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	7 %, min. (R)	10% min. (R)	27.2	25.8	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 (D)	125 (D)	105	112	Yes



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1	2	3	4	5 a	5 b	6 a	6 b	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)	110	104	102	Yes
	g) Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.36 (R)	0.20	--	0.83	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 meter (R)	3.25 per meter (R)	--	0.98	Yes
6.1.2	Safety features :							
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 (part 2))	--	--	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)	--	--	Meets the requirement	--	Yes
d)	Technical requirements for PTO shaft	Non-Evaluative	Should meet the requirements of IS 4931 (as amended from time to time)	--	--	Meets the requirement	--	Yes
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)	--	--	Meets the requirement	--	Yes



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1	2	3	4	5 a	5 b	6 a	6 b	7
6.1.3	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			Yes
2)	Model	Evaluative		-	Powertrac 439 DS PLUS ALT 4000			Yes
3)	Year of manufacture	Evaluative		-	15-B-01 (01 st February 2015)			Yes
4)	Engine number	Evaluative		-	E-3292649			Yes
5)	Chassis number	Evaluative		-	T05-3263750			Yes
6)	Declaration of PTO power, kW	Evaluative		-	27.8(37.2)			Yes

6.1.5 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

6.2 Salient Observations:

6.2.1 Laboratory tests:

6.2.1.1 PTO Performance:

- i) The percentage of backup torque was recorded as **27.2% & 25.8** in case of base & variant model respectively.
- ii) The maximum power in case of base & variant was observed as 25.4 & 28.6 kW respectively against the declaration of 25.0 and 27.8 kW respectively, which is within the tolerance limit specified in IS: 12207-2014.

6.2.1.2 Location and operation of operator's control:

- i) Provision of safety against accidental start of engine has not been provided.
- ii) The fuel shut-off lever does not remain in stop position

6.2.1.3 Three point linkage:

Lateral distance from lower hitch point to centre line of tractor does not meet the requirement as per IS:4468 (part -I)1997(mm).

6.3 Maintenance / Service Problems:

No noticeable maintenance or service problem was observed during the 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 of safety against accidental start of engine.
- ii) Provision for spark arresting device in exhaust system.
- iii) Provision of differential lock.
- iv) The fuel shut-off lever does not remain in stop position

6.5 Adequacy of Literature supplied with machine:

6.5.1 The following literature were supplied with the tractor

- a) Operator's manual
- b) Service Parts catalogue
- c) Service Manual



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6.5.2 It is therefore, recommended that following literature may be brought out as per IS: 8132-1999 (Reaffirmed in March, 2009) for the guidance of users and service personnel in national as well as regional languages for this model of tractor.

7. CITIZEN CHARTER

Duration of Test	Time frame for Testing & Evaluation as per Citizen Charter	Whether the Test Report is released within the time frame given in Citizen Charter	Remarks
July to march , 2016	10 Months	Yes	None

TESTING AUTHORITY:

**P.C MESHARAM
SENIOR AGRICULTURAL ENGINEER**

**C. R LOHI
DIRECTOR**

Test report compiled by **Mr. Chanchlesh Singh Raghuwanshi**, Senior Technical Assistant

8. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
8.1	6.2.1.2,6.2.1.3,6.4	Your valuable comments & suggestions for improvements are well taken. Under our policy of continuous product improvement these aspects are further being looked into and 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	12.8
3.	Theoretical speed test	0.4
4.	Location of Centre of gravity	0.2
5.	Turning Ability	0.2
6.	Operator's field of vision	0.2
B.	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.	0.5
	Total	14.3