

T/E

व्यावसायिक परीक्षण रिपोर्ट, (वैरिएंट)  
COMMERCIAL TEST REPORT (Variant)

संख्या / No. : T-1095/1620/2017  
माह / Month : June, 2017



**ESCORTS LIMITED, EURO 50  
(BRAND NAME : POWERTRAC) 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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T-1095/1620/2017	ESCORTS LIMITED, EURO 50 (Brand Name : POWERTRAC) TRACTOR- Commercial (Variant)
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**Manufacturer** : M/s. Escorts Limited,  
 Plot No. 2 & 3, Sector – 13  
 FARIDABAD – 121 007  
 HARYANA  
**Test requested by (applicant)** : M/s. Escorts R & D Centre,  
 15/5, Mathura Road,  
 FARIDABAD – 121 003  
 HARYANA

Month: June	Test Report No. T-1095/1620/2017	Year : 2017
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T-1095/1620/2017

ESCORTS LIMITED, EURO 50 (Brand Name : POWERTRAC)  
TRACTOR- Commercial (Variant)

Type of Test : **COMMERCIAL (Variant)**  
 Test code/Procedure : IS: 5994-1998 (Reaffirmed in 2009) and IS: 12207-2014  
 Period of Test : January to May, 2017  
 Test Report No. : T-1095 / 1620 / 2017  
 Month/Year : **June, 2017**

- i) The results reported in this report are observed values and no corrections have been applied for atmospheric and site conditions.
- ii) The data given in this report pertain to the particular machine submitted by the applicant for test.
- iii) The results presented in this report do not in any way attribute to the durability of the machine.
- iv) This report should not be reproduced in part or full without prior permission of the Director, Central Farm Machinery Training and Testing Institute, Budni (M.P.).
- v) This is a Variant test report and, should be read in conjunction with the Test Report of base model i.e. "ESCORTS LIMITED, EURO 41 E3" tractor bearing Test Report No. T-1087/1612/2017, May 2017.

**SELECTED CONVERSIONS**

SELECTED CONVERSIONS		
Sl. No	Units	Conversion Factor
1	<b>Force:</b>	
	1 kgf	9.80665 N 2.20462 lbf
2	<b>Power:</b>	
	1 hp	1.01387 metric hp (Ps) 745.7 W
	1 Ps	735.5 W
	1 kW	1.35962 Ps
3	<b>Pressure:</b>	
	1 psi	6.895 kPa
	1 kgf/cm <sup>2</sup>	98.067 kPa = 735.56 mm of Hg
	1 bar	100 kPa = 10 N/cm <sup>2</sup>
	1 mm of Hg	1.3332 m-bar

ABBREVIATIONS	
apa	As per applicant
TDC	Top Dead Centre
IS	Indian Standard
LHS/RHS	Left Hand Side/ Right Hand Side
Hg.	Mercury
Temp.	Temperature
N.R.	Not recorded
rpm	Revolutions per minute
O.D/I.D	Outer diameter/ Inner diameter
N.A.	Not available/ Not applicable
PTO	Power take-off
R.H.	Relative Humidity

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T-1087/1612/2017

**ESCORTS LIMITED, EURO 50 (Brand Name : POWERTRAC)  
TRACTOR- Commercial (Variant)**

**Manufacturer** : M/s. Escorts Limited,  
Plot No. 2 & 3, Sector – 13  
FARIDABAD – 121 007  
HARYANA

**Test requested by (applicant)** : M/s. Escorts R & D Centre,  
15/5, Mathura Road,  
FARIDABAD – 121 003  
HARYANA

**Selected for test by** : Applicant  
**Place of running-in** : At applicant's works

**Duration of said running-in (h):**  
- Engine : 15  
- Transmission : 30

**Method of Selection** : The tractor was submitted directly by the applicant for test. Hence, method of selection is not known.

### 1. SCOPE OF TEST

The "ESCORTS LIMITED, EURO 41 E3 (Brand Name: POWERTRAC)" tractor has undergone "Initial Commercial Test" at this Institute and an Initial Commercial Test report No. T-1087/1612/2017 was released in May, 2017. The applicant has submitted an application vide letter No. Euro 50-B-74/16, dated 12.09.2016 for testing of "Escorts Limited, EURO 50 (Brand Name: POWERTRAC)" tractor as a Variant of "ESCORTS LIMITED, EURO 41 E3 (Brand Name: POWERTRAC)" tractor.

The applicant having enclosed a list of following differences in the technical specifications between "ESCORTS LIMITED EURO 41 E3 (Brand Name: POWERTRAC)" and "Escorts Limited, EURO 50 (Brand Name: POWERTRAC)" tractor and has requested to test the "Escorts Limited, EURO 50 (Brand Name: POWERTRAC)" as a variant of "ESCORTS LIMITED, EURO 41 E3 (Brand Name: POWERTRAC)" tractor.

The major features of Base Model and Variant Model are listed below:

S. No.	Parameters	Base Model	Variant Model
1	2	3	4
1	Model of tractor	EURO 41 E3	EURO-50
2	Model of engine	AE3.249A-3A	AE3.276B-3A
3	Nominal bore/stroke, (mm)	98/110	98/122
4	Cubic capacity, (cc)	2490	2761
5	Model/group combination of fuel injection pump	F 002 A3ZF05 PES 3A 90D 410RS 3500	F 002 A3ZF07 PES 3A 90D 410RS 3500
6	Injection timing	7 ±1° before TDC	8 ±1° before TDC (apa)
7	Exhaust gas pressure at maximum power (kPa)	3.1 to 3.2	5.5 to 7.2
8	Type of clutch	Mechanical, dual, dry friction plates	Mechanical, single, dry friction plates
9	Number of friction plates	Two	One
10	Material of clutch plate	Cerametallic	Organic
11	Range of nominal speed, (kmph):		
	- Forward	2.65 to 29.28	2.65 to 29.27
	- Reverse	3.45 to 10.77	3.47 to 10.78
12	Number of PTO speed available	Single speed	Dual speed
13	PTO shaft speed corresponding to rated engine speed, (rpm)	660	645 & 1023



1	2	3	4
14	Engine to PTO speed ratio	3.333:1	3.410:1 & 2.150:1
15	Rear towing hitch, height from ground level, (mm):		
	-Maximum	700	735
	-Minimum	545	490
16	Wheel base, (mm)	2045	2050
17	Mass of tractor [front/rear/total], (kg)	815/1255/2070	895/1425/2320
18	Overall dimensions of tractor(mm): -		
	-Length	3555	3635
	-Width	1750	1720
	-Height	2165	2180
	-Ground clearance	395	400
19	Colours:		
	Chassis & engine	Black	Black
	-Mudguard	Silver	Silver
	-Wheel discs & rims	Silver	Silver
20	Declared maximum PTO power test, (kW)	30.65	34.00
	Power at rated engine speed, (kW)	30.65	34.00
21	Declared specific fuel consumption corresponding to maximum power, (g/kWh)	240	250
22	Declared maximum equivalent crankshaft torque, (Nm)	170.5	193.0
23	Declared equivalent crankshaft torque at maximum power, (Nm)	138.0	153.0
24	Declared maximum drawbar power without ballast, (kW)	24.52	27.20

Subsequent to the examination of the case in the light of Indian Standard 12207: 2014, the following tests were considered to be carried out on the variant model :

1. Specification checking
2. Nominal speed test
3. PTO performance test under natural ambient condition
4. Measurement of capacities

## 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/cm<sup>3</sup> at 15°C was used.

2.2 **Lubricants:**

Sl. No.	Particulars	As recommended by the manufacturer	As used during the test
1.	Engine oil	SAE 20 W 40	As recommended
2.	Transmission, Hydraulic, differential, brakes, rear final drive.	TRACT ELFSF-3I	Oil originally filled in the tractor was not changed
3.	Steering system	SAE-90	--do--
4.	Grease	Servo grease MP	Servo grease MP



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**ESCORTS LIMITED, EURO 50 (Brand Name : POWERTRAC)  
TRACTOR- Commercial (Variant)**

**3. ESSENTIAL TESTS  
3.1 SPECIFICATIONS**

	<u>Base Model</u>	<u>Variant Model</u>
<b>3.1.1 Tractor:</b>		
Make	: Escorts Limited	Escorts Limited
Model	: EURO 41 E3	EURO 50
Type	: Four wheeled, rear-wheels driven, General Purpose Agricultural Tractor.	
Year of manufacture	: 2015 (FD)	2015 (HD)
Brand name	: POWERTRAC	POWERTRAC
Chassis number	: T 05 3281160FD	T 05 3288114HD
Country of Origin	: INDIA	INDIA
<b>3.1.2 Engine:</b>		
Make	: Escorts Limited	Escorts Limited
Model	: AE3.249 A-3A	AE3.276 B-3A
Type	: Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.	
Serial number	: E3312096	E3320707
<b>Engine speed (Manufacturer's recommended production setting), (rpm):</b>		
- Maximum speed at no load	: 2305 to 2455	2305 to 2455
- Low idle speed	: 700 to 800	700 to 800
- Speed at max. torque	: 900 to 1100	900 to 1100
<b>Rated speed, (rpm)</b>	: 2200	2200
<b>3.1.3 Cylinder &amp; Cylinder Head:</b>		
Number	: Three	Three
Disposition	: Vertical, Inline	Vertical, Inline
Bore/stroke, (mm)	: 98/110	98/122
Capacity as specified by the applicant, (cc)	: 2490	2761
Compression ratio, (apa)	: 17.5±5% : 1	17.5±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	
Arrangement of valves	: Overhead, inline	Overhead, inline
<b>Valve clearance (cold/hot):</b>		
- Inlet valve, (mm)	: 0.3 / 0.4	0.3 / 0.4
- Exhaust valve, (mm)	: 0.3 / 0.4	0.3 / 0.4
<b>3.1.4 Fuel System:</b>		
Type of fuel feed system	: Gravity and force feed	Gravity and force feed
<b>3.1.4.1 Fuel tank:</b>		
Capacity, (l)	: 47.60	51.75
Location	: Above clutch housing	Above clutch housing
Provision for draining of sediments/ water	: Not provided	Not provided
Material of fuel tank	: Metallic	Metallic
<b>3.1.4.2 Water separator:</b>		
Make	: Hilux	Hilux
Type	: Gravity, inverted funnel type	
Capacity (l)	: 0.50	0.45
Location	: Between fuel tank and primary feed pump	



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**ESCORTS LIMITED, EURO 50 (Brand Name : POWERTRAC)**  
**TRACTOR- Commercial (Variant)**

	<u>Base Model</u>	<u>Variant Model</u>
<b>3.1.4.3 Fuel feed pump:</b>		
Make	Bosch, India	Bosch, India
Type	Plunger	Plunger
Model/Group combination No.	FP/KS22AD62, 9 440 030 029	FP/KS22AD62, 9 440 030 029
Provision of sediment bowl	Provided	Provided
Method of drive	Through timing gears	
<b>3.1.4.4 Fuel filters:</b>		
Make	Bosch, India	Bosch, India
Model/Group combination No.	9 450 030 120	9 450 030 120
Number	Two	Two
Type of elements		
-Primary	Cloth	Cloth
-Secondary	Paper	Paper
Capacity of final stage filter, (l)	0.50	0.50
<b>3.1.4.5 Injection pump:</b>		
Make	Bosch, India	Bosch, India
Model/Group combination No.	F 002 A3ZF05, PES 3A 90D 410RS 3500	F 002 A3ZF07, PES 3A 90D 410RS 3500
Type	Inline, plungers	In-line, plunger
Serial number	55473767	55850228
<b>3.1.4.6 Injectors:</b>		
Make	Bosch, India	Bosch, India
Type	Multi hole (05 holes)	
Holder number	F002 C700 23 517	F002 C700 23 517
Nozzle number	DSLA 146P 5602	DSLA 146P 5602
Manufacturer's production pressure setting, (MPa)	25.0 to 25.8	25.0 to 25.8 (apa)
Injection timing	7 ±1° before TDC (apa)	8 ±1° before TDC (apa)
<b>3.1.4.7 Governor:</b>		
Make	BOSCH (apa)	BOSCH (apa)
Model/Group combination No.	RSV 375...1100 A4C1...L (apa)	RSV 375...1100 A4C1...L
Type	Mechanical, centrifugal, variable speed.	
Governed range of engine speed, (rpm)	700 – 2455	700 – 2455
Rated engine speed, (rpm)	2200	2200
<b>3.1.5 Air Intake System:</b>		
<b>3.1.5.1 Pre-cleaner</b>		
Make	Escort (apa)	
Type	Centrifugal with transparent dust collector.	
Location	Above main air cleaner inlet tube, outside the bonnet.	
<b>3.1.5.2 Air cleaner:</b>		
Make	Escorts(apa)	Escorts
Type	Oil bath	Oil bath
Location	In the front of the radiator , under the bonnet	
Oil capacity (l)	0.9	1.0
Range of suction pressure at maximum power, (kPa)	3.1	2.8
Oil change period	After every 50 hours of operation during normal working condition and after every 10 hours of operation in dusty condition.	





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**ESCORTS LIMITED, EURO 50 (Brand Name : POWERTRAC)**  
**TRACTOR- Commercial (Variant)**

		<u>Base Model</u>	<u>Variant Model</u>
<b>3.1.6</b>	<b>Exhaust System:</b>		
	Type of silencer :	Up-draught (cylindrical)	
	Position of silencer outlet with respect to SIP, (mm):		
	- Vertical :	840	855
	- Longitudinal :	1690	1620
	- Lateral :	440 ( on LHS)	425 (on LHS)
	Range of exhaust gas pressure at maximum power (kPa) :	3.1 to 3.2	5.5 to 7.2
<b>3.1.7</b>	<b>Lubricating system:</b>		
	Type :	Forced feed-cum-splash	
	Oil sump capacity, ( l ) :	6.00	6.25
	Total lub oil capacity, ( l ) :	6.95	7.00
	Oil change period :	First change after 100 hours of operation and subsequently after every 250 hours of operation.	
	Cooling device, (if any) :	None	
	<b>Filters:</b>		
	Type :	Full flow, spin-on throw away, paper element.	
	Number :	One	One
	<b>Pump:</b>		
	Type :	Gear	
	Method of drive :	Through timing gears	
	Pressure release setting, (kPa) :	275 to 314	275 to 314
	Minimum permissible pressure, (kPa) :	98.1	98.1
<b>3.1.8</b>	<b>Cooling system:</b>		
	Type :	Forced circulation of water	
	Coolant as recommended :	Not available	Not available
	Details of pump :	Centrifugal, semi open impeller of 103.7 mm diameter having eight vanes and driven through crankshaft pulley by a cogged "V-belt" common to alternator	
	Details of fan :	Suction type, having six polypropylene blades of 390 mm diameter and mounted on water pump shaft.	
	Means of temperature control :	Thermostat	Thermostat
	Bare radiator capacity, ( l ) :	2.80	2.80
	Capacity of expansion tank :	0.60	0.60
	Total coolant capacity, ( l ) :	7.35	7.15
	Radiator cap pressure, (kPa) :	49	49
<b>3.1.9</b>	<b>Starting System:</b>		
	Type :	12V, DC, Electrical	12V, DC, electrical
	Aid for cold starting :	None	None
	Any other device provided for easy starting. :	None	None
<b>3.1.10</b>	<b>Electrical System:</b>		
<b>3.1.10.1</b>	<b>Battery:</b>		
	Make and model :	Amaron, TRA 500R	Amaron, TRA 500R
	Type :	Lead acid	Lead acid
	Capacity and rating :	12 V, 75 Ah at 20 hours discharge rate	12V, 88 Ah at 20 hours discharge rate.
	Location :	On LHS of tractor in a separate metallic box.	



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**ESCORTS LIMITED, EURO 50 (Brand Name : POWERTRAC)  
TRACTOR- Commercial (Variant)**

<b>3.1.10.2 Starter :</b>	<b>Base Model</b>	<b>Variant Model</b>
Make	: Autolek	Panalfa
Model	: Not available	Not available
Type	: Pre engaging, solenoid operated	
Power rating	: 12V, 2.2 kW	Not available
Serial number	: Not available	Not available
<b>3.1.10.3 Generator:</b>		
Make	: Panalfa	Spark (MINDA)
Model	: Not available	EF056-2706
Type	: Alternator	Alternator
Serial number	: 0323501002	12V, 35 ampere
Output rating	: 12V, 35 ampere	0323504002
Method of drive	: Through crankshaft pulley	
<b>3.1.10.4 Voltage regulator</b>	: In built in alternator	
<b>3.1.10.5 Details of light:</b>		

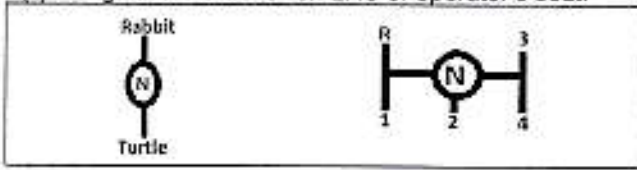
Description	No. & capacity of bulbs		Height of the centre of beam above ground level, (mm)		Size of beam, (mm)		Distance between centre of the beam and outside edge of tractor at standard rear track setting, (mm)	
	Base model	Variant model	Base model	Variant model	Base model	Variant model	Base model	Variant model
1	2	3	4	5	6	7	8	9
<b>Front Lights:</b>								
- Head lights	2, 12V, 35/35W		965	970	130 Ø	130 Ø	475	470
- Parking lights	2, 12V, 5W		1295	1265	70 x 96	60 x 65	195	160
- Turn Indicators-cum-Hazard lights	2, 12V, 21W		1295	1265	70 x 96	70 x 65	85	100
-Work lamp	02, 12V, 27W		1185	Not provided	62 Ø	Not provided	650	Not provided
- Reflectors (white)	02		1295	1265	70 x 48	30 x 55	145	210
<b>Rear lights:</b>								
-Tail light-cum-brake light	2, 12V, 21/5W		1285	1280	70 x 96	60 x 65	175	185
- Turn Indicators-cum-Hazard lights	2, 12V, 21W		1285	1280	70 x 96	70 x 65	65	120
- Plough light (on RHS mudguard)	1, 12 V, 55W		1330	1440	150 Ø	125 Ø	305	335
-Reflectors (Red)	02		1285	1280	70 x 48	30 x 55	125	225
Registration plate Light (RHS)	01, 12V, 5W		1200	Part of rear combination assembly	30 Ø	Part of rear combination assembly	125	Part of rear combination assembly

<b>3.1.10.5 Instrument panel details:</b>	<b>Base Model</b>	<b>Variant Model</b>
i) Engine speed meter analog type (0 – 27 x 100)	Provided	Provided
ii) Digital cumulative run hour meter	Provided	Provided
iii) Water temperature gauge (with colour zones)	Provided	Provided
iv) Fuel level gauge (with coloured zones)	Provided	Provided
v) Battery charging gauge with colour zone (red-green-red)	Provided	Provided
vi) Battery charging indicator	Provided	Provided
vii) Lubrication oil pressure gauge with colour zone (red – green)	Provided	Provided
viii) Turn/hazard indicator (left, right)	Provided	Provided



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**ESCORTS LIMITED, EURO 50 (Brand Name : POWERTRAC)  
TRACTOR- Commercial (Variant)**

		Base Model	Variant Model
ix)	Head light long beam ON indicator	Provided	Provided
x)	Hazard light switch	Provided	Provided
xi)	Turn indicator light switch (left, right)	Provided	Provided
xii)	Horn push button	Provided	Provided
xiii)	Mobile charging socket	Provided	Provided
xiv)	Hand accelerator lever	Provided	Provided
xv)	Rear view mirror	Provided	Provided
xvi)	Steering control wheel	Provided	Provided
xvii)	Engine stop knob (fuel-shut-off knob, pull type)	Provided	Provided
<b>3.1.11</b>	<b>Transmission System:</b>		
<b>3.1.11.1</b>	<b>Clutch:</b>		
	Make	: LUK India	LUK India
	Type	: Dual , dry friction plates	Single, dry friction plate, diaphragm type, One
	No. of friction plate(s)	: Two	One
	Size, [OD/ID (mm)] :		
	-Main transmission clutch	: 279.63/165.85 $\Phi$	280/165.85 $\Phi$
	-PTO clutch	: 279.54/165.75 $\Phi$	Not applicable
	<b>Method of operation:</b>		
	-Main transmission clutch	: By pressing LHS foot pedal halfway.	By pressing LHS foot pedal fully.
	-PTO clutch	: By pressing LHS foot pedal fully.	Not applicable
<b>3.1.11.2</b>	<b>Gear box:</b>		
	Make	: Escorts	Escorts
	Model	: Not available	Not available
	Type	: Mechanical, Constant mesh	
	Location of gear shifting levers	: Side shift arrangement (i) Main gear shift lever on RHS of operator's seat (ii) Range selector lever on LHS of operator's seat.	
	Gear shifting pattern	: 	
	<b>No. of speeds:</b>		
	- Forward	: 08	08
	- Reverse	: 02	02
	<b>Range of speeds (Kmph):</b>		
	- Forwards	: 2.65 to 29.28	2.65 to 29.27
	- Reverses	: 3.45 to 10.77	3.47 to 10.78
	Oil capacity (l)	: 39.45 (common with differential, final drive, hydraulic and brake systems)	40.0 (Common with differential, rear axle & final drive, hydraulic and brake systems)
	Oil changing period	: Change after every 1200 hours of operation.	
<b>3.1.11.3</b>	<b>Differential:</b>		
	Type	: Crown wheel and bevel pinion with differential assembly accommodated inside the differential housing.	
	Reduction through crown wheel & bevel pinion	: 3.727 : 1 (41/11 T)	3.727 : 1 (41/11 T)
	<b>Differential lock:</b>		
	Type	: Pin type	Pin type
	Method of operation	: By pressing the pedal on RHS of operator's seat.	



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**ESCORTS LIMITED, EURO 50 (Brand Name : POWERTRAC)**  
**TRACTOR- Commercial (Variant)**

- 3.1.11.4 Rear axle & final drive:**
- |                                  | <u>Base Model</u>   | <u>Variant Model</u>   |
|----------------------------------|---|--|
| Type                             | : Bull & Pinion type reduction unit, accommodated outside the differential housing on both sides. |  |
| Reduction through final drive    | : 4.636 : 1 (51/11T)  | : 4.636 : 1 (51/11T)   |
| Oil capacity of final drive, (l) | : 39.45 (common with gear box, differential, hydraulic and brake systems)                         | : 40.0 (common with gear box, differential, hydraulic and brake systems) |
| Oil changing period              | : Change after every 1200 hours of operation.   |  |
- 3.1.12 Power lift (Hydraulic System):**
- |                                    |   |  |
|------------------------------------|---|--|
| Make                               | : Escorts (apa)   | : Escorts (apa)  |
| Type                               | : Open centre, live, ADDC   |  |
| No. and type of cylinder           | : One, single acting  | : One, single acting (apa)   |
| Type of linkage lock for transport | : Not provided  |  |
| <b>Hydraulic pump :</b>            |   |  |
| - Make                             | : Dynamics  | : Dynamics   |
| - Type                             | : Gear  | : Gear   |
| - Location & drive                 | : On LHS of engine and driven through timing gears.                         |  |
| No. & type of filters              | : One, full flow, spin-on paper element.                                    |  |
| Hydraulic oil capacity, ( l )      | : 39.45 (common with gear box, differential, final drive and brake systems) | : 40 (Common to gear box, differential, final drive, and brake system) |
- 3.1.12.1 Three point linkage:**

S. No.	Observations	As per IS: 4468- (Part-1) -1997, (Cat.I / Cat.II), (mm)	As measured (mm)		Remarks in case of variant model
			Base Model	Variant Model	
1	2	3	4	5	6
I.	<b>Upper hitch points:</b>				
a)	Dia of hitch pin hole	19.30 to 19.50 / 25.70 to 25.90	25.84	25.88	Conforms to Cat.II
b)	Width of ball	44.0 (max.) / 51.0 (max.)	50.8	51.0	Conforms to Cat.II
II.	<b>Lower hitch points:</b>				
a)	Dia of hitch pin hole	22.40 to 22.65 / 28.70 to 29.00	28.80	29.0	Conforms to Cat.II
b)	Width of ball	34.8 to 35.0 / 44.8 to 45.0	45.0	44.8	-do-
III.	Lateral distance from lower hitch point to centre line of tractor	359 /435	364	364	<b>Does not conform</b>
IV.	Lateral movement of lower hitch points	100 (min) / 125 (min)	165	200	Conforms
V.	Distance from end of power take-off to centre of lower hitch point (lower links in horizontal position)	450 to 575 / 550 to 625	530	620	Conforms
VI.	Transport height	820 (min)/ 950 (min)	910	870	Conforms
VII.	Power range (without force)	560(min)/ 650 (min)	605	640	Conforms

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1	2	3	4	5	6
VIII	Leveling adjustment	100 (min)/ 100 (min)	300	425	Conforms
IX	Lower hitch point clearance	100 (min)/ 100 (min)	205	290	Conforms
X	Lower hitch point height	200 (max)/ 200 (max)	200	200	Conforms

3.1.12.2

Drawbar:

Linkage Drawbar (Refer Fig.1) :

Notation	As per IS: 12953-1990, (Cat.I) / (Cat.II), (mm)	As measured, (mm)		Remarks in case of variant model
		Base Model	Variant model	
A	683 ± 1.5 / 825 ± 1.5	684	684	Conforms to Cat.II
B	75 (min) / 75 (min)	76	75	Conforms
C	30 (min) / 30 (min)	32	30.1	Conforms
D $\emptyset$	21.79 to 22.0 / 27.79 to 28.0	27.90	27.85	Conforms to Cat.II
E	39.0 (min) / 49.0 (min)	56.5	56.3	Conforms
F $\emptyset$	12.0 (min) / 12.0 (min)	12.0	12.0	Conforms
G	15.0 (min) / 15.0 (min)	15.4	16.2	Conforms
H $\emptyset$	25 ± 1 / 25 ± 1	25.0	24.8	Conforms
J	80 ± 1.5 / 80 ± 1.5	80.0	80.2	Conforms
No. of holes	7 / 9	7	7	Conforms to Cat.II

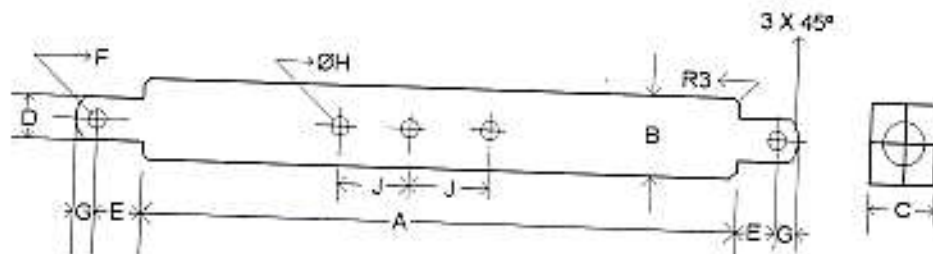


Fig. 1: DIMENSIONAL NOTATIONS FOR LINKAGE DRAWBAR

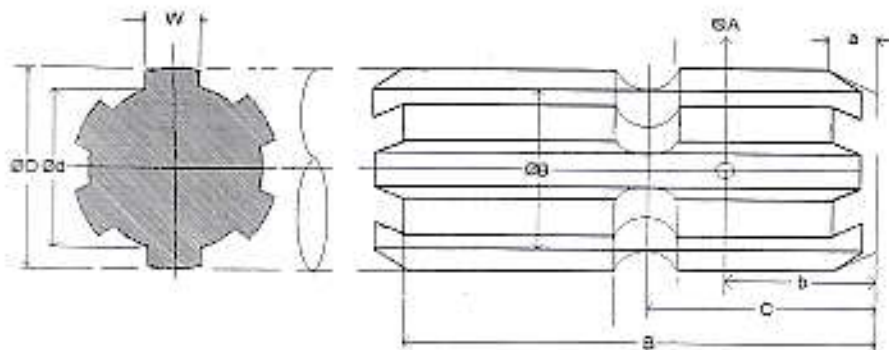
3.1.13	Power take-off shaft:	Base Model	Variant Model
Type	:	Type-I, independent	Type I, Not Independent
Method of engaging	:	By a hand lever provided on LHS of operator's seat.	
No. of shaft(s)	:	One	One
PTO speed corresponding to rated engine speed (rpm)	:	660	645 - In low range selection 1023 - in high range selection
Distance behind rear axle, (mm)	:	320	320
Engine to PTO speed ratio	:	3.333 : 1	3.410 : 1 & 2.150:1
Whether the PTO shaft is capable of transmitting the full power of engine	:	Yes	Yes

**3.1.13.1 Specifications of Power Take-off Shaft: [Refer Fig. 2(a)]**

Specification	As per IS: 4931-1995	As observed		Remarks
		Base Model	Variant Model	
1	2	3	4	5
Nominal speed, (rpm)	540 ± 10	540 rpm of PTO corresponding to 1800 rpm of engine	540 rpm of PTO corresponds to 1841 rpm of engine	Conforms
No. of splines	6	6	6	Conforms
Direction of rotation	Clockwise	Clockwise	Clockwise	Conforms
Location	The position of the centre of the end of PTO shaft shall be within 50 mm to right or left of the centre line of the tractor	8 mm LHS from centre line of the tractor	Centrally located	Conforms

**Dimensions, (mm) (See Fig. 2(a)):**

D $\varnothing$	34.79 ± 0.06	34.79	34.79	Conforms
d $\varnothing$	28.91 ± 0.05	28.88	28.91	Conforms
B $\varnothing$	29.4 ± 0.1	29.4	29.4	Conforms
A $\varnothing$ (optional)	8.3 ± 0.1	8.3	8.3	Conforms
W	8.69 - 0.09 - 0.16	8.60	8.63	Conforms
a	7	7	7	Conforms
b(optional)	25 ± 0.5	25.0	25.0	Conforms
c	38	38	38	Conforms
X	30°	30°	30°	Conforms
B	76 (min)	80	80	Conforms
h	450 to 675	555	550	Conforms



**Fig. 2 (a) DIMENSIONAL NOTATIONS FOR TYPE-I POWER TAKE-OFF SHAFT**

**1.13.2 Master Shield of Power Take-Off Shaft : provided**

**3.1.13.2 Power Take-off Master Shield (Type I&II):**

**Dimensions of Power take-Off Shaft, [See Fig. 2(b)]:**

Specification	As per IS 4931-1995 (mm)	As Observed		Remark
		Base Model	Variant Model	
K	70(Min.)	80	75	Conforms
M	125 ± 5	120	130	Conforms
N	85 ± 5	90	90	Conforms
P	285 ± 5	285	280	Conforms
R	76 (Max.)	06	20	Conforms

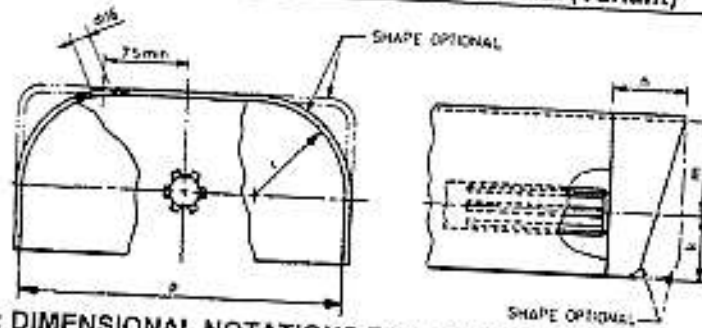


Fig. 2 (b): DIMENSIONAL NOTATIONS FOR PTO SHAFT MASTER SHIELD

		Base Model	Variant Model
3.1.14	<b>Towing hitch:</b>		
3.1.14.1	<b>Front :</b>		
	Type	Clevis	Clevis
	Location	At front of tractor in bumper	
	Height above ground level, (mm):	650 (Fixed)	645 (Fixed)
	Dia of pin hole, (mm)	35.0	35.0
	Width of clevis, (mm)	61.0	61.0
3.1.14.2	<b>Rear :</b>		
	Type	Clevis	Clevis
	Location	At the rear of transmission housing	
	Height above ground level, (mm):		
	- Maximum	700	735
	- Minimum	545	490
	<b>Distance of hitch point,(mm):</b>		
	- From rear axle centre	125	430
	- From power take-off shaft end	115	110
	Dia of pin hole, (mm)	35.0	36.0
	Width of clevis, (mm)	77.0	75.0
3.1.15	<b>Steering:</b>		
	Make	ZF, India	Rane (apa)
	Type	Manual, worm & roller type with single drop arm	
	Location of control wheel	Above gear box housing.	
	Method of operation	Manually, through steering control wheel.	
	Diameter of steering control wheel, (mm)	430	430
	Steering oil capacity, (l)	0.70	0.70
	Lubricant change period	First change after 150 hours and subsequently after every 850 hours of operation	
3.1.15	<b>Brakes:</b>		
3.1.15.1	<b>Service Brake:</b>		
	Make	JMI	JMI
	Type	Mechanically operated, oil immersed disc brakes	
	Location	At the pinion shaft of final reduction located in separate housing.	
	No. of disc (s)	Four on each side	
	Area of liners. (cm <sup>2</sup> )	1034.2 (on each wheel side)	
	Material of liners	Non-asbestos (apa)	Non Asbestos (apa)
	Method of operation	By depressing RHS foot pedal independently or combined.	
	Oil capacity (l)	39.45 (common with gear box, differential, final drive and hydraulic steering system)	40.0 (Common with differential, rear axle & final drive, hydraulic systems)
	Oil changing period	Change after every 1200 hours of operation.	



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		<u>Base Model</u>	<u>Variant Model</u>
<b>3.1.15.2</b>	<b>Parking Brake:</b>		
	Type	Paul & Ratchet arrangement	
	Method of operation	Service brake acts as parking brake when locked in position by a hand lever provided on RHS of operator's seat.	
<b>3.1.16</b>	<b>Wheel Equipment:</b>		
<b>3.1.16.1</b>	<b>Steered Wheel(s):</b>		
	Make	Good Year, FTI95	Good Year
	Number	Two	Two
	Type of tyre	Pneumatic, ribbed	Pneumatic, ribbed
	Size	6.00-16	6.00-16
	Ply rating	8	8
	Maximum permissible loading capacity of each tyre at 196 kPa pressure, (kgf)	406	406
	<b>Recommended inflation pressure, kPa :</b>		
	- for field work	196	196
	- for transport	196	196
	Track width, (mm)	1340 (std.), 1520	1340 (std.), 1500
	Make & size of rim	SSWL, 4.50E x 16	SSWL, 4.50E x 16
<b>3.1.16.2</b>	<b>Drive wheel(s):</b>		
	Make	Good Year, DTI95	Good Year, DTI95
	Number	Two	Two
	Type of tyre	Pneumatic, traction	Pneumatic, traction
	Size	13.6-28	13.6-28
	Ply rating	12	12
	Maximum permissible loading capacity of each tyre at 137 kPa pressure, (kgf)	1100	1100
	<b>Recommended inflation pressure, (kPa) :</b>		
	- for field work	100	100
	- for transport	108	108
	Track width, (mm)	1365 (std.), 1455, 1565, 1595, 1705, 1795 & 1915	1370 (std.), 1450, 1500, 1600, 1710, 1800 & 1900
	Make & size of rim	SSWL, W11 x 28	WIL, W11 x 28
<b>3.1.16.3</b>	<b>Wheel base (mm)</b>	2045	2050
<b>3.1.17</b>	<b>Operator's seat:</b>		
	Make	Not available	
	Type	Cushioned seat with back rest	
	Type of suspension	Two helical coil springs	
	Type of dampening	Hydraulic shock absorber	
	<b>Range of adjustment, (mm):</b>		
	- Vertical	Fixed 3 positions at 30 mm pitch	Nil
	- Lateral	NIL	Nil
	- Longitudinal	± 110	± 30





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**3.1.18 Provision for safety and comfort of operator:**

**3.1.18.1 Operator's Seat:**

All parameters meets the minimum requirements of IS: 12343-1998, (Re-affirmed in March, 2009), **except the following:**

**Base Model**

i) Longitudinal distance from seat index point to the centre of steering control wheel,

**Variant Model**

i) Meets the requirement of IS: 12343-1998.

**3.1.18.2 Conformity with IS: 6283 (Part-1 & 2)-1998 (Re-affirmed in March, 2009):**

i) Controls are identifiable with symbols and displays with colour codes as per IS: 6283 (Part-1 & 2)-1998

i) Controls are identifiable with symbols as per IS: 6283 (Part-1 & 2)-1998

**3.1.18.3 Conformity with IS:8133-1983 (Re-affirmed in March, 2009):**

Location and movement of various controls meets the requirement of IS: 8133-1983), **except the following:**

i) The provision for starting the engine unless the traction transmission is in neutral position or park position or the traction clutch is disengaged or the operator is in operator's seat (station) is not available.

i) The provision for starting the engine unless the traction transmission is in neutral position or park position or the traction clutch is disengaged or the operator is in operator's seat (station) is not available.

ii) Stop compression ignition is provided but does not remain in stop position,

ii) Stop compression ignition is provided but does not remain in stop position.

**3.1.18.4 Conformity with IS: 12239 (Part-1)-1996 (Re-affirmed in March, 2007):**

Meets the requirements of IS:12239(Part-1)-1996, **except the following:**

i) Provision of spark arresting device in the exhaust system.

i) Provision of spark arresting device in the exhaust system.

**3.1.18.5 Conformity with IS:12239 (Part-2)-1999 (Re-affirmed in March, 2009):**

Meets the requirements of IS:12239 (Part-2)-1999, **except the following:**

i) The mudguard front of the rear wheels is shorter than the circumference of tyre.

i) The working clearance between draft control lever and position control is not provided as per minimum requirement.

ii) The working clearance between draft control lever and seat is not provided as per minimum requirement.

**3.1.18.6 Conformity with IS: 14683 – 1999 (Re-affirmed in March, 2009) :**

Lighting requirements conform to IS: 14683-1999 for both the Base Model and Variant Model.

**3.1.18.7 Rear view mirror:**

Rear view mirror has been provided in both the Base Model and Variant Model.

**3.1.19 0Mass of tractor, (kg):**

	<b>Base Model</b>
- Front	: 815
- Rear	: 1255
- Total	: 2070

<b>Variant Model</b>
810
1250
2060

**3.1.20 Overall dimensions (mm):**

- Length	: 3555
- Width	: 1750
- Height	: 2165

Minimum ground clearance, (mm)	: 395 (below transmission drain plug)
--------------------------------	---------------------------------------

3635
1720
2180
400 (Below brake actuating link)

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3.1.21	<b>Colour of tractor:</b>		<u>Base Model</u>	<u>Variant Model</u>
	Engine & Chassis	:	Smoke Grey	Smoke grey
	<b>Sheet metal:</b>			
	-Bonnet	:	Blue	Red
	-Mudguard	:	Silver	Red & Silver white
	-Rim & disc	:	Silver	Silver white
3.1.22	<b>Number of external lubricating points:</b>			
	-Oiling	:	Nil	Nil
	-Grease cups	:	02	02
	-Grease nipples	:	15	15

3.1.23

**Labeling of tractor:**

The labeling plate is riveted on inner side of LHS fender, provides the following information:

Name of Manufacturer	ESCORTS LIMITED- AGRI MACHINERY FARIDABAD
Make	ESCORTS LIMITED
Model	EURO 50
Brand Name	POWERTRAC
ATN/Chassis Number	T053288114HD
Engine Serial Number	E3320707
Maximum PTO Power, kW (hp)	34.0
Specific fuel consumption, g/kWh (g/hph)	250
Month & Year of manufacturing	HD ( November, 2015)

**3.2 NOMINAL SPEED TEST**

Movement	Gear No.	No. of engine revolutions for one revolution of driving wheel		Variation in engine revolution, (%)	Nominal speed at rated engine speed when fitted with 13.6-28 size tyres of 610mm radius index, (kmph)		Variation in nominal speed (%)
		Base model	Variant model		Base model	Variant model	
Forward	L1	190.72	190.72	0.0	2.65	2.65	0.0
	L2	135.98	135.93	0.0	3.72	3.72	0.0
	L3	85.61	85.58	0.0	5.91	5.92	0.2
	L4	53.60	53.57	-0.1	9.44	9.44	0.0
	H1	61.44	61.34	-0.2	8.23	8.25	0.2
	H2	43.82	43.75	-0.2	11.55	11.55	0.0
	H3	27.58	27.58	0.0	18.35	18.35	0.0
	H4	17.28	17.28	0.0	29.28	29.27	0.0
Reverse	R1	146.45	145.7	-0.5	3.45	3.47	0.6
	R2	46.99	46.86	-0.3	10.77	10.78	0.1

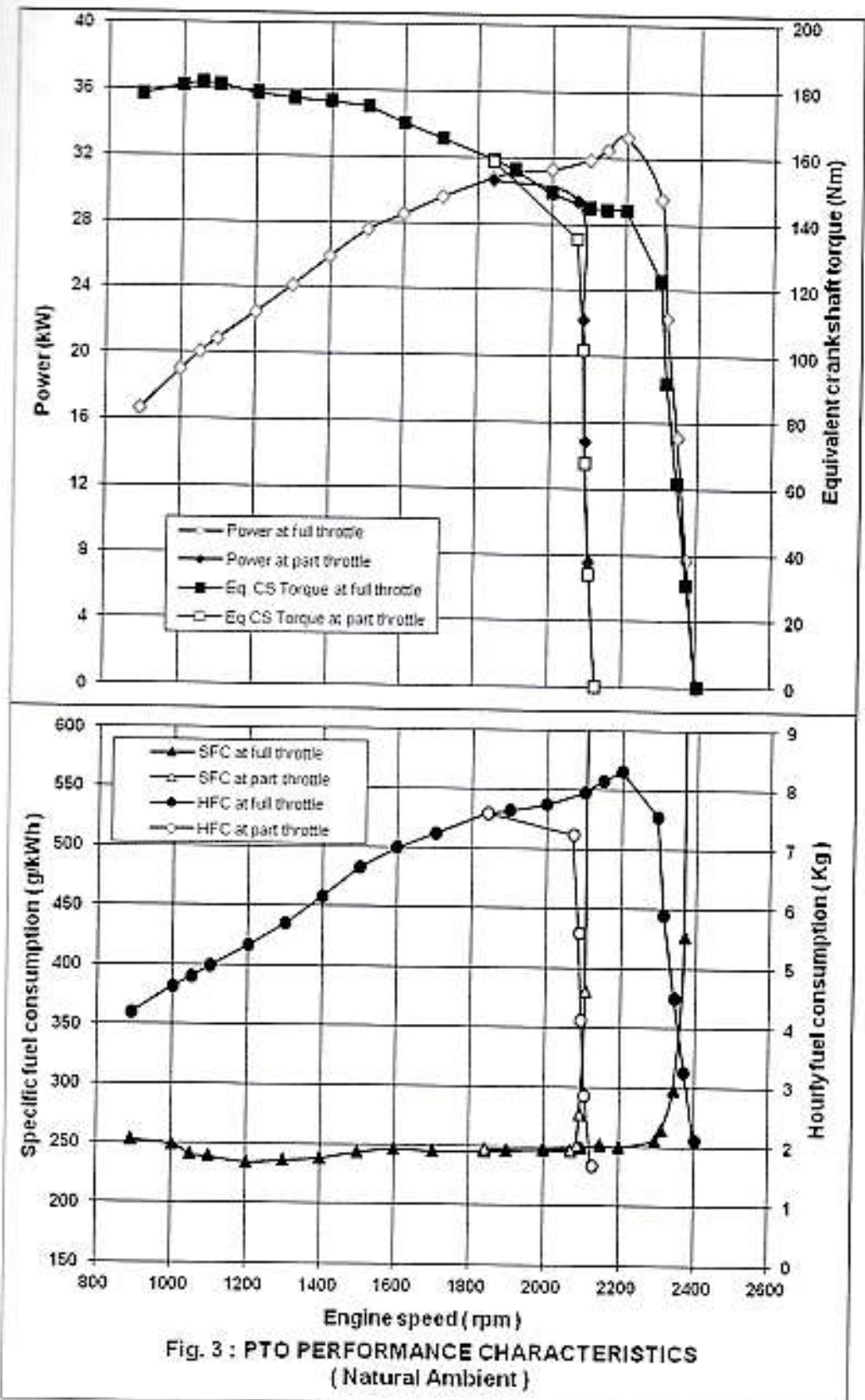
### 3.3 PTO PERFORMANCE TEST

S. No.	Particulars	Base model	Variant model
1	Date(s) of test	20.10.2016 and 21.10.2016	18.04.2017
2	Tractor run prior to institute start of PTO test, (h)	8.31	0.2
3	Dynamometer test bench used	Eddy Current, SAJ -AG- 250	

Power take-off performance test under natural ambient condition was conducted due to change in Engine to PTO speed ratio. The results of Power take-off performance test under natural ambient of Base & Variant Model are tabulated in Table-1.

Table-1

Model	Power, (kW)	Speed. (rpm)		Fuel Consumption			Specific energy, (kWh/l)
		PTO	Engine	(l/h)	(kg/h)	(kg/kWh)	
1	2	3	4	5	6	7	8
<b>a) Maximum power – 2 hours test (under natural ambient condition):</b>							
Base model	31.1	660	2200	9.15	7.65	0.246	3.40
	29.2	660	2200	8.68	7.26	0.249	3.36*
Variant model	33.3	645	2199	9.94	8.31	0.250	3.35
<b>b) Power at rated engine speed (2200 rpm) :</b>							
Base model	31.1	660	2200	9.15	7.65	0.246	3.40
	29.2	660	2200	8.68	7.26	0.249	3.36*
Variant model	33.3	645	2199	9.94	8.31	0.250	3.35
<b>c) Power at standard power take-off speed ( 540 ± 10 rpm):</b>							
Base model	27.1	540	1800	7.66	6.40	0.236	3.54
	25.4	540	1800	7.34	6.14	0.242	3.46*
Variant model	30.7	540	1841	7.58	9.07	0.247	3.39
<b>d) Varying loads at rated engine speed:</b>							
<b>i) Torque corresponding to maximum power available at rated engine speed:</b>							
Base model	31.1	660	2200	9.15	7.65	0.246	3.40
Variant model	33.3	645	2199	9.94	8.31	0.250	3.35
<b>ii) 85% of the torque obtained in (i):</b>							
Base model	28.1	700	2333	8.27	6.92	0.246	3.40
Variant model	29.5	673	2295	9.03	7.55	0.256	3.27
<b>iii) 75% of the torque obtained in (ii):</b>							
Base model	21.3	708	2360	6.47	5.41	0.254	3.29
Variant model	22.3	678	2312	7.06	5.90	0.265	3.16
<b>iv) 50% of the torque obtained in (ii) :</b>							
Base model	14.4	714	2380	4.90	4.09	0.284	2.94
Variant model	15.1	687	2343	5.39	4.51	0.298	2.80
<b>v) 25% of the torque obtained in (ii):</b>							
Base model	7.3	722	2406	3.51	2.93	0.401	2.08
Variant model	7.6	695	2370	3.90	3.26	0.427	1.96
<b>vi) Unloaded:</b>							
Base model	0.2	729	2430	2.26	1.89	9.450	0.09
Variant model	0.1	704	2401	2.51	2.10	21.000	0.04



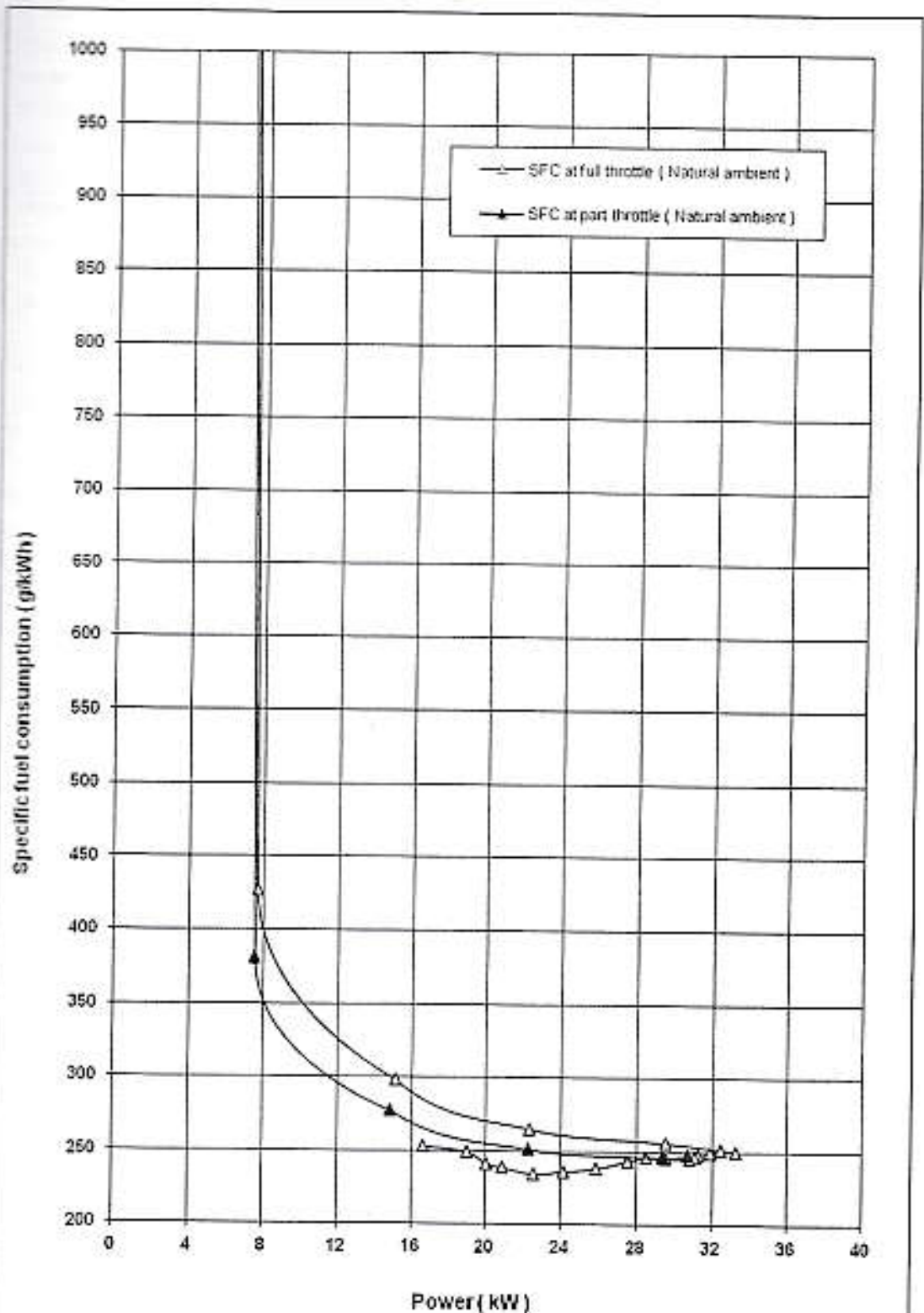


Fig. 4 : PTO PERFORMANCE CHARACTERISTICS  
(Natural Ambient)



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	1	2	3	4	5	6	7	8
<b>e) Varying loads at standard PTO speed (540 + 10 rpm):</b>								
Base model		27.1	540	1800	7.66	6.40	0.236	3.54
Variant model		30.7	540	1841	7.58	9.07	0.247	3.39
<b>ii) 85% of the torque obtained in (i):</b>								
Base model		24.4	574	1913	6.77	5.66	0.232	3.60
Variant model		29.4	607	2070	8.66	7.24	0.246	3.40
<b>iii) 75% of the torque obtained in (ii):</b>								
Base model		18.5	580	1933	5.24	4.38	0.237	3.53
Variant model		22.2	612	2087	6.68	5.58	0.251	3.33
<b>iv) 50% of the torque obtained in (ii) :</b>								
Base model		12.4	583	1943	3.88	3.24	0.261	3.20
Variant model		14.9	614	2094	4.92	4.12	0.277	3.02
<b>v) 25% of the torque obtained in (ii):</b>								
Base model		6.3	591	1970	2.69	2.25	0.357	2.34
Variant model		7.5	618	2107	3.42	2.86	0.381	2.20
<b>vi) Unloaded:</b>								
Base model		0.1	600	2000	1.65	1.38	13.800	0.06
Variant model		0.1	624	2128	2.00	1.67	16.700	0.05

\*Under high ambient condition

S. No.	Parameters	Base Model		Variant Model
		Natural Ambient	High Ambient	Natural Ambient (Max. power Two Hours)
1	2	3	4	5
i)	No load maximum engine speed, (rpm)	2430	2430	2401
ii)	Equivalent crankshaft torque at maximum power (Nm)	135.1	126.6	144.4
iii)	Maximum equivalent crank shaft torque (Nm)	163.9	156.4	182
iv)	Engine speed at maximum equivalent crankshaft torque, (rpm)	1050	1050	1050
v)	Backup torque (%)	21.3	23.5	26.0
<b>Range of atmospheric condition :</b>				
vi)	- Temperature, (°C)	25 to 26	41 to 45	28 to 32
	- Pressure, (kPa)	98.6 to 99.2	99.7 to 100	97.5 to 97.6
	- Relative humidity, (%)	61 to 65	21 to 37	69 to 74
<b>Maximum Temperature, (°C):</b>				
vii)	- Engine oil	91	102	106
	- Coolant	82	93	82
	- Fuel	49	65	55
	- Air intake	33	49	31
	- Exhaust gas	597	599	621
<b>Pressure at maximum power:</b>				
viii)	- Intake air, (kPa)	3.1	3.1	2.8
	- Exhaust gas, (kPa)	3.1 to 3.2	2.5 to 2.9	5.5 to 7.2
<b>ix) Consumptions:</b>				
ix)	-Lub. Oil (g/kWh)	-	0.11	-
	-Coolant (% of total coolant capacity)	-	1.36	-



## 4. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

Sl. No.	Adjustments/Defects/Breakdowns and Repairs	Tractor run hours
-	----None ----	--

5. COMPARISON BETWEEN CHANGES IN BASE MODEL AND VARIANT MODEL  
(Based on Table 3 & 4 of Indian Standard 12207: 2014)

S. No.	Clause No.	Features	Observation on base model (T-1087/1612/May,2017)	Observation on variant model	Remarks		
1	2	3	4	5	6		
1.	i)	Single/dual/dry/wet/ independent clutch/increase in size of clutch	Dual , dry friction plate of 280 mm diameter	Single, dry friction plate of 280 mm diameter	<b>Changed</b>		
2.	ii)	Air cleaner.	Same configuration in base & variant models (refer para 3.1.5)		No change		
3.	iii)	Exhaust system	Same configuration in base & variant models (refer para 3.1.6)		No change		
4.	iv)	<b>Gear Box:</b>					
		- Type	Mechanical, const-ant mesh		No change		
		<b>Reduction ratio of transmission:</b>					
		<b>Movement</b>	<b>Gear</b>	<b>Base model</b>	<b>Variant model</b>	<b>Variation, (%)</b>	<b>Remakes</b>
		Forward	L1	190.72	190.72	0.0	Similar
			L2	135.98	135.93	0.0	-do-
			L3	85.61	85.58	0.0	-do-
			L4	53.60	53.57	-0.1	-do-
			H1	61.44	61.34	-0.2	-do-
			H2	43.82	43.75	-0.2	-do-
			H3	27.58	27.58	0.0	-do-
			H4	17.28	17.28	0.0	-do-
		Reverse	RL	146.45	145.7	-0.5	-do-
			RH	46.99	46.86	-0.3	-do-
5.	v)	<b>Nominal speeds (%):</b>					
		- Forward	2.65 to 29.28	2.65 to 29.27 (0.0 to 0.2 % variation)		Similar	
		- Reverse	3.45 to 10.77	3.47 to 10.78 (0.1 to 0.6 % variation)		Similar	
		Additional no. of speed	None	None		No change	
6.	vi)	<b>Fitment/change of engine accessories:</b>					
		-Expansion tank capacity, (l)	0.60	0.60		No change	
		- Bare Radiator Capacity,(l)	2.80	2.60		<b>Changed</b>	
		- Total coolant capacity, (l)	7.35	6.20		<b>Changed</b>	
		Air compressors	Not provided	Not provided		No change	
		Oil coolers	Not provided	Not provided		No change	
7.	vii)	<b>Brake system:</b>					
		Type-disc, drum, oil immersed brakes	Mechanical, oil immerse disc brakes		No change		



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1	2	3	4	5	6
8.	viii)	<b>Three point linkages:</b>			
		Type	Cat.I/Cat.II	Cat.I/Cat.II	No change
		Rear/front mounted	Rear mounted	Rear mounted	No change
9.	ix)	<b>PTO shaft (s):</b>			
		Location	Centrally located	Centrally located	No change
		Type	Type-I, Not Independent	Type-I, Not Independent	No change
		Speed corresponding to rated engine speed (rpm)	660 - Clockwise rotation	645 & 1023- Clockwise rotation	Changed
		Engine to speed PTO ratio	3.333:1	3.410:1 & 2.150:1	Changed
10.	x)	<b>Type of drive:</b>			
		2 WD or 4 WD	2 WD	2 WD	No change
11.	xi)	<b>Hydraulic pump drive:</b>			
		Location & type of Hydraulic pump drive	Same configuration in base & variant models (refer para 3.1.12).		No change
12.	xii)	<b>Positioning of hydraulic sensing mechanism:</b>			
		Lower link, top link, etc.	Through top link	Through top link	No change
13.	xiii)	<b>Final reduction:</b>			
		Location, type & reduction ratio	Same configuration in base & variant models (refer para 3.1.11.4).		No change
14.	xiv)	<b>Type of fuel injection pump:</b>			
		Inline/Rotary/Common rail	Inline plunger	Inline plunger	No change
		Injection timing (by spill cut off method)	7±1° BTDC	8±1° BTDC	Changed
		Fuel delivery for 500 no. stroke at pump speed of 2200 rpm, (mm <sup>3</sup> ) (Test bench figures)	45.2 to 49.2	50.5 to 54.5	Changed
15.	<b>Changes related to engine parameters (as per Table-4)</b>				
	i)	Engine operating principle (spark/ compression ignition, two/four stroke)	Compression ignition, four stroke	Compression ignition, four stroke	No change
	ii)	Number & arrangement of cylinders	Three & vertical inline	Three & vertical inline	No change
	iii)	Maximum declared PTO power, (kW)	30.65	34.0	Changed
	iv)	Engine displacement, (cc)	2490	2761	Changed
	v)	Bore /stroke, (mm)	98/110	98/122	Changed
	vi)	Naturally aspirated/turbo charged	Naturally aspirated	Naturally aspirated	No change
16.	<b>Changes related to ergonomics, safety comfort, statutory/mandatory requirements:</b>				
	a)	IS: 10273	Conformed	Conforms	No change
	b)	IS: 4931	Conformed	Conforms	No change
	c)	IS: 4468	Did not conform	Does not conform	No change
	d)	IS: 12953	Conformed	Conforms	No change
	e)	IS:12343	Did not conform	Conforms	Changed
	f)	IS:12239 (Pt-I)	Did not conform	Does not conform	No change
	g)	IS:12239 (Pt-II)	Did not conform	Conforms	Changed
	h)	IS:8133	Did not conform	Does not conform	No change
	i)	IS: 6283	Conformed	Conforms	No change
	j)	IS:14683	Conformed	Conforms	No change





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

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	Declaration/ Requirement		As observed		Whether variant model meets the require- ments (Yes/ No.)
				Base Model	Variant Model	Base model	Variant model	
1	2	3	4	5 a	5 b	6a	6b	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 / +10% for PTO power >26kW. -7.5/+10% for PTO power ≤ 26 kW	30.65 (D)	34.0 (D)	31.1	33.3	Yes
b)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	240 (D)	250 (D)	246	250	Yes
c)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	170.5 (D)	193 (D)	163.9	182	Yes
d)	Back-up torque, percent	Non Evaluative	10 percent, min.	10 %, min. (R)	10% min. (R)	21.3	26.0	Yes
e)	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)	0.11	0.22	Yes
<b>6.1.2 Safety features :</b>								
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 (part 2))	Provided	Provided	Provided	Provided	Yes
b)	Lighting arrangement (Tractor having more than 1150 mm rear track width)	Evaluative	As per CMVR	Provided	Provided	Provided	Provided	Yes



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1	2	3	4	5 a	5 b	6 a	6 b	7
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)	Did not meets the requirement		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		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)	Did not meets the requirement		Does not meets 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		Meets the requirement		Yes
<b>6.1.3 Labelling of tractors (Provision of labelling plate):</b>								
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	-	Escorts limited			Yes
2)	Model	Evaluative		-	EURO 50			Yes
3)	Brand Name			-	POWERTRAC			
4)	Year of manufacture	Evaluative		-	HD (i.e. NOVEMBER, 2015)			Yes
5)	Engine number	Evaluative		-	E3320707			Yes
6)	Chassis number	Evaluative		-	T053288114HD			Yes
7)	Declaration of PTO power, kW	Evaluative		-	34.0			Yes
<b>6.1.4 Literature (Submission to test agency)</b>								
(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 maximum PTO power in case of base & variant models was observed as 31.1 & 33.3 kW respectively against the declaration of 30.65 & 34.0 kW, which is within the tolerance limit as specified in IS:12207-2014.



- ii) The specific fuel consumption in case of base & variant models corresponding to maximum power was observed as 246 & 250 g/kWh, against the declaration of 240 & 250 g/kWh, respectively, which is within the tolerance limit as specified in IS:12207-2014.
- iii) The backup torque was observed as 26.0%.

#### 6.2.1.2 Three point linkage:

- i) The lateral distance from lower hitch point to centre line of tractor does not meet the requirement of IS: 4468 (Part-1)-1997. This may be looked into for necessary corrective action.

#### 6.2.1.3 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

#### 6.3 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

#### 6.5.1 Applicant submitted the Literature during test with machine:

- a) Operator's Manual for "Escorts Ltd., EURO 45 & EURO 50" tractor models.
- b) Spare Parts Catalogue for "Escorts Ltd., EURO 45 & EURO 50" tractor models.
- c) Service manual for "Escorts Ltd., EURO 45 & EURO 50" tractor models.

The following point should be incorporated in the operator's manual.

Information related to PTO & Drawbar performance of the tractor such as, maximum PTO power, rated power, power at standard PTO speed, maximum torque, backup torque, specific fuel consumption, maximum drawbar power & pull etc should be included in the technical specification of the tractor for the guidance of the user's.

- 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.

The results of the tests carried out on variant model "Escorts limited, EURO 50 (Brand Name: POWERTRAC)" Tractor have been compared with those on base model "Escorts limited, EURO 41 E3 (Brand Name: POWERTRAC)" Tractor and found within the limit, as specified in Indian Standard: 12207-2014.



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## 7. CITIZEN CHARTER

Time frame for Testing & Evaluation as per Citizen Charter	Duration of test	Whether the report is released within the time frame given in the Citizen Charter	Remark
10 Months	5 Months (January 2017 to May, 2017)	Yes	None

TESTING AUTHORITY:C.S. RAGHWANSHI  
AGRICULTURAL ENGINEERC. V. CHIMOTE  
TEST ENGINEERY. K. RAO  
SENIOR AGRICULTURAL  
ENGINEERJ.J.R. NARWARE  
DIRECTOR

## 8. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
8.1	6.2.1.2, 7.5.1 & 7.5.2	These being studied & corrective action would be taken in near future.
8.2	6.2.1.3, 6.4	Your valuable comments & suggestions for improvement are well taken. Under our policy of continuous product improvement these aspects are future being looked into & will try to eliminate these deviation soon wherever necessary.



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ANNEXURE- I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running-in	Nil
2.	Nominal speed test	1.20
3.	PTO performance test	7.40
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	0.50
	<b>TOTAL:</b>	<b>9.10</b>