

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT (Initial)

संख्या / No. : T-1125/1651/2017
माह / Month : December, 2017



**ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME - FARMTRAC)**



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

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO : 9001 - 2015 Certified Institute)

Tractor Nagar, Budni (M.P.) 466 445

E-mail fmti-mp@nic.in

Website : <http://www.fmttibudni.gov.in>

Telephone : 07564 - 234729

Fax : 07564 - 234743



T-1125/1651/2017	ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR (BRAND NAME – FARMTRAC) - Commercial (Initial)
------------------	---

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

Month: December	Test Report No. T-1125/1651/2017	Year: 2017
-----------------	----------------------------------	------------



सत्यमेव जयते

GOVERNMENT OF INDIA
CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
TRACTOR NAGAR, BUDNI (MADHYA PRADESH) 466445, INDIA

E-mail: fmti-mp@gov.in

Web site: <http://www.fmttibudni.gov.in>

Telephone: 07564-234729

FAX: 07564-234743



Type of Test : COMMERCIAL (Initial)

Test code/Procedure : IS: 5994-1998 (Reaffirmed in 2009), IS: 9253-2001(Reaffirmed in 2012) and IS: 12207-2014

Period of Test : November, 2016 to November, 2017

Test Report No : T-1125/1651/2017
Month/Year : December, 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 tests.
- 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.).

SELECTED CONVERSIONS			ABBREVIATIONS	
Sl. No	Units	Conversion Factor		
1	Force:		apa	As per applicant
	1 kgf	9.80665 N	TDC	Top Dead Centre
		2.20462 lbf	IS	Indian Standard
2	Power:		LHS/RHS	Left Hand Side/ Right Hand Side
	1 hp	1.01387 metric hp (Ps)	Hg.	Mercury
		745.7 W	Temp.	Temperature
	1 Ps	735.5 W	N.R.	Not recorded
	1 kW	1.35962 Ps	rpm	Revolutions per minute
3	Pressure:		O.D/I.D	Outer diameter/ Inner diameter
	1 psi	6.895 kPa	N.A.	Not available/ Not applicable
	1 kgf/cm ²	98.067 kPa = 735.56 mm of Hg	PTO	Power take-off
	1 bar	100 kPa = 10 N/cm ²	R.H.	Relative Humidity
	1 mm of Hg	1.3332 m-bar		

CONTENTS

	<u>PAGE NO.</u>
1. Specification	05
2. Fuel and Lubricants	21
3. PTO Performance Test	21
4. Drawbar Performance Test	26
5. Power Lift and Hydraulic Pump Performance Test	31
6. Brake Test	32
7. Noise Measurement	33
8. Mechanical Vibration Measurement	34
9. Location of Centre of Gravity	34
10. Turning Ability	34
11. Operator's Field of Vision	35
12. Field Test	35
13. Haulage Test	36
14. Components/Assembly Inspection	37
15. Adjustments, Defects, Breakdowns & Repairs	39
16. Summary of Observations, Comments & Recommendations	40
17. Citizen Charter	48
18. Applicant's Comments	48
ANNEXURE – I & II	49



T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

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 manufacturer's works

Duration of said running-in (h):

- Engine : 20
- Transmission : 30

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

1. SPECIFICATIONS

- 1.1 Tractor:**
- Make : Escorts Limited
 - Model : FARMTRAC 6065 UM
 - Brand name : FARMTRAC
 - Variants, if any : None
 - Type : Four Wheeled, Four Wheel Driven,
General Purpose Agricultural Tractor.
 - Year of manufacture : September, 2015 (FD)
 - Chassis number : T05 2348025FD
 - Country of Origin : INDIA
- 1.2 Engine:**
- Make : Escorts Limited
 - Model : AE4.286F-3A
 - Type : Four stroke, liquid cooled, turbocharged,
direct injection, diesel engine.
 - Serial number : E2351618
 - Engine speed (Manufacturer's recommended production setting), (rpm) :**
 - Maximum speed at no load, (rpm) : 2475 to 2525
 - Low idle speed, (rpm) : 600 to 700
 - Speed at max. torque, (rpm) : 1300 to 1400 - Rated speed, (rpm):**
 - For PTO use : 2200
 - For drawbar use : 2200
- 1.3 Cylinder & Cylinder Head:**
- Numbers : Four
 - Disposition : Vertical, Inline
 - Bore/stroke, (mm) : 91/110
 - Capacity as specified by the applicant, (cc) : 2860



	Compression ratio, (apa)	: 17.5±0.5% : 1
	Type of cylinder head	: Mono block
	Type of cylinder liners	: Wet, replaceable
	Type of combustion chamber	: Cavity on piston crown
	Arrangement of valves	: Over head, Inline
	Valve clearance (cold):	
	- Inlet valve, (mm)	: 0.30
	- Exhaust valve, (mm)	: 0.40
1.4	Fuel System:	
	Type of fuel system	: Gravity and force feed
1.4.1	Fuel tank:	
	Capacity, (l)	: 59.0
	Location	: Above clutch housing
	Provision for draining of sediments/water	: Not provided
	Material of fuel tank	: Metallic
1.4.2	Water separator:	
	Make	: Hilux
	Type	: Gravity, inverted funnel transparent
	Location	: Between fuel tank and primary feed pump
	Capacity, (l)	: 0.45
1.4.3	Fuel feed pump:	
	Type	: Plunger
	Make	: BOSCH, India
	Model/Group combination No.	: FP/KS 22AD62, 9440 030 029
	Provision of sediment bowl	: Provided
	Method of drive	: Through camshaft of fuel injection pump.
1.4.4	Fuel filters:	
	Make	: Bosch, India
	Model/Group combination No.	: 9450 030 120
	Numbers	: Two
	Type of elements:	
	- Primary	: Cloth
	-Secondary	: Paper
	Capacity of final stage filter, (l)	: 0.45
1.4.5	Fuel Injection pump:	
	Make	: Bosch, India
	Model/Group combination No.	: F 002 A0Z 900 PES 4A 90D 410RS 3500
	Type	: Inline, plungers
	Serial number	: 30344336
	Method of drive	: Through timing gears
1.4.6	Fuel injectors:	
	Make	: Bosch, India
	Model/Group combination No.:	
	Nozzle holder number	: F002 C70 023
	Nozzle number	: DSLA 146P 5509
	Type	: Multi hole (05 holes)
	Manufacturer's production pressure setting, (MPa)	: 24.5 to 25.3
	Injection timing	: 12 ±1° before TDC (apa)

T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

- 1.4.7 Governor:**
 Make : Bosch, India (apa)
 Model/Group combination No. : RSV 375... 1100 A4C 1662L
 Type : Mechanical, centrifugal, variable speed.
 Rated engine speed, (rpm) : 2200
 Governed range of engine speed, (rpm) : 600 – 2525
- 1.5 Air Intake System:**
1.5.1 Pre-cleaner : **Not provided**
1.5.2 Air cleaner:
 Make : Fleetguard
 Type : Dry
 Location : In front of radiator, under the bonnet
 Range of suction pressure at maximum power, (kPa) : 4.9 to 5.1
- | | <u>Primary element</u> | <u>Secondary element</u> |
|--------------------------------|--|--------------------------|
| Details of elements: | | |
| - Size (OD/ID), (mm) | : 155.0/93.1 | 88.6/72.0 |
| - Length, (mm) | : 315.0 | 270.4 |
| - Type | : Paper | Paper |
| Air flow restriction indicator | : Provided | |
| Dust unloading valve | : Provided | |
| Maintenance schedule | : Clean the element every day and replace after 500 hours working hours. | |
- 1.6 Exhaust System:**
 Type of silencer : Up-draught (cylindrical)
Position of silencer outlet with respect to SIP, (mm):
 - Upward : 930
 - Longitudinal : 1760
 - Lateral : 240 (on LHS)
 Range of exhaust gas pressure at maximum power, (kPa) : 162.0 to 164.9
 Provision of spark arresting device : None
 Provision against entry of rain water : A bend is provided on the outlet of silencer.
- 1.6.1 Turbocharger:**
 Make : Holset
 Model : HX20, TD03L 6T/4 (apa)
 Type : Without waste gate
 Boost pressure ratio : 1.93 (apa)
 Speed at rated engine speed, (rpm) : 1,50,000 (apa)
 Method of lubrication : Force feed lubrication from main oil gallery of engine.
 Location : In between silencer and exhaust manifold.
- 1.6.2 EGR Details:**
 Make : Padmini
 Model : EGR ECU BS 3
 Type /Function : Electronically operated
 Location : On the top of cylinder head connected between exhaust & inlet manifold.
- 1.7 Lubricating system:**
 Type : Force feed cum splash
 Oil sump capacity, (l) : 5.50

	Total lube oil capacity, (l)	:	7.00
	Oil change period	:	First change after 100 hours and subsequently after every 300 hours.
	Cooling device, (if any)	:	None
	Filters:		
	Make	:	Farmtrac
	Type	:	Full flow, spin-on, paper element
	Number (s)	:	One (01)
	Pump:		
	Type	:	Gear
	Method of drive	:	Through timing gears
	Minimum permissible pressure,(kPa)	:	98.07 (apa)
1.8	Cooling system:		
	Type	:	Forced circulation of liquid
	Name & brand name of coolant	:	Not specified
	Coolant water ratio	:	Not specified
	Details of pump	:	Centrifugal, semi-open type impeller of diameter 74.7 mm having eight numbers of vanes and driven through crankshaft pulley by a cogged 'V'-belt common to alternator.
	Details of fan	:	Suction type fan having seven polypropylene blades of 445 mm diameter and mounted on water pump shaft.
	Means of temperature control	:	Thermostat
	Bare radiator capacity, (l)	:	6.45
	Capacity of expansion tank, (l)	:	0.59
	Total coolant capacity, (l)	:	12.20
	Radiator cap pressure, (kPa)	:	89.6
1.9	Starting System:		
	Type	:	12V, DC, Electrical
	Aid for cold starting	:	None
	Any other device provided for easy starting.	:	None
1.10	Electrical System:		
1.10.1	Battery:		
	Make & Model	:	Exide Express, MHD 880
	Type	:	Lead acid
	Capacity and rating	:	12 V, 88 Ah at 20 hours discharge rate
	Location	:	On RHS clutch housing fitted in a separate box.
1.10.2	Starter:		
	Make	:	Bosch
	Model	:	M -127 (apa)
	Type	:	Pre engaging, solenoid operated
	Capacity and rating	:	12V, 2.8 kW (apa)
	Serial Number	:	Not available
1.10.3	Generator:		
	Make	:	Auto-Lek
	Model	:	A115 36 (apa)

T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

- Type : Alternator
 Output rating : 12V, 55 ampere
 Serial number : Not available
 Method of drive : Through crankshaft pulley
 1.10.4 Voltage regulator: : In-built with alternator
 1.10.5 Details of lights:

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)
1	2	3	4	5
Front lights:				
- Head lights	2, 12V, 35/35W	1065	125Ø	625
- Parking lights	2, 12V, 5W	1470	65 x 65	320
- Turn Indicators-cum- hazard light	2, 12V, 21W	1470	70 x 65	255
- Reflectors (white)	2	1470	30 x 55	365
Rear lights:				
- Stop/tail light	2, 12V, 21/5W	1450	65 x 65	290
- Turn Indicators-cum- hazard light	2, 12V, 21W	1450	70 x 65	225
- Plough light	1, 12 V, 55W	1550	125Ø	465
- Registration plate Light	Part of rear light assembly			
- Reflectors (Red)	2	1450	30 x 55	340

- 1.10.6 Main switch : Key turn type having three positions viz. OFF; Circuit ON & START
 1.10.7 Light switch : Rotary type having four positions viz.
 i) OFF
 ii) Parking light + dash board light
 iii) Head light (short beam) + (ii)
 iv) Head light (long beam) + (ii)
 1.10.8 Horn:
 Make : Minda
 Type : 12 V, 2B, electromagnetically vibrated diaphragm type
 Location : In front of radiator, under the bonnet
 1.10.9 Fuse box : Contains six numbers of fuses of following capacity.
- | Capacity | 10 A | 15 A |
|----------|------|------|
| Numbers | 02 | 04 |
- 1.10.10 Flasher Unit:
 Make : Interface
 Capacity: 12 V
 -Turn signal : 21W x 2 + 2W x 1
 - Hazard signal : 21W x 4 + 2W x 2
 Flashes/Min. : 85
 1.10.10.1 Seven pin trailer socket : Provided
 1.10.10.2 Slow moving triangle : Provided
 1.10.10.3 Safety switch : Provided in forward/reverse shifting lever

- 1.11 Instrument panel details:**
- i) Engine rpm cum digital cumulative run hour meter (0 – 25 x 100)
 - ii) Lubrication oil pressure gauge with colour zone
 - iii) Water temperature gauge with colour zone
 - iv) Fuel level gauge with colour zone
 - v) Battery charging warning indicator
 - vi) Air cleaner clogging indicator
 - vii) Turn/hazard light indicator
 - viii) Head light long beam ON indicator
 - ix) Hazard light switch
 - x) Turn indicator light switch
 - xi) Horn push button
 - xii) Mobile charging socket
 - xiii) Hand accelerator lever
 - xiv) Rear view mirror
 - xv) Steering control wheel
 - xvi) Engine stop knob (fuel-shut-off knob)

1.12 Transmission System:

1.12.1 Clutch:

Make	: LUK, India
Type	: Mechanical, dual, dry friction plates
-Transmission	: Dry friction pads
- PTO	: Dry friction plate
No. of friction plate(s)	: Two
Material:	
-Main transmission clutch	: VALEO F808 MCC (Non-asbestos) (apa)
-PTO clutch	: SILA H27 (Non-asbestos) (apa)
Size, [OD/ID (mm)] :	
-Main transmission clutch	: 308.86/198.14 Φ and 26.98 cm ² contact area of each pad having six pads.
-PTO clutch	: 311.37/190.91 Φ
Method of operation:	
-Main transmission clutch	: By pressing LHS foot pedal
-PTO clutch	: By LHS hand operated lever

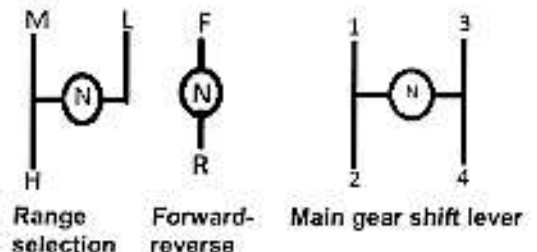
1.12.2 Gear box:

Make	: CARRARO (apa)
Model	: Not available
Type	: Mechanical, Constant mesh

No. of speeds:

Forward	: 12
Reverse	: 12

Gear shifting pattern:





T-1125/1651/2017

**ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)**

- Location of gear shifting levers : Side shift arrangement
 (i) Main gear shift lever on RHS of operator's seat
 (ii) Range selector lever on RHS of operator's seat.
 (iii) Forward-Reverse lever on LHS of operator's seat.
- Oil capacity, (l) : 35.00 (common with rear differential, rear axle & rear final drive, hydraulic, brake and steering systems)
- Oil changing period : First change at 200 hours and thereafter every 1200 hours of operation.

1.12.3 Nominal Speed:

Movement	Gear No.	No of engine revolutions for one revolution of driving wheel	Nominal speed at rated engine speed when fitted with 16.9 - 30 size tyres of 695 mm radius index, (kmph)
Forward	L1	402.18	1.43
	L2	271.48	2.12
	L3	185.71	3.10
	L4	132.09	4.36
	M1	158.38	3.63
	M2	106.96	5.39
	M3	73.08	7.89
	M4	52.00	11.04
	H1	59.71	9.65
	H2	40.08	14.28
	H3	27.62	20.92
	H4	19.63	29.32
Reverse	RL1	479.97	1.20
	RL2	324.12	1.78
	RL3	221.19	2.61
	RL4	157.42	3.66
	RM1	188.72	3.06
	RM2	127.67	4.52
	RM3	87.15	6.59
	RM4	62.09	9.28
	RH1	71.15	8.11
	RH2	48.15	11.97
	RH3	32.89	17.53
	RH4	23.42	24.62

Number of front wheel revolution for one revolution of rear wheel : 1.35

1.12.4 Rear differential unit:

- Type : Crown wheel and bevel pinion with differential assembly accommodated inside the differential housing.
- Reduction through crown wheel & pinion : 3.167 : 1 (38/12 T)
- Oil capacity of differential housing, (l) : 35.00 (common with gear box, rear axle & rear final drive, hydraulic, brake and steering systems)
- Oil changing period : First change at 200 hours and thereafter every 1200 hours of operation.

	Differential lock:	
	Type	: Pin type
	Method of operation	: By pressing the pedal provided on RHS of operator's seat.
1.12.5	Rear axle & Rear final drive:	
	Type	: Epicyclic, accommodated inside the rear differential housing
	Reduction through final drive	: 6.857 : 1 (ring-82T, sun-14T, planet-33T)
	Oil capacity of final drive, (l)	: 35.00 (common with gear box, rear differential unit, hydraulic, brake and steering systems)
	Oil changing period	: First change at 200 hours and thereafter every 1200 hours of operation.
1.12.6	Front differential unit:	
	Type	: Crown wheel and bevel pinion with differential assembly accommodated inside the centre of front axle housing.
	Reduction through crown wheel & pinion	: 2.333 : 1 (28/12 T)
	Oil capacity of differential housing, (l)	: 4.50
	Oil changing period	: Not specified
	Differential lock:	Not provided
1.12.7	Front axle & Front final drive:	
	Type	: Epicyclic reduction unit accommodate at the end of the front axle housing near front wheels.
	Reduction through final drive	: 6.000 : 1 (ring-60T, sun-12T, planet-24T)
	Oil capacity of final drive, (l)	: 0.65 (each side)
	Oil changing period	: Not specified
1.13	Power lift (Hydraulic System):	
	Make	: Farmtrac (apa)
	Type	: Open centre, live, ADDC
	No. and type of cylinder	: One, single acting
	Type of linkage lock for transport	: The knob provided on distributor when fully closed acts as a transport lock.
1.13.1	Hydraulic pump:	
	- Make	: Eaton
	- Type	: Gear (Tandem)
	- Location & drive	: On LHS of engine and driven through timing gears.
	No. & type of filters	: One & spin on, throwaway paper element
	Hydraulic oil capacity, (l)	: 35.00 (common with gear box, rear differential unit, rear axle & rear final drive, brake and steering systems)
	Oil change period	: First change at 200 hours and thereafter every 1200 hours of operation.
	Provision for external tapping	: Provided
	Details of control levers	: i) Position control lever (yellow) ii) Draft control lever (red) iii) External circuit lever iv) A knob on distributor



Method of draft sensing : Through top link

1.13.2 Three point linkage:

S. No.	Observations	As per IS: 4468- (Part-I) 1997 (Category I / II), (mm)	As measured (mm)	Remarks
1	2	3	4	5
I. Upper hitch points:				
a)	Dia. of hitch pin hole	19.30 to 19.50/ 25.70 to 25.90	25.84	Conforms
b)	Width of ball	44.0 (max)/51.0 (max)	51.0	Conforms to Cat. II
II. Lower hitch points:				
a)	Dia. of hitch pin hole	22.40 to 22.65/28.70 to 29.00	28.90	Conforms to Cat. II
b)	Width of ball	34.8 to 35.0/ 44.8 to 45.0	44.6	Does not conform
III.	Lateral distance from lower hitch point to centre line of tractor	359/435	364	Does not conform
IV.	Lateral movement of lower hitch points	100 (min)/125 (min)	90	Does not conform
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	535	Conforms to Cat. I
VI.	Transport height	820 (min) /950 (min)	870	Conforms to Cat. I
VII.	Power range (without force)	560 (min)/ 650 (min)	565	Conforms to Cat. I
VIII.	Leveling adjustment	100 (min)/100 (min)	380	Conforms
IX.	Lower hitch point tyre clearance	100 (min)/100 (min)	245	Conforms
X.	Lower hitch point height	200 (max) /200 (max)	200	Conforms

1.13.3 Linkage geometry dimensions (Refer Fig.-1(a)):

The following are dimensions observed, corresponding to 670 mm as tyre dynamic radius index:

S. No.	Parameter	Notation	Dimension or range, (mm)	Setting used during test, (mm)
1	2	3	4	5
1.	Length of lower link	A	870	870
2.	Length of lift arm	B	260	260
3.	Length of lift rods	C	540 to 660	600
4.	Length of top link	D	590 to 790	710
5.	Distance of lift rod connection point from pivot point of lower link	E	485	485
6. Distance of lower link pivot point from rear wheel axis:				
	-Horizontally	F	65, behind	65, behind
	-Vertically	G	200, below	200, below
7. Distance of upper link pivot point from rear wheel axis:				
	-Horizontally	H	250, 230 & 240 behind	230, behind
	-Vertically	J	250, 280 & 315 above	280, above

T-1125/1651/2017	ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR (BRAND NAME – FARMTRAC) - Commercial (Initial)
------------------	---

1	2	3	4	5
8.	Distance of lift arm pivot point from rear wheel axis:			
	-Horizontally	K	30, behind	30, behind
	-Vertically	L	300, above	300, above
9.	Height of lower hitch points relative to the rear wheel axis:			
	- In high position	M	-35 to 175	70, above
	- In low position	N	-645 to -345	495, below
10.	Height of lower link hitch points when locked in transport position	--	70, above	

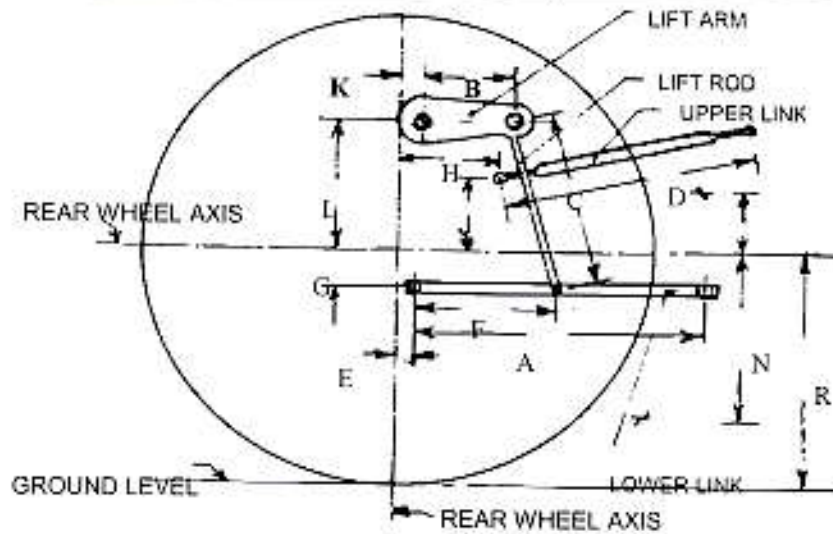


Fig.1 (a): DIMENSIONAL NOTATIONS FOR TABLE OF LINKAGE GEOMETRY

1.13.4 Drawbar:

1.13.4.1 Linkage Drawbar [Refer Fig.1(b)]:

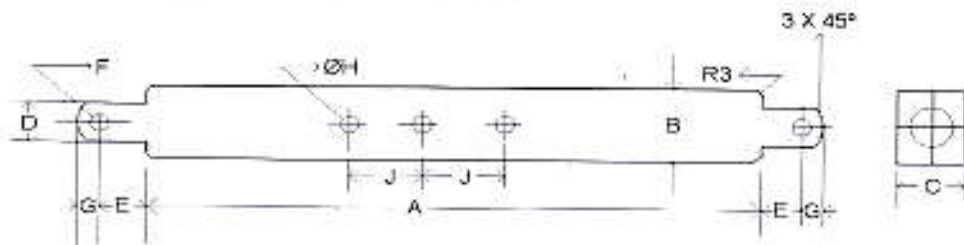


Fig. 1 (b): DIMENSIONAL NOTATIONS FOR LINKAGE DRAWBAR

T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

Notation	As per IS: 12953-1990 (Cat. I)/ (Cat. II), (mm)	As measured, (mm)	Remarks
A	683 ± 1.5/825 ± 1.5	683	Conforms to Cat. I
B	75 (min)/75 (min)	76	Conforms
C	30 (min) / 30 (min)	32	Conforms
D \varnothing	21.79 to 22.0/27.79 to 28.0	27.87	Conforms to Cat. II
E	39.0 (min)/49.0 (min)	57.0	Conforms
F \varnothing	12.0 (min)/12.0 (min)	12.0	Conforms
G	15.0 (min)/15.0 (min)	15.4	Conforms
H \varnothing	25 ± 1/25 ± 1	25	Conforms
J	80 ± 1.5/80 ± 1.5	80.6	Conforms
No. of holes	7/9	7	Conforms to Cat. I

1.13.4.2 Swinging drawbar:

: Not provided

1.14 Power take-off shaft:

Type

: Type-I, independent

Method of engaging

: By a hand lever provided on LHS of operator's seat.

No. of shaft (s)

: One

PTO speed corresponding to rated engine speed, (rpm)

: 562

Distance behind rear axle, (mm)

: 400

Engine to PTO speed ratio

: 3.917 : 1

Whether PTO Shaft is capable of transmitting the full power of engine

: Yes

Other speeds, if any

: Not provided

1.14.1 Power take-off proportional to ground speed:

Indicate 540 or 1000 (rev/min)

: 540

Traveling distance for one revolution of take-off shaft, (m)

: 0.394

Number of power take-off shaft revolutions for one revolution of (rear) driving wheels

: 11.07

Direction of rotation with forward gear engaged (viewed from behind tractor)

: Clockwise

1.14.2 Specifications of Power Take-Off Shaft: -

Specification	As per IS:4931-1995 (Type-I)	As observed	Remarks
1	2	3	4
Nominal speed, (rpm)	540 ± 10	540 rpm of PTO corresponding to 2115 rpm of engine	Conforms
No. of splines	6	6	Conforms
Direction of rotation	Clockwise	Clockwise	Conforms

T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

1	2	3	4
Location	The position of the centre of the end of PTO shaft shall be within 50mm to right or left of the centre line of the tractor.	In the centre line of the tractor	Conforms
Dimensions (mm) [See Fig. 2 (a)]:			
D \varnothing	34.79 \pm 0.06	34.73	Conforms
d \varnothing	28.91 \pm 0.05	27.93	Does not conform
B \varnothing	29.4 \pm 0.1	29.5	Conforms
A \varnothing (Optional)	8.3 \pm 0.1	8.4	Conforms
W	8.69 - 0.09 - 0.16	8.59	Conforms
a	7	7	Conforms
b (Optional)	25 \pm 0.5	25.0	Conforms
c	38	38	Conforms
x	30 ^U	30 ^U	Conforms
B	76 (min)	82	Conforms
h	450 to 675	683	Does not conform

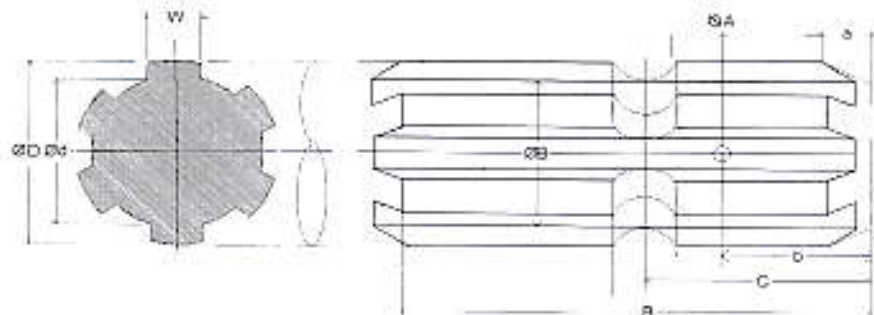


Fig. 2 (a): DIMENSIONAL NOTATIONS FOR TYPE-I POWER TAKE-OFF SHAFT

1.14.2 Master Shield of Power Take-Off Shaft:

Specification	As per IS 4931-1995 (mm)	As Observed	Remark
K	70(Min.)	70	Conforms
M	125 \pm 5	130	Conforms
N	85 \pm 5	85	Conforms
P	285 \pm 5	285	Conforms
r	76 (Max.)	25	Conforms

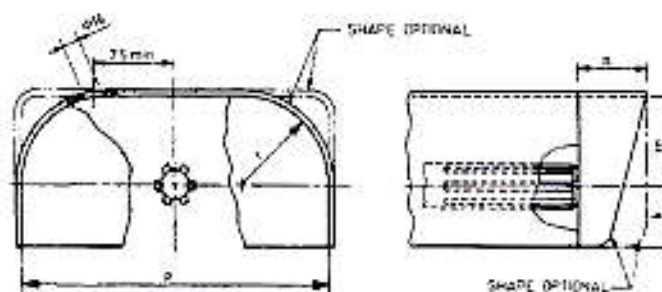


Fig. 2(b): DIMENSIONAL NOTATIONS FOR PTO SHAFT MASTER SHIELD

T-1125/1651/2017	ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR (BRAND NAME – FARMTRAC) - Commercial (Initial)
-------------------------	---

1.15	Towing hitch:	
1.15.1	Front:	
	Type	: Clevis
	Location	: At front of tractor on standard ballasting weight
	Height above ground level, (mm)	: 805 (Fixed)
	Dia of pin hole, (mm)	: 34.1
	Width of clevis, (mm)	: 57.0
1.15.2	Rear:	
	Type	: Clevis
	Location	: At the rear of differential housing
	Height above ground level, (mm):	
	Maximum	: 840
	Minimum	: 500
	Number of positions	: 10
	- Type of adjustment	: By changing hitch position on its mounting bracket and reversing the hitch.
	Distance of hitch point, (mm):	
	- From rear wheel centre	: 500
	- From power take-off shaft end	: 100
	Dia. of pin hole, (mm)	: 28.0
	Width of clevis, (mm)	: 75.4
1.16	Steering:	
	Make	: Danfos
	Type	: Hydrostatic, power steering
	Location	: Above flywheel housing
	Diameter of steering control wheel, (mm)	: 375
	Make & type of pump	: Eaton & gear (tandem)
	Location & drive	: LHS of engine, through timing gears.
	Method of operation	: Manually, through steering control wheel
	Make, type & number of hydraulic ram cylinder	: Rane Madras Limited (apa), double acting, one
	Location of ram cylinder	: Mounted on LHS of front axle towards rear side.
	Oil capacity of steering system, (l)	: 35.00 (common with gear box, rear differential unit, rear axle & rear final drive, brake and hydraulic systems)
	Oil change period	: First change at 200 hours and thereafter every 1200 hours of operation.
1.17	Brakes:	
1.17.1	Service Brake:	
	Make	: CARRARO (apa)
	Type	: Mechanically operated, oil immersed disc brakes
	Location	: On half axle shaft before final drive.



T-1125/1651/2017	ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR (BRAND NAME – FARMTRAC) - Commercial (Initial)
-------------------------	---

	No. of disc(s)	:	Four on each side
	Area of liners, (cm ²)	:	941.8 (on each wheel side)
	Material of liners	:	S.K. WELLMAN HDT 303 Non-asbestos (apa)
	Method of operation	:	By depressing RHS foot pedal independently or combined.
	Oil capacity, (l)	:	35.00 (common with gear box, rear differential unit, rear axle & rear final drive, hydraulic and steering systems)
	Oil change period	:	First change at 200 hours and thereafter every 1200 hours of operation.
1.17.2	Parking Brake:		
	Type	:	Paul & Ratchet arrangement
	Location & Method operation of operation	:	Service brake acts as parking brake when locked in position by a hand lever provided on LHS of operator's seat.
1.18	Wheel Equipment:		
1.18.1	Steered Wheel(s):		
	Make	:	Good Year
	Numbers	:	Two
	Type of tyre	:	Pneumatic, traction
	Size	:	11.2-24
	Ply rating	:	8
	Maximum permissible loading capacity of each tyre at 230 kPa pressure, (kgf)	:	1250
	Recommended inflation pressure, (kPa):		
	- For field work	:	210
	- For transport	:	210
	Track width, (mm)	:	1360,1440 (Std), 1470, 1540, 1550, 1650, & 1770
	Method of changing track width	:	By reversing wheel disc and changing the position of disc on offset rim lugs
	Make & size of rim	:	SSWL, W10 x 24
1.18.2	Drive wheel(s):		
	Make	:	Good Year
	Numbers	:	Two
	Type of tyre	:	Pneumatic, traction
	Size	:	16.9-30
	Ply rating	:	12
	Maximum permissible loading capacity of each tyre at 230 kPa pressure, (kgf)	:	2500
	Recommended inflation pressure, (kPa):		
	- For field work	:	110
	- For transport	:	130
	Track width, (mm)	:	1310, 1390, 1510 (std.), 1590,1690, 1790, & 1890
	Method of changing track width	:	By reversing wheel disc and changing the position of disc on offset rim lugs
	Make & size of rim	:	SSWL, W15 x 30
1.18.3	Wheel base, (mm)	:	2210



T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

Method of changing wheel base, if any, : None
and range

1.19 Operator's seat:

Make : Not available
Type : Cushioned seat with back rest
Type of suspension : Two helical coil springs
Type of dampening : Hydraulic shock absorber

Range of adjustment, (mm):

Vertical : Nil
Lateral : Nil
Longitudinal : ± 30

1.20 Provision for safety and comfort of operator:

1.20.1 Conformity with IS: 12343-1998 (Reaffirmed in March, 2009)

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

- i) Longitudinal distance from seat index point to the centre of differential lock pedal.
- ii) Longitudinal distance from seat index point to the centre of steering control wheel.
- iii) Vertical distance from seat index point to the centre of steering control wheel.

1.20.2 Conformity with IS: 6283 (Part 1)-2006

All the controls are identifiable with symbols as per IS: 6283(Part 1) -2006

1.20.3 Conformity with IS: 6283 (Part 2)-2007

All the displays are identifiable with colour codes as per IS: 6283(Part 2) -2007

1.20.4 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:**

Stop knob does not remain in stop position

1.20.5 Conformity with IS:12239 (Part-1)-1996 (Re-affirmed in February, 2012) :

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

- i) The height of foot step from ground level.
- ii) Provision of spark arresting device in the exhaust system.

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

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

The working clearance between draft control lever and mud guard is not provided as per minimum requirement.

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

Lighting meets the requirements of IS: 14683 – 1999.

1.20.8 Rear view mirror:

Rear view mirror has been provided.

1.21 Labeling of tractor as per IS: 10273-1987 (Reaffirmed in March, 2009):

Location : The labeling plate is riveted on the inner side of LHS mudguard at its rear end which provides the following information:



T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

Name of Manufacturer	ESCORTS LIMITED-AGRI MACHINERY FARIDABAD
Make	ESCORTS LIMITED
Model	FARMTRAC 6065 UM
Year of manufacturer	FD (September, 2015)
Engine Serial Number	E2351618
Chassis Serial Number	T05 2348025FD
Maximum PTO Power, kW	41.17
Specific fuel consumption, g/kWh	248

1.22 Ballast Conditions:

Particulars		Ballast mass as used, (kg)			
		Front		Rear	
		Water	C.I.weight	Water	C.I.weight
i)	As used during drawbar performance test	Nil	110	420	450
ii)	As used during field test, except rotavator	NIL	NIL	NIL	NIL
iii)	As used during haulage test	NIL	NIL	NIL	NIL

1.22.1 Standard ballast, if any:

Particulars	Front	Rear
C. I. weight, (kg)	208	Nil
Location	On front engine support	--

1.23 Masses:

Particulars		Mass of the tractor without operator but with all the liquid reservoirs full, (kg)		
		Front	Rear	Total
i)	With standard ballast without canopy	1345	1425	2770
ii)	With ballast as used during drawbar performance test without canopy.	1520	2230	3750
iii)	With ballast as used during dry land operation with canopy (other than rotavator operation)	1365	1430	2800
iv)	Without ballast as used during wet land operation.	NA	NA	NA
v)	As used during the haulage test with trailer hitch, canopy and drawbar.	1345	1455	2800

1.24 Overall dimensions:

Condition	Length, (mm)	Width, (mm)	Height, (mm)	Ground Clearance, (mm)
With standard ballast	3990	1965	2440 (with exhaust pipe)	395 (below front axle)

1.25 Number of external lubricating Points:

- Oiling : Nil
- Greasing cups : Nil



T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

- Greasing nipples : 22
- 1.26 **Color of tractor:**
 Chassis & engine : Blue
Sheet metal:
 Bonnet : Blue
 Mudguard : White
 Wheel rims & discs : White
- 1.27 **Optional features, if any** : None

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/cm³ 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 15 W 40	As recommended
2.	Transmission, hydraulic, differential, rear final drive and brakes.	UTTO (Tract ELFSF-3I)	Oil originally filled in the tractor was not changed
3.	Steering system	SAE 80 W 90	--do--
4.	Grease	Servo grease MP	Servo grease MP

3. PTO PERFORMANCE TEST

- Date(s) of test : 22.12.2016, 23.12.2016 & 26.12.2016
 Tractor run at the Institute prior to start of : 10.83
 PTO test (h)
 Type of dynamometer bench : ESF 1000 S Eddy current

- 3.1 The results of power take-off performance are tabulated in Table-1 and graphically represented in Fig. 3, 4 and 5.

Table - 1

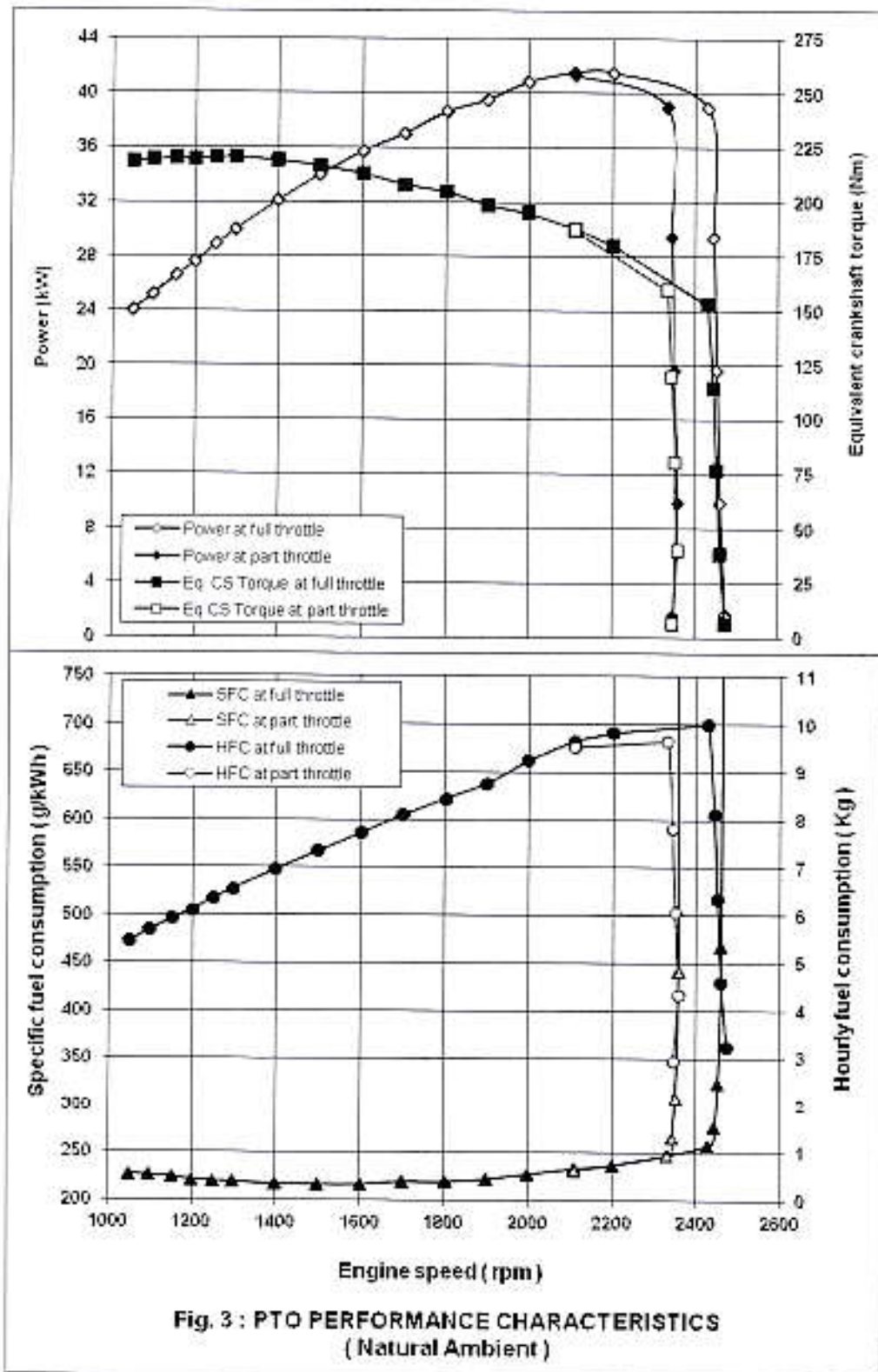
Power (kW)	Speed, (rpm)		Fuel consumption			Specific energy, (kWh/l)
	P.T.O.	Engine	l/h	kg/h	Specific, (kg/ kWh)	
1	2	3	4	5	6	7
a) Maximum power - 2 hours test:						
41.5	562	2201	11.76	9.83	0.237	3.53
40.3	562	2199	11.44	9.57	0.237	3.52*
b) Power at rated engine speed (2200 rpm):						
41.5	562	2201	11.76	9.83	0.237	3.53
40.3	562	2199	11.44	9.57	0.237	3.52*
c) Power at standard power take-off speed (540 ± 10 rpm):						
41.5	539	2111	11.56	9.66	0.233	3.59
40.3	539	2111	11.26	9.41	0.233	3.58*

T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

1	2	3	4	5	6	7
d) Varying loads at rated engine speed:						
i) Torque corresponding to maximum power available at rated engine speed:						
41.5	562	2201	11.76	9.83	0.237	3.53
ii) 85% of the torque obtained in (i):						
38.9	620	2429	11.95	9.99	0.257	3.26
iii) 75% of the torque obtained in (ii):						
29.3	624	2444	9.72	8.13	0.277	3.01
iv) 50% of the torque obtained in (ii) :						
19.7	626	2452	7.60	6.35	0.322	2.59
v) 25% of the torque obtained in (ii):						
9.9	628	2460	5.50	4.60	0.465	1.80
vi) Unloaded:						
1.6	631	2472	3.88	3.24	2.025	0.41
e) Varying loads at standard PTO speed (540 ± 10 rpm):						
i) Torque corresponding to maximum power available at standard PTO speed						
41.5	539	2111	11.56	9.66	0.233	3.59
ii) 85% of the torque obtained in (i) :						
38.9	595	2331	11.54	9.65	0.248	3.37
iii) 75% of the torque obtained in (ii) :						
29.4	598	2342	9.35	7.82	0.266	3.14
iv) 50% of the torque obtained in (ii) :						
19.7	600	2350	7.25	6.06	0.308	2.72
v) 25% of the torque obtained in (ii):						
9.8	602	2358	5.19	4.34	0.443	1.89
vi) Unloaded:						
1.5	599	2346	3.52	2.94	1.960	0.43

* Under High ambient conditions



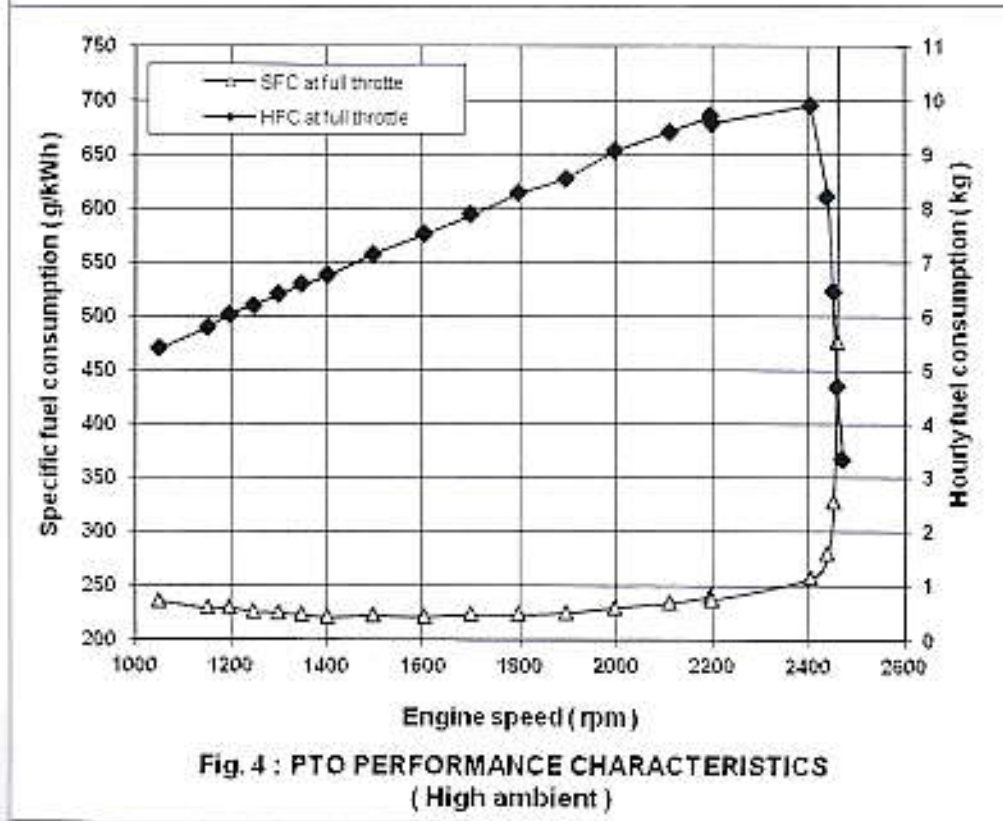
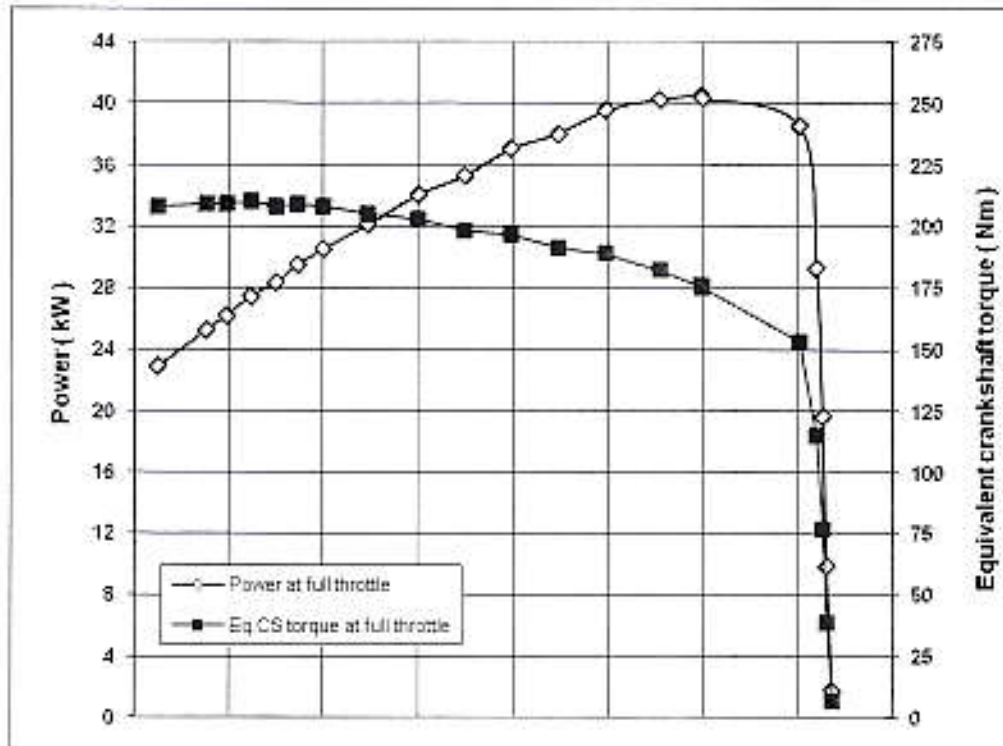
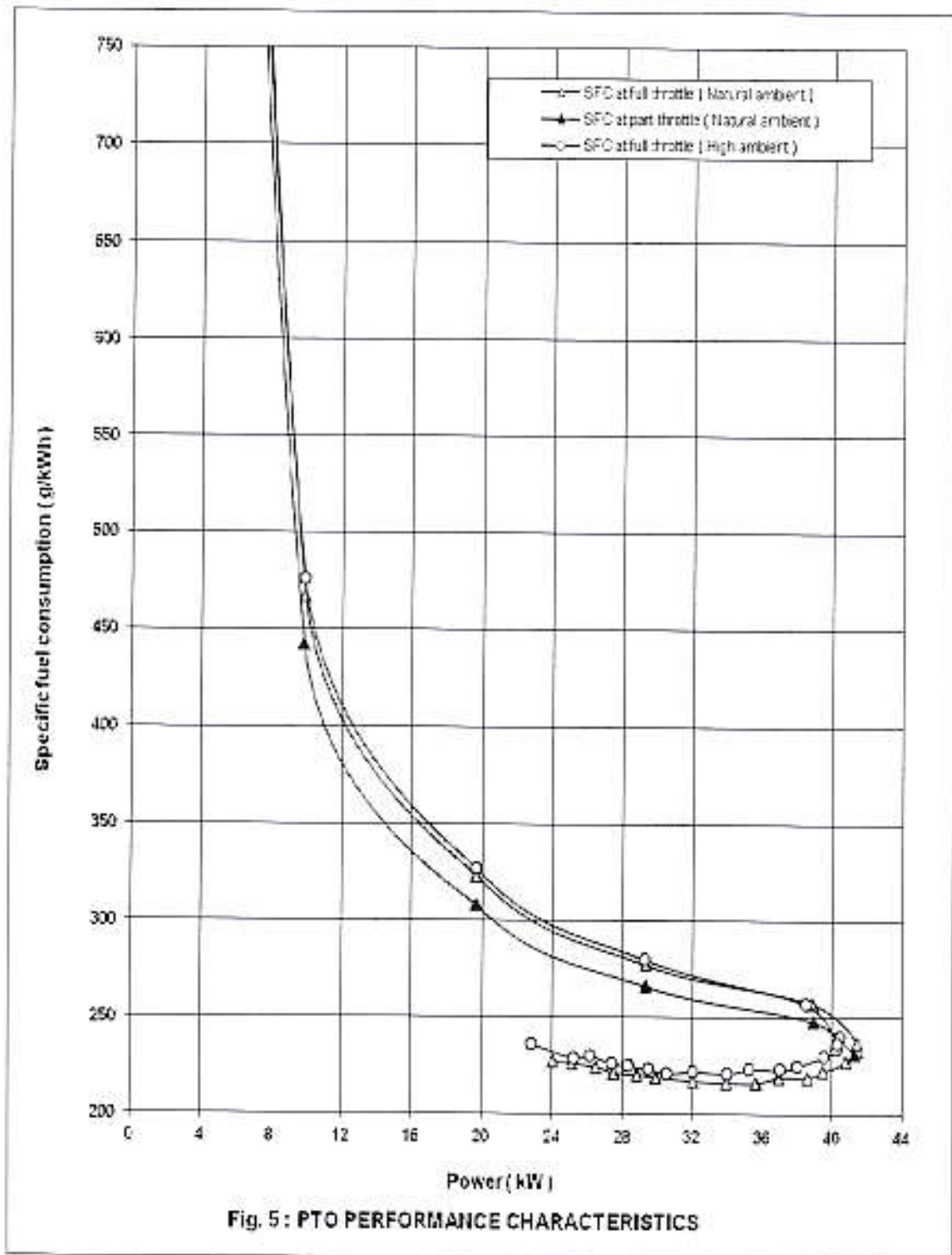


Fig. 4 : PTO PERFORMANCE CHARACTERISTICS
(High ambient)





	<u>Natural ambient</u>	<u>High ambient</u>
- No load maximum engine speed, (rpm)	2472	2472
-Equivalent crankshaft torque at maximum power, (Nm)	179.9	175.0
- Maximum equivalent crankshaft torque, (Nm)	220.6	210.2
-Engine speed at maximum equivalent crankshaft torque, (rpm)	1297	1246
- Back-up torque, percent	22.62	20.11
- Smoke level , maximum light absorption coefficient (per meter)	0.07	--
- Range of atmospheric conditions:		
Temperature, (°C)	27 to 31	41 to 44
Pressure, (kPa)	99.0 to 99.6	100.3 to 100.8
Relative humidity, (%)	22 to 37	10 to 19
- Maximum temperatures (°C):		
Engine oil	107	118
Coolant (water)	89	103
Fuel	53	64
Air intake	38	48
Exhaust gas	490	502
- Pressure at maximum power:		
Intake air, (kPa)	4.9 to 5.1	4.4 to 4.7
Exhaust gas, (kPa)	162.0 to 164.9	144.5 to 153.3
- Consumptions:		
Lub. oil, (g/kWh)	--	0.70
Coolant (water), (% of total coolant capacity)	--	0.82

4. DRAWBAR PERFORMANCE TEST

Date(s) of test	: 11.06.2017, 13.06.2017 & 14.06.2017
Tractor run at the Institute prior to start of drawbar performance test, (h)	: 35.50
Type of track	: Concrete
Height of drawbar, (mm):	
- With standard ballast	: 530
- With ballast	: 500

- 4.1 The results of drawbar performance test with 4WD engaged condition, consisting of maximum power and pull with standard ballast/with ballast and ten hours test are tabulated in **Table - 2**. The results of the tests with ballast are also represented graphically in **Fig. 6 & 7**.

Table - 2

DRAWBAR PERFORMANCE TEST

G e a r	Travel Speed, (Km/h)	Draw- bar power, (kW)	Draw- bar pull, (kN)	Engine Speed (rpm)	Wheel Slip, (%)	Fuel consumption		Specific Energy, (KWh/l)	Atmospheric conditions			Temperature (°C)		Max. sust- ained pull, (kN)		
						kg/ kWh	l/h		Temp (°C)	Pre- Ssure (kPa)	R.H. (%)	Fuel	Trans- mission		Cool- ant (water)	En- gine oil
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
i) Maximum power test (Tractor with standard ballast & 4WD in engaged condition):																
L2	2.06	12.33	21.60	2346	15.3	0.489	7.19	1.71	32	97.9	52	41	77	78	96	23.75
L3	3.00	19.2	23.03	2420	15.1	0.396	9.09	2.11	31	97.9	53	39	77	81	97	24.24
L4	4.24	26.3	22.34	2415	14.6	0.358	11.36	2.34	30	97.9	48	39	77	83	97	23.51
M1	3.52	21.6	22.03	2431	15.3	0.378	9.77	2.21	29	98.0	51	39	75	79	98	23.51
M2	5.30	31.0	21.02	2368	11.8	0.314	11.64	2.66	28	98.0	63	36	64	83	98	22.95
M3	7.58	33.8	16.04	2199	7.3	0.290	11.72	2.88	27	98.1	61	35	64	84	99	19.74
M4	11.02	34.4	11.12	2201	3.7	0.289	11.75	2.89	26	98.1	64	33	61	83	94	14.04
H1	9.50	33.9	12.84	2108	4.9	0.289	11.72	2.89	25	98.0	68	32	59	82	100	16.21
ii) Maximum power test (Tractor with ballasted & 4WD in engaged condition):																
L2	1.99	16.3	29.41	2418	15.2	0.417	8.13	2.01	35	97.7	44	44	78	87	102	32.50
L3	2.89	24.2	30.18	2404	15.2	0.361	10.45	2.32	33	97.8	50	41	78	85	101	33.02
L4	3.86	30.0	27.98	2197	11.9	0.314	11.27	2.66	33	97.9	55	40	80	93	102	32.47
M1	3.34	28.0	30.21	2365	15.0	0.344	11.52	2.43	30	97.9	52	38	77	85	103	30.92
M2	5.00	32.4	23.30	2199	7.8	0.298	11.55	2.81	29	98.0	59	37	77	86	101	28.54
M3	7.59	33.2	15.74	2197	4.3	0.292	11.60	2.86	28	98.0	60	36	75	86	100	19.47
M4	10.86	32.4	10.72	2198	2.2	0.297	11.51	2.81	29	98.0	57	36	75	85	100	13.76
H1	9.39	32.9	12.60	2199	3.3	0.297	11.69	2.77	27	98.0	56	34	58	84	95	15.96

Contd., Table - 2

Table - 2 (Contd.)

Gear	Travel Speed (Km/h)	Drawbar power (kW)	Drawbar pull (kN)	Engine Speed (rpm)	Wheel Slip (%)	Fuel consumption		Specific Energy (kWh/l)	Atmospheric conditions				Temperature (°C)				Max sustained pull (kN)
						kg/kWh	l/h		Temp (°C)	Pressure (kPa)	R.H. (%)	Fuel	Trans. oil	Coolant (water)	Engine oil		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
iii) Five hours test at 75 percent of pull corresponding to max. power (ballasted wheeled tractor):																	
L4	4.50	26.3	20.99	2413	6.9	0.340	10.88	2.41	26	98.0	47	33	52	81	83	--	
									10	10	10	10	10	10	10	--	
									32	98.2	64	38	81	88	106	--	
iv) Five hours test at pull corresponding to 15 percent wheel slip (ballasted wheeled tractor):																	
M1	3.39	28.5	30.23	2360	--	0.330	11.60	2.45	31	97.8	33	40	80	87	106	--	
									37	98.1	51	46	81	94	112	--	

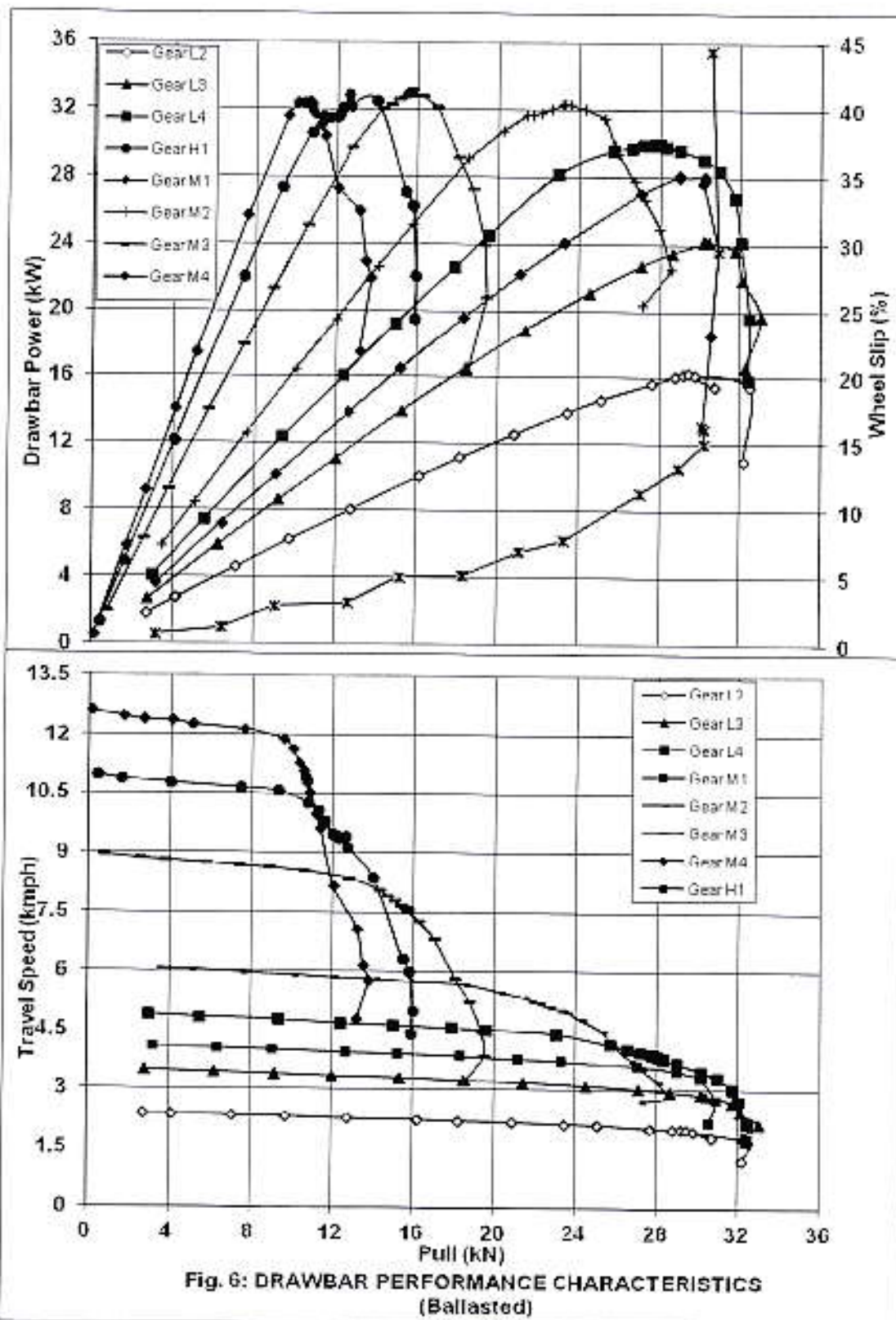
i) The coolant (water) and lub oil consumption during 10 hours test were observed as 10 ml/h and Nil respectively.

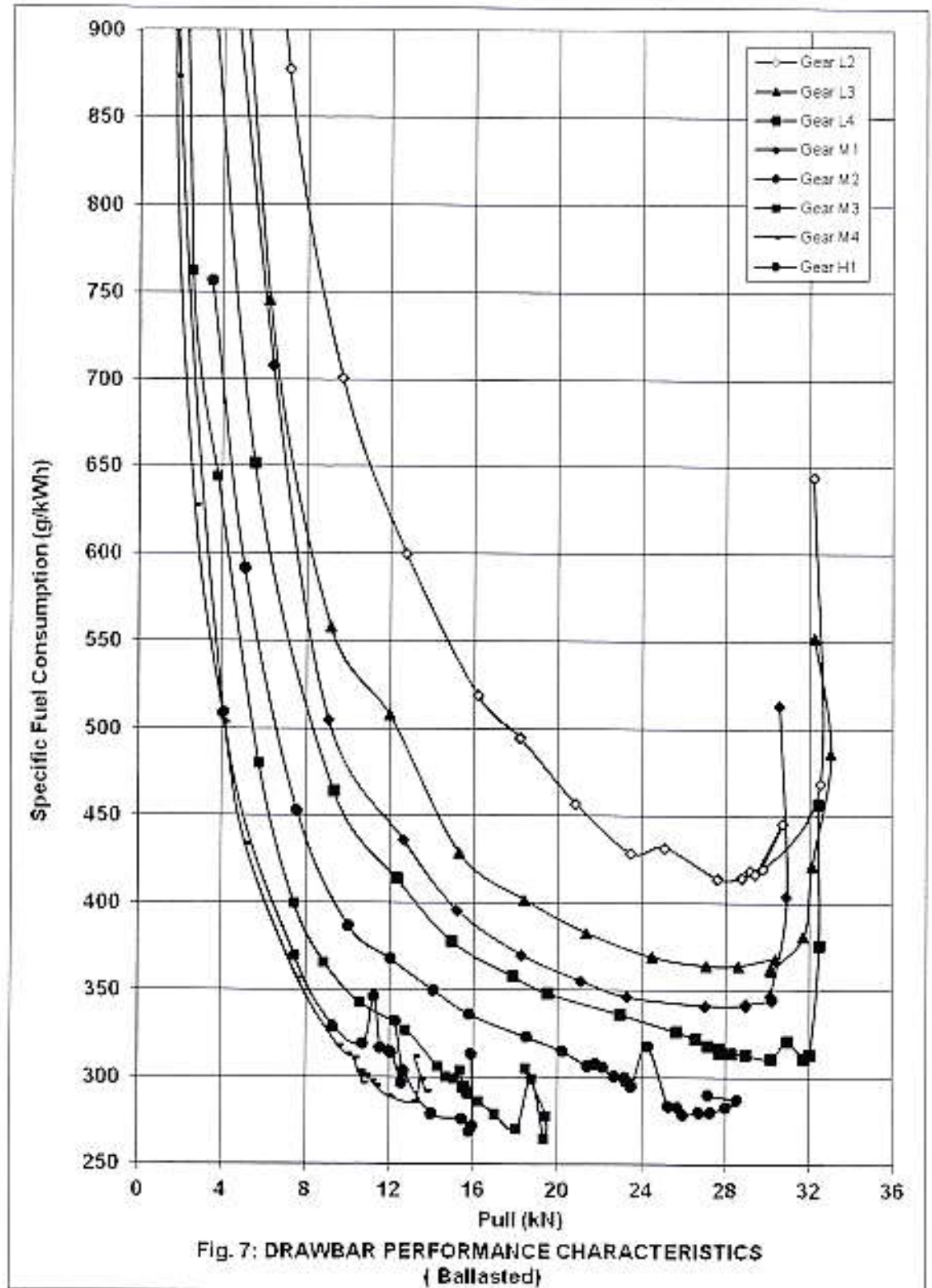
ii) Creeping of rear tyres. (mm):

- LHS:	Front wheel	Rear wheel
- RHS:	Nil	Nil
	Nil	Nil

iii) Maximum temperatures during entire drawbar test, (°C)

Engine oil	: 112
Coolant (water)	: 95
Transmission oil	: 81
Fuel	: 46







T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

5. POWER LIFT AND HYDRAULIC PUMP PERFORMANCE TEST

Date(s) of test : 19.12.2016 & 20.12.2016
Tractor run at the Institute prior to start of hydraulic test, (h) : 5.10
Pump speed at rated engine speed,(rpm) : 2200 (apa)

5.1 Hydraulic power test:

Pump delivery rate at minimum pressure and rated engine speed (l/min) : 34.46
Maximum hydraulic power,(kW) : 9.5
Pump delivery rate at maximum hydraulic power, (l/min) : 34.46
Pressure at maximum hydraulic power, (MPa) : 16.5
Sustained pressure of the open relief valve, (MPa) : 19.0

Tapping point:

a) Relief valve test : At external circuit
b) Pump performance test : At pump outlet
Temperature of hydraulic fluid, (°C) : 60 to 62

5.2 Lifting capacity test:

Test	Height of lower hitch point above ground in down position, (mm)	Vertical Movement with lifting forces, (mm)	Maximum corrected force exerted through full range, (kN)	Corresponding pressure, (MPa)	Moment about rear axle, (kN-m)	Maximum tilt angle of mast from vertical, (degrees)
At hitch points	200	560	21.93	17.1	20.50	--
On the standard frame	200	555	18.83	17.1	29.09	10.4°

5.3 Maintenance of lift load:

Force applied at the frame, (kN) : 16.23
Temperature of hydraulic fluid at the start of test, (°C) : 62

Test data:

Elapsed Time, (minute)	5	10	15	20	25	30
Cumulative drop in height of lift, (mm)	5	8	10	15	15	15

T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

6. BRAKE TEST

6.1 Service brake:

6.1.1 Cold brake test:

Date of test : 15.12.2016
 Type of track : Concrete
 Maximum attainable speed (kmph):
 -Standard ballast : 34.1

		At maximum attainable speed			
Std ballasted tractor	Braking device control force, (N)	550	516	482	448
	Mean deceleration, (m/sec. sq.)	3.00	2.82	2.71	2.50
	Stopping distance, (m)	15.24	15.91	16.57	17.94

		At 25 kmph travel speed			
Std ballasted tractor	Braking device control force, (N)	588	539	490	441
	Mean deceleration, (m/sec. sq.)	2.88	2.55	2.51	2.50
	Stopping distance, (m)	8.48	9.45	9.61	9.65

6.1.2 Brake fade test:

		At maximum attainable speed			
Std ballasted tractor	Braking device control force, (N)	544	518	493	467
	Mean deceleration, (m/sec. sq.)	2.80	2.75	2.69	2.50
	Stopping distance, (m)	15.83	16.31	16.65	17.94

		At 25 kmph travel speed			
Std ballasted tractor	Braking device control force, (N)	588	576	563	551
	Mean deceleration, (m/sec. sq.)	2.58	2.59	2.55	2.50
	Stopping distance, (m)	9.23	9.30	9.45	9.65

Max. deviation of tractor from its original course, (m) : None

Abnormal vibration : None

The brakes were heated by : Self braking

Remark: The manufacturer has not recommended ballasting for road test, therefore the brake test was conducted under standard ballast condition only.

6.2 Parking brake test:

Particulars	Parked on 18 percent slope		Parked on 12 percent slope with trailer of 2.77 tonnes.	
	Facing up	Facing down	Facing Up	Facing Down
Braking device control force, (N)	352	378	268	281
Efficacy of parking brake	----- Effective -----			

7. NOISE MEASUREMENT

7.1 Noise at bystander's position:

Date of test	: 07.12.2016
Type of track	: Concrete
Background noise level, dB (A)	: 54
Atmospheric conditions:	
Temperature, (°C)	: 19
Pressure, (kPa)	: 98.9
Relative humidity, (%)	: 57
Wind velocity, (m/s)	: 1.0 to 1.6

Test Data:

S. No.	G e a r	Travelling speed before acceleration, (kmph)	Noise level, dB (A)
1.	L1	1.25	85
2.	L2	1.85	85
3.	L3	2.71	85
4.	L4	3.77	85
5.	M1	3.16	85
6.	M2	4.69	85
7.	M3	6.83	84
8.	M4	9.55	85
9.	H1	8.36	84
10.	H2	12.41	84
11.	H3	18.06	84
12.	H4	25.28	84

7.2 Noise at operator's ear level:

Date of test	: 11.06.2017
Type of track	: Concrete
Background noise level, dB (A)	: 52
Atmospheric conditions:	
Temperature, (°C)	: 31
Pressure, (kPa)	: 97.9
Relative humidity, (%)	: 46
Wind velocity, (m/s)	: 1.5

Test Data:

Gear	Drawbar pull at which the tractor develops the max. noise level, (kN)	Corresponding travelling speed, (kmph)	Noise level dB (A)
L2	14.04 to 21.60	2.28 to 2.06	92
L3	16.00 to 23.03	3.28 to 3.00	93
L4	12.78 to 22.34	4.68 to 4.24	93
M1	21.56 to 22.03	3.61 to 2.52	93
M2	21.02 to 21.66	5.30 to 5.00	94
*M3	11.81 to 16.04	8.65 to 7.58	93
M4	9.98 to 10.92	11.90 to 11.13	94
H1	12.52 to 12.84	9.59 to 9.50	93

* Gear corresponds to the nominal traveling speed nearest to 7.5 kmph.

T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

8. MECHANICAL VIBRATION MEASUREMENT

Date of test : 29.12.2016
Type of test surface : Concrete

Sl. No.	Measuring points		Vibration, microns			
			At no load		At load corresponding to 85% of maximum PTO power	
			VD	HD	VD	HD
1	2		3	4	5	6
i)	Foot rest	Left	30	60	20	60
		Right	30	80	60	60
ii)	Steering wheel		120*	60	130*	80
iii)	Seat	Bottom	20	20	30	40
		Back	40	20	50	60
iv)	Mudguard	Left	30	40	60	70
		Right	30	40	70	30
v)	Head light	Left	60	70	60	60
		Right	90	100	90	40
vi)	Battery base, centre		90	40	80	80
vii)	Tail light	Left	60	60	60	110*
		Right	30	60	130*	90
viii)	Plough light		150*	50	130*	170*
ix)	Gear shifting lever		30	30	20	30
x)	Accelerator lever	Hand	100	30	130*	60
		Foot	60	60	120*	100
xi)	Brake pedal	Left	190*	110*	90	160*
		Right	120*	140*	140*	160*
xii)	Clutch pedal		50	30	120*	150*
xiii)	Main hydraulic control lever		30	30	30	20
xiv)	PTO engaging lever		60	60	90	70
xv)	Differential lock lever		40	50	70	60

* The amplitude of mechanical vibration is on higher side.

9. LOCATION OF CENTRE OF GRAVITY

Condition	Particulars	Coordinates
Tractor under standard ballasted condition but with all the liquid reservoirs full & the operator replaced by a 75 kg mass on the seat	Height above ground, (mm)	842
	Distance forward from the vertical plane containing the axis of rear wheels, (mm)	1055
	Distance from the median plane parallel to the longitudinal axis of tractor bisecting the track, (mm)	0 (in centre)

10. TURNING ABILITY

Characteristics	Minimum turning diameter,(m)		Minimum clearance diameter,(m)	
	RHS	LHS	RHS	LHS
Brake applied	7.61	7.53	7.95	7.87
Brakes released	8.64	8.22	9.00	8.58

11. OPERATOR'S FIELD OF VISION

The operator's field of vision to the front and rear from the operator's seat is represented in Fig. 8. The observations are as under:

- i) The non visible space in front is 7800 mm which is 3.52 times of wheel base (i.e. 2210 mm).
- ii) The non-visible space on LHS and RHS is 3000 mm which is 1.98 times of rear track width (i.e. 1510 mm).
- iii) Silencer is creating masking effect.

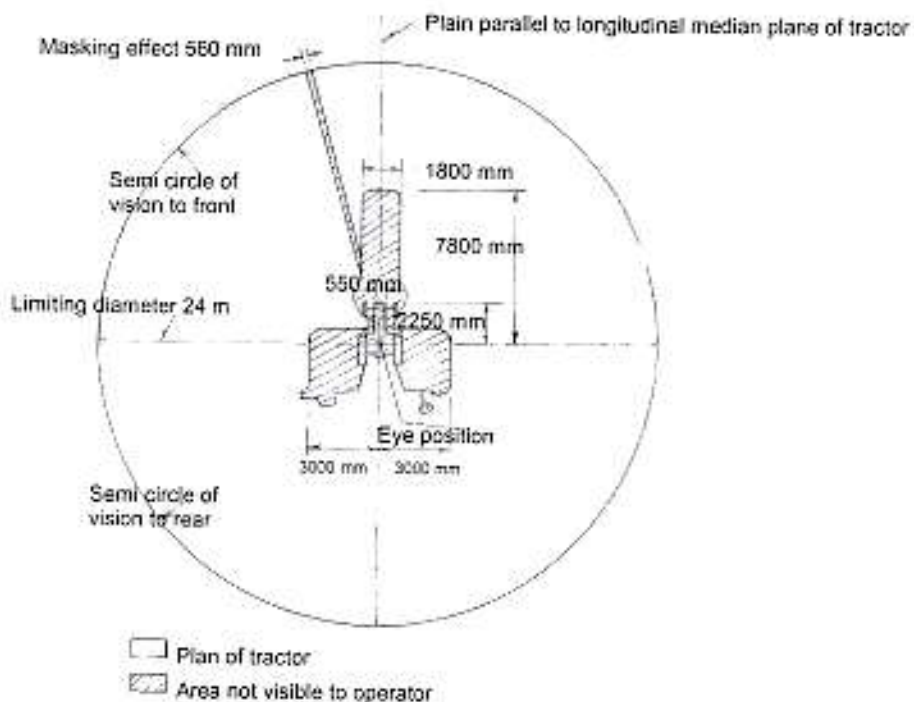


Fig. 8: OPERATOR'S FIELD OF VISION

12. FIELD TEST

- 12.1 The field tests comprising of Disc ploughing and Rotavation were conducted for 20.33 and 18.57 hours respectively.
All the field tests were conducted at the full accelerator settings, when the no load speed of the engine varied from 2479 to 2487 rpm.
- 12.2 The brief specifications of the implements used during field tests are given in Annexure- II.
- 12.3 The summary of field test observation with Disc plough and Rotavator is given in Table- 3.

Table – 3

SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameter/operation	Disc Ploughing	Rotavation
i)	Type of soil (refer IS: 7926-1975)	Light	Heavy
ii)	Av. soil moisture, (%)	7 to 8	14
iii)	Bulk density of soil, (g/cc)	1.80 to 1.90	1.80
iv)	Cone index, (kg/sq.cm)	6.30 to 8.17	6.30 to 7.32
v)	Gear used	L3	L3
vi)	Av. speed of operation, (kmph)	2.71 to 3.10	3.41 to 3.44
vii)	Av. wheel slip, (%) / Av. Travel reduction, (%)	8.8 to 9.8	-0.8 to -0.7
viii)	Av. depth of cut, (cm)	20 to 29	6 to 7
ix)	Av. working width, (cm)	67 to 83	199 to 207
x)	Area covered, (ha/h)	0.147 to 0.222	0.625 to 0.642
xi)	Fuel consumption:		
	- (l/h)	4.70 to 5.23	7.42 to 8.17
	- (l/ha)	23.54 to 31.97	11.87 to 12.72
xii)	Av. draft of implement, (kN)	5.34 to 5.88	--

Remarks: The average lub oil and coolant (water) consumptions during the entire field tests were observed as **2.57** and **2.57** ml/h respectively.

12.4 Wet land cultivation (Puddling):

The tractor was not recommended for the wet land cultivation (puddling operation) by the manufacturer hence test was not conducted.

13. HAULAGE TEST

Type of trailer:	Two wheel (Single axle)	Four wheel (Double axle)
Gross mass of trailer, (tonnes)	: 5.0	6.0
Height of trailer hitch above ground Level, (mm)	: 540	600
Gear used during the test for negotiating slopes up to 8%	: H4	H4
Average travel speed, (kmph)	: 29.97 to 32.57	28.72 to 29.54
Average fuel consumption:		
- (l/h)	: 7.07 to 7.87	6.94 to 7.11
- (ml/km/tonne)	: 47 to 48	40
Average distance traveled per litre of fuel consumption, (km)	: 4.14 to 4.24	4.14 to 4.15
General observations:		
Effectiveness of brakes	: Effective	Effective
Maneuverability of tractor-trailer Combination	: Satisfactory	Satisfactory

14. COMPONENTS / ASSEMBLY INSPECTION

The engine and other assemblies were dismantled after 107.5 hours of tractor operation at this Institute.

14.1 Engine:

14.1.1 Cylinder bore:

Cylinder No.	Cylinder bore dia. (mm)						Max. permissible limit, (mm)
	Top position		Middle position		Bottom position		
	Thrust side	Non-thrust side	Thrust side	Non-thrust side	Thrust side	Non-thrust side	
1.	90.986	90.992	90.989	90.993	90.992	90.991	91.3
2.	90.990	91.005	90.998	90.998	90.998	90.994	
3.	91.002	90.990	90.999	91.002	90.996	91.002	
4.	90.997	90.988	90.997	90.994	90.989	90.996	

14.1.2 Piston:

Piston No.	Piston dia., (mm)				Max. permissible wear limit of piston dia. (mm)	Clearance between piston and cylinder liner at the skirt of the piston, (mm)	
	Top (above top compression ring)		At skirt			As observed	Max. Permissible limit
	Thrust side	Non-thrust side	Thrust side	Non-thrust side			
1.	90.340	90.270	90.899	*	When the ring and groove clearance exceeds discard limit	0.094	0.45
2.	90.350	90.288	90.931	*		0.074	
3.	90.298	90.297	90.946	*		0.056	
4.	90.290	90.270	90.905	*		0.092	

* Not measured due to piston design feature.

14.1.3 Ring end gap:

Rings	Ring end gap, (mm)												Max. Permissible end gap limit, (mm)
	Cylinder No.1			Cylinder No.2			Cylinder No.3			Cylinder No.4			
	Top	Middle	Bottom	Top	Middle	Bottom	Top	Middle	Bottom	Top	Middle	Bottom	
1 st comp ring	0.45	0.45	0.45	0.37	0.37	0.40	0.45	0.45	0.45	0.45	0.50	0.50	2.0
2 nd comp ring	0.45	0.45	0.45	0.60	0.60	0.60	0.55	0.55	0.55	0.55	0.60	0.60	2.0
Oil ring	0.40	0.40	0.40	0.45	0.55	0.55	0.45	0.45	0.45	0.40	0.40	0.40	2.00

14.1.4 Ring side clearance:

Rings	Ring side clearance, (mm)				Max. Permissible clearance Limit, (mm)
	Piston-I	Piston-II	Piston-III	Piston-IV	
1 st Compression ring	0.139	0.140	0.123	0.137	0.20
2 nd Compression ring	0.075	0.059	0.073	0.067	0.20
Oil ring	0.044	0.040	0.054	0.039	0.15



T-1125/1651/2017	ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR (BRAND NAME – FARMTRAC) - Commercial (Initial)
------------------	---

14.1.5 Main bearing:

Bearing No.	Diametrical Clearance, (mm)	Crankshaft end float, (mm)	Max. Permissible clearance limit, (mm)	
			Diametrical clearance	Crankshaft end float
1	0.071 to 0.075	0.18	0.40	0.67
2	0.077 to 0.094			
3	0.057 to 0.068			
4	0.060 to 0.066			
5	0.071 to 0.075			

14.1.6 Big end bearings:

Bearing No.	Clearance, (mm)		Max. Permissible clearance limit, (mm)	
	Diametrical	Axial	Diametrical	Axial
1	0.056 to 0.093	0.40	0.40	0.60
2	0.050 to 0.074	0.35		
3	0.071 to 0.074	0.35		
4	0.080 to 0.084	0.35		

14.1.7 Valve, guides and timing gears:

	<u>Observation</u>
Any marked sign of overheating of valves	: None
Pitting of seat/faces of valves	: Normal
Any visual damage to the teeth of timing gears	: None
Spring Rate, (N/mm):	
- Intake valve spring	: 10.7 to 12.1
- Exhaust valve spring	: 10.3 to 11.5
	Against discard limit of 8.83 N/mm
Clearance between valve guide and valve stem, (mm):	
- Intake valve	: 0.062 to 0.070
- Exhaust valve	: 0.075 to 0.083
	Against discard limit of 0.25 mm

14.2 Clutch:

Any marked wear on clutch friction plate(s)	: None
Condition of clutch release bearing	: Normal
Condition of pilot bearing	: Normal
Condition of diaphragm and springs	: Normal
Presence of oil in clutch housing	: None
Any marks on fly wheel/ pressure plate	: None
Overall thickness of clutch plate, (mm):	
-Main transmission	: 10.68 to 10.82
-PTO	: 7.93 to 7.97
	5.50
Height of lining over rivet head, (mm):	
-Main transmission	: 1.16 to 1.60
-PTO	: 1.26 to 1.53
	Up to rivet head

14.3 Transmission gears:

Any visual damage, pitting & chipping of any transmission gear teeth.	: None
---	--------



T-1125/1651/2017	ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR (BRAND NAME – FARMTRAC) - Commercial (Initial)
------------------	---

Backlash between crown wheel and Pinion, : 0.28
(mm)

(Re-shim to attain the desired backlash)

14.4 Brakes:

Description	Initial specified thickness of brake lining, (mm)	Measured thickness of brake lining after test, (mm)	Measured depth of oil groove of brake lining, (mm)	Minimum permissible thickness of brake lining, (mm)	Minimum permissible depth of oil groove of brake lining, (mm)
Left	4.70 to 4.80	4.76 to 4.79	0.29 to 0.58	3.90	Not specified
Right	4.70 to 4.80	4.73 to 4.80	0.31 to 0.52		

14.5 Front axle : Front axle final drive reduction unit case is located near front wheel hub in a separate case. The differential unit is accommodated inside centre of the front axle housing. Bearing pins and bushes are provided at end of front axle and final drive.

Condition of front axle seals, bushes & bearing pins : Normal

Any visual damage, pitting & chipping of front axle transmission gear teeth : None

Any marked wear of bearing pins and bushes : None

Clearance between bearing pins and bushes at top, mm : 0.076 to 0.095

Against discard limit of 0.40 mm

Clearance between centre pin (journals) and bushes, mm : 0.021 to 0.087

Against discard limit of 0.40 mm

14.6 Steering system:

Visual condition of the components of complete steering assembly : Normal

14.7 Starter motor & Alternator:

Presence of soil/oil in housing : None

Condition of bearings and other Components : Normal

15. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

S. No.	Adjustments/Defects/Breakdowns and repairs	Category of breakdown	Tractor run hours
1	2	3	4
1.	During the ploughing operation it was observed that, the hydraulic lift of the tractor was not working properly. During the inspection of the hydraulic system it was observed that the locking nut (M-8 screw) fitted on the linkages of position control lever found loose and tightened the same screw.	–	64.3

T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

1	2	3	4
2.	During the field operation with rotavator, the male-female joint of propeller shaft of the rotavator came out due to bending of safety bolt instead of shearing, resulting into bending of PTO shaft end of tractor while rotating along with the propeller shaft of rotavator. It seems the bending of PTO shaft end of tractor was resulted due to the failure of safety bolt to shear on overloading and hence considered as a consequential failure. To rectify this defect, front bearing (Part No. D10064630.9), PTO shaft with gear (Part No. D10061070.9) and rear bearing (Part No. D10063570.9) were replaced with new one.	--	88.7
3.	During the field operation with rotavator the leakage of lubrication oil from Hydrostatic Steering Unit was observed. While inspection, the metallic pipe end joining to Hydrostatic Steering Unit adopter found damaged. To rectify this defect, adopter (Part No. D10021080.9) and metallic pipe (tube assembly) (Part No. D10224980.9) were replaced with new one.	Mj21	90.7

16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

16.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2014 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: 12207-2014	Values declared by the applicant(D)/ Requirement (R)	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
16.1.1	PTO Performance:					
a)	Maximum 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 ≤ 26kW	41.17 (D)	41.5	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	±5%	41.17 (D)	41.5	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	248 (D)	237	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	275 (D)	220.6	No
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	10 percent, min (R)	22.6	Yes



T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

1	2	3	4	5	6	7
f)	Maximum operating temperature (^oC):					
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.	130 (D)	118	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 (D)	103	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under high ambient conditions	Max. 2.48 (D) 1% of SFC, max. (R)	0.70	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	0.07 per meter	Yes
16.1.2	Drawbar performance:					
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip. (kN).	Non Evaluative	Minimum 65% of static mass of tractor with ballast	24.60 (D) 23.90 (R) Minimum	30.21	Yes
b)	Maximum drawbar pull with standard ballast corresponding to 15 percent wheel slip. (kN).	Evaluative	Minimum 65% of static mass of tractor with standard ballast	18.35 (D) 17.66 (R) Minimum	23.03	Yes
c)	Maximum drawbar power with standard ballast (kW).	Evaluative	Minimum 60% of PTO power as referred in Sl. No. i) a) of PTO performance in case of tractors having total static mass >1500 kg. Minimum 75% of PTO power as referred in Sl. No. i) a) of PTO performance in case of light weight tractors. Minimum 75% of the engine power as referred in Sl. No. i) a) of PTO performance in case of tractors which do not have a PTO shaft.	32.93 (D) 33.2 (R) Minimum	34.4	Yes
d)	Maximum transmission oil temperature (^o C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company.	125 (D)	81	Yes
16.1.3	Power lift and hydraulic pump performance:					
a)	Maximum lifting capacity throughout the range of lift. (kN):					
1)	At hitch points	Non Evaluative	[Tolerance of minus 10%]	20.0 (D)	21.93	Yes
2)	With the standard frame	Evaluative	The lift capacity should at least be 24 kg/PTO kW and it should be 21.5 kg/engine kW where the tractor is not provided with a PTO shaft	17.0 (D) 9.77 (R) Minimum	18.63	Yes

T-1125/1651/2017

ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)

1	2	3	4	5	6	7
b)	Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 minute, (mm)	Non Evaluative	The observed value should not exceed 50 mm	50 (D) 50 (R) Maximum	15	Yes
16.1.4 Brake performance at 25 kmph:						
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with standard ballast*, (m):					
	1) Cold brake	Evaluative	10	10 (R)	8.48	Yes
	2) Hot brake	Evaluative	10	10 (R)	9.23	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² , (N)	Evaluative	600	600 (R)	441 to 551	Yes
c)	Whether parking brake is effective at a force of 600 N at foot pedal(s) or 400 N at hand lever	Evaluative	Yes/No	Yes (R)	Yes	Yes
* The manufacturer has not recommended ballasting for road test, therefore the brake test was conducted under standard ballast condition only.						
16.1.5 Noise measurement:						
a)	Maximum ambient noise emitted by the tractor, dB(A)	Evaluative	As per CMVR	88 (R)	85	Yes
b)	Maximum noise at operator's ear level, dB(A)	Evaluative	As per CMVR	96 (R)	94	Yes
16.1.6 Amplitude of mechanical vibrations at:						
	1) Left foot rest	Non Evaluative	100 microns (max)	100 (R)	60	Yes
	2) Right foot rest			100 (R)	80	Yes
	3) Seat (with driver seated)			100 (R)	60	Yes
	4) Steering wheel			100 (R)	130	No
16.1.7 Air cleaner:						
	Air cleaner oil pull over, (%)	Non Evaluative	0.25 % (maximum)	Dry type air cleaner	Not applicable	--
16.1.8 Haulage requirements:						
a)	Gross mass of the trailers, (tonnes):					
	1) Two wheel	Non Evaluative	--	5.0 (D)	5.0	Yes
	2) Four wheel	Evaluative	--	6.0 (D)	6.0	Yes
b)	Distance travelled / litre of fuel consumption, (km/l):					
	1) Two wheel	Non Evaluative	--	3.5 to 6.0 (D)	4.14 to 4.24	Yes
	2) Four wheel	Evaluative	--	3.5 to 6.0 (D)	4.14 to 4.15	Yes
c)	Fuel consumption, (ml/km/tonne):					
	1) Two wheel	Non Evaluative	--	35 to 45 (D)	47 to 48	No
	2) Four wheel	Evaluative	--	35 to 45 (D)	40	Yes



T-1125/1651/2017	ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR (BRAND NAME – FARMTRAC) - Commercial (Initial)
------------------	---

1	2	3	4	5	6	7
16.1.9	Wetland cultivation (Puddling Operation):					
	Sealing for the following assemblies:	Evaluative	The identified assemblies should essentially meet the requirement of IS-11092. No water ingress in the identified assembly given in column-2. If tractor does not meet the requirements of wetland cultivation, it may be recommended for dry land operation only	The manufacturer has recommended that the tractor is not suitable for wetland cultivation (puddling operation)	Not recommended	--
	1) Clutch assembly	-do-				
	2) Brake housings	-do-				
	3) Front axle hubs	-do-				
	4) Engine oil	-do-				
	5) Transmission oil	-do-				
16.1.10	Safety features:					
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes (As per IS 12239 Part 2)	--	Meets the requirements	Yes
b)	Lighting arrangement	Evaluative	As per CMVR	--	Meets the requirements	Yes
c)	Sealing requirements (Tractors having more than 1150 mm track width)	Non Evaluative	Should meet the requirements of IS 12343 (as amended from time to time)	--	Does not meet the requirements	No
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 requirements	No
e)	Dimensions 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 requirements	No
f)	Specifications of linkage drawbar	Non Evaluative	Should meet the requirements of IS 12953 (as amended from time to time)	--	Meets the requirements	Yes
	Specifications of swinging drawbar	Non Evaluative	Should meet the requirements of IS 12362 (Part 3) (as amended from time to time)	--	Not provided	NA
16.1.11	Labeling of tractors (Provision of labeling plate):					
	1) Make	Evaluative	Should conform to the requirements of CMVR	--	ESCORTS LIMITED	Yes
	2) Model	Evaluative		--	FARMTRAC 6065 UM	Yes
	3) Year of manufacture	Evaluative		--	FD (September, 2015)	Yes
	4) Engine serial number	Evaluative		--	E2351618	Yes
	5) Chassis number	Evaluative		--	T052348025FD	Yes
	6) Declaration of PTO power, (kW)	Evaluative		--	41.17	Yes
16.1.12	Discard limit for:					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer and supported by printed literature.	91.300	90.986 to 91.005	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.45	0.056 to 0.094	Yes



1	2	3	4	5	6	7
(c)	Ring end gap (mm):					
	- Top comp. ring.	Evaluative	-do-	2.00	0.37 to 0.50	Yes
	- 2 nd comp. ring.		-do-	2.00	0.45 to 0.60	Yes
	- Oil ring.		-do-	2.00	0.40 to 0.55	Yes
(d)	Ring groove clearance (mm):					
	- Top comp. ring.	Evaluative	-do-	0.20	0.123 to 0.140	Yes
	- 2 nd comp. ring.		-do-	0.20	0.059 to 0.075	Yes
	- Oil ring.		-do-	0.15	0.039 to 0.054	Yes
(e)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	-do-	0.40	0.057 to 0.094	Yes
	- Crankshaft end float	Evaluative	-do-	0.67	0.18	Yes
(f)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.40	0.050 to 0.093	Yes
	- Axial	Evaluative	-do-	0.60	0.35 to 0.40	Yes
(g)	Clearance between bearing pins and bush, (mm)	Non Evaluative	-do-	0.40	0.076 to 0.095	Yes
(h)	Clearance between center pin (journals) and bushes, (mm)	Non Evaluative	- do-	0.40	0.021 to 0.087	Yes
16.1.13	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

16.1.14 CATEGORY OF BREAKDOWNS / DEFECTS:					
S. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	As observed	Whether meets the requirements (Yes/No.)
1	2	3	4	5	6
1.	Critical	Evaluative	No critical breakdown.	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature.	One (Mj21)	Yes
3.	Minor	Evaluative	Not more than five and frequency of each should not be more than two.	None	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed five, that is, (2 major + 3 minor) or 5 minor breakdowns.	One (Mj21)	Yes

T-1125/1651/2017

**ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR
(BRAND NAME – FARMTRAC) - Commercial (Initial)**

16.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2014:				
S. No.	Characteristic	Requirements as per IS: 12207-2014	As observed	Whether meets the requirements (Yes/No.)
1	2	3	4	5
1.	Fitment of ROPS	With a provision for fitment of ROPS. If ROPS fitted it should meet the requirement of IS: 11821-1992.	Not provided ROPS not fitted	No Not applicable
2.	Accessories	Trailer hitch, front tow hook may be provided.	Trailer hitch provided Front tow hook provided	Yes

16.3 Conformity with following IS:

- i) Guidelines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS 10273:1987 (Reaffirmed in March, 2009)] : **Conforms**
- ii) Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS: 4931-1995 (Reaffirmed in March, 2009)] : **Does not conform**
- iii) Agricultural wheeled tractors - Three-point linkage: Part 1 Categories 1, 2, 3 & 4 (Fourth Revision) [IS 4468 (Part-1):1997/ ISO 730-1:1994 (Reaffirmed in March, 2009)] : **Does not conform**
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in March, 2007)] : **Conforms**
- v) Agricultural tractors - Operator's seat technical requirement [IS 12343 –1998 (First revision) (Re-affirmed in March, 2009)] : **Does not conform**
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision): [IS 12239 (PT-1) 1996 (Reaffirmed in February, 2012)/ISO 4254-1:1989] : **Does not conform**
- vii) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1) – 2006 (Reaffirmed in March, 2009) and IS: 6283 (Part-2)-2007 (Reaffirmed in March, 2009)]/ISO 3767-2:1991] : **Conforms**
- viii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) [(IS 12239 (PT-2) 1999) (Re-affirmed in March, 2009)] : **Does not conform**
- ix) Guidelines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983) (Re-affirmed in March, 2009) : **Does not conform**



- x) Agricultural Tractor & Machinery Lighting device for : Conforms
travel on public roads (IS: 14683-1999) (Re-affirmed
in March, 2009)

16.4 Salient Observations:

16.4.1 Laboratory tests:

16.4.1.1 PTO Performance:

- i) The maximum PTO power was observed as **41.5 kW** against the declaration of **41.17 kW** which meets the requirement of IS: 12207-2014 with regard to tolerance limit.
- ii) The specific fuel consumption corresponding to maximum power was recorded as **237 g/kWh** against the declaration of **248 g/kWh**, which meets the requirement of IS: 12207-2014 with regard to tolerance limit.
- iii) The maximum equivalent crankshaft torque was observed as **220.6 Nm** against the declaration of **275 Nm** which does not meet the requirement of IS: 12207-2014 with regard to tolerance limit. This should be looked into for necessary corrective action.
- iv) The backup torque is **22.6 %**.

16.4.1.2 Mechanical Vibration:

The amplitude of mechanical vibration on various assemblies marked as (*) in Chapter-8 of this test report is on very higher side, especially at the steering control wheel. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

16.4.1.3 Haulage requirements:

The specific fuel consumption with two wheel trailer was recorded as **47 to 48 ml/km/tonne** against the declaration of 35 to 45 ml/km/tonne. This should be looked into.

16.4.1.4 Operator's Seat:

The longitudinal distance from seat index point to the centre of differential lock pedal, the longitudinal distance from seat index point to the centre of steering control wheel and vertical distance from seat index point to the centre of steering control wheel does not meet the requirement of IS: 12343-1998, This should be looked into for necessary corrective action.

16.4.1.5 Technical Requirements for Power Take Off Shaft:

Dimension "d ϕ " and "h" [Refer Fig.2(a)] of power take off shaft does not meet the requirement of IS: 4931-1995. This should be looked into for necessary corrective action.

16.4.1.6 Three Point Linkage:

The width of ball, the lateral distance from lower hitch point to centre line of tractor and lateral movement of lower hitch points does not meet the requirement of IS: 4468 (Part-1) -1997. This should be looked into for necessary corrective action.

16.4.1.7 Nominal speed:

The nominal speed of the tractor recorded as **24.62 kmph** in high reverse gear (RH4). The speed recorded in reverse gear RH4 is not safe as far as the reversing of the tractor is concerned. This should be looked into for necessary corrective action.

- 16.4.2 **Field performance test:**
- 16.4.2.1 **Dry land cultivation:**
During the dry land cultivation with ploughing operation and rotavation, the defects and breakdowns recorded in **Chapter 15** of this test report are occurred. This should be looked into for necessary corrective action.
- 16.4.2.2 **Wet land cultivation (Puddling operation):**
The manufacturer has recommended that the tractor is not suitable for wetland cultivation (puddling operation). Hence the, wetland cultivation was not conducted. **Therefore, the declaration of the fact that the tractor is not suitable for wetland cultivation (Puddling operation) should be mentioned clearly and boldly in all the literature relevant to this tractor.**
- 16.5 **Maintenance / Service Problems:**
No noticeable maintenance or service problem was observed during the test.
- 16.6 **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 longitudinal distance from seat index point to the centre of differential lock pedal, the longitudinal distance from seat index point to the centre of steering control wheel and vertical distance from seat index point to the centre of steering control wheel should be within the limit for easy handling of tractor.
 - iii) The height of foot step from ground level should be within the limit for easy mounting and dismounting from the tractor.
 - iv) Stop knob is provided but does not remain in stop position
 - v) The working clearance between draft control lever and mudguard should be as per the minimum requirements of relevant Indian Standard for easy operating the lever.
- 16.7 **Adequacy of Literature supplied with machine:**
- 16.7.1 The following literature was supplied with the tractor for reference during the test:
- i) Tractor Operator's Manual
 - ii) Parts Catalogue
 - iii) Service Manual
- 16.7.2 The printed literature supplied with the test sample is in English. The literature may be brought out as per IS: 8132-1999 (Reaffirmed in March, 2009) for the guidance of user and service personnel in national as well as other regional languages.



T-1125/1651/2017	ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR (BRAND NAME - FARMTRAC) - Commercial (Initial)
------------------	---

17. 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	11 Months (November, 2016 to November, 2017)	No	Due to waiting in drawbar performance test and seasonal constraints.

TESTING AUTHORITY:


C. K. TIJARE
AGRICULTURAL ENGINEER


C. V. CHIMOTE
TEST ENGINEER


Y. K. RAO
SENIOR AGRICULTURAL
ENGINEER


J.J.R. NARWARE
DIRECTOR

18. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
18.1	16.4.1.1(iii), 16.4.1.4, 16.4.1.5, 16.4.1.6, & 16.4.2.1	These being studied & corrective action would be taken in near future.
18.2	16.4.1.7	For reverse speed, we will also take necessary action after discussion with Carraro as per Ministry's recommendations.
18.3	16.4.1.2, 16.4.1.3, 16.6, 16.7.1 & 16.7.2	Under our policy of continuous product improvement these aspects are further being looked into & will try to eliminate these deviations soon.



T-1125/1651/2017	ESCORTS LIMITED, FARMTRAC 6065 UM TRACTOR (BRAND NAME – FARMTRAC) - Commercial (Initial)
------------------	---

ANNEXURE – I

BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST

S. No.	Item	Disc Plough	Rotavator
1.	Make	Field King	Messy Ferguson
2.	Type	Mounted	Mounted
3.	No. of bottom / blades	03	48 in 9 flanges
4.	Type of bottom / blades	Concave	Hatchet
5.	Size of bottom /disc/blade, (mm)	385	160x80x7.0
6.	Spacing of bottom/flanges, (mm)	280	230
7.	Lower hitch point span, (mm)	785	830
8.	Mast height, (mm)	510	630
9.	Overall dimensions, (mm):		
	- Length	1920	780
	- Width	1040	2275
	- Height	1180	1080
10.	Gross mass, (kg)	345	550

ANNEXURE-II

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	12.29
3.	Power lift and hydraulic pump performance test	1.41
4.	Drawbar performance test	19.17
5.	Turning ability	0.40
6.	Location of centre of gravity	--
7.	Operator's field of vision	--
8.	Brake test	2.5
9.	Noise measurement	2.58
10.	Mechanical vibration test	0.75
11.	Theoretical speed test	4.89
B.	FIELD TEST:	
1.	Disc ploughing	20.33
2.	Rotavation	18
C.	HAULAGE TEST:	5.49
D.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	19.69
	TOTAL:	107.5