OECD Approval No. : 1/1 991
Date of approval : 11th July, 2002

Report on test in accordance with
OECD STANDARD CODE 1
for the Official Testing of Agricultural and Forestry Tractors



Agricultural Tractor

SONALIKA SOLIS 50 (2 WD) TRACTOR

Manufactured by	:	**M/s International Tractors Ltd.,** **Village CHAK GUJRAN,** **P.O. Piplanwala, Jalandhar Road,** **Distt. HOSHIARPUR (Punjab)– 146 002** **INDIA**
Submitted for test by	:	**The manufacturer**
Report No.	:	**T- 446/894/06/OECD**
Date	:	**August, 2002**

GOVERNMENT OF INDIA
Ministry of Agriculture, (Deptt. of Agriculture and Co-opn.)
CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
Tractor Nagar.P.O., BUDNI (M.P.) 466 445

This is a report on a tractor test in accordance with OECD STANDARD CODE 1 for the Official Testing of Agricultural and Forestry Tractors.

It does not contain an evaluation of the tractor on practical work.

Date of approval	11th July, 2002	OECD No.	1/1 991

In this report all performance characteristics are given corresponding to the international system of units.

The relationship to the Technical System of Units is given by the following conversions:							
Forces	1	kN	=	1000	N	= 102	kgf
Powers	1	kW	=	1000	W	= 1.36	Ps
Pressures	1	MPa	=	10	bar	= 10.2	kgf/cm^2
	100	kPa	=	1000	mbar	= 750.1	mm of Hg

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Tractor manufacturer's name and address	:	M/s International Tractors Ltd., Village CHAK GUJRAN, P.O. Piplanwala, Jalandhar Road, Distt. Hoshiarpur(Punjab) – 146 022 INDIA
Location of tractor assembly	:	M/s International Tractors Ltd., Village CHAK GUJRAN, P.O. Piplanwala, Jalandhar Road, Distt. Hoshiarpur(Punjab) – 146 022 INDIA
Submitted for test by	:	The manufacturer
Selected for test by	:	The manufacturer with agreement of the testing station.
Place of running-in	:	At manufacturer's works
Duration of running-in	:	Engine - 35 h Transmission - Nil
Location of test	:	Central Farm Machinery Training and Testing Institute, P.O.Tractor Nagar, 466 445 BUDNI (Madhya Pradesh) INDIA

1. SPECIFICATIONS OF TRACTOR

1.1 Identification

1.1.1	**Make**	:	Sonalika
	Model	:	Solis – 50
	Type	:	2 WD
1.1.2	**Numbers:**		
	1st Serial No.	:	0007 ZZ 2020
	Serial No.	:	0102 ZZ 4987
1.1.3	**Other specifications**	:	Not applicable
1.2	**Engine**		
	Make	:	Sonalika
	Model	:	4095 F
	Type	:	Four stroke, direct injection, naturally aspirated, water cooled diesel engine.
	Serial No.	:	4095 F 12 B 05051
1.2.1	**Cylinders:**		
	Number & disposition	:	Four, Vertical inline
	Bore/Stroke	:	95 mm /110 mm
	Capacity	:	3120 cm^3
	Compression ratio	:	17.4 : 1
	Arrangement of valves	:	Over head
	Cylinder liners	:	Wet
1.2.2	**Supercharging**	:	Not provided

1.2.3	**Fuel feed system**	:	Gravity and force feed
	Filters:		
	Make	:	MICO LIC BOSCH, INDIA
	Model	:	0 450 226 029
	Type	:	Primary cloth and secondary paper element.
	Number	:	Two
	Capacity of fuel tank	:	69 dm^3
	Injection pump:		
	Make	:	MICO LIC BOSCH, INDIA
	Model	:	F 002 AOZ 190 PES 4 A 90D 320 RS 2989
	Type	:	Inline, plunger
	Serial Number	:	09136370
	Manufacturer's production setting of injection pump:		
	Flow rate	:	10.03 to 10.82 dm^3/h at rated engine speed.
	Timing	:	18 ± 1 degree before TDC
	Injectors:		
	Make	:	MICO LIC BOSCH , INDIA
	Model	:	F00 2C 70210
	Type	:	Multihole
	Injection pressure	:	20.59 ± 0.98 MPa
1.2.4	**Governor:**		
	Make	:	MICO LIC BOSCH, INDIA
	Model	:	RSV -300 ... 1100 A5C 1213 R
	Type	:	Mechanical, variable speed
	Governed range of engine speed	:	600 to 2400 rev./min.
	Rated engine speed	:	2200 rev./min.
1.2.5	**Air cleaner:**		
	Pre-cleaner:		
	Make	:	Own make
	Type	:	Centrifugal with transparent dust collector
	Location of air intake	:	On top of air cleaner tube, outside bonnet.
	Main cleaner:		
	Make	:	Own make
	Type	:	Oil bath
	Maintenance indicator	:	Not provided

1.2.6 Lubricating System:

Type of feed pump	:	Gear
Type of filter(s)	:	Full flow, spin on paper filter.
Number	:	One

1.2.7 Cooling System:

Type of coolant	:	Water
Type of pump	:	Centrifugal

Specification of fan:

Type	:	Suction
Number of fan blades	:	6
Fan diameter	:	380 mm
Coolant capacity	:	10.6 dm^3
Type of temperature control	:	Thermostat
System pressure	:	49 kPa

1.2.8 Starting system:

Make	:	LUCAS-TVS
Model	:	3SM 114
Type	:	Pre-engaged, solenoid.
Starter motor power rating	:	2.9 kW
Cold starting aid	:	None
Safety device	:	None

1.2.9 Electrical System:

Voltage	:	12 V

Generator:

Make	:	LUCAS - TV S
Model	:	A 115 - 36
Type	:	Alternator
Power	:	0.55 kW

Battery:

Number	:	One
Rating	:	88 Ah at 20 hour

1.2.10 Exhaust System:

Make	:	Own make
Model	:	None
Type	:	Updraft , multi-chamber expansion.
Location	:	Right hand side of engine.

1.3 Transmission:

1.3.1 Clutch (Travel and power take-off):

Make	:	Own make
Model	:	None
Type	:	Dry, friction plates.
Number of plates	:	Two
Diameter of plates	:	295mm(travel), 280mm(PTO),
Method of disengagement	:	Mechanically actuated by pedal.

1.3.2 Gear Box:

Make	:	Own make
Model	:	None
Type	:	Mechanical sliding mesh gears.
Description	:	Central shift arrangement

	Forward	Reverse
Number of gears	4	1
Number of ranges/groups	2	2
Total of arrangements	8	2

Available options : High/low

1.3.3 Rear axle and final drives:

Make	:	Own make
Model	:	None
Type	:	Spiral bevel gear type crown wheel & pinion, spur gear type final reduction units.
Differential lock	:	Not provided

1.3.4 Front axle and final drives:

- Make/Model/Type	:	Sonalika/None/Telescopic without final drive.
- Differential lock	:	Not provided

1.3.5. Total ratios and travelling speeds:

Gear No.	Range	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed of 2200, rev/min (km/h)
L1	Low	186.95	2.71
L2	Low	142.10	3.56
L3	Low	85.48	5.92
L4	Low	62.51	8.09
H1	High	47.50	10.65
H2	High	36.10	14.02
H3	High	21.70	23.32
H4	High	15.88	31.85
LR	Low	133.47	3.79
HR	High	33.87	14.94

(*) Calculated with a tyre dynamic radius index (ISO 4251-1-1998) of 610 mm(tyre: 13.6 – 28)

1.4 Power take-off:

1.4.1. Main power take-off:

Type	:	Independent
Method of engagement	:	Mechanically engaged by a hand lever, dry friction type clutch provided.
Number of shafts	:	One
Method of changing power take-off shaft end speeds.	:	Fixed speed

1.4.1.1 Power take-off proportional to engine speed:

Power take-off at 1000 (rev./min):

Location	:	At rear of tractor
Diameter of power take-off shaft end	:	34.69mm
Number of splines	:	21, in conformity with ISO 500:1991
Height above ground	:	620 mm
Distance from the median plane of the tractor	:	08 mm on LHS
Distance behind rear axle centre	:	360 mm
Maximum torque transmissible	:	1250 Nm
Direction of rotation (viewed from shaft end)	:	Clockwise

PTO type	PTO speed (rev/min)	Engine speed (rev/min)	Engine/PTO transmission ratio	Power restriction
1000	1000	2047	2.047	None
	1075	2200		

1.4.1.2 Power take-off proportional to ground speed: : None

1.4.2 Optional power take-off : None

1.5 Hydraulic power-lift:

Make	:	Own make
Model	:	None
Type	:	Hydraulic 3-point hitch with position and draft control.
Type of hydraulic system	:	Open centre
Make, type and number of cylinders	:	Own make, single acting, one
Type of linkage lock for transport	:	Hydraulically, by closing response valve.
Relief valve pressure setting (tolerance)	:	19.61 ± 1 MPa
Opening pressure of cylinder safety valve	:	23.54 ± 1 MPa
Lift pump type	:	Gear
Transmission between pump and engine	:	Gear drive
Type and number of filters	:	Spin on paper filter – One No. Wire mesh strainers - Two Nos.
Site of oil reservoir	:	Transmission case
Type, number and location of tapping points:		
Type	:	Threaded, female
Number	:	Two
Location	:	On R.V. housing
Maximum volume of oil available to external cylinders	:	Hydraulic oil to be added for external hydraulic circuit.

1.6 Three point linkage:

Category : 1 in conformity to ISO 730-1:1994 + Cor.1:1995(Ref. Fig. 1.1 and 1.2)

Category adapter : None

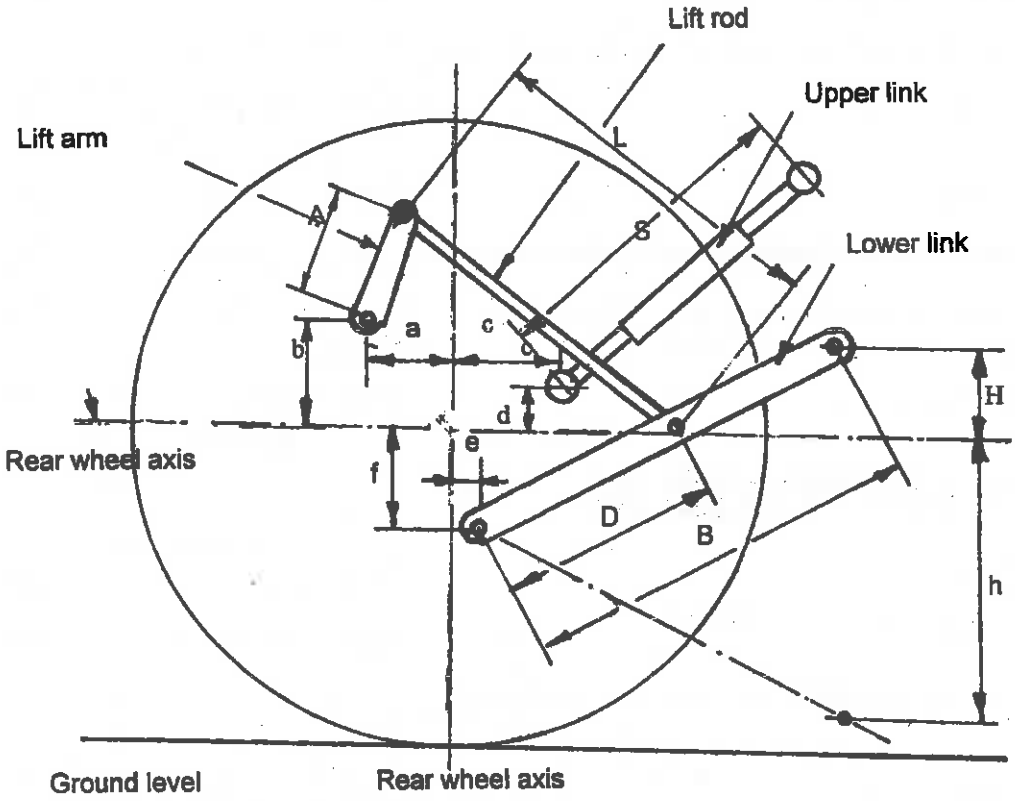


Figure 1.1
Lift test – Linkage geometry

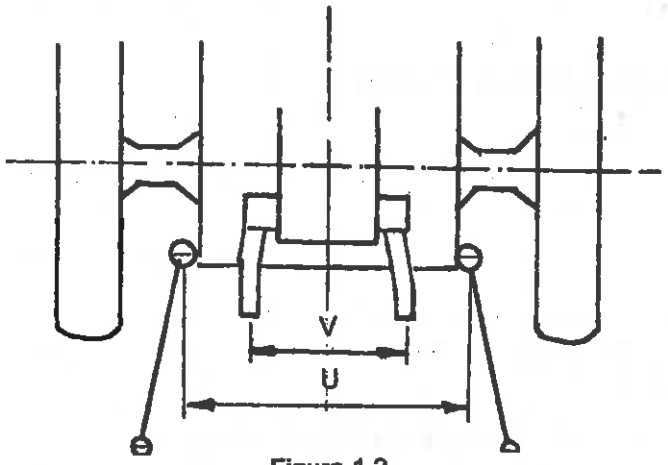


Figure 1.2
Lift test – Linkage geometry

		Dimension or range mm	Settings used in test mm
Length of lift arms:	(A)	270	270
Length of lower links:	(B)	775	775
Distance of lift arm pivot point from rear-wheel axis:			
horizontally	(a)	130 forward	130 forward
vertically	(b)	335	335
Horizontal distance between the 2 lower link points:	(u)	515	515
Horizontal distance between the 2 lift arm end points:	(v)	605	605
Length of upper link:	(S)	From 490 to 710	555
Distance of upper link pivot point from rear wheel axis:			
horizontally	(c)	320 and 325	325
vertically	(d)	265 and 305	265
Distance of lower link pivot point from rear wheel axis:			
horizontally	(e)	105	105
vertically	(f)	145	145
Distance of lower link pivot points to lift rod pivot points on lower links:	(D)	420	420
Length of lift rods:	(L)	From 635 to 765	710
Height of lower hitch points relative to the rear-wheel axis:			
in low position	(h)	From 205 to 560	410
in high position	(H)	From 125 to 330	225
Height above ground of lower hitch points when locked in transport position (*)	-	From 735 to 940	835

(*) Assuming r= 610 mm rear tyre (tyre 13.6-28) dynamic radius index (ISO 4251-1:1998)

Table 1.1

Dimensions of linkage geometry when connected to the standard frame

1.7 Swinging drawbar:

Type	:	Not provided

1.8 Trailer hitch:

Type	:	Clevis
Hole diameter	:	34.38 mm
Height above ground	:	550 mm to 700 mm
Distance of hitch point from rear-wheel axis,		
- Horizontal	:	500 mm
Distance of hitch point from power take-off shaft end:		
- Vertical	:	70 mm below, 80 mm above
- Horizontal	:	140 mm
Maximum vertical permissible load	:	9 kN

1.9 Holed drawbar:

Number of holes	:	07
Distance between holes	:	80 mm
Hole diameter	:	25 mm
Thickness/Width of drawbar	:	30.4 mm/75.6 mm
Height above ground:		
- Minimum	:	50 mm
- Maximum	:	940 mm
Horizontal distance to power take-off shaft end (rear) lower links in horizontal position.	:	520 mm

1.10 Steering:

Make	:	ZF
Model	:	None
Type	:	Mechanical, worm and nut
Method of operation	:	Mechanically, steering wheel operated

1.11 Brakes:

1.11.1 Service brake:

Make	:	Own make
Model	:	None
Type	:	Mechanical dry disc
Method of operation	:	Independently/combined foot operated with provision for locking the pedals for simultaneous operation.
Trailer braking take-off (hydraulic or air brake)	:	None

1.11.2 Parking brake:

Type : Mechanical ratchet lock on service brakes.

Method of operation : Depressed pedals are locked by ratchet operated by a hand lever.

1.12 Wheels:

Number:

Front : Two, steering
Rear : Two, driving
Wheel base : 2080mm

Track width adjustment:

	Minimum [mm]	Maximum [mm]	Adjustment method
Front	1200	1640	By extending telescopic axle and reversing the wheel rims.
Rear	1350	1890	By changing the position of wheel discs on rim lungs and reversing the wheel discs.

1.13 Protective structure : Not provided

1.14 Seat:

1.14.1 Driver's seat:

Make : Own make
Model : None
Type : Cushioned with back rest
Seat and steering wheel reversible : None
Type of suspension : Helical springs
Type of damping : Hydraulic shock absorber

Range of adjustment:
Longitudinal : 65 mm
Vertical : None
Safety belt : None

1.14.2 Optional driver's seat(s) : None

1.14.3 Passenger seat : On rear mudguards, 2

1.15 Lighting:

	Height above ground of centre	Size	Distance from outside edge of lights to median plane of tractor
	[mm]	[mm]	[mm]
Head lights	1230	130 x 100	225
Side lights	1290	75 x 70	780
Rear lights	1290	75 x 70	692
Reflectors (Rear mudguard)	1290	65 x 40	730
Flashers	1290	75 x 70	780

2 TEST CONDITIONS

2.1 Overall dimensions

	Length [mm]	Width		Height at top of	
		minimum [mm]	maximum [mm]	Exhaust silencer [mm]	Steering wheel [mm]
Unballasted	3720	1730	2350	2425	1645
Ballasted	3720	2007	2450	2425	1645

2.2 Ground clearance : 390 mm
(Unballasted tractor)
Clearance – limiting part : Rear transmission housing drain plug.

2.3 Tractor Mass:

	Ballasted		Unballasted	
	Without driver	With driver	Without driver	With driver
	[kg]	[kg]	[kg]	[kg]
Front	960	965	960	965
Rear	1845	1915	1145	1215
Total	2805	2880	2105	2180

2.4 Ballast:
Front : Nil

Rear: 10 weights, total : 400 kg
Water in the tyres : 300 kg

2.5 Tyres and track width specifications:

Tyres:		Front	Rear
dimensions		6.00- 16	13.6 - 28
ply rating		6	12
type		Pneumatic, ribbed	Pneumatic, traction
maximum load (tyre manufacturer's)	kN	6.62	16.13
maximum load (tractor manufacturer's)	kN	4.61	11.42
inflation pressure (tyre manufacturer's)	kPa	250	110
dynamic radius index	mm	--	610
Chosen track width	mm	1200	1350

2.6 Fuel:

Type : Diesel fuel conforming to IS:1460-1998.

Density at 15 °C : 0.839 g/cm^3

2.7 Oils and lubrication:

2.7.1 Capacity and change interval:

	Capacity (dm^3)	Oil change (h)	Filter change (h)
Engine	11.1	First - 50 Subsequent - 200	First - 50 Subsequent - 200
Gear box, rear axle final drive(rear) and hydraulic system	50.0	Every 1800	Every 250
Steering box	0.50	--	--

2.7.2 Specifications:

	Recommended	Used during test
Engine oil:		
- Type	SAE 20W/40	As recommended
- Viscosity	13.5 to 16.0 cSt	
- Classification	API – CD	
Transmission steering and Hydraulic oils:		
- Type	SAE EP – 80	As recommended
- Viscosity	9 to 11 cSt	
- Classification	GL – 4	

2.7.3 Grease:

Number of lubricating points:

Grease nipples : 22

Grease cups : 03

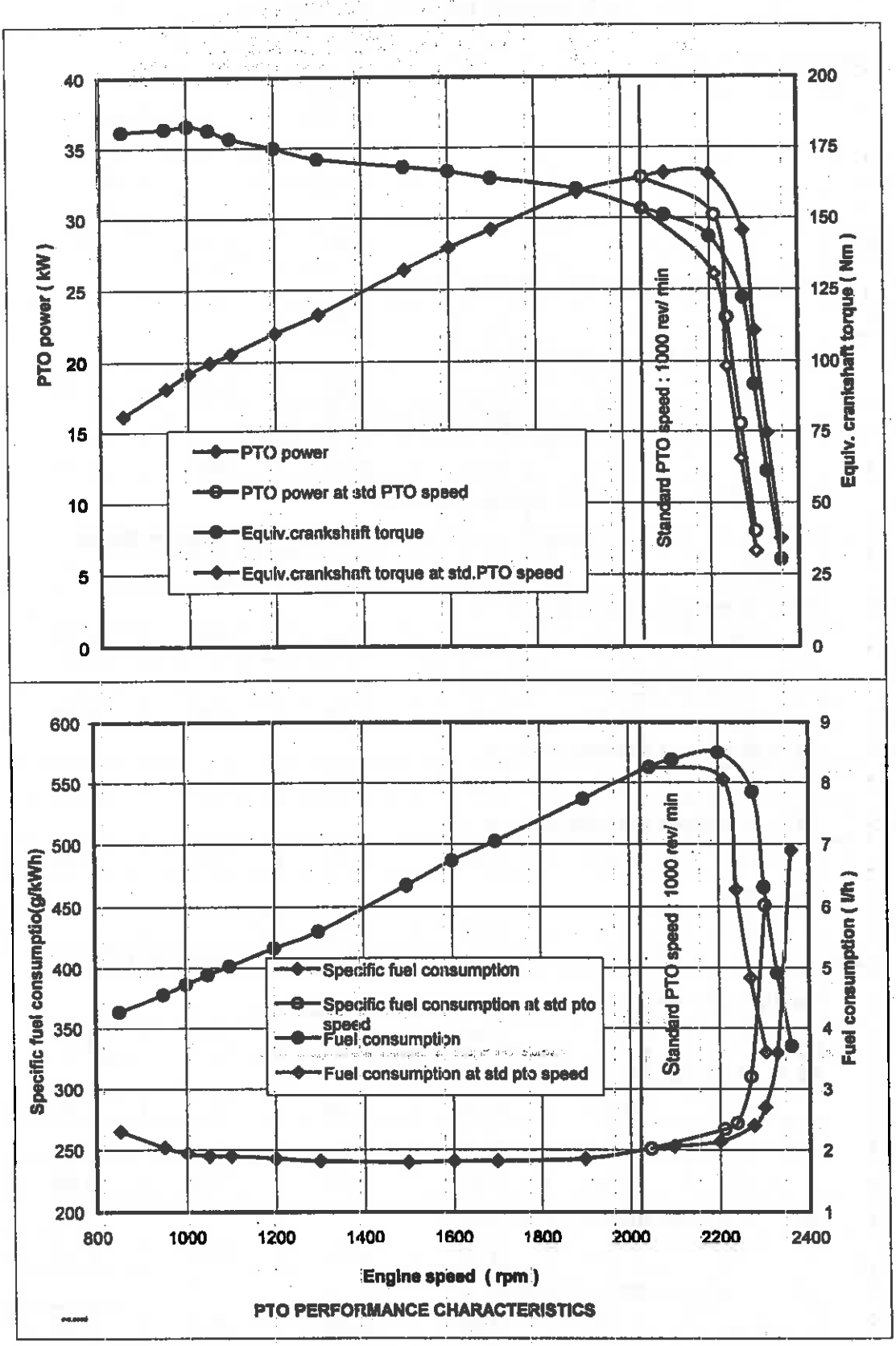
3 COMPULSORY TESTS RESULTS

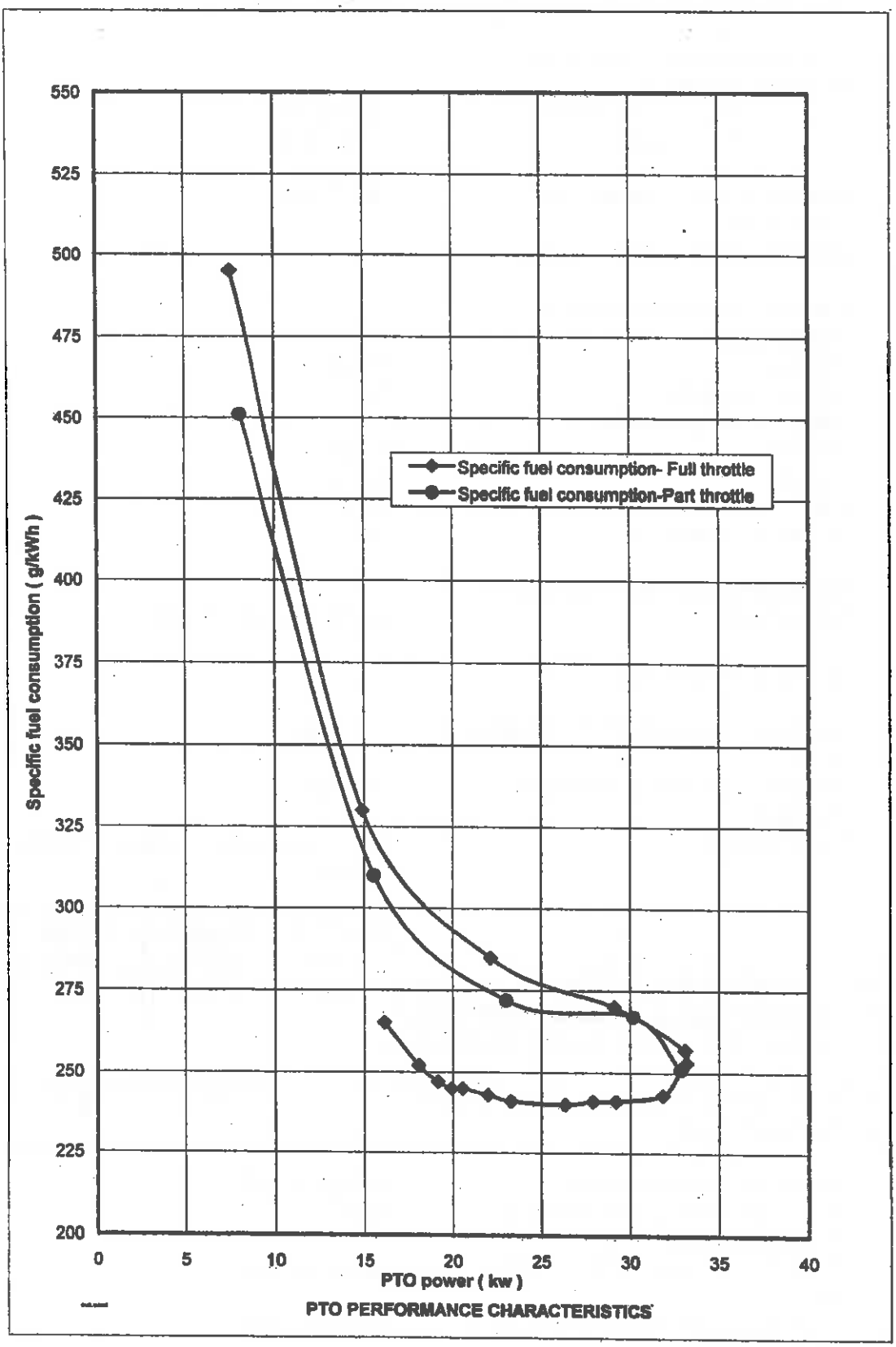
3.1 Main power take-off:

Date and location of tests : 21st May, 2001 at CFMT&TI, BUDNI(INDIA)

Type of dynamometer bench : Eddy Current, Fuchino ESF 1000

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	min $^{-1}$ (rev/min)		l/h	kg/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER - TWO HOURS TEST:						
33.2	2098	1025	9.99	8.38	253	3.33
3.1.2 POWER AT RATED ENGINE SPEED:						
33.1	2200	1075	10.13	8.50	257	3.27
3.1.3 STANDARD POWER TAKE-OFF SPEED [1000 ± 25 (rev/min)]:						
32.9	2047	1000	9.85	8.26	251	3.34
3.1.4 PART LOADS AT RATED ENGINE SPEED:						
3.1.4.1 the torque corresponding to maximum power at rated engine speed:						
33.1	2200	1075	10.13	8.50	257	3.27
3.1.4.2 85 % of torque obtained in 3.1.4.1:						
29.1	2276	1112	9.36	7.85	270	3.11
3.1.4.3 75 % of torque defined in 3.1.4.2:						
22.1	2301	1124	7.52	6.31	285	2.94
3.1.4.4 50 % of torque defined in 3.1.4.2:						
14.9	2329	1138	5.85	4.91	330	2.55
3.1.4.5 25 % of torque defined in 3.1.4.2:						
7.5	2360	1153	4.42	3.71	495	1.69
3.1.4.6 Unloaded						
0.0	2379	1162	3.12	2.62	-	-
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED[1000± 25 (rev/min)]:						
3.1.5.1 The torque corresponding to maximum power :						
32.9	2047	1000	9.85	8.26	251	3.34
3.1.5.2 85 % of torque obtained in 3.1.5.1:						
30.2	2211	1080	9.59	8.05	267	3.15
3.1.5.3 75 % of torque defined in 3.1.5.2:						
23.0	2239	1094	7.47	6.27	272	3.08
3.1.5.4 50 % of torque defined in 3.1.5.2:						
15.6	2270	1109	5.76	4.83	310	2.70
3.1.5.5 25 % of torque defined in 3.1.5.2:						
8.0	2303	1125	4.30	3.61	451	1.86
3.1.5.6 Unloaded:						
0.0	2315	1131	2.98	2.50	-	-


PTO power (kW)
Equiv. crankshaft torque (Nm)
Standard PTO speed : 1000 rev/ min
PTO power
PTO power at std PTO speed
Equiv.crankshaft torque
Equiv.crankshaft torque at std.PTO speed
Specific fuel consumptio(g/kWh)
Fuel consumption (l/h)
Specific fuel consumption
Specific fuel consumption at std pto speed
Fuel consumption
Fuel consumption at std pto speed
Engine speed (rpm)
PTO PERFORMANCE CHARACTERISTICS


550
525
500
475
450
425
400
375
350
325
300
275
250
225
200
Specific fuel consumption (g/kWh)
Specific fuel consumption- Full throttle
Specific fuel consumption-Part throttle
0
5
10
15
20
25
30
35
40
PTO power (kw)
PTO PERFORMANCE CHARACTERISTICS

Other results:

No load maximum engine speed : 2379 rev/min

Torque (equivalent crankshaft) at maximum power:

At rated engine speed : 143.62 Nm

At 2 - hour test : 151.03 Nm

Maximum torque (equivalent crankshaft) (Engine speed : 1001 rev/min) : 182.71 Nm

Mean atmospheric conditions:

Temperature : 21 °C

Pressure : 97.4 kPa

Relative humidity : 79%

Maximum temperatures:

Coolant : 91 °C

Engine oil : 99 °C

Fuel : 36 °C

Engine air intake : 24 °C

3.2 Hydraulic power and lifting force:

Date of tests : 26.07.2001,27.07.2001

3.2.1 Hydraulic Power Test:

Sustained pressure with relief valve open : 22.0 MPa

Pump delivery rate at minimum pressure : 17.8 l/min.

Pump stalled : Not applicable, open centre system

	Flow rate (l / min)	Pressure (MPa)	Power (kW)
Flow rate corresponding to a hydraulic pressure equivalent to 90 percent of the actual relief valve pressure setting and corresponding hydraulic power	10.4	19.8	3.4
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	12.7	17.5	3.7

Tapping point used for test : External circuit

Temperature of hydraulic fluid, if different from 65 ± 5 °C : None

Opening pressure of the unloading valve : Not applicable

Closing pressure of the unloading valve : Not applicable

3.2.2 Power Lift Test:

3.2.2.1 Standard setting (without additional external cylinder)

		At hitch point	On the frame
Height of lower hitch points above ground in down position	[mm]	200	200
Vertical movement without lifting forces	[mm]	605	605
with lifting forces	[mm]	600	600
Maximum corrected force exerted through full range	[kN]	12.43	11.47
Corresponding pressure of hydraulic fluid	[MPa]	22.85	18.5
Moment about rear wheel axle	[kNm]	10.94	17.09
Maximum tilt angle of mast from vertical	[Degrees]	--	9.5

Lifting height relative to the horizontal plane including the lower link pivot points.											
mm	-245	-240	-100	0	+100	+200	+300	+310	+335	+355	+360
At the hitch point (kN)	Lifting forces (the values of the force measured have been corrected to correspond to a hydraulic pressure equivalent to 90% of actual relief valve pressure setting of the hydraulic lift system.)										
	--	12.43	13.42	14.95	15.74	16.58	17.05	17.00	16.84	17.04	19.21
	Corresponding pressure 19.8 MPa										
At the frame (kN)	12.13	--	12.65	12.83	12.94	12.69	--	11.88	11.65	11.47	--
	Corresponding pressure 19.8 MPa										

3.3 Drawbar power test (ballasted and unballasted tractor):

Date of tests : 19.09.2001;20.09.2001,03.10.2001, 04.10.2001& 05.10.2001

Type of track : Concrete

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
	(mm)	(kPa)	(kPa)
Un-ballasted	600	250	110
Ballasted	600	250	110

DRAWBAR PERFORMANCE TEST

Gear number and range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperature				Atmospheric conditions		
								Fuel	Coolant	Engine oil	Transmission oil	Temp.	Relative humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kWh	kWh/l	°C	°C	°C	°C	°C	%	kPa
3.3.1 MAXIMUM POWER IN TESTED GEARS - (Unballasted tractor) :														
L1	9.2	13.0	2.55	2322	15.3	472	1.73	38	90	107	77	35	75	97.4
L2	12.4	13.3	3.34	2304	15.1	406	2.01	37	91	107	76	34	76	97.4
L3	20.3	13.3	5.48	2268	15.1	342	2.39	37	92	106	72	33	77	97.4
L4	25.9	12.6	7.41	2210	14.2	317	2.58	35	90	103	63	32	80	97.4
H1	26.8	9.7	9.94	2179	11.2	306	2.68	31	93	103	51	30	81	97.5
H2	26.7	7.2	13.35	2176	9.4	305	2.66	43	95	105	71	36	69	97.3
3.3.2 MAXIMUM POWER IN TESTED GEARS (ballasted tractor):														
L1	14.4	20.8	2.49	2298	15.1	377	2.17	33	90	100	62	32	82	97.7
L2	18.7	20.6	3.27	2278	14.5	340	2.41	34	91	103	73	32	83	97.5
L3	26.6	17.5	5.46	2200	11.2	311	2.63	33	93	103	67	31	82	97.5
L4	27.4	12.6	7.79	2215	8.3	305	2.69	32	93	99	54	32	82	97.5
H1	27.7	9.6	10.35	2193	6.3	300	2.72	37	93	102	67	28	86	97.1
H2	27.6	7.0	14.12	2237	5.3	300	2.72	34	93	100	57	28	86	97.2
3.3.3 FIVE-HOUR TESTS:														
3.3.3.1 FIVE-HOUR TEST at 75% of the pull corresponding to maximum power at rated speed:														
L3	21.3	13.2	5.82	2271	8.4	318	2.58	35	92	106	85	33	81	97.4
3.3.3.2 FIVE-HOUR TEST at pull corresponding to 15% wheel slip (Additional ballast – None):														
L2	18.9	20.9	3.27	2279	14.7	343	2.39	30	91	102	74	29	86	97.8

The oil consumption during the test 3.3.3.1 & 3.3.3.2 was not measurable by dipstick.

3.4 Turning area and turning circle:

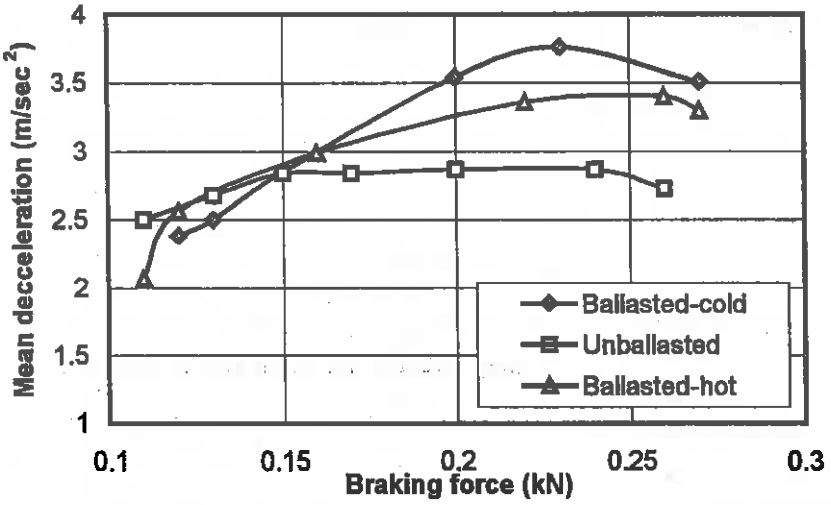
	Without brakes	
	Left-hand	Right-hand
	[m]	[m]
Radius of turning area	3.55	3.68
Radius of turning circle	3.47	3.60

3.5 Location of centre of gravity:

Height above ground	:	785 mm
Distance from the vertical plane containing the axis of the rear wheels	:	900 mm
Distance from the median longitudinal plane of the tractor(towards right)	:	8 mm

3.6 Braking:

Date of test(s) : 25.09.2001&19.10.2001



Figure

Cold service braking device test and fade test

3.6.1 Cold service braking device test:

	Speed before application of brakes	Braking device control force	Mean deceleration	Stopping distance
	(km/h)	(kN)	(m/s^2)	(m)
Ballasted tractor	34.92	0.12	2.38	19.77
		0.13	2.50	18.82
		0.15	2.85	16.50
		0.20	3.54	13.30
		0.23	3.76	12.50
		0.27	3.51	13.40
Unballasted tractor	35.59	0.11	2.50	19.57
		0.13	2.68	18.21
		0.15	2.84	17.22
		0.17	2.84	17.20
		0.20	2.87	17.00
		0.24	2.87	17.03
		0.26	2.73	17.92

Maximum deviation of tractor from its original course : None

- Abnormal vibration : None

3.6.2 Fade test:

Speed before application of brakes	Braking device control force	Mean deceleration	Stopping distance
(km/h)	(kN)	(m/s^2)	(m)
34.92	0.11	2.07	22.70
	0.12	2.56	18.40
	0.16	2.99	15.72
	0.22	3.36	14.00
	0.26	3.40	13.84
	0.27	3.30	14.24

Maximum deviation of tractor from its original course : None

Abnormal vibration : None

Brake heating method : By means of towing the tractor for 1 km at speed of 28.74 km/h with the towing force of 2.82 kN.

3.6.3 Parking braking device test:

	Ballasted tractor on 18% slope	
	Uphill	Downhill
Braking device control force(N)	255	235

3.7 External Noise Level:

Date of tests : 24-09-2001

Sound level meter:

- Make : Bruel & Kjaer
- Model : 2230
- Type : Integrated

Type of track : Concrete

Gear number : H-4

Travelling speed before acceleration : 26.69 km/h

Sound level : 87 dB(A)

3.8 Repairs and adjustments during Tests : Safety valve(part no.0189625 AB) and relief valve(part no.0180501 AB) were replaced with new one due to their incorrect pressure setting during the hydraulic test.

3.9 Remarks : None

TEST CARRIED OUT AT C.F.M.T.&.T.I, BUDNI (M.P), INDIA

TESTING AUTHORITY

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ASSISTANT ENGINEER(T)

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