OECD Approval No. : 1/1 992
Date of approval : 12th 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 40 (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- 447/895/07/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	12th July, 2002	OECD No.	1/1 992

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	100	kPa	=	1000	mbar	= 750.1	mm of Hg
	1	MPa	=	10	bar	= 10.2	kgf/cm^2

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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) Pin – 146 022; INDIA
Location of tractor assembly	:	- do -
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, Ministry of Agriculture, (Department of Agriculture & Co-operation) Tractor Nagar,Budni - 466 445 (Madhya Pradesh) INDIA

1. SPECIFICATIONS OF TRACTOR

1.1 Identification:

1.1.1	Make	:	Sonalika
	Model	:	Solis - 40
	Type	:	2 WD
1.1.2	Numbers:		
	1st Serial No.	:	0112 ZE 3777
	Serial No.	:	0112 ZE 3876
1.1.3	Other specification	:	Not applicable

1.2 Engine:

Make	:	Sonalika
Model	:	3100F
Type	:	Four stroke, direct injection, naturally aspirated, water cooled, diesel engine.
Serial No.	:	3100F 02L 04058

1.2.1	Cylinders:		
	Number and disposition	:	Three, vertical, inline
	Bore/Stroke	:	100mm/110mm
	Capacity	:	2592 cm^3
	Compression ratio	:	17.4 : 1
	Arrangement of valves	:	Over head, inline
	Cylinder liners	:	Wet

1.2.2	**Supercharging**	:	Not provided
1.2.3	**Fuel system:**		
	Fuel feed system	:	Gravity and force feed
	Filters:		
	Make	:	MICO LIC BOSCH, INDIA
	Model	:	F002 H20109
	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 222 PES 3 A 90D 320 RS 2979
	Type	:	In line, plunger
	Serial Number		09027814
	Manufacturer's production setting of injection pump:		
	Flow rate	:	8.69 to 9.26 dm^3/h at rated engine speed and full load
	Timing	:	18 ± 1 degree before TDC
	Injectors:		
	Make	:	MICO LIC BOSCH, INDIA
	Model	:	FOO2 C 70210
	Type	:	Multihole
	Injection pressure	:	20.59 ± 0.98 MPa
1.2.4	**Governor:**		
	Make	:	MICO LIC BOSCH, INDIA
	Model	:	RSV- 300.... 1050 A5, C1247R
	Type	:	Mechanical variable speed
	Governed range of engine speed	:	600 to 2300
	Rated engine speed	:	2100

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, out side the 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 element
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	:	392 mm
Coolant capacity	:	9.4 dm^3
Type of temperature control	:	Thermostat
System pressure	:	49 kPa

1.2.8 Starting system:

Make	:	LUCAS TVS, INDIA
Model	:	2SM 114
Type	:	Pre-engaged, solenoid
Starter motor power rating	:	1.9 kW
Cold starting aid	:	None
Safety device	:	None

1.2.9 Electrical System:

Voltage	:	12 V

Generator:

Make	:	LUCAS TVS, INDIA
Model	:	A 115 - 36
Type	:	Ventilated alternator
Power	:	0.43 kW

Battery:

Number		One
Rating	:	70 Ah. at 20 hours discharge rate.

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	:	280mm(PTO),295mm(travel)
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	:	Bevel gear type differential and 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 2100 (rev/min) [km/h]
		Forward	Forward
L1	Low	201.23	2.32
L2	Low	152.95	3.05
L3	Low	98.84	4.73
L4	Low	62.51	7.47
H1	High	51.16	9.13
H2	High	38.87	12.02
H3	High	25.12	18.59
H4	High	15.88	29.42
RL	Low	143.80	3.25
RH	High	36.53	12.78
(*) Calculated with a tyre dynamic radius index (ISO 4251-1:1998) of 590 mm (tyre:12.4-28)			

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 : 34.60 mm
- Number of splines : 21
- Height above ground : 593 mm
- Distance from the median plane of the tractor : 8 mm on LHS
- Distance behind rear axle centre : 360mm
- 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
	1026	2100		

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	:	Wire mesh strainer – Two and Spin-on paper filter – One.
Site of oil reservoir	:	Transmission case
Type, number and location of tapping points:		
- Type	:	Threaded, female
- Number	:	Two
- Location	:	On RV 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 of ISO 730-1:1994 + Cor. 1:1995(Ref. Fig. 1.1 and 1.2)

Category adapter : None

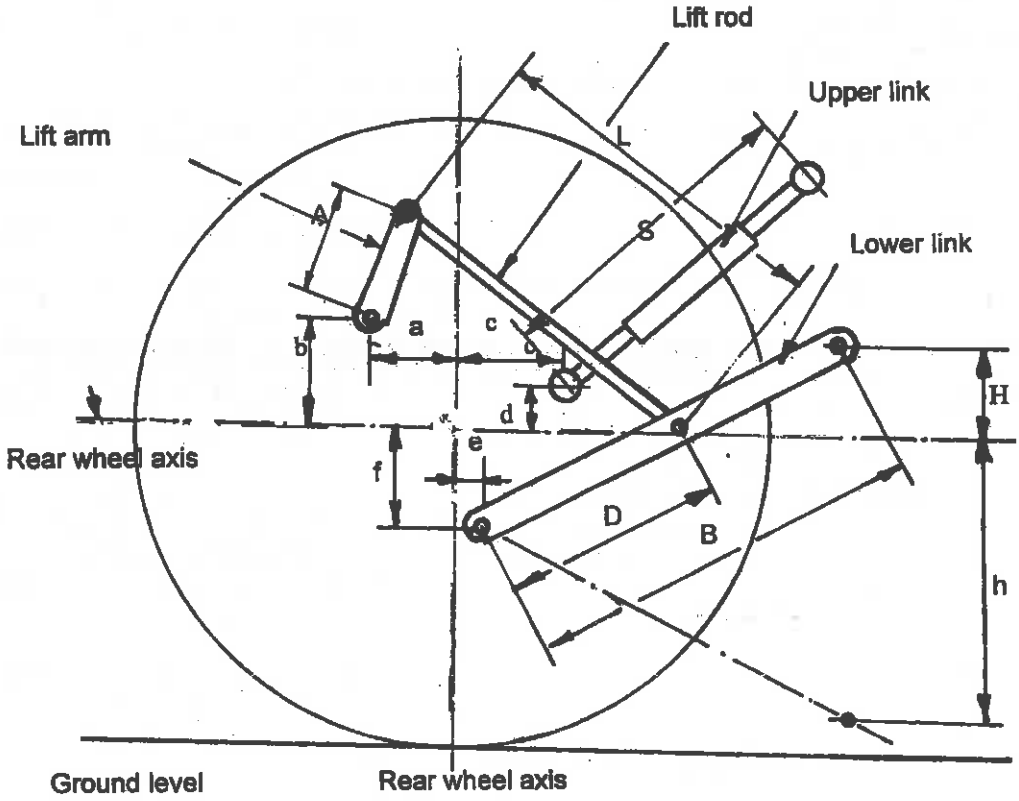


Figure 1.1
Lift test – Linkage geometry

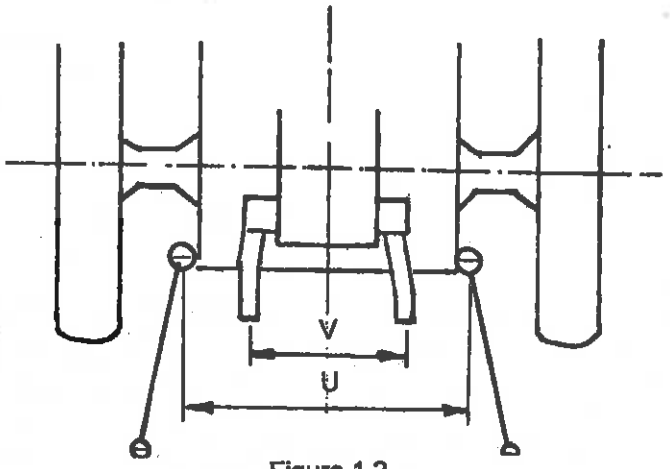


Figure 1.2
Lift test – Linkage geometry

		Dimension or range mm	Settings used in test mm
Length of lift arms:	(A)	235	235
Length of lower links:	(B)	775	775
Distance of lift arm pivot point from rear-wheel axis:			
- horizontally	(a)	110 forward	110 forward
- vertically	(b)	345	345
Horizontal distance between the 2 lower link points:	(u)	530	530
Horizontal distance between the 2 lift arm end points:	(v)	610	610
Length of upper link:	(S)	From 500 to 740	545
Distance of upper link pivot point from rear wheel axis:			
- horizontally	(c)	320 and 325	320
- vertically	(d)	260 and 300	300
Distance of lower link pivot point from rear wheel axis:			
- horizontally	(e)	100 behind	100 behind
- vertically	(f)	165 below	165 below
Distance of lower link pivot points to lift rod pivot points on lower links:	(D)	415	415
Length of lift rods:	(L)	From 650 to 780	705
Height of lower hitch points relative to the rear-wheel axis:			
- in low position	(h)	From 240 to 510	390
- in high position	(H)	From 115 to 385	235
Height above ground of lower hitch points when locked in transport position (*)	-	705 to 975	825

(*) Assuming r = 590 mm, rear tyre dynamic radius index (ISO: 4251-1:1998) (tyre : 12.4-28).

Table 1.1
Dimensions of linkage geometry when connected to the standard frame

1.7	**Swinging drawbar:**	:	Not provided
1.8	**Trailer hitch:**		
	Type	:	Clevis
	Hole diameter	:	41.5 mm
	Height above ground	:	570 mm to 640 mm
	Distance of hitch point from rear-wheel axis,		
	Horizontally	:	505 mm
	Distance of hitch point from power take-off shaft end:		
	Vertically	:	25 mm below, 45 mm above.
	Horizontally	:	145 mm
	Maximum vertical permissible load	:	9 kN
1.9	**Holed drawbar:**		
	Number of holes	:	07
	Distance between holes	:	80mm
	Hole diameter	:	25. 1 mm
	Thickness/Width of drawbar	:	30.3 mm / 75.6 mm
	Height above ground:		
	Minimum	:	80 mm
	Maximum	:	975 mm
	Horizontal distance to power take-off shaft end (rear) lower links in horizontal position.	:	515 mm
1.10	**Steering:**		
	Make	:	ZF
	Model	:	None
	Type	:	Mechanical, worm and nut
	Method of operation	:	Steering wheel operated, mechanically.
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 type hand lever.

1.12 **Wheels:**

Number:

Front : Two, steering

Rear : Two, driving

Wheel base : 1980 mm

Track width adjustment:

	Minimum [mm]	Maximum [mm]	Adjustment method
Front	1290	1630	By extending telescopic axle and reversing wheel rims along with tyres.
Rear	1340	1890	By changing the position of wheel discs on rim lugs 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 : No.

Type of suspension : Helical springs

Type of damping : Hydraulic shockabsorber

Range of adjustment:

Longitudinal : 155 mm

Vertically : 65 mm

Safety belt : None

1.14.2 Optional driver's seat(s) : No provision
1.14.3 Passenger seat : On rear mudguards – 2 Nos.

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	1260	160 x 100	245
Side lights	1300	75 x 70	775
Rear lights	1240	75 x70	715
Reflectors (Rear mudguard)	1240	38 x 60	735
Flashers	1300	75 x 70	775

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	3610	1735	2250	2420	1750
Ballasted	3610	1990	2350	2420	1750

2.2 Ground clearance

Ground clearance : 385 mm
Clearance – limiting part : Differential housing drain plug

2.3 Tractor Mass:

	Ballasted		Unballasted	
	Without driver	With driver	Without driver	With driver
	[kg]	[kg]	[kg]	[kg]
Front	940	945	900	905
Rear	1750	1820	1110	1180
Total	2690	2765	2010	2085

2.4 Ballast :

Front : C.I. Weight : Nil
Water in the tyres : 40 kg
Rear : 10 weights, total : 400 kg
Water in the tyres : 240 kg

2.5 Tyres and track width specifications :

Tyres:		Front	Rear
- dimensions		6.00 - 16	12.4 - 28
- ply rating		8	12
- type		Ribbed	Traction
- maximum load (tyre manufacturer's)	kN	6.62	14.81
- maximum load (tractor manufacturer's)	kN	4.61	9.41
- inflation pressure (tyre manufacturer's)	kPa	250	110
- dynamic radius index	mm	--	590
Chosen track width	mm	1290	1340

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	6.7	First – 50 Subsequent - 250	First – 50 Subsequent - 250
Gear box, hydraulic and final drive(rear)	50	1800	250
Steering system	0.5	1000	--
Front differential case	--	--	--
Final drive (front)	--	--	--
Service brake	--	--	--

2.7.2 Specifications:

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

2.7.3 Grease:

Number of lubricating points:

Grease nipples : 21

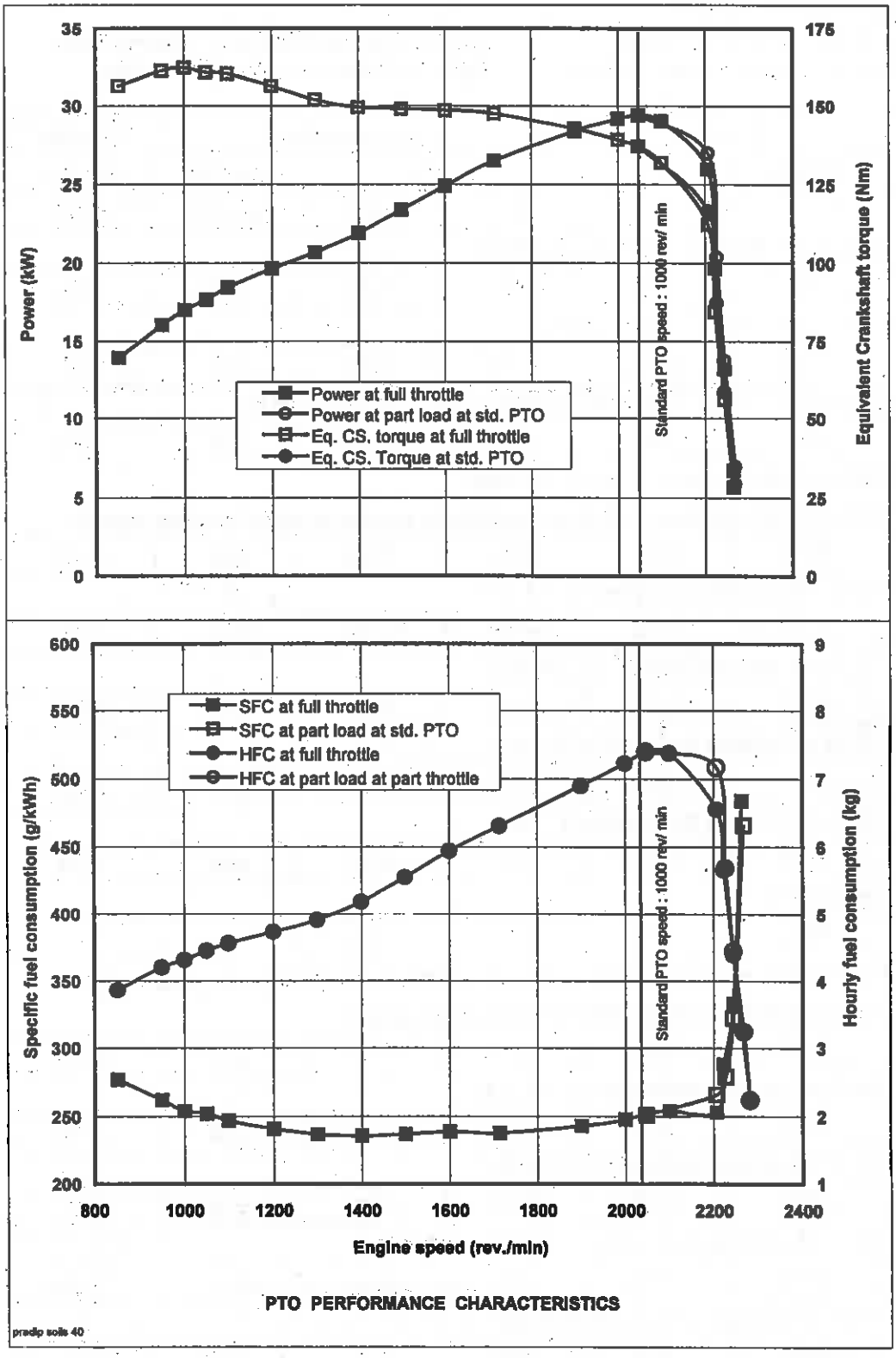
Grease cups : 03

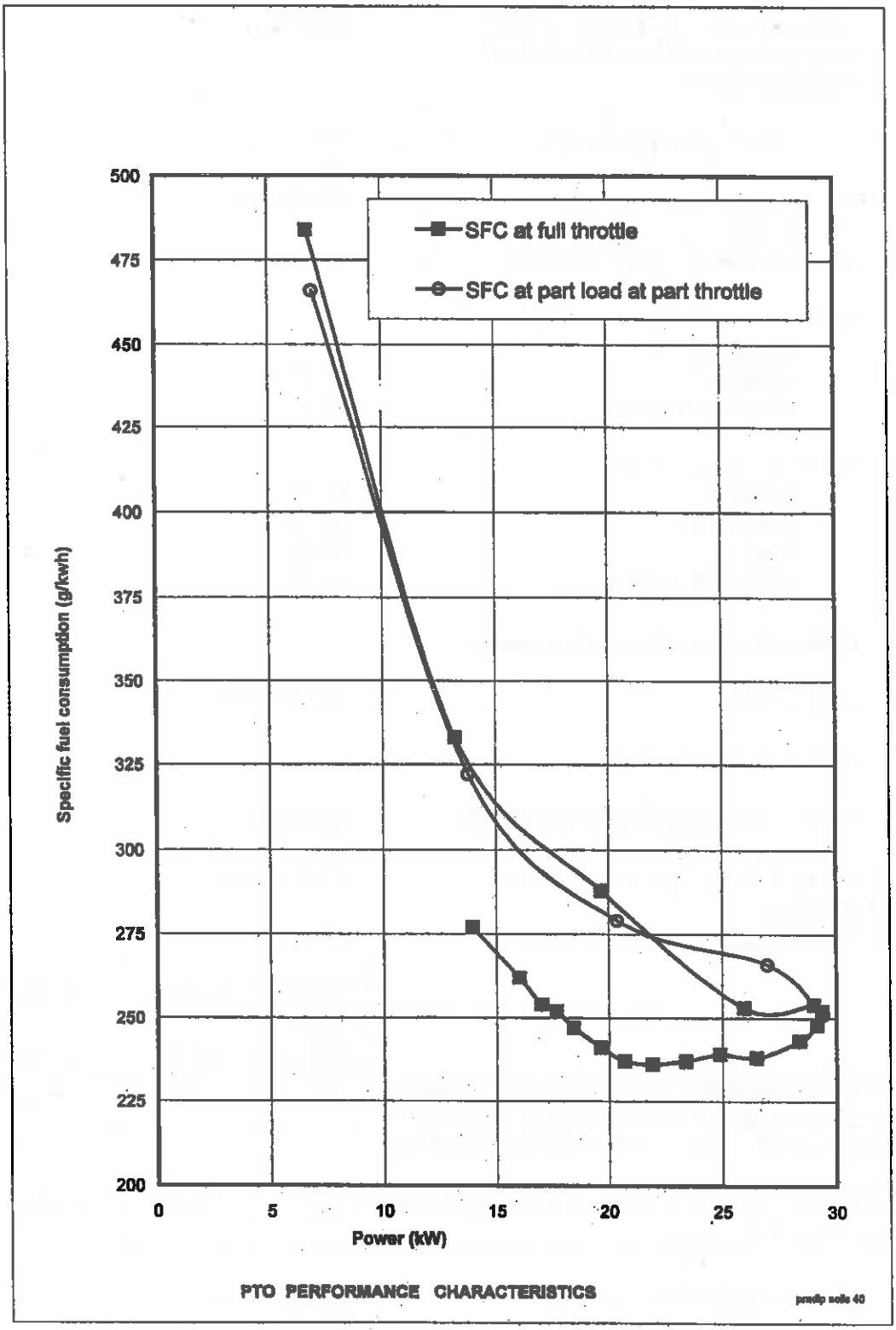
3. COMPULSORY TESTS RESULT

3.1 Main power take-off:

Date and location of tests : 25.05.2001 at CFMT&TI, Budni, India
Type of dynamometer bench : Eddy Current, Fuchino ESF-1000

Power	Speed		Fuel consumption			Specific energy
	Engine	PTO	Hourly		Specific	
kW	min $^{-1}$ (rev/min)		l/h	kg/h	g/kWh	kWh/l
3.1.1 Maximum Power - Two Hours Test:						
29.4	2047	1000	8.82	7.40	252	3.33
3.1.2 Power at Rated Engine Speed:						
29.0	2100	1026	8.80	7.38	254	3.30
3.1.3 Standard Power Take-Off Speed [1000 ± 25 (rev/min)]:						
29.4	2047	1000	8.82	7.40	252	3.33
3.1.4 Part Loads at Rated Engine Speed:						
3.1.4.1 The torque corresponding to maximum power at rated engine speed:						
29.0	2100	1026	8.80	7.38	254	3.30
3.1.4.2 85 % of torque obtained in 3.1.4.1:						
26.0	2207	1078	7.82	6.56	253	3.32
3.1.4.3 75 % of torque defined in 3.1.4.2:						
19.7	2223	1086	6.75	5.66	288	2.91
3.1.4.4 50 % of torque defined in 3.1.4.2:						
13.2	2244	1096	5.23	4.39	333	2.52
3.1.4.5 25 % of torque defined in 3.1.4.2:						
6.7	2264	1106	3.87	3.25	484	1.74
3.1.4.6 Unloaded:						
0.0	2282	1115	2.69	2.26	-	-
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 :						
29.4	2047	1000	8.82	7.40	252	3.33
3.1.5.2 85 % of torque obtained in 3.1.5.1:						
27.0	2207	1078	8.55	7.17	266	3.16
3.1.5.3 75 % of torque defined in 3.1.5.2:						
20.4	2227	1088	6.78	5.69	279	3.01
3.1.5.4 50 % of torque defined in 3.1.5.2:						
13.8	2244	1096	5.29	4.44	322	2.60
3.1.5.5 25 % of torque defined in 3.1.5.2:						
7.0	2268	1108	3.86	3.24	466	1.80
3.1.5.6 Unloaded:						
0.0	2282	1115	2.67	2.24	-	-


Power (kW)
Equivalent Crankshaft torque (Nm)
Standard PTO speed : 1000 rev/ min
Power at full throttle
Power at part load at std. PTO
Eq. CS. torque at full throttle
Eq. CS. Torque at std. PTO
Specific fuel consumption (g/kWh)
Hourly fuel consumption (kg)
SFC at full throttle
SFC at part load at std. PTO
HFC at full throttle
HFC at part load at part throttle
Engine speed (rev./min)
PTO PERFORMANCE CHARACTERISTICS
pradip solis 40


SFC at full throttle
SFC at part load at part throttle
Specific fuel consumption (g/kwh)
500
475
450
425
400
375
350
325
300
275
250
225
200
0
5
10
15
20
25
30
Power (kW)
PTO PERFORMANCE CHARACTERISTICS

Other results:

No load maximum engine speed : 2282 rev/min
Torque (equivalent crankshaft) at maximum power:

At rated engine speed : 131.9 Nm
At 2 - hour test : 137.1 Nm
Maximum torque (equivalent crankshaft) : 162.2 Nm
(Engine speed : 1001 rev/min)

Mean atmospheric conditions:
Temperature : 22 °C
Pressure : 97 kPa
Relative humidity : 78 %

Maximum temperatures:
Coolant : 85 °C
Engine oil : 98 °C
Fuel : 36 °C
Engine air intake : 25 °C

3.2 Hydraulic power and lifting force

Date of tests : 24-07-2001

3.2.1 Hydraulic Power Test:

Sustained pressure with relief valve open : 20.5 MPa
Pump delivery rate at minimum pressure : 17.6 l/ min
Temperature of hydraulic fluid : 60 to 62 °C

	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	10.1	18.5	3.12
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	14.2	16.0	3.79

Tapping point used for test : External circuit
Temperature of hydraulic fluid if different from 65 ± 5 °C : Not applicable
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 force	[mm]	605	595
With lifting force	[mm]	570	575
Maximum corrected force exerted through full range	[kN]	11.76	9.89
Corresponding pressure of hydraulic fluid	[MPa]	21.3	21.1
Moment about rear wheel axle	[kNm]	10.29	14.69
Maximum tilt angle of mast from vertical	[Degrees]	--	9.5

Lifting height relative to the horizontal plane including the lower link pivot points.													
mm	-180	-175	-100	0	+100	+200	+300	+350	+370	+385	+390	+395	+400
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.)													
At the hitch point (kN)	--	11.76	12.66	13.77	14.58	15.38	15.85	16.19	16.31	--	16.38	16.03	14.47
	Corresponding pressure 18.5 MPa												
At the frame (kN)	11.48	--	11.65	11.86	11.85	11.81	11.53	10.40	--	9.89	10.97	11.13	11.02
	Corresponding pressure 18.5 MPa												

3.3 Drawbar power test (ballasted and unballasted tractor):

Date(s) of tests : 25.09.2001, 26.09.2001, 11.10.2001, 12.10.2001 and 13.10.2001

Type of track : Concrete

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
	mm	kPa	kPa
Un-ballasted	770	250	100
Ballasted	650	250	100

DRAWBAR PERFORMANCE TEST

Gear No. and range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Specific fuel consum-ption	Specific energy	Temperature				Atmospheric conditions		
								Fuel	Cool-ant	Eng-ine oil	Trans-mission oil	Temp.	Rela-tive humi-dity	Press-ure
	kW	kN	km/h	rev/ min	%	g/kWh	kWh/l	°C	°C	°C	°C	°C	%	kPa
3.3.1 MAXIMUM POWER IN TESTED GEARS - (Un-ballasted tractor):														
L1	8.8	14.6	2.18	2237	15.1	446	1.83	39	89	104	79	37	62	97.4
L2	11.7	14.7	2.87	2228	14.8	388	2.10	37	89	104	79	36	70	97.4
L3	17.5	14.4	4.39	2202	15.0	341	2.40	37	89	106	79	35	72	97.5
L4	23.7	12.4	6.90	2096	11.3	300	2.72	35	92	104	67	33	78	97.5
H1	24.0	10.2	8.45	2056	9.2	297	2.75	34	91	102	58	33	77	97.4
H2	24.2	7.8	11.18	2017	7.5	286	2.85	39	92	105	71	37	61	97.5
3.3.2 MAXIMUM POWER IN TESTED GEARS (ballasted tractor):														
L1	11.8	20.0	2.13	2232	15.1	387	2.11	34	89	103	69	33	78	98.3
L2	16.0	20.6	2.79	2213	15.2	348	2.35	32	89	102	58	31	84	98.3
L3	23.1	20.6	4.04	2057	14.8	314	2.59	38	92	107	--	31	86	98.0
L4	24.7	13.0	6.86	2062	8.8	292	2.79	40	92	108	--	33	84	98.0
H1	24.5	10.2	8.63	2089	7.3	294	2.76	44	93	107	--	35	78	97.9
H2	24.4	7.6	11.56	2095	5.7	292	2.79	40	92	102	--	36	75	97.9
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	19.5	15.6	4.52	2201 to 2205	11.0	320	2.55	36 to 37	89 to 90	95 to 108	64 to 90	32 to 35	67 to 82	97.9 to 98.2
3.3.3.2 FIVE-HOUR TEST at pull corresponding to 15% wheel slip (Additional ballast – None):														
L2	15.8	20.3	2.79	2213 to 2217	15.1	351	2.33	31 to 36	88 to 89	102 to 105	62 to 82	31 to 35	69 to 84	97.8 to 98.3

Oil consumption during 3.3.3.1 and 3.3.3.2 was not measurable by the dipstick. Coolant water consumption was measured as 0.02 dm^3/h.

3.4 Turning area and turning circle

	Without brakes	
	Left-hand	Right-hand
	[m]	[m]
Radius of turning area	3.47	3.56
Radius of turning circle	3.32	3.41

3.5 Location of centre of gravity:

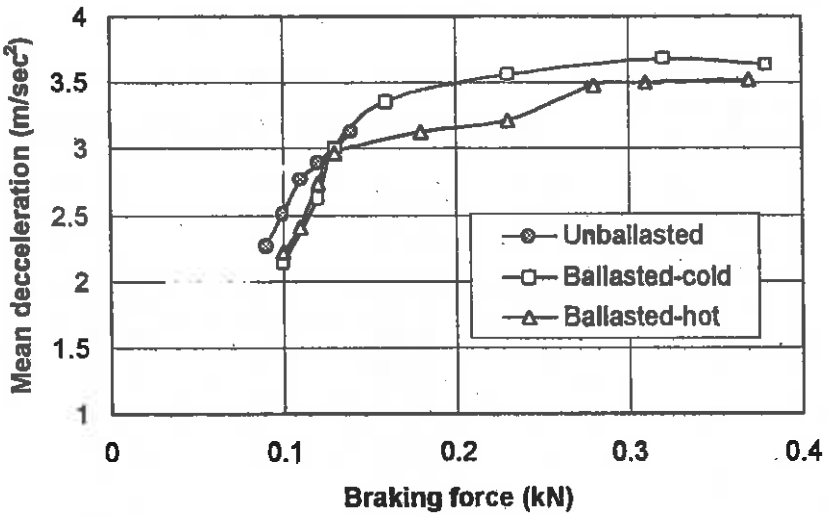
Height above ground : 775 mm

Distance forward the vertical plane containing the axis of the rear wheels : 837 mm

Distance from the median longitudinal plane of the tractor (towards right) : 2.0 mm

3.6 Braking performance:

Date(s) of tests : 19.10.2001 and 01.11.2001



figure

Cold service braking device test and fade test

3.6.1 Cold service braking device test:

Unballasted Tractor			
Speed before application of brakes	Braking device control force	Mean deceleration	Stopping distance
(km/h)	(kN)	(m/s^2)	(m)
32.33	0.09	2.27	17.8
	0.10	2.52	16.0
	0.11	2.76	14.6
	0.12	2.92	13.8
	0.14	3.13	12.9
Ballasted Tractor			
32.04	0.10	2.14	18.55
	0.12	2.63	15.06
	0.13	3.00	13.19
	0.16	3.36	11.80
	0.23	3.56	11.14
	0.32	3.68	10.77
	0.38	3.63	10.90

Max. deviation 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)
32.04	0.10	2.22	17.87
	0.11	2.41	16.46
	0.12	2.74	14.45
	0.13	2.96	13.38
	0.18	3.12	12.70
	0.23	3.21	12.35
	0.28	3.48	11.39
	0.31	3.50	11.33
	0.37	3.52	11.25

Max. deviation tractor from its original course : None

Abnormal vibration : None

Brake heating method : By means of towing the tractor for 1 km at speed of 30.4 km/h with the towing force of 2.71 kN

3.6.3 Parking braking device test:

	Ballasted tractor on 18% slope	
	Uphill	Downhill
Braking device control force(kN)	0.25	0.23

3.7 External Noise Level:

Date of tests	:	27.11.2001
Sound level meter:		
- Make		Bruel & Kjaer
- Model	:	2230
- Type	:	Integrated
Type of track	:	Concrete
Gear number	:	H4
Travelling speed before acceleration	:	23.81 km/h
Sound level	:	87 dB(A)

3.8 Repairs and adjustments during Tests : During lifting capacity test the safety valve for ram cylinder was cleaned and adjusted to the pressure as recommended by the manufacturer.

3.9 Remarks : None

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

TESTING AUTHORITY

P.C. JAIN
ASSISTANT ENGINEER(T)

R.K. SINGHAI
SENIOR TEST ENGINEER

S.C. JAIN
DIRECTOR

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