OECD Approval No : 1/1981
Date of approval : 10th April, 2002

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



Agricultural Tractor

SONALIKA SOLIS 60 (2 WD) TRACTOR

Manufactured by	:	**M/s International Tractors Ltd., Village Chak Gujran, P.O. Piplanwala, Jalandhar Road, Distt. HOSHIARPUR – 146 002 INDIA**
Submitted for test by	:	**The manufacturer**
Report No.	:	**T- 436/881/03/OECD**
Date	:	**May, 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

T-436/881/03/OECD	SONALIKA SOLIS 60 (2 WD) TRACTOR	

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	10th April, 2002	OECD Approval No.	1/1981

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

All rights including the right of translation, re-print and copying by any means are reserved by the Central Farm Machinery Training & Testing Institute, Tractor Nagar, Budni(M.P.), India.

TABLE OF CONTENTS

			PAGE No.
1.		**SPECIFICATIONS OF TRACTOR**	1
2.		**TEST CONDITIONS**	11
3.		**COMPULSORY TEST RESULTS**	13
	3.1	Main power take-off performance	13
	3.2	Hydraulic power and lifting force	16
	3.3	Drawbar power test(ballasted and unballasted tractor)	17
	3.4	Turning area and turning circle	19
	3.5	Location of centre of gravity	19
	3.6	Braking performance	19
	3.7	External noise level	21
	3.8	Repairs and adjustments during tests	21
	3.9	Remarks	21

Tractor manufacturer's name and address	:	M/s International Tractors Ltd., Village Chak Gujran, P.O. Piplanwala, Jalandhar Road, Distt. HOSHIARPUR(Pb) – 146 022 INDIA
Location of tractor assembly	:	M/s International Tractors Ltd., Village Chak Gujran, P.O. Piplanwala, Jalandhar Road, Distt. HOSHIARPUR(Pb) – 146 022 INDIA
Submitted for test by	:	The manufacturer
Selected for test by	:	The manufacturer
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:

Make	:	Sonalika
Model	:	Solis – 60
Type	:	2 WD
Number of driving wheels	:	Two
Serial No.	:	0112 ZB 3873
1st Serial No.	:	0007 ZB 1998

1.2 Engine:

Make	:	Sonalika
Model	:	4100 F
Type	:	Four stroke, direct injection, naturally aspirated, water cooled diesel engine.
Serial No.	:	4100 F 02 L 04045

1.2.1 Cylinders:

Number and disposition	:	Four, vertical inline
Bore/Stroke	:	100 mm/110 mm
Capacity	:	3456 cm^3
Compression ratio	:	17.4:1
Arrangement of valves	:	Overhead, 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	:	0450 226029
	Type	:	Primary cloth and secondary paper element.
	Number	:	Two
	Capacity of fuel tank	:	69.75 dm^3
	Injection pump:		
	Make	:	MICO, LIC BOSCH, INDIA
	Model	:	F022 A0Z 190 PES 4 A 90D 320 RS 2989 C,
	Type	:	Inline, plunger
	Serial Number		08616290
	Manufacturer's production setting of injection pump:		
	Flow rate	:	10.82 to 11.88 dm^3/h at rated engine speed and full load.
	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 - 1100A 5C 1213R
	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, out side bonnet.
	Main cleaner:		
	Make	:	Own make
	Type	:	Oil bath
	Location of air intake	:	In front of radiator, under bonnet.
	Maintenance indicator	:	Not provided

1.2.6 Lubricating System:

Type of feed pump	:	Gear
Type of filter(s)	:	Full flow spinon, paper element
Number of filter(s)	:	One

1.2.7 Cooling System:

Type of coolant	:	Water
Type of pump	:	Centrifugal
Specification of fan:		
Type	:	Suction
Number of blades	:	6
Diameter	:	378 mm
Coolant capacity	:	10.5 dm^3
Type of temperature control	:	Thermostat
System pressure	:	49 kPa

1.2.8 Starting system:

Make	:	Lucas TVS, India
Model	:	2 SM, 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
Type	:	Ventilated alternator
Power	:	0.43 kW
Battery:		
Number	:	One
Rating	:	88 Ah. at 20 hours.

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 plate(s)	:	Two
Diameter of plates	:	280 mm (PTO) and 295 mm (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 : 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.	201.23	2.76
L2	Low	152.95	3.63
L3	Low	92.02	6.04
L4	Low	62.51	8.89
H1	High	51.14	10.87
H2	High	38.85	14.30
H3	High	23.38	23.77
H4	High	15.88	34.99
RL	Low	143.86	3.86
RH	High	36.54	15.21

(*)Calculated with a tyre dynamic radius index (ISO 4251-1:1998)of 670 mm tyre (16.9-28)

1.4 Power take-off:

1.4.1. Main Power Take-Off:

Type : Independent
Method of engagement : Mechanically engaged by a hand lever
Number of shaft(s) : One
Method of changing power take-off shaft ends 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 : 34.65 mm
Number of splines : 21, in conformity with ISO:500-1991
Height above ground : 690 mm
Distance from the median plane of the tractor : 8 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	:	Single acting, one
	Type of linkage lock for transport	:	Hydraulically by closed response valve.
	Relief valve pressure setting (tolerance)	:	19.61 ± 0.5 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	:	Wiremesh strainer - two and spinon paper filter - one.
	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.

Category adapter : None

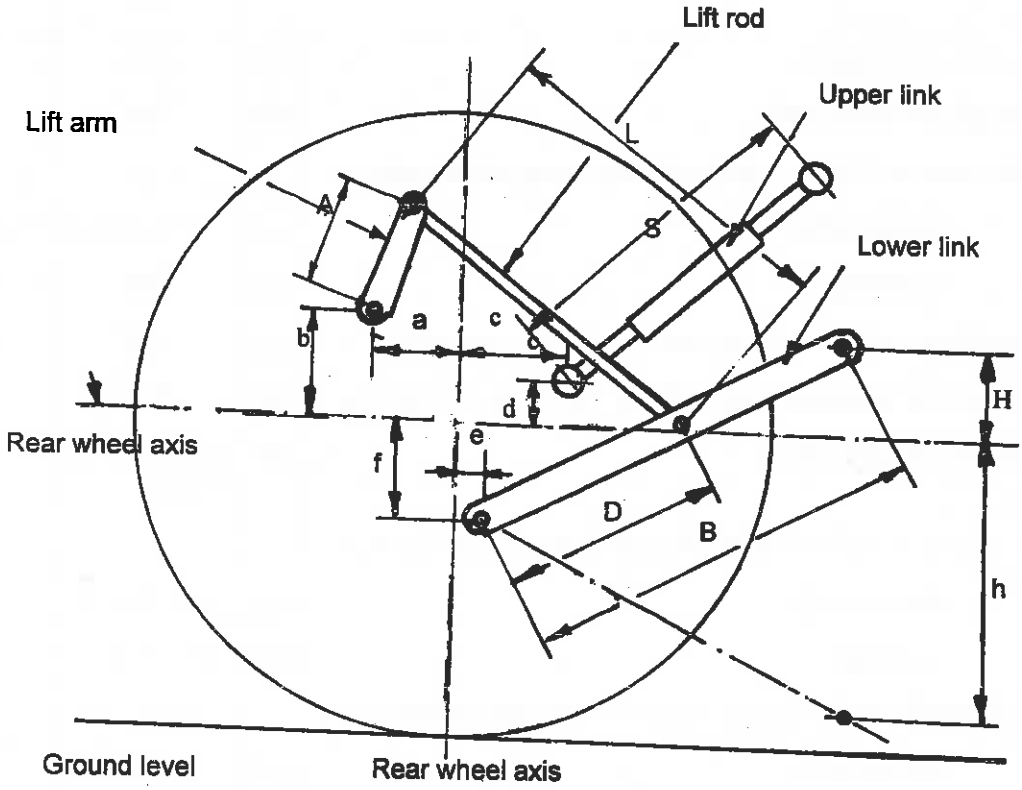


Figure 1.1
Lift test – Linkage geometry

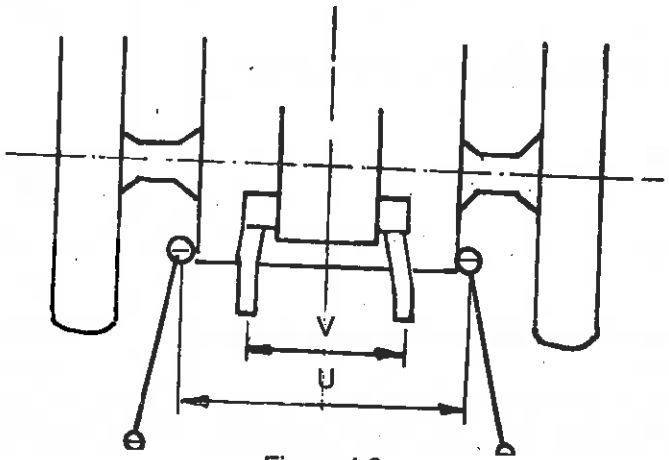


Figure 1.2
Lift test – Linkage geometry

		Dimension or range, mm	Settings used in test mm
Length of lift arms:	(A)	210	210
Length of lower links:	(B)	765	765
Distance of lift arm pivot point from rear-wheel axis:			
- horizontally	(a)	110 forward	110 forward
- vertically	(b)	335	335
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,490 to 690	550
Distance of upper link pivot point from rear wheel axis:			
- horizontally	(c)	320 & 315	320
- vertically	(d)	270 & 310	270
Distance of lower link pivot point from rear wheel axis:			
- horizontally	(e)	100	100
- vertically	(f)	145	145
Distance of lower link pivot points to lift rod pivot points on lower links:	(D)	400	400
Length of lift rods:	(L)	From 650 to 755	730
Height of lower hitch points relative to the rear-wheel axis:			
- in low position	(h)	From 230 to 550	470
- in high position	(H)	From 160 to 340	195
Height above ground of lower hitch points when locked in transport position (*)	-	830 to 1010	865

(*) Assuming r = 670 mm rear tyre (16.9-28) dynamic radius index (ISO 4251-1:1998)

Table 1.1

Dimensions of linkage geometry when connected to the standard frame

1.7	**Swinging drawbar**	:	Not provided
1.8	**Trailer hitch:**		
	Type	:	Clevis
	Hole diameter	:	41 mm
	Height above ground	:	680 mm to 750 mm
	Distance of hitch point from rear-wheel axis,		
	- Horizontally	:	470 mm
	Distance of hitch point from power take-off shaft end:		
	- Vertically	:	10 mm below, 60 mm above
	- Horizontally	:	115 mm
	Maximum vertical permissible load	:	9 kN
1.9	**Holed drawbar:**		
	Number of holes	:	07
	Distance between holes	:	80 mm
	Hole diameter	:	25.2 mm
	Thickness/width of drawbar	:	30.5 mm/75.5 mm
	Height above ground:		
	- Minimum	:	120 mm
	- Maximum	:	1010 mm
	Horizontal distance to power take-off shaft end (rear) lower links in horizontal position.	:	505 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 : 2150 mm

Track width adjustment:

	Minimum (mm)	Maximum (mm)	Adjustment method
Front	1405	1735	By extending telescopic axle and reversing wheel rims.
Rear	1420	1930	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 : None
Type of suspension : Helical springs
Type of damping : Hydraulic shock-absorber

Range of adjustment:
- Longitudinal : 150 mm
- Vertically : 50 mm

Safety belt : None

1.14.2 Optional driver's seat(s) : No provision

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	1290	160 x 100	754
Side lights	1410	70 x 75	186
Rear lights	1410	70 x 75	270
Reflectors (Rear mudguard)	1410	65 x 40	225
Flashers	1410	70 x 75	186

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	3710	1845	2355	2360	1760
Ballasted	3710	2215	2430	2360	1760

2.2 Ground clearance (unballasted tractor) : **475 mm**

Clearance – limiting part : Differential housing drain plug.

2.3 Tractor Mass:

	Unballasted		Ballasted	
	Without driver	With driver	Without driver	With driver
	(kg)	(kg)	(kg)	(kg)
Front	975	980	1025	1030
Rear	1330	1400	2340	2410
Total	2305	2380	3365	3440

2.4 Ballast:

Front: C.I. Weight : Nil
Water in the tyres : 50 kg

Rear: 14 weights, total : 580 kg
Water in the tyres : 430 kg

2.5 Tyres and track width specifications:

Tyres:	Front	Rear
- dimensions	6.50 – 20	16.9 – 28
- ply rating	8	12
- type	Cross ply	Cross ply
- maximum load (tyre manufacturer's)	6.18 kN	16.33 kN
- maximum load (tractor manufacturer's)	6.18 kN	16.33 kN
- inflation pressure (tyre manufacturer's)	250 kPa	110 kPa
- dynamic radius index	--	670 mm
Chosen track width	1405 mm	1420 mm

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	11.35	First - 50 , Subsequent - 250	First – 50 , Subsequent– 250
Gear box, hydraulic and final drive	48.50	1800	250
Steering system	0.50	1000	–

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 & hydraulic oils:		
Type	SAE EP-80	As recommended
Steering oil:		
- Type	SAE EP – 80	As recommended
- Viscosity	9 to 11 cSt	

2.7.3 Grease:

Number of lubricating points:

Grease nipples : 24

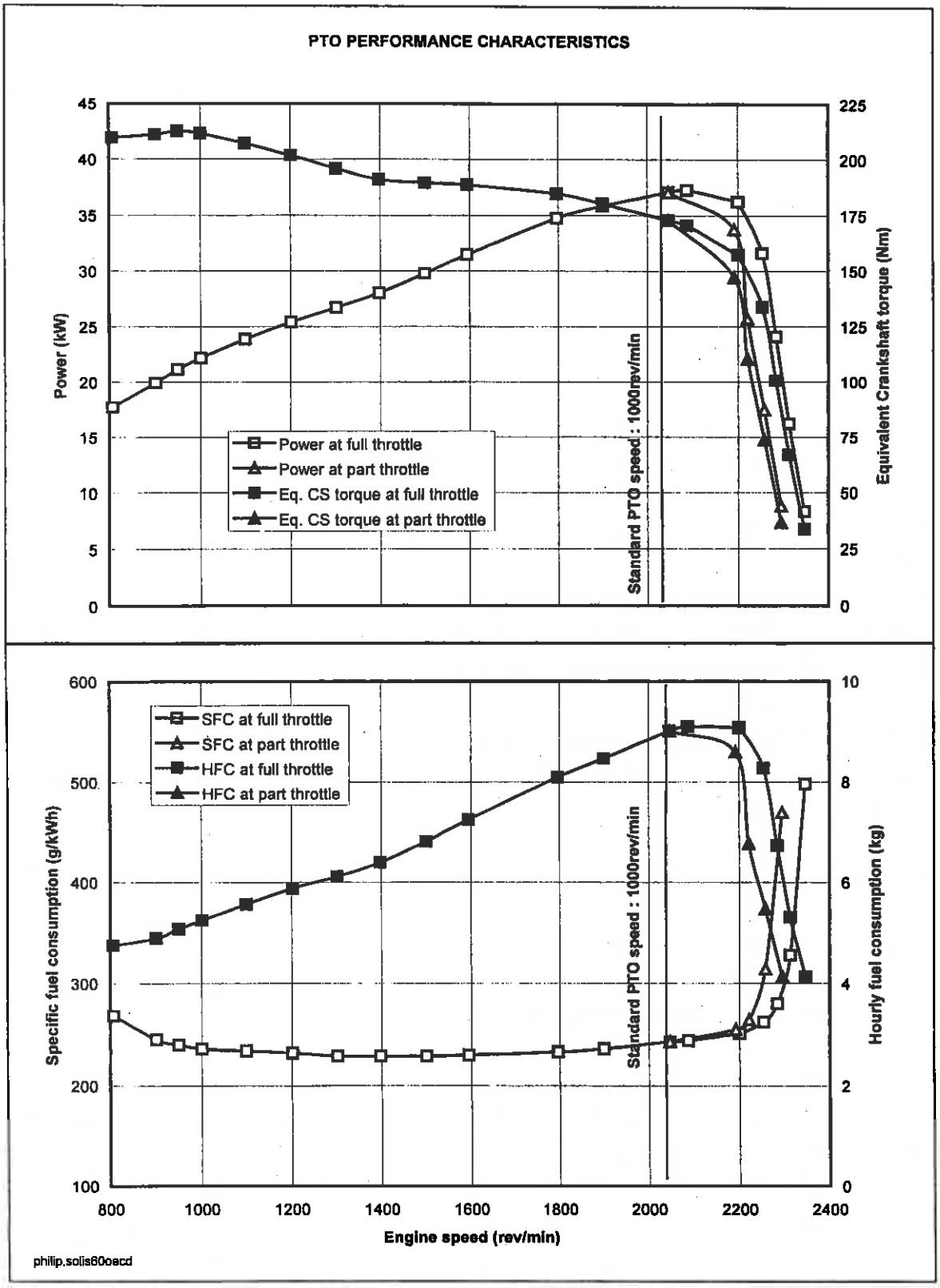
Grease cups : 03

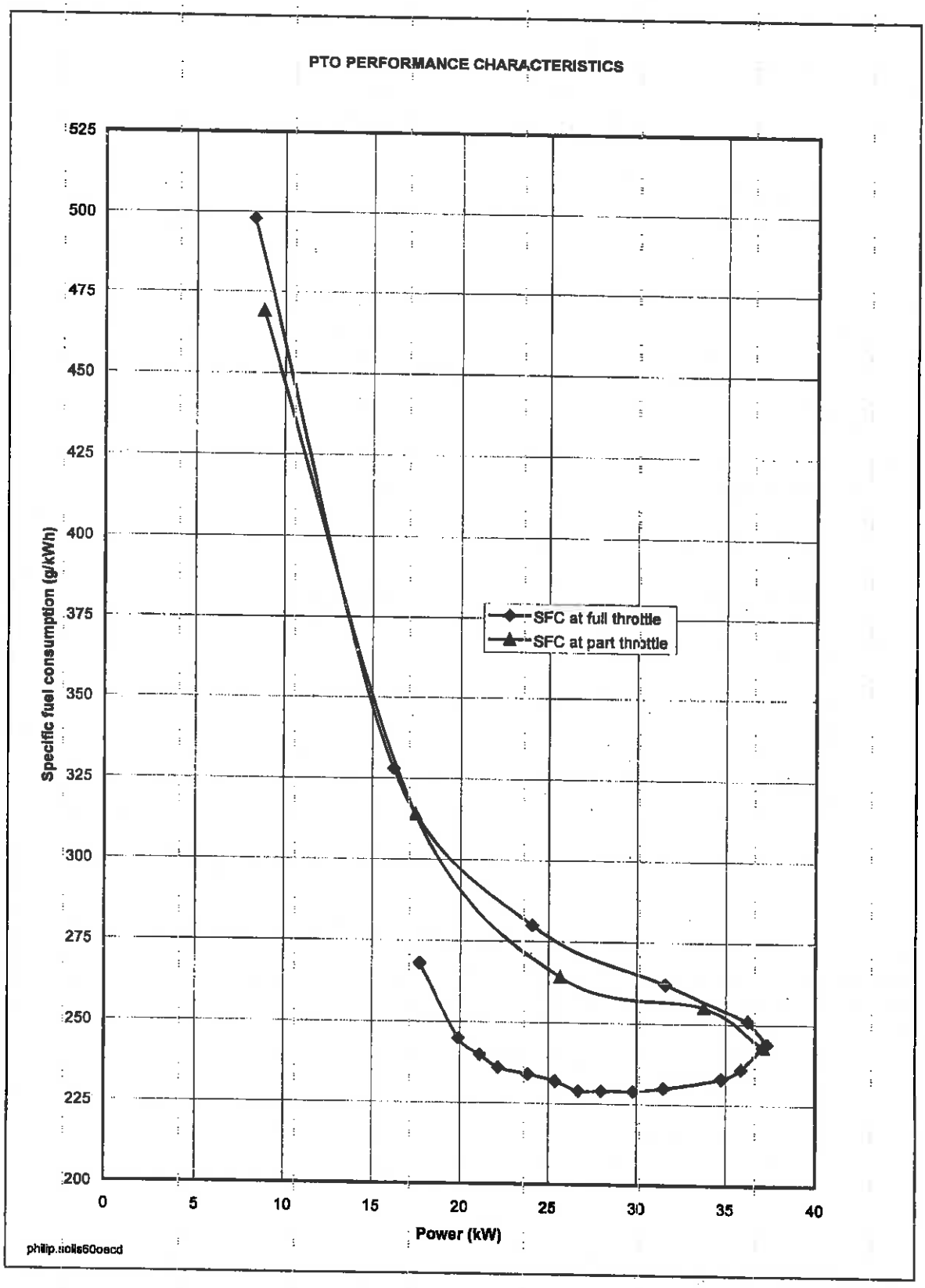
3. COMPULSORY TESTS RESULTS

3.1 Main power take-off:

- Date and location of tests : 11.05.2001, CFMT&TI, BUDNI
- Type of dynamometer bench : Eddy current, Fuchino ESF 1000

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	(rev/min)		l/h	kg/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER - TWO HOURS TEST						
37.3	2088	1020	10.85	9.11	244	3.44
3.1.2 POWER AT RATED ENGINE SPEED						
36.3	2200	1075	10.83	9.09	251	3.35
3.1.3 STANDARD POWER TAKE-OFF SPEED (1000 ± 25 rev/min)						
37.1	2047	1000	10.75	9.02	243	3.45
3.1.4 PART LOADS AT RATED ENGINE SPEED						
3.1.4.1 The torque corresponding to maximum power at rated engine speed						
36.3	2200	1075	10.83	9.09	251	3.35
3.1.4.2 85 % of torque obtained in 3.1.4.1						
31.6	2254	1101	9.86	8.27	262	3.20
3.1.4.3 75 % of torque defined in 3.1.4.2						
24.1	2284	1116	8.02	6.73	280	3.00
3.1.4.4 50 % of torque defined in 3.1.4.2						
16.2	2313	1130	6.33	5.31	328	2.56
3.1.4.5 25 % of torque defined in 3.1.4.2						
8.3	2347	1147	4.92	4.13	498	1.68
3.1.4.6 **Unloaded**						
--	2372	1159	3.46	2.90	--	--
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 :						
37.1	2047	1000	10.75	9.02	243	3.45
3.1.5.2 85 % of torque obtained in 3.1.5.1						
33.8	2192	1071	10.25	8.60	255	3.29
3.1.5.3 75 % of torque defined in 3.1.5.2						
25.7	2221	1085	8.07	6.77	264	3.18
3.1.5.4 50 % of torque defined in 3.1.5.2						
17.4	2258	1103	6.53	5.48	314	2.67
3.1.5.5 25 % of torque defined in 3.1.5.2						
8.8	2295	1121	4.92	4.13	469	1.79
3.1.5.6 Unloaded						
--	2327	1137	3.25	2.73	--	--


PTO PERFORMANCE CHARACTERISTICS
Power (kW)
Equivalent Crankshaft torque (Nm)
Standard PTO speed : 1000rpv/min
Power at full throttle
Power at part throttle
Eq. CS torque at full throttle
Eq. CS torque at part throttle
Specific fuel consumption (g/kWh)
Hourly fuel consumption (kg)
Standard PTO speed : 1000rev/min
SFC at full throttle
SFC at part throttle
HFC at full throttle
HFC at part throttle
Engine speed (rev/min)
philip.solis60oecd


PTO PERFORMANCE CHARACTERISTICS
Specific fuel consumption (g/kWh)
525
500
475
450
425
400
375
350
325
300
275
250
225
200
0
5
10
15
20
25
30
35
40
Power (kW)
SFC at full throttle
SFC at part throttle
philip.solis60oecd

- No load maximum engine speed : 2372 rev/min

- Torque (equivalent crankshaft) at maximum power:
  - At rated engine speed : 157.3 Nm
  - At 2 - hour test : 170.6 Nm

- Maximum torque (equivalent crankshaft) (Engine speed : 950 rev/min) : 212.5 Nm

Mean atmospheric conditions:

Temperature	: 21 °C
Pressure	: 97.3 kPa
Relative humidity	: 69%

Maximum temperatures:

Coolant	: 92 °C
Engine oil	: 98 °C
Fuel	: 37 °C
Engine air intake	: 25 °C

3.2 Hydraulic Power and Lifting Force:

Date of tests : 09.07.2001 & 12.07.2001

3.2.1. Hydraulic Power Test:

Sustained pressure with relief valve open	: 19.0 MPa
Pump delivery rate at minimum pressure	: 15.5 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	13.3	17.1	3.76
Flow rate and hydraulic pressure correspond-ing to maximum hydraulic power	14.3	16.0	3.80

- Tapping point used for test : External circuit tapping
- 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 Linkage setting for test – see Table 1.1 and figures 1.1 and 1.2

	At hitch point	On the frame
Height of lower hitch points above ground in down position	200 mm	200 mm
Vertical movement:		
- Without lifting force	655 mm	645 mm
- With lifting force	630 mm	635 mm
Maximum corrected force exerted through full range	10.48 kN	9.36 kN
Corresponding pressure of hydraulic fluid	19.1 MPa	19.5 MPa
Moment about rear wheel axle	9.06 kNm	13.81 kNm
Maximum tilt angle of mast from vertical	□	9.0 degrees

	Lifting height relative to the horizontal plane including the lower link pivot points.										
mm	-265	-200	-100	0	+100	+200	+300	+340	+350	+365	+370
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.)										
	10.48	11.38	12.00	12.97	13.90	14.69	15.10	15.28	--	14.67	--
	Corresponding pressure 17.1 MPa										
At the frame (kN)	10.62	10.67	10.71	10.83	11.07	10.65	10.18	--	9.53	9.39	9.36
	Corresponding pressure 17.1 MPa										

3.3 Drawbar power test (ballasted and unballasted tractor):

Date of tests : 30.08.2001 to 31.08.2001, 07.09.2001 and 11.09.2001

Type of track : Concrete

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
	(mm)	(kPa)	(kPa)
Unballasted	625	250	110
Ballasted	550	250	110

DRAWBAR PERFORMANCE TEST

Gear number and range	Power	Draw-bar pull	Speed	Engine speed	Slip of wheels	Specific fuel consumpt-ion	Specific energy	Temperature				Atmospheric conditions		
								Fuel	Cool-ant	Eng-ine oil	Trans-miss-ion 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 (Unballasted tractor)**													
L1	11.4	16.1	2.56	2291	14.6	439	1.86	36	88	101	73	30	84	97.3
L2	14.7	15.9	3.34	2276	14.7	392	2.08	37	89	101	73	29	84	97.3
L3	24.5	16.2	5.44	2229	14.8	332	2.45	40	90	100	69	28	86	97.3
L4	28.2	12.7	7.99	2114	10.5	305	2.68	35	93	104	77	32	75	97.0
H1	29.3	10.6	9.91	2097	8.7	291	2.81	34	92	100	68	32	75	97.0
H2	29.2	7.8	13.39	2108	6.9	299	2.73	36	92	96	60	27	86	97.3
3.3.2	**MAXIMUM POWER IN TESTED GEARS (ballasted tractor)**													
L1	16.9	24.7	2.47	2262	15.2	367	2.23	35	90	101	80	34	76	97.2
L2	22.3	24.9	3.21	2234	15.1	336	2.43	35	91	102	78	33	78	97.3
L3	28.4	18.1	5.65	2198	8.8	298	2.74	35	92	106	89	33	80	97.4
L4	29.4	12.4	8.54	2201	6.7	293	2.79	32	92	102	63	31	83	97.5
H1	29.8	10.8	9.95	2091	6.6	284	2.87	41	92	103	76	32	78	97.4
H2	29.3	7.9	13.32	2116	6.0	293	2.78	40	92	100	64	31	82	97.4
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	22.3	13.6	5.89	2239	6.8	318	2.58	30 to 36	90 to 91	99 to 105	62 to 92	29 to 33	75 to 82	97.4 to 97.5
3.3.3.2	**FIVE-HOUR TEST at pull corresponding to 15% wheel slip**													
L2	22.3	25.0	3.22	2230	–	335	2.44	37 to 38	89 to 91	103 to 105	91 to 92	34 to 36	70 to 77	97.3 to 97.4

The oil consumption during tests 3.3.3.1 and 3.3.3.2 was not measurable by the dipstick.

3.4 Turning area and turning circle:

	With brakes	Without brakes
	Right-hand	Left-hand
	(m)	(m)
Radius of turning area	3.89	4.05
Radius of turning circle	3.80	3.96

3.5 Location of centre of gravity:

Height above ground	:	801 mm
Distance forward from the vertical plane containing the axis of the rear wheels	:	885 mm
Distance from the median longitudinal plane of the tractor, to the right	:	8 mm

3.6 Braking performance:

Date of tests	:	03.09.2001 to 06.09.2001
Type of track	:	Concrete

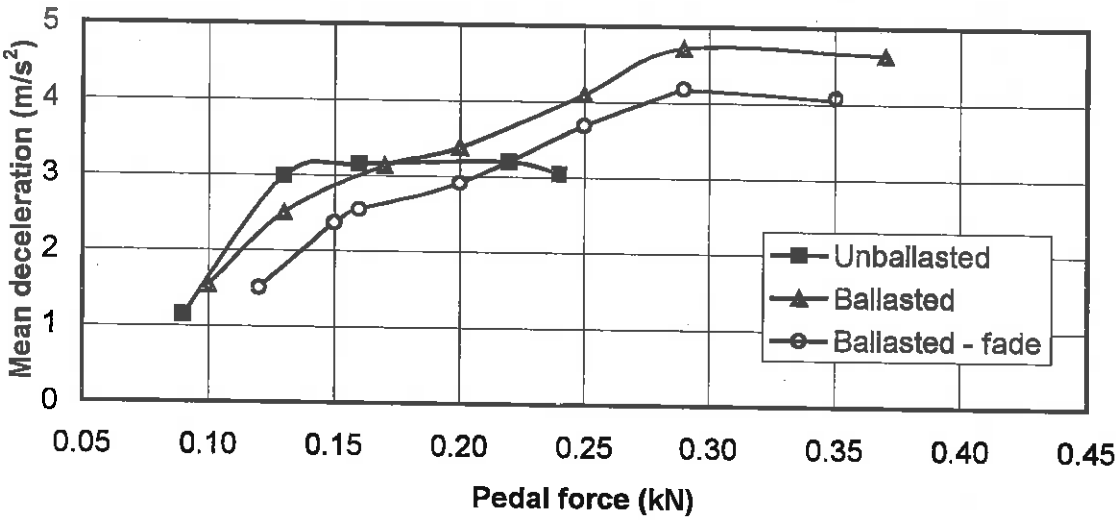


Figure
Cold service braking device test and fade test

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)
38.52	0.09	1.15	49.60
	0.13	2.98	19.20
	0.16	3.15	18.20
	0.22	3.20	17.90
	0.24	3.04	18.86
Ballasted Tractor			
37.98	0.10	1.54	36.08
	0.13	2.50	22.29
	0.17	3.13	17.77
	0.20	3.38	16.45
	0.25	4.10	13.57
	0.29	4.72	11.79
	0.37	4.64	12.00

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
37.98	0.12	1.50	37.00
	0.15	2.37	23.47
	0.16	2.55	21.50
	0.20	2.91	19.12
	0.25	3.69	15.09
	0.29	4.19	13.28
	0.35	4.07	13.67

Max. deviation tractor from its original course : None

Abnormal vibration : None

Brake heating method : By means of towing the tractor for 1 km at 30.4 km/h with the towing force of 3.37 kN

3.6.3 Parking braking device test:

	Ballasted tractor on 18% slope	
	Uphill	Downhill
Braking device control force(N)	0.20 kN	0.18 kN

3.7 External Noise Level:

Date of tests	:	03.09.2001
Sound level meter:		
- Make	:	Bruel & Kjaer
- Model	:	2230
- Type	:	Integrated
Type of track	:	Concrete
Gear number	:	H4
Travelling speed before acceleration	:	28.3 km/h
Sound level	:	88 dB(A)

3.8 Repairs and adjustments during tests : None

3.9 Remarks : None

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

TESTING AUTHORITY

C.R. RAI
ASSISTANT ENGINEER(ST)

R.K. SINGHAI
SENIOR TEST ENGINEER

S.C. JAIN
DIRECTOR

Hari/solis 60 oecd 01