ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

Report on test in accordance with the OECD Standard Code I (Full Code) for the Official Testing of Agricultural and Forestry Tractor

HÜRLIMANN 909 VDT

40 km/h four-wheel drive agricultural tractor

OECD No. **1638/1**
Full Code



LAMBORGHINI 950 VDT

40 km/h four-wheel drive agricultural tractor

OECD No. **1638/2**
Full Code



Manufactured by: S+L+H S.p.A.
V.le F. Cassani 15
24047 Treviglio BG
Italy

Date of OECD approval: 15 October 1996
Period of test: July - August 1996

ISMA Via Milano 43 24047 Treviglio BG Italy
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The Lamborghini 950 VDT (4WD) and Hürlimann 909 VDT (4WD) tractors are technically identical in all main respects except with regard to model designation, colour and side bonnets design.

All tests were carried out on the Lamborghini 950 VDT (4WD).

All stated dimensions and tests refer to tyre size 16.9 R24 at front and 18.4 R34 at rear, as well as to track widths 1700 mm at front and 1600 mm at rear.

Tractor manufacturer

- Name:	S+L+H S.p.A.;
- Address:	V.le F. Cassani 15, 24047 Treviglio BG, Italy;
- Location of tractor assembly:	Treviglio BG, Italy;
- Submitted for test by:	the manufacturer;
- Selected by:	the manufacturer with the agreement of ISMA;
- Place of running in:	Treviglio BG, Italy;
- Duration of running in:	50 hours,
- Location of test:	ISMA, Via Milano 43, Treviglio BG, Italy.

SPECIFICATION OF TRACTOR

TRACTOR

- Make:	LAMBORGHINI;
- Model:	950 VDT, 40 km/h version;
- Type:	four-wheel drive, unit construction;
- Number of driving wheels:	4;
- Serial number:	1418;
- First serial number:	1001.

ENGINE

- Make:	S+L+H;
- Model:	1000.4 WT2;
- Type:	water cooled 4-stroke diesel, direct injection, turbocharged;
- Serial number:	1545.

Cylinders

- Number and disposition:	4, vertical, in-line;
- Bore x stroke:	105 x 115.5 mm;
- Capacity:	4000 cm^3;
- Compression ratio:	16:1;
- Arrangement of valves:	overhead;
- Cylinder liners:	wet liners.

Supercharging:

- Make:	SCHWITZER;
- Model:	S 2A;
- Type:	exhaust driven supercharger;
- Supercharging pressure:	60 kPa.

Fuel system

- Fuel feed system:	AC corone fuel feed pump;
- Make, model and type of fuel filter:	FIAMM FNA 166/20;
- Capacity of fuel tank:	150 dm^3;
- Make, model and type of injection pump:	BOSCH PFR 1K 90 A 517, immersed, one per cylinder in line;
. serial number:	without serial number;
- Manufacturer's production setting of injection pump:	
. flow rate:	64 ± 2 mm^3/stroke at rated speed and full load corresponding 19.33 dm^3/h;
. timing:	16° before TDC;
- Make, model and type of injectors:	BOSCH DLLA 150 S 925 multihole injection nozzles;
- Injection pressure:	18 ± 1 MPa.

Governor

- Make:	S+L+H;
- Model:	085.1650.4/30;
- Type:	mechanical;
- Governor range of engine speed:	from 650 to 2724 rev/min;
- Rated engine speed:	2500 rev/min.

Air cleaner

- Pre-cleaner	
. make:	DONALDSON;
. model:	P 01-6330;
. type:	cyclone;
. location:	above bonnet.
- Main filter	
. make:	DONALDSON;
. model:	FLG 08-0524;
. type:	dry paper element filter with replaceable cartridge;
. location:	front of engine;
. air intake location:	above bonnet;
- Maintenance indicator:	with the warning lamp on the dashboard.

Lubrication system

- Type of feed pump:	forced feed from gear pump;
- Type of filter:	FIAMM FT 4803;
- Oil specifications:	see page 23.

Cooling system

- Type and detail:	water cooling with impeller pump;
- Specification of fan:	propeller fan driven by engine shaft;
- Number of fan blades:	6;
- Fan diameter:	500 mm;
- Type of temperature control:	none.

Starting system

- Make:	ISKRA;
- Model:	AZ 1349 12 V;
- Type:	electromagnetic engagement;
- Starter motor power rating:	3 kW;
- Safety device:	electrical lockout on clutch and PTO controls;
- Starting system for low temperatures:	none.

Electrical equipment

- Voltage:	12 V;
- Generator	
. make:	ISKRA;
. model:	AAK 5114 14 V 85 A;
. type:	alternator;
. power:	85 A;
- Battery:	1lead acid;
. capacity:	180 Ah at 20 hours rating.

Exhaust system

- Make:	S+L+H;
- Model:	DGM SA 1554;
- Type:	one reflection absorption chamber;
- Location:	on the left hand side of engine, vertical position, under side bonnet;
- Height of outlet above ground:	2710 mm.

TRANSMISSION

Clutch (utilized only for travelling of tractor)

- Make:	S+L+H;
- Model:	618.23;
- Type:	single disk dry clutch;
- Number of plates:	1;
- Plates diameter:	330 mm;
- Control system:	hydraulic, operated by pedal.

Gear box

The tractors can be fitted alternatively with a "normal" or a "heavy duty" gear box, slightly differing in their dimensions (see report No. CSD 1385 OECD).
The test tractor was fitted with the "heavy duty" version.

. make:	S+L+H;
. model:	618.31;
. type:	heavy duty gear box, mechanical synchromesh speed change gear; 5 speed with 4 ranges of speeds (C/S/N/F), one electrohydraulic reduction gear (low/medium/high), and one reverse group;
. number of gears:	60 forward and 60 reverse.
- Available options:	5 speed with 3 ranges of speeds (S/N/F), one electrohydraulic reduction gear (low/medium/high), and one reverse group;
. number of gears:	45 forward and 45 reverse.

Rear axle and final drives

- Make:	own make;
- Model:	618.44;
- Type:	bevel gear differential and epicyclic final drive.

Rear differential lock

- Make:	own make;
- Model:	618.47;
- Type:	electrohydraulic;
- Control system:	engaged or disengaged by button.

Front axle and final drives

- Make: own make;
- Model: 618.43;
- Type: original S+L+H system with central shaft, bevel gear drive, differential and epicyclic final drives.

Front differential lock

- Make: own make;
- Model: 618.46;
- Type: electrohydraulic;
- Control system: engaged or disengaged by button.

Total rations and speed

Gear	Group	Number of engine revolution for one revolution of the driving wheels			Nominal travelling speed at rated engine speed of 2500 rev/min (*) km/h		
		Low	Medium	High	Low	Medium	High
FORWARD							
1	Creep	2466.0	2061.3	1691.3	0.29	0.35	0.43
2	Creep	1664.9	1391.4	1141.6	0.44	0.52	0.64
3	Creep	1251.3	1045.8	858.0	0.58	0.69	0.85
4	Creep	948.6	792.8	650.3	0.77	0.92	1.12
5	Creep	714.7	597.3	490.1	1.02	1.21	1.48
1	Slow	725.5	606.3	497.5	1.00	1.20	1.46
2	Slow	489.7	409.3	335.8	1.48	1.77	2.16
3	Slow	368.1	307.6	252.4	1.97	2.36	2.88
4	Slow	279.0	233.2	191.3	2.60	3.11	3.79
5	Slow	210.2	175.7	144.1	3.45	4.13	5.04
1	Normal	280.1	234.1	192.1	2.59	3.10	3.78
2	Normal	189.1	158.0	129.6	3.84	4.59	5.60
3	Normal	142.0	118.7	97.4	5.11	6.11	7.45
4	Normal	107.7	90.0	73.8	6.74	8.06	9.83
5	Normal	81.1	67.8	55.6	8.95	10.70	13.05
1	Fast	94.1	78.6	64.5	7.71	9.23	11.25
2	Fast	63.5	53.1	43.5	11.43	13.67	16.68
3	Fast	47.7	39.9	32.7	15.21	18.19	22.19
4	Fast	36.2	30.2	24.8	20.05	24.03	29.26
5	Fast	27.3	22.8	18.7	26.58	31.83	38.81

(*) Calculated with a tyre dynamic radius index of 770 mm (ISO 4251/1-1992).

Number of revolutions of front wheels for one revolution of rear wheels: 1.3072.

Total rations and speed (continued)

Gear	Group	Number of engine revolution for one revolution of the driving wheels			Nominal travelling speed at rated engine speed of 2500 rev/min (*) km/h		
		Low	Medium	High	Low	Medium	High
REVERSE							
1	Creep	2368.0	1979.4	1624.1	0.31	0.37	0.45
2	Creep	1598.8	1336.1	1096.3	0.45	0.54	0.66
3	Creep	1201.6	1004.3	823.9	0.60	0.72	0.88
4	Creep	910.9	761.3	624.5	0.80	0.95	1.16
5	Creep	686.3	573.6	470.6	1.06	1.27	1.54
1	Slow	696.7	582.2	477.7	1.04	1.25	1.52
2	Slow	470.2	393.0	322.5	1.54	1.85	2.25
3	Slow	353.5	295.4	242.4	2.05	2.46	2.99
4	Slow	267.9	223.9	183.7	2.71	3.24	3.95
5	Slow	201.9	168.7	138.4	3.60	4.30	5.24
1	Normal	269.0	224.8	184.5	2.70	3.23	3.93
2	Normal	181.6	151.7	124.5	4.00	4.78	5.83
3	Normal	136.4	114.0	93.5	5.32	6.37	7.76
4	Normal	103.4	86.4	70.9	7.02	8.40	10.24
5	Normal	77.9	65.1	53.4	9.32	11.15	13.59
1	Fast	90.4	75.5	61.9	8.03	9.61	11.72
2	Fast	61.0	51.0	41.8	11.90	14.23	17.37
3	Fast	45.8	38.3	31.4	15.84	18.94	23.11
4	Fast	34.8	29.0	23.8	20.88	25.02	30.47
5	Fast	26.2	21.9	18.0	27.68	33.15	40.41

(*) Calculated with a tyre dynamic radius index of 770 mm (ISO 4251/1-1992).

Number of revolutions of front wheels for one revolution of rear wheels: 1.3072.

POWER TAKE-OFF

Main power take-off proportional to engine speed

- Type: independent, at rear of tractor, in tractor's median plane, engaged or disengaged by push botton, driven by multiplate wet clutch independent of travel clutch;
- Number of shafts: 1;
- Method of changing power take-off shaft ends: it is possibie, through 6 screws, to mount one PTO shaft end, 35 mm diameter, 6 splines, ISO 500-1991, type 1or 35 mm diameter, 21 splines, ISO 500-1991, type 2;
- Method of changing speed: combination of internal and external hand lever;

- Height above ground: 770 mm;
- Distance from the median plane of the tractor: 0 mm;
- Distance behind rear axle: 480 mm;
- Direction of rotation (viewed facing driving end): clockwise.

PTO type	PTO speed rev/min	Engine speed rev/min	Engine/PTO transmission ratio	Power restriction kW
540	540 614	2198 2500	4.071	-
775	775 786	2463 2500	3.179	-
1000	1000 1020	2450 2500	2.450	-
1300	1300 1306	2487 2500	1.913	-

Secondary power take-off proportional to engine speed
(optional, fitted tested tractor)

- Type:	independent, at front of tractor, in tractor's median plane, engaged or disengaged by push botton, driven by multiplate wet clutch independent of travel clutch;
- Number and type of shafts:	1, ISO 500-1991, type 1 (35 mm dia, 6 splines)
- Height above ground:	800 mm;
- Distance from the median plane of the tractor:	0 mm;
- Distance forward front axle:	700 mm;
- Ratio of rotation speeds (engine speed/PTO speed):	2.4;
- Direction of rotation (viewed facing driving end):	anticlockwise.

Power take-off proportional to ground speed
(optional, not fitted on tested tractor)

- Type:	independent, not adjustable to 540-1000 rev/min, location at rear of tractor, in tractor's median plane, below the mean PTO, engaged or disengaged by hand lever at the left hand side of the seat;
- Number and type of shafts:	1, ISO 500-1991, type 1 (35 mm dia, 6 splines);
- Method of changing power take-off shaft ends:	none;
- Direction of rotation with forward gear engaged:	clockwise;
- Travelling distance for one revolution of power take-off shaft:	0.18 m;
- Number of power take-off shaft revolutions for one revolution of rear driving wheels:	25.666.

REAR POWER LIFT

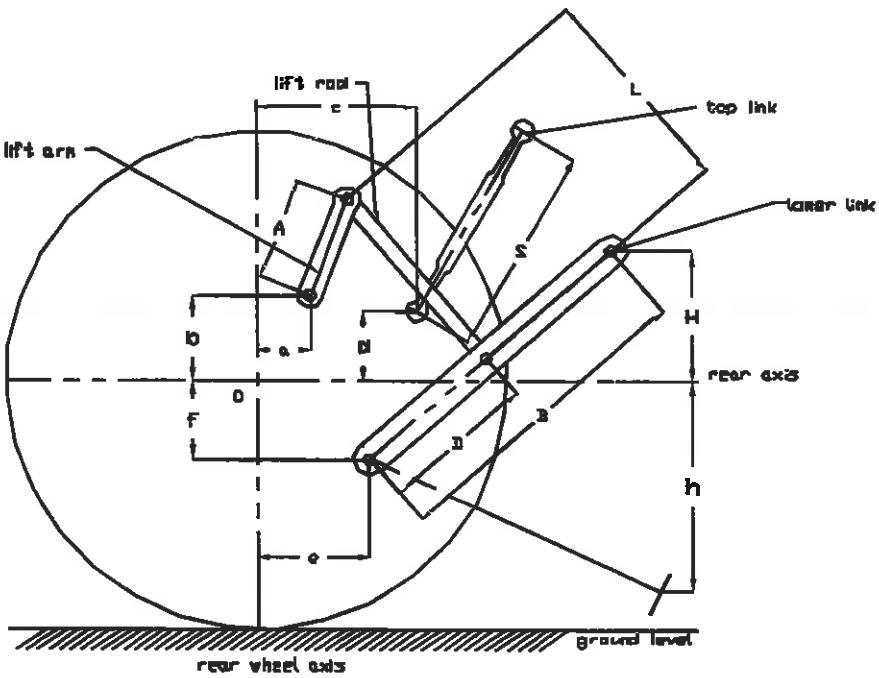
- Make:	S+L+H;
- Model:	618.39; fitted on tested tractor;
- Type:	load sensing;
- Type of hydraulic system:	open centre system;
- Number and type of cylinders:	1 internal single-acting;
- Type of lock for transport:	mechanical, with screwed tie rods that lock the lower links;
- Relief valves pressure setting:	18.0 ± 0.5 MPa;
- Opening pressure of anti-shock valve:	21.0 ± 0.5 MPa;

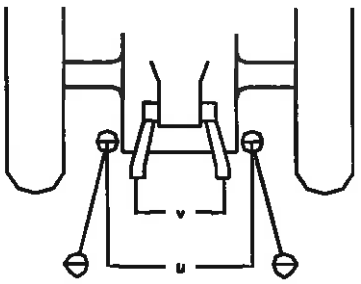
- Lift pump
  . make: BOSCH;
  . type: hydraulic rotary pumps, driven by engine shaft;
- Transmission between pump and engine: mechanical;
- Number and type of filters: 1, replaceable paper cartridge;
- Oil capacity: 71 dm^3;
- Site of oil reservoir: gear box;
- Number, type and location of tapping points: 4 ways distributor at rear of tractor;
- Maximum volume of oil available to external cylinders: 15 dm^3.

- Recommended oil: see page 23.

Rear three-point linkage

- Category (ISO 730/1-1990): 2;
- Category adapter: none.





REAR LINKAGE GEOMETRY

REAR POWER LIFT (continued)

Dimensions of linkage geometry (when connected to the standard frame)

		Dimension or range mm	Settings used in test mm
Length of lift arms	(A)	280	280
Length of lower links	(B)	840	840
Distance of lift arm pivot point from rear wheel axis (behind)			
- horizontally	(a)	135	135
- vertically	(b)	402	402
Horizontal distance between the 2 lower link points	(u)	460	460
Horizontal distance between the 2 lift arm end points	(v)	580	580
Length of upper link	(S)	from 640 to 860	663
Distance of upper link pivot point from rear wheel axis			
- horizontally	(c)	397	397
- vertically	(d)	217-282-347	282
Distance of lower link pivot point from rear wheel axis			
- horizontally	(e)	220	220
- vertically	(f)	230	230
Distance of lower link pivot point to lift rod pivot points on lower links	(D)	420	420
Length of lift rods	(L)	from 697 to 823	735

Height of lower hitch points relative to the rear wheel axis:

Length of lift rods	(L)	697	823	735
Linkage distance of lift rods	(D)	420	420	420
Lowest position	(h)	384	675	470
Highest position	(H)	304	87	250
Height above ground of lower hitch points when locked in transport position (*)				920

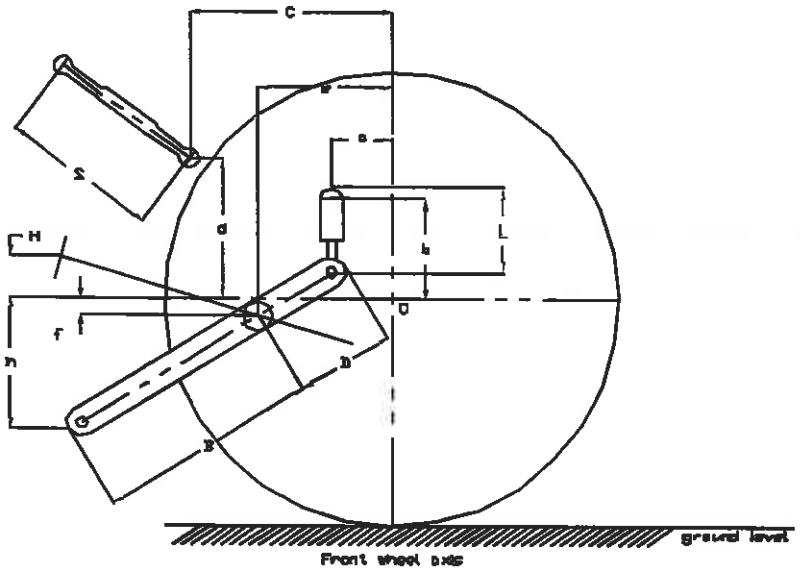
(*) *Assuming the dynamic radius index = 770 mm (ISO 4251/1-1992)*

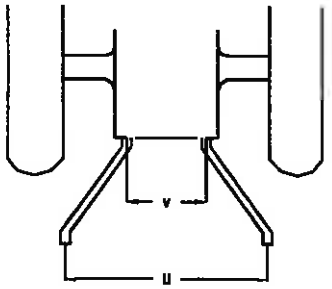
FRONT POWER LIFT (optional, fitted on tested tractor)

- Make:	S+L+H;
- Model:	ORIGINAL SAME SYSTEM 526-59 FRONT;
- Type and number of cylinders:	2 at single acting;
- Type of lock for transport:	none;
- Relief valve pressure setting:	18.0+/- 0.5 MPa;
- Opening pressure of anti-shock valve:	21.0 MPa;
- Lift pump type:	hydraulic rotary pump, driven by engine shaft, pump make BOSCH;
- Trasmission between pump and engine:	mechanical;
- Type and number of filters:	1, repeceable paper cartridge;
- Change interval:	2400 hrs or when the filter clogging warning lamp is lighted;
- Oil capacity:	71 dm^3;

Front three-point linkage

- Category (ISO 730/1-1990): 2;
- Category adapter: none .





FRONT LINKAGE GEOMETRY

FRONT POWER LIFT

Dimensions of linkage geometry (when connected to the standard frame)

		Dimension or range mm	Settings used in test mm
Length of lower links	(B)	750	750
Distance of cylinders pivot point from front wheel axis (forward)			
- horizontally	(a)	300	300
- vertically	(b)	334	334
Horizontal distance between the 2 lower link points	(u)	860	860
Horizontal distance between the 2 lift arm end points	(v)	300	300
Length of upper link	(S)	from 500 to 770	580
Distance of upper link pivot point from front wheel axis			
- horizontally	(c)	662 - 677	677
- vertically	(d)	177 - 437	437
Distance of upper link pivot point from front wheel axis			
- horizontally	(e)	507	507
- vertically	(f)	60	60
Distance of lower link pivot point to cylinders pivot points on lower links	(D)	214	214
Length of cylinders			
- in low position	(L)	325	325
- in high position	(L)	500	500
Height of lower hitch points relative to the front wheel axis			
- in low position	(h)	455	460
- in high position	(H)	162	165
Height above ground of lower hitch points (*)			785

(*) *Assuming the dynamic radius index = 620 mm (ISO 4251/1-1992)*

SWINGING DRAWBAR: optional, not fitted on tested tractor

HOLED DRAWBAR:

- Number of holes:	7;
- Distance between holes:	100 mm;
- Hole diameter:	28.5 mm;
- Thickness x width of the drawbar:	30 x 80 mm;
- Height above ground,	
. min:	157 mm;
. max:	1060 mm;
- Horizontal distance behind power take-off shaft end:	620 mm;
- Diameter of the pinhole:	28 mm.

TRAILER HITCH

- Type:	KRAMER;
- Hole diameter:	28 mm;
- Height above ground	
. min:	540 mm;
. max:	1080 mm;
- Distance of hitch point from rear wheel axis	
. horizontally:	570 mm;
- Distance of hitch point from power take-off shaft end	
. vertically:	300 mm below, 300 mm above;
. horizontally:	140 mm;
- Maximum vertical permissible load:	14.7 kN.

STEERING

- Specification:	hydrostatic steering with BOSCH hydraulic gear pump, two simple acting ram acting directly on front axle.
- Make:	DANFOSS;
- Model:	ORBITROLL OSPC 80 OR;
- Type:	hydrostatic;
- Working pressure:	15 MPa;
- Recommended oil:	see page 23.

BRAKES

Service brake

- Make:	S+L+H;
- Model:	618.54;
- Type:	oil bath disc, total 4 discs, 2 at front (1 per wheel) and 2 at rear (1 per wheel), all mounted before the final drive;
. front disc diameter:	224 mm,
. rear disc diameter:	280 mm,
. material:	FRENDO HDT 303 lining material;
- Method of operation:	hydraulically actuated with 2 pedals;
- Trailer braking take-off:	hydraulic brake system.

Parking brake

- Type:	fully independent of service brake, 3 oil bath disc mounted on the pinion shaft in the gear box;
- Method of operation:	mechanical by hand lever.

Steering brake

- Metod of operation:	divided pedal of service brake, for normal use locked together.

STEERING WHEELS

- Number:	2;
- Location:	at front;
- Track widths	
. min:	1600 mm:
. max:	1900 mm;
- Adjustment:	changing the position of the rims with respect to the disc.

DRIVING WHEELS

- Number:	4;
- Location:	two at front and two at rear;
- Rear track widths	
. min:	1600 mm;
. max:	1900 mm;
- Adjustment:	changing the position of the rims with respect to the disc.

WHEELBASE: 2373 mm.

ISTITUTO SPERIMENTALE PER
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PROTECTIVE STRUCTURE

Specifications

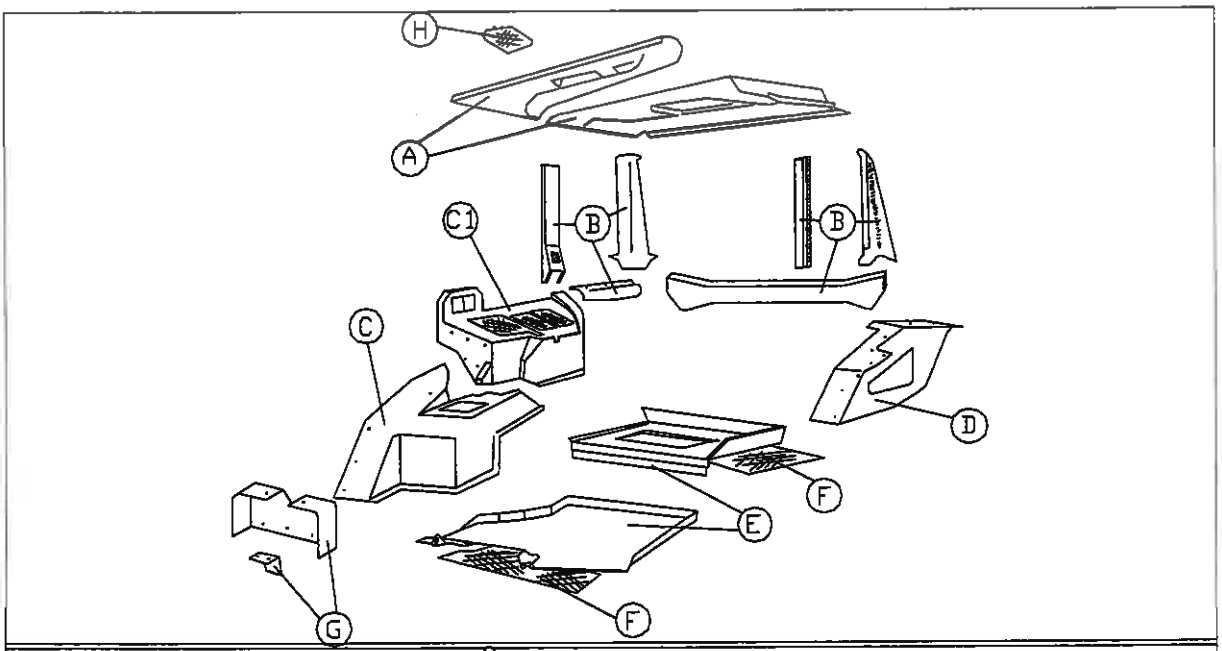
Tractor	Seat	Gear box	OECD approval number
LAMBORGHINI 950 VDT "4WD"	GRAMMER LS 95 H 1 / 90 AR	"heavy duty"	CSD 1385/143
		"normal"	CSD 1385/139
	GRAMMER DS 83 H / 90 A	"heavy duty"	CSD 1385/141
		"normal"	CSD 1385/137
	GRAMMER DS 85 H / 90 A	"heavy duty"	CSD 1385/142
		"normal"	CSD 1385/138
	KAB XH 2 / U	"heavy duty"	CSD 1385/144
		"normal"	CSD 1385/140
HÜRLIMANN 909 VDT "4WD"	GRAMMER LS 95 H 1 / 90 AR	"heavy duty"	CSD 1385/59
		"normal"	CSD 1385/55
	GRAMMER DS 83 H / 90 A	"heavy duty"	CSD 1385/57
		"normal"	CSD 1385/53
	GRAMMER DS 85 H / 90 A	"heavy duty"	CSD 1385/58
		"normal"	CSD 1385/54
	KAB XH 2 / U	"heavy duty"	CSD 1385/60
		"normal"	CSD 1385/56

- Date of approval: 21 December 1993;
- Location and country of test of protective structure: Istituto di Ingegneria Agraria, Università degli Studi di Milano, Italy;
- Mass used for calculating impact energies and crushing forces: 4500 kg;
- Wheelbase used for calculating impact energy at the rear: 2633 mm;
- Make: S+L+H;
- Model: C 37;
- Type: cab, not tiltable;
- Manufacturer's name and address: S+L+H S.p.A., Viale F. Cassani 15, 24047 Treviglio BG, Italy.

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Details of materials used for sound proofing the protective structure

- Glass:
  . type: security glass, thickness 5 and 6 mm;
  . model: 43 R - 000589 (doors, windscreen, windows);
- Windscreen wipers: OSLV, parallelogram type;
- Direction indicators: COBO E3;
- Heating and ventilation system: BORLETTI;
- Draught proofing: rubber GMTA 20 - 70 P, SP 550 and PEC 75.
- Interior padding: see below;



A) Porous material, 50-60 g/m^3, thickness 15-20 mm + Tassel AD, 1200-1400 g/m^3, thickness 6 mm + textile fiber + TNT.

B) PUR, low density, 250-300 g/m^3, coated with expanded laminated PVC.

C) Polypropylene, thickness 3 mm, internally covered with polyurethan foam, thickness 30 mm, and bitumen sheet.

C1) Polypropylene, thickness 3 mm, internally covered with polyurethan foam, thickness 30 mm.

D) Tassel AD, 1400-1600 g/m^3 + PVC, thickness 12 + 22 mm.

E) Rubber, 2-3 kg/m^3, thickness 5 mm + polyurethan foam, thickness 20 mm + thermoplastic film.

F) Bitumen, thickness 6 mm.

G) Rubber + Tassel AB x AD, 800-1000 g/m^3 + Tassel AB x BD, 1400 g/m^3, thickness 23 mm.

H) Polyurethan foam, thickness 30 mm.

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DRIVER'S SEAT: four seats available;

Make	Model	Type of suspension	Type of damping	Range of adjustment vertical	longitudinal
GRAMMER	LS95 H 1 / 90 AR	pneumatic	hydraulic	60 mm	150 mm
GRAMMER	DS 83 H / 90 A	mechanical	hydraulic	60 mm	150 mm
GRAMMER	DS 85 H / 90 A	mechanical	hydraulic	60 mm	150 mm
KAB	XH 2 / U	mechanical	hydraulic	60 mm	150 mm

PASSENGER'S SEAT : 1 place seat at the left side of the driver seat.

LIGHTING

Lighting system in accordance with EEC 78/933

	Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headligths	1170	160x100	130
Sidelights	1707	110x35	805
Rearlights	1720	120x65	805
Reflectors	720	∅ 80	420

TEST CONDITIONS

OVERALL DIMENSIONS

	Length with front power lift mm	Length without front power lift mm	Width minimum mm	Width maximum mm	Height at top of protective structure mm	Height at top of exhaust silencer mm
Unballasted	4813	4123	2240	2500	2680	2710
Ballasted	4883	4553	2240	2500	2680	2710

- Ground clearance: 415 mm below front axle;

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TRACTOR MASS (with full fuel tank, cab and front power lift)

	Unballasted		Ballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	1980	2000	2505	2525
Rear	2320	2375	2425	2480
Total	4300	4375	4930	5005

BALLAST

	Weights		Water
	Number	Total mass kg	kg
Front	1	375	-
Rear wheels	3+3	255	-

TYRES AND TRACK WIDTH SPECIFICATIONS

	Front	Rear
Tyres		
make	PIRELLI	PIRELLI
model	TM 700	TM 700
dimensions	16.9R24	18.4R34
ply rating	-	-
load index/speed index	134 A8	144 A8
type	radial	radial
maximum load (tyre manufacturer's)	1373 daN	2206 daN
inflation pressure (tyre manufact.'s)	160 kPa	160 kPa
dinamic radius index	620 mm	770 mm
Chosen track width	1700 mm	1600 mm
Technically permissible axle load	2747 daN	4415 daN
Other tyres available	14.9R24 16.9R24	16.9R24 520/70R34

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OILS AND LUBRICATION

Capacity and change interval

	Capacity dm^3	Oil change h	Filter change h
Engine	11	150	300
Gear box with rear axle and final drives, hydraulic system, steering	71	1200	2400(*)
Front PTO transmission	2.5	1200	-
Front axle / final drives	10.5 / 5	1200	-
Brakes	2.5	-	-

(*) *Or when the warning lamp is lighted*

Specifications

	Recomended	Using during test
Engine oil		
Type	AKROS MOTOR OIL	AKROS MOTOR OIL
Viscosity	12.5 cSt	12.5 cSt
Classification	API SE - CD	API SE - CD
Transmission oil used in Gear box Front PTO transmission Front axle and final drives Rear axle and final drives		
Type	AKROS MULTI	AKROS MULTI
Viscosity	11.5 cSt	11.5 cSt
Classification	API GL 4	API GL 4
Steering oil		
Type	AKROS MULTI	AKROS MULTI
Viscosity	11.5 cSt	11.5 cSt
Classification	API GL 4	API GL 4
Braking oil		
Type	AKROS MATIC	AKROS MATIC
Viscosity	6.7 cSt	6.7 cSt
Classification	API GL 4	API GL 4

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Grease

- Type:	AKROS GREASE T2;
- Number of lubrication points:	10.

FUEL

- Type:	AGIP DIESEL, DIN 51601; (in accordance with the national standard)
- Density at 15 °C:	0.838 g/cm^3.

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TEST RESULTS

COMPULSORY TESTS RESULTS

1. MAIN POWER TAKE-OFF PERFORMANCE

- Date and location of test: 18 July 1996, ISMA, Treviglio BG, Italy;

- Type of dynamometer: ZÖLLNER B 500.

Power	Speed		Fuel consumption			Specific energy
	Engine	PTO	Hourly		Specific	
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
1.1 MAXIMUM POWER - TWO-HOUR TEST						
65.8	2499	1020	19.33	16.20	246	3.40
1.2 POWER AT RATED ENGINE SPEED						
65.8	2499	1020	19.33	16.20	246	3.40
1.3 STANDARD POWER TAKE-OFF SPEED (1000 rev/min)						
65.6	2450	1000	19.08	15.99	244	3.44
1.4 PART LOADS 1.4.1 The torque corresponding to maximum power at rated engine speed						
65.8	2499	1020	19.33	16.20	246	3.40
1.4.2 85% of torque obtained in 1.4.1						
58.5	2623	1071	18.17	15.23	261	3.22
1.4.3 75% of torque defined in 1.4.2						
44.4	2656	1084	15.07	12.63	284	2.95
1.4.4 50% of torque defined in 1.4.2						
29.9	2684	1096	12.16	10.19	341	2.46
1.4.5 25% of torque defined in 1.4.2						
15.1	2703	1103	9.01	7.55	502	1.67
1.4.6 unloaded						
0	2724	1112	6.68	5.6	-	-

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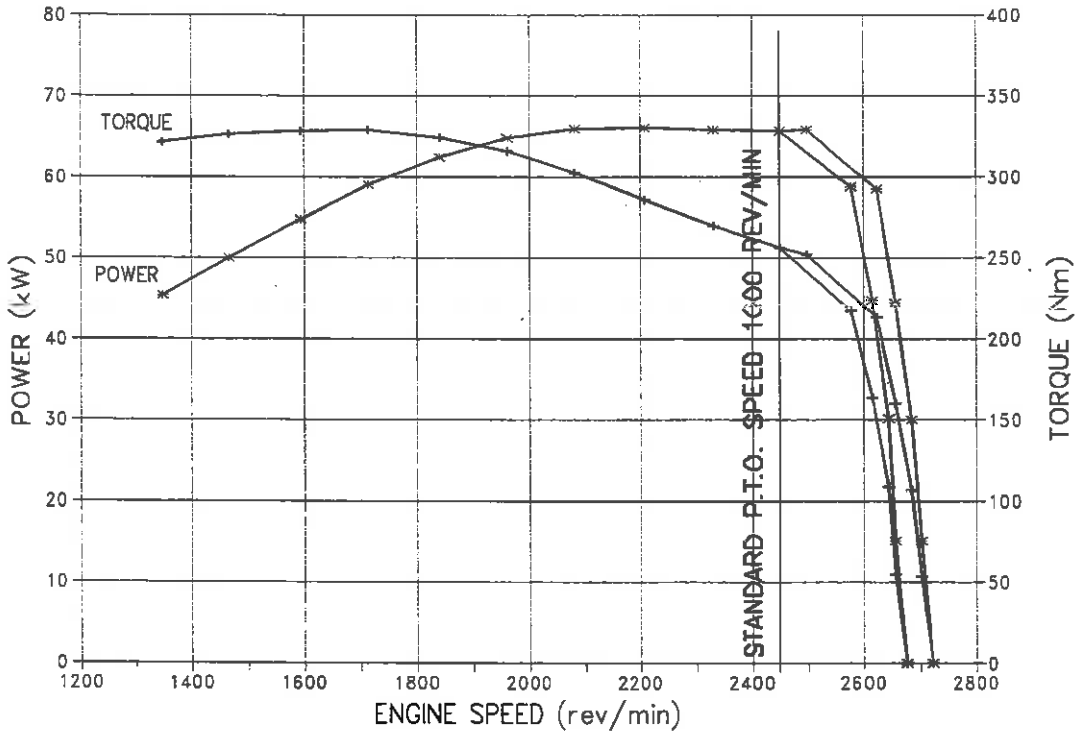
Power	Speed		Fuel consumption			Specific
	Engine	PTO	Hourly		Specific	energy
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED (1000 rev/min)						
1.5.1 The torque corresponding to maximum power available						
65.6	2450	1000	19.08	15.99	244	3.44
1.5.2 85% of torque obtained in 1.5.1						
58.7	2578	1052	18.02	15.10	257	3.26
1.5.3 75% of torque defined in 1.5.2						
44.7	2616	1068	14.96	12.54	281	2.98
1.5.4 50% of torque defined in 1.5.2						
30.0	2643	1079	11.93	10.00	333	2.52
1.5.5 25% of torque defined in 1.5.2						
15.1	2655	1084	8.71	7.30	484	1.73
1.5.6 unloaded						
0	2676	1092	6.18	5.18	-	-

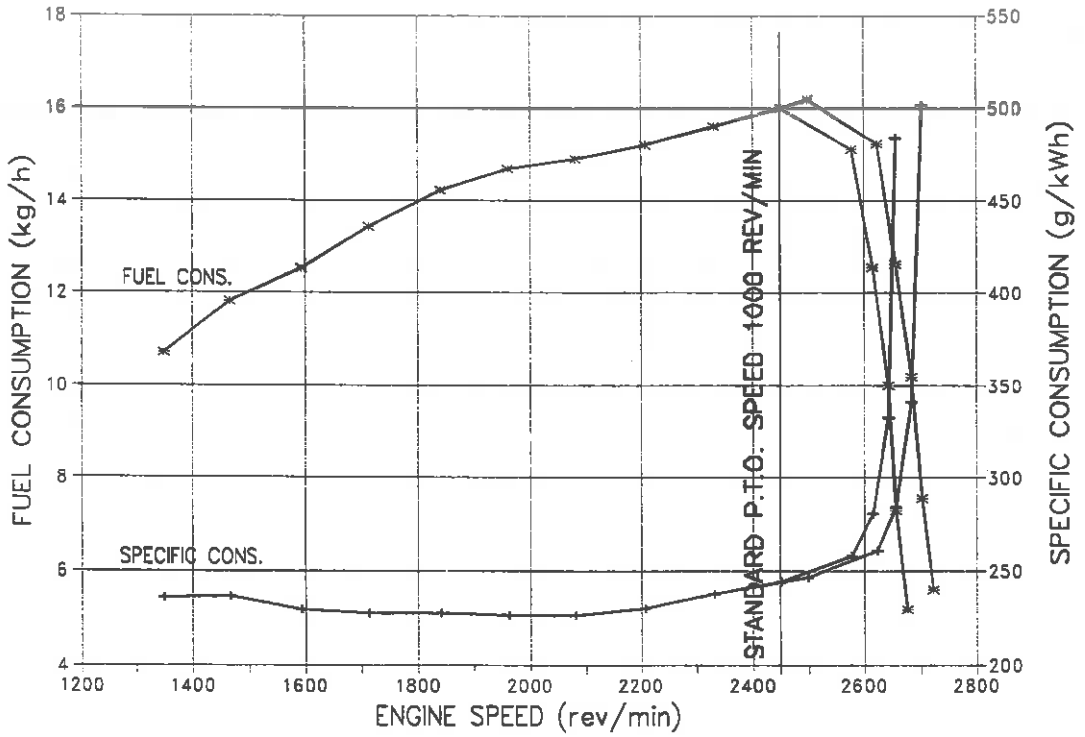
- No load maximum engine speed: 2724 rev/min;
- Equivalent flywheel torque at rated engine speed: 251.4 Nm;
- Equivalent flywheel torque at 2-hour test: 251.4 Nm;
- Maximum equivalent flywheel torque: 329.0 Nm at 1714 rev/min of the engine.

- Mean atmospheric conditions
  . temperature: 27 °C;
  . pressure: 99.8 kPa;
  . relative humidity: 66 %.

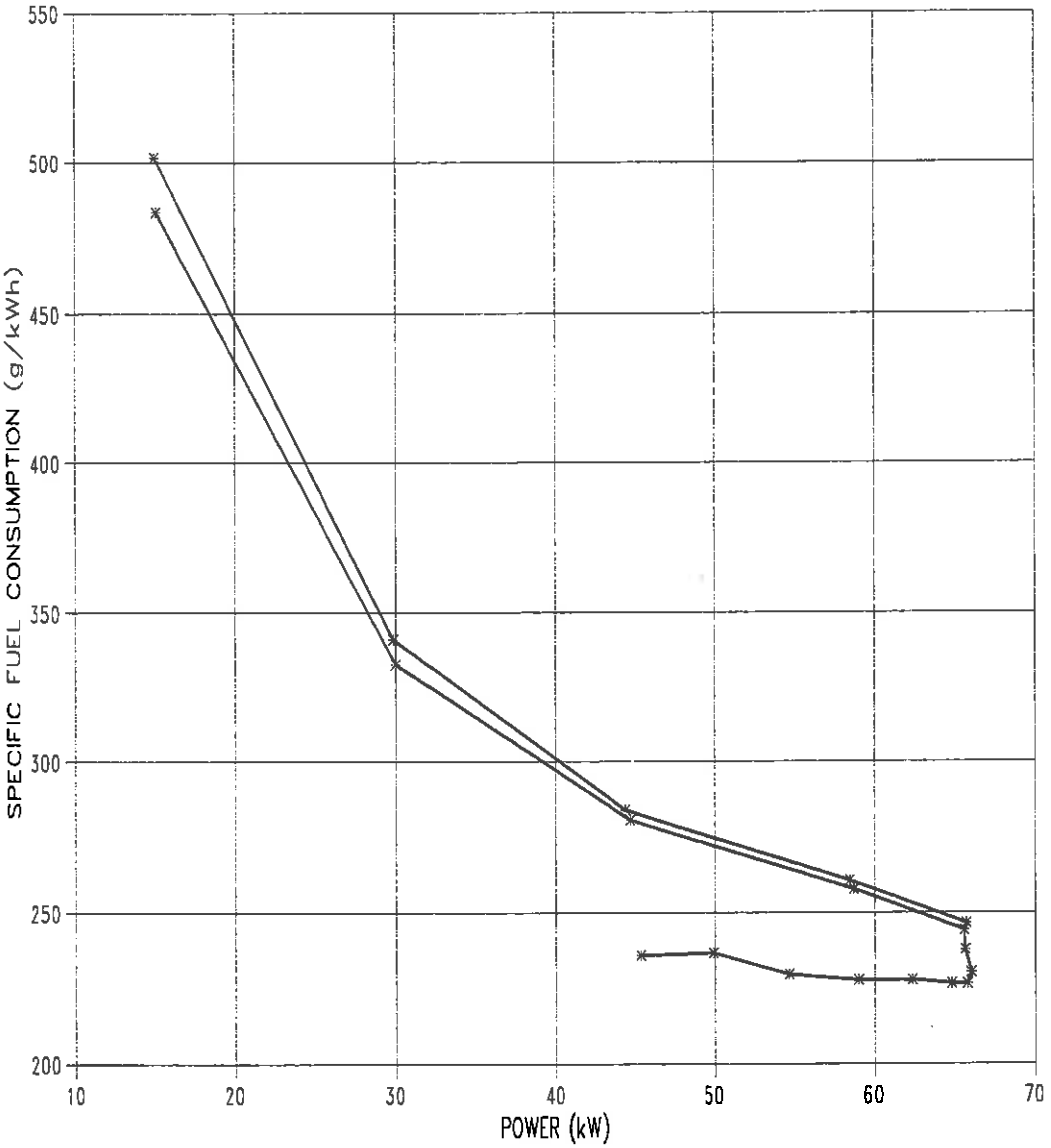
- Maximum temperatures
  . coolant: 87 °C
  . engine oil: 118 °C
  . fuel: 34 °C
  . engine air intake: 30 °C

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2. HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 2 Agoust 1996.

2.1 HYDRAULIC POWER TEST

- Sustained pressure with relief valve open: 18.0 MPa;
- Pump delivery rate at minimum pressure: 61.0 l/min;

	Power kW	Flow rate l/min	Pressure MPa	Oil temp. °C
At 90% of the actual relief valve setting	12.4	45.9	16.2	64
Maximum	12.8	49.6	15.5	64

- Tapping point used for test: at rear of tractor;
- Temperature of hydraulic fluid if different from 65 ± 5 °C: - °C;
- Opening pressure of the unloading valve: - MPa;
- Closing pressure of the unloading valve: - MPa.

2.2 REAR POWER LIFT

		At hitch point	On the frame
Height of lower hitch point above ground in down position	mm	300	300
Vertical movement			
without lifting forces	mm	720	773
with lifting forces	mm	712	754
Maximum corrected force exerted through full range	kN	20.70	21.19
Corresponding pressure of hydraulic fluid	MPa	16.2	16.2
Moment about rear axle	kNm	21.94	35.39
Maximum tilt angle of mast over range of lift	degrees	-	5

Lifting heights relative to the horizontal lower links												
mm	- 240	- 229	-200	-100	0	+100	+200	+300	+ 400	+ 472	+500	+ 525
Lifting forces at hitch points, corrected to 16.2 MPa												
kN	20.70	-	21.50	23.44	24.99	26.31	27.13	28.23	30.35	32.05	-	-
Lifting forces at test frame, corrected to 16.2 MPa												
kN	-	21.19	21.32	22.60	23.49	23.97	24.01	23.62	23.49	-	23.35	23.31

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2.3 FRONT POWER LIFT

		At hitch point	On the frame
Height of lower hitch point above ground in down position	mm	160	160
Vertical movement			
without lifting forces	mm	625	603
with lifting forces	mm	590	557
Maximum corrected force exerted through full range	kN	16.95	15.01
Corresponding pressure of hydraulic fluid	MPa	16.2	16.2
Moment about rear axle	kNm	21.31	28.02
Maximum tilt angle of mast over range of lift	degrees	-	1

Lifting heights relative to the horizontal lower links									
mm	- 400	- 357	-300	-200	- 100	0	+100	+190	+ 200
Lifting forces at hitch points, corrected to 16.2 MPa									
kN	19.49	-	18.54	17.94	17.76	17.53	17.19	16.95	-
Lifting forces at test frame, corrected to 16.2 MPa									
kN	-	24.15	22.49	19.93	18.63	17.44	16.29	-	15.01

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3. DRAWBAR PERFORMANCE

- Date of test: 26 July 1996;
- Type of track: concrete.

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
	mm	kPa	kPa
Unballasted	580	160	160
Ballasted	585	160	160

Gear and range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperatures			Atmospheric conditions		
								Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
1NH	34.6	36.73	3.39	2639	15	406	2.06	32	85	112	23	75	100.0
4SH	33.4	35.52	3.39	2622	15	456	1.84	32	85	112	23	75	100.0
2NL	35.5	36.41	3.51	2626	15	420	1.99	32	85	112	23	75	100.0
5SM	38.4	36.47	3.79	2619	15	397	2.11	32	86	112	22	74	100.0
2NM	41.4	35.60	4.19	2614	15	369	2.27	32	86	114	23	74	100.2
5SH	43.0	34.47	4.49	2499	13	378	2.22	32	86	113	23	74	100.2
3NL	46.0	35.61	4.65	2504	12	350	2.39	34	85	114	24	72	100.1
2NH	47.3	33.82	5.04	2499	11	344	2.43	34	87	114	24	73	100.1
3NM	48.5	31.19	5.60	2499	10	336	2.50	32	86	113	25	72	100.2
4NL	47.5	27.16	6.30	2504	8	337	2.49	32	87	112	24	72	100.2
3NH	48.3	24.37	7.13	2499	8	336	2.50	33	87	112	25	71	100.2
1FL	49.1	23.78	7.44	2501	7	329	2.54	35	87	112	25	71	100.2
4NM	51.1	23.93	7.69	2494	7	320	2.62	35	87	113	25	71	100.2
5NL	48.9	19.98	8.81	2504	5	330	2.54	34	86	114	25	70	100.3
1FM	52.0	20.85	8.98	2499	5	315	2.66	32	87	112	26	70	100.3
4NH	47.5	17.52	9.77	2500	4	343	2.44	32	87	112	26	70	100.2
5NM	47.7	16.13	10.64	2500	4	341	2.46	32	86	113	26	69	100.3

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Gear and range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperatures			Atmospheric conditions		
								Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
	kW	· kN	km/h	rev/min	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.2 MAXIMUM POWER IN TESTED GEARS (ballasted tractor)													
1CL	2.7	34.11	0.29	2715	15	2382	0.35	33	85	110	28	53	100.2
1CM	3.0	35.23	0.31	2715	15	2172	0.39	33	85	110	28	53	100.2
1CH	4.1	36.88	0.40	2717	15	1537	0.55	32	84	110	28	53	100.2
2CL	3.7	38.32	0.35	2720	15	1613	0.52	32	84	109	28	53	100.2
2CM	5.2	38.25	0.49	2717	15	1221	0.69	32	85	109	28	53	100.[illegible]
3CL	5.9	41.19	0.52	2720	15	1029	0.81	33	85	110	29	52	100.2
2CH	6.3	41.97	0.54	2700	15	1272	0.66	33	86	100	29	52	100.2
3CM	7.3	42.25	0.62	2710	15	977	0.86	34	85	111	28	52	100.3
4CL	7.6	42.06	0.65	2702	15	955	0.88	34	85	111	29	53	100.2
3CH	8.8	42.83	0.74	2695	15	989	0.85	32	86	110	29	52	100.2
4CM	10.0	41.34	0.87	2695	15	875	0.96	33	86	110	29	52	100.1
1SL	10.5	39.33	0.96	2700	15	772	1.09	33	87	111	29	52	100.2
5CL	10.0	39.23	0.92	2695	15	864	0.97	32	87	111	29	52	100.2
4CH	10.7	40.32	0.96	2695	15	811	1.03	32	87	113	29	51	100.2
1SM	12.8	41.79	1.10	2700	15	636	1.32	32	88	112	30	51	100.2
5CM	12.7	41.19	1.11	2690	15	748	1.12	33	87	113	30	52	100.3
1SH	16.7	42.35	1.42	2695	15	527	1.59	32	87	113	30	52	100.3
5CH	16.3	42.52	1.38	2683	15	593	1.41	32	87	113	30	52	100.3
2SL	15.1	39.33	1.38	2693	15	560	1.50	32	87	113	30	51	100.3
2SM	18.7	41.83	1.61	2683	15	519	1.62	32	86	114	30	52	100.3
3SL	20.3	40.70	1.80	2678	15	526	1.59	33	86	113	31	51	100.3
2SH	21.6	39.03	1.99	2683	15	452	1.85	33	86	113	30	51	100.3
3SM	22.4	37.17	2.17	2671	15	480	1.74	34	87	114	30	51	100.3
1NL	25.7	38.10	2.43	2668	15	436	1.92	33	87	114	30	51	100.3
4SL	25.1	38.03	2.38	2666	15	469	1.79	33	87	114	31	50	100.3
3SH	27.5	36.68	2.70	2658	15	445	1.88	32	86	114	31	50	100.3
1NM	30.6	38.02	2.90	2651	15	429	1.95	32	87	112	31	51	100.2
4SM	28.9	35.88	2.90	2646	15	459	1.83	32	87	113	31	50	100.2

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Gear and range	Power kW	Drawbar pull kN	Speed km/h	Engine speed rev/min	Slip of wheels %	Specific fuel consumption g/kWh	Specific energy kWh/l	Temperatures Fuel °C	Coolant °C	Engine oil °C	Atmospheric conditions Temperature °C	Relative humidity %	Pressure kPa
3.2 MAXIMUM POWER IN TESTED GEARS (ballasted tractor) continued													
5SL	35.3	38.54	3.30	2646	15	377	2.23	33	86	113	31	51	100.2
1NH	34.2	35.57	3.46	2656	15	371	2.26	32	86	113	32	51	100.0
4SH	34.5	35.96	3.45	2641	15	406	2.06	32	85	113	32	50	100.0
2NL	35.0	35.81	3.52	2634	15	407	2.06	32	86	113	32	50	100.0
5SM	39.3	37.31	3.79	2624	15	386	2.17	33	86	112	32	50	100.0
2NM	44.5	38.68	4.14	2612	15	344	2.44	33	86	113	33	50	100.2
5SH	45.1	34.74	4.67	2506	10	355	2.36	34	87	114	33	50	100.2
3NL	48.6	37.22	4.70	2501	10	332	2.53	34	86	114	33	49	100.1
2NH	48.6	34.15	5.12	2504	10	329	2.54	34	86	113	32	49	100.1
3NM	50.2	30.94	5.84	2499	7	325	2.58	33	87	113	32	49	100.2
4NL	50.6	28.34	6.43	2499	7	323	2.60	34	87	114	33	49	100.2
3NH	48.9	24.51	7.19	2494	6	334	2.51	33	87	113	32	48	100.2
1FL	50.1	24.03	7.51	2497	5	323	2.59	32	86	113	32	48	100.2
4NM	51.5	23.67	7.83	2501	5	316	2.65	33	86	113	33	48	100.2
5NL	51.6	21.35	8.70	2501	5	314	2.66	33	87	113	33	49	100.3
1FM	52.8	21.04	9.03	2499	4	306	2.73	32	87	114	32	48	100.2
4NH	48.7	17.95	9.77	2500	4	334	2.51	32	87	113	32	48	100.2
5NM	50.5	17.16	10.59	2500	4	323	2.60	32	87	113	32	48	100.3
3.3 FIVE HOUR TESTS													
3.3.1 FIVE HOUR TEST at 75% of pull at maximum power													
3NH	39.5	18.44	7.71	2626	4	380	2.21	34	87	113	29	55	100.2
3.3.2 FIVE HOUR TEST at pull corresponding to 15% wheel slip with additional ballast: 85 kg													
2NM	47.3	38.50	4.42	2599	(*)	(*)	(*)	35	87	114	30	56	100.2

(*) *Having the test been carried out with additional ballast, these figures are irrelevant*

Oil consumption during ten hours duration of tests 3.3.1 and 3.3.2: 71g/h.

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4.TURNING AREA AND TURNING CIRCLE (front wheel drive disengaged)

	With brakes		Without brakes	
	left-hand	right-hand	left-hand	right-hand
	m	m	m	m
Radius of turning area	4.07	4.00	5.85	5.66
Radius of turning circle	3.75	3.65	5.53	5.31

5. LOCATION OF CENTRE OF GRAVITY

	mm
Height above ground	905
Distance forward from rear axle centre	1085
Distance from tractor's median plane to the left	4

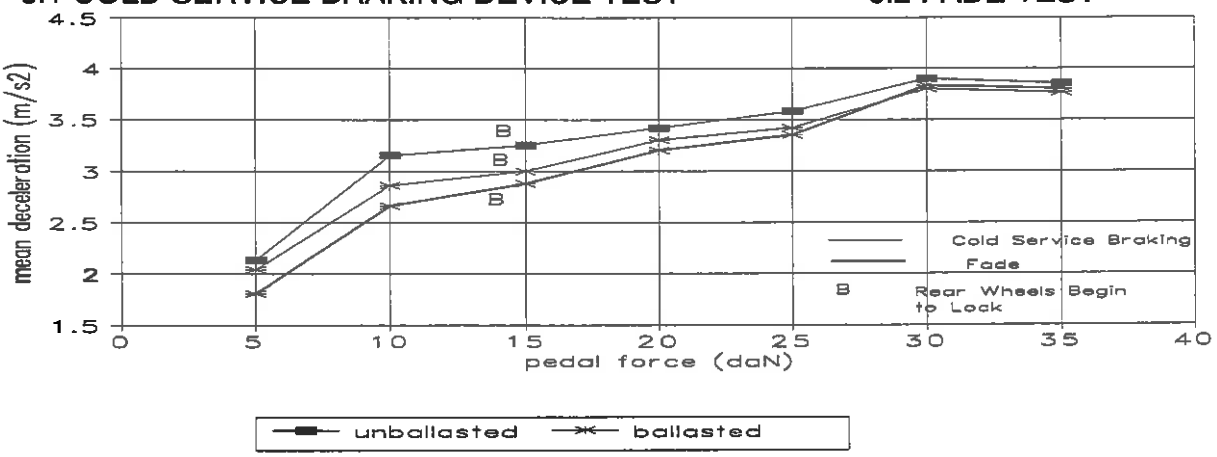
6. BRAKING (front wheel drive disengaged)

- Date of test: 1 August 1996;
- Type of track: concrete.

	Tractor mass (with driver)			Speed before application brakes
	front	rear	total	
	kg	kg	kg	km/h
Unballasted	2000	2375	4375	42.0
Ballasted	2525	2480	5005	42.0

6.1 COLD SERVICE BRAKING DEVICE TEST

6.2 FADE TEST



No significant deviation of tractor from original course and no abnormal vibrations
The tractor brakes were heated by towing of the tractor for 1 km

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6.3 PARKING BRAKE

	Ballasted tractor on 18% slope	
	up	down
	daN	daN
Braking device control force	10.8	12.7

7. MEASUREMENT OF EXTERNAL NOISE LEVEL

- Date of test: 5 August 1996;
- Type of track: concrete;
- Type of sound level meter: BRÜEL & KJÆR model 2231.

Gear	Travelling speed before acceleration	Sound level
	km/h	dB(A)
5 FAST high	31.5	82.9

8. REPAIRS: none.

9. REMARKS

Due to a malfunction of the pressure valve occurred during the first drawbar performance test, the original gear box cover has been replaced with a new current type.

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APPENDIX

MEASUREMENT OF NOISE IN THE PROTECTIVE STRUCTURE - OECD code V

- Test report of: LAMBORGHINI 950 VDT "4WD" and HÜRLIMANN 909 VDT "4WD";
- OECD test Nos.: CSD 1385/143/NM 1679 and CSD 1385/59/NM 1679
- Protective structure: S+L+H C37;
- Gear box: heavy duty;
- Driver's seat: GRAMMER LS 95 H1/90 AR;
- Date of approval: 26 February 1996;
- Date of test: 22 to 23 November 1995;
- Location: ISMA, Via Milano 43, Treviglio BG, Italy;
- Type of sound level meter: BRÜEL & KJÆR 2231;
- Type of track: concrete.

Gear	Driving axles	Drawbar pull kN	Travelling speed km/h	Sound level a dB(A)	Sound level b dB(A)
Unloaded test in the gear giving the forward speed nearest to 7.5 km/h					
3 N high	1	0	7.9	77.2	87.5
3 N high	2	0	8.1	77.0	87.3
Unloaded test in the gear giving the maximum forward speed					
5 F high	1	0	41.3	76.8	88.8
5 F high	2	0	41.2	77.0	89.3
Test with the drawbar pull for which the tractor gives the maximum sound level in a gear giving the nominal forward speed nearest to 7.5 km/h					
3 N high	1	26.5	5.3	78.8	89.4
3 N high	2	23.4	6.9	78.5	89.7
Test with the drawbar pull for which the tractor gives the maximum sound level in any gear with a sound level increase of at least 1 dB(A) compared to the previous test					
-	-	-	-	-	-

a - *all openings closed*
b - *doors, side and rear windows and roof hatch open*

TEST ENGINEER
(Dr. Carlo BISAGLIA)

DIRECTOR OF TESTING STATION
(Prof. Giuseppe COLZANI)

HEAD OF ISMA
(Ing. Giovanni SANTORO)