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





LAMBORGHINI L10S704WVT

Trade name:
LAMBORGHINI 674-70 SPRINT VDT

HÜRLIMANN H10S704WVT

Trade name:
HÜRLIMANN XA 607 VDT

45 forward and 45 reverse speeds
40 km/h
four-wheel drive agricultural tractors

Manufactured by:	SAME DEUTZ-FAHR Group S.p.A. V.le F. Cassani 15 24047 Treviglio BG Italy
OECD approval No.:	1/1737 Full Code
Date of approval:	5 March 1998
Period of test:	November - December 1997

ISMA Via Milano 43 24047 Treviglio BG Italy
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Table of contents

SPECIFICATION OF TRACTOR 1

TEST CONDITIONS 16

TEST RESULTS

1. Main power take-off performance 20
2. Hydraulic power and lifting force 24
3. Drawbar performance 26
4. Turning area and turning circle 29
5. Location of centre of gravity 29
6. Braking performance 29
7. Measurement of external noise level 30
8. Repairs 30
9. Remarks 30

APPENDIX

Measurement of noise in the protective structure 31

The Lamborghini 674-70 Sprint VDT (4WD) and Hürlimann XA 607 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 674-70 Sprint VDT (4WD).

All stated dimensions and tests refer to tyre size 11.2R24 at front and 16.9R30 at rear, as well as to track widths 1700 mm at front and 1600 mm at rear.

Tractor manufacturer

- Name:	SAME DEUTZ-FAHR Group 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:	L10S704WVT, with 45 forward and 45 reverse speeds 40 km/h version;
- Trade name:	674-70 Sprint VDT;
- Type:	four-wheel drive, unit construction;
- Number of driving wheels:	4;
- Serial number:	1844;
- First serial number:	1001.

ENGINE

- Make:	SAME DEUTZ-FAHR Group;
- Model:	1000.4 W4;
- Type:	water cooled 4-stroke diesel, direct injection, naturally aspirated;
- Serial number:	23050.

Cylinders

- Number and disposition:	4, vertical, in-line;
- Bore x stroke:	105 x 115.5 mm;
- Capacity:	4000 cm^3;
- Compression ratio:	17:1;
- Arrangement of valves:	overhead;
- Cylinder liners:	wet liners.

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:	90 dm^3;
- Make, model and type of injection pump:	BOSCH PFR 1K 90 A 542, immersed, one per cylinder in line;
. serial number:	without serial number;
- Manufacturer's production setting of injection pump:	
. flow rate:	53 ± 2 mm^3/stroke at rated speed and full load corresponding 14.99 dm^3/h;
. timing:	16° before TDC;
- Make, model and type of injectors:	BOSCH DLLA 155S 1323 multihole injection nozzles;
- Injection pressure:	18 ± 1 MPa.

Governor

- Make:	SAME DEUTZ-FAHR Group;
- Model:	007.0992.4;
- Type:	electronic;
- Governor range of engine speed:	from 650 to 2530 rev/min;
- Rated engine speed:	2350 rev/min.

Air cleaner

- Pre-cleaner	
. make:	DONALDSON;
. model:	P 01-6330;
. type:	cyclone;
. location:	above the bonnet.
- Main filter	
. make:	DONALDSON;
. model:	FLG 08-0553 or 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 18.

Cooling system

- Type and detail:	water cooling with axial blower;
- Specification of fan:	propeller fan driven by engine shaft;
- Number of fan blades:	6;
- Fan diameter:	400 mm;
- Coolant capacity:	11 dm^3;
- Type of temperature control:	electrical control;
- Superpressure system:	60 kPa.

Starting system

- Make:	ISKRA;
- Model:	AZ 1349 12 V;
- Type:	electromagnetic engagement;
- Starter motor power rating:	3.0 kW;
- Cold starting aid:	thermostarter;
- Safety device:	electrical lockout on clutch and PTO controls;

Electrical equipment

- Voltage:	14 V;
- Generator	
. make:	ISKRA;
. model:	AAK 3563 14 V 65 A;
. type:	alternator;
. power:	65 A;
- Battery:	1lead acid;
. capacity:	100 Ah at 20 hours rating.

Exhaust system

- Make:	SAME DEUTZ-FAHR Group;
- Model:	DGM SA 3516;
- Type:	one reflection absorption chamber;
- Location:	on the left hand side of engine, horizontal position, under side bonnet;
- Height of outlet above ground:	460 mm.

TRANSMISSION

Clutch (utilized only for travelling of tractor)

- Make:	SAME DEUTZ-FAHR Group;
- Model:	650.23;
- Type:	single disk dry clutch;
- Number of plates:	1;
- Plates diameter:	305 mm;
- Control system:	hydraulic, operated by pedal.

Gear box

. make:	SAME DEUTZ-FAHR Group;
. model:	650.31;
. type:	mechanical synchromesh speed change gear; 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.
- Available options:	5 speed with 3 ranges of speeds (S/N/F), one electrohydraulic reduction gear (low/high), and one reverse group;
. number of gears:	30 forward and 15 reverse.

Rear axle and final drives

- Make:	own make;
- Model:	650.44;
- Type:	bevel gear differential and epicyclic final drive.

Rear differential lock

- Make:	own make;
- Model:	650.47;
- Type:	electrohydraulic;
- Control system:	engaged or disengaged by button.

Front axle and final drives

- Make: SAME DEUTZ-FAHR GROUP;
- Model: 650.43;
- Type: original SAME DEUTZ-FAHR system with central shaft, bevel gear drive, differential and epicyclic final drives.

Front differential lock

- Make: own make;
- Model: 648.46;
- Type: electrohydraulic;
- Control system: engaged or disengaged by button.

Total ratios and speed

Gear	Group	Number of engine revolutions for one revolution of the driving wheels			Nominal travelling speed at rated engine speed of 2350 rev/min (*) km/h		
		Low	Medium	High	Low	Medium	High
FORWARD							
1	Slow	3046.50	2537.39	2093.62	0.20	0.24	0.29
2	Slow	2131.73	1776.32	1464.72	0.29	0.35	0.42
3	Slow	1487.73	1239.74	1022.68	0.41	0.50	0.60
4	Slow	1064.51	887.29	731.86	0.58	0.69	0.84
5	Slow	765.28	637.31	525.94	0.80	0.97	1.17
1	Normal	482.13	401.70	331.41	1.28	1.53	1.86
2	Normal	337.59	281.41	231.91	1.82	2.19	2.66
3	Normal	235.62	196.27	161.87	2.61	3.14	3.80
4	Normal	168.55	140.58	115.83	3.65	4.38	5.32
5	Normal	121.28	100.98	83.41	5.08	6.10	7.38
1	Fast	87.62	73.01	60.14	7.03	8.43	10.24
2	Fast	61.38	50.99	42.32	10.03	12.08	14.55
3	Fast	42.82	35.64	29.45	14.38	17.28	20.91
4	Fast	30.69	25.49	21.04	20.06	24.15	29.27
5	Fast	22.03	18.32	15.10	27.95	33.61	40.77

(*) Calculated with a tyre dynamic radius index of 695 mm (ISO 4251/1-1992).

Number of revolutions of front wheels for one revolution of rear wheels: 1.383.

I.S.M.A.
ISTITUTO SPERIMENTALE PER LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

Total ratios and speed (continued)

Gear	Group	Number of engine revolutions for one revolution of the driving wheels			Nominal travelling speed at rated engine speed of 2350 rev/min (*) km/h		
		Low	Medium	High	Low	Medium	High
REVERSE							
1	Slow	3210.92	2674.33	2206.61	0.19	0.23	0.28
2	Slow	2246.78	1872.19	1543.76	0.27	0.33	0.40
3	Slow	1568.02	1306.64	1077.87	0.39	0.47	0.57
4	Slow	1121.96	935.18	771.36	0.55	0.66	0.80
5	Slow	806.58	672.23	554.33	0.76	0.92	1.11
1	Normal	508.15	423.37	349.29	1.21	1.45	1.76
2	Normal	355.81	296.60	244.43	1.73	2.08	2.52
3	Normal	248.34	206.86	170.60	2.48	2.98	3.61
4	Normal	177.65	148.17	122.08	3.47	4.16	5.04
5	Normal	127.82	106.43	87.91	4.82	5.79	7.00
1	Fast	92.34	76.95	63.39	6.67	8.00	9.71
2	Fast	64.69	53.74	44.61	9.52	11.46	13.80
3	Fast	45.13	37.56	31.04	13.64	16.39	19.84
4	Fast	32.35	26.87	22.17	19.04	22.92	27.77
5	Fast	23.22	19.30	15.91	26.52	31.90	38.70

(*) Calculated with a tyre dynamic radius index of 695 mm (ISO 4251/1-1992).

Number of revolutions of front wheels for one revolution of rear wheels: 1.383.

POWER TAKE-OFF

Mainver take-off proportional to engine speed

- Ty: 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;
- Nuer of shafts: 1;
- Mod of changing and dimsions of power take-off shaends: not changeable, 35 mm diameter, 6 splines, ISO 500-1991, type 1;
- Mod of changing speed: combination of internal and external hand lever;
- Height above ground: 785 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	2077	3.846	none
	611	2350		
750	750	2300	3.066	none
	766	2350		
1000	1000	2300	2.300	none
	1022	2350		

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

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

- Type:	independent, at front of tractor, in tracmedian plane, engaged or disengaged by pushton, driven by multiplate wet clutch indepent of travel clutch;
- Number and type of shafts:	1, ISO 500-1991, type 1 (35 mm dia, 6ines)
- Height above ground:	570 mm;
- Distance from the median plane of the tractor:	0 mm;
- Distance forward front axle:	647 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:	0.24 m;
- Number of power take-off shaft revolutions for one revolution of rear driving wheels:	14.74.

REAR POWER LIFT

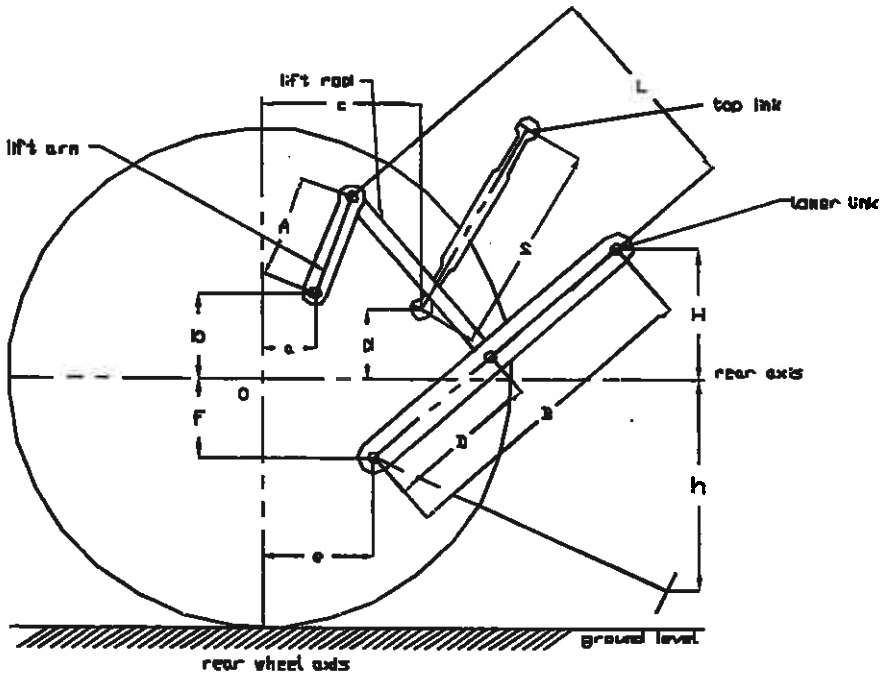
- Make:	SAME DEUTZ-FAHR Group;
- Model:	650.39;
- Type:	load sensing;
- Type of hydraulic system:	open centre system;
- Number and type of cylinders:	1 internal single-acting;
- Type of lock for transport:	hydraulic;
- Relief valves pressure setting:	18.0 ± 0.5 MPa;
- Opening pressure of anti-shock valve:	21.0 ± 0.5 MPa;

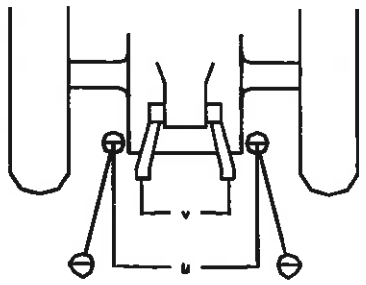
- Lift pump
  . make: BOSCH;
  . type: hydraulic rotary pumps, driven by engine shaft;
- Transmission between pump and engine: mechanical;
- Number and type of filters: 1, replaceable paper cartridge;
- Oil capacity: 41 dm^3;
- Site of oil reservoir: gear box;
- Number, type and location of tapping points: 7 ways distributor at rear of tractor;
- Maximum volume of oil available to external cylinders: 15 dm^3.

- Recommended oil: see page 18.

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)	250	250
Length of lower links	(B)	870	870
Distance of lift arm pivot point from rear wheel axis (behind)			
- horizontally	(a)	177	177
- vertically	(b)	315	315
Horizontal distance between the 2 lower link points	(u)	360	360
Horizontal distance between the 2 lift arm end points	(v)	450	450
Length of upper link	(S)	from 530 to 760	650
Distance of upper link pivot point from rear wheel axis			
- horizontally	(c)	397	397
- vertically	(d)	260-295-335	335
Distance of lower link pivot point from rear wheel axis			
- horizontally	(e)	183	183
- vertically	(f)	154	154
Distance of lower link pivot point to lift rod pivot points on lower links	(D)	400	400
Length of lift rods	(L)	from 535 to 689	620

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

Length of lift rods	(L)	535	689	620
Linkage distance of lift rods	(D)	400	400	400
Lowest position	(h)	290	662	495
Highest position	(H)	364	62	205
Height above ground of lower hitch points when locked in transport position (*)				909

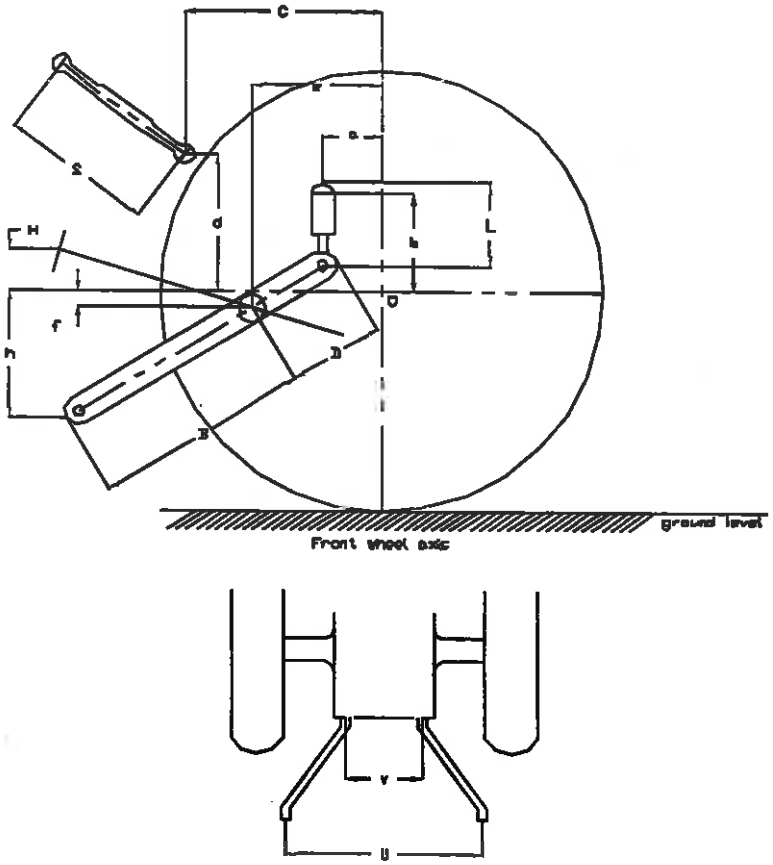
(*) *Assuming the dynamic radius index = 695 mm (ISO 4251/1-1992)*

FRONT POWER LIFT (optional, fitted on tested tractor)

- Make:	SAME DEUTZ-FAHR Group;
- Model:	ORIGINAL SAME SYSTEM 650.59 FRONT;
- Type of hydraulic system:	open centre system;
- 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:	41 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)	647	647
Distance of cylinders pivot point from front wheel axis (forward)			
- horizontally	(a)	245	245
- vertically	(b)	474	474
Horizontal distance between the 2 lower link points	(u)	855	855
Horizontal distance between the 2 lift arm end points	(v)	340	340
Length of upper link	(S)	from 450 to 680	451
Distance of upper link pivot point from front wheel axis			
- horizontally	(c)	592-617-634	634
- vertically	(d)	319-373-431	431
Distance of upper link pivot point from front wheel axis			
- horizontally	(e)	435	435
- vertically	(f)	25	25
Distance of lower link pivot point to cylinders pivot points on lower links	(D)	215	215
Length of cylinders			
- in low position	(L)	303	303
- in high position	(L)	503	503
Height of lower hitch points relative to the front wheel axis			
- in low position	(h)	320	315
- in high position	(H)	282	282
Height above ground of lower hitch points (*)			785

(*) *Assuming the dynamic radius index = 515 mm (ISO 4251/1-1992)*

SWINGING DRAWBAR: none.

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:	70 mm;
. max:	1051 mm;
- Horizontal distance behind power take-off shaft end:	555 mm;
- Diameter of the pinhole:	28 mm.

TRAILER HITCH

- Type:	KRAMER;
- Hole diameter:	28 mm;
- Height above ground	
. min:	555 mm;
. max:	950 mm;
- Distance of hitch point from rear wheel axis	
. horizontally:	607 mm;
- Distance of hitch point from power take-off shaft end	
. vertically:	155 mm below, 240 mm above;
. horizontally:	150 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 18.

BRAKES

Service brake

- Make:	SAME DEUTZ-FAHR Group;
- Model:	650.54;
- 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:	178 mm,
. rear disc diameter:	224 mm,
. material:	FRENDO HDT 303 SITERIX 2 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, 2 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:	1440 mm:
. max:	1740 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:	1400 mm;
. max:	1700 mm;
- Adjustment:	changing the position of the rims with respect to the disc.

WHEELBASE: 2186 mm.

PROTECTIVE STRUCTURE

Specifications

tractor	Seat	OECD approval number
LAMBORGHINI	GRAMMER DS 83 H / 7 L	CSS 0299/19
L10S704WVT	KAB P2 XH 2	CSS 0299/20
HÜRLIMANN	GRAMMER DS 83 H / 7 L	CSS 0299/3
H10S704WVT	KAB P2 XH 2	CSS 0299/4

- Date of approval: 28 October 1994;
- 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: 3000 kg;
- Make: S+L+H;
- Model: C 36;
- Type: cab, not tiltable;
- Manufacturer's name and address: SAME DEUTZ-FAHR GROUP S.p.A., Viale F. Cassani 15, 24047 Treviglio BG, Italy.

Details of materials used for sound proofing the protective structure

- Interior padding
  - . roof: vinyl + polyurethan, thickness 10 mm;
  - . roof front part: ABS, thickness 4 mm;
  - . floor: PVC, thickness 3 mm + polyurethan foam, 400/500 kg/m^3, thickness 25 mm + polythene film;
  - . seat support: PVC, thickness 3 mm + polyurethan foam, 400/500 kg/m^3, thickness 25 mm + polythene film;
  - . rear panel: PVC, thickness 3 mm + polyurethan foam, 400/500 kg/m^3, thickness 25 mm + polythene film;
  - . console panel: ABS, thickness 4 mm;
  - . mudguards: polystyrene, thickness 3 mm.
- Padding of gear levers box: polyurethan 1470 kg/m^3
- Glass
  - . type: security glass, thickness 5 and 6 mm;
  - . model: 43 R - 002493 (doors), 43 R - 29091 (windscreen), 43 R - 005171 (windows);
- Windscreen wipers: OSLV, parallelogram type;
- Direction indicators: COBO E3;
- Heaters and ventilators: BORLETTI;
- Draught proofing: SAIAG 8546.

DRIVER'S SEAT

Make	Model	Type	Width mm	Depth mm	Back rest height mm
GRAMMER	DS 83 H/7L	upholstered seat	490	415	390
KAB (*)	P 2/XH 2	with back rest	520	400	260

(*) fitted on tested tractor

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 out side edge of lights to median plane of tractor mm
Headligths	1105	160 x 100	210
Front parking lights	1855	110 x 35	805
Front direction indicator	1890	110 x 35	805
Rear parking lights	1500	50 x 60	705
Rear direction indicator	1500	50 x 60	755
Brake lights	1500	50 x 60	655
Reflectors	1145	∅ 80	702

TEST CONDITIONS

OVERALL DIMENSIONS

	Length		Width		Height at top of protective structure mm
	with front power lift mm	without front power lift mm	minimum mm	maximum mm	
Unballasted	4371	3856	1785	2180	2620
Ballasted	4441	4186	1785	2180	2620

- Ground clearance: 396 mm below front axle;

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	1450	1475	1785	1810
Rear	1700	1750	1770	1820
Total	3150	3225	3555	3630

BALLAST

	Weights		Water
	Number	Total mass kg	kg
Front	1	235	-
Rear wheels	4	170	-

TYRES AND TRACK WIDTH SPECIFICATIONS

	Front	Rear
Tyres		
make	PIRELLI	PIRELLI
model	TM 200	TM 300
dimensions	11.2R24	16.9R30
ply rating	-	-
load index/speed index	114 A8	137 A8
type	radial	radial
maximum load (tyre manufacturer's)	1157 daN	2196 daN
inflation pressure (tyre manufact.'s)	160 kPa	160 kPa
dinamic radius index	515 mm	695 mm
Chosen track width	1700 mm	1600 mm
Technically permissible axle load	2196 daN	3055 daN
Other tyres available	360/70R20 11.2R24 370/70R24	420/70R30 12.4R36 480/70R30

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	41	1200	2400(*)
Front PTO transmission	2.5	1200	-
Front axle / final drives	6 / 3	1200	-
Brakes	2.5	-	-

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

Specifications

	Recomended	Using during test
Engine oil		
Type	AKROS TURBO	AKROS TURBO
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

Grease

- Type: AKROS GREASE T2 NLGI2 LITIO/Ca;
- Number of lubrication points: 15.

FUEL

- Type: AGIP DIESEL, DIN 51601;
  (in accordance with the national standard)
- Density at 15 °C: 0.839 g/cm^3.

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

TEST RESULTS

COMPULSORY TESTS RESULTS

1. MAIN POWER TAKE-OFF PERFORMANCE

- Date and location of test: 29 October 1997, ISMA, Treviglio BG, Italy;

- Type of dynamometer: ZÖLLNER 350 AC.

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						
47.6	2348	1021	14.99	12.58	264	3.17
1.2 POWER AT RATED ENGINE SPEED						
47.6	2348	1021	14.99	12.58	264	3.17
1.3 STANDARD POWER TAKE-OFF SPEED (1000 rev/min)						
47.1	2299	1000	14.70	12.33	262	3.20
1.4 PART LOADS 1.4.1 The torque corresponding to maximum power at rated engine speed						
47.6	2348	1021	14.99	12.58	264	3.17
1.4.2 85% of torque obtained in 1.4.1						
42.0	2436	1059	13.48	11.31	269	3.11
1.4.3 75% of torque defined in 1.4.2						
32.2	2501	1087	11.17	9.37	291	2.88
1.4.4 50% of torque defined in 1.4.2						
21.6	2517	1094	9.05	7.59	351	2.39
1.4.5 25% of torque defined in 1.4.2						
10.9	2539	1104	6.88	5.77	529	1.58
1.4.6 unloaded						
0	2561	1113	4.56	3.83	-	-

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

Power	Speed		Fuel consumption			Specific energy
	Engine	PTO	Hourly		Specific	
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						
47.1	2299	1000	14.70	12.33	262	3.20
1.5.2 85% of torque obtained in 1.5.1						
41.5	2382	1036	12.80	10.74	259	3.25
1.5.3 75% of torque defined in 1.5.2						
32.0	2451	1066	10.99	9.22	289	2.91
1.5.4 50% of torque defined in 1.5.2						
21.5	2475	1076	8.90	7.47	347	2.42
1.5.5 25% of torque defined in 1.5.2						
10.7	2495	1085	6.51	5.46	508	1.65
1.5.6 unloaded						
0	2512	1092	4.48	3.76	-	-

- No load maximum engine speed: 2561 rev/min;
- Equivalent flywheel torque at rated engine speed: 193.68 Nm;
- Equivalent flywheel torque at 2-hour test: 193.68 Nm;
- Maximum equivalent flywheel torque: 246.63 Nm at 1419 rev/min of the engine.

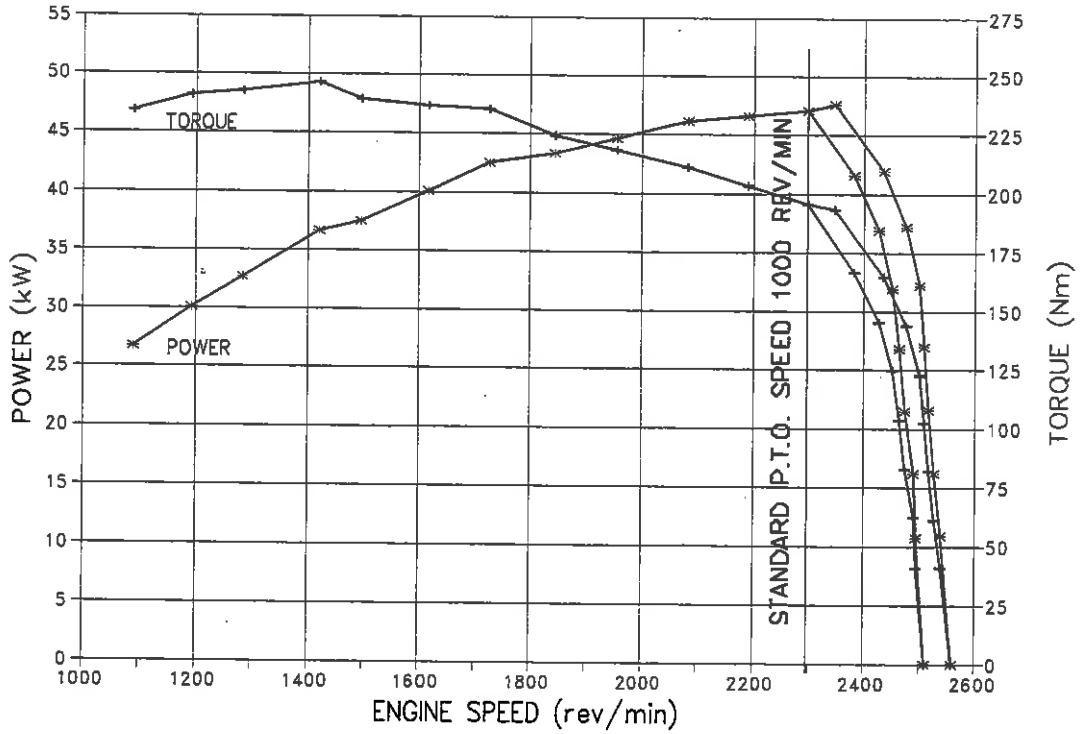
- Mean atmospheric conditions

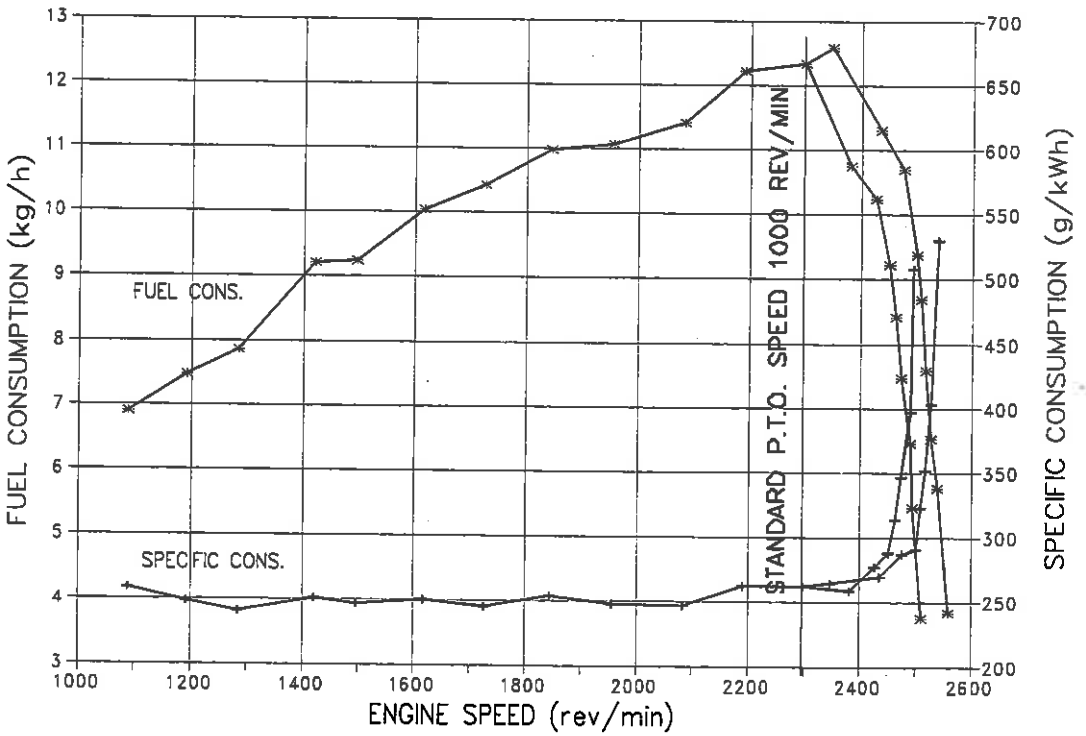
. temperature: 19°C
. pressure: 99.9 kPa
. relative humidity: 62%

- Maximum temperatures

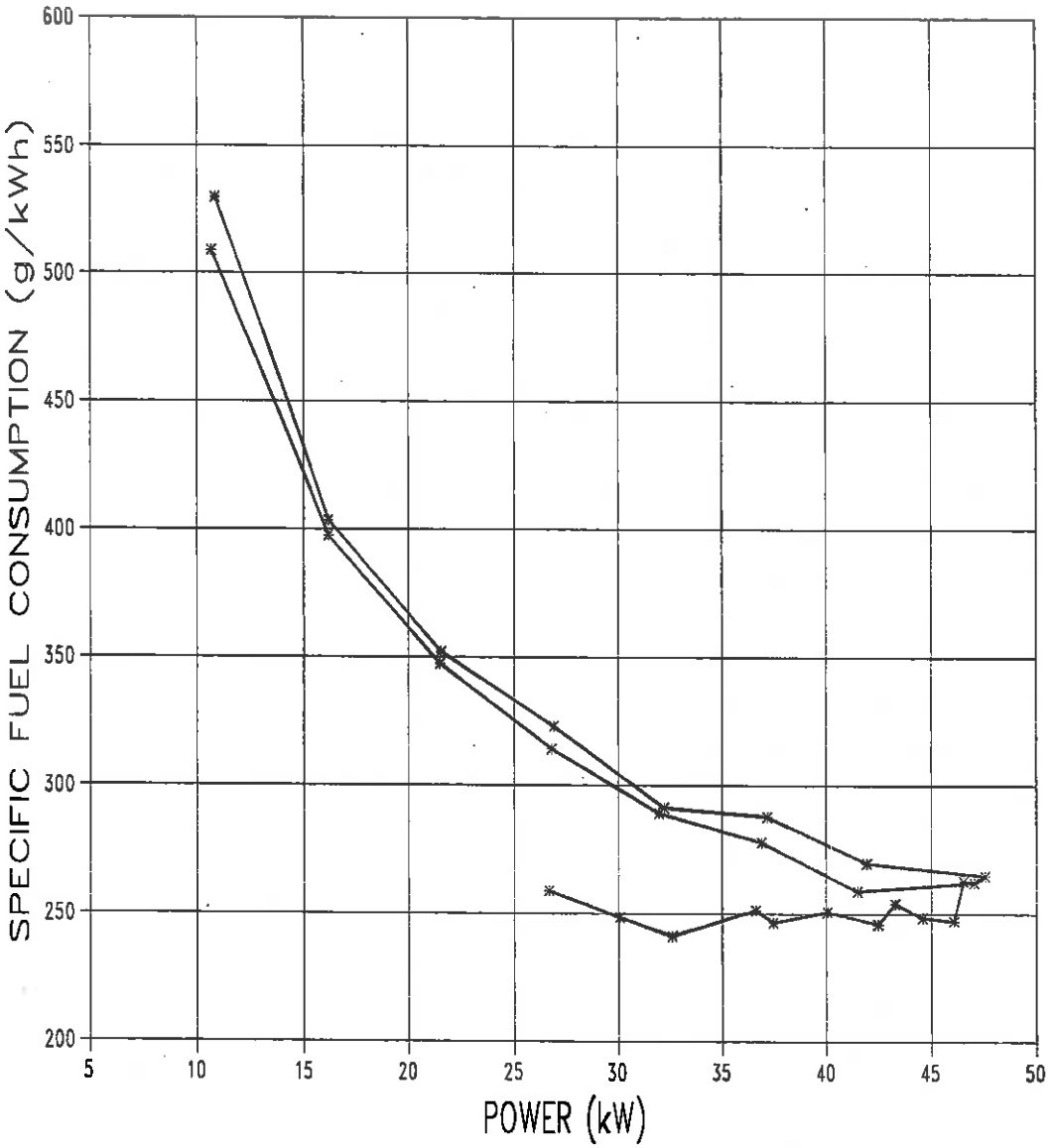
. coolant: 84°C
. engine oil: 122°C
. fuel: 29°C
. engine air intake: 22°C

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO





ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO



ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

2. HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 3 November 1997.

2.1 HYDRAULIC POWER TEST

- Sustained pressure with relief valve open: 18.0 MPa;
- Pump delivery rate at minimum pressure: 47.8 l/min;

	Power kW	Flow rate l/min	Pressure MPa	Oil temp. °C
At 90% of the actual relief valve setting	12.42	46.0	16.2	69
Maximum	12.43	46.6	16.0	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	200	200
Vertical movement			
without lifting forces	mm	700	701
with lifting forces	mm	651	641
Maximum corrected force exerted through full range	kN	24.47	22.60
Corresponding pressure of hydraulic fluid	MPa	16.2	16.2
Moment about rear axle	kNm	25.77	37.58
Maximum tilt angle of mast over range of lift	degrees	-	2

Lifting heights relative to the horizontal lower links											
mm	-341	-310	-300	-200	-100	0	+100	+200	+300	+310	+331
Lifting forces at hitch points, corrected to 16.2 MPa											
kN	24.70	-	24.47	25.37	26.03	26.73	26.55	26.65	26.67	26.69	-
Lifting forces at test frame, corrected to 16.2 MPa											
kN	-	28.02	27.39	26.22	25.56	24.83	23.59	22.88	22.66	-	22.60

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

2.3 FRONT POWER LIFT

		At hitch point	On the frame
Height of lower hitch point above ground in down position	mm	190	190
Vertical movement			
without lifting forces	mm	597	708
with lifting forces	mm	580	681
Maximum corrected force exerted through full range	kN	12.57	9.12
Corresponding pressure of hydraulic fluid	MPa	16.2	16.2
Moment about rear axle	kNm	13.60	15.43
Maximum tilt angle of mast over range of lift	degrees	-	10

Lifting heights relative to the horizontal lower links										
mm	-290	-285	-200	-100	0	+100	+200	+290	+300	+396
Lifting forces at hitch points, corrected to 16.2 MPa										
kN	12.57	-	12.67	13.08	13.41	13.62	13.75	13.87	-	-
Lifting forces at test frame, corrected to 16.2 MPa										
kN	-	13.99	13.31	12.71	12.17	11.50	10.68	-	9.71	9.12

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

3. DRAWBAR PERFORMANCE

- Date of test: 4 to 18 November 1997;
- Type of track: concrete.

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
Unballasted	540 mm	160 kPa	160 kPa
Ballasted	542 mm	160 kPa	160 kPa

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)													
1NL	9.5	29.03	1.18	2526	14	705	1.19	26	85	98	12	63	99.8
1NM	11.1	28.79	1.39	2523	15	630	1.33	26	85	98	12	63	99.8
2NL	12.3	26.46	1.67	2519	14	595	1.41	26	85	98	12	63	99.8
1NH	12.5	26.40	1.70	2517	15	618	1.36	27	85	98	13	64	99.8
2NM	14.1	25.44	2.00	2513	15	587	1.43	26	84	99	13	64	99.7
3NL	15.3	23.10	2.38	2509	15	570	1.47	26	84	99	13	63	99.7
2NH	15.6	23.34	2.41	2507	15	570	1.47	26	84	98	13	63	99.8
3NM	20.6	25.99	2.85	2504	15	442	1.90	26	83	98	13	64	99.8
4NL	22.9	24.79	3.32	2500	15	411	2.04	26	84	100	14	63	99.7
3NH	24.4	25.72	3.42	2495	15	397	2.11	26	85	100	13	62	99.7
4NM	26.1	23.63	3.97	2489	15	384	2.19	27	85	100	14	62	99.6
5NL	31.6	24.81	4.59	2490	15	313	2.68	27	85	99	15	62	99.9
4NH	29.0	21.81	4.79	2484	15	355	2.36	26	86	99	15	62	99.8
5NM	38.3	23.80	5.79	2470	10	282	2.97	26	84	99	15	61	99.9
1FL	41.1	22.86	6.48	2350	8	301	2.78	25	85	100	15	61	99.9
5NH	38.5	20.10	6.89	2350	7	322	2.60	25	85	100	15	61	100.0
1FM	42.6	19.23	7.97	2351	6	294	2.86	25	84	101	15	61	100.0
2FL	41.7	15.85	9.47	2350	6	300	2.80	24	84	101	15	62	100.0
1FH	39.2	14.44	9.77	2350	5	316	2.65	24	85	101	15	61	99.9
2FM	42.6	13.10	11.71	2349	3	293	2.86	25	85	101	15	61	99.9
3FL	42.6	11.02	13.92	2349	3	293	2.86	25	85	101	14	60	99.9
2FH	41.8	10.62	14.16	2350	3	299	2.80	25	84	100	15	60	100.0

I.S.M.A.
ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

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)													
1SL	1.6	30.40	0.19	2547	14	3156	0.27	29	86	99	14	62	99.8
1SM	2.0	30.69	0.23	2546	14	2679	0.31	29	86	99	14	62	99.8
2SL	2.3	30.20	0.27	2543	15	2389	0.35	29	85	99	14	62	99.8
1SH	2.2	29.42	0.27	2542	15	2489	0.34	28	85	99	14	62	99.8
2SM	2.7	29.71	0.33	2541	13	2059	0.41	28	84	99	14	61	99.8
3SL	3.1	29.62	0.38	2540	15	1805	0.46	29	84	98	14	61	99.8
2SH	3.4	31.48	0.39	2537	14	1730	0.48	29	85	98	14	61	99.7
3SM	4.0	31.19	0.46	2537	15	1482	0.57	28	85	98	14	61	99.8
4SL	4.5	30.89	0.53	2534	15	1341	0.63	28	85	99	15	61	99.8
3SH	4.8	31.68	0.55	2532	15	1302	0.64	28	86	99	14	61	99.9
4SM	6.1	34.32	0.64	2531	15	1049	0.80	28	86	100	15	62	99.9
5SL	5.8	28.44	0.74	2529	15	1113	0.75	28	86	99	15	62	99.9
4SH	6.8	32.02	0.77	2527	15	978	0.86	28	86	99	15	61	100.0
5SM	8.2	33.73	0.88	2522	15	862	0.97	29	85	98	15	61	100.0
5SH	9.4	31.49	1.07	2518	15	801	1.05	29	85	99	14	61	100.0
1NL	10.3	31.99	1.16	2522	15	689	1.22	28	86	99	14	60	99.9
1NM	11.7	29.91	1.41	2517	15	632	1.33	28	86	100	15	60	99.9
2NL	13.5	29.42	1.65	2515	15	593	1.41	28	86	100	15	60	99.9
1NH	15.4	32.54	1.70	2511	15	553	1.52	28	85	100	14	59	100.0
2NM	16.8	30.40	1.99	2506	15	530	1.58	28	86	100	14	59	100.0
3NL	17.4	26.29	2.38	2503	15	532	1.58	27	86	101	14	60	100.0
2NH	18.5	27.60	2.41	2500	15	509	1.65	27	85	100	15	59	99.8
3NM	21.7	27.46	2.84	2495	15	446	1.88	28	86	100	14	59	99.8
4NL	25.5	27.95	3.29	2472	15	419	2.00	28	87	99	14	59	99.8

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

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) continued													
3NH	27.0	28.44	3.42	2470	15	400	2.10	28	86	100	15	59	99.8
4NM	30.0	27.46	3.93	2470	15	360	2.33	28	86	101	15	59	99.8
5NL	35.7	28.44	4.52	2450	15	311	2.70	27	86	101	15	59	99.9
4NH	32.2	24.52	4.73	2450	15	345	2.43	27	87	101	16	60	99.8
5NM	40.1	26.18	5.51	2350	10	312	2.69	27	87	100	16	59	99.8
1FL	42.0	23.07	6.56	2350	7	297	2.82	28	87	100	15	59	99.8
5NH	39.9	20.59	6.97	2349	6	311	2.70	28	87	101	16	58	99.9
1FM	41.2	18.75	7.91	2349	6	301	2.79	28	86	101	15	59	99.9
2FL	42.3	16.18	9.42	2350	6	295	2.84	27	86	101	15	59	100.0
1FH	39.9	14.71	9.76	2349	5	314	2.68	26	85	102	15	59	100.0
2FM	42.4	13.14	11.62	2350	4	295	2.85	26	86	102	15	60	100.0
3FL	41.9	10.79	13.98	2350	3	296	2.83	27	85	102	16	60	100.1
2FH	40.5	10.30	14.16	2350	3	306	2.74	26	86	101	15	59	100.1

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
3.3 FIVE HOUR TESTS													
3.3.1 FIVE HOUR TEST at 75% of pull at maximum power													
5NH	31.1	14.71	7.61	2467	3	349	2.40	26	85	101	16	57	99.8
3.3.2 FIVE HOUR TEST at pull corresponding to 15% wheel slip with additional ballast: 85 kg													
4NH	35.8	24.52	5.26	2455	(*)	(*)	(*)	26	85	102	14	60	99.6

(*) *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: 43 g/h.

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

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	4.14	4.45	5.09	4.88
Radius of turning circle	3.84	4.10	4.81	4.62

5. LOCATION OF CENTRE OF GRAVITY

	mm
Height above ground	921
Distance forward from rear axle centre	1006
Distance from tractor's median plane to the right	1

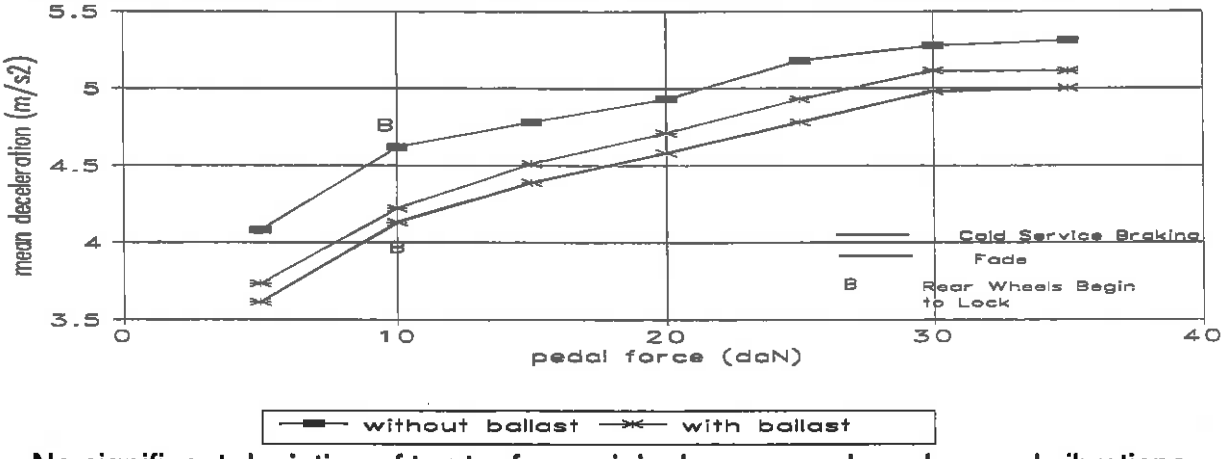
6. BRAKING (front wheel drive disengaged)

- Date of test: 19 November 1997;
- Type of track: concrete.

	Tractor mass (with driver)			Speed before application brakes
	front	rear	total	
	kg	kg	kg	km/h
Unballasted	1475	1750	3225	44.1
Ballasted	1810	1820	3630	44.1

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

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

6.3 PARKING BRAKE

	Ballasted tractor on 18% slope	
	up	down
	daN	daN
Braking device control force	13.0	13.0

7. MEASUREMENT OF EXTERNAL NOISE LEVEL

- Date of test: 2 December 1997;
- 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	33.1	83.4

8. REPAIRS: none.

9. REMARKS: none.

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

APPENDIX

MEASUREMENT OF NOISE IN THE PROTECTIVE STRUCTURE - OECD code V

- Test report of: LAMBORGHINI L10S704WVT "4WD";
- Protective structure: S+L+H C36;
- Driver's seat: GRAMMER DS 83 H/7L;
- OECD test No.: CSS 0299/19/NM 1858;
- Date of approval: 18 October 1996;
- Date of test: 24 September 1996;
- Location: ISMA, Via Milano 43, Treviglio BG, Italy;
- Type of sound level meter: BRÜEL & KJÆR 2231;
- Type of track: concrete.

Test carried out with all openings closed

Gear	Driving axles	Drawbar pull kN	Engine speed rev/min	Travelling speed km/h	Sound level dB(A)
Unloaded test in the gear giving the forward speed nearest to 7.5 km/h					
5 Normal high	1	0	2496	7.8	75.0
5 Normal high	2	0	2495	7.8	75.1
Unloaded test in the gear giving the maximum forward speed					
5 Fast high	1	0	2492	43.2	78.0
5 Fast high	2	0	2490	43.1	78.0
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					
5 Normal high	1	13.64	2410	6.8	76.3
5 Normal high	2	10.00	2436	7.1	77.0
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					
5 Normal medium	1	13.34	2430	5.9	77.9
5 Normal medium	2	15.30	2440	6.1	79.0

TEST ENGINEER
(Dr. Carlo BISAGLIA)

DIRECTOR OF TESTING STATION
(Prof. Giuseppe COLZANI)

HEAD OF ISMA
(Ing. Giovanni SANTORO)