Consiglio Nazionale delle Ricerche
ISTITUTO PER LA MECCANIZZAZIONE AGRICOLA
Strada delle Cacce, 73 - 10135 TORINO (Italy)

Report No. 2075/T/1996

TEST IN ACCORDANCE WITH THE OECD FULL
CODE FOR THE OFFICIAL TESTING OF AGRICULTURAL TRACTORS

TRACTORS: Make: **S+L+H**

Models: **HÜRLIMANN 908 V/DT**
with 60 Forward and 60 Reverse Speeds

Type: **4 WD - 40 km/h Version**

Date of approval: 25th September 1996 O.E.C.D. No. 1634/1 FULL CODE

Models: **LAMBORGHINI 850 V/DT**
with 60 Forward and 60 Reverse Speeds

Type: **4 WD - 40 km/h Version**

Date of approval: 25th September 1996 O.E.C.D. No. 1634/2 FULL CODE



Manufactured by: S+L+H S.p.A. - TREVIGLIO (Italy)

Date and location of the tests: June÷July 1996 - TORINO (Italy)

This report has been approved by the O.E.C.D. Co-ordinating Center (CEMAGREF, France) as being in accordance with the O.E.C.D. Tractor Test Code.

PRELIMINARY REMARK

The S+L+H LAMBORGHINI 850 V/DT (4 WD) and the S+L+H HÜRLIMANN 908 V/DT (4 WD) tractors are technically identical in all main respects, except with regard to the following items:

- model designation;
- colour;
- side bonnet design.

Therefore, tests have not been repeated, and approval number is valid for both tractor models.
All tests were carried out on the S+L+H LAMBORGHINI 850 V/DT (4 WD) tractor. Measurement of external noise level has been carried out on the S+L+H HÜRLIMANN 908 V/DT (4 WD) tractor too, in order to verify difference between the models.

This bulletin is based on engineering tests in accordance with O.E.C.D. Full Code (Code I).
It does not contain an evaluation of performance of the tractor on practical farm work.

The S+L+H LAMBORGHINI 850 V/DT (4 WD) and the S+L+H HÜRLIMANN 908 V/DT (4 WD) tractors are manufactured in following variants:

1. with 60 forward and 60 reverse speeds (5x4 gear units plus one reduction gear (HI-MEAN-LO) and one reverse group);

2. with 40 forward and 40 reverse speeds (5x4 gear units plus one reduction gear (HI- LO) and one reverse group);

Tests have been carried out on tractor with the first variant.

In this report all performance characteristics are given corresponding to the International System of Units.

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- Tractor manufacturer's name and address:	S+L+H S.p.A. Viale Cassani, 15 24047 TREVIGLIO (BG) - Italy
- Location of tractor assembly:	TREVIGLIO (BG) - ITALY
- Submitted for test by:	The Manufacturer
- Selected for test by:	Manufacturer with the agreement of IMA
- Place of running-in:	TREVIGLIO (BG) - ITALY
- Duration of running-in:	Appr. 50 hours
- Location of test :	IMA - Torino - Italy

1 SPECIFICATIONS OF TRACTOR

1.1 IDENTIFICATION

- Make/Model/Type:	S+L+H S.p.A., LAMBORGHINI 850 V/DT (4WD), wheeled tractor, unit construction, all wheels drive tractors
- Number of driving wheels:	4
- Serial N°:	1196
- 1st serial N°:	1001

1.2 ENGINE

- Make/Model/Type:	S+L+H S.p.A., 1000.4 WT3, water cooled, 4 stroke, Diesel engine, direct injection
- Serial N°:	1231

1.2.1 Cylinders

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

1.2.2 Supercharging

- Make/Model/Type:	GARRETT make, TA 31-50 model, supercharger driven by exhaust gas type
- Pressure:	60 kPa

1.2.3 Fuel system

- Fuel feed system:	AC CORONE fuel feed pump
- Make/Model/type of fuel filter(s):	n° 1, FIAMM FNA 166/20, with replaceable cartridge and n° 1 pre-filter on the intake line with replaceable cartridge

- Capacity of fuel tank:	150 dm^3
- Make/Model/Type of injection pump:	BOSCH PFR 1K 90A 517, immersed pump, one for cylinder, without serial number, in line injection pump
- Serial N°:	none
- Manufacturer's production setting of injection pump:	
- flow rate:	62 mm^3/stroke at rated speed and full load corresponding 18.71 dm^3/h
- timing:	16.0° before TDC
- Make/Model/Type of injectors:	BOSCH DLLA 150 S 925 multihole injection nozzles
- Injection pressure:	18 ± 1 MPa
- Make/Model/Type of carburettor:	none

1.2.4 Governor

- Make/Model/Type:	S+L+H, 007.0992.4, mechanical
- Governed range of engine speed:	from 650 to 2735 rev/min
- Rated engine speed:	2500 rev/min

1.2.5 Air cleaner

- Pre-cleaner:	
• Make/Model/Type:	DONALDSON, P01-6330, cyclone
• Location of air intake:	in front of the engine over the bonnet
- Main cleaner:	
• Make/Model/Type:	DONALDSON, FLG 08-0524, dry paper element filter with two replaceable cartridge elements; S+L+H make, 2.4249.130.7 type for the internal one and 2.4249.131.0 type for the external one
Location of air intake:	there is the pre-cleaner
- Maintenance indicator:	with the warning lamp on the dashboard

1.2.6 Lubrication system

- Type of feed pump:	forced feed from gear pump
- Type of filter(s):	FIAMM FT 4803
- Number of filters:	1

1.2.7 Cooling System

- Type of coolant:	water
- Type of pump:	impeller pump
- Specification of fan:	propeller fan driven by engine shaft
- Number of fan blades:	6
- Fan diameter:	500 mm
- Coolant capacity:	12 dm^3
- Type of temperature control:	none
- Superpressure system:	---

1.2.8 Starting system

- Make/Model/Type:	ISKRA, 1349, electromagnetic engagement
- Starter motor power rating:	2.5 kW
- Cold starting aid:	none
- Safety device:	preventing engine start in gear

1.2.9 Electrical system

- Voltage:	12 V, negative earth
- Generator:	
• Make/Model/Type:	ISKRA, AA K3563 14 V 65A, Alternator
• Power:	910 W
- Battery:	1 lead acid type
• Rating:	180 Ah at 20 hours

1.2.10 Exhaust system

- Make/Model/Type:	S+L+H, DGM SA 1554, one reflection absorption chamber
- Location:	on the left hand side of engine, under the bonnet cowling, with the vertical exhaust pipe above the bonnet cowling

1.3 TRANSMISSION

1.3.1 Clutch

utilized only for travelling

- Make/Model/Type:	S+L+H, 615.23, independent single disk dry clutch
- Number of plates:	1
- Diameter of plates	330 mm
- Method of operation:	Hydraulically operated by pedal

1.3.2 Gearbox

- Make/Model/Type:	S+L+H, 615.31, mechanical syncromesh speed change gear
- Arrangement:	five speeds forward with four ranges, one reduction gear (HI-MEAN-LO) and one reverse group;
- Number of gears:	60 forward and 60 reverse
- Available options:	
• Arrangement:	five speeds forward with four ranges, one reduction gear (HI-LO) and one reverse group;
• Number of gears:	40 forward and 40 reverse

1.3.3 Rear axle and final drives

- Make/Model/Type:	S+L+H, 615.44, bevel gear differential and epyciclic final drive
- Differential lock	
• Make/Model/Type:	S+L+H, 615.47, electrohydraulic
• Method of engagement:	by push button
• Method of disengagement:	by push button

1.3.4 Front axle and final drives

- Make/Model/Type:	S+L+H, 615.43, S+L+H original system with central shaft, bevel gear drive, differential and epyciclic final drives
- Differential lock	
• Make/Model/Type:	S+L+H, 615.46, electrohydraulic
• Method of engagement:	by push button
• Method of disengagement:	by push button

1.3.5 Total ratios and travelling speeds

LAMBORGHINI 850 V/DT with 60 forward and 60 reverse speeds

Gear no.	Group or range	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed of 2500 rev/min km/h
		FORWARD	
1 LO	Creeper	2508.0	0.29
1 MEAN	Creeper	2096.1	0.35
1 HI	Creeper	1719.8	0.42
2 LO	Creeper	1692.9	0.43
2 MEAN	Creeper	1414.8	0.51
3 LO	Creeper	1272.4	0.57
2 HI	Creeper	1160.8	0.63
3 MEAN	Creeper	1063.4	0.68
4 LO	Creeper	964.6	0.75
1 LO	Low	891.7	0.81
3 HI	Creeper	872.5	0.83
4 MEAN	Creeper	806.1	0.90
1 MEAN	Low	745.3	0.97
5 LO	Creeper	726.7	1.00
4 HI	Creeper	661.4	1.10
1 HI	Low	611.5	1.19
5 MEAN	Creeper	607.4	1.19
2 LO	Low	601.9	1.21
2 MEAN	Low	503.1	1.44
5 HI	Creeper	498.3	1.46
3 LO	Low	452.4	1.60
2 HI	Low	412.7	1.76
3 MEAN	Low	378.1	1.92
4 LO	Low	343.0	2.12
3 HI	Low	310.2	2.34
4 MEAN	Low	286.6	2.53
1 LO	Normal	280.0	2.59
5 LO	Low	258.4	2.81
4 HI	Low	235.2	3.09
1 MEAN	Normal	234.0	3.10
5 MEAN	Low	215.9	3.36
1 HI	Normal	192.0	3.78
2 LO	Normal	189.0	3.84
5 HI	Low	177.2	4.10
2 MEAN	Normal	157.9	4.60
3 LO	Normal	142.0	5.11
2 HI	Normal	129.6	5.60
3 MEAN	Normal	118.7	6.11
4 LO	Normal	107.7	6.74
3 HI	Normal	97.4	7.45
1 LO	High	94.1	7.71
4 MEAN	Normal	90.0	8.06
5 LO	Normal	81.1	8.95
1 MEAN	High	78.6	9.23
4 HI	Normal	73.8	9.83
5 MEAN	Normal	67.8	10.70
1 HI	High	64.5	11.25
2 LO	High	63.5	11.43
5 HI	Normal	55.6	13.05
2 MEAN	High	53.1	13.67
3 LO	High	47.7	15.21
2 HI	High	43.5	16.68
3 MEAN	High	39.9	18.19
4 LO	High	36.2	20.05
3 HI	High	32.7	22.19
4 MEAN	High	30.2	24.03
5 LO	High	27.3	26.58
4 HI	High	24.8	29.26
5 MEAN	High	22.8	31.83
5 HI	High	18.7	38.81

Gear no.	Group or range	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed of 2500 rev/min km/h
		REVERSE	
1 LO	Creeper	2373.0	0.31
1 MEAN	Creeper	1983.6	0.37
1 HI	Creeper	1627.5	0.45
2 LO	Creeper	1602.1	0.45
2 MEAN	Creeper	1338.9	0.54
3 LO	Creeper	1204.1	0.60
2 HI	Creeper	1098.5	0.66
3 MEAN	Creeper	1006.4	0.72
4 LO	Creeper	912.8	0.80
1 LO	Low	825.6	0.88
3 HI	Creeper	762.9	0.95
4 MEAN	Creeper	698.1	1.04
1 MEAN	Low	687.7	1.06
5 LO	Creeper	625.8	1.16
4 HI	Creeper	583.4	1.24
1 HI	Low	574.8	1.26
5 MEAN	Creeper	478.7	1.52
2 LO	Low	471.6	1.54
2 MEAN	Low	471.2	1.54
5 HI	Creeper	393.9	1.84
3 LO	Low	354.2	2.05
2 HI	Low	323.1	2.25
3 MEAN	Low	296.0	2.45
4 LO	Low	269.5	2.69
3 HI	Low	268.5	2.70
4 MEAN	Low	242.9	2.99
1 LO	Normal	225.3	3.22
5 LO	Low	224.4	3.23
4 HI	Low	202.3	3.59
1 MEAN	Normal	184.9	3.93
5 MEAN	Low	184.1	3.94
1 HI	Normal	182.0	3.99
2 LO	Normal	169.1	4.29
5 HI	Low	152.0	4.77
2 MEAN	Normal	138.7	5.23
3 LO	Normal	136.6	5.31
2 HI	Normal	124.7	5.82
3 MEAN	Normal	114.2	6.35
4 LO	Normal	103.6	7.00
3 HI	Normal	93.7	7.74
1 LO	High	90.6	8.01
4 MEAN	Normal	86.6	8.38
5 LO	Normal	78.0	9.30
1 MEAN	High	75.6	9.59
4 HI	Normal	71.0	10.22
5 MEAN	Normal	65.2	11.12
1 HI	High	62.1	11.69
2 LO	High	61.1	11.88
5 HI	Normal	53.5	13.56
2 MEAN	High	51.1	14.20
3 LO	High	45.9	15.81
2 HI	High	41.9	17.34
3 MEAN	High	38.4	18.90
4 LO	High	34.8	20.83
3 HI	High	31.5	23.06
4 MEAN	High	29.1	24.97
5 LO	High	26.3	27.62
4 HI	High	23.9	30.41
5 MEAN	High	21.9	33.08
5 HI	High	18.0	40.33

(*) 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: 1.242

LAMBORGHINI 850 V/DT with 40 forward and 40 reverse speeds

Gear no.	Group or range	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed of 2500 rev/min km/h
		FORWARD	
1 LO	Creeper	2010.65	0.36
1 HI	Creeper	1723.37	0.42
2 LO	Creeper	1357.17	0.53
2 HI	Creeper	1163.25	0.62
3 LO	Creeper	1020.06	0.71
3 HI	Creeper	874.31	0.83
4 LO	Creeper	773.27	0.94
1 LO	Low	714.90	1.02
4 HI	Creeper	662.79	1.09
1 HI	Low	612.75	1.18
5 LO	Creeper	582.60	1.25
5 HI	Creeper	499.35	1.45
2 LO	Low	482.59	1.50
2 HI	Low	413.58	1.75
3 LO	Low	362.67	2.00
3 HI	Low	310.86	2.33
4 LO	Low	274.93	2.64
4 HI	Low	235.65	3.08
1 LO	Normal	224.44	3.23
5 LO	Low	207.13	3.50
1 HI	Normal	192.39	3.77
5 HI	Low	177.54	4.09
2 LO	Normal	151.50	4.79
2 HI	Normal	129.87	5.59
3 LO	Normal	113.86	6.37
3 HI	Normal	97.61	7.44
4 LO	Normal	86.32	8.41
1 LO	High	75.39	9.63
4 HI	Normal	73.97	9.81
5 LO	Normal	65.03	11.16
1 HI	High	64.63	11.23
5 HI	Normal	55.74	13.02
2 LO	High	50.89	14.26
2 HI	High	43.63	16.63
3 LO	High	38.25	18.97
3 HI	High	32.79	22.13
4 LO	High	28.99	25.03
4 HI	High	24.85	29.20
5 LO	High	21.84	33.22
5 HI	High	18.73	38.75

Gear no.	Group or range	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed of 2500 rev/min km/h
		REVERSE	
1 LO	Creeper	1930.78	0.38
1 HI	Creeper	1654.92	0.44
2 LO	Creeper	1303.26	0.56
2 HI	Creeper	1117.04	0.65
3 LO	Creeper	979.54	0.74
3 HI	Creeper	839.58	0.86
4 LO	Creeper	742.56	0.98
1 LO	Low	686.50	1.06
4 HI	Creeper	636.47	1.14
1 HI	Low	588.41	1.23
5 LO	Creeper	559.46	1.30
5 HI	Creeper	479.51	1.51
2 LO	Low	463.42	1.57
2 HI	Low	397.16	1.83
3 LO	Low	348.27	2.08
3 HI	Low	298.51	2.43
4 LO	Low	264.01	2.75
4 HI	Low	226.29	3.21
1 LO	Normal	215.53	3.37
5 LO	Low	198.91	3.65
1 HI	Normal	184.75	3.93
5 HI	Low	170.48	4.26
2 LO	Normal	145.48	4.99
2 HI	Normal	124.71	5.82
3 LO	Normal	109.33	6.64
3 HI	Normal	93.73	7.74
4 LO	Normal	82.89	8.76
1 LO	High	72.40	10.02
4 HI	Normal	71.03	10.22
5 LO	Normal	62.44	11.62
1 HI	High	62.06	11.69
5 HI	Normal	53.53	13.56
2 LO	High	48.87	14.85
2 HI	High	41.90	17.32
3 LO	High	36.73	19.76
3 HI	High	31.49	23.05
4 LO	High	27.84	26.07
4 HI	High	23.86	30.41
5 LO	High	20.97	34.60
5 HI	High	19.99	40.35

(*) 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: 1.242

1.4 POWER TAKE OFF

1.4.1 Main power take-off

- Type: independent
- Method of engagement: engaged or disengaged by push button. Driven by multiplate wet clutch independent of travel clutch; ISO Standard 500-1991
- Number of shafts: 1
- Method of changing power take-off shaft ends and speeds: by means of 6 screws. Speed selection by external hand lever combined with a lever at the left hand side of the seat

1.4.1.1Main power take-off

540 rev/min

- Location:	at rear of tractor, in tractor's median plane
- Diameter of power take-off shaft end:	35 mm
- Number of splines:	6, in conformity with ISO 500/1991 type 1
- Height above ground:	770 mm
- Distance from the median plane of the tractor:	0 mm
- Distance behind rear-wheel axis:	430 mm
- PTO speed at rated engine speed:	614 rev/min
- Engine speed at standard power take-off speed:	2198 rev/min
- Ratio of rotation speeds (engine speed/p.t.o. speed):	4.0714
- Power restriction and maximum torque:	-----
- Direction of rotation (viewed from behind tractor):	clockwise

1000 rev/min

- Location:	at rear of tractor, in tractor's median plane
- Diameter of power take-off shaft end:	35 mm
- Number of splines:	6, not in conformity with ISO 500/1991 type 1
- Height above ground:	770 mm
- Distance from the median plane of the tractor:	0 mm
- Distance behind rear-wheel axis:	430 mm
- PTO speed at rated engine speed:	1020 rev/min
- Engine speed at standard power take-off speed:	2450 rev/min
- Ratio of rotation speeds (engine speed/p.t.o. speed):	2.45
- Direction of rotation (viewed from behind tractor):	clockwise

775 rev/min

- Location:	at rear of tractor, in tractor's median plane
- Diameter of power take-off shaft end:	35 mm
- Number of splines:	6, not in conformity with ISO 500/1991 type 1
- Height above ground:	770 mm
- Distance from the median plane of the tractor:	0 mm
- Distance behind rear-wheel axis:	430 mm
- PTO speed at rated engine speed:	786 rev/min
- Engine speed at standard power take-off speed:	2464 rev/min
- Ratio of rotation speeds	

(engine speed/p.t.o. speed): 3.1791
- Direction of rotation (viewed from behind tractor): clockwise

1300 rev/min

- Location: at rear of tractor, in tractor's median plane
- Diameter of power take-off shaft end: 35 mm
- Number of splines: 6, not in conformity with ISO 500/1991 type 1
- Height above ground: 770 mm
- Distance from the median plane of the tractor: 0 mm
- Distance behind rear-wheel axis: 430 mm
- PTO speed at rated engine speed: 1307 rev/min
- Engine speed at standard power take-off speed: 2487 rev/min
- Ratio of rotation speeds (engine speed/p.t.o. speed): 1.913
- Direction of rotation (viewed from behind tractor): clockwise

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

1.4.2 Front Power take-off

1000 rev/min

- Location: at front of tractor, in tractor's median plane
- Diameter of power take-off shaft end: 35 mm
- Number of splines: 6, not in conformity with ISO 500/1991 type 1
- Height above ground: 750 mm
- Distance from the median plane of the tractor: 0 mm
- Distance forward from front wheel axis: 705 mm
- PTO speed at rated engine speed: 1000 rev/min
- Engine speed at standard power take-off speed: 2400 rev/min
- Ratio of rotation speeds (engine speed/p.t.o. speed): 2.4
- Direction of rotation (viewed facing driving end): clockwise

1.5 POWER LIFT

1.5.1 Rear power lift

- Make/Model/Type: S+L+H make, 615.39 model, LOAD SENSING type
- Type of hydraulic system: open centre system
- Type and number of cylinders: 1, single acting, internal
- Type of linkage lock for transport: none

- Relief valve pressure setting: 18 ± 1 MPa
- Opening pressure of anti-shock valve: 21 ± 0.5 MPa
- Opening pressure of cylinder safety valve: none
- Lift pump type: hydraulic BOSCH rotary pump, driven by engine shaft;
- Transmission between pump and engine: mechanical
- Type and number of filters: 1, replaceable paper cartridge;
- Site of oil reservoir: gear-box
- Type, number and location of tapping points: 3 ways distributor at rear of tractor
- Maximum volume of oil available to external cylinders: 15 dm^3

1.5.2 Front power lift

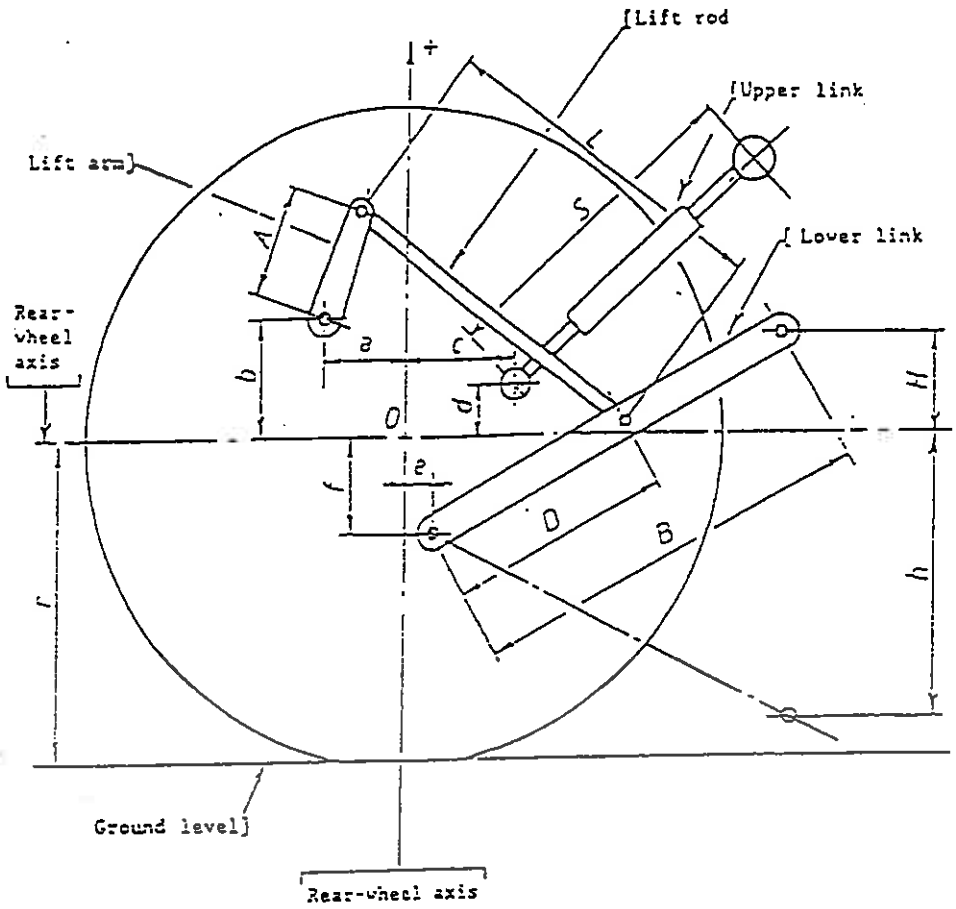
- Make/Model/Type: S+L+H make, ORIGINAL SAME SYSTEM model, 515.59 type
- Type of hydraulic system: open centre system
- Type and number of cylinders: 2, single acting
- Type of linkage lock for transport: none
- Relief valve pressure setting: 18 ± 1 MPa
- Opening pressure of anti-shock valve: 21 ± 0.5 MPa
- Opening pressure of cylinder safety valve: none
- Lift pump type: hydraulic BOSCH rotary pump, driven by engine shaft;
- Transmission between pump and engine: mechanical
- Type and number of filters: 1, replaceable paper cartridge;
- Site of oil reservoir: gear-box

1.6 THREE POINT LINKAGE

1.6.1 Rear three point linkage

Category: 2nd, implement attachment with three point linkage and lower links with quick connection, in conformity with I.S.O. STANDARD 730/I-1990

Category adapter: 3rd



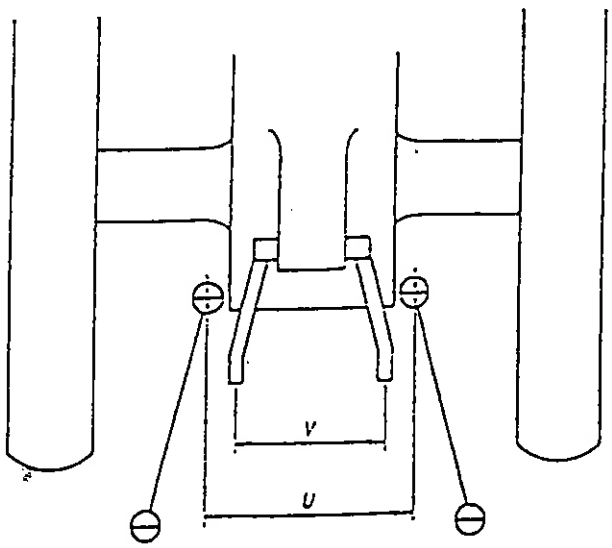


Figure 1.1

Lift test - Rear linkage geometry

		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: - horizontally	(a)	90	90
- 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 620 to 845	630
Distance of upper link pivot point from rear wheel axis: - horizontally	(c)	350	350
- vertically	(d)	220-285-350	220
Distance of lower link pivot point from rear wheel axis: - horizontally	(e)	145	145
- vertically	(f)	170	170
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	420	420
Length of lift rods	(L)	from 700 to 780	760
Heigth of lower hitch points relative to the rear wheel axis:			
- in low position	(h)	570	570
- in high position	(H)	185	185
Height above ground of lower hitch points when locked in transport position (*)		-	-

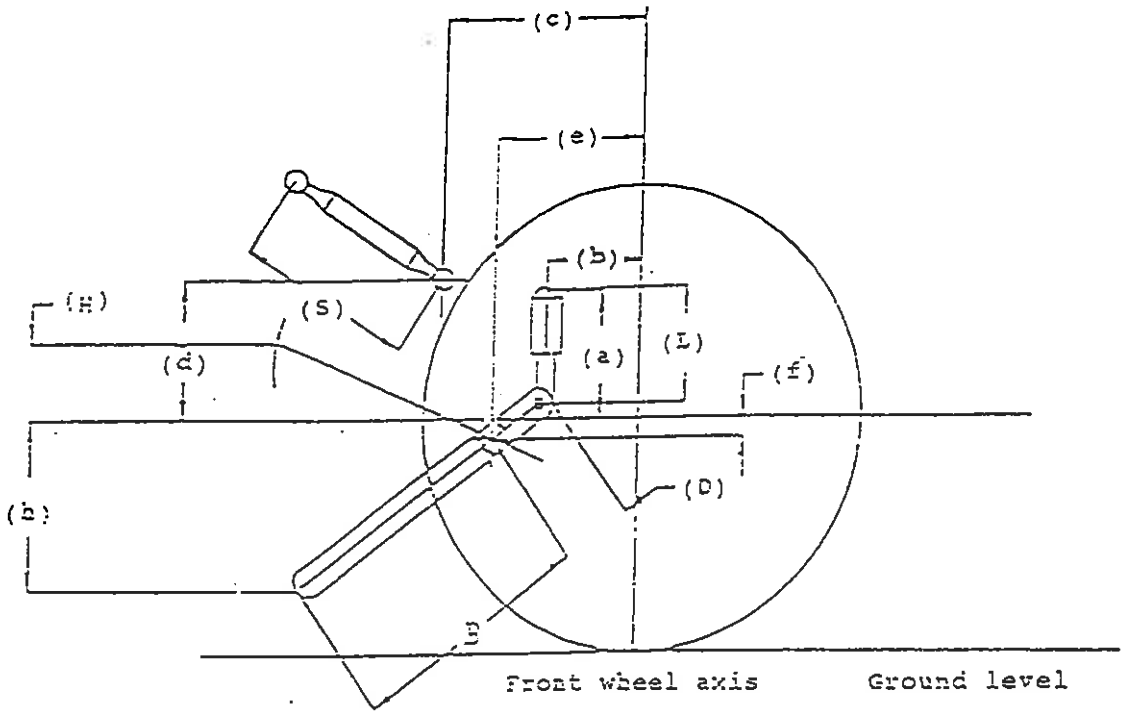
Table 1.1 - **Dimension of rear linkage geometry**
(when connected to the standard frame)

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

1.5.2 Front three point linkage

Category: 2nd, implement attachment with three point linkage and lower links with quick connection

Category adapter: 3rd



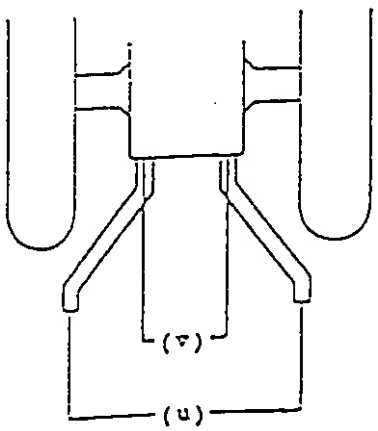


Figure 1.2

Lift test - Front linkage geometry

		Dimension or range mm	Settings used in test mm
Length of lower links	(B)	750	750
Distance of lift arm pivot point from front wheel axis: - 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 480 to 690	590
Distance of upper link pivot point from front wheel axis: - horizontally	(c)	665	665
- vertically	(d)	380	380
Distance of lower link pivot point from front wheel axis: - horizontally	(e)	505	505
- vertically	(f)	60	60
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	215	215
Length of cylinders:			
- in low position	(L)	480	480
- in high position	(L)	300	300
Heigth of lower hitch points relative to the front wheel axis:			
- in low position	(h)	420	420
- in high position	(H)	210	210

Table 1.2 - **Dimension of front linkage geometry**
(when connected to the standard frame)

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

1.7 **SWINGING DRAWBAR** (optional not fitted on tested tractor)

1.8 **TRAILER HITCH**

- Type: DGM-GA 2107 C 6t V1.5
- Hole diameter: 28 mm
- Height above ground:
- min: 395 mm
- max: 1080 mm
- Distance of hitch point from rear wheel axis, horizontally: 625 mm
- Distance of hitch point from power take-off shaft end:
- vertically: 380 mm below, 310 mm above
- horizontally: 195 mm

- Maximum vertical permissible load:	14.7 kN

1.9 HOLED DRAWBAR

- Number of holes:	7
- Distance between holes:	100 mm
- Hole diameter:	28.5 mm
- Thickness/width of the drawbar:	30/80 mm
- Height above ground with tyre 18.4 R 34:	
- minimum:	200 mm
- maximum:	955 mm
- Horizontal distance behind power take-off shaft end:	555 mm

1.10 STEERING

- Make/Model/Type:	DANFOSS make, ORBITROL OSPC 80 OR model, hydrostatic type
- Method of operation:	
- pump:	hydrostatic steering with BOSCH hydraulic gear pump
- rams:	two single acting rams acting directly on front axle
- Working pressure:	15 MPa

1.11 BRAKES

1.11.1 Service brake

- Make/Model:	S+L+H make, 615.54 model
- Type:	oil bath disc, total 4 discs, 2 at front (1 for wheel) and 2 at rear (1 for wheel), all mounted before the final drive. Front disc 224 mm dia, rear disc 280 mm dia, FRENDO HDT 303 lining material
- Method of operation:	hydraulically actuated with 2 pedals
- Trailer braking take-off:	none

1.11.2 Parking brake:

- Type:	fully independent of service brake, 3 oil bath discs mounted on the pinion shaft in the gear box, SINTERIX 2 lining material
- Method of operation:	mechanical by hand lever

1.12 WHEELS

Steering wheels

- Number:	2
- Location:	at front

Driving wheels

- Number:	4
- Location:	2 at front and 2 at rear

- Wheelbase: 2373 mm

- Track width adjustment:

	Minimum mm	Maximum mm	Adjustement method
Front	1600	1900	Changing the position of the rims with respect to the disc
Rear	1600	1900	Changing the position of the rims in respect to the disc

1.13 PROTECTIVE STRUCTURE

- Make/Model/Type: S+L+H make, C 37 model, not tiltable cab type
- Manufacture's name and address: S+L+H S.p.A., Viale F. Cassani 15, 24047 TREVIGLIO (BG) - Italy
- Protective device: cab, not tiltable
- OECD approval number: CSD 1385/143 for the S+L+H LAMBORGHINI 950 V/DT tractor with "HEAVY DUTY GEARBOX" and seat GRAMMER LS 95 H 1/90 AR and CSD 1385/83 for the S+L+H HÜRLIMANN 908 V/DT tractor with "HEAVY DUTY GEARBOX" and seat GRAMMER LS 95 H 1/90 AR
- Date of approval: 21st december 1993

1.14 SEAT

1.14.1 Driver's seat

- Make/Model/Type: GRAMMER make, LS95H1/90AR model, upholstered seat with back rest
- Type of suspension: adjustable spring
- Type of damping: shock absorber
- Range of adjustment:
  - longitudinal: 150 mm
  - vertical: 60 mm

1.14.2 Optional driver's seat

none

1.14.3 Passenger seat

- Location: none
- Number of places: -

1.15 LIGHTING

	Height above ground of centre (*) mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlights:	1150	165 x 105	215
Sidelights	1725	110 x 35	860
Rearlights	1700	115 x 70	855
Reflectors	710	Ø 80	460

(*) with tyres: 16.9 R 24 front - 18.4 R 34 rear

2. TEST CONDITIONS

2.1 OVERALL DIMENSIONS (with tyres 16.9 R 24 front and 18.4 R 34 rear)

	Length	Width		Height at top of	
		minimum	maximum	protective structure	exhaust silencer
	mm	mm	mm	mm	mm
Ballasted	4890	2080	2380	2700	2660
Unballasted	4815	2080	2380	2700	2660

2.2 GROUND CLEARANCE

(unballasted tractor): 455 mm

- Clearance-limiting part: front axle

2.3 TRACTOR MASS

Mass (with protective structure and full fuel tank):

	Ballasted		Unballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	2320	2340	1950	1970
Rear	2530	2585	2200	2255
Total	4850	4925	4150	4225

2.4 BALLAST

	Weights		Water (kg)
	Number	Total mass (kg)	
Front wheels	-	-	-
Front weight	1	400	-
Rear wheels	6	300	-
Optional	-	-	-

2.5 TYRES AND TRACK WIDTH SPECIFICATIONS

	Front	Rear
Tyres:		
- dimensions	16.9 R 24	18.4 R 34
- ply rating	134 A8	144 A8
- type	radial	radial
- maximum load (tyre manufacturer')	19.95 kN	27.46 kN
- maximum load (tractor manufacturer's)	13.72 kN	24.51 kN
- inflaction pressure (tyre manufacturer's)	160 kPa	160 kPa
- dynamic radius index	620 mm	770 mm
Chosen track width:	1720 mm	1600 mm

Tyre matching			
At front		At rear	
16.9 R 24	134 A8	18.4 R 34	144 A8
14.9 R 24	126 A8	16.9 R 34	139 A8
16.9 R 24	134 A8	520/70 R 34	148 A8

2.5 OILS AND LUBRICANTS

2.5.1 Capacity and change interval

	Capacity dm^3	Oil change h	Filter change h
Engine with filter	11.0	150	300
Gear box with power lifts, rear axle, final drive and hydraulic system	71.0	1200	2400 (*)
Front axle and final drive	15.5	1200	-

(*) or when the warning lamp is lighted.

2.5.2 Specifications (SAE, API, MIL-L, ISO)

	Recommended	Used during test
Engine oil - Type: - Viscosity: - Classification:	AKROS TURBO 15 W/40 12.50 cSt API SE - CD	As recommended
Hydraulic fluid - Type: - Viscosity: - Classification	AKROS MULTI 11.50 cSt API GL 4	As recommended
Front and rear axle, final drives and gear box - Type: - Viscosity: - Classification:	AKROS MULTI 11.50 cSt API GL 4	As recommended
Steering oil - Type: - Viscosity: - Classification:	AKROS MULTI 11.50 cSt API GL 4	As recommended

2.5.3 Grease: AKROS GREASE 30

- Number of lubrication points: 10

2.7 FUEL

- Type: ERG DIESEL oil, in conformity with national standard.
- Density at 15 °C: 0.830 g/cm^3

3. COMPULSORY TEST RESULTS

3.1 Main power take-off

- Date and location of tests: 10th June 1996, I.M.A., TORINO, ITALY
- Type of dynamometer: PARASITIC CURRENTS, BORGHI & SAVERI FA 300-30 SP

Power	Speed		Fuel consumption			Specific energy
	Engine	P.t.o.	Hourly		Specific	
KW	rev/min		kg/h	l/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER - TWO HOUR TEST						
59,71	2499	1020	15,53	18,71	260	3,19
3.1.2 POWER AT RATED ENGINE SPEED						
59,71	2499	1020	15,53	18,71	260	3,19
3.1.3 STANDARD POWER TAKE OFF SPEED (1000 ± 25 rev/min)						
59,48	2455	1002	15,31	18,45	257	3,22
3.1.4 PART LOADS						
3.1.4.1 the torque corresponding to maximum power at rated engine speed						
59,71	2499	1020	15,53	18,71	260	3,19
3.1.4.2 85% of torque obtained in 3.1.4.1						
53,84	2648	1081	15,05	18,13	280	2,97
3.1.4.3 75% of torque defined in 3.1.4.2						
40,86	2678	1093	12,74	15,35	312	2,66
3.1.4.4 50% of torque defined in 3.1.4.2						
27,60	2710	1106	10,42	12,55	378	2,20
3.1.4.5 25% of torque defined in 3.1.4.2						
13,91	2720	1110	7,81	9,41	562	1,48
3.1.4.6 unloaded						
-	2737	1117	5,65	6,81	-	-
3.1.5 PART LOADS AT STANDARD POWER TAKE OFF SPEED (1000 rev/min)						
3.1.5.1 the torque corresponding to maximum power						
59,48	2455	1002	15,31	18,45	257	3,22
3.1.5.2 85% of torque obtained in 3.1.5.1						
54,05	2626	1072	15,11	18,20	280	2,97
3.1.5.3 75% of torque defined in 3.1.5.2						
41,08	2663	1087	12,58	15,16	306	2,71
3.1.5.4 50% of torque defined in 3.1.5.2						
27,71	2688	1097	10,22	12,31	369	2,25
3.1.5.5 25% of torque defined in 3.1.5.2						
13,91	2697	1101	7,79	9,39	560	1,48
3.1.5.6 unloaded						
-	2715	1108	5,54	6,67	-	-

- No load maximum engine speed: 2737 rev/min
- Torque (equivalent crankshaft) at maximum power:
  - at rated engine speed 228.2 Nm
  - at standard power take-off speed 231.4 Nm
- Maximum torque (equivalent crankshaft) 293.0 Nm
  (engine speed: 1502 rev/min)

Mean atmospheric conditions	
Temperature:	27.5 °C
Pressure:	99.80 kPa
Relative humidity:	55 %
Maximum temperatures	
Coolant:	84.0 °C
Engine oil:	116.0 °C
Fuel:	40.0 °C
Engine air intake:	30.0 °C

3.2 HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 3rd July 1996

3.2.1 Hydraulic Power Test

- Sustained pressure with relief valve open: 18.0 MPa
- Pump delivery rate at minimum pressure: 41.0 l/min

	Flow rate l/min	Power kW	Pressure MPa
Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power	**37.0**	**10.0**	**16.2**
Flow rate and hydraulic pres-sure corresponding to maximum hydraulic power	**39.5**	**10.1**	**15.3**

- Tapping point used for test: at rear of tractor
- Temperature of hydraulic fluid: --- °C
- Opening pressure of the unloading valve: --- MPa
- Closing pressure of the unloading valve: --- MPa

3.2.2 POWER LIFT TEST

Rear power lift linkage settings for test - see Table 1.1 and fig. 1.1

	at the hitch point		on the frame	
Height of lower hitch points above ground in down position	200	mm	200	mm
Vertical movement	700 (*)	mm	715 (*)	mm
	755 (+)	mm	765 (+)	mm

Maximum corrected force exerted through full range	20.39	kN	21.69	kN
Corresponding pressure of hydraulic fluid	16.2	MPa	16.2	MPa
Moment about rear-wheel axis	20.08	kNm	34.60	kNm
Maximum tilt angle of mast from the vertical	- degrees		8 degrees	

Lifting heights relative to the horizontal plane including the lower pivot points										
mm	- 400	- 300	- 200	- 100	- 50	0	50	150	300	315
Lifting forces										
at the hitch points kN	20.39	22.42	24.45	25.73	26.12	26.65	27.01	27.98	27.45	-----
Corresponding pressure: 16.2 MPa										
at the frame kN	21.69	23.14	23.14	23.07	22.89	22.74	22.50	22.15	21.82	21.84
Corresponding pressure: 16.2 MPa										

(*) with lifting forces (+) without lifting forces

Front power lift linkage settings for test - see Table 1.2 and fig. 1.2

	at the hitch point		on the frame	
Height of lower hitch points above ground in down position	200	mm	200	mm
Vertical movement	570 (*) 630 (+)	mm mm	610 (*) 625 (+)	mm mm
Maximum corrected force exerted through full range	16.11	kN	10.11	kN
Corresponding pressure of hydraulic fluid	16.2	MPa	16.2	MPa
Moment about front-wheel axis	20.22	kNm	18.86	kNm
Maximum tilt angle of mast from the vertical	- degress		3 degress	

Lifting heights relative to the horizontal plane including the lower pivot points										
mm	- 360	- 300	- 200	- 100	- 50	0	50	100	210	250
Lifting forces										
at the hitch points kN	17.69	17.58	17.32	17.00	16.88	16.68	16.53	16.33	16.11	-----
Corresponding pressure: 16.2 MPa										
at the frame kN	21.34	19.06	17.61	16.33	15.80	15.27	14.78	14.30	13.33	10.11
Corresponding pressure: 16.2 MPa										

(*) with lifting forces (+) without lifting forces

3.3 DRAWBAR PERFORMANCE

Date of tests: 13th ÷ 25th June 1996
Type of track: concrete
Tyre size - front: 16.9 R 24 134 A8
- rear: 18.4 R 34 144 A8

	Height of hitch above ground	Tyre inflaction pressure	
		Front	Rear
Unballasted	410 mm	160 kPa	160 kPa
Ballasted	405 mm	160 kPa	160 kPa

Gear no. and group	Driving speed km/h	Power kW	Drawbar pull daN	Engine speed rev/min	Wheel slip %	Specific fuel consumpt. g/kWh	Specific energy kWh/l	Temperature			Atmospheric conditions		
								Fuel °C	Coolant °C	Engine oil °C	Tempe rature °C	Relative humidity %	Pres sure kPa
3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
2 MEAN Normal	4,25	42,87	3628	2627	15,1	353	2,35	31	87	110	21,0	42	99,0
3 LO Normal	4,50	45,37	3628	2497	15,0	338	2,46	31	86	111	21,0	42	99,0
2 HI Normal	5,10	46,50	3285	2498	11,5	329	2,52	31	88	111	21,0	42	99,0
3 MEAN Normal	5,70	48,11	3040	2507	9,7	318	2,61	31	87	110	21,0	43	99,0
4 LO Normal	6,42	47,55	2667	2506	7,7	322	2,58	31	88	110	21,0	43	99,0
3 HI Normal	7,16	47,59	2393	2498	6,5	320	2,59	31	88	110	20,5	43	99,0
1 LO High	7,42	49,68	2412	2498	6,5	307	2,70	31	87	110	20,5	43	99,0
4 MEAN Normal	7,77	48,43	2246	2497	6,3	319	2,61	31	86	110	20,5	43	99,0
5 LO Normal	8,51	45,68	1932	2503	7,7	335	2,47	31	86	110	20,5	43	99,0
1 MEAN High	9,03	50,68	2020	2500	5,0	304	2,73	31	87	110	20,5	43	99,0
4 HI Normal	9,77	46,05	1697	2503	3,5	337	2,46	30	87	111	20,5	43	99,0
5 MEAN Normal	10,61	47,09	1598	2500	3,7	327	2,54	30	86	111	20,5	43	99,0
1 HI High	11,16	49,23	1589	2500	3,6	313	2,65	29	85	111	20,5	43	99,0
3.3.2 MAXIMUM POWER IN TESTED GEARS (ballasted tractor)													
1 LO Creeper	0,28	3,00	3923	2692	14,9	-	-	45	88	114	31,0	35	99,33
1 MEAN Creeper	0,33	3,57	3903	2699	15,0	-	-	45	88	115	31,0	35	99,33
1 HI Creeper	0,40	4,37	3913	2701	15,1	-	-	45	88	114	31,0	35	99,33
2 LO Creeper	0,41	4,40	3883	2696	15,1	-	-	45	88	115	31,0	35	99,33
2 MEAN Creeper	0,49	5,25	3864	2699	14,9	-	-	45	88	115	31,0	35	99,33
3 LO Creeper	0,54	5,85	3874	2700	15,0	-	-	45	88	114	31,0	35	99,33
2 HI Creeper	0,60	6,48	3923	2697	15,0	-	-	45	88	115	31,0	35	99,33
3 MEAN Creeper	0,65	7,11	3942	2697	15,0	-	-	45	88	114	31,0	35	99,33
4 LO Creeper	0,72	7,80	3923	2696	15,0	-	-	45	88	114	31,0	35	99,33
1 LO Low	0,77	8,45	3932	2695	15,0	-	-	45	88	113	31,0	35	99,33

Gear no. and group	Driving speed km/h	Power kW	Drawbar pull daN	Engine speed rev/min	Wheel slip %	Specific fuel consumpt. g/kWh	Specific energy kWh/l	Temperature			Atmospheric conditions		
								Fuel °C	Coolant °C	Engine oil °C	Tempe rature °C	Relative humidity %	Pres sure kPa
3 HI Creeper	0,79	8,62	3923	2695	15,0	-	-	45	88	113	31,0	35	99,33
4 MEAN Creeper	0,86	9,39	3952	2693	15,0	-	-	45	88	113	31,0	35	99,33
1 MEAN Low	0,93	10,10	3923	2697	15,0	-	-	45	88	114	31,0	35	99,33
5 LO Creeper	0,95	10,39	3942	2698	15,1	-	-	45	88	114	31,0	35	99,33
4 HI Creeper	1,04	11,25	3893	2692	15,0	-	-	45	88	115	31,0	35	99,33
1 HI Low	1,13	12,32	3932	2694	14,9	-	-	45	88	114	31,0	35	99,33
5 MEAN Creeper	1,13	12,35	3923	2697	15,1	-	-	45	88	115	31,0	35	99,33
2 LO Low	1,15	12,42	3903	2694	14,9	-	-	45	88	114	31,0	35	99,33
2 MEAN Low	1,37	14,89	3923	2689	15,0	-	-	45	88	114	31,0	35	99,33
5 HI Creeper	1,38	14,92	3893	2686	14,9	-	-	45	87	115	31,0	35	99,33
3 LO Low	1,52	16,59	3942	2682	15,0	-	-	45	87	115	31,0	35	99,33
2 HI Low	1,66	17,97	3903	2680	15,1	-	-	45	87	116	31,0	35	99,33
3 MEAN Low	1,82	19,77	3923	2684	15,0	-	-	45	87	116	31,0	35	99,33
4 LO Low	2,01	21,86	3923	2691	15,0	-	-	45	87	116	31,0	35	99,33
3 HI Low	2,22	24,13	3923	2687	15,0	-	-	45	87	116	31,0	35	99,33
4 MEAN Low	2,39	26,40	3972	2683	15,0	-	-	45	88	116	31,0	35	99,33
1 LO Normal	2,45	26,66	3923	2678	14,9	-	-	45	88	117	31,0	35	99,33
5 LO Low	2,65	28,51	3874	2674	14,9	474	1,76	45	88	111	31,0	35	99,33
4 HI Low	2,91	32,07	3972	2672	14,9	422	1,98	45	88	110	31,0	35	99,33
1 MEAN Normal	2,92	32,22	3972	2669	14,9	422	1,98	45	88	112	31,0	35	99,33
5 MEAN Low	3,16	34,83	3972	2665	15,0	392	2,13	45	88	113	31,0	35	99,33
1 HI Normal	3,55	38,72	3923	2661	14,8	357	2,34	45	88	113	31,0	35	99,33
2 LO Normal	3,62	39,41	3923	2665	14,7	352	2,37	46	88	113	30,5	35	99,33
5 HI Low	3,66	39,42	3874	2506	14,6	380	2,20	44	88	113	30,5	35	99,33
2 MEAN Normal	4,12	45,49	3972	2547	15,0	335	2,49	44	88	113	30,0	35	99,33
3 LO Normal	4,62	46,33	3609	2501	12,8	325	2,57	44	88	113	30,0	40	99,33
2 HI Normal	5,15	46,30	3236	2507	11,5	324	2,57	44	88	113	30,0	40	99,33
3 MEAN Normal	5,65	47,69	3040	2504	11,0	318	2,63	44	88	114	30,0	40	99,33
4 LO Normal	6,32	46,78	2667	2498	9,5	322	2,60	43	88	114	30,0	40	99,33
3 HI Normal	7,13	47,02	2373	2501	7,6	321	2,60	42	87	114	30,0	39	99,33
1 LO High	7,35	49,66	2432	2496	7,9	308	2,71	42	87	114	30,0	38	99,33
4 MEAN Normal	7,78	48,31	2236	2508	7,2	314	2,66	42	86	113	30,0	39	99,33
5 LO Normal	8,66	46,92	1952	2504	6,8	322	2,60	38	87	113	29,5	40	99,33
1 MEAN High	8,95	50,47	2030	2498	6,4	298	2,80	38	87	113	29,5	40	99,33
4 HI Normal	9,58	45,65	1716	2499	6,0	337	2,47	38	86	111	29,5	41	99,33
5 MEAN Normal	10,53	47,03	1608	2499	5,1	323	2,59	38	86	111	29,0	41	99,33
1 HI High	11,01	48,88	1598	2498	5,5	311	2,68	38	85	111	29,0	42	99,33

Gear no. and group	Driving speed km/h	Power kW	Drawbar pull daN	Engine speed rev/min	Wheel slip %	Specific fuel consumpt. g/kWh	Specific energy kWh/l	Temperature			Atmospheric conditions		
								Fuel °C	Coolant °C	Engine oil °C	Tempe rature °C	Relative humidity %	Pres sure kPa
3.3.3 FIVE-HOUR TESTS													
3.3.3.1 FIVE HOUR TEST at 75% of pull at maximum power													
3 HI Normal	7,71	38,11	1780	2657	6,0	362	2,29	46	88	110	31	34	99,33
3.3.3.2 FIVE HOUR TEST at pull corresponding to 15% wheelslip - with 500 kg as additional ballast													
2 LO Normal	3,72	40,57	3923	2649	-	-	-	46	88	110	31	34	993,30

Oil consumption during ten hours tests 3.3.3.1 and 3.3.3.2: 60 g/h

Tests 3.3.3.2 was carried out with additional ballast; so, the not quoted figures are irrelevant

3.4 TURNING AREA AND TURNIG CIRCLE (front wheel disengaged)

Wheel equipment: front: 16.9R24 (134 A8) rear: 18.4R34 (144 A8)
Track width: front: 1720 rear: 1600

	With brakes		Without brakes	
	Right-hand m	Left-hand m	Right-hand m	Left-hand m
Radius of turning area	4.07	4.21	5.57	5.87
Radius of turning circle	3.85	3.97	5.35	5.65

3.5 LOCATION OF CENTRE OF GRAVITY

Height above ground	910 mm
Distance forward from the vertical plane containing the axis of the rear wheels	1106 mm
Distance from the median plane of the tractor: to the left	3 mm

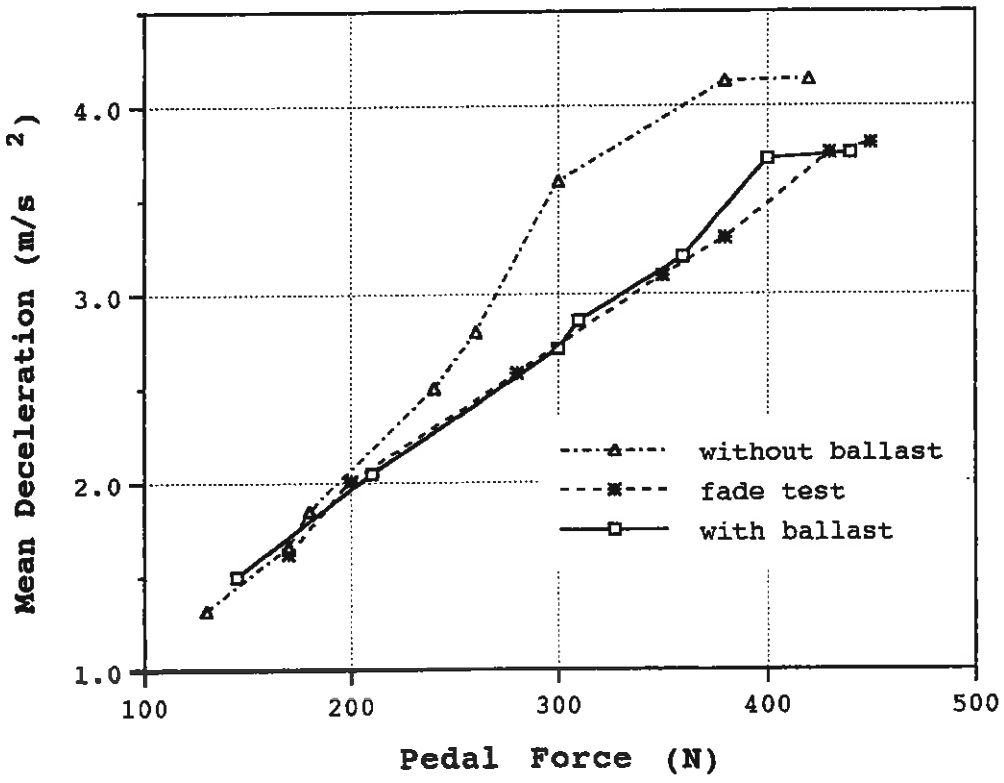
3.6 BRAKING

- Date of tests: 11th June 1996
- Type of track: asphalt
- Type of decelerometer: PEISELER
- Tractor masses during test (*)

	front axle kg	rear axle kg	total kg
Ballasted	2340	2595	4935
Unballasted	1970	2265	4235

(*) tractor carring a driver and the decelerometer (85 kg)

3.6.1 Cold service braking device test - 3.6.2 Fade test



3.6.1 Cold service braking device test

	Ballasted tractor	Unballasted tractor
Speed before application of brakes (km/h)	40.6	40.6

3.6.2 Fade test

- Maximum deviation of the tractor from its original course: none
- Abnormal vibration: none
- Brake heating method: by means of towing the tractor for 1 km at 32.4 km/h with a towing force of 4.93 kN

3.6.3 Parking braking device test

	Uphill	Downhill
Braking device control force	19.0 daN	19.5 daN

3.7 MEASUREMENT OF EXTERNAL NOISE LEVEL

- Date of tests: 1st July 1996 - I.M.A. - TORINO
- Sound level meter: make,model and type: RION make, NA 29 E model, impulse precision type
- Type of track: asphalt
- Gear number: 5 HI High
- Travelling speed before acceleration: 30.4 km/h
- Sound level:
  - LAMBORGHINI 850 V/DT 83.0 dB(A)
  - HÜRLIMANN 908 V/DT 83.0 dB(A)

4. REPAIRS = none

5. REMARKS = none

The Head of the Section

R. MARENGO

The Director

P. REDOLFI

Torino, 26th August 1996

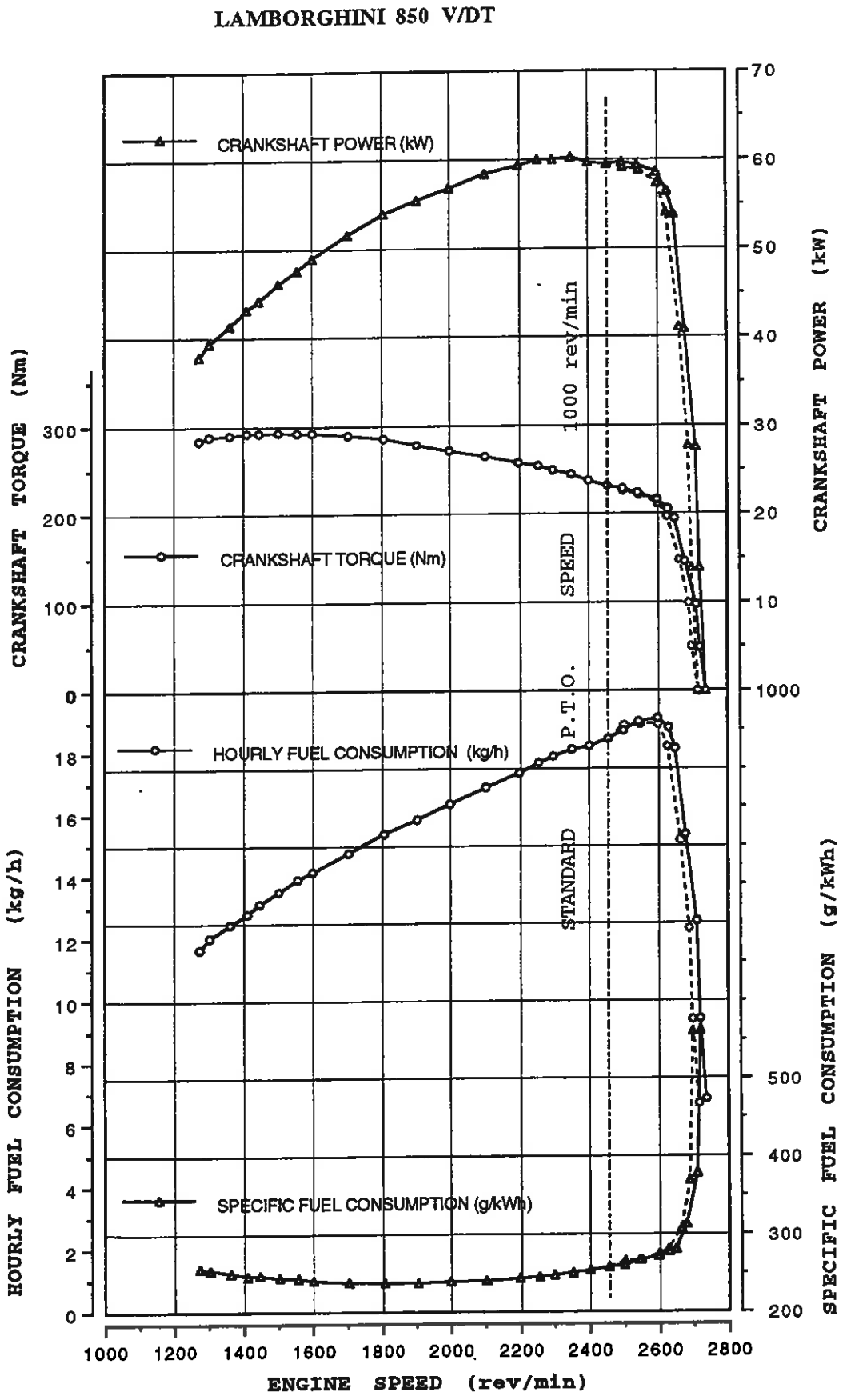


FIG. 1 - POWER TAKE-OFF TEST

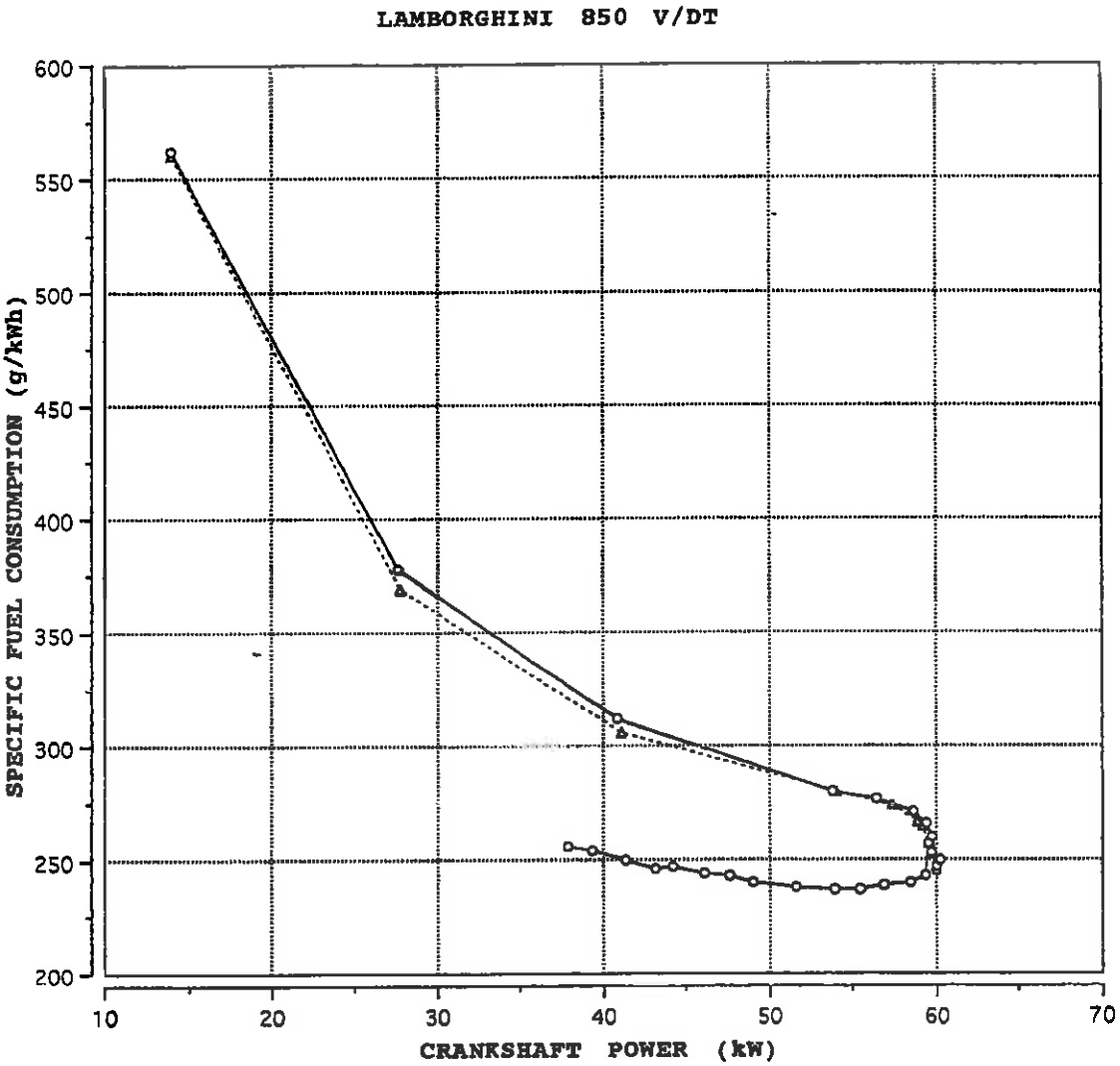


Fig. 2 - POWER TAKE- OFF TEST