ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

CODE 1

OECD STANDARD CODE FOR THE OFFICIAL TESTING OF AGRICULTURAL AND FORESTRY TRACTOR PERFORMANCE





LAMBORGHINI L10N703WVT

trade name:
LAMBORGHINI AGILE 770 S

HÜRLIMANN H10N703WVT

trade name:
HÜRLIMANN XN 707

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

Manufactured by:	SAME DEUTZ-FAHR Group Viale F. Cassani 15 24047 Treviglio BG Italy
OECD approval No.:	**1/1822**
Date of approval:	21 April 1999
Period of test:	December 1998 - February 1999

ISMA Via Milano 43 24047 Treviglio BG Italy
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The Lamborghini Agile 770 S (4WD) and Hürlimann XN 707 (4WD) tractors are technically identical in all main respects except with regard to model, designation, colour and side bonnets design.

All test were carried out on the Lamborghini Agile 770 S (4WD)

All stated dimensions and tests refer to tyre size 240/70R16 at front and 380/70R20 at rear, as well as to track widths 1060 mm at front and 915 mm at rear.

- Tractor manufacturer's name and address:	SAME DEUTZ-FAHR Group S.p.A.; 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.

1. SPECIFICATION OF TRACTOR

1.1 Identification

- Make:	LAMBORGHINI;
- Model:	L10N703WVT with 45 forward and 45 reverse speeds 40 km/h version;
- Trade name:	AGILE 770 S;
- Type:	four-wheel drive, unit construction;
- Number of driving wheels:	4;
- Serial number:	1061;
- First serial number:	1001.

1.2 Engine

- Make:	SAME DEUTZ-FAHR Group;
- Model:	1000.3 WT1;
- Type:	water cooled 4-stroke diesel, direct injection turbo charged;
- Serial number:	1086.

1.2.1 *Cylinders*

- Number and disposition:	3 vertical in line;
- Bore x stroke:	105 x 115.5 mm;
- Capacity:	3000 cm^3;
- Compression ratio:	16:1;
- Arrangement of valves:	overhead;
- Cylinder liners:	dry.

1.2.2 *Supercharging*

- Make:	GARRET;
- Model:	TA 25;
- Type:	exhaust driven supercharger, without intercooler;
- Pressure:	74.1 kPa.

1.2.3 *Fuel system*

- Fuel feed system:	AC corone fuel feed pump;
- Make, model and type of fuel filter:	FIAMM FNA 166/20;
- Total capacity of fuel tanks:	58 dm^3 (26+32 dm^3);
- Make, model and type of injection pump:	BOSCH PFR 1 K-90A 543, immersed, one per cylinder in line;
- Serial number:	without serial number;
- Manufacturer's production setting of injection pump:	
. Flow rate:	68 ± 2 mm^3/stroke at rated speed and full load corresponding 14.41 dm^3/h;
. Timing:	16° before TDC;
- Make, model and type of injectors:	BOSCH DLLA 150 S 1323 multihole injecton nozzles;
- Injection pressure:	18 ± 1 MPa.

1.2.4 *Governor*

- Make:	SAME DEUTZ-FAHR Group;
- Model:	007.0992.4;
- Type:	electronic;
- Governed range of engine speed:	from 650 to 2500 rev/min;
- Rated engine speed:	2350 rev/min.

1.2.5 *Air cleaner*

- Pre-cleaner:	(optional, fitted on tested tractor)
. Make:	DONALDSON;
. Model:	PB01-6330;
. Type:	cyclone;
. Location:	above the bonnet;
- Main filter	
. Make:	DONALDSON;
. Model:	FLG 08-0524;
. Type:	dry paper element filter with replaceable cartridge;
. Location of air intake :	front of engine, above bonnet;
- Maintenance indicator	with warning lamp on the dashboard.

1.2.6 *Lubrication system*

- Type of feed pump:	forced feed from gear pump;
- Type of filter:	FIAMM FT 4803;
- Number of filters:	1.

1.2.7 *Cooling system*

- Type of coolant:	water cooling with axial blower;
- Specification of fan:	propeller fan driven by engine shaft;
- Number of fan blades:	6;
- Fan diameter:	400 mm;
- Type of temperature control:	electrical control.

1.2.8 *Starting system*

- Make:	ISKRA;
- Model:	AZJ 8149 12 V;
- Type:	electromagnetic engagement;
- Starter motor power rating:	2.7 kW;
- Cold starting aid:	thermostarter;
- Safety device:	electrical lockout on clutch and PTO controls;

1.2.9 *Electrical equipment*

- Voltage:	14 V;
- Generator	
. Make:	ISKRA;
. Model:	AAK 3563 14 V 65 A;
. Type:	alternator;
. Power:	65 A;
- Battery:	1 lead acid;
. capacity:	100 Ah at 20 hours rating.

1.2.10 *Exhaust system*

- Make:	SAME DEUTZ-FAHR Group;
- Model:	DGM SA 1857;
- Type:	one reflection absorption chamber;
- Location:	on the left hand side of engine, horizontal position under side bonnet;
- Height of outlet above ground:	320 mm.

1.3 Transmission

1.3.1 *Clutch (utilized only for travelling of tractor)*

- Make:	SAME DEUTZ-FAHR Group;
- Model:	791.23;
- Type:	single disk dry clutch;
- Number of plates:	1;
- Plates diameter:	280 mm;
- Control system:	hydraulic operated by pedal.

1.3.2 *Gear box*

- Make: SAME DEUTZ-FAHR Group;
- Model: 791.31;
- Type: mechanical synchromesh speed change gear; 5 speeds with 3 ranges of speed (S/N/F), one electrohydraulic reduction gears (low/medium/high), and one reverse group.

	Forward	Reverse
Number of gears	5	5
Number of ranges	3	3
Number of reduction gears	3	3
Total of arrangements	45	45

- Available options: 5 speeds forward with 3 ranges (S/N/F) and 2 reduction gears (low/high), 5 speeds reverse with 3 ranges (S/N/F).

	Forward	Reverse
Number of gears	5	5
Number of ranges	3	3
Number of reduction gears	2	-
Total of arrangements	30	15

- Available options: 5 speeds forward with 2 ranges (N/F) and 2 reduction gears (low/high), 5 speeds reverse with 2 ranges (N/F).

	Forward	Reverse
Number of gears	5	5
Number of ranges	2	2
Number of reduction gears	2	-
Total of arrangements	20	10

1.3.3 *Rear axle and final drives*

- Make: SAME DEUTZ FAHR Group;
- Model: 791.44;
- Type: bevel gear differential and epyciclic final drive.
- Differential lock
  . Make: SAME DEUTZ FAHR Group;
  . Model: 791.47;
  . Type: electrohydraulic;
  . Control system: engaged or disengaged by button.

1.3.4 *Front axle and final drives*

- Make: SAME DEUTZ FAHR Group;
- Model: 791.43;
- Type: original SAME DEUTZ-FAHR system with central shaft bevel gear drive, differential and epicyclic final drives.

- Differential lock
  . Make: SAME DEUTZ FAHR Group;
  . Model: 791.46;
  . Type: electrohydraulic;
  . Control system: engaged or disengaged by button.

1.3.5 *Total ratios and travelling speeds*

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	2952.67	2460.57	2004.41	0.15	0.18	0.23
2	Slow	2067.08	1722.62	1421.20	0.22	0.26	0.32
3	Slow	1442.63	1202.17	991.87	0.31	0.38	0.46
4	Slow	1032.36	860.27	709.79	0.44	0.53	0.64
5	Slow	679.20	566.00	466.96	0.67	0.80	0.97
1	Normal	467.54	389.60	321.43	0.97	1.16	1.41
2	Normal	327.30	272.79	225.00	1.38	1.66	2.01
3	Normal	228.41	190.39	157.02	1.98	2.37	2.88
4	Normal	163.46	136.25	112.36	2.76	3.32	4.02
5	Normal	107.54	89.62	73.94	4.20	5.04	6.11
1	Fast	84.96	70.83	58.41	5.32	6.38	7.74
2	Fast	59.45	49.59	40.87	7.60	9.11	11.06
3	Fast	41.53	34.61	28.54	10.88	13.06	15.83
4	Fast	29.68	24.75	20.39	15.22	18.26	22.16
5	Fast	19.54	16.28	13.44	23.12	27.75	33.63

(*) *Calculated with a tyre dynamic radius index of 510 mm. (ISO 4251/1-1992)*

- Number of revolutions of front wheels for one revolution of rear wheels: 1.4998.

1.3.5 *Total ratios and travelling speeds* (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	3112.01	2593.36	2112.58	0.15	0.17	0.21
2	Slow	2593.36	1815.58	1497.90	0.21	0.25	0.30
3	Slow	1520.48	1267.05	1045.40	0.30	0.36	0.43
4	Slow	1088.07	906.69	748.10	0.42	0.50	0.60
5	Slow	715.85	596.55	492.16	0.63	0.76	0.92
1	Normal	492.77	410.62	338.77	0.92	1.10	1.33
2	Normal	344.97	287.51	237.14	1.31	1.57	1.91
3	Normal	240.74	200.67	165.49	1.88	2.25	2.73
4	Normal	172.28	143.60	118.42	2.62	3.15	3.82
5	Normal	113.34	94.46	77.93	3.99	4.78	5.80
1	Fast	89.54	74.65	61.56	5.05	6.05	7.34
2	Fast	62.66	52.26	43.07	7.21	8.64	10.49
3	Fast	43.77	36.48	30.08	10.32	12.39	15.02
4	Fast	31.28	26.08	21.49	14.45	17.32	21.03
5	Fast	20.60	17.16	14.16	21.94	26.33	31.91

(*) *Calculated with a tyre dynamic radius index of 510 mm. (ISO 4251/1-1992)*

- Number of revolutions of front wheels for one revolution of rear wheels: 1.4998.

1.4 Power take-off

1.4.1 *Main power take-off*

- Type: independent; at rear of tractor;
- Method of engagement: engaged or disengaged by push button, driven by multiplate wet clutch independent of travel clutch;
- Number of shafts: 1;
- Method of changing of power take-off shaft ends: not changeable;
- Method of changing speeds: by external hand lever;

1.4.1.1 Power take-off proportional to engine speed

Power take-off at 540 (rev/min)

- Location: at rear of tractor;
- Diameter of power take-off shaft ends: 35 mm;
- Number of splines: 6, in conformity with ISO 500-1991, type 1;
- Height above ground: 500 mm;
- Distance from the median plane of the tractor: 0 mm;
- Distance behind rear axle: 440 mm;
- PTO speed at rated engine speed: 611 rev/min;
- Engine speed at standard power take-off speed: 2077 rev/min;
- Ratio of rotation speeds (engine speed/p.t.o. speed): 3.8462;
- Power restriction: none;
- Maximum torque transmissible: none;
- Direction of rotation (viewed from behind tractor): clockwise.

Power take-off at 750 (rev/min)

- Location: at rear of tractor;
- Diameter of power take-off shaft ends: 35 mm;
- Number of splines: 6, in conformity with ISO 500-1991, type 1;
- Height above ground: 500 mm;
- Distance from the median plane of the tractor: 0 mm;
- Distance behind rear axle: 440 mm;
- PTO speed at rated engine speed: 752 rev/min;
- Engine speed at standard power take-off speed: 2344 rev/min;
- Ratio of rotation speeds (engine speed/p.t.o. speed): 3.125;
- Power restriction: none;
- Maximum torque transmissible: none;
- Direction of rotation (viewed from behind tractor): clockwise.

Power take-off at 1000 (rev/min) (not fitted on tested tractor)

- Location:	at rear of tractor;
- Diameter of power take-off shaft ends:	35 mm;
- Number of splines:	6, in conformity with ISO 500-1991, type 1;
- Height above ground:	500 mm;
- Distance from the median plane of the tractor:	0 mm;
- Distance behind rear axle:	440 mm;
- PTO speed at rated engine speed:	1021 rev/min;
- Engine speed at standard power take-off speed:	2300 rev/min;
- Ratio of rotation speeds (engine speed/p.t.o. speed):	2.3;
- Power restriction:	none;
- Maximum torque transmissible:	none;
- 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)

- Type:	independent, not adjustable to 540-1000 rev/min location at rear of tractor, in tractor's median plane, below the main 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;
- Travelling distance for one revolution of power take-off shaft:	0.28 m;
- Number of power take-off shaft revolutions for one revolution of rear driving wheels:	14.74.
- Direction of rotation with forward gear engaged (viewed from behind tractor):	clockwise;

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

- Type: independent at front of tractor;
- Method of engagement: engaged or disengaged by push button, driven by multiplate wet clutch independent of travel clutch;
- Number of shafts: 1;
- Method of changing power take-off shaft ends: not changeable;
- Method of changing speeds: none;
- Location: at front of tractor;
- Diameter of power take-off shaft ends: 35 mm;
- Number of splines: 6, in conformity with ISO 500-1991, type 1;
- Height above ground: 530 mm;
- Distance from the median plane of the tractor: 0 mm;
- Distance forward front axle: 630 mm;
- PTO speed at rated engine speed: 979 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;
- Power restriction: none;
- Maximum torque transmissible: none;
- Direction of rotation (viewed facing driving end): anticlockwise

1.5 Hydraulic power lift

1.5.1 *Rear power lift*

- Make: SAME DEUTZ-FAHR Group;
- Model: 791.39;
- 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 pump, driven by engine shaft;
- Transmission between pump and engine: mechanical;
- Number and type of filters: 1, replaceable paper cartridge;
- Oil capacity: 41 dm^3;

1.5.1 *Rear power lift* (continued)

- Site of oil reservoir: gear box;
- Number, type and location of tapping points: 7, double acting, at rear of tractor;
- Maximum volume of oil available to external cylinders: 15 dm^3 ;

1.5.2 *Front power lift* (optional, fitted on tested tractor)

- Make: SAME DEUTZ-FAHR Group;
- Model: 791.59;
- Type of hydraulic system: open centre system;
- Type and number of cilinders: 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;
- 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: none;
- Maximum volume of oil available to external cylinders: none;

1.6 Three-point linkage

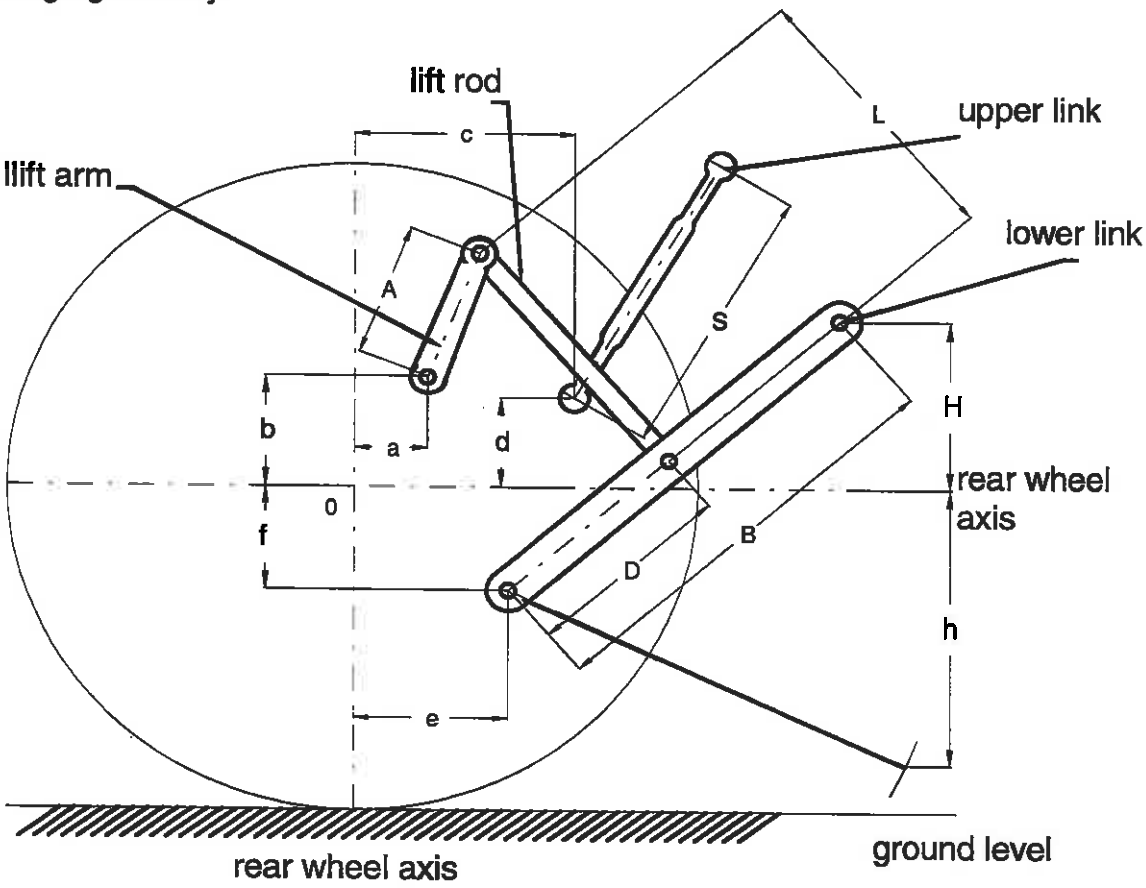
1.6.1 *Rear three point linkage*

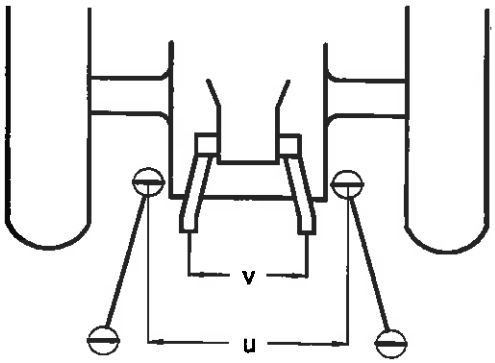
- Category (ISO 730/1-1994): 2;
- Category adapter: none.

1.6.2 *Front three point linkage*

- Category (ISO 730/1-1994): 2
- Category adapter: none

Rear linkage geometry



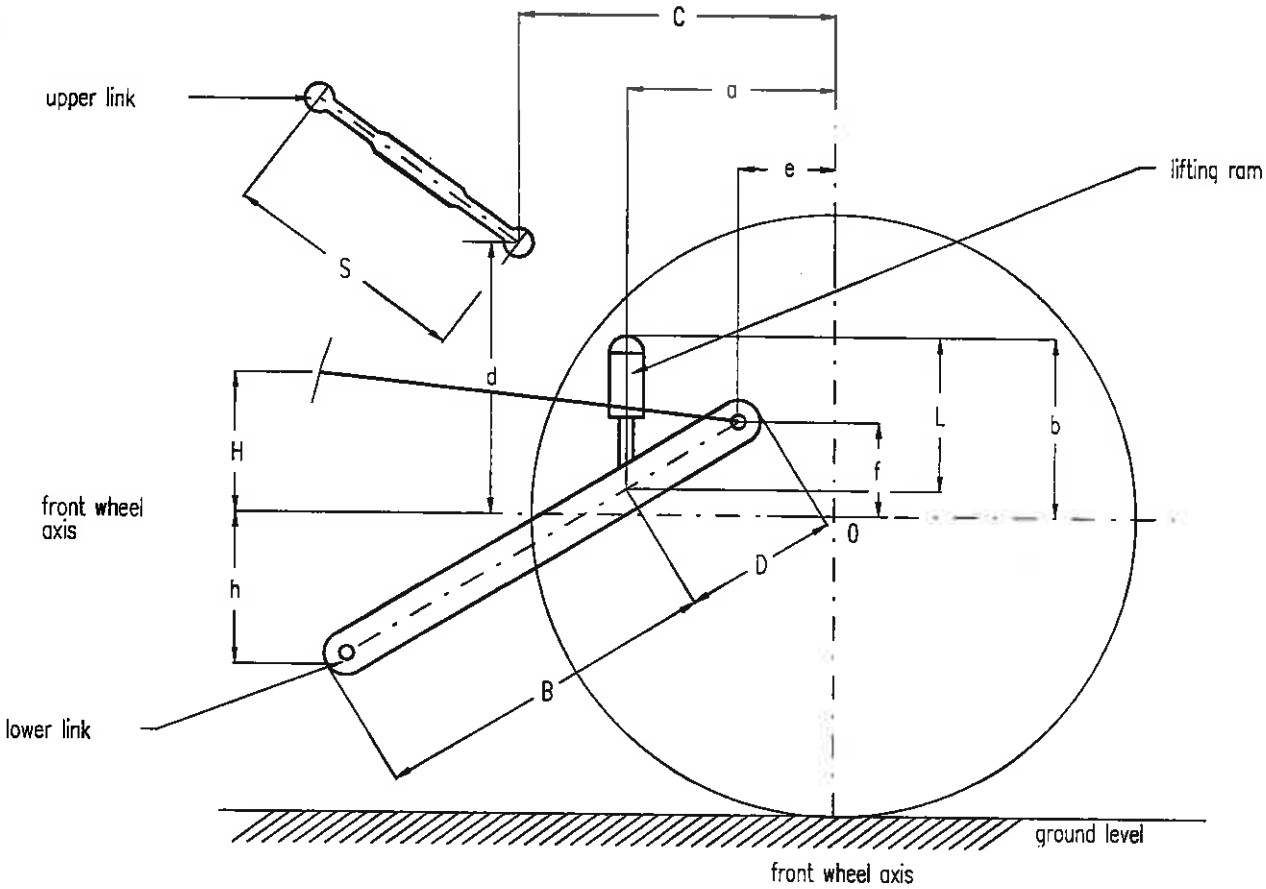


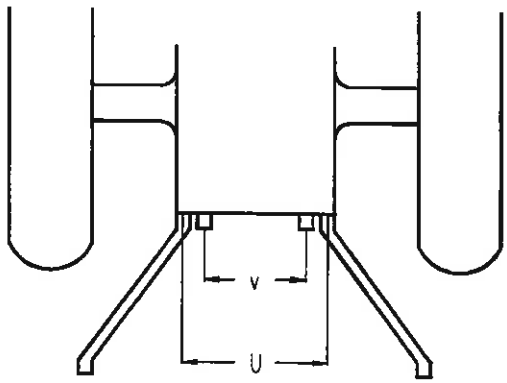
Dimensions of rear linkage geometry when connected to the standard frame

			Dimension or range mm	Settings used in test mm
Length of lift arms		(A)	380	380
Length of lower links		(B)	746	746
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)	435	435
Horizontal distance between the 2 lift arm end points		(v)	330	330
Length of upper link		(S)	from 475 to 680	535
Distance of upper link pivot point from rear wheel axis				
- horizontally		(c)	407-397-407	397
- vertically		(d)	260-295-335	295
Distance of lower link pivot point from rear wheel axis				
- horizontally		(e)	183	183
- vertically		(f)	154	154
Distance of lower link pivot points to lift rod pivot points on lower links		(D)	520	520
Length of lift rods		(L)	from 500 to 640	555
Height of lower hitch points relative to the rear wheel axis:				
Length of lift rods	(L)	500	640	555
Linkage distance of lift rods	(D)	520	520	520
Lowest position	(h)	281	503	360
Highest position	(H)	381	221	327
Height above ground of lower hitch points when locked in transport position (*)				837

(*) *Assuming the dynamic radius index = 510 mm (ISO 4251/1-1992)*

Front linkage geometry





Dimensions of front linkage geometry when connected to the standard frame

		Dimension or range mm	Settings used in test mm
Length of lower links	(B)	670	670
Distance of cilinders pivot point from front wheel axis (forward)			
- horizontally	(a)	630	630
- vertically	(b)	485	485
Horizontal distance between the 2 lower link points	(u)	280	280
Horizontal distance between the 2 lift arm end points	(v)	310	310
Length of upper link	(S)	from 470 to 680	478
Distance of upper link pivot point from front wheel axis			
- horizontally	(c)	630 - 675	630
- vertically	(d)	540 - 480	540
Distance of upper link pivot point from front wheel axis			
- horizontally	(e)	438	438
- vertically	(f)	40	40
Distance of lower link pivot points to cylinders pivot points on lower links	(D)	235	235
Length of cylinders			
- in low position	(L)	360	360
- in high position	(L)	560	560
Height of lower hitch points relative to the front wheel axis			
- in low position	(h)		230
- in high position	(H)		345
Height above ground of lower hitch points (*)			695

(*) Assuming the dynamic radius index = 350 mm (ISO 4251/1-1992)

1.7 Swinging drawbar (not available)

1.8 Trailer hitch

- Type:	DGM-GA 4200 C 6t V1,5;
- Hole diameter:	28 mm;
- Height above ground	
. Min.:	250 mm;
. Max.:	670 mm;
- Distance of hitch point from rear wheel axis	
. Horizontally:	600 mm;
- Distance of hitch point from power take-off shaft end	
. Vertically:	270 mm below, 140 mm above;
. Horizontally:	160 mm;
- Maximum vertical permissible load:	14.7 kN.

1.9 Holed drawbar (optional, not fitted on tested tractor)

- 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.:	155 mm;
. Max.:	890 mm;
- Horizontal distance behind power take-off shaft end:	470 mm;

1.10 Steering

- Specification:	hydrostatic steering with BOSCH hydraulic gear pump, 2 simple acting ram directly on front axle.
- Make:	DANFOSS;
- Model:	ORBITROLL OSPC 80 R;
- Type:	hydrostatic;
- Working pressure:	15 MPa;

1.11 Brakes

1.11.1 *Service brake*

- Make: SAME DEUTZ-FAHR Group;
- Model: 791.54;
- 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 SINTERIX 2 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, 2 oil bath disc mounted on the pinion shaft in the gear box;
- Method of operation: mechanical by hand lever.

1.11.3 *Steering brake*

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

1.12 Wheels

- Number
  - . Front: 2, steering and driving;
  - . Rear: 2, driving;
- Wheelbase: 1926 mm.

-Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front	1020	1265	changing the position of the rims with respect to the disc
Rear	890	1290	

1.13 Protective strutture

- Make:	SAME DEUTZ-FAHR GROUP;
- Model:	C 40;
- Type:	cab, not tiltable;
- Manufacturer's name and address:	SAME DEUTZ-FAHR GROUP S.p.A., Viale F. Cassani 15, 24047 Treviglio BG, Italy.
- OECD approval number:	7/S/0 125;
- Date of approval:	19 March 1998;
- Modification certificate:	none.

1.14 Seat

1.14.1 *Driver's seat*

- Make:	GRAMMER;
- Model:	MSG 83/8;
- Type:	upholstered seat with back rest;
- Seat and steering wheel reversible:	no;
- Type of suspension:	adjustable spring;
- Type of damping:	shock absorber;
- Range of adjustment:	150 mm longitudinally and 60 mm vertically;
- Safety belt:	no.

1.14.2 *Optional driver's seats*

- Make:	KAB;
- Models:	P1/XH 2;
- Type:	upholstered seat with back rest
- Seat and steering wheel reversible:	no;
- Type of suspension:	adjustable spring;
- Type of damping:	shock absorber;
- Range of adjustment:	150 mm longitudinally and 60 mm vertically;
- Safety belt:	no.

1.14.2 *Optional driver's seats* (continued)

- Make: GRAMMER;
- Models: MSG 93/8;
- Type: upholstered seat with back rest
- Seat and steering wheel reversible: no;
- Type of suspension: pneumatic, with automatic weight adjustment;
- Type of damping: shock absorber;
- Range of adjustment: 150 mm longitudinally and 60 mm vertically;
- Safety belt: no.

- Make: GRAMMER;
- Models: DS 83H/8;
- Type: upholstered seat with back rest;
- Seat and steering wheel reversible: no;
- Type of suspension: adjustable spring;
- Type of damping: shock absorber;
- Range of adjustment: 150 mm longitudinally and 60 mm vertically;
- Safety belt: no.

1.14.3 *Passenger's seat* none.

1.15 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
Headlights	990	160 x 100	185
Front parking lights	1220	110 x 35	495
Front direction indicator	1220	110 x 35	535
Rear parking lights	1080	50 x 60	430
Rear direction indicator	1080	50 x 60	480
Brake lights	1080	50 x 60	380
Reflectors	650	⌀ 80	490

2. TEST CONDITIONS

2.1 Overall dimensions

	Length		Width		Height at top of protective structure
	with front power lift	without front power lift	minimum	maximum	
	mm	mm	mm	mm	mm
Unballasted	4036	3431	1290	1640	2110
Ballasted	4136	3671	1290	1640	2110

2.2 Ground clearance:

230 mm below front axle (unballasted tractor).

2.3 Tractor mass (with full fuel tanks, cab and front power lift)

	Unballasted		Ballasted	
	Without driver	With driver	Without driver	With driver
	kg	kg	kg	kg
Front	1160	1180	1515	1535
Rear	1295	1350	1175	1230
Total	2455	2530	2690	2765

2.4 Ballast

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

2.5 Tyres and track width specifications

	Front	Rear
Tyres		
make	GOOD YEAR	PIRELLI
model	DT 810 RADIAL	TM 700
dimensions	240/70R16	380/70R20
ply rating	-	-
load index/speed index	104 A8	122 A8
type	radial	radial
maximum load (tyre manufacturer's)	900 daN	1500 daN
inflation pressure (tyre manufact.'s)	240 kPa	160 kPa
dynamic radius index	350 mm	510 mm
Chosen track width	1060 mm	915 mm
Technically permissible axle load	1766 daN	2943 daN
Other tyres available	280/65R15.5	380/70R20

2.6 Fuel

- Type: AGIP DIESEL, DIN 51601; (in accordance with the national standard)
- Density at 15 °C: 0.836 g/m^3.

2.7 Oils and lubricants

2.7.1 *Capacity and change interval*

	Capacity dm^3	Oil change h	Filter change h
Engine	6.7	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

2.7.2 *Specifications*

	Recommended	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/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

2.7.3 *Grease*

- Type: AKROS GREASE T2;
- Number of lubrication points: 15.

3. COMPULSORY TESTS RESULTS

3.1 Main power take-off

- Date and location of test: 21 December 1998, ISMA, Treviglio BG, Italy;
- Type of dynamometer: eddy-current, ZÖLLNER B350.

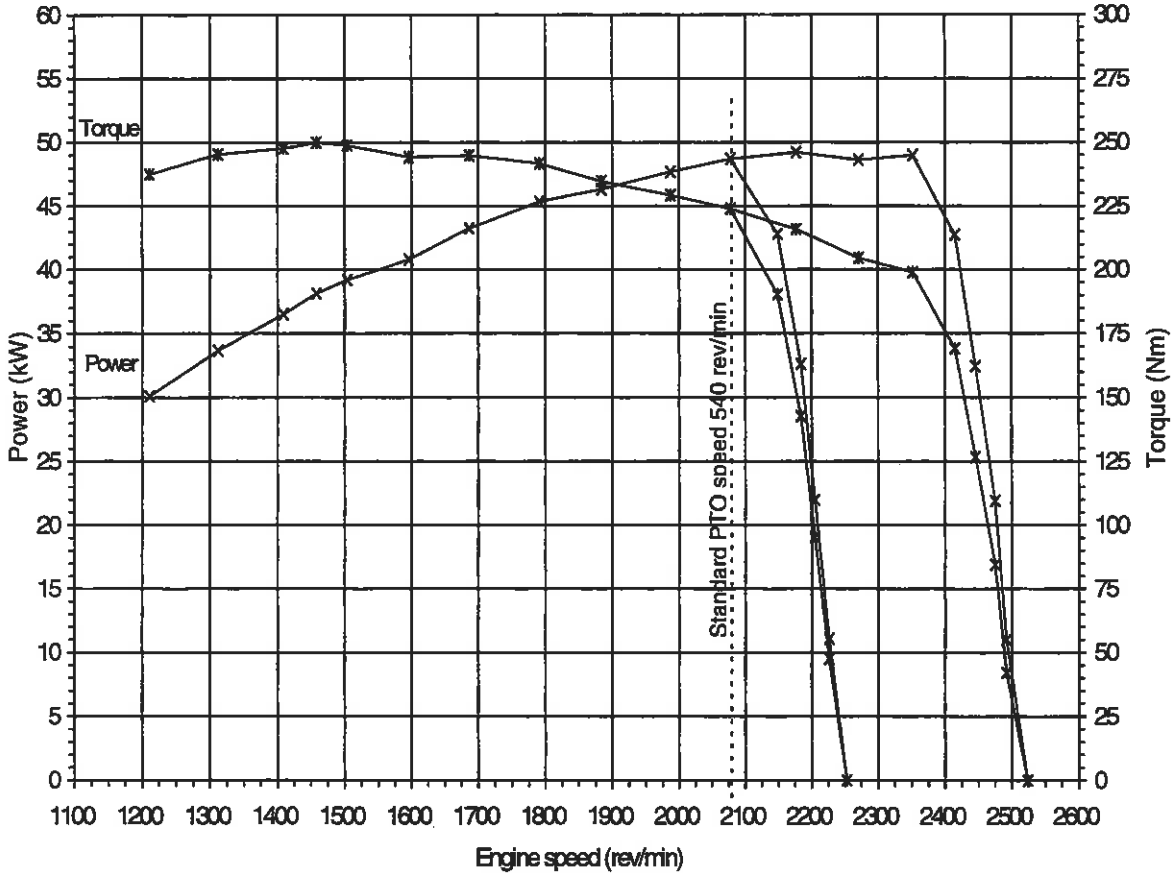
Power	Speed		Fuel consumption			Specific energy
	Engine	PTO	Hourly		Specific	
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER - TWO-HOUR TEST						
49.23	2177	566	13.91	11.63	236	3.54
3.1.2 POWER AT RATED ENGINE SPEED						
48.99	2352	612	14.41	12.05	246	3.40
3.1.3 STANDARD POWER TAKE-OFF SPEED (540 rev/min)						
48.71	2078	540	13.64	11.40	234	3.57
3.1.4 PART LOADS 3.1.4.1 The torque corresponding to maximum power at rated engine speed						
48.99	2352	612	14.41	12.05	246	3.40
3.1.4.2 85% of torque obtained in 3.1.4.1						
42.75	2415	628	12.88	10.77	252	3.32
3.1.4.3 75% of torque defined in 3.1.4.2						
32.45	2446	636	10.73	8.97	276	3.02
3.1.4.4 50% of torque defined in 3.1.4.2						
21.90	2475	643	8.50	7.11	325	2.58
3.1.4.5 25% of torque defined in 3.1.4.2						
11.02	2492	648	6.42	5.37	487	1.72
3.1.4.6 unloaded						
0	2524	656	3.85	3.22	-	-

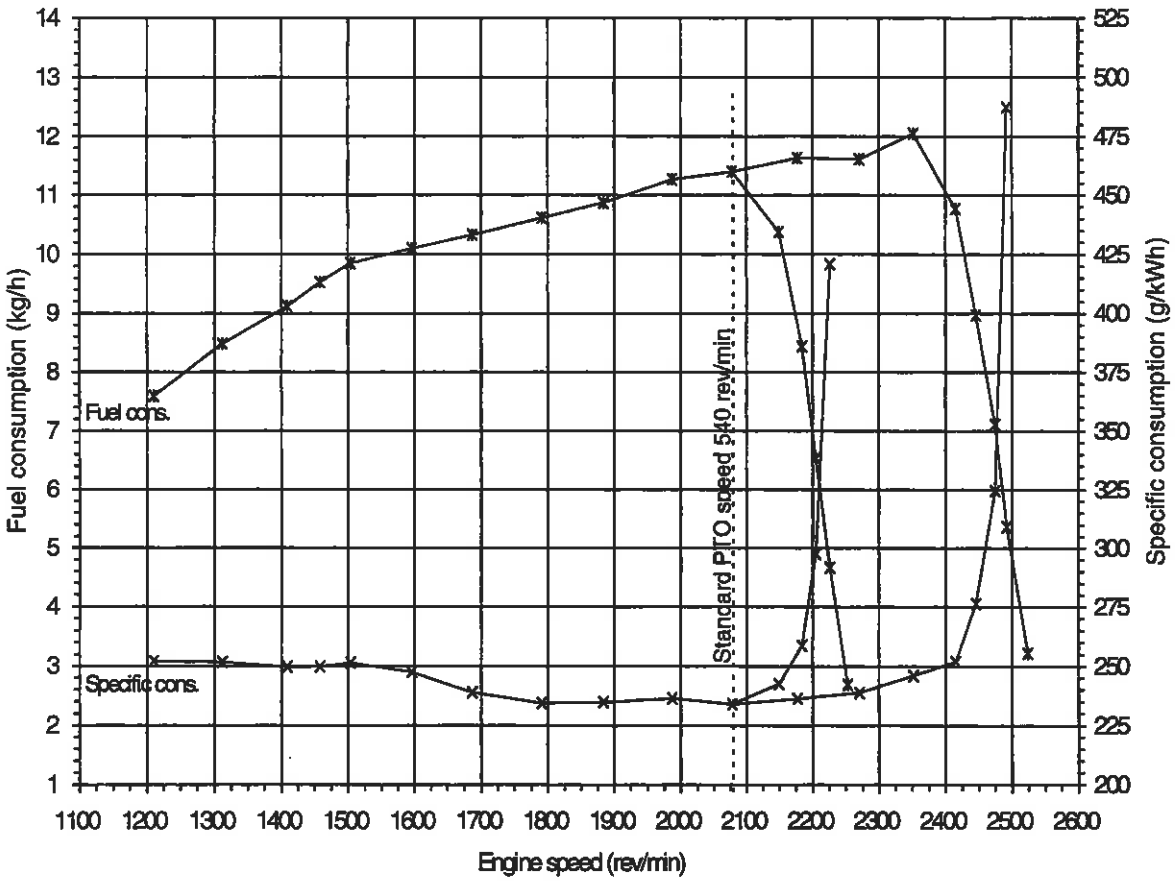
Power	Speed		Fuel consumption			Specific energy
	Engine	PTO	Hourly		Specific	
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED (540 rev/min)						
3.1.5.1 The torque corresponding to maximum power available						
48.71	2078	540	13.64	11.40	234	3.57
3.1.5.2 85% of torque obtained in 3.1.5.1						
42.81	2149	559	12.42	10.38	242	3.45
3.1.5.3 75% of torque defined in 3.1.5.2						
32.64	2184	568	10.10	8.40	259	3.23
3.1.5.4 50% of torque defined in 3.1.5.2						
21.98	2205	573	7.82	6.54	298	2.81
3.1.5.5 25% of torque defined in 3.1.5.2						
11.09	2226	579	5.59	4.67	421	1.99
3.1.5.6 unloaded						
0	2253	586	3.22	2.69	-	-

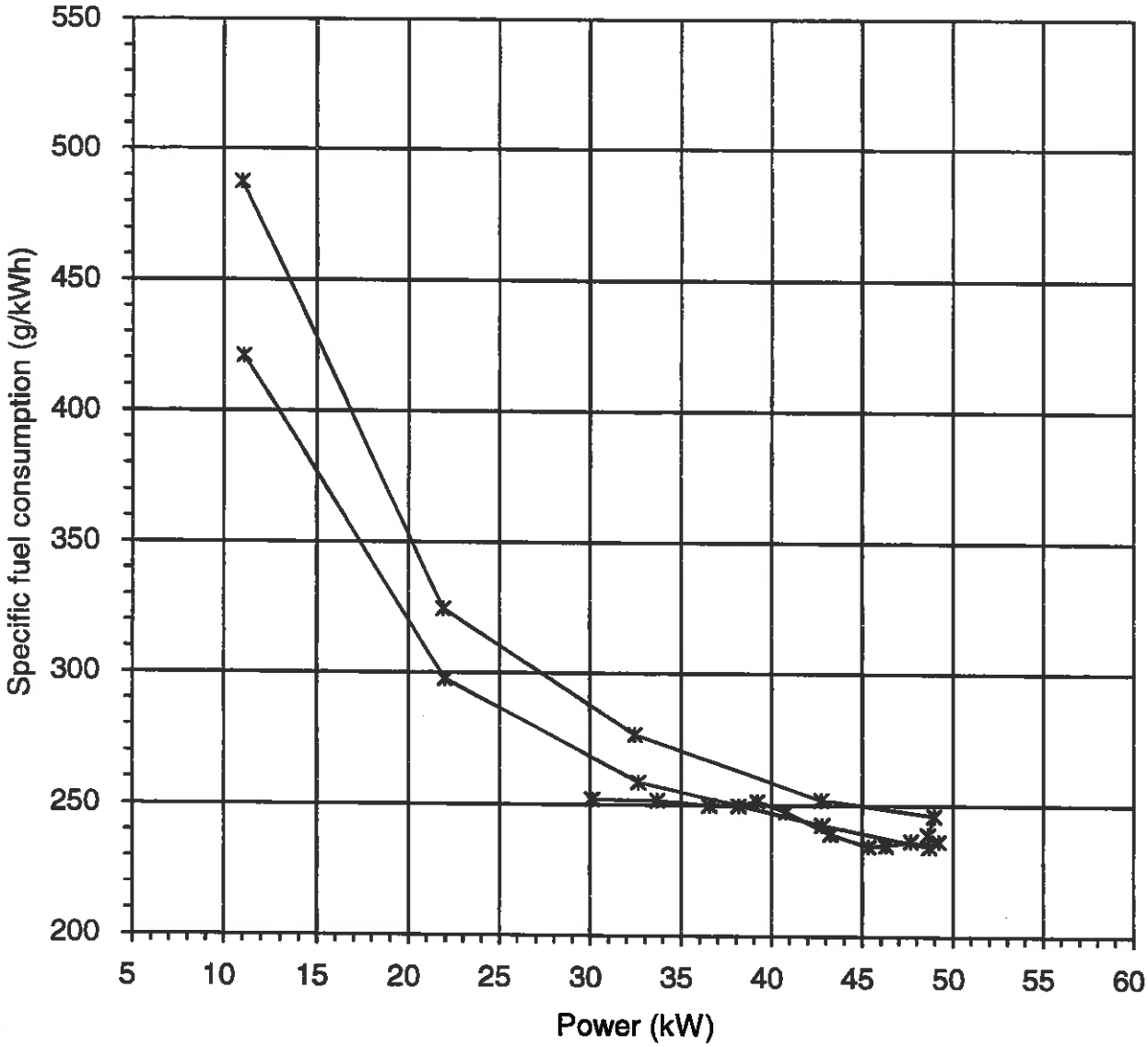
- No load maximum engine speed: 2524 rev/min;
- Equivalent flywheel torque at rated engine speed: 198.97 Nm;
- Equivalent flywheel torque at 2-hour test: 216.02 Nm;
- Maximum equivalent flywheel torque: 249.97 Nm at 1458 rev/min of the engine.

- Mean atmospheric conditions
  . Temperature: 18 °C
  . Pressure: 99.8 kPa
  . Relative humidity: 69 %

- Maximum temperatures
  . Coolant: 38 °C
  . Engine oil: 128 °C
  . Fuel: 23 °C
  . Engine air intake: 18 °C


Torque
Power
Power (kW)
Torque (Nm)
Standard PTO speed 540 rev/min
Engine speed (rev/min)


Fuel cons.
Specific cons.
Fuel consumption (kg/h)
Specific consumption (g/kWh)
Standard PTO speed 540 rev/min
Engine speed (rev/min)


Specific fuel consumption (g/kWh)
550
500
450
400
350
300
250
200
5
10
15
20
25
30
35
40
45
50
55
60
Power (kW)

3.2 Hydraulic power and lifting force

- Date of tests: 24 February 1999.

3.2.1 *Hydraulic power test*

- Sustained pressure with relief valve open: 18.0 MPa;
- Pump delivery rate at minimum pressure: 33 l/min;

	Flow rate l/min	Pressure MPa	Power kW
At 90% of the actual relief valve setting	25.5	16.2	6.89
Maximum	25.0	16.8	7.00

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

(*) Opening and closing pressures of the unloading valve could not be measured

3.2.2 *Rear power lift test*

		At hitch point	On the frame
Height of lower hitch point above ground in down position	mm	150	150
Vertical movement			
without lifting forces	mm	687	917
with lifting forces	mm	669	877
Maximum corrected force exerted through full range	kN	16.27	10.74
Corresponding pressure of hydraulic fluid	MPa	16.2	16.2
Moment about rear axle	kNm	15.11	16.53
Maximum tilt angle of mast from vertical	degrees	-	19

Lifting heights relative to the horizontal lower links (mm)											
-217	-206	-100	0	+100	+200	+300	+400	+463	+500	+600	+660
Lifting forces at hitch points (kN), corrected to 16.2 MPa											
-	16.27	17.11	17.98	18.43	18.69	18.85	19.87	21.29	-	-	-
Lifting forces at test frame (kN), corrected to 16.2 MPa											
15.79	-	15.48	15.36	14.80	14.27	12.94	12.06	-	11.21	10.80	10.74

3.2.3 *Front power lift test*

		At hitch point	On the frame
Height of lower hitch point above ground in down position	mm	120	120
Vertical movement			
without lifting forces	mm	575	607
with lifting forces	mm	556	577
Maximum corrected force exerted through full range	kN	14.83	11.55
Corresponding pressure of hydraulic fluid	MPa	16.2	16.2
Moment about rear axle	kNm	16.43	19.84
Maximum tilt angle of mast from vertical	degrees	-	4

Lifting heights relative to the horizontal lower links											
mm	-270	-249	-200	-100	0	+100	+200	+286	+328	-	-
Lifting forces at hitch points, corrected to 16.2 MPa											
kN	15.14	-	15.04	14.83	15.01	15.30	15.64	15.77	-	-	-
Lifting forces at test frame, corrected to 16.2 MPa											
kN	-	16.76	15.96	14.68	14.02	13.38	12.68	-	11.55	-	-

3.3 Drawbar performance

- Date of tests: 15, 16, 17 and 18 February 1999;
- Type of track: concrete.

	Height of drawbar above ground mm	Tyre inflation pressure	
		Front kPa	Rear kPa
Unballasted	338	240	160
Ballasted	340	240	160

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 kP
3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
5SL	4.51	27.05	0.60	2473	14.1	1603	0.52	12	82	111	10	60	100.2
5SM	4.97	25.20	0.71	2469	15.0	1497	0.56	12	82	111	10	60	100.2
1NL	6.27	25.65	0.88	2477	13.7	1105	0.76	12	82	111	9	60	100.2
5SH	6.15	25.16	0.88	2465	13.6	1246	0.67	12	82	112	10	60	100.2
1NM	7.31	25.30	1.04	2469	15.1	1026	0.81	12	82	112	10	60	100.2
2NL	8.75	25.40	1.24	2465	14.9	873	0.96	12	82	112	11	60	100.2
1NH	8.99	25.49	1.27	2465	14.5	854	0.98	12	82	112	11	60	100.2
2NM	9.98	24.29	1.48	2462	15.4	798	1.05	12	83	112	11	60	100.2
3NL	12.22	24.58	1.79	2462	14.5	655	1.28	13	82	112	11	60	100.3
2NH	12.54	25.09	1.80	2454	15.1	675	1.24	13	83	112	11	59	100.3
3NM	14.58	24.76	2.12	2450	15.0	602	1.39	12	83	113	11	59	100.2
4NL	17.30	25.43	2.45	2442	15.0	529	1.58	12	83	113	11	59	100.2
3NH	18.59	25.84	2.59	2442	14.4	491	1.70	13	83	113	12	59	100.1
4NM	21.46	26.11	2.96	2442	14.8	428	1.95	13	82	113	12	59	100
4NH	25.31	25.46	3.58	2427	14.6	397	2.10	13	83	113	12	58	100.2
5NL	25.69	24.87	3.72	2423	15.0	402	2.08	13	83	113	11	58	100.2
5NM	32.02	26.20	4.40	2408	15.0	339	2.46	13	83	113	11	58	100.2
1FL	33.32	25.53	4.70	2412	14.6	324	2.58	13	83	113	12	58	100.2
5NH	35.82	24.66	5.23	2338	14.8	335	2.49	13	84	114	12	58	100.1
1FM	39.39	25.56	5.55	2385	15.0	301	2.78	13	84	114	12	58	100.1
2FL	44.79	23.34	6.91	2350	9.8	271	3.08	13	83	114	13	59	100.1
1FH	45.05	23.14	7.01	2331	9.4	264	3.16	12	83	114	13	59	100.1
2FM	44.63	18.91	8.50	2346	7.0	270	3.09	12	83	113	13	58	100.1
3FL	45.02	15.71	10.32	2331	4.9	263	3.18	13	84	114	13	58	100.1
2FH	44.25	15.12	10.54	2338	4.9	268	3.12	13	83	114	13	58	100.2
3FM	43.75	12.46	12.64	2342	3.5	274	3.05	13	83	115	13	58	100.2
4FL	44.47	10.86	14.75	2327	2.8	268	3.12	13	83	114	13	58	100.2
3FH	43.33	10.18	15.33	2323	2.5	276	3.03	12	82	115	13	58	100.2

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
3.3.2 MAXIMUM POWER IN TESTED GEARS (ballasted tractor)													
1SL	1.10	26.41	0.15	2473	14.6	6618	0.13	13	83	112	9	62	100.2
1SM	1.24	27.84	0.16	2469	14.5	6048	0.14	13	83	112	9	62	100.2
2SL	1.56	26.68	0.21	2469	14.9	4776	0.18	13	83	112	9	62	100.2
1SH	1.44	24.67	0.21	2465	14.6	5354	0.16	13	83	112	9	62	100.2
2SM	2.04	29.38	0.25	2465	14.9	3775	0.22	13	83	113	9	62	100.2
3SL	2.33	29.95	0.28	2458	14.9	3532	0.24	13	83	113	9	62	100.2
2SH	2.50	30.00	0.30	2458	14.7	3312	0.25	13	83	113	9	62	100.2
3SM	2.46	26.09	0.34	2462	14.9	3171	0.26	14	83	113	9	62	100.3
4SL	3.32	29.87	0.40	2458	15.0	2500	0.33	14	84	112	9	62	100.3
3SH	3.24	28.42	0.41	2454	15.1	2614	0.32	14	84	113	10	62	100.3
4SM	3.83	29.36	0.47	2462	14.6	2031	0.41	14	84	113	10	61	100.3
4SH	4.26	26.90	0.57	2454	14.8	1995	0.42	14	84	113	10	61	100.3
5SL	4.82	29.43	0.59	2458	14.9	1726	0.48	14	84	113	10	61	100.3
5SM	5.76	29.21	0.71	2450	15.2	1524	0.55	14	84	114	10	61	100.3
1NL	7.31	29.90	0.88	2454	14.7	1163	0.72	14	84	114	10	61	100.3
5SH	7.08	28.96	0.88	2446	14.4	1271	0.66	14	84	114	10	61	100.3
1NM	8.35	28.65	1.05	2458	15.1	994	0.84	15	84	114	10	61	100.3
2NL	10.42	29.78	1.26	2458	14.9	799	1.05	15	84	114	11	61	100.3
1NH	10.95	30.81	1.28	2458	14.8	758	1.10	15	84	115	11	61	100.2
2NM	12.24	29.39	1.50	2454	15.0	692	1.21	15	84	115	11	61	100.2
3NL	14.40	29.13	1.78	2450	14.7	611	1.37	15	84	115	11	61	100.2
2NH	14.46	28.76	1.81	2450	14.7	609	1.37	15	84	115	11	60	100.2
3NM	17.27	29.06	2.14	2446	14.7	523	1.60	15	84	115	11	61	100.2
4NL	18.59	27.10	2.47	2438	14.8	503	1.66	14	83	115	11	61	100.2
3NH	20.26	28.50	2.56	2438	15.0	460	1.82	14	83	115	11	60	100.2
4NM	23.10	28.11	2.96	2431	14.7	424	1.97	14	84	116	12	60	100.2
4NH	27.14	27.53	3.55	2412	14.6	397	2.11	14	84	115	12	60	100.3
5NL	27.99	27.24	3.70	2408	15.0	390	2.14	14	84	115	12	60	100.3
5NM	33.56	27.47	4.40	2392	14.9	332	2.52	14	85	116	12	60	100.3
1FL	35.71	27.54	4.67	2396	14.8	311	2.68	14	85	116	12	60	100.3
5NH	37.48	24.27	5.56	2342	9.5	320	2.61	14	84	116	12	59	100.3
1FM	40.00	26.48	5.44	2340	14.7	298	2.81	13	84	116	12	59	100.3
2FL	43.60	22.27	7.05	2338	7.6	272	3.07	13	84	116	12	59	100.3
1FH	44.15	22.08	7.20	2342	7.2	272	3.08	13	84	117	12	59	100.3
2FM	43.49	18.04	8.68	2342	5.3	275	3.04	13	84	117	12	59	100.3
3FL	43.44	14.90	10.50	2338	3.8	274	3.05	13	84	117	13	59	100.3
2FH	44.74	15.14	10.64	2338	3.9	267	3.14	13	84	117	12	59	100.3
3FM	44.64	12.70	12.66	2342	3.0	268	3.12	13	84	117	13	59	100.3
4FL	44.84	10.84	14.90	2335	2.1	267	3.14	13	84	117	13	59	100.3
3FH	44.64	10.41	15.44	2327	1.9	266	3.14	13	85	117	13	59	100.3

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
3.3.3 FIVE HOUR TESTS													
3.3.3.1 FIVE HOUR TEST at 75% of pull at maximum power													
2FL	35.19	16.67	7.60	2423	3.2	283	2.96	17	86	117	12	58	100.3
3.3.3.2 FIVE HOUR TEST at pull corresponding to 15% wheel slip, without additional ballast													
1FM	40.14	26.38	5.48	2345	14.6	297	2.81	16	86	118	12	58	100.3

Oil consumption during ten hours duration of test 3.3.3.1 and 3.3.3.2: 35 g/h.

3.4 Turning area and turning circle (front wheel drive disengaged)

	With brakes		Without brakes	
	left-hand m	right-hand m	left-hand m	right-hand m
Radius of turning area	4.07	3.97	4.35	4.30
Radius of turning circle	3.42	3.31	3.71	3.65

3.5 Location of centre of gravity

	mm
Height above ground	673
Distance forward from rear axle centre	898
Distance from tractor's median plane to the left	12

3.6 Braking

- Date of tests: 22 February 1999.

3.6.1 *Cold service braking device test*

	Speed before application of brakes km/h	Braking device control force kN	Mean deceleration m/s²
Ballasted tractor	36.0	1.0	3.53
		2.0	3.77
		3.0	4.10
		4.0	4.28
		5.0	4.66
		6.0	4.82
Unballasted tractor	36.0	1.0	4.18
		2.0	4.30
		3.0	4.36
		4.0	4.68
		5.0	5.10
		6.0	5.71

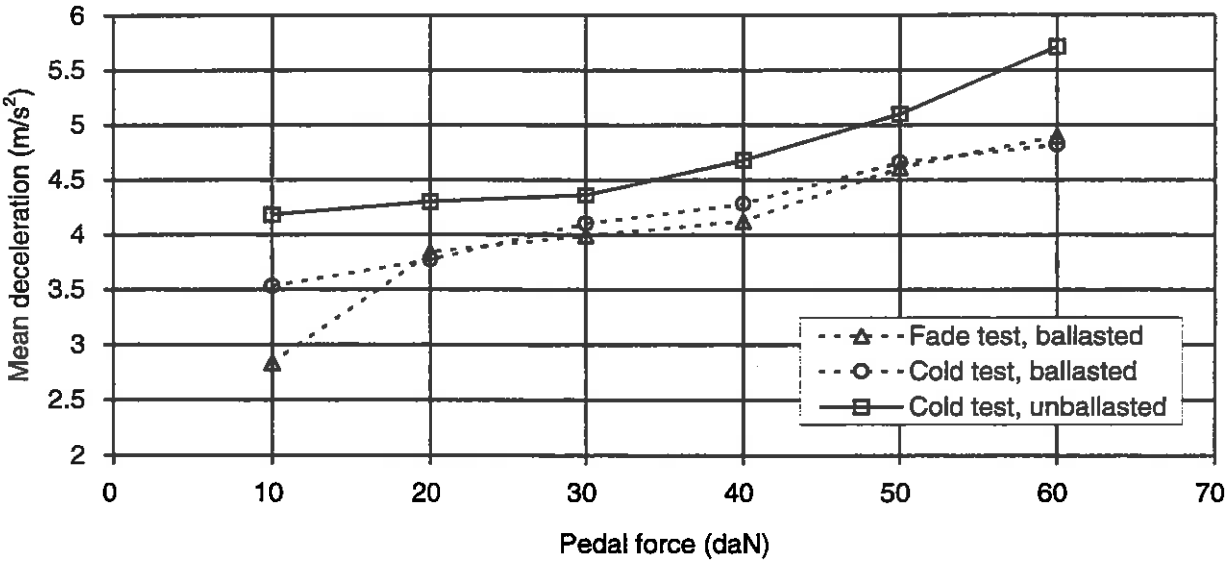
- Maximum deviation of tractor from its original course: none;
- Abnormal vibration: none;
- Brake heating method: heated by towing of the tractor for 1 km.

3.6.2 *Fade test*

	Speed before application of brakes km/h	Braking device control force kN	Mean deceleration m/s²
Ballasted tractor	36.0	1.0	2.83
		2.0	3.84
		3.0	3.99
		4.0	4.12
		5.0	4.61
		6.0	4.90

- Maximum deviation of tractor from its original course: none;
- Abnormal vibration: none;
- Brake heating method: heated by towing of the tractor for 1 km.

3.6.1 *Cold service braking device test* (continued)
3.6.2 *Fade test* (continued)



3.6.3 *Parking brake*

	Ballasted tractor on 18% slope	
	up	down
	daN	daN
Braking device control force	14.7	14.7

3.7 Measurement of external noise level

- Date of test: 4 February 1999;
- Type of track: concrete;
- Type of sound level meter: BRÜEL & KJÆR model 2231.

Gear	Travelling speed before acceleration	Sound level
	km/h	dB(A)
5FH	27.1	83.8

3.8 Repairs: none.
3.9 Remarks: none.

TEST ENGINEER
(Dr. Carlo BISAGLIA)

DIRECTOR OF TESTING STATION
(Prof. Giuseppe COLZANI)

HEAD OF ISMA
(Ing. Giovanni SANTORO)