CRA
CONSIGLIO PER LA RICERCA
E LA SPERIMENTAZIONE
IN AGRICOLTURA

REPORT ON TEST IN ACCORDANCE WITH OECD STANDARD CODE FOR THE OFFICIAL TESTING OF AGRICULTURAL AND FORESTRY TRACTOR PERFORMANCE (CODE 2)



SAME LASER 125

24 forward and 12 reverse speeds
30 km/h
four-wheel drive agricultural tractor

Manufactured by:	SAME DEUTZ-FAHR ITALIA S.p.A Viale F. Cassani 15 24047 Treviglio BG Italy
OECD approval No.:	2/2 396
Date of approval:	31 January 2008
Period of test:	November 2007

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Note

The information opposite each item has been validated by the Testing Station. An item marked C indicates to the test report user that the information declared by the manufacturer has been checked; an item marked D indicates that the manufacturer's declaration has been endorsed.

C	- Tractor manufacturer's name and address:	SAME DEUTZ-FAHR ITALIA S.p.A.; V.le F. Cassani 15, 24047 Treviglio BG, Italy;
D	- Location of tractor assembly:	Treviglio BG, Italy;
D	- Submitted for test by:	the manufacturer;
C	- Selected for test by:	the manufacturer with the agreement of CRA-ING;
D	- Place of running-in:	Treviglio BG, Italy;
D	- Duration of running-in:	50 hours;
C	- Location of test:	CRA-ING, Via Milano 43, Treviglio BG, Italy.

1. SPECIFICATIONS OF TRACTOR

1.1 Identification

1.1.1 Denomination

C	- Make:	SAME;
C	- Model:	LASER 125;
C	- Type:	four-wheel drive, unit construction.

1.1.2 Numbers

D	- First serial number:	S33S256WT1001;
C	- Serial number:	S33S256WT1001.

1.1.3 Other specification

D	- Model for other countries:	none.

1.2 Engine

C	- Make/Model/Type:	SAME DEUTZ-FAHR ITALIA / 1000.6 WT1 / water cooled 4-stroke diesel, direct injection, supercharged;
C	- Serial number:	8704.

1.2.1 Cylinders

C	- Number and disposition:	6 vertical in line;
D	- Bore x stroke:	105 x 115.5 mm;
D	- Capacity:	6000 cm^3;
D	- Compression ratio:	16:1;
D	- Arrangement of valves:	overhead valves, 2 per cylinder;
D	- Cylinder liners:	wet liners.

1.2.2 Supercharging

C	- Make/Model/Type:	GARRETT / 70707-4 / exhaust driven supercharger;
C	- Pressure:	55.9 kPa.

1.2.3 Fuel system

C	- Fuel feed system:	AC corone fuel feed pump;
C	- Make/Model/Type of fuel filter:	FIAMM / FNA 255/00 / replaceable paper element filter;
D	- Capacity of fuel tank:	61 dm^3;
C	- Make/Model/Type of injection pump:	BOSCH / PFR 1 K-90A 555 / immersed, one per cylinder in line;
C	- Serial number:	without serial number;
	- Manufacturer's production setting of injection pump:	
C	. Flow rate:	65 ± 2 mm^3/stroke at rated speed and full load corresponding 27.5 dm^3/h;
D	. Timing:	13° before TDC;
D	- Make/Model/Type of injectors:	BOSCH / DLLA 155 S 1323 / multihole injection nozzles;
D	- Injection pressure:	18 ± 1 MPa.

1.2.4 Governor

C	- Make/Model/Type:	SAME DEUTZ-FAHR ITALIA / SAME 06516510 / mechanical;
C	- Governed range of engine speed:	from 650 to 2505 min^{-1};
C	- Rated engine speed:	2350 min^{-1}.

1.2.5 Air cleaner

	- Pre-cleaner:	
C	- Make/Model/Type:	DONALDSON / P01-6330 / cyclone;
C	- Location of air intake:	front of engine, above the bonnet;
	- Main cleaner	
C	- Make/Model/Type:	DONALDSON 2.4249.380.0 / dry paper element filter with two replaceable cartridge elements;
C	- Maintenance indicator:	none.

1.2.6 Lubrication system

D	- Type of feed pump:	forced feed from gear pump;
C	- Type of filter:	FIAMM FT 4803 IN;
C	- Number of filters:	2.

1.2.7 Cooling system

C	- Type of coolant:	water cooling;
D	- Type of pump:	impeller pump;
	- Specification of fan	
C	- Number of fan blades:	7;
C	- Fan diameter:	520 mm;
D	- Coolant capacity:	16 dm^3;
C	- Type of temperature control:	electrical control;
D	- Superpressure system:	60 kPa.

1.2.8 Starting system

C	- Make/Model/Type:	BOSCH / 12V / JF12V / electromagnetic engagement;
D	- Starter motor power rating:	3 kW;
C	- Cold starting aid:	not fitted;
C	- Safety device:	gear lever shifted in neutral position.

1.2.9 Electrical system

C	- Voltage:	12 V;
	- Generator	
C	- Make/Model/Type:	ISKRA / AAK 5114 14V 85A / alternator;
D	- Power:	1190 W;
	- Battery:	
C	- Number:	1 lead acid;
D	- Rating:	120 Ah at 20 hours.

1.2.10 Exhaust system

C	- Make/Model/Type:	SAME DEUTZ-FAHR ITALIA / DGM-SA 1686 / one reflection absorption chamber;
C	- Location:	on the left hand side of engine, vertical position above side bonnet.

1.3 Transmission

1.3.1 Clutch (utilized only for travelling of tractor)

D	- Make/Model/Type:	LUK Gmbh & CO. / - / single disk dry clutch;
D	- Number of plates:	1;
D	- Diameter of plates:	348 mm;
C	- Method of operation:	hydraulic operated by pedal.

1.3.2 Gear box

D - Make/Model/Type: SAME DEUTZ-FAHR ITALIA / F40.31 / mechanical synchromesh;

- Description: 4 speeds forward with 3 ranges (S/N/F) and 2 reduction gear (High/Low), 4 speeds reverse with 3 ranges (S/N/F).

		Forward	Reverse
C	Number of gears	4	4
C	Number of ranges	3	3
C	Number of reduction gears	2	-
C	Total of arrangements	24	12

D - Available option: 16 forward and 12 reverse.

1.3.3 Rear axle and final drives

D - Make/Model/Type: SAME DEUTZ-FAHR ITALIA / F40.44 / bevel gear differential and epyciclic final drives.

- Differential lock

D - Type: mechanical;

C - Method of engagement: pedal operated;

C - Method of disengagement: pedal operated.

1.3.4 Front axle and final drives

D - Make/Model/Type: SAME DEUTZ-FAHR ITALIA / F40.43 / central shaft bevel gear drive, differential and epicyclic final drives.

- Differential lock

D . Type: mechanical;

C . Method of engagement: pedal operated;

C . Method of disengagement: pedal operated.

1.3.5 Total ratios and travelling speeds

	Gear	Range	Number of engine revolutions for one revolution of the driving wheels		Nominal travelling speed at rated engine speed of 2350 min^{-1} (*) km/h	
	FORWARD		Low	High	Low	High
C	1	Slow	647.2	552.4	1.10	1.29
C	2	Slow	480.9	410.4	1.47	1.73
C	3	Slow	370.4	316.2	1.91	2.24
C	4	Slow	287.8	245.6	2.47	2.89
C	1	Normal	203.7	173.9	3.48	4.08
C	2	Normal	151.4	129.2	4.68	5.48
C	3	Normal	116.6	99.5	6.08	7.12
C	4	Normal	90.6	77.3	7.82	9.17
C	1	Fast	64.1	54.7	11.06	12.96
C	2	Fast	47.7	40.7	14.86	17.41
C	3	Fast	36.7	31.3	19.31	22.64
C	4	Fast	28.5	24.3	24.87	29.16
	REVERSE					
C	1	Slow	634.2		1.12	
C	2	Slow	471.2		1.50	
C	3	Slow	363.0		1.95	
C	4	Slow	282.0		2.52	
C	1	Normal	199.6		3.55	
C	2	Normal	148.3		4.78	
C	3	Normal	114.3		6.20	
C	4	Normal	88.8		7.98	
C	1	Fast	62.9		11.27	
C	2	Fast	46.7		15.17	
C	3	Fast	36.0		19.68	
C	4	Fast	27.9		25.40	

(*)*Calculated with a tyre dynamic radius index of 800 mm (ETRTO 2004)*

- Number of revolutions of front wheels for one revolution of rear wheels: 1.2725.

1.4 Power take-off

1.4.1 Main power take-off

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

1.4.1.1 Power take-off proportional to engine speed

Power take-off at 540 min^{-1}

C	- Location:	at rear of tractor;
C	- Diameter of power take-off shaft ends:	35 mm;
C	- Number of splines:	6, in conformity with 500-1:2005, type 1;
C	- Height above ground:	780 mm;
C	- Distance from the median plane of the tractor:	0 mm;
C	- Distance behind rear axle:	500 mm;
C	- PTO speed at rated engine speed:	609 min^{-1};
C	- Engine speed at standard power take-off speed:	2083 min^{-1};
C	- Ratio of rotation speeds (engine speed/p.t.o. speed):	3.8571;
D	- Power restriction:	not specified;
D	- Maximum torque transmissible:	not specified;
C	- Direction of rotation (viewed from behind tractor):	clockwise.

Power take-off at 1000 min^{-1}

C	- Location:	at rear of tractor;
C	- Diameter of power take-off shaft ends:	35 mm;
C	- Number of splines:	6, in conformity with ISO 500-1:2005, type 1;
C	- Height above ground:	780 mm;
C	- Distance from the median plane of the tractor:	0 mm;
C	- Distance behind rear axle:	500 mm;
C	- PTO speed at rated engine speed:	1100 min^{-1};

Power take-off at 1000 min^{-1} (continued)

C	- Engine speed at standard power take-off speed:	2136 min^{-1} ;
C	- Ratio of rotation speeds (engine speed/p.t.o. speed):	2.1364;
D	- Power restriction:	not specified;
D	- Maximum torque transmissible:	not specified;
C	- Direction of rotation (viewed from behind tractor):	clockwise.

1.4.1.2 Power take-off proportional to ground speed: not available.

1.4.2 Optional power take-off: none.

1.5 Hydraulic power lift

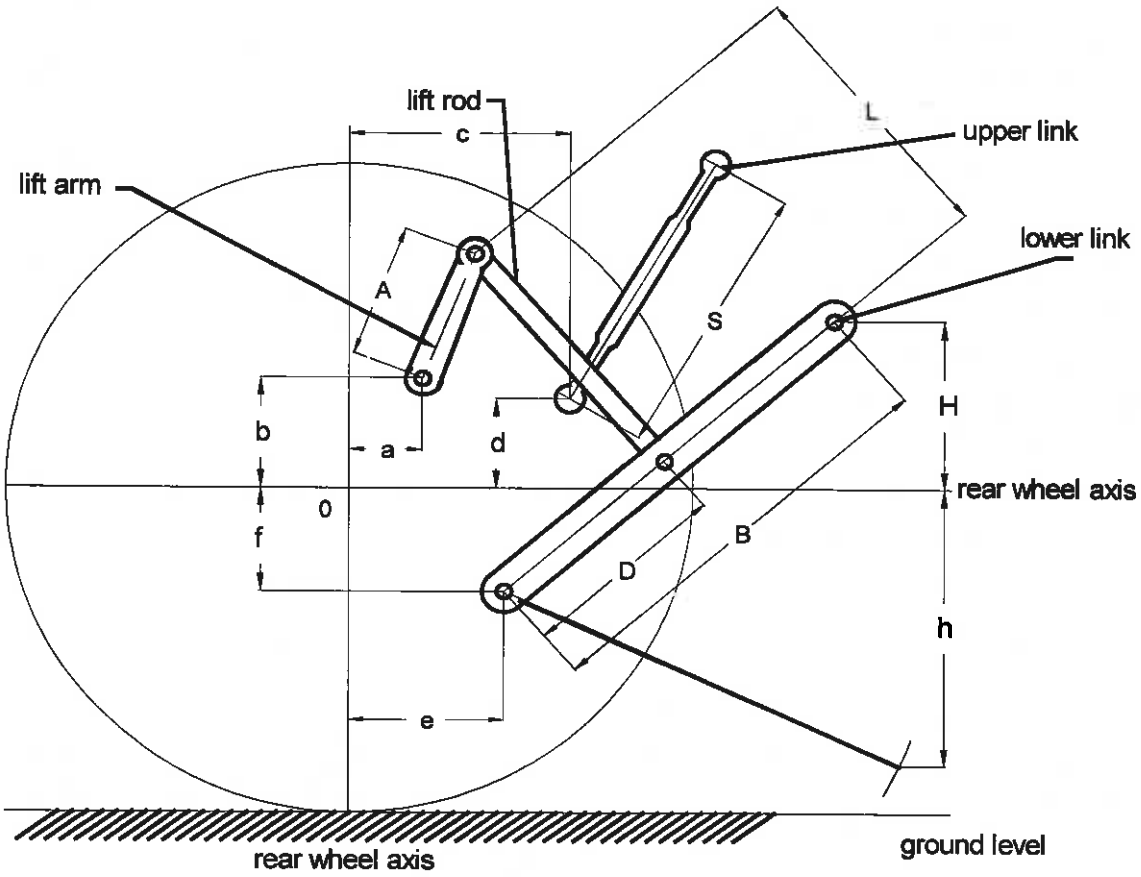
C	- Make/Model/Type:	SAME DEUTZ-FAHR ITALIA / - / open centre system, load sensing;
C	- Type and number of cylinders:	1 internal single acting;
C	- Type of linkage lock for transport:	not available;
D	- Relief valve pressure setting:	19.0 ± 0.5 MPa;
D	- Opening pressure of cylinder safety valve:	21.0 ± 0.5 MPa;
D	- Lift pump type:	hydraulic rotary pump, driven by engine shaft;
D	- Transmission between pump and engine:	mechanical;
C	- Type and number of filters:	1, replaceable paper cartridge;
C	- Site of oil reservoir:	gear box;
C	- Type, number and location of tapping points:	4, double acting, at rear of tractor;
D	- Maximum volume of oil available to external cylinders:	20 dm^3 .

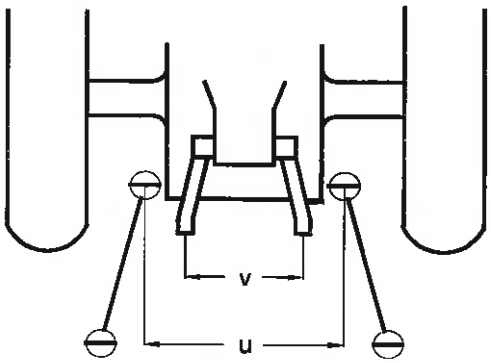
1.6 Three-point linkage

C - Category: 3, in conformity with category 3 of ISO 730-1:1994 + corrigendum 1:1995;

C - Category adapter: 2.

Linkage geometry





Dimensions of linkage geometry when connected to the standard frame

			Dimension or range		Settings used in test
			mm		mm
C	Length of lift arms:	(A)	300		300
C	Length of lower links:	(B)	935		935
	Distance of lift arm pivot point from rear wheel axis (behind):				
C	- horizontally	(a)	140		140
C	- vertically	(b)	450		450
C	Horizontal distance between the 2 lower link points:	(u)	550		550
C	Horizontal distance between the 2 lift arm end points:	(v)	650		650
C	Length of upper link:	(S)	from 600 to 780		690
	Distance of upper link pivot point from rear wheel axis:				
C	- horizontally	(c)	420		420
C	- vertically	(d)	245-310-375		310
	Distance of lower link pivot point from rear wheel axis:				
C	- horizontally	(e)	165		165
C	- vertically	(f)	195		195
C	Distance of lower link pivot points to lift rod pivot points on lower links:	(D)	425-465-505		465
C	Length of lift rods:	(L)	from 780 to 910		805
	Height of lower hitch points relative to the rear wheel axis:				
C	Length of lift rods:	(L)	780	910	805
C	Linkage distance of lift rods:	(D)	465		
C	Lowest position:	(h)	539	823	595
C	Highest position:	(H)	252	0	205
C	Height above ground of lower hitch points when locked in transport position(*)		1052	800	1005

(*) *Assuming a dynamic radius index of 800 mm (ETRTO 2004)*

1.7	**Swinging drawbar**	not avalaible.

1.8	**Trailer hitch**	
C	- Type:	adjustable in height;
C	- Hole diameter:	29 mm;
C	- Height above ground:	centre of clevis adjustable in 2 steps to 655, 570 mm;
C	- Distance of hitch point from rear wheel axis - Horizontally:	675 mm;
C	- Distance of hitch point from power take-off shaft end - Vertically:	below 125, 210 mm; above, none;
C	- Horizontally:	175 mm;
D	- Maximum vertical permissible load:	15 kN.

1.9	**Holed drawbar**	optional, not fitted on tested tractor.
D	- Number of holes:	9;
D	- Distance between holes:	100 mm;
D	- Hole diameter:	33 mm;
D	- Thickness x width of the drawbar:	30 x 80 mm;
	- Height above ground,	
D	- Min.:	- 34 mm;
D	- Max.:	1047 mm;
D	- Horizontal distance behind power take-off shaft end:	535 mm.

1.10	**Steering**	
D	- Make/Model/Type:	DANFOSS / OSPC 200 OR / hydrostatic steering, acting on front wheels.
	- Method of operation	
D	- Pump:	hydraulic gear pump;
D	- Rams:	2 simple acting directly on front axle;
D	- Working pressure:	15 MPa.

1.11 Brakes

1.11.1 Service brake

D	- Make/Model/Type:	SAME DEUTZ-FAHR ITALIA / F40.54 / oil-immersed disc, total 8 discs, 4 at front (2 for wheel, diameter 224 mm), and 4 at rear (2 for wheel, diameter 302 mm) all mounted before the final drive;
C	- Method of operation:	hydraulically actuated with 2 pedals;
C	- Trailer braking take-off:	hydraulic trailer braking take-off.

1.11.2 Parking brake

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

1.12 Wheels

- Number

C	- Front:	2, steering and driving;
C	- Rear:	2, driving;
C	- Wheelbase:	2750 mm.

-Track width adjustment:

		Minimum	Maximum	Adjustment method
		mm	mm	
D	Front	1700	2000	changing the position of the rims with respect to the disc
D	Rear	1700	2000	

1.13 Protective structure

C	- Make/Model/Type:	SAME DEUTZ-FAHR ITALIA / C 28 / cab;
C	- Manufacturer's name and address:	SAME DEUTZ-FAHR ITALIA S.p.A., Viale F. Cassani 15, 24047 Treviglio BG, Italy.

- Protective device

C	- Cab/frame/rollguard/other:	cab;
C	- Tiltable/not tiltable:	not tiltable.

- OECD approval

C	- Model:	C28;
C	- Approval number:	3/0 759/1;
C	- Date of approval:	21/06/2007;
C	- No. of minor modification certificate :	-.

1.14 Seat

1.14.1 Driver's seat

C	- Make/Model/Type:	GRAMMER / MSG 85-721 / upholstered seat with back rest;
C	- Seat and steering wheel reversible:	no;
C	- Type of suspension:	adjustable spring;
C	- Type of damping:	shock absorber;
	- Range of adjustment	
C	- Longitudinally	150 mm;
C	- Vertically	60 mm;
C	- Safety belt:	no.

1.14.2 Optional driver's seats — not available

1.14.3 Passenger's seat: — none.

1.15 Lighting

		Height above ground of centre	Size	Distance from out side edge of lights to median plane of tractor
		mm	mm	mm
C	Headlights	1060	160 x 110	215
C	Side lights	1745	110 x 70	950
C	Rear lights	1590	120 x 70	870
C	Reflectors	1700	100 x 53	870
		740	∅ 80	480

2. TEST CONDITIONS

2.1 Overall dimensions

	Length	Width		Height at top of	
		minimum	maximum	protective structure	exhaust pipe
	mm	mm	mm	mm	mm
Ballasted	4805	2180	2420	2760	2890
Unballasted	4450	2180	2420	2760	2890

2.2 Ground clearance: 490 mm (unballasted tractor);
Clearance-limiting part: gear box.

2.3 Tractor mass (with full fuel tank, cab).

	Ballasted		Unballasted	
	Without driver	With driver	Without driver	With driver
	kg	kg	kg	kg
Front	2415	2440	2000	2025
Rear	3230	3280	3020	3070
Total	5645	5720	5020	5095

2.4 Ballast

	Weights		Water
	Number	Total mass	
		kg	kg
Front	8	315	-
Rear wheels	4 + 4	310	-

2.5 Track specifications Not applicable.

2.6 Tyres and track width specifications

	Front	Rear
Tyres		
- make	BKT	BKT
- model	AGRIMAX RT 855	AGRIMAX RT 855
- dimensions	380/85R28	420/85R38
- ply rating	-	-
- load index/speed index	133 A8	144 A8
- type	radial	radial
- maximum load (tyre manufacturer's)	20.21 kN	27.46 kN
- maximum load (tractor manufacturer's)	27.00 kN	54.00 kN
- inflation pressure (tyre manufacturer's)	160 kPa	160 kPa
- dynamic radius index	650 mm	800 mm
Chosen track width	1930 mm	1800 mm

2.7 Fuel

- Type: AGIP DIESEL, DIN 51601 (in accordance with the national standard);
- Density at 15 °C: 0.842 g/cm^3.

2.8 Oils and lubricants

2.8.1 Capacity and change interval

	Capacity	Oil change	Filter change
	dm^3	h	h
Engine	15.0	150	300
Gear box with rear axle and final drives, hydraulic system, steering	118	1200	2400(*)
Front axle/final drives	13/5	1200	-
Brakes	max level	1200	2400

(*) Or when the warning lamp is lighted

2.8.2 Specifications

	Recommended	Used during test
Engine oil		
Type	AKROS TURBO	AKROS TURBO
Viscosity	12.5 cSt	12.5 cSt
Classification	API CE MIL	API CE MIL
Transmission oil used in gear box, front/rear axle, final drives and steering		
Type	AKROS MULTI FCT	AKROS MULTI FCT
Viscosity	11.5 cSt	11.5 cSt
Classification	API GL 4	API GL 4
Hydraulic fluid		
Type	AKROS MULTI FCT	AKROS MULTI FCT
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

2.8.3 Grease

- Type: AKROS GREASE T2;
- Number of lubrication points: 18.

3. TESTS RESULTS

3.1 Main power take-off

- Date and location of tests: 13 November 2007, CRA-ING, Treviglio BG, Italy;
- Type of dynamometer bench: eddy-current, ZÖLLNER B500.

Power	Speed			Fuel consumption			Specific
	Engine	P.T.O.	Fan	Hourly		Specific	energy
kW	min^{-1}			kg/h	l/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER - ONE-HOUR TEST							
80.0	2200	1030	2640	22.23	26.40	278	3.03
3.1.2 POWER AT RATED ENGINE SPEED							
79.0	2350	1100	2820	23.15	27.49	293	2.87
3.1.3 STANDARD POWER TAKE-OFF SPEED (1000 ± 25 min^{-1})							
79.9	2136	1000	2563	21.77	25.86	272	3.09
3.1.4 PART LOADS 3.1.4.1 The torque corresponding to maximum power at rated engine speed							
79.0	2350	1100	2820	23.15	27.49	293	2.87
3.1.4.2 85% of torque obtained in 3.1.4.1							
69.8	2444	1144	2933	22.04	26.18	316	2.67
3.1.4.3 75% of torque defined in 3.1.4.2							
52.8	2463	1153	2956	18.42	21.88	349	2.41
3.1.4.4 50% of torque defined in 3.1.4.2							
35.4	2478	1160	2974	14.79	17.57	418	2.01
3.1.4.5 25% of torque defined in 3.1.4.2							
17.8	2490	1165	2988	11.44	13.59	643	1.31
3.1.4.6 unloaded							
0	2505	1172	3006	7.87	9.35	-	-

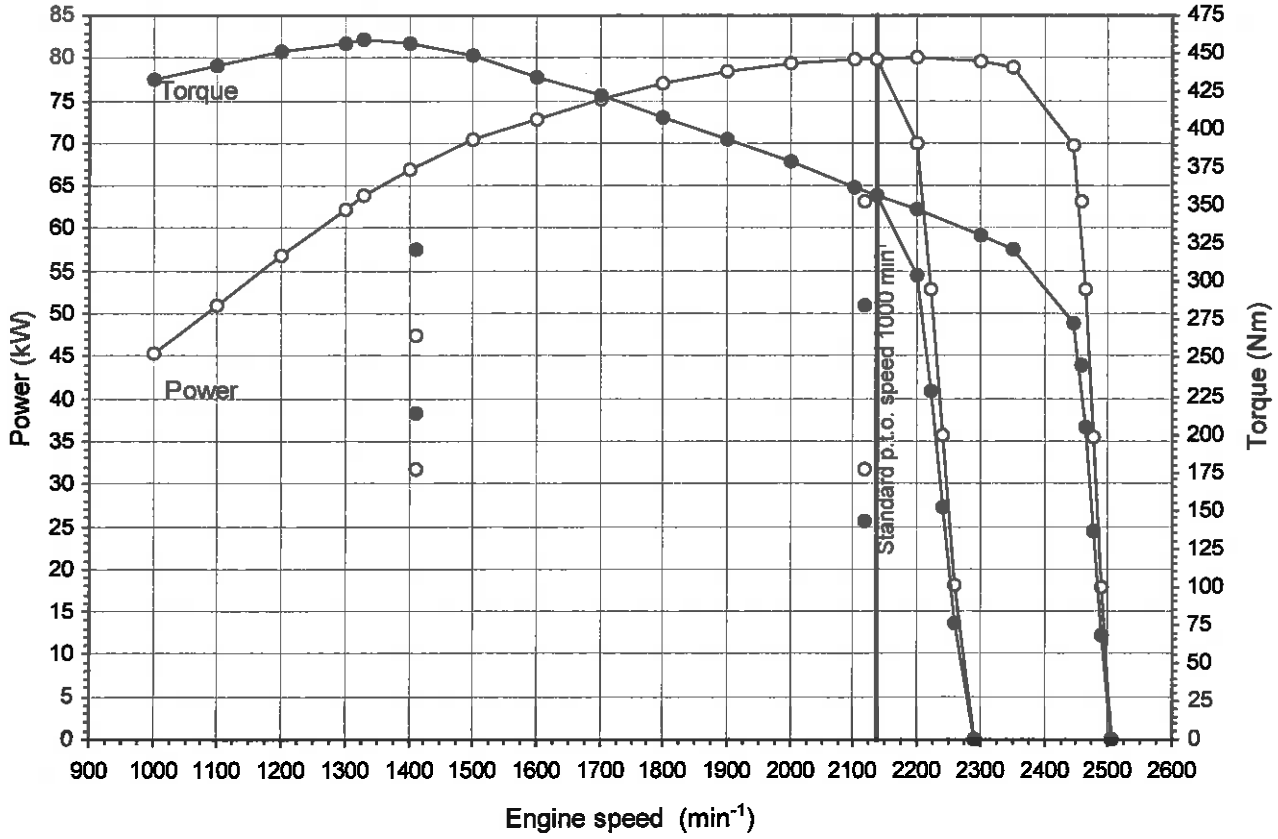
Power	Speed			Fuel consumption			Specific energy
	Engine	P.T.O.	Fan	Hourly		Specific	
kW	min^{-1}			kg/h	l/h	g/kWh	kWh/l
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED (1000 ± 25 min^{-1}) 3.1.5.1 The torque corresponding to maximum power available							
79.9	2136	1000	2563	21.77	25.86	272	3.09
3.1.5.2 85% of torque obtained in 3.1.5.1							
70.0	2200	1030	2640	19.85	23.57	284	2.97
3.1.5.3 75% of torque defined in 3.1.5.2							
52.9	2221	1039	2665	16.38	19.45	310	2.72
3.1.5.4 50% of torque defined in 3.1.5.2							
35.6	2241	1049	2690	13.06	15.51	367	2.30
3.1.5.5 25% of torque defined in 3.1.5.2							
18.0	2258	1057	2709	9.74	11.57	541	1.56
3.1.5.6 unloaded							
0	2291	1072	2749	7 .00	8.31	-	-

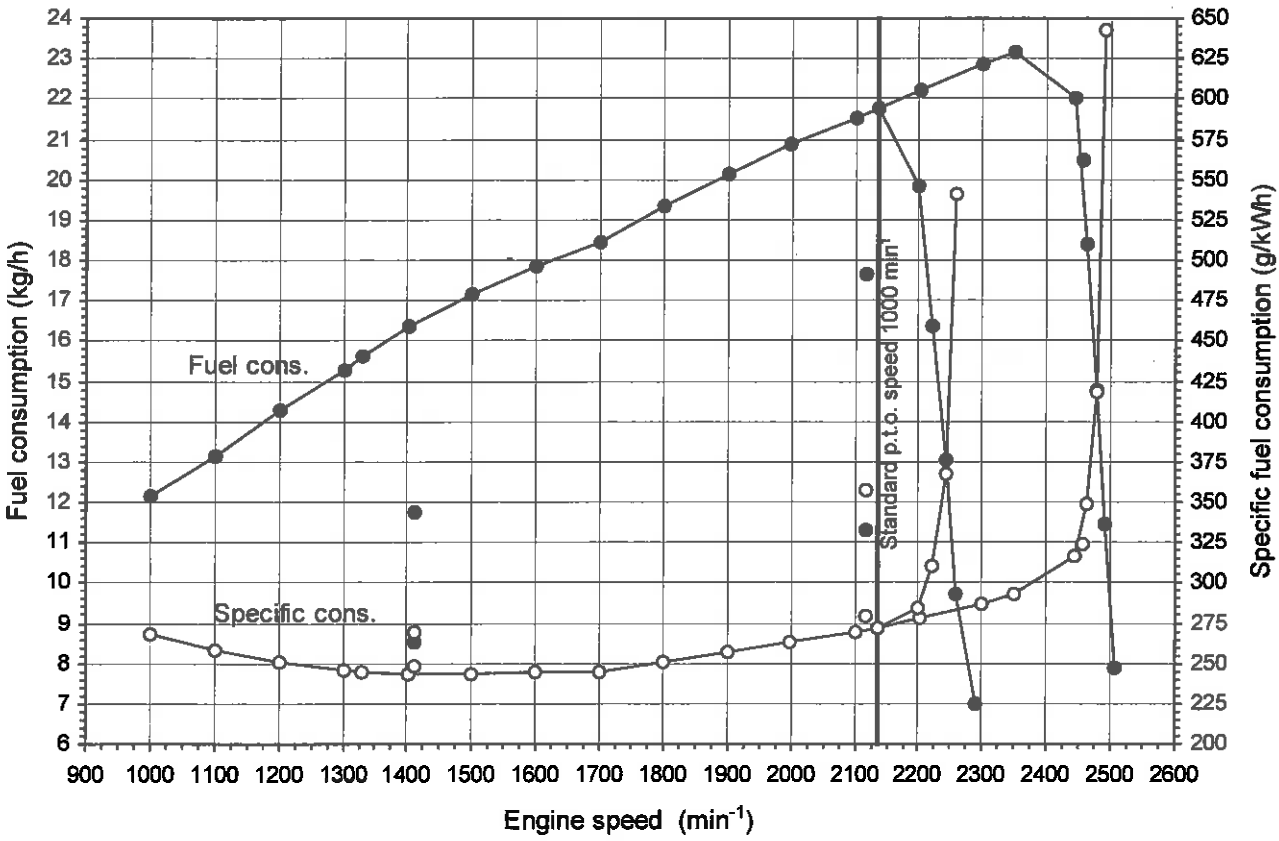
Power	Speed			Fuel consumption			Specific energy
	Engine	P.T.O.	Fan	Hourly		Specific	
kW	min^{-1}			kg/h	l/h	g/kWh	kWh/l
3.1.6 PART LOADS AT DIFFERENT ENGINE SPEED							
3.1.6.1 maximum power at rated engine speed							
79.0	2350	1100	2820	23.15	27.49	293	2.87
3.1.6.2 80% of power obtained in 3.1.6.1 at maximum speed setting							
63.2	2457	1150	2948	20.46	24.30	324	2.60
3.1.6.3 80% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
63.2	2117	991	2541	17.63	20.94	279	3.02
3.1.6.4 40% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
31.6	2117	991	2540	11.31	13.43	358	2.35
3.1.6.5 60% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed							
47.4	1411	660	1694	11.74	13.94	248	3.40
3.1.6.6 40% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed							
31.6	1411	660	1693	8.52	10.12	270	3.12

- No load maximum engine speed: 2505 min^{-1};
- Equivalent flywheel torque at rated engine speed: 321.02 Nm;
- Equivalent flywheel torque at 1-hour test: 347.31 Nm;
- Maximum equivalent flywheel torque: 459.39 Nm at 1328 min^{-1} of the engine.

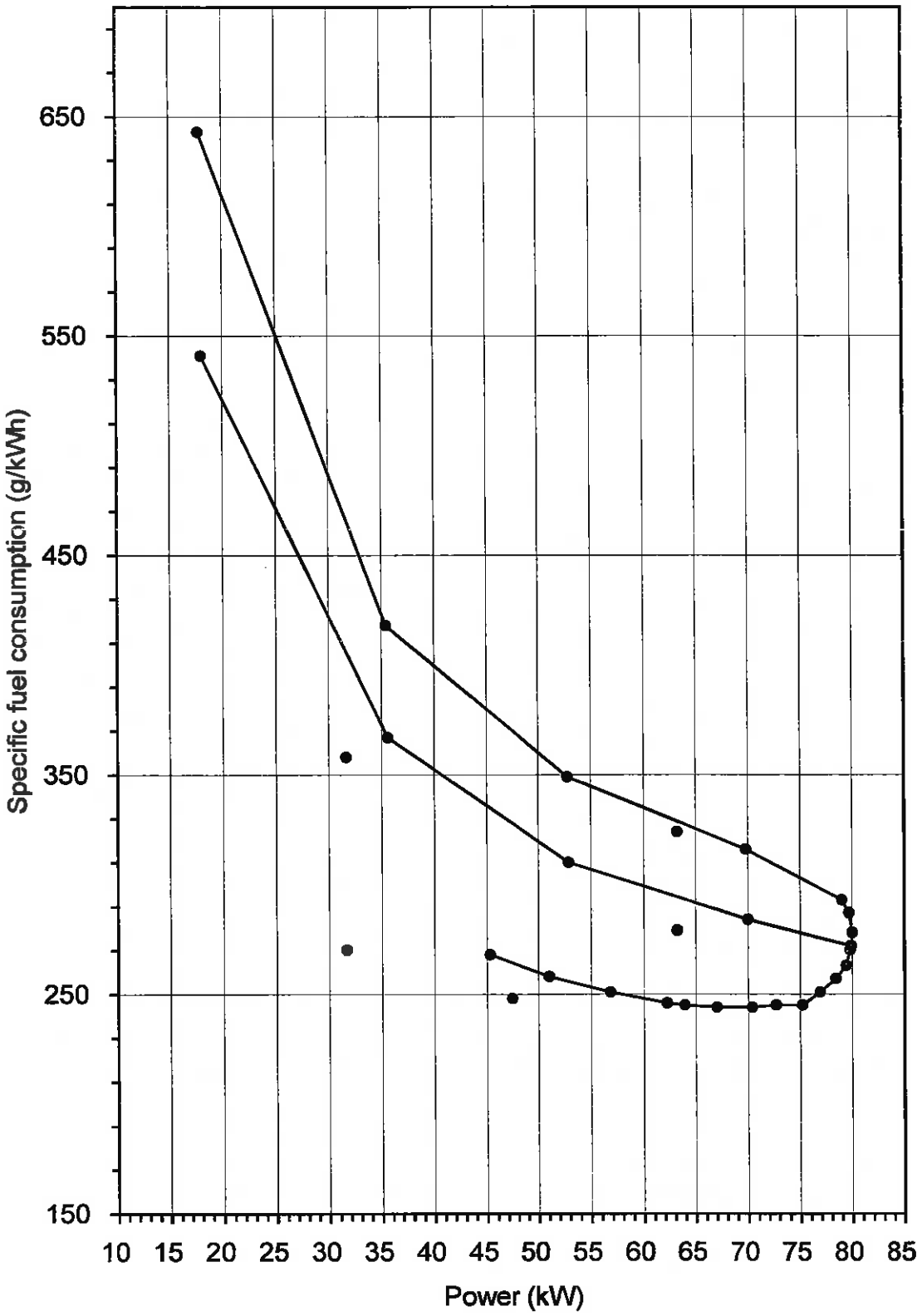
Mean atmospheric conditions:	
Temperature	21 °C
Pressure	105.2 kPa
Relative humidity	50 %
Maximum temperatures:	
Coolant	85 °C
Engine oil	117 °C
Fuel	33 °C
Engine air intake	26 °C

Power take-off test





Power take-off test



3.2 Hydraulic power and lifting force

- Date of tests: 21 November 2007.

3.2.1 *Hydraulic power test*

3.2.1.1 Hydraulic fluid data

- Hydraulic fluid type: AKROS MULTI FCT;
- Viscosity index (ISO 3448:1992): 160;
- Viscosity at 65°C: 29 mm^2/s.

3.2.1.2 Test results

	Pressure	Reservoir oil Temperature		Engine Speed	Flow rate	Power
		Min.	Max.			
	MPa	°C	°C	min^{-1}	l/min	kW
Rated engine speed				-		
3.2.1.2.1 Maximum pressure with relief valve open as measured at the coupler Pump stalled: No	19.0	62	64	2485		
3.2.1.2.2 Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power	17.1	62		2480	61.3	17.47
3.2.1.2.3 Maximum available flow and maximum power from one coupler pair	2.4 18.1	62 63		2502 2480	67.8 61.0	- 18.40
3.2.1.2.4 Maximum available flow and maximum power from coupler pairs operating simultaneously	Simultaneous operation not available					

3.2.2 *Power lift test*

Linkage setting for test - see paragraph 1.6

		At the hitch point	On the frame
Height of lower hitch point above ground in down position	mm	200	160
Vertical movement			
without lifting forces	mm	800	947
with lifting forces	mm	749	863
Maximum corrected force exerted through full range	kN	38.54	37.79
Corresponding pressure of hydraulic fluid	MPa	17.1	17.1
Moment about rear-wheel axis	kNm	42.39	64.62
Maximum tilt angle of mast from vertical	degrees	-	10

Lifting heights relative to the horizontal plane including the lower link pivot points (mm)											
-440	-400	-300	-200	-100	0	+100	+200	+300	+349	+400	+423
Lifting forces (the values of force measured shall be corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve setting of the hydraulic lift system):											
at the hitch points (kN). corrected to 17.1 MPa											
-	38.54	42.85	46.58	49.30	51.26	51.96	53.56	56.90	57.92	-	-
at the frame (kN). corrected to 17.1 MPa											
37.79	38.56	41.48	43.39	44.07	44.17	43.16	42.68	42.33	-	42.05	41.82

3.3 Drawbar power and fuel consumption

- Date of tests: 14. 15. 16. and 19 November 2007;
- Type of track: concrete.

	Height of drawbar above ground mm	Tyre inflation pressure	
		Front kPa	Rear kPa
Unballasted	570	160	160
Ballasted	570	160	160

Gear and range	Power	Drawbar pull	Speed	Engine speed	Fan speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperatures			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
	kW	kN	km/h	min^{-1}	min^{-1}	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)														
4Sh	29.5	40.97	2.59	2472	2966	14.5	556	1.51	30	82	102	21	61	100.7
1Nl	35.4	40.93	3.11	2469	2963	14.8	486	1.73	30	82	102	21	61	100.7
1Nh	42.3	41.58	3.66	2461	2953	15.1	449	1.88	30	82	102	20	61	100.7
2Nl	48.1	41.67	4.16	2453	2944	15.0	425	1.98	32	82	104	20	61	100.7
2Nh	56.6	41.95	4.86	2442	2930	15.1	392	2.15	32	82	104	20	61	100.7
3Nl	63.0	42.33	5.36	2430	2916	15.0	354	2.38	31	83	104	20	60	100.7
3Nh	66.1	41.71	5.71	2201	2641	14.7	337	2.50	30	82	105	20	60	100.7
4Nl	68.3	37.57	6.55	2200	2640	10.9	327	2.58	30	82	105	21	60	100.8
4Nh	69.9	31.62	7.96	2200	2640	7.6	320	2.63	30	83	104	21	60	100.8
1Fl	70.5	26.02	9.76	2202	2642	6.0	316	2.66	31	83	104	20	60	100.8
1Fh	70.5	21.86	11.61	2201	2641	4.4	317	2.66	30	83	105	20	60	100.7
2Fl	68.7	18.30	13.52	2202	2642	3.1	325	2.59	30	83	105	19	60	100.7
2Fh	68.8	15.51	15.97	2202	2642	2.6	324	2.60	31	82	106	19	60	100.7
3Fl	65.4	13.27	17.76	2203	2644	2.2	341	2.47	30	82	106	19	60	100.7

Gear and range	Power	Drawbar pull	Speed	Engine speed	Fan speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperatures			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
	kW	kN	km/h	min^{-1}	min^{-1}	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.3.2 FUEL CONSUMPTION 3.3.2.1 In selected gear nearest to 7.5 km/h. at rated engine speed														
4Nl	67.9	34.08	7.18	2349	2819	8.6	342	2.46	29	82	104	19	60	100.7
3.3.2.1.1 75% of pull corresponding to maximum power at rated engine speed														
4Nl	54.8	25.60	7.71	2449	2939	5.2	387	2.18	28	80	102	19	61	100.7
3.3.2.1.2 50% of pull corresponding to maximum power at rated engine speed														
4Nl	37.9	17.05	8.00	2469	2963	3.0	452	1.86	28	81	102	19	61	100.8
3.3.2.1.3. Highest gear setting at reduced engine speed able to achieve both 3.3.2.1.1 and 3.3.2.1.2 ; same pull and travelling speed as in 3.3.2.1.1														
4Nh	54.2	25.58	7.63	2056	2467	5.1	335	2.51	29	81	102	19	61	100.8
3.3.2.1.4. Same gear selection as 3.3.2.1.3 at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2														
4Nh	37.7	16.99	7.98	2102	2522	3.0	390	2.16	28	81	101	19	61	100.7
3.3.2.2 In selected gear setting nearest between 7 km/h and 10 km/h at rated engine speed														
4Nh	69.8	29.23	8.60	2353	2824	6.5	332	2.54	29	82	106	19	61	100.7
3.3.2.2.1 75% of pull corresponding to maximum power at rated engine speed														
4Nh	55.6	21.92	9.14	2453	2944	4.3	367	2.29	29	81	106	19	61	100.8
3.3.2.2.2 50% of pull corresponding to maximum power at rated engine speed														
4Nh	38.3	14.65	9.42	2469	2963	2.5	448	1.88	28	81	104	19	62	100.8
3.3.2.2.3. Highest gear setting at reduced engine speed able to achieve both 3.3.2.2.1 and 3.3.2.2.2 ; same pull and travelling speed as in 3.3.2.2.1														
1Fl	55.4	21.92	9.10	2013	2416	4.1	316	2.67	28	81	102	19	62	100.8
3.3.2.2.4. Same gear selection as 3.3.2.1.3 at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2														
1Fl	38.4	14.69	9.41	2044	2453	2.4	388	2.17	29	82	102	18	62	100.8

Gear and range	Power	Drawbar pull	Speed	Engine speed	Fan speed	Slip of wheels	Specific fuel con-sumption	Specific energy	Temperatures			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Tempe-rature	Relative humidity	Pres-sure
	kW	kN	km/h	min^{-1}	min^{-1}	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.3.3 OPTIONAL MAXIMUM POWER IN TESTED GEARS (ballasted tractor)														
1Sl	13.4	49.81	0.97	2499	2999	15.0	697	1.21	28	81	105	18	62	100.9
1Sh	16.0	49.96	1.15	2490	2988	14.9	719	1.17	28	81	105	18	62	100.9
2Sl	18.2	49.60	1.32	2488	2986	15.0	663	1.27	28	81	105	18	62	100.9
2Sh	21.1	49.05	1.55	2485	2982	15.0	610	1.38	28	81	106	18	62	100.9
3Sl	23.2	48.63	1.72	2484	2981	14.9	564	1.49	27	81	106	19	63	100.9
3Sh	27.1	48.83	2.00	2480	2976	15.0	527	1.60	28	82	107	18	62	100.9
4Sl	30.2	49.45	2.20	2476	2971	15.2	508	1.66	27	82	107	18	62	100.8
4Sh	35.4	49.45	2.58	2472	2966	15.0	461	1.83	27	82	106	19	63	100.8
1Nl	42.6	49.44	3.10	2465	2958	15.0	427	1.97	27	82	107	19	62	100.8
1Nh	49.2	48.96	3.62	2453	2944	14.8	416	2.02	27	82	106	19	62	100.9
2Nl	56.6	49.13	4.15	2449	2939	14.9	374	2.25	27	81	107	20	62	100.9
2Nh	64.7	48.34	4.82	2422	2906	14.9	346	2.43	27	81	107	20	62	100.8
3Nl	66.3	47.72	5.00	2268	2722	15.0	343	2.45	28	81	107	20	62	100.8
3Nh	69.0	41.34	6.01	2202	2642	9.9	324	2.60	27	82	106	20	62	100.8
4Nl	70.0	37.40	6.74	2202	2642	8.1	320	2.63	28	82	105	21	62	100.8
4Nh	70.9	31.60	8.08	2202	2642	6.0	315	2.67	27	82	105	20	62	100.9

Gear and range	Power	Drawbar pull	Speed	Engine speed	Fan speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperatures			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
	kW	kN	km/h	min^{-1}	min^{-1}	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.3.3 OPTIONAL MAXIMUM POWER IN TESTED GEARS (ballasted tractor) continued														
1Fl	71.3	26.07	9.85	2200	2640	4.7	313	2.69	28	82	105	20	62	100.8
1Fh	71.0	21.87	11.69	2202	2642	3.6	315	2.67	28	83	105	19	62	100.8
2Fl	69.0	18.34	13.54	2202	2642	2.8	324	2.60	27	82	106	19	62	100.8
2Fh	68.2	15.35	16.00	2202	2642	2.1	328	2.57	27	83	105	19	63	100.8
3Fl	66.0	13.38	17.76	2200	2640	1.8	338	2.49	27	83	105	19	62	100.9
3Fh	64.0	11.01	20.92	2202	2642	1.4	350	2.41	28	82	105	19	63	100.7
4Fl	61.2	9.55	23.09	2206	2647	1.0	364	2.31	27	82	104	19	63	100.8
4Fh	58.0	7.68	27.20	2201	2641	0.2	385	2.19	27	82	104	19	63	100.8
3.3.4 FIVE HOUR TESTS														
3.3.4.1 FIVE HOUR TEST at 75% of pull at maximum power														
4Nl	60.6	28.05	7.78	2445	2935	4.5	363	2.32	29	84	107	21	62	100.7
3.3.4.2 FIVE HOUR TEST at pull corresponding to 15% wheelslip. with additional ballast 80 kg														
3Nl	67.4	47.66	5.09	2226	2671	(*)	(*)	2.52	30	85	110	20	62	100.9

(*) Those figures not quoted are irrelevant due to additional ballast.
Oil consumption during ten hours duration of test 3.3.3.1 and 3.3.3.2: 66 g/h.

4. OPTIONAL TEST RESULTS

4.1 Turning area and turning circle

	Without brakes	
	Right-hand	Left-hand
	m	m
Radius of turning area	6.41	6.38
Radius of turning circle	6.31	6.28

4.2 Location of centre of gravity

Height above ground: 1007 mm
Distance from the vertical plane containing the axis of the rear-wheels: 1093 mm
Distance from the median longitudinal plane to the right of the tractor: 7 mm
Angle of suspension of the tractor: 20°

4.3 Braking

Date of tests: 20 November 2007.

4.3.1 *Cold service braking device test*

	Speed before application of brakes	Braking device control force	Mean deceleration	Minimum stopping distance without locking the wheels
	km/h	kN	m/s^2	m
Ballasted tractor	30.9	0.08	1.02	36.1
	30.3	0.13	1.79	19.8
	30.9	0.16	2.35	15.7
	30.3	0.20	3.10	11.4
	31.2	0.22	3.40	11.0
	30.8	0.23	3.62	10.1
Unballasted tractor	30.3	0.08	1.11	31.9
	30.9	0.11	1.61	22.9
	30.2	0.15	2.25	15.6
	30.8	0.20	3.24	11.3
	31.0	0.22	3.56	10.4
	31.1	0.23	3.70	10.1

4.3.1 *Cold service braking device test* (continued)

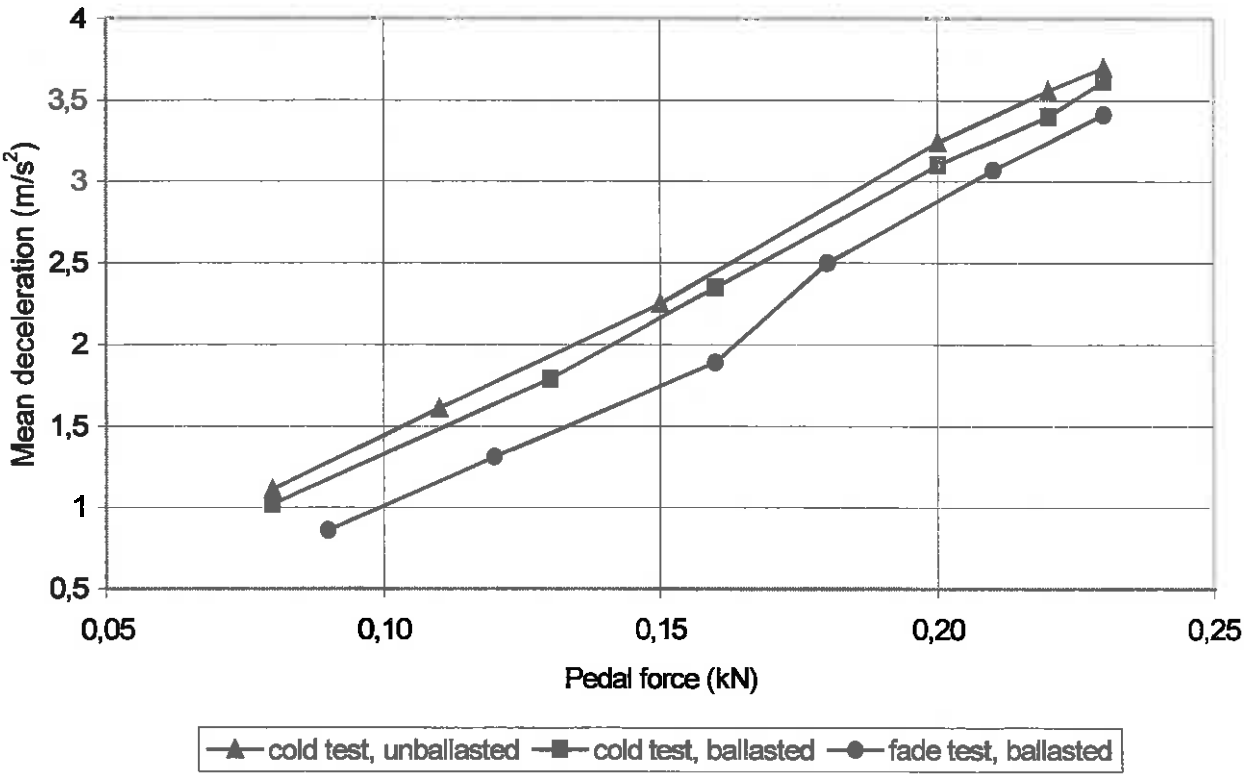
- Maximum deviation of tractor from its original course: none;
- Abnormal vibration: none;

4.3.2 *Fade test*

	Speed before application of brakes	Braking device control force	Mean deceleration	Minimum stopping distance without locking the wheels
	km/h	kN	m/s^2	m
Ballasted tractor	30.9	0.09	0.86	42.8
	30.3	0.12	1.31	27.0
	31.0	0.16	1.89	19.6
	30.9	0.18	2.50	14.7
	30.6	0.21	3.07	11.8
	30.7	0.23	3.41	10.7

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

Service brake test



4.3.3 *Parking brake device test*

	Ballasted tractor on 18% slope	
	Uphill	Downhill
	kN	kN
Braking device control force	0.24	0.24

4.4 Measurement of external noise level

- Date of test: 20 November 2007;
- Type of sound level meter: BRÜEL & KJÆR model 2231;
- Type of track: concrete.

Gear	Travelling speed before acceleration	Sound level
	km/h	dB(A)
4Fh	23.2	89.3

5. REPAIRS: none.

6. REMARKS: none.

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C. Bisaglia

Test engineer
G. Rozzoni

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