ORDNER KOMPLETT

Report on test in accordance with O.E.C.D STANDARD CODE

Restricted Code

O.E.C.D. No. 1100



Agricultural Tractor LANDINI R 6030 (2WD)

Type denomination TL 39 N/B

submitted for test by
Landini Trattori S.p.A.
I-42042 Fabbrico (R.E.), Italy

Deutsche Landwirtschafts-Gesellschaft e.V.
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This bulletin is based on engineering tests in accordance with the O.E.C.D. RESTRICTED STANDARD CODE for the Official Testing of Agricultural Tractor Performance, C (84) 163 (Final), Appendix IV.

Duration of Tests: September till November 1986
DLG-Testing-Station for Agricultural Machinery, Max-Eyth-Weg 1,
D-6114 Groß-Umstadt

This report has been approved by the O.E.C.D. Coordinating Centre (C.E.M.A.G.R.E.F., France) as being in accordance with the O.E.C.D. STANDARD CODE.

Date of Approval: 27th October 1987

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The tractor LANDINI 6030, serial-no. 239 B 00431, had been tested in 2 variants
— as model DT 6030 (4WD)
— as model R 6030 (2WD).

Complete front axle and front axle drive had been changed.
In the rest the 2 variants are identical.
This report refers to the model R 6030

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

The reference to the former used Technical System of Units is given by the following relations:

Forces	1 daN = 10 N	=	1,02 kp	or 1 kp	= 0,981 daN
Powers	1 kw	=	1,36 PS	or 1 PS	= 0,376 kW
Pressure	1 bar	=	1,02 kp/cm^2	or 1 kp/cm^2	= 0,981 bar
	1000 mbar	=	750,10 mm Hg		

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Tractor manufacturer:	MASSEY-FERGUSON S.P.A. LANDINI DIVISION, WORKS OF FABBRICO (R.E.), Italy
Submitted for test by:	LANDINI TRATTORI S.P.A., 42042 FABBRICO (R.E.), Italy
Selected by:	Manufacturer with agreement by DLG
Place of running-in:	Fabbrico and Groß-Umstadt
Duration of running-in:	Engine and tractor appr. 35 hours

SPECIFICATION OF TRACTOR

Tractor

Make:	LANDINI
Trade name:	R 6030
Type denomination:	TL 39 N/B
Type:	Wheel tractor, unit construction, rear wheel driven
Serial No.:	239 B 00431
Start of series:	139 B 00001

Engine

Make:	PERKINS
Model:	AT 3.152.4
Type:	Watercooled 4-stroke Diesel-engine, direct injection, turbo-supercharged
Serial No.:	CN 31139 U 781 272 N
Cylinders:	3, in line, bore 91,4 mm, stroke 127 mm, displacement 2500 cm^3, compression ratio 15,1:1; replaceable wet cylinder liners
Valves:	Overhead
Fuel system:	AC-DELCO fuel supply pump; CAV distributor injection pump DPA 3238 F440; serial no. 44124 LCG; manufacturer's production setting 56±2 mm^3/stroke at rated engine speed and full load; with injection timing device; injection timing 18+8° before TDC; CAV 4 hole-injection nozzles BKBL 67 S 5336, injection pressure 255±5 bar, CAV fuel filter with replaceable paper element; capacity of fuel tank 60,5 l

Governor:	CAV centrifugal variable speed governor, governed range of engine speed 750 to 2360 min-1 rated engine speed 2250 min-1 without manifold-pressure compensator
Supercharger:	GARRET, model TA 3117, exhaust driven turbo supercharger, maximum charge-air pressure 370 mbar
Air cleaner:	FISPA oil bath air filter, cyclone pre-cleaner; oil capacity 0,7 l, oil change every 100 operating hours, no maintenance indicator; air intake in front of engine, below bonnet
Exhaust silencer:	MASSEY FERGUSON expansion type silencer, vertical, 130 x 100 mm oval, 800 mm long; on the left, beside of engine bonnet, mouth showing upwards, 2302 mm above ground
Lubrication system:	Forced feed with gear pump; strainer in sump, PERKINS oil filter in full flow, replaceable filter, filter change every 200 operating hours; oil capacity 6,5 l; recommended oil quality API-CC, MIL-L-2104 B, oil change every 200 operating hours, specified oil viscosities: winter SAE 10W, 20W or 10W/30 summer SAE 20W or 20W/30 tropics SAE 30, 20W/40 or 20W/50 or for all conditions SAE 15W/40
Cooling system:	Water cooling with impeller pump, overpressure relief valve set to 0,7 bar, thermostat with by-pass; fan with 4 blades with 394 mm dia, water capacity 10,5 l
Starting system:	Electrical; LUCAS solenoid pre engaged-drive starter motor 2,5 kW; depressed pedal of clutch as safety device; CAV flame plug in intake manifold

Electrical equipment: 12 Volt, negative earth;
LUCAS 3-phase alternator 12 V 500 W;
1 lead acid battery, 100 Ah at 20 hours rating

Transmission

Clutch: OMG or LUK
dry dual-disc clutch;
pedal operated travel drive,
disc 279 mm dia, organic lining;
handlever operated p.t.o. drive,
disc 279 mm dia

Gear box: MASSEY FERGUSON
synchronized speed change gear with 4 gears, range gear with 3 forward ranges (L-range sliding gear, M- and H-ranges collar shifted) and 1 sliding gear shifted reverse range (R); total 12 forward and 4 reverse speeds, 2 gear shift levers;
optionally available creeper group

Rear axle and final drives: MASSEY FERGUSON
bevel gear drive,
bevel gear differential with pedal operated lock, self disengaging;
spur gear final drives

Front axle: MASSEY FERGUSON, not propelled

Lubrication:

	Oil quality API - MIL-L-	Oil viscosity SAE	Oil capacity l	Oil change interval operating hours
Gear box incl. rear axle and hydraulic system	TOU 2104 B	15W/30 or 15W/40	33	1500
Final drives at rear	GL 4 2105 (A)	80W, 90 80W/90	2,2 each	

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Total ratios and speeds

Range	Gear	Total ratio engine : driving wheel	Nominal travelling speed *) at rated engine speed km/h
L	1	347,52	1,70
	2	222,50	2,65
	3	172,43	3,42
	4	117,10	5,03
M	1	142,17	4,15
	2	91,02	6,48
	3	70,54	8,36
	4	47,91	12,31
H	1	57,72	10,21
	2	36,95	15,95
	3	28,64	20,58
	4	19,45	30,31
R	1	133,28	4,42
	2	85,33	6,91
	3	66,13	8,91
	4	44,91	13,13

*) calculated with the radius index 695 mm

Power-take-off

Main p.t.o.: Shiftable by hand lever (collar shifting) to independent or ground speed p.t.o. and by second hand lever to 540 or 1000 min^{-1}

1 p.t.o. shaft at rear of tractor,
in tractor's median plane;
height above ground 690 mm,
horizontal distance to rear wheels centre line 265 mm;
35 mm Ø, 6 splines, in conformity with ISO 500, type 1, when using 540 min^{-1} speed

Independent p.t.o.: Driven by second plate of dry dual-disc clutch; sense of rotation clockwise, viewed to tractor's rear

P.t.o.	P.t.o. speed min^{-1}	Engine speed min^{-1}	Transmission ratio engine : p.t.o.
540	540	1944	3,6000
	625	2250	
1000	1000	1917	1,9167
	1174	2250	

Ground speed p.t.o.: Driven by rear axle drive, sense of rotation clockwise, at forward movement

P.t.o.	Travel distance per p.t.o. revolution m	Number of p.t.o. revolutions per rear wheel revolution
540	0,4431	9,854
1000	0,2359	18,509

Power lift: MASSEY FERGUSON
hydraulic power lift, unit construction;
draft and position control, floating position;
adjustable raise control,
top link sensing

Hydraulic system: Open centre system
TUROLLA (PLESSEY) gear type pump TFP 200/11 S, gear driven by engine, delivery 36 l/min at rated engine speed;
hydraulic oil circuit in common with gear box with 33 l capacity,
5 l can be taken off when tractor is working stationary or moving,
hydraulic oil filter within suction line, filter change every 200 operating hours

MASSEY FERGUSON control valve 3306 467, relief valve pressure setting 170±5 bar; single acting cylinder with 100 mm bore and 130 mm stroke, overpressure relief valve in cylinder set to 200 bar; with a change-over valve 1 oil coupling may be controlled by the a.m. MF control valve;

2 OMC additional control valves 2-1180 (adjustable to single or double acting), with 2 oil couplings each at rear of tractor

Implement linkage: See pages 10 and 11

Pull attachment

Trailer hitch and swinging drawbar: Optionally available (not fitted on tested tractor)

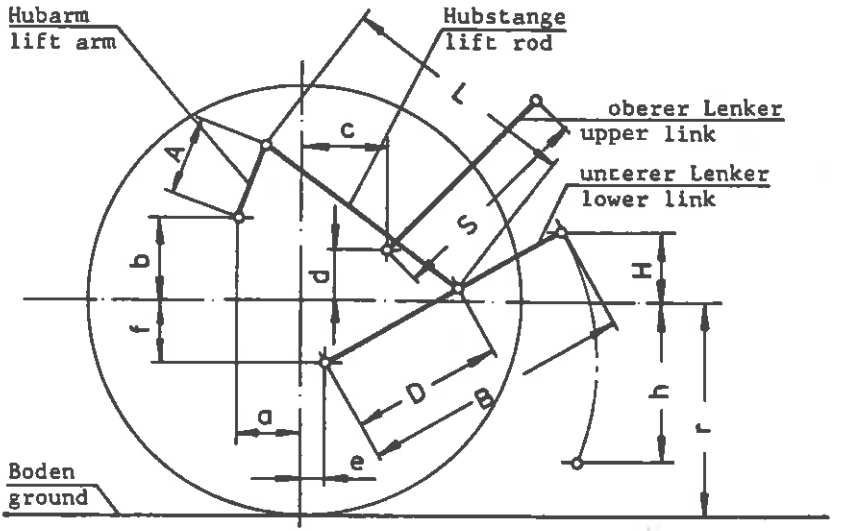
Holed drawbar: Long bar; length 1500 mm, thickness 30 mm, width 80 mm, length between joint balls 770 mm; 7 holes between joint balls with 80 mm distance each, 2 holes outside of joint balls on either side with 120 mm distance each, holes diameter 22 mm and 24 mm alternately; at each end of the bar 1 hole with 32 mm dia;

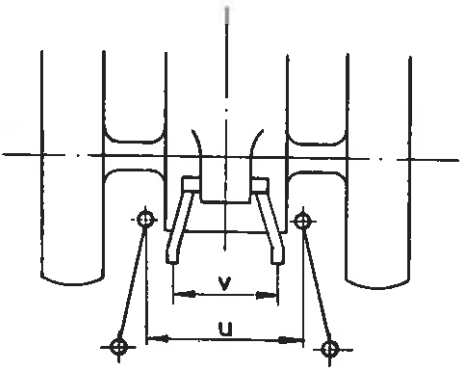
height above ground	minimum	150 mm
	maximum	1055 mm
holes centre line behind p.t.o. shaft end		710 mm

(lower links in horizontal position)

Towing hitch: None

Implement linkage: Three point linkage, category 2 acc. to ISO 730/I, DIN 9674





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Dimensions of rear implement linkage (projected lengths in mm, underlined dimensions are valid for power lift measurements p.19)

Rear tyres (size 16.9 R 30)	radius index	(r)	695
Front tyres (size 7.50 - 18)	static radius	(r')	403
Length of lift arms		(A)	272
Length of lower links		(B)	865
Distance of lift arm pivot points from rear wheel centre	horizontal	(a)	12
	vertical	(b)	310
Horizontal distance between lower link pivot points		(u)	390
Horizontal distance between lift arm end points		(v)	525
Length of upper link		(S)	640 to 840, 691
Distance of upper link pivot point from rear wheel centre	horizontal	(c)	224
	vertical	(d)	256 or 301
Distance of lower link pivot point from rear wheel centre	horizontal	(e)	70
	vertical	(f)	138
Distance of lower link pivot points from lift rod pivot points on lower links		(D)	455
Length of lift rods		(L)	560 to 665, 620

Height of lower link hitch points relative to rear wheels' centre line (situated 695 mm above ground), these data are valid for unloaded power lift:

Length of lift rods	(L)	620	560	665
Linkage distance of lift rods	(D)	455		
Lowest position	(h)	495	350	610
Highest position	(H)	183	295	102
Transport position	(H')	183	295	102

Type of transport lock: Hydraulic-mechanical

Steering	MASSEY FERGUSON hydrostatic steering; separate oil circuit with 2,3 l capacity, specified oil ATF, oil change every 1000 operating hours, oil filter cleaning every 500 operating hours, TUROLLA gear type pump at front of engine, driven by crankshaft, delivery 25 l/min at rated speed, working pressure 100 bar; 1 double acting differential ram, 45 mm bore, 165 mm stroke, piston rod 20 mm dia; acting on steering levers of front axle
Brakes	
Service brake:	Pedal operated muscle power brake with mechanical transmission, acting on rear axle of tractor; wet disc brakes on the differential half shafts with 4 lining discs each, with 178 mm dia
Parking brake:	Mechanically actuated by hand lever with ratchet, acting on the discs of service brake
Steering brake:	Divided pedals of service brake, for normal use locked together
Trailer braking take-off:	None
Wheels	
Steering wheels:	At front, 2 pneumatics 7.50 - 18 6 ply MICHELIN cross-ply tyres; maximum permissible load per tyre 810 kg at 2,25 bar inflation pressure and 30 km/h; track width 1320 mm, by extending telescopic half axles adjustable in steps of 100 mm up to 1820 mm; rims 5.50 F x 18
Driving wheels:	At rear: 2 pneumatics 16.9 R 30 137 A8 PIRELLI TM 300 S, radial-ply tyres; maximum permissible load per tyre 2300 kg at 1,6 bar inflation pressure and 30 km/h; track width variable by adjustable gauge bowl wheels in steps of 100 mm each from 1400 to 1900 mm; rims W14 x 30
Wheel base:	2080mm

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Safety frame: LANDINI
TS9
OECD tested safety frame
OECD approval no. CSD 0700/37

Seat: GRAMMER
DS 20/4 H
upholstered seat with back rest, adjustable suspension and hydraulic shock absorber; height of driver's platform above ground 800 mm, height of unloaded seat above platform from 530 to 590 mm infinitely adjustable;
longitudinal seat adjustment 200 mm

Lighting equipment: Electrical 12 Volt, in accordance with Italian legislation

	Dimensions mm	Height above ground of centre mm	Distance from outside edge of tractor to centre mm
Head lights	130 Ø	1085	783
Side lights	70 x 60	1480	245
Rear lights	80 x 60	1485	300
Reflectors			
1st pair	80 Ø	1390	175
2nd pair	80 Ø	610	570

Running-time meter: Mechanical, combined with tachometer, driven by camshaft of engine; reference engine speed for one really counted hour 1600 min^{-1}

Overall dimensions

Total length:	3510 mm
Total width:	1920 mm
Total height:	2335 mm to top of safety frame
Ground clearance:	495 mm below gear box

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TEST CONDITIONS

Track setting: 1320 mm at front
1500 mm at rear

Weights		without driver	with driver
	front	780 kg	785 kg
	rear	1475 kg	1540 kg
	total	2255 kg	2325 kg

Fuels and lubricants used in tests

Fuel:	ARAL diesel-fuel DIN 51 601 density at 15°C	
	at p.t.o. test	0,843 kg/l
	at drawbar test	0,838 kg/l
Engine:	MF SUPER UNIVERSALOIL 15W/30	
Transmission and rear axle:	MF SUPER UNIVERSALOIL 15W/40	
Rear final drives:	MOBIL MOBILUBE GX 90	
Steering:	MOBIL ATF 200	
Grease points:	Multi purpose grease (16 points)	

Remarks and repairs None

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COMPULSORY TESTS

(1) MAIN POWER TAKE OFF PERFORMANCE (540 r/min)

Date of tests: 26th September 1986
Location of tests: DLG-Testing Station Groß-Umstadt
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power kW	speed engine r/min	speed p.t.o. r/min	fuel consumption hourly l/h	fuel consumption hourly kg/h	fuel consumption specific g/kWh	specific energy kWh/l
Maximum power						
At 2-hour test						
38,0	2250	625	11,09	9,35	246	3,42
At rated speed						
38,0	2250	625	11,09	9,35	246	3,42
At standard p.t.o. speed						
34,9	1944	540	9,86	8,31	238	3,54
Part loads, the governor hand lever in the position corresponding to maximum power at full load (curve a)						
(i) the torque corresponding to maximum power at rated speed						
38,0	2250	625	11,09	9,35	246	3,42
(ii) 85% of the torque obtained in (i)						
32,9	2290	636	9,84	8,30	253	3,34
(iii) 75% of the torque defined in (ii)						
24,9	2309	641	7,93	6,68	269	3,14
(iv) 50% of the torque defined in (ii)						
16,7	2323	645	6,16	5,19	312	2,71
(v) 25% of the torque defined in (ii)						
8,4	2347	652	4,52	3,81	452	1,87
(vi) unloaded						
-	2361	656	2,91	2,45	-	-

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Power kW	speed engine r/min	speed p.t.o. r/min	fuel consumption hourly l/h	fuel consumption hourly kg/h	fuel consumption specific g/kWh	specific energy kWh/l
Part loads, the governor hand lever in the position corresponding to the standard p.t.o. speed at full load (curve b)						
(i) the torque corresponding to maximum power						
34,9	1944	540	9,86	8,31	238	3,54
(ii) 85% of the torque obtained in (i)						
30,5	2002	556	8,78	7,40	242	3,48
(iii) 75% of the torque defined in (ii)						
23,1	2023	562	7,01	5,91	256	3,30
(iv) 50% of the torque defined in (ii)						
15,6	2043	568	5,34	4,50	289	2,91
(v) 25% of the torque defined in (ii)						
7,9	2066	574	3,78	3,19	404	2,09
(vi) unloaded						
-	2080	578	2,28	1,92	-	-

Standard specific fuel consumption (g/kWh): 253/312/242/289

No load maximum engine speed: 2361 r/min
Equivalent flywheel torque at rated engine speed: 161 Nm
Maximum equivalent flywheel torque: 178 Nm at 1499 r/min of the engine

Mean atmospheric conditions

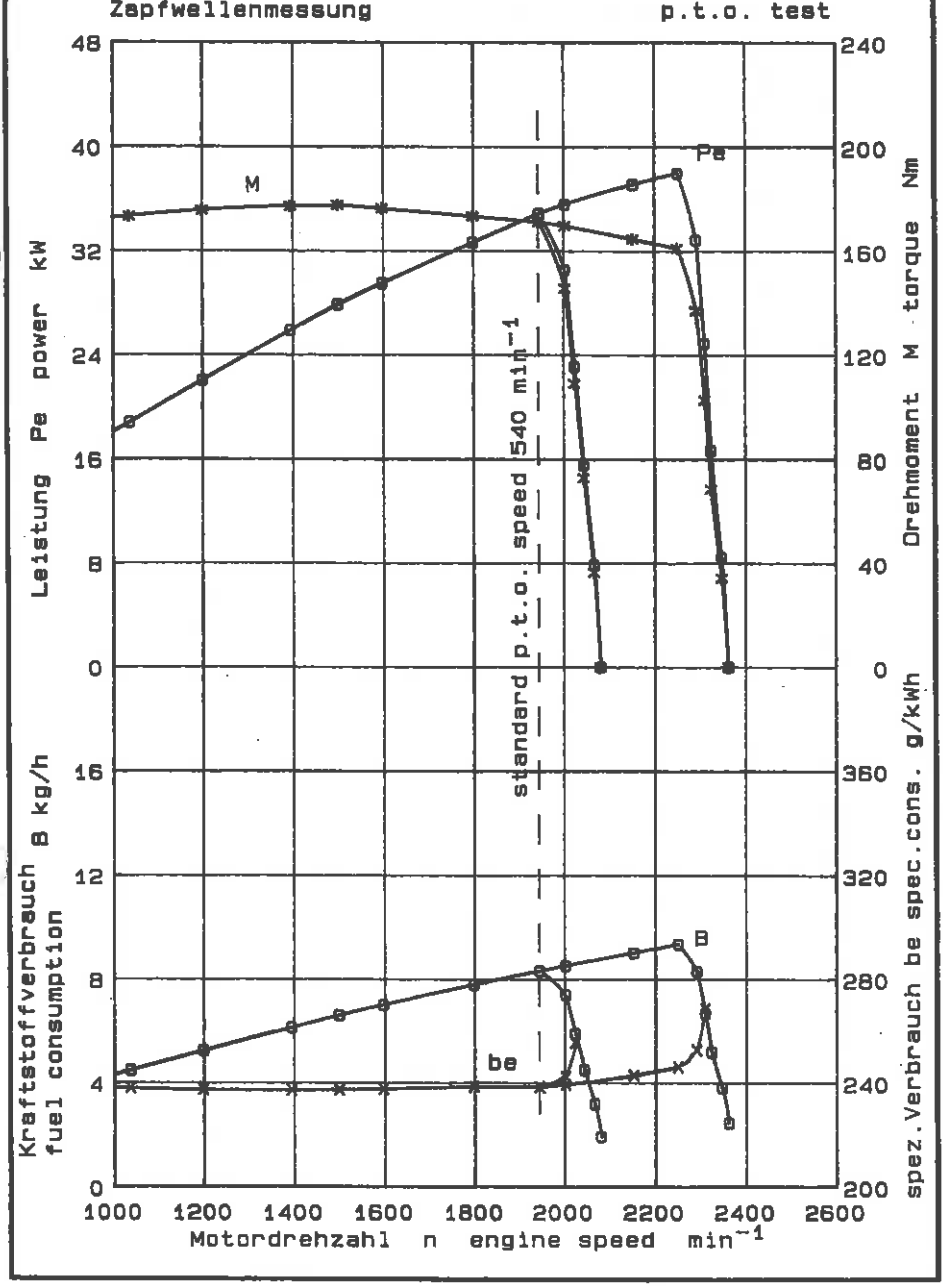
temperature	20 °C
pressure	1000 mbar
rel. humidity	45 %

Maximum temperatures

coolant	84 °C
oil	105 °C
fuel	19 °C
air intake	22 °C

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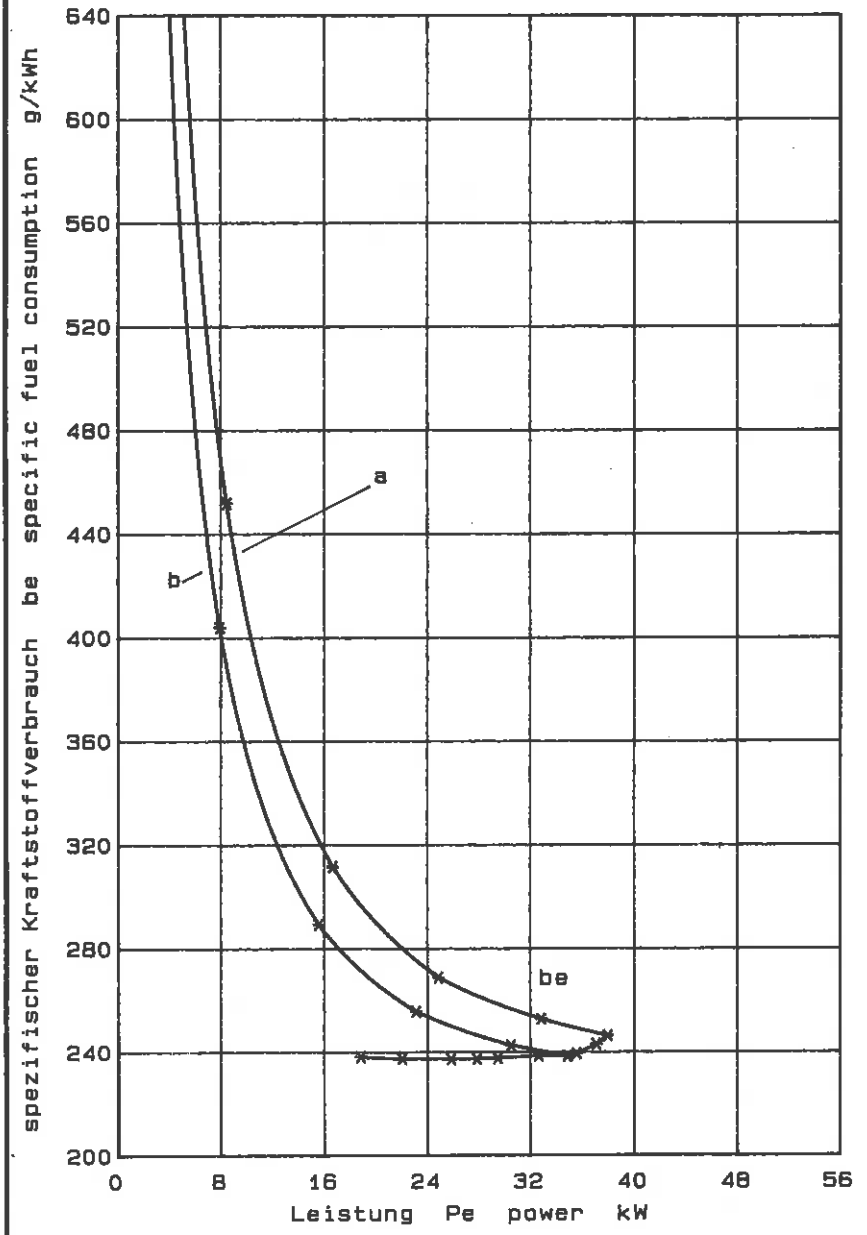


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Zapfwellenmessung

p.t.o. test



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(2) LIFTING FORCES AND HYDRAULIC POWER

Date of tests: 14th and 20th October 1986

Lifting Forces (Linkage dimensions: see page 10 and 11)

	Height of lower hitch points above ground in down pos. mm	Vertical movement mm	Max. force exerted through full range daN	Corresp. pressure of hydraul. fluid bar	Moment about rear axle daNm	Max. tilt angle of mast over range of lift degrees
At hitch points	200	645	1420	146	1328	-
On the frame	200	740	1330	146	2055	12

Temperature of hydraulic fluid at start of test 65°C

Lifting heights relative to horizontal lower links

mm	-412	-400	-357	-300	-200	-100	0	+100	+200	+288	+300	+328
Lifting forces at hitch points												
daN			1420	1550	1740	1870	1970	2040	2080	2140		
Lifting forces at test frame												
daN	1330	1360		1480	1580	1611	1640	1630	1590		1560	1550

Hydraulic Power

Sustained pressure with relief valve open 172 bar
Pump delivery rate at minimum pressure 36,5 l/min

	Hydraulic power kW	Flow rate l/min	Pressure bar	Oil temperature °C
at 90% of the actual relief valve setting	5,6	20,4	165	65
maximum	8,2	33,9	146	65

Tapping point used for test: at rear of tractor

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(3) DRAWBAR PERFORMANCE (unballasted)

Date of tests: 6th November 1986
Type of track: Concrete
Height of drawbar above ground: 570 mm

Gear	Driving speed km/h	Power kW	Drawbar pull daN	Engine speed min^{-1}	Slip of wheels %
1) MAXIMUM POWER					
1 M	3,74	22,7	2186	2336	14,9
4 L	4,50	27,6	2208	2313	15,1
2 M	5,85	30,6	1881	2252	11,5
3 M	7,80	31,1	1437	2246	8,2
1 S	9,73	31,8	1177	2252	6,4
4 M	11,87	31,1	944	2252	5,1
2) TRANSMISSION AND FUEL CONSUMPTION CHARACTERISTICS					
a) 1st selected gear: 3 M (nominal speed nearest to 7,5 km/h)					
(i) Maximum power					
3 M	7,80	31,1	1437	2246	8,2
(ii) 75% of pull at max. power					
3 M	8,29	25,0	1084	2327	5,8
(iii) 50% of pull at max. power					
3 M	8,55	17,0	714	2351	3,8
(iv) Higher gear: 1 S, same pull as in (ii), reduced engine speed					
1 S	8,34	24,9	1073	1919	5,8
(v) Higher gear: 1 S, same pull as in (iii), reduced engine speed					
1 S	8,62	17,1	713	1944	3,9
b) 2nd selected gear: 1 S (max. available power)					
(i) Maximum power					
1 S	9,73	31,8	1177	2252	6,4
(ii) 75 % of pull at max. power					
1 S	10,25	25,0	879	2329	4,6
(iii) 50 % of pull at max. power					
1 S	10,53	17,1	585	2354	3,1
(iv) Higher gear: 4 M, same pull as in (ii), reduced engine speed					
4 M	10,26	25,1	880	1933	4,5
(v) Higher gear: 4 M, same pull as in (iii), reduced engine speed					
4 M	10,56	17,3	590	1962	3,1

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Tyre size front: 7.50 - 18
rear: 16.9 R 30

Tyre inflation pressure 0,8 bar at rear
Tread bar height at the beginning of drawbar tests:
97 % at rear of the value when new

Specific fuel consumpt. g/kWh	Specific energy kWh/l	Temperatures Fuel °C	Coolant °C	Engine-oil °C	Atmospheric conditions Tempe-rature °C	Relative humidity %	Pressure mbar
337	2,48	17	79	83	10	84	1011
331	2,54	18	79	81	11	81	1011
305	2,75	17	81	88	10	94	1011
299	2,81	16	81	88	10	90	1011
295	2,84	16	80	87	10	91	1011
300	2,80	15	78	87	12	88	1011
299	2,81	16	81	88	10	90	1011
310	2,71	17	81	88	10	90	1011
352	2,38	17	81	88	10	90	1011
282	2,97	17	80	87	10	91	1011
307	2,73	17	80	87	10	91	1011
295	2,84	16	80	87	10	91	1011
308	2,72	17	80	87	10	91	1011
357	2,35	17	80	86	10	91	1011
292	2,87	18	78	87	12	88	1011
321	2,61	18	78	86	12	88	1011

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