Report on test in accordance with OECD STANDARD CODE

OECD No. 1201 / 1

Agricultural Tractor LANDINI R 8860 (2WD)

Type denomination

TL 23 N/M



OECD No. 1201 / 2

Agricultural Tractor MASSEY-FERGUSON 393 (2WD)

Type denomination

TL 23 N/N



Manufacturer

Massey-Ferguson S.p.A., Landini Division
I-42042 Fabbrico (R.E.) Italy

Deutsche Landwirtschafts-Gesellschaft e.V.
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This is a report on a tractor test in accordance with OECD STANDARD CODE for the Official Testing of Agricultural Tractor Performance (C(87)53(Final), Code I).

It does not contain an evaluation of the tractor on practical work.

Duration of tests: July till December 1988
DLG-Testing Station for Agricultural Machinery, Max-Eyth-Weg 1,
D-6114 Groß-Umstadt

This report has been approved by the OECD Co-Ordinating Centre (CEMAGREF, France) as being in accordance with the OECD STANDARD CODE.

Date of approval: 24th Mai 1989
OECD No. 1201/1 for LANDINI R 8860 (2WD)
OECD No. 1201/2 for MASSEY-FERGUSON 393 (2WD)

The tractors LANDINI R 8860 (2WD) and
MASSEY-FERGUSON 393 (2WD)
are technically identical in all main respects except colour and denominations.

The tractor LANDINI 8860, serial no. 5377V51261 had been tested in 2 variants: As model DT 8860 (4WD) and as model R 8860 (2WD).

Model DT 8860 was converted into model R 8860 by dismantling the front axle drive and by exchange of front axle and steering.

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 kN	=	1000 N	=	102 kp
Powers			1 kW	=	1,36 PS
Pressures	1 MPa	=	10 bar	=	10,2 kp/cm²
	100 kPa	=	1000 mbar	=	750,10 mm Hg

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PRÜFUNGS-ABTEILUNG
LANDINI R 8860

Test No. 88-88

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Tractor manufacturer:	MASSEY-FERGUSON S.p.A. I-42042 Fabbrico (R.E.), Italy
Location of tractor assembly:	I-42042 Fabbrico
Submitted for test by:	Manufacturer
Selected by:	Manufacturer with agreement by DLG
Place of running-in:	Fabbrico and Groß-Umstadt
Duration of running-in:	Engine 15 hours, tractor appr. 73 hours

SPECIFICATION OF TRACTOR

Tractor

Make:	LANDINI respectively MASSEY-FERGUSON
Trade name:	R 8860 respectively 393
Type denomination:	TL 23 N/M respectively TL 23 N/N
Type:	Wheel tractor, unit construction, rear wheel driven
Serial No.:	5377V51261
Start of series:	5376V51004 (see note on page 2)

Engine

Make:	PERKINS
Model:	4.248
Type:	Watercooled 4-stroke Diesel-engine, direct injection, naturally aspirated
Serial No.:	LF 31204 U2437195 A4081
Cylinders:	4, in line, bore 101,1 mm, stroke 127 mm, displacement 4078 cm³, compression ratio 16±1:1; replaceable wet cylinder liners
Valves:	Overhead

Fuel system:	PERKINS fuel supply pump; CAV distributor injection pump DPA 3343 F010, serial no. B 05857 AF; manufacturer's production setting 64±2 mm³/stroke at rated engine speed and full load; without automatic injection timing device; injection timing 24±2° before TDC; CAV multihole-injection nozzles P/N 2646826, injection pressure 17,5 MPa, CAV fuel filter with replaceable paper element; capacity of fuel tank 86 dm³
Governor:	CAV centrifugal variable speed governor, governed range of engine speed 750 to 2280 rev/min, rated engine speed 2200 rev/min;
Air cleaner:	FISPA oil bath air filter, cyclone pre-cleaner; no maintenance indicator; air intake in front of engine, below bonnet
Lubrication system:	Forced feed with gear pump; strainer in sump, PERKINS oil filter in full flow, replaceable
Cooling system:	Water cooling with impeller pump, overpressure relief valve set to 70 kPa, thermostat with by-pass; fan with 6 blades with 410 mm dia, water capacity 15 dm³
Starting system:	Electrical; LUCAS solenoid pre engaged-drive starter motor 2,5 kW; depressed pedal of clutch as safety device; ISKRA flame plug in intake manifold
Electrical equipment:	12 Volt, negative earth; LUCAS 3-phase alternator 12 V 500 W; 1 lead acid battery, 95 Ah at 20 hours rating, test current for low temperature 510 A

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Exhaust silencer:	ANSA, DGM SA 1269, expansion type silencer, vertical, 130 x 100 mm oval, 660 mm long; on the left, beside the engine bonnet, mouth showing upwards, 2325 mm above ground

Transmission

Clutch:	LUK dry dual-disc clutch; pedal operated travel drive, disc 305 mm dia, cerametallic lining, hand lever operated p.t.o. drive, disc 305 mm dia, organic lining
Gear box:	MASSEY-FERGUSON synchronized speed change gear with 4 gears, collar shifted range gear with 3 forward ranges (L, M and H) and 1 reverse range (R); total 12 forward and 4 reverse speeds, 2 gear shift levers; two further gear box models on request available: 1. gear arrangement as described above, additional range gear with 3 ranges, in 3 varaiants: Standard range combined with a) creeper and underdrive range, or b) creeper and overdrive range, or c) underdrive and overdrive range; in each case total: 36 forward and 12 reverse speeds 2. change gear with 4 gears, range gear with 3 forward ranges, reversing gear (acting on 4x3 forward speeds), combined in 3 variants with a) creeper range, or b) underdrive range, or c) overdrive range; in each case total: 24 forward and 12 reverse speeds
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 driven, telescopically adjustable
Lubrication:	Gear box, rear axle and hydraulic system have oil in common, see pages 15 and 16

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Total ratios and speeds

Range	Gear	Total ratio engine : driving wheel	Nominal travelling speed *) at rated engine speed of 2200 rev/min km/h
L	1	358,12	1,73
	2	227,83	2,71
	3	180,40	3,43
	4	122,27	5,05
M	1	149,91	4,12
	2	95,37	6,48
	3	75,52	8,18
	4	51,18	12,07
H	1	60,77	10,17
	2	38,66	15,98
	3	30,52	20,18
	4	20,75	29,78
R	1	134,18	4,60
	2	85,36	7,24
	3	67,59	9,14
	4	45,81	13,49

*) calculated with the radius index 745 mm (ISO 4251/1-1984)

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 rev/min;
p.t.o. speed indicator lamps

1 p.t.o. shaft at rear of tractor, in tractor's median plane; height above ground 737 mm, horizontal distance to rear wheels centre line 227 mm;
35 mm dia, 6 splines, in conformity with ISO 500/1979, type 1, when using 540 rev/min speed

Power take-off proportional to engine 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. type	P.t.o. speed rev/min	Engine speed rev/min	Ratio engine : p.t.o.	Power restriction kW
540	540	1944	3,6000	-
	611	2200		
1000	1000	1917	1,9167	-
	1148	2200		

Power take-off proportional to ground speed:
Driven by rear axle drive, sense of rotation clockwise (at forward movement, viewed to tractor's rear)

P.t.o. type	Travel distance per p.t.o. revolution m	Number of p.t.o. revolutions per rear wheel revolution
540	0,4722	9,9136
1000	0,2514	18,6203

Power lift

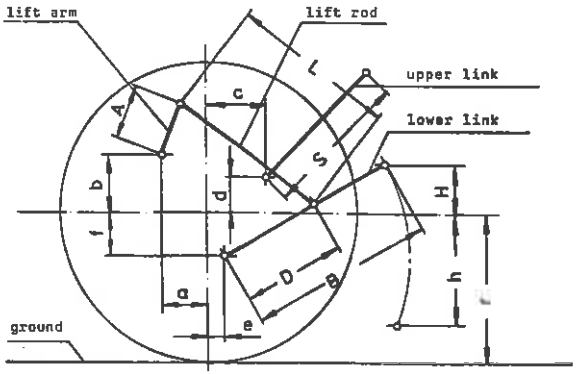
MASSEY-FERGUSON
hydraulic power lift, unit construction;
draft and position control, both infinitely mixable, floating position, lowering throttle (non-adjustable);
adjustable raise control, top link sensing;
open centre system
1 single acting lifting cylinder,
100 mm bore, 127 mm stroke;
cylinder safety valve set to 19,0 MPa

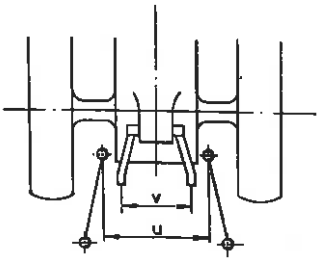
optionally available:
2 single acting assister cylinders
40 mm bore,207 mm stroke;

no linkage lock for transport;
SUNDSTRAND/TUROLLA gear type pump TFA/211 S,
gear driven by engine;
delivery 37 l/min at rated engine speed, relief valve pressure setting 17,0+0,5 MPa;
1 hydraulic oil filter within suction line;
hydraulic oil circuit in common with gear box lubrication, reservoir within gear box;

MASSEY-FERGUSON control valve,
1 double acting OMC additional control valve, 2 oil couplings ar rear of tractor;
maximum volume of oil available to external cylinders 5 dm³

Three-point linkage — category 2 acc. to ISO 730/I-1977





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Dimensions of rear implement linkage (projected lengths in mm, underlined dimensions are valid for power lift measurements p.21)

Rear tyres 16.9 R 34 Front tyres 9.00 - 16		radius index static radius	(r) (r')	745 402
Length of lift arms			(A)	272
Length of lower links			(B)	910
Distance of lift arm pivot points from rear wheel centre		horizontal vertical	(a) (b)	12 310
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, <u>745</u>
Distance of upper link pivot point from rear wheel centre		horizontal vertical	(c) (d)	205 <u>256</u> or 301
Distance of lower link pivot point from rear wheel centre		horizontal vertical	(e) (f)	32 138
Distance of lower link pivot points from lift rod pivot points on lower links			(D)	495
Length of lift rods			(L)	545 to 665, <u>650</u>

Height of lower link hitch points relative to rear wheels' centre line (situated 745 mm above ground), these data are valid for unloaded power lift:

Length of lift rods	(L)	<u>650</u>	545	665
Linkage distance of lift rods	(D)	495		
Lowest position	(h)	545	275	595
Highest position	(H)	150	355	140
Transport position	(H')	150	355	140

Pull attachment

Swinging drawbar: Optionally available (not fitted on tested tractor)

Trailer hitch: LANDINI, DGM GA 725 C-87 6tV1,5; non-automatical, height adjustable;

hole diameter	28 mm
hitch point	
above ground	530, 625, 730 or 850 mm
behind rear wheel axis	
horizontal	364 mm
distance from p.t.o. shaft end	
vertical, above	18 or 113 mm
below	112 or 207 mm
horizontal	137 mm
maximum permissible vertical load	15 kN

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 the 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	200 mm
maximum	1150 mm
holes' centre line behind p.t.o. shaft end	755 mm

(lower links in horizontal position)

Towing hitch: At front of tractor,

height above ground	730 mm

Steering	MASSEY-FERGUSON and DANFOSS, model ORBITROL OSPC 80, hydrostatic steering; separate oil circuit fed by SUNDSTRAND/ TUROLLA gear type pump TFA/211 S, directly driven by front end of crankshaft; delivery 24 l/min at rated engine speed, working pressure 12,0 MPa; 1 double acting differential ram, bore 45 mm, stroke 165 mm, piston rod 20 mm dia, acting on track rod of front axle; oil filter incorporated in steering oil tank
Brakes	
Service brake:	SIRMAC, 7 x 5,5 inches pedal operated muscle power brake with mechanical transmission, acting on rear axle of tractor; wet disc brakes on the differential half shafts with 5 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 9.00 - 16 rims W8x16
Driving wheels:	At rear, 2 pneumatics 16.9 R 34 rims W14Lx34
Wheelbase:	2341 mm
Track widths:	At front 1420 to 1920 mm, in steps of 100 mm each, variable by extending telescopic half axles
	at rear: 1324 to 1824 mm in steps of 100 mm each, variable by adjustable gauge bowl wheels, or after turning the wheels from 1506 to 2006 mm

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Permissible tyre combinations:

Tyre sizes at front		at rear	
7.50 - 16	6 ply	16.9 R 30 13.6 R 38	6 ply 128 A8
7.50 - 20	6 ply	13.6 R 38 16.9 R 34 18.4 R 30	128 A8 139 A8 142 A8
9.00 - 16	8 ply	16.9 R 34 18.4 R 30 480/70 R 34	139 A8 142 A8 143 A8

Protective structure: LANDINI TS 19/2, MASSEY-FERGUSON TS 20/2, 4 post frame, OECD-tested, approval-no. CSS 081/2 for LANDINI R 8860 (TL 23 N/M), CSS 081/22 for MASSEY-FERGUSON 393 (TL 23 N/N)

Driver's seat: GRAMMER, DS 44/1H; upholstered seat with back rest, adjustable suspension and hydraulic shock absorber; driver's platform 870 mm above ground, 1 step, 595 mm above ground; range of adjustment of unloaded seat: longitudinal 200 mm vertical 510 to 570 mm (stepless) above platform

Running-time meter: Electronic, counts real operating hours, when engine speed rises above 800 rev/min

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Lighting — Electrical 12 Volt, in accordance with Italian legislation

	Size mm	Height above ground of centre mm	Distance from outside edge of lights to median plane of tractor mm
Head lights	130 dia	1130	240
Side lights	110x130	1450	787
Rear lights	70x50	1555	595
Reflectors			
1st pair	45x50	1555	642
2nd pair	80 dia	635	400

TEST CONDITIONS

Overall dimensions

Length: 3810 mm without ballast, 4110 mm with ballast

Width: 1975 mm without ballast, 1975 mm with ballast

Height: 2420 mm to top of protective structure
2325 mm to exhaust pipe's mouth

Ground clearance: 540 mm below bracket of trailer hitch

Tractor mass

			without driver kg	with driver kg
Without ballast:	Mass	front	1020	1030
		rear	1900	1980
		total	2920	3010
With ballast:	Mass	front	1340	1350
		rear	2710	2790
		total	4050	4140

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Ballast

Front:	8 weights, total	288 kg
Rear:	2 weights per wheel, total	240 kg
	water in the tyres	602 kg

Tyres and track widths specifications

	Front	Rear
Tyres:	PIRELLI TD 300	MICHELIN BIB'X
dimensions	9.00 - 16	16.9 R 34
type	cross-ply	radial
ply rating/load index	8/-	-/139 A8
maximum load	1080 kg (30 km/h)	2430 kg
inflation pressure	310 kPa	160 kPa
radius index	402 mm (static)	745 mm
Chosen track width:	1520 mm	1524 mm
Technically permissible axle load:	1350 kg	4000 kg
Technically permissible total weight:	4150 kg	

Oils and lubrication

Capacity and change interval:

	Capacity dm³	Oil change h	Filter change h
engine	7,0	250	250
gear box including rear axle and hydraulic system	33,0	1000	250 *)
final drives at rear	2x3,6		-
steering system	2,3		500 *)

*) only filter cleaning

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Specifications

	Recommended	Used during test
Engine oil:		
type	engine oil	MF SUPER UNIVERSALOIL
viscosity		
winter	SAE 10W, 20W or 10W/30	SAE 15W/40
summer	SAE 20W or 20W/30	
tropics	SAE 30, 20W/40 or 20W/50	
for all conditions	SAE 15W/40	
classification	API - CC	API - CC
Transmission oils:		
Gearbox, rear axle hydraulic system		
type	super tractor oil universal	MF SUPER UNIVERSALOIL
viscosity	SAE 15W/40	SAE 15W/40
classification	API - CD/API -GL4	API - CD/API - GL4
Final drives at rear		
type	gear oil	MOBILUBE GX85W/90-A
viscosity	SAE 85W/90	SAE 85W/90
classification	API - GL4	API - GL4
Steering oil:		
Steering system		
type	automatic transmission fluid	MOBIL ATF 200
viscosity	-	
classification	Type A, SUFFIX A	

Grease: Multi purpose grease
number of lubrication points 15

Fuel

type: ARAL Diesel-fuel in conformity with DIN 51601
density: at 15°C at engine test 0,819 g/cm³
at p.t.o. test 0,838 g/cm³
at drawbar power test 0,836 g/cm³

REPAIRS None

REMARKS None

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COMPULSORY TESTS

1. MAIN POWER TAKE OFF PERFORMANCE (1000 rev/min)

Date of tests: 6th October 1988
Location of tests: DLG-Testing Station Groß-Umstadt
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power kW	Speed Engine rev/min	Speed P.t.o. rev/min	Fuel consumption hourly l/h	Fuel consumption hourly kg/h	Fuel consumption specific g/kWh	Specific energy kWh/l
Maximum power						
1.1 At 2-hour test						
55,8	2200	1148	17,22	14,43	259	3,24
1.2 At rated speed						
55,8	2200	1148	17,22	14,43	259	3,24
1.3 At standard p.t.o. speed						
52,4	1917	1000	15,50	12,99	248	3,38
1.4 Part loads, the governor hand lever in the position corresponding to maximum power at full load (curve a)						
1.4.1 the torque corresponding to maximum power at rated speed						
55,8	2200	1148	17,22	14,43	259	3,24
1.4.2 85% of the torque obtained in 1.4.1						
48,4	2245	1171	14,73	12,35	255	3,29
1.4.3 75% of the torque defined in 1.4.2						
36,5	2258	1178	11,80	9,88	271	3,10
1.4.4 50% of the torque defined in 1.4.2						
24,4	2266	1182	8,99	7,54	308	2,72
1.4.5 25% of the torque defined in 1.4.2						
12,2	2265	1182	6,57	5,50	451	1,86
1.4.6 unloaded						
-	2278	1189	4,38	3,67	-	-

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Power kW	Speed Engine rev/min	Speed P.t.o. rev/min	Fuel consumption hourly l/h	Fuel consumption hourly kg/h	Fuel consumption specific g/kWh	Specific energy kWh/l
1.5 Part loads, the governor hand lever in the position corresponding to the standard p.t.o. speed at full load (curve b)						
1.5.1 the torque corresponding to maximum power						
52,4	1917	1000	15,50	12,99	248	3,38
1.5.2 85% of the torque obtained in 1.5.1						
45,7	1966	1026	13,11	10,99	240	3,49
1.5.3 75% of the torque defined in 1.5.2						
34,6	1980	1033	10,49	8,79	254	3,29
1.5.4 50% of the torque defined in 1.5.2						
23,2	1994	1041	7,85	6,58	284	2,95
1.5.5 25% of the torque defined in 1.5.2						
11,7	2008	1048	5,52	4,63	396	2,11
1.5.6 unloaded						
-	2027	1057	3,34	2,80	-	-

No load maximum engine speed: 2278 rev/min
Equivalent flywheel torque at rated engine speed: 242 Nm
Maximum equivalent flywheel torque: 278 Nm at 1252 rev/min of the engine

Mean atmospheric conditions

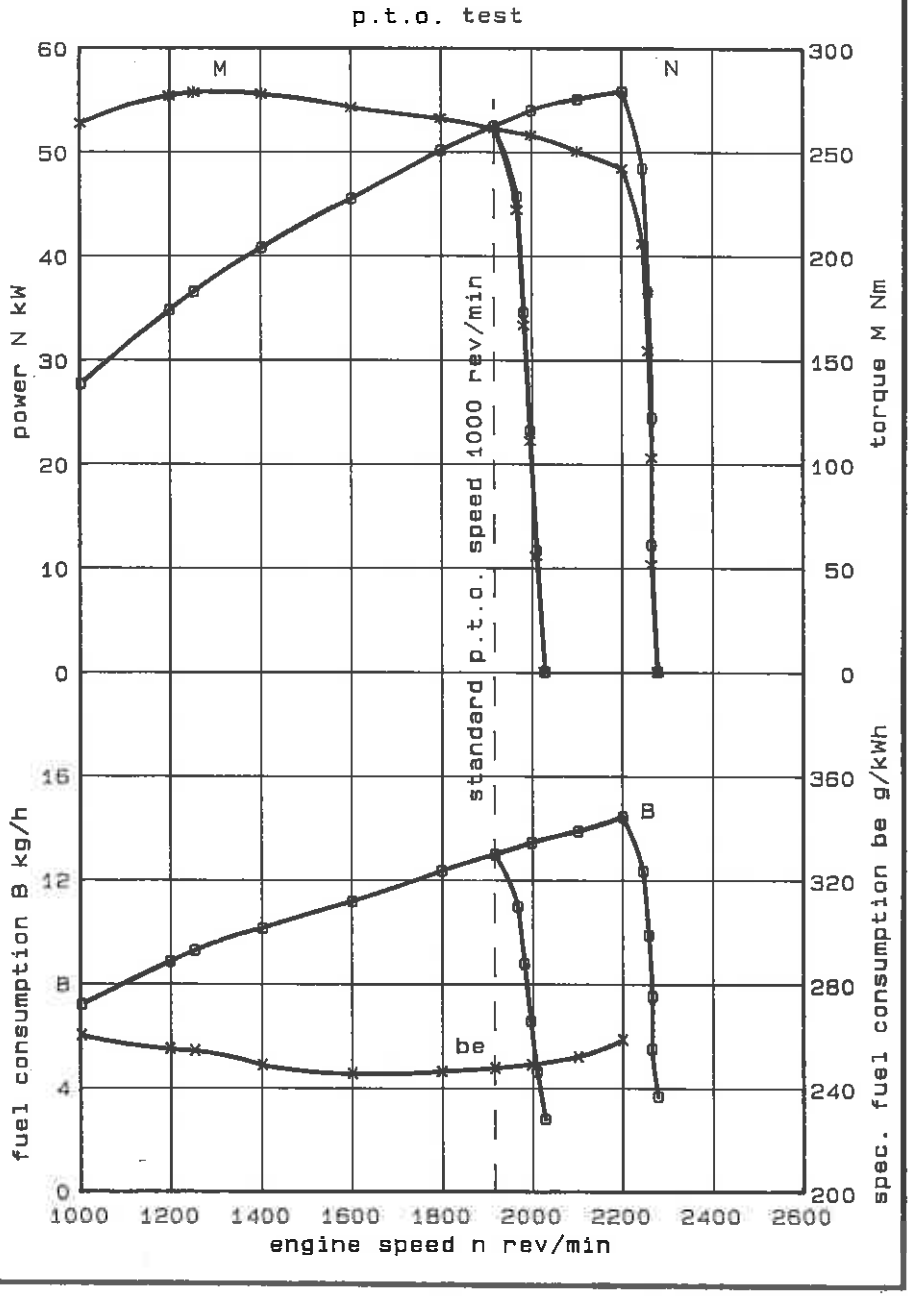
temperature	20 °C
pressure	99 kPa
rel. humidity	65 %

Maximum temperatures

coolant	94 °C
oil	106 °C
fuel	29 °C
air intake	20 °C

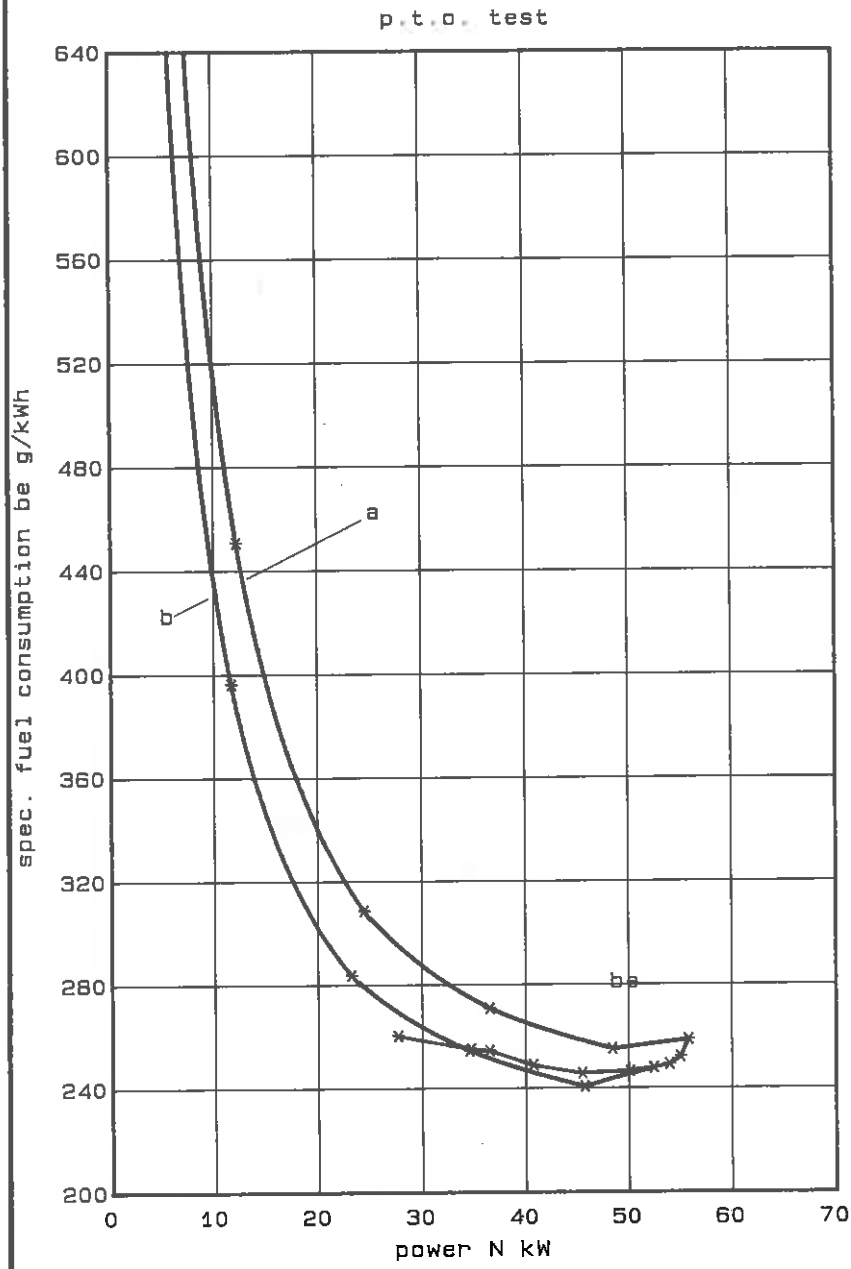
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2 HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 22nd November 1988

2.1 Hydraulic power test

Sustained pressure with relief valve open 17,5 MPa
Pump delivery rate at minimum pressure 35,3 l/min

	Hydraulic power kW	Flow rate l/min	Pressure MPa	Oil temperature °C
At 90% of the actual relief valve setting	7,8	29,8	15,8	35 +)
At max. power	8,7	34,2	15,2	35 +)

Tapping point used for test: At rear of tractor
+) oil temperature in suction line of hydraulic pump more than 65°C

2.2 Power lift test

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	200 mm	200 mm
Vertical movement without lifting forces	695 mm	810 mm
Vertical movement with lifting forces	685 mm	755 mm
Max. corrected force exerted through full range	13,5 kN	12,4 kN
Corresponding pressure	15,2 MPa	15,2 MPa
Moment about rear axle	-	19,2 kNm
Max. tilt angle of mast from vertical	-	6°

Lifting heights relative to horizontal lower links

mm	-472	-407	-400	-300	-200	-100	0	+100	+200	+278	+283

Lifting forces at hitch points, corrected to 15,2 MPa

kN		13,5	13,9	16,1	17,6	18,6	19,3	19,9	20,1	20,3	

Lifting forces at standard frame, corrected to 15,2 MPa

kN	12,4		13,9	15,2	15,8	16,0	16,2	16,2	15,8		15,4

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3 DRAWBAR PERFORMANCE

Date of tests: 13th till 16 December 1988
Type of track: Concrete

Gear	Driving speed km/h	Power kW	Drawbar pull kN	Engine speed rev/min	Slip of wheels %
3.1 Maximum power in tested gears (unballasted tractor) height of drawbar above ground 650 mm					
4 L	4,44	35,2	28,51	2262	15,1
2 M	5,54	44,0	28,62	2197	14,9
3 M	7,56	48,3	23,02	2202	7,9
1 H	9,62	49,8	18,63	2200	5,6
4 M	11,59	48,2	14,98	2202	4,3
3.2 Maximum power in tested gears (ballasted tractor) height of drawbar above ground 650 mm					
1 L	1,53	16,1	37,79	2267	14,9
2 L	2,39	25,0	37,68	2256	15,1
3 L	3,00	31,4	37,64	2250	15,1
1 M	3,62	37,9	37,71	2260	15,1
4 L	4,38	45,9	37,70	2223	14,9
2 M	6,06	49,2	29,25	2197	7,0
3 M	7,81	49,8	22,96	2198	4,9
1 H	9,84	50,5	18,47	2200	3,7
4 M	11,75	48,4	14,84	2198	2,9
3.3.1 Five-hour-test at 75% of pull at maximum power in 2 M gear					
2 M	6,50	37,6	20,82	2244	2,7
3.3.2 Five-hour-test at pull corresponding to 15% wheel slip in test 3.2 *)					
3 L	3,17	40,5	46,02	2237	-

Total oil consumption during ten hours duration of tests 3.3.1 and 3.3.2 : 34 g/h

*) The tests 3.3.1 and 3.3.2 were carried out with the model DT 8860

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Tyre size front: 9.00 - 16
rear: 16.9 R 34

Specific fuel consumption g/kWh	Specific energy kWh/l	Temperatures Fuel °C	Coolant °C	Engine-oil °C	Atmospheric conditions Tempe-rature °C	Relative humidity %	Pressure kPa
tyre inflation pressure: 170 kPa at front and 80 kPa at rear							
340	2,46	27	80	81	8	63	101,1
328	2,55	24	79	82	8	69	101,1
298	2,81	30	82	89	8	73	101,1
290	2,88	31	82	89	8	73	101,1
301	2,78	32	82	89	7	78	101,1
tyre inflation pressure: 170 kPa at front and 80 kPa at rear							
428	1,95	30	79	80	8	80	101,0
352	2,38	30	79	82	8	84	101,0
329	2,54	27	79	81	6	92	101,0
326	2,57	28	79	81	6	90	101,0
316	2,65	30	79	84	6	90	101,0
291	2,87	30	83	86	6	88	101,0
290	2,88	29	83	87	6	88	101,0
287	2,91	29	82	88	6	89	101,0
299	2,80	30	83	87	6	86	101,0
304	2,70	21	74	91	8	76	100,0
-	-	23	77	94	11	73	100,4

Test 3.3.2 was carried out with additional ballast of 672 kg, relative to the weight of ballasted model DT 8860 (4WD), the figures not quoted are therefore irrelevant

PRÜFUNGS-ABTEILUNG
LANDINI R 8860

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4 TURNING AREA AND TURNING CIRCLE

Wheel equipment front: 9.00 - 16
rear: 16.9 R 34

Track of wheels front: 1520 mm
rear: 1524 mm

	With brakes		Without brakes	
	left-hand m	right-hand m	left-hand m	right-hand m
Radius of turning area	4,11	3,79	4,66	4,21
Radius of turning circle	3,91	3,58	4,46	4,00

5 LOCATION OF CENTRE OF GRAVITY

Height above ground	812 mm
Distance forward from rear axle centre	801 mm
Distance from tractor's median plane, to the right	1 mm

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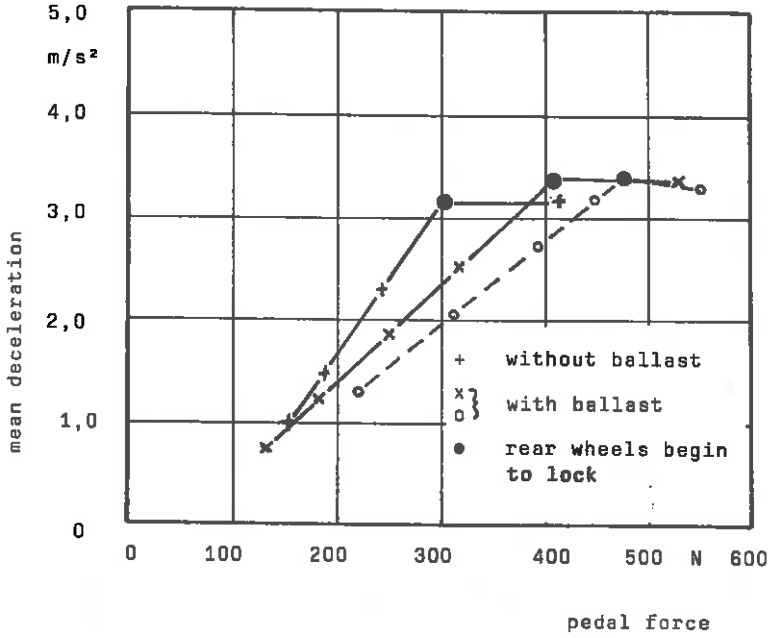
6 BRAKING

Date of tests: 13th and 14th December 1988

	Tractor mass (with driver) front kg	rear kg	total kg	Speed before application of brakes km/h
Without ballast	1030	1980	3010	31,0
With ballast	1350	2790	4140	31,0

6.1 Cold service braking device test

6.2 Fade test



No significant deviation of tractor from original course and no abnormal vibrations

Brakes-heating: Actuating of brake for 1 km with pedal force corresponding to 1 m/s²

6.3 Parking braking device test

		Ballasted tractor on 18% - slope up	down
Braking device control force	N	220	210

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7 MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of test: 15th December 1988
Type of track: Concrete
Type of sound level meter: BRÜEL & KJAER model 2233

Results of test

Gear: 4 H
Travelling speed before acceleration: 23,3 km/h
Sound level: 90,0 dB(A)

APPENDIX

MEASUREMENT OF NOISE IN THE PROTECTIVE STRUCTURE

with 4-post frame LANDINI TS 19/2

Date of test: 15th December 1988
Type of track: Concrete
Type of sound level meter: BRÜEL & KJAER model 2233

Gear	Drawbar pull kN	Travelling speed km/h	Sound level dB(A)
1 L	27,60	1,51	93,0
2 L	27,35	2,40	94,0
3 L	27,35	3,02	95,0
1 M	27,27	3,68	95,5
4 L	27,62	4,47	97,5
2 M	28,15	5,57	99,0
3 M +)	22,99	7,47	99,5
3 M +)	light load	8,50	91,5
1 H	18,62	9,60	100,0
4 M	14,93	11,60	99,5
2 H	11,12	15,41	100,0
4 H	light load	31,04	94,5

+) The 3 M gear corresponds to the nominal travelling speed nearest to 7,5 km/h

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OPTIONAL TEST

8. ENGINE PERFORMANCE

Date of tests: 26th September 1988
Location of tests: DLG-Testing-Station Groß-Umstadt
Type of dynamometer: SCHENCK eddy-current-dynamometer W 150

Power kW	Engine speed rev/min	Fuel consumption hourly l/h	Fuel consumption hourly kg/h	Fuel consumption specific g/kWh	Specific energy kWh/l
Maximum power					
8.1 At 2-hour test					
59,6	2200	17,56	14,38	241	3,39
8.2 At rated engine speed					
59,6	2200	17,56	14,38	241	3,39
8.3 At standard p.t.o. speed (1000 rev/min)					
55,0	1917	15,77	12,91	235	3,49
8.4 Part loads					
8.4.1 the torque corresponding to maximum power at rated speed					
59,6	2200	17,56	14,38	241	3,39
8.4.2 85% of the torque obtained in 8.4.1					
51,4	2235	14,83	12,15	236	3,47
8.4.3 75% of the torque obtained in 8.4.2					
38,8	2247	11,74	9,62	248	3,30
8.4.4 50% of the torque obtained in 8.4.2					
26,0	2261	8,79	7,20	277	2,96
8.4.5 25% of the torque obtained in 8.4.2					
13,0	2261	6,22	5,09	392	2,09
8.4.6 unloaded					
-	2269	3,69	3,02	-	-

Optimum fuel consumption: 220 g/kWh at 28,6 kW and 1320 rev/min
No load maximum engine speed: 2269 rev/min
Torque at rated engine speed: 258 Nm
Maximum torque: 291 Nm at 1251 rev/min of the engine

Mean atmospheric conditions

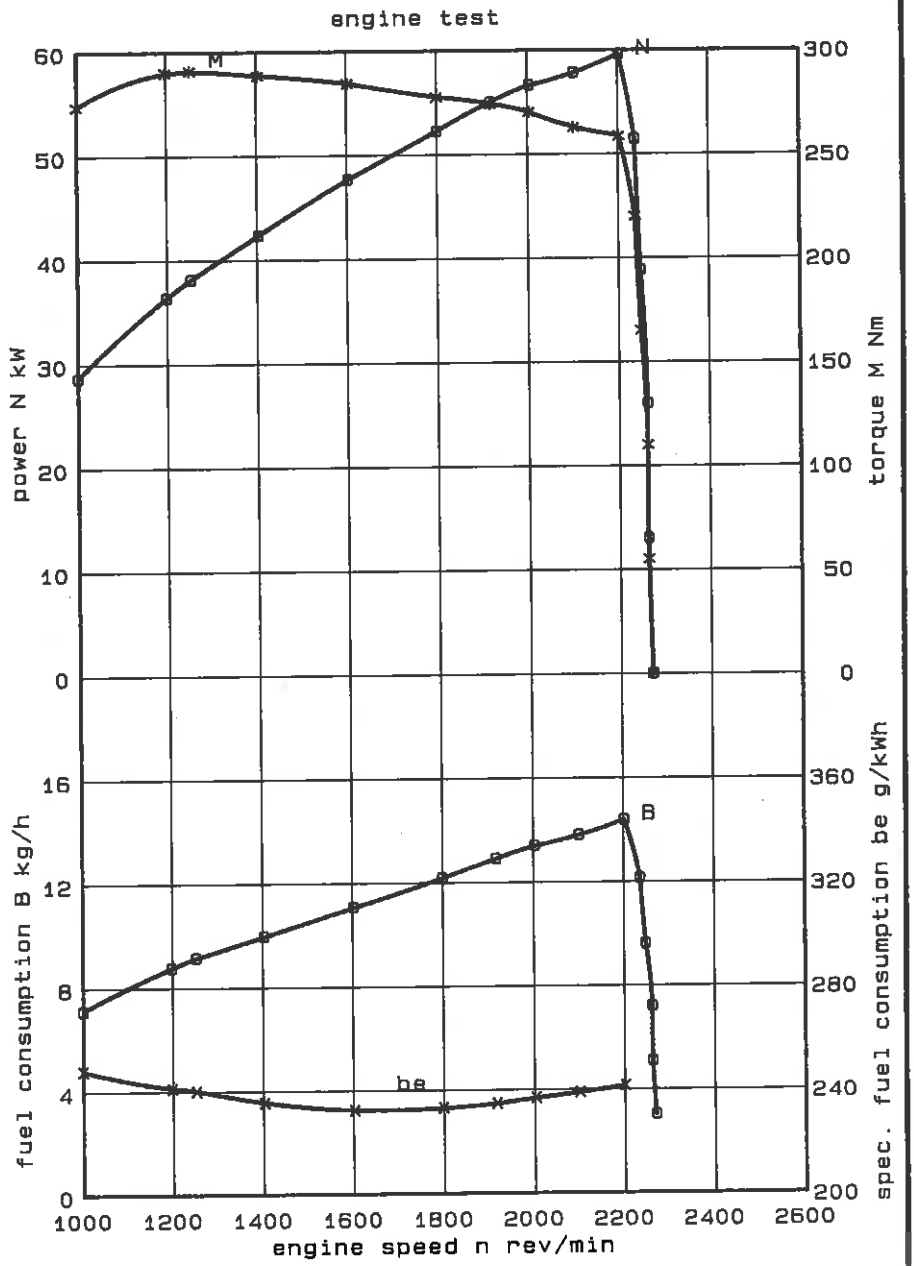
temperature	21 °C
pressure	100 kPa
relative humidity	55 %

Maximum temperatures

coolant	83 °C
oil	101 °C
fuel	23 °C
engine air intake	22 °C

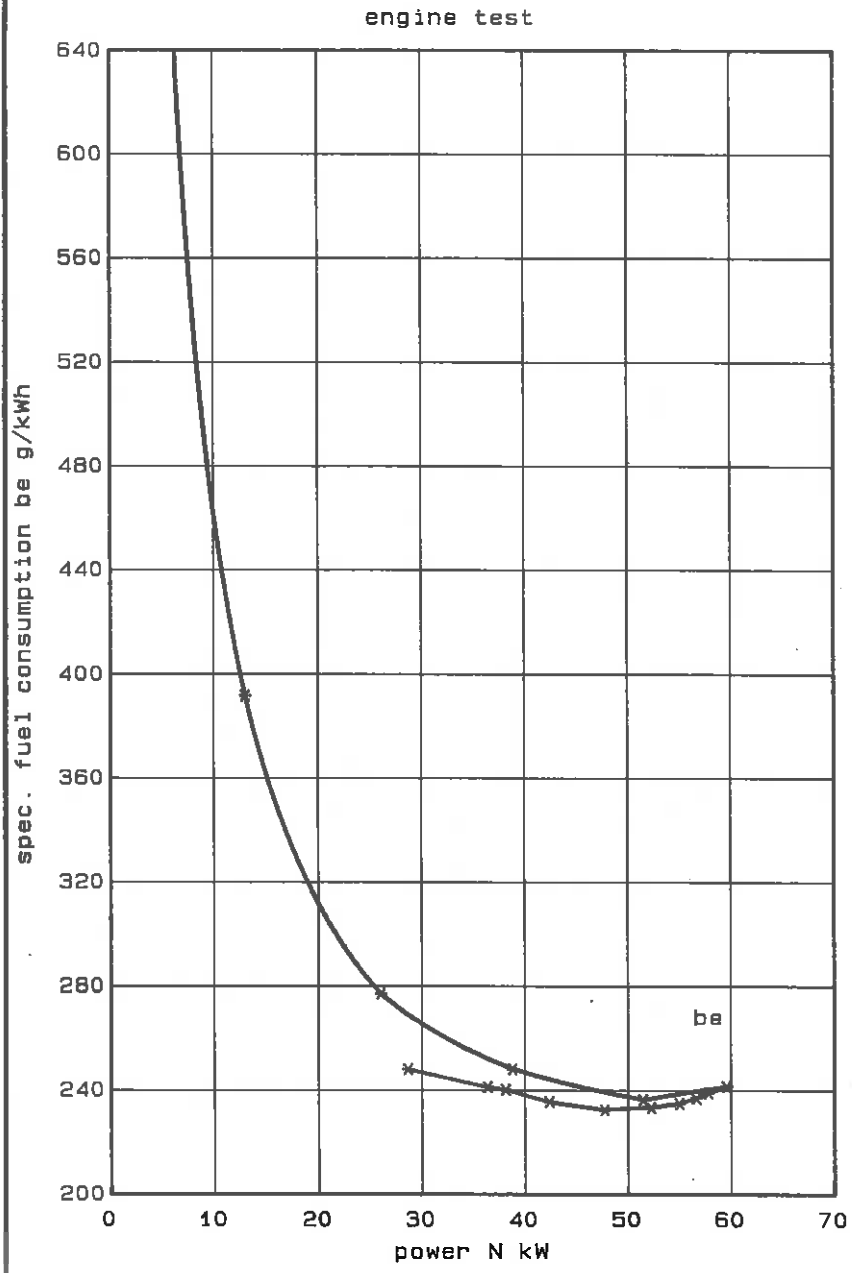
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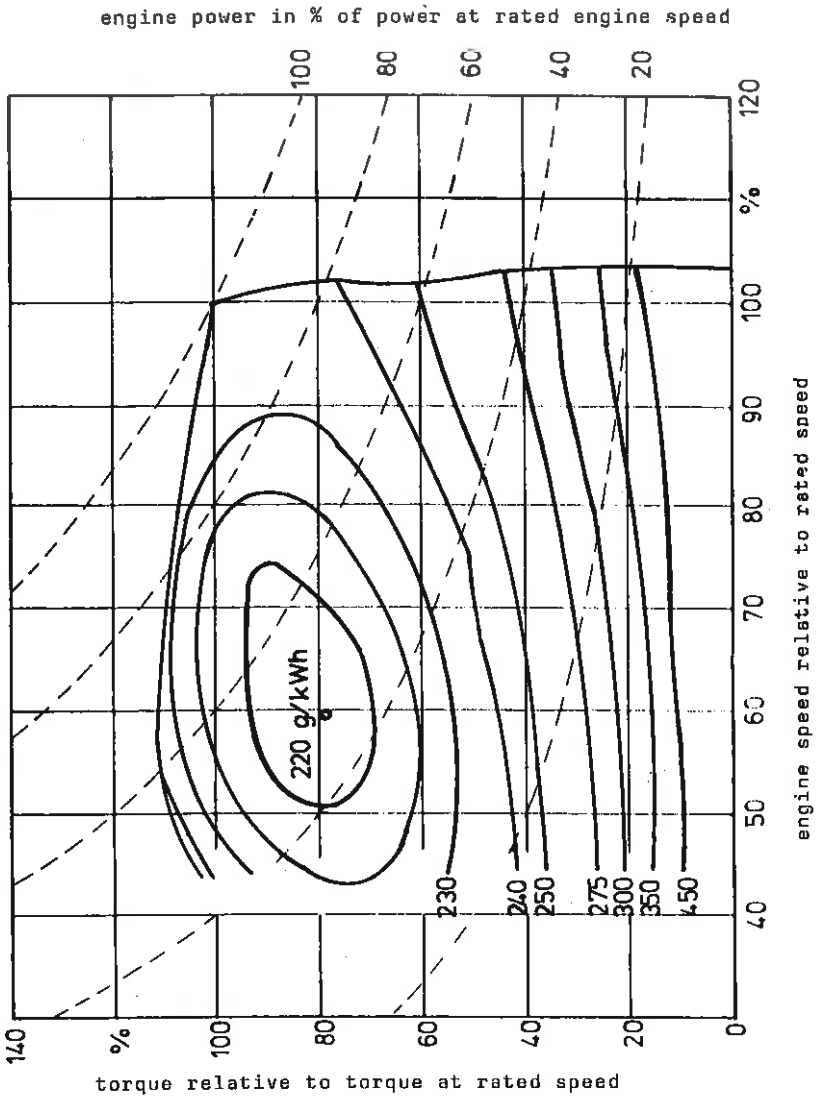
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ADDITIONAL TESTS

under the responsibility of the DLG-Testing Station

9 LIFTING FORCES at rear power lift
(fitted with 2 assister cylinders)

Date of tests: 22nd November 1988

2.2 Power lift test

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	200 mm	200 mm
Vertical movement without lifting forces	695 mm	810 mm
Vertical movement with lifting forces	685 mm	755 mm
Max. corrected force exerted through full range	23,7 kN	22,0 kN
Corresponding pressure	15,2 MPa	15,2 MPa
Moment about rear axle	-	34,1 kNm
Max. tilt angle of mast from vertical	-	6°

Lifting heights relative to horizontal lower links

mm	-472	-407	-400	-300	-200	-100	0	+100	+200	+278	+283

Lifting forces at hitch points, corrected to 15,2 MPa

kN		23,7	23,9	26,1	27,8	28,8	29,5	29,9	29,9	29,9	

Lifting forces at standard frame, corrected to 15,2 MPa

kN	22,0		23,3	24,3	25,0	25,2	25,0	24,5	23,9		23,3

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