Report on test in accordance with OECD STANDARD CODE

OECD No. 1169



Agricultural Tractor FENDT FARMER 312 LSA TURBOMATIK (4WD)

Type denomination FWA 199 S

Manufacturer

X. Fendt & Co., Maschinen- und Schlepperfabrik
D-8952 Marktoberdorf

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: June till October 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: 17th January 1989 OECD No. 1169

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	=	102,00 kp
Powers			1 kW	=	1,36 PS
Pressures	1 MPa	=	10 bar	=	10,20 kp/cm²
	100 kPa	=	1000 mbar	=	750,10 mm Hg

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PRÜFUNGS-ABTEILUNG
FENDT FARMER 312 LSA

Test No. 87-201

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Test No. 87-201

Tractor manufacturer:	X. Fendt & Co., D-8952 Marktoberdorf
Location of tractor assembly:	D-8952 Marktoberdorf
Submitted for test by:	Manufacturer
Selected by:	Manufacturer with agreement by DLG
Place of running-in:	Marktoberdorf and Groß-Umstadt
Duration of running-in:	Engine and tractor appr. 200 hours
Location of test:	D-6114 Groß-Umstadt

SPECIFICATION OF TRACTOR

Tractor

Make:	FENDT
Trade name:	FARMER 312 LSA TURBOMATIK
Type denomonation:	FWA 199 S
Type:	Four wheel-drive tractor, unit construction
Serial No.:	199/21/0006 1st serial no.: 199/21/0001

Engine

Make:	MWM
Model:	D226 B 6
Type:	Watercooled 4-stroke diesel engine, direct injection, naturally-aspirated
Serial No.:	D226.6B.700124
Cylinders:	6, in-line, bore/stroke 105/120 mm, capacity 6234 cm³, compression ratio 16,6±0,5:1, wet replaceable cylinder liners
Valves:	Overhead
Fuel system:	SOLEX fuel supply pump; replaceable BOSCH fuel filter, dual filter on request, capacity of fuel tank 160 dm³; BOSCH in-line injection pump PES 6A 90D320/3RS 2660, serial no. 54402875; manufacturer's production setting of injection pump: Flow rate (rated engine speed and full load) 54±1,6 mm³/stroke, timing 23°±0,5° before TDC; BOSCH multihole injection nozzles DLLA 151 S 985, injection pressure 22±0,5 MPA

Governor:	BOSCH, centrifugal variable speed governor RSV 325-1500 A2C 605-2R, governed range of engine speed from 700 to 2560 rev/min, rated engine speed 2400 rev/min
Air cleaner:	MANN dry paper element filter with pre-cleaner, replaceable cartridge; air intake above bonnet, lengthened intake pipe on request; electrical maintenance indicator
Lubrication system:	Forced-feed lubrication with gear pump, main lubricating oil filter, replaceable; engine oil cooling water heat exchanger between oil filter and filter socket
Cooling system:	Water cooling with centrifugal pump, controlled by thermostat, dual-circuit cooling system; fan with 5 blades, 480 mm dia, V-belt driven; cooling water capacity 20 dm^3. overpressure relief valve set to 70 kPa, cooling system for tropic conditions on request
Starting system:	Electrical; BOSCH solenoid pre-engaged-drive starting motor 2,7 kW; electronically controlled flame plug; safety device: depressed pedal of travel clutch
Electrical system:	12 V, BOSCH 3-phase alternator KI 14V 65A 910W; 1 lead acid battery, 135 Ah at 20 hours rating, 600 A test current for low temperature
Exhaust system:	EBERSPÄCHER, reflection-absorption-type silencer, on the left at the bottom, beside the engine, 735 mm long, 210 mm dia; exhaust pipe above bonnet, mouth showing upwards, 2800 mm above ground; exhaust pipe optionally available showing downwards to the rear and to the left with an angle of 45°

Transmission to wheels

Clutch:	1. VOITH fluid coupling 390 TD for travel and p.t.o. 2. FICHTEL & SACHS single-plate dry clutch GTF 330N for travel, disc 330 mm dia; self readjusting, hydraulically operated by pedal (see on page -13- braking)
Gear box:	FENDT, R 21/6 synchromesh gear box with 3 forward gears and 1 reverse gear; 1 close stepped synchromesh gear box with 3 ranges FL, FM and FS; 1 range gearbox with road range S (collar shifted) and field range A (sliding gear change); 3 independent synchronized overdrive speeds; total 21 forward and 6 reverse speeds, 3 shift levers; creeper range optionally available; with creeper range installed, fast range FS and 3rd overdrive not available, then total 20 forward and 6 reverse speeds; Lubrication: forced-feed lubrication with pump and filter, oil cooler in front of engine's water cooler
Rear axle and final drives:	FENDT, portal axle; bevel gear drive; bevel gear differential with pedal operated lock, not self disengaging, with pilot lamp; spur gear final drives with double transmission
Front axle and final drives:	ZF, APL.700F6; drive of universally-jointed propeller shaft attached to the left, beside the gear box, shiftable by multi-plate dry clutch, operated by hand lever; bevel gear drive, multi-plate limited slip differential, planetary final drives

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Total ratios and travelling speeds

Range	Close stepped range	Gear	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed*) at rated engine speed of 2400 rev/min km/h
Forward speeds				
A	FL	1	563,70	1,29
		2	352,31	2,06
		3	233,13	3,26
	FM	1	465,05	1,56
		2	290,66	2,50
		3	184,08	3,95
	FS	1	391,12	1,86
		2	244,45	2,97
		3	154,82	4,70
S	FL	1	140,93	5,16
		2	88,08	8,25
		3	55,78	13,03
	FM	1	116,26	6,25
		2	72,66	10,00
		3	46,02	15,80
	FS	1	97,78	7,44
		2	61,11	11,90
		3	38,70	18,79
1st overdrive			30,39	23,93
2nd overdrive			24,76	29,37
3rd overdrive			19,05	38,17
Reverse speeds				
A	FL	R	389,40	1,87
	FM	R	321,26	2,26
	FS	R	270,18	2,69
S	FL	R	97,35	7,47
	FM	R	80,31	9,05
	FS	R	67,55	10,76

*) calculated with a tyre dynamic radius of 820 mm (ISO 4251/1-1984) and 2,0% slip of the fluid coupling

Number of revolutions of front wheels for one revolution of rear wheels: 1,3055

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Power take-off

Main p.t.o.: Independent,
(shifting to ground speed p.t.o. on request);
driven by multi-plate dry clutch, lever operated, discs 168 mm dia;
1 p.t.o. shaft at rear of tractor;
3 p.t.o. speeds are preselectable by hand lever;

Power take-off proportional to engine speed: 35 mm dia, 6 splines, in conformity with ISO 500-1979, type 1;
height above ground 770 mm
distance from tractor's median plane 0 mm
distance form rear wheel axis 400 mm

P.t.o.	P.t.o. speed rev/min *)	Engine speed rev/min *)	Ratio of rotation speeds (engine speed/ p.t.o. speed)	Power restriction kW	Maximum torque Nm
540	540	2185	4,0457	55	1750
	593	2400			
750	750	2323	3,0972	55	1338
	775	2400			
1000	1000	2217	2,2174	-	958
	1082	2400			

*) the quoted figures are only valid for the unloaded p.t.o.;
under load, speed differences are caused by slip of fluid clutch, depending on transmitted torque and speed

Optional p.t.o.: Front p.t.o. is available for 750 or 1000 rev/min
(not fitted on tested tractor)

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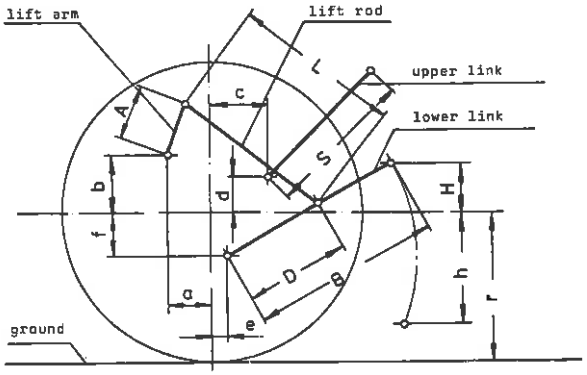
Power lift

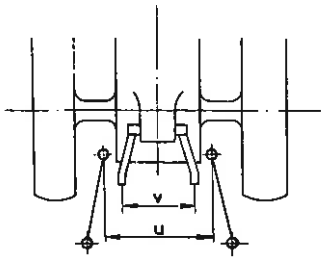
Make:	FENDT/BOSCH
Model:	Electronic-hydraulic power lift FENDT-Tronic
Type:	Disintegrated construction; BOSCH control unit EHR, additional remote control
Control:	Draft and position control, both infinitely mixable, floating position, continously adjustable limitation of power stroke; lower link sensing
Hydraulic system:	Open centre system, 2 separate oil circuits; BOSCH tandem gear pump HY/ZFFS 11/16+14L, gear driven by engine
	hydraulic circuit 1: 1st pump with 40 l/min delivery at rated engine speed supplies power lift control valve and 1 double and 1 single acting additional control valve (up to 3 additional control valves on request)
	hydraulic circuit 2: 2nd pump with 35 l/min delivery at rated engine speed supplies steering with priority with constant 11 l/min and on request 1 additional control valve (not fitted) with residual oil flow of 24 l/min
	automatic flow valve feeds residual oil flow of circuit 2 into circuit 1, resulting in an oil flow of 64 l/min at rated engine speed; by opening a stopcock the residual oil flow of circuit 2 may be directly drained into oil tank, then results an oil flow of 40 l/min at rated engine speed;
	power lift is switchable to be controlled by double acting additional valve, then lifting and pushing procedures are possible
Cylinders:	2, double acting; bore/stroke:80/125 mm, piston rod 40 mm dia; maximum working pressure 18+1 MPa, cylinder safety valve set to 21 MPa
Linkage lock for transport:	EHR method of operation, lowering throttle, quick lift switch lockable
Filter:	Filter in joint returnpipe of circuits 1 and 2, filter cartridge exchangeable

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Oil reservoir:	Separate oil reservoir on the right beside the engine
Oil tappings:	At rear of tractor and on the right in tractor's middle each: 1 pair of couplings for double acting additional valve (up to 4 pairs possible); 1 coupling for separate return pipe; maximum volume of oil available to external cylinders: 25 dm³ if tractor is travelling 35 dm³ if tractor is working stationary
Three-point linkage:	With WALTERSCHEID quick couplers, category 2; (or category 3 after changing the joint balls), in conformity with ISO 730/1-1977; lower links side stabilization by quick clamping devices with middle centering





Dimensions of rear implement linkage (projected lengths in mm, underlined dimensions are valid for power lift measurements p.23)

Rear tyres	radius index	(r)	820
Front tyres	radius index	(r')	645
Length of lift arms		(A)	340
Length of lower links		(B)	965
Distance of lift arm pivot points from rear wheel centre	horizontal	(a)	157
	vertical	(b)	303
Horizontal distance between lower link pivot points		(u)	462
Horizontal distance between lift arm end points		(v)	595
Length of upper link		(S)	705 to 980, <u>780</u>
Distance of upper link pivot point from rear wheel centre	horizontal	(c)	<u>299</u>, 287 or 265
	vertical	(d)	<u>215</u>, 262 or 309
Distance of lower link pivot point from rear wheel centre	horizontal	(e)	119
	vertical	(f)	261
Distance of lower link pivot points from lift rod pivot points on lower links		(D)	635
Length of lift rods		(L)	602 to 732, <u>732</u>

Height of lower link hitch points relative to rear wheels' centre line (situated 820 mm above ground), these data are valid for unloaded power lift:

Length of lift rods	(L)	<u>732</u>	602
Linkage distance of lift rods	(D)	635	
Lowest position	(h)	620	387
Highest position	(H)	100	265
Transport position	(H')	100	265

Pull attachments

Swinging drawbar	Optionally available (with piton-fix), not fitted
Trailer hitch:	FENDT, AK-003, non automatical (automatical hitch on request); height above ground adjustable by one-hand quick adjustment
	hitch hole dia 33 mm
	hitch point above ground 807, 849, 891, 933 or 975 mm
	behind rear wheel axis, horizontally 595 mm
	above p.t.o. shaft end, vertically 37, 79, 121, 163 or 205 mm
	behind p.t.o. shaft end, horizontally 195 mm
	maximum permissible vertical load 1500 kg
Holed drawbar:	Long bar, total length 1700 mm
	length between joint balls 825 mm
	thickness/width 25/100 mm
	9 holes between joint balls, distance between the holes each 80 mm
	hole dia 33 mm
	height above ground
	minimum 250 mm
	maximum 1135 mm
	horizontal distance of holes' centre line to p.t.o. shaft end (lower links in horizontal position) 739 mm
Towing hitch:	Height above ground 860 mm

Steering

FENDT/ZF;
hydrostatic, SERVOSTAT 8492;
oil supply by oil circuit 2 of hydraulic system (see on page 9);
1 steering cylinder, symmetrical design, in front axle integrated, directly acting on steering levers;
bore/stroke 63/235 mm, piston rod 36 mm dia

Brakes

Service brake: FENDT/GIRLING/TEVES;
pedal operated muscle power brake with hydraulic transmission, acting on 2 dry disc brakes on the differential half shafts of rear axle, 2 lining discs each, 165 mm dia;
1 internally ventilated double-caliper brake, acting on joint shaft to front axle drive, disk 260 mm dia;
1 common tank with brake fluid for hydraulic actuation of travel clutch and brake
Steering brake:
Divided pedal of service brake, locked together for normal use;
if steering brake is used, front axle brake automatically disengages

Trailer brake:
Optionally available, not fitted

Parking brake: Independent of service brake;
lever operated muscle power brake with mechanical transmission, acting on 2 brake drums on the differential half shafts of rear axle;
drum 180 mm dia
38 mm width
brake indicator lamp

Wheels

4 pneumatics

Front: 2, driving and steering, rims DW **14x26**

Rear: 2, driving, rims W16Lx38

Wheelbase: 2589 mm

Track width adjustment:

	Mimimum mm	Maximum mm	Adjustment method *)
Front	1800	1940	Reversing the wheels
Rear	1662	1800	

*) offset lug type rims optionally available

Available tyres:

Tyre size	
Front	Rear
13.6 - 28 14.9 - 26	16.9 - 38
14.9 - 28	16.9 - 38 18.4 - 38 23.1 - 30
16.9 - 24	16.9 - 38 23.1 - 30
16.9 - 26	16.9 - 38 18.4 - 38 520/70 - 38
9.5 - 36	9.5 - 48 11.2 - 48 12.4 - 46
420/70 R 28	18.4 - 38 520/70 R 38

Protective structure

Cab:

FENDT, model 198.501;
OECD-tested, approval no. CSS 044/5-a(C);
not tiltable, mounted by 4 silent blocks on tractor;
1 door and 3 steps each on the left and right;
steps 550, 770 and 980 mm, driver's platform 1200 mm above ground;
doors optionally lockable in ventilation position;
front-, rear- and side-windows as well as roof hatch tiltable;

combined heating and ventilation system with 3-stage blower, heating connected to cooling water circuit;
air intake below windscreen, dry air filter;
air outlet jets at instrument panel, defroster nozzles, heating by circulation air possible;
cab optionally available with air conditioner; tinted glass standard;

optionally available equipment, fitted on tested tractor:
Additional 3-stage blower, incorporated in roof;
6 air outlet jets for head room, air intake above windscreen, dry air cleaner (on request poison filter);

Noise reduction materials:

roof and roof hatch:	phenolic resin bonded cotton fleece with FT-covering fabric, molded	6 mm
	partially up to	16 mm
in front part of roof	foam	40 mm
in rear part of roof	partially cotton fleece	30 mm
front wall, lower part	heavy-layer-foil with foam	5 mm
	partially up to	15 mm
rear wall, lower part	PU-mat	10 mm
mudguards	PU-foam with imitation leather	15-40 mm
uprights-middle	plastic coated	
floor	ribbed PU-mat with foam	15 mm
	bitumen mat	2 mm
seat support	ribbed PU-mat	10 mm
	bitumen mat	2 mm
instrument and steering support, upper part	inside covered with bitumen mat	5 mm
lower part	inside foam on the pedal openings	
cab floor bottom side	phenolic resin bonded cotton fleece	10-40 mm
- lateral, on the mudguards	phenolic resin bonded cotton fleece	10 mm
bulk head	glass fiber mat with alu-foil, stamped	10 mm

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Driver's seat

GRAMMER, DS 85 H1 SOR;
mechanical suspension, suspension adjustable, hydraulic shock absorber;
upholstered seat with integrated arm rests and adjustable folding back rest, additional horizontal suspension;
height of unloaded seat above platform adjustable in 2 steps from 510 mm to 570 mm;
longitudinal adjustment range 150 mm;
on request GRAMMER LS 95 H1/90 available (pneumatic suspension);

Lighting

Electrical, 12 Volt, corresponding to German legislation

	Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlights	1055	135x115	240
Sidelights	1605	65x20	865
Rearlights	1600	33x60	805
Reflectors	1550 635	115x25 70 dia	848 435

TEST CONDITIONS

Overall dimensions

	Without ballast	With ballast
Length	4450 mm	4890 mm
Width	2290 mm	2445 mm
Height	2780 mm to top of cab 2800 mm to upper edge of exhaust pipe mouth	
Ground clearance	510 mm below mounting bracket of trailer hitch	

Tractor mass (with cab)

	Ballasted		Unballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	3490	3500	2120	2130
Rear	4440	4500	2885	2945
Total	7930	8000	5005	5075

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Ballast

	Number of weights	Total mass kg	Water kg
Front	21	871	426
Rear	12	768	860

Tyres and track widths specifications

	Front	Rear
Tyres:	PIRELLI TM 200	GOODYEAR
dimensions	16.9R26	18.4R38
ply rating/load index	-/135	8/-
type	radial	radial
maximum load	2180 kg	2715 kg
at inflation pressure	160 kPa	140 kPa
at travelling speed	40 km/h	40 km/h
dynamic radius index	645 mm	820 mm
Chosen track width	1800 mm	1800 mm
Technically permissible axle load	3500 kg	5430 kg
Technically permissible total weight	8000 kg	

Oils and lubrication

Capacity and change interval:

	Capacity dm^3	Oil change h/years	Filter change h/years
Engine	16,5	250/-	250/-
Fluid clutch	8,3	5000/-	-
Gearbox including rear axle	21,0	1000/2	1000/2
Front axle differential	7,0	1000/2	-
Front final drives	0,75 each		
Rear final drives	0,65 each		
Hydraulic system including steering	45,0	1000/2	1000/2
Service brake including travel clutch	0,7	-/2	-

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Specifications

	Recommended	Used during test
Engine oil:		
Engine		
Type	Engine oil	MOBIL DELVAC SUPER
Viscosity SAE *)	15W/40 15W/30 10W	15W/40
Classification API	CD	CD
Fluid clutch		
Type	Engine oil	MOBIL DELVAC 1310
Viscosity SAE	10W	10W
Classification API	CD	CD
Gear oil:		
Gearbox including rear axle; front axle, final drives at front and rear		
Type	Hypoid-gear oil	MOBIL MOBILUBE HD85W/90A
Viscosity SAE	85W/90 80W/90 90	85W/90
Classification API	GL5	GL5
Hydraulic Fluid:		
Hydraulic system, steering		
Type	Engine oil	MOBIL DELVAC 1320
Viscosity SAE *)	20W/20 30	20W/20
Classification API	CD	CD

*) according to atmospheric temperatures

Grease: Multipurpose grease

Number of lubrication points: 11

Fuel

Type: ARAL Diesel-fuel in conformity with DIN 51601

Density at 15°C: at p.t.o. tests 0,834 kg/l
at drawbar performance test 0,832 kg/l

REPAIRS: None

REMARKS: None

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COMPULSORY TESTS

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

Date of tests: 12th July 1988
Location of tests: DLG-Testing Station Groß-Umstadt
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power	Engine	Speed Fl-clutch output	P.t.o.	Fuel consumption hourly		spec.	Specific energy
kW	rev/min	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
Maximum power							
1.1 At 2-hour test							
78,6	2400	2353	1061	23,57	19,65	250	3,33
1.2 At rated speed							
78,6	2400	2353	1061	23,57	19,65	250	3,33
1.3 At standard p.t.o. speed							
76,3	2275	2217	1000	22,45	18,72	245	3,40
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							
78,6	2400	2353	1061	23,57	19,65	250	3,33
1.4.2 85% of the torque obtained in 1.4.1							
68,2	2450	2404	1084	20,77	17,32	254	3,29
1.4.3 75% of the torque defined in 1.4.2							
52,2	2482	2450	1105	16,91	14,11	270	3,08
1.4.4 50% of the torque defined in 1.4.2							
35,3	2512	2490	1123	13,11	10,94	310	2,69
1.4.5 25% of the torque defined in 1.4.2							
18,0	2550	2539	1145	9,67	8,06	447	1,86
1.4.6 unloaded							
-	2589	2586	1166	6,33	5,28	-	-

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Power	Engine	Speed Fl-clutch output	P.t.o.	Fuel consumption hourly		spec.	Specific energy
kW	rev/min	rev/min	rev/min	l/h	kg/h	g/kWh	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							
76,3	2275	2217	1000	22,45	18,72	245	3,40
1.5.2 85% of the torque obtained in 1.5.1							
66,9	2338	2287	1031	19,95	16,64	249	3,35
1.5.3 75% of the torque defined in 1.5.2							
51,0	2363	2326	1049	16,03	13,37	262	3,18
1.5.4 50% of the torque defined in 1.5.2							
34,6	2388	2365	1066	12,36	10,31	298	2,80
1.5.5 25% of the torque defined in 1.5.2							
17,6	2426	2412	1088	9,00	7,51	426	1,96
1.5.6 unloaded							
-	2459	2458	1108	5,75	4,80	-	-

No load maximum engine speed: 2586 rev/m
Equivalent flywheel torque at rated engine speed: 319 Nm
Maximum equivalent flywheel torque: 390 Nm at 1534 rev/min of the engine
The equivalent flywheel torques are given relative to the output shaft of the fluid clutch

Mean atmospheric conditions

temperature	24 °C
pressure	100 kPa
rel. humidity	33 %

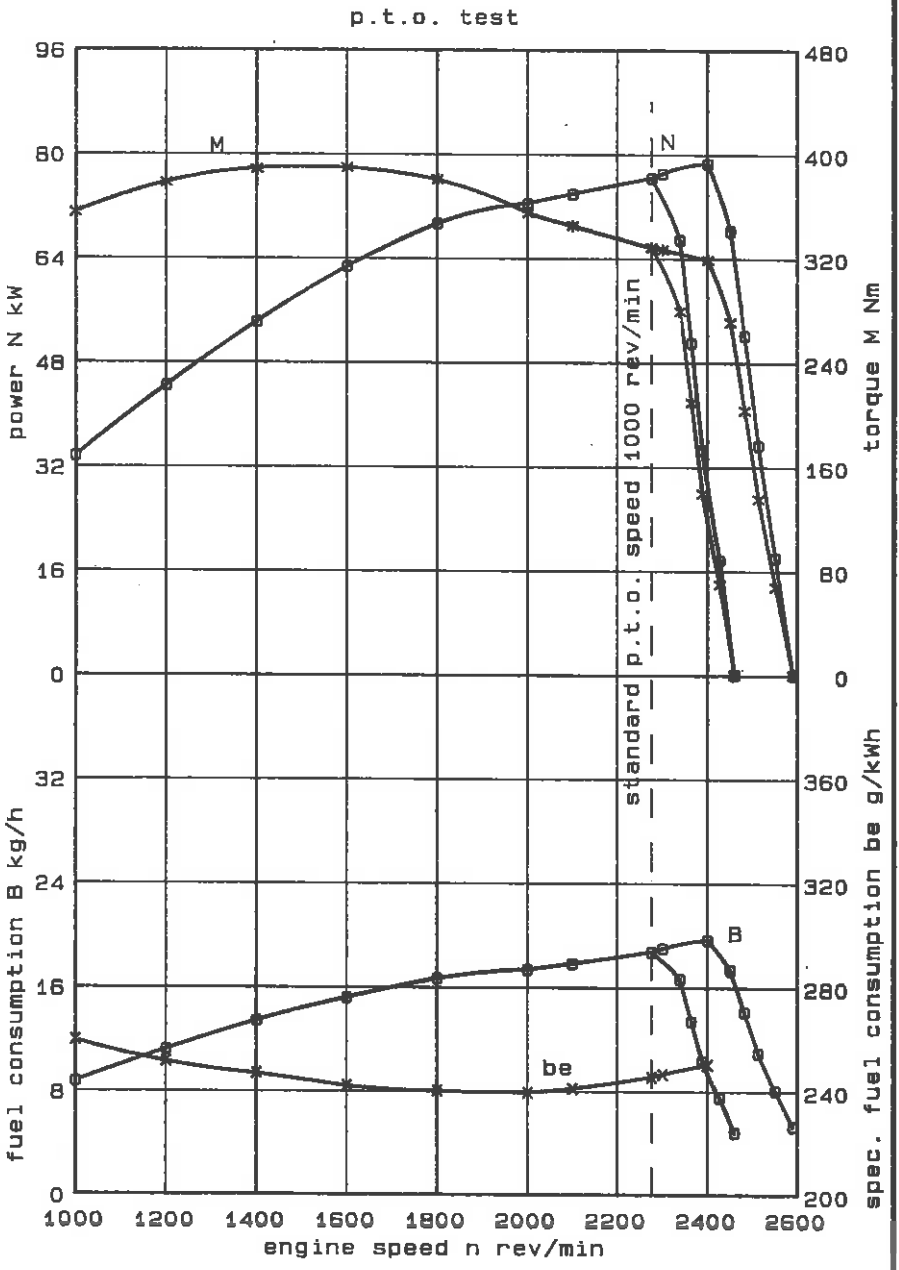
Maximum temperatures

coolant	86 °C
oil	104 °C
fuel	26 °C
air intake	29 °C

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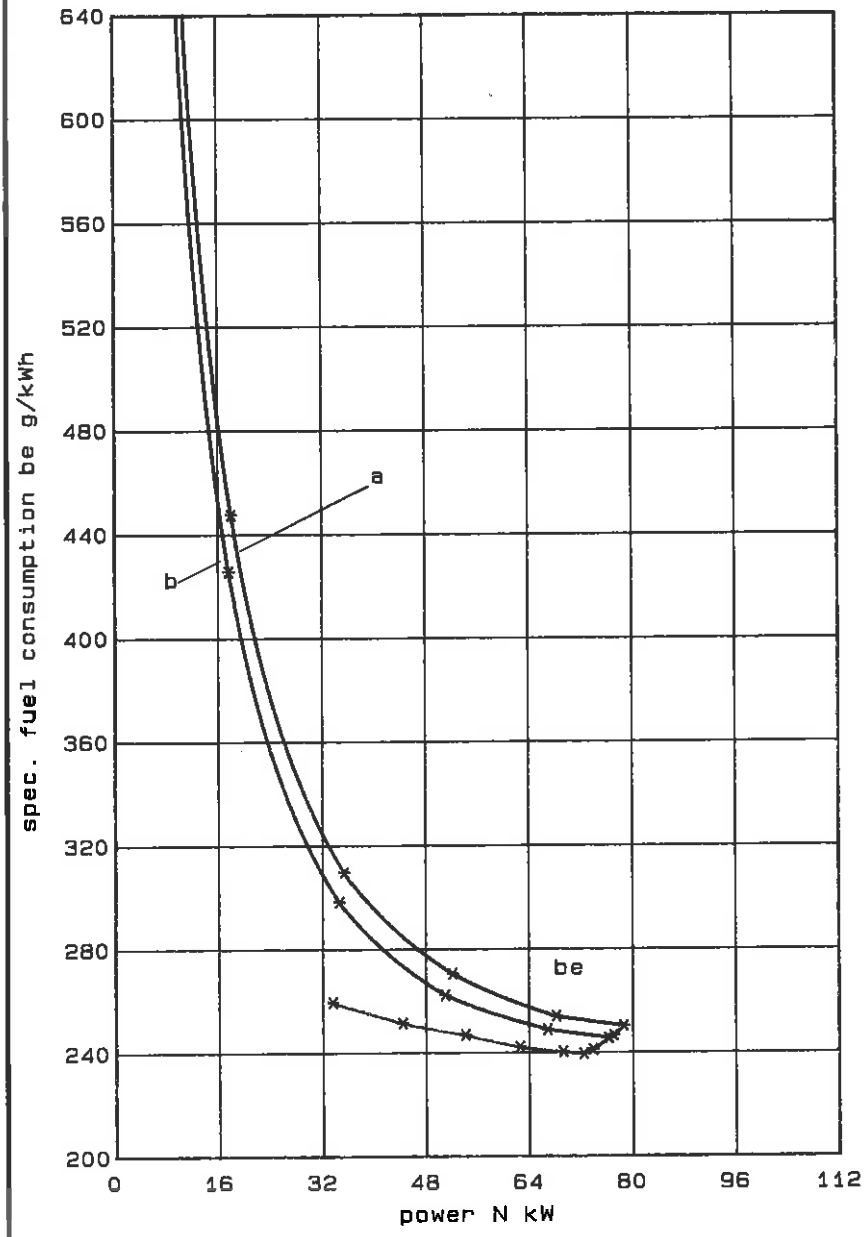
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2 HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 20th October 1988

2.1 Hydraulic power test

Sustained pressure with relief valve open 18,5 MPa
Pump delivery rate at minimum pressure 70,1 l/min

	Hydraulic power kW	Flow rate l/min	Pressure MPa	Oil temperature °C
At 90% of the actual relief valve.setting	17,0	60,9	16,7	65
At max. power	17,0	60,0	17,0	65

Tapping point used for test: At rear of tractor (single acting), separate return pipe

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	720 mm	758 mm
Vertical movement with lifting forces	705 mm	730 mm
Max. corrected force exerted through full range	39,7 kN	43,2 kN
Corresponding pressure	16,7 MPa	16,7 MPa
Moment about rear axle	-	73,2 kNm
Max. tilt angle of mast from vertical	-	4,0 °

Lifting heights relative to horizontal lower links

mm	-364	-359	-300	-200	-100	0	+100	+200	+300	+346	+366

Lifting forces at hitch points, corrected to 16,7 MPa

kN		39,7	42,8	46,4	49,0	51,2	52,6	53,4	53,4	52,6	

Lifting forces at standard frame, corrected to 16,7 MPa

kN	43,7		45,4	46,8	47,6	48,1	47,2	46,3	45,0		43,2

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3 DRAWBAR PERFORMANCE

Date of tests: 15th till 26th August 1988
Type of track: Concrete

Gear	Driving speed km/h	Power kW	Drawbar pull kN	Engine speed rev/min	Slip pf wheels %
3.1 Maximum power in tested gears (unballasted tractor) height of drawbar above ground 530 mm					
3 A FM	3,50	50,8	52,22	2460	15,1
3 A FS	4,11	59,7	52,33	2443	15,1
1 S FL	4,64	65,1	50,54	2400	11,3
1 S FM	5,92	67,9	41,29	2398	6,6
1 S FS	7,18	69,3	34,75	2396	4,4
2 S FL	8,06	69,1	30,88	2400	3,6
2 S FM	9,87	69,6	25,40	2400	2,6
2 S FS	11,76	68,9	21,10	2398	1,9
3.2 Maximum power in tested gears (ballasted tractor) height of drawbar above ground 515 mm					
1 A FL	1,18	25,7	78,42	2524	15,1
1 A FM	1,43	31,1	78,40	2512	15,0
1 A FS	1,68	36,5	78,23	2503	15,1
2 A FL	1,86	40,4	78,27	2491	15,0
2 A FM	2,23	48,4	78,20	2474	15,0
2 A FS	2,62	56,9	78,15	2456	15,1
3 A FL	2,83	61,2	77,91	2400	14,5
3 A FM	3,76	68,7	65,79	2403	6,2
3 A FS	4,54	68,5	54,34	2398	4,4
1 S FL	5,02	70,7	50,71	2398	3,9
1 S FM	6,13	70,2	41,22	2398	3,0
1 S FS	7,32	69,6	34,25	2398	2,4
3.3.1 Five-hour-test at 75% of pull at maximum power in 1 S FM gear					
1 S FM	6,38	54,9	30,90	2470	2,1
3.3.2 Five-hour-test at pull corresponding to 15% wheel slip in test 3.2					
2 A FS	2,57	56,0	78,42	2443	-

Total oil consumption during ten hours duration of tests 3.3.1 and 3.3.2 : 15 g/h

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Tyre size front: 16.9 R 26
rear: 18.4 R 38

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
tyre inflation pressure: 80 kPa at front, 100 kPa at rear							
329	2,53	38	79	90	28	76	99,5
324	2,57	38	79	89	28	83	99,5
300	2,77	38	79	91	28	79	99,5
288	2,89	38	78	91	27	71	99,6
285	2,92	38	79	91	27	72	99,6
285	2,92	38	80	92	27	73	99,6
282	2,95	34	78	90	24	76	99,8
285	2,92	36	78	89	24	81	99,8
tyre inflation pressure: 120 kPa at front, 100 kPa at rear							
416	2,00	23	78	84	17	88	98,8
379	2,20	23	78	86	17	88	98,8
360	2,31	26	76	88	17	90	98,8
349	2,38	28	76	89	17	85	98,8
333	2,50	28	77	89	17	84	98,8
326	2,55	30	76	89	18	81	98,8
322	2,58	31	77	90	18	77	98,8
289	2,88	31	76	89	16	84	99,2
288	2,89	30	77	91	16	84	99,2
280	2,97	30	77	91	16	83	99,2
282	2,95	32	77	90	17	83	99,2
285	2,92	31	78	91	17	84	99,2
295	2,82	32	78	98	24	70	99,0
-	-	38	77	99	21	91	99,0

Test 3.3.2 was carried out with additional ballast of 456 kg, the figures not quoted are therefore irrelevant

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	5,00	5,09	5,93	6,05
Radius of turning circle	4,64	4,74	5,57	5,70

5 LOCATION OF CENTRE OF GRAVITY

Height above ground	1008 mm
Distance forward from the vertical plane containing the axis of the rear wheels	1086 mm
Distance from tractor's median plane, to the left	4 mm

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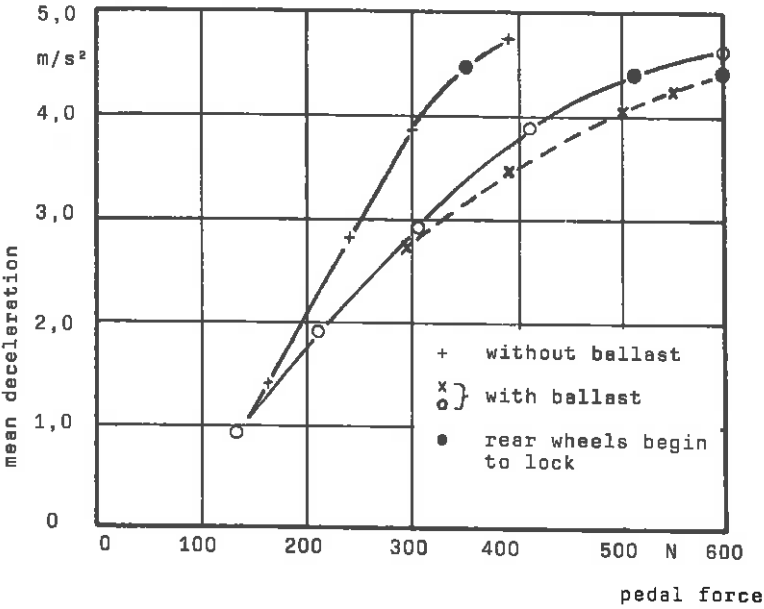
6 BRAKING (Front wheel drive disengaged)

Date of tests: 18th and 25th August 1988

	Tractor mass (with driver) front kg	rear kg	total kg	Speed before application of brakes km/h
Without ballast	2130	2945	5075	39,5
With ballast	3500	4500	8000	38,9

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	260	290

7 MEASUREMENTS OF EXTERNAL NOISE LEVEL

Date of test: 16th August 1988
Type of track: Concrete
Type of sound level meter: BRÜEL & KJAER model 2233

Results of test

Gear: 3rd Overdrive *)
Travelling speed before acceleration: 29,7 km/h
Sound level: 87,0 dB(A)

APPENDIX

MEASUREMENTS OF NOISE IN THE PROTECTIVE STRUCTURE

Results of OECD-test no. CSS 044/5-a(C) with FENDT safety cab model 198.501

Date of test: 11th May 1987
Type of track: Concrete
Type of sound level meter: BRÜEL & KJAER model 2209

Gear	Drawbar pull kN	Travelling speed km/h	Sound level dB(A)	Noise rating N
1 S FS +)	33,45	7,15	77,0	72,5
1 S FS +)	light load	8,16	76,0	-
3rd Overdrive*)	light load	38,81	76,5	-

+) The 1 S FS gear corresponds to the nominal travelling speed nearest to 7,5 km/h

*) Front wheel drive disengaged

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ADDITIONAL TESTS

under the responsibility of the DLG-Testing Station

8 LIFTING FORCES at rear power lift with modified linkage setting

Date of tests: 20th October 1988

Length of lift rods	(L)	602 mm
Distance of lower link pivot points to lift rod pivot on lower links	(D)	635 mm
Distance of upper link pivot point from rear wheel centre, vertical	(d)	309 mm
Length of upper link	(S)	814 mm

see pages 10 and 11

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	433 mm	433 mm
Vertical movement without lifting forces	652 mm	617 mm
Vertical movement with lifting forces	637 mm	592 mm
Max. corrected force exerted through full range	46,80 kN	53,00 kN
Corresponding pressure	16,7 MPa	16,7 MPa
Moment about rear axle	-	89,3 kNm
Max. tilt angle of mast from vertical	-	-2 °

Lifting heights relative to horizontal lower links

mm	-126	-121	-100	0	+100	+200	+300	+400	+471	+500	+511

Lifting forces at hitch points, corrected to 16,7 MPa

kN	46,8		48,1	51,2	53,9	55,8	57,0	57,9		57,7	57,4

Lifting forces at standard frame, correted to 16,7 MPa

kN		54,3	54,7	56,5	56,9	56,9	56,5	54,7	53,0		

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