

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



O.E.C.D. No.

928



**Agricultural Tractor
FENDT FARMER 311 LSA TURBOMATIK
(4WD)**

Type denomination FWA 198 S

Manufacturer

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

This bulletin is based on engineering tests in accordance with the O.E.C.D. STANDARD CODE for the Official Testing of Agricultural Tractor Performance. It does not contain an evaluation of the tractor performance on practical work.

Duration of Tests: October 1984 till February 1985
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: 15th April 1985

O.E.C.D. No. 928

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	=	0,736 kW
Pressures	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: X. FENDT & CO.
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. 150 hours

SPECIFICATION OF TRACTOR

Tractor

Make: FENDT
Trade name: FARMER 311 LSA TURBOMATIK
Type denomination: FWA 198 S
Type: Wheel tractor, unit construction,
four wheel driven
Serial No.: 198/21/0005
1st serial No.: 198/21/0001

Engine

Make: MWM
Model: D-226-6;
Type: Watercooled 4-stroke Diesel-engine,
direct injection
Serial No.: D 226.6.2.08401
Cylinders: 6, in line, bore 105 mm, stroke 120 mm,
displacement 6234 cm³, compression ratio
16,6 ± 0,5 : 1;
dry cylinder liners
Valves: Overhead
Fuel system: PIERBURG fuel supply pump PE 20136;
BOSCH in line injection pump
PES 6A 80D 320/3 RS 1302,
manufacturer's production setting
50,0 ± 1 mm³/stroke at rated speed and full
load, injection timing 28 ± 0,5° before TDC;
BOSCH multihole injection nozzles
DLLB 150 S 821, injection pressure 180 bar;
BOSCH fuel filter with replaceable
cartridge, cartridge change yearly or after
1000 operating hours; on request dual filter
with water separator;
capacity of fuel tank 135 l
Serial no. of
injection pump: 150 240 80



- Governor:** BOSCH centrifugal variable speed type governor
EP/RSV 325-1500 A 2 B 505 DR;
governed range of engine speed 650 to 2410 1/min,
rated engine speed 2300 1/min
- Air cleaner:** MANN
dry paper element filter with pre-cleaner,
replaceable main cartridge and safety cartridge,
electrical maintenance indicator;
air intake above bonnet,
optional air intake with longer pipe and cyclone
- Exhaust
silencer:** EBERSPÄCHER
reflection-absorption-type silencer,
above engine bonnet;
760 mm long, 220 x 85 mm oval;
mouth showing upwards, 2708 mm above ground;
silencer optional on the left side of engine
with mouth showing rearwards
- Lubrication
system:** Forced feed from gear type pump;
filter in full flow with by-pass valve and
replaceable cartridge;
oil and cartridge change period
200 operating hours;
oil capacity 16,5 l;
specified oil quality MIL-L-2104 C
- recommended oil viscosities:
over + 5°C SAE 30
over - 10°C to + 10°C SAE 20W/20
below - 5°C SAE 10W
- engine oil-cooling water heat exchanger
between oil filter and filter socket
- Cooling system:** Watercooling with impeller pump;
overpressure valve set to 0,4 bar;
cooling circuit with by-pass and thermostat,
fan with 7 blades, 455 mm dia;
water capacity 18 l;
optional cooling system for tropic conditions



Starting system: Electrical
BOSCH solenoid pre engaged-drive starting
motor 2,7 kW;
depressed pedal of travel clutch
as safety device;
BERU flame plug in intake manifold

Electrical
equipment: 12 Volt, negative earth
BOSCH 3-phase alternator KI 14 V 55A 770W
1 lead acid battery, 135 Ah at 20 hours
rating

Transmission

Clutch: 1. VOITH
fluid clutch 390 TD for travel and
p.t.o. drive
2. FICHTEL & SACHS
dry disc clutch GTF 320 N for travel drive,
disc 320 mm dia, hydraulically operated by
pedal, self readjusting

Gear box: FENDT type R 21/6;
synchro-mesh gear box with 3 forward
speeds and 1 reverse speed;
1 synchro-mesh close stepped range gear with
3 ranges, slow (FL) intermediate (FM) and
fast (FS);
1 range gear with collar shifted road range
(S) and sliding gear shifted field range (A);
3 independent synchronized overdrive speeds,
total 21 forward and 6 reverse speeds;
optionally available with creeper range,
if creeper range is installed, fast range (FS)
and the 1st overdrive are omitted, then
total 20 forward and 6 reverse speeds;
forced-feed gear lubrication with pump,
oil-cooler and oil-filter; filter change
interval 1000 operating hours,
not longer than 2 years



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FENDT FARMER 311 LSA

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Test No. 84-202

Rear axle and
final drives:

FENDT
portal construction;
bevel gear drive; bevel gear differential
with pedal operated lock, not selfdisengaging;
differential lock with pilot lamp;
double spur gear final drives in portals

Front axle and
final drives:

ZAHNRADFABRIK FRIEDRICHSHAFEN
APL 345
driven by universal joint shaft on the left
hand side of gear box, dry multi-disc clutch
to be shifted by hand lever under load;
bevel gear drive, multi-plate self locking
differential;
planetary final drives

Lubrication:

	oil quality	oil viscosity	oil capacity	oil change interval
	MIL-L-	SAE	l	operating hours
fluid clutch	46152	10W	7,7	500
gear box	2105 (A)	80	34,5	1000 or after 2 years
front axle differential	2105 B	90	6,0	
final drives at front			0,75 each	
final drives at rear			7,5 each	



Total ratios and speeds

Range	Close stepped range	Gear	Total ratio engine : driving wheel	Nominal travelling speed *) at rated engine speed km/h
-------	---------------------	------	------------------------------------	--

Forward speeds

A	FL	1	523,44	1,33
		2	327,15	2,13
		3	202,06	3,44
	FM	1	434,30	1,60
		2	271,44	2,56
		3	167,65	4,15
	FS	1	363,19	1,92
		2	226,99	3,07
		3	140,20	4,96
S	FL	1	130,86	5,32
		2	81,79	8,51
		3	50,52	13,78
	FM	1	108,58	6,41
		2	67,86	10,26
		3	41,91	16,61
	FS	1	90,80	7,67
		2	56,75	12,27
		3	35,05	19,86
1st overdrive			29,44	23,64
2nd overdrive			23,65	29,43
3rd overdrive			18,45	37,72

Reverse speeds

A	FL	R	361,59	1,93
	FM	R	300,01	2,32
	FS	R	250,88	2,77
S	FL	R	90,40	7,70
	FM	R	75,00	9,28
	FS	R	62,72	11,10

***) calculated with the radius index 820 mm
and 2,1 % slip of the fluid clutch**



Power-take-off

Main p.t.o.:

Independent,
optionally shiftable as ground p.t.o.
(not installed on tested tractor);
driven by multi-plate clutch, lever operated,
independent of travel clutch;
discs 168 mm dia;
1 p.t.o. shaft at rear of tractor,
in tractor's median plane;
height above ground 740 mm, 400 mm behind rear
axle centre line, 35 mm dia,
6 splines ISO 500/DIN 9611, type 1;
rotation clockwise, viewed to tractor's rear
3 speeds are preselectable by hand lever
(with engaging pilot lamp and digital speed
indicator)

p.t.o.	p.t.o. transmission ratio	p.t.o. speed 1/min	engine speed 1/min	slip of fluid clutch in %	
				full load	without load
540	4,046	568	2300	*)	0
		540	2185	*)	0
750	3,097	727	2300	2,1	-
		743	2300	-	0
		540	1673	3,5	-
1000	2,217	1016	2300	2,1	-
		1037	2300	-	0
		1000	2264	2,1	-

*) not tested

Secondary p.t.o.: Optionally available front p.t.o.
1000 or 750 1/min;
(not installed on tested tractor)



Power lift

FENDT and BOSCH
electro-hydraulic power lift FENDT-TRONIC,
draft- and position-control, both steplessly
mixable, floating position;
lower link sensing, continuous stroke limiter,
lowering throttle

Hydraulic system: Open centre system with 2 separated oil
circuits;
BOSCH tandem gear pump HY ZFFS 11/16 + 14 L
directly driven by engine

hydraulic circuit 1:
pump with 40 l/min delivery at rated engine
speed;
supplies power lift control valve and up to
3 additional control valves;
oil filter with replaceable cartridge
incorporated in oil reservoir,
cartridge changing yearly or after
1000 operating hours

hydraulic circuit 2:
pump with 35 l/min delivery at rated engine
speed;
supplies steering with priority with constant
9 l/min and optionally an additional control
valve (not fitted on tested tractor) with
residual oil flow of 26 l/min;

oil filter in pressure line, filter changing
yearly or after 1000 operating hours;
oil tank in common with circuit 1;

automatic flow valve steers residual oil flow
of circuit 2 into circuit 1, with that oil
flow 66 l/min at rated engine speed;
by opening a shutoff valve, residual oil flow
of circuit 2 may be drained directly into oil
tank, then oil flow 40 l/min at rated
engine speed



BOSCH control valve,
maximum working pressure 175 + 12 bar;
single acting ram with 86 mm bore and
138 mm stroke;
overpressure relief valve in cylinder set
to 210 bar;
2 double acting additional rams with 35 mm
bore and 203 mm stroke;
1 single acting and 1 double acting
additional BOSCH control valve,
couplings and separate return pipe at rear
of tractor and in tractor's middle
(between rear and front axle);
maximum 4 additional control valves with
couplings and separate oil return pipe at
rear and in middle of tractor available;
up to 23 l oil may be taken off by tappings
if tractor is working stationary, up to 15 l
if tractor is travelling

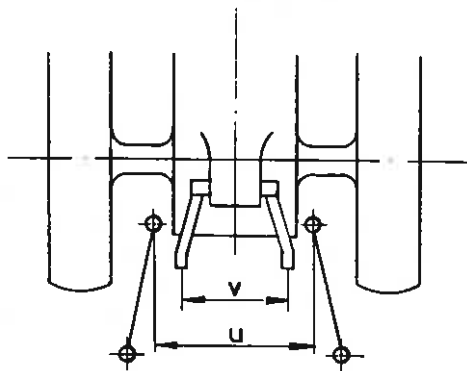
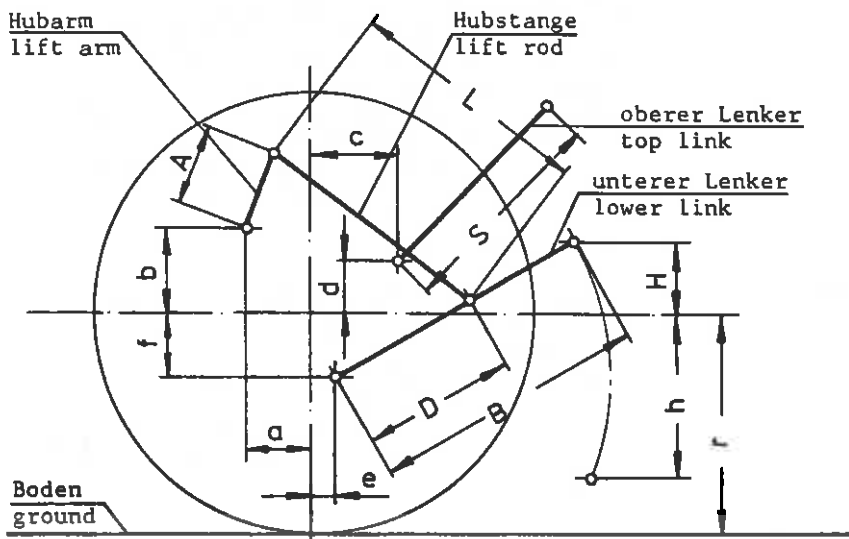
Hydraulic oil: Hydraulic oil tank with 27 l capacity
on the right hand side of engine;
recommended:
engine oil SAE 20W/20 (tropics SAE 30)
or SAE 20W/30,
MIL-L-46152 or MIL-L-2104 C;
oil change interval 1000 operating hours
or yearly

**Lift shaft
lubrication:** Own oil reservoir incorporated in power lift
unit, oil level checking interval
200 operating hours;
specified:
multi purpose gear oil SAE 80,
MIL-L-2105 (A)

**Implement
linkage:** Three point linkage with WALTERSCHEID
quick couplers, joint balls category 2
acc. to ISO 730/I, DIN 9674;
lower link hitch points in the height above
ground steplessly hydraulically lockable;
lower link side stabilization by quick
clamping devices with middle centering



Figures of power lift:



dimensions see on page 13



Dimensions of rear implement linkage (projected lengths, in mm)
(underlined dimensions are valid for power lift measurement
page 29)

Rear tyres (size 18.4 R 38)	radius index (r)	820
Front tyres (size 14.9 R 26)	radius index (r')	615
Length of lift arms	(A)	310
Length of lower links	(B)	954
Distance of lift arm pivot point from rear wheel centre line	horizontally (a) vertically (b)	-15 303
Horizontal distance between the 2 lower link points	(u)	456
Horizontal distance between the 2 lift arm end points	(v)	530
Length of upper link	(S)	721 to 1021
Distance of upper link pivot point from rear wheel centre line	horizontally (c) vertically (d)	<u>166</u> , 148 or 130 <u>214</u> , 263 or 312
Distance of lower link pivot point from rear wheel centre	horizontally (e) vertically (f)	104 261
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	<u>614</u> or 697
Length of lift rods	(L)	<u>787</u> , 722 to 853
Height of lower link hitch points relative to rear axle centre line (situated 820 mm above ground), these data are valid for unloaded power lift		

Length of lift rods	(L)	787	722		853	
Linkage distance of lift rods (D)		614	614	697	614	697
Lowest position	(h)	620	480	395	805	700
Highest position	(H)	110	205	172	-5	-24
Highest transport position	(H')	110	205	172	-5	-24



Implement
linkage at
front:

Optionally available, not fitted on tested tractor

Pull attachment

Swinging
drawbar:

Reversible and shiftable;
height above ground 425 or 515 mm
hitch point
 behind rear axle 729, 742, 789, 813 or 873 mm
 behind p.t.o. shaft 329, 342, 389, 413 or 473 mm
 below p.t.o. shaft 345 or 255 mm
lateral adjustment about 140 resp. 200 mm
to either side;
pivot point behind
rear axle centre 252 or 312 mm
hitch hole diameter 33 mm
piton fix optionally available dia 45 mm

Trailer hitch: ROCKINGER 248 U 140 B, automatical *)

hitch point
 above ground 807, 849, 891, 933 or 975 mm
 behind rear axle 595 mm
 behind p.t.o. shaft end 195 mm
 above p.t.o. shaft end 37, 79, 121, 163 or 205 mm
height adjustable by one-hand quick
adjustment
maximum permissible vertical load 1500 kg

Holed drawbar:

Long bar; total length 1700 mm,
length between joint balls 825 mm,
thickness 25 mm, width 100 mm;
9 holes between joint balls with 80 mm
distance each, outside of joint balls
4 holes on each side with 80 mm distance
each;
all holes 33 mm dia;
height above ground (without load)
 minimum 85 mm
 maximum 1095 mm
holes' centre line behind p.t.o. shaft end 695 mm
(lower links in horizontal position)

*) serial equipment with trailer hitch
FENDT AK-001, non automatical



Towing hitch: At front, 800 mm above ground

Steering FENDT with ZF;
hydrostatic steering model 8492;
oil supply by oil circuit 2 of
hydraulic system (see page 10);
1 double acting ram, integrated
in front axle, 230 mm stroke,
63 mm dia, piston rod 36 mm dia

Brakes

Parking brake: Internal-expanding-shoe brake;
mechanically acting on 2 brake drums
with 180 mm dia and 30 mm width,
on each differential half shaft;
operated by pulling handle with ratchet,
brake indicator lamp

Service brake: FENDT with GIRLING and TEVES;
pedal operated muscle power brake with
hydraulic transmission to 2 dry disc brakes
on the differential half shafts with 2 lining
discs each, with 165 mm dia;
additional double-caliper disc brake, disc
260 mm dia, acting on joint shaft to front
axle drive

Steering brake: Divided pedal of service brake,
for normal use locked together

Wheels

Steered wheels: At front, 2 pneumatics
14.9 R 26 8 ply KLEBER SUPER TRACSOL,
radial-ply tyres;
maximum permissible load per tyre 1456 kg
at 1,8 bar inflation pressure and 40 km/h
road speed;
track width 1698 mm, adjustable to 1834 mm
by reversing the wheels;
rims W 12 x 26,
offset lug type rims optionally available



Driving wheels: At front and at rear;
rear driving wheels:
2 pneumatics 18.4 R 38 8 ply CONTINENTAL,
radial-ply tyres;
maximum permissible load per tyre 2172 kg
at 1,4 bar inflation pressure and 40 km/h
road speed;
track width 1662 mm, adjustable to 1516 mm
by reversing the wheels;
rims DW 15 x 38,
offset lug type rims optionally available

Wheel base: 2611 mm

Cab

FENDT, model 198.500;
OECD-tested, approval no. CSS 007/1-a(C);
antivibration mounted by 4 silent blocks on
tractor, for maintenance tiltable, 1 door
and 3 steps each on the left and right;
steps 530, 745 and 960 mm,
driver's platform 1170 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 circulating air possible;
additional ventilation system with 3-stage
blower incorporated in roof (outfit on
request), 6 air outlet jets for head room,
air intake above windscreen, dry air filter;
tinted glass;
cab optionally with air conditioner available



noise reduction materials:

floor	napped rubber mat with foam	15 mm
	under it bitumen mat	2 mm
roof	phenolic resin bonded cotton	
	fleece with FT-covering fabric	6-16 mm
mudguards	PU-foam coated with	
	imitation leather	15 mm
seat support	napped rubber mat	10 mm
	under it bitumen mat	2 mm
rear wall	rubber mat	10 mm
	under it bitumen mat	2 mm
switch box (inside bottom)	foam with imitation leather	20 mm
	bulk head	4 mm
instrument and steering support	inside:	
	covered with bitumen mat	5 mm
	inside:	
	foam on pedal openings	
	outside:	
	foam with imitation leather	20 mm

Seat

GRAMMER, model DS 85 H1/90 AR;
upholstered seat with arm rests and
folding back rest (upper part);
adjustable spring with shock absorber,
additional horizontal spring suspension
with shock absorber;
height of unloaded seat above platform
adjustable in 2 steps from 510 to 570 mm;
longitudinal adjustment range 150 mm;
on request available:
seat GRAMMER model LS 95 H1/90
(air suspension)

Number of
grease points

20


Dimensions

Total length: 4375 mm without ballast
4705 mm with ballast
Total width: 2145 mm without and with ballast
Total height: 2750 mm to top of cab roof,
cab with roof which is 70 mm lower
optionally available
Ground clearance: 440 mm below swinging drawbar

Lighting equipment Electrical, 12 Volt, as per
German legislation

	Dimensions mm	Height above ground of centre mm	Distance from outside edge of tractor to centre mm
Head lights	135 x 115	990	915
Side lights	65 x 20	1605	245
Rear lights	33 x 60	1600	285
Reflectors			
1st pair	115 x 25	1550	285
2nd pair	70 dia	635	670

Available tyres

Tyre sizes		
at front	at rear	
14.9/80-24 10 ply	16.9 R 38	8 ply
	18.4 R 34	8 ply
14.9 - 26 8 ply +)	18.4 R 38	8 ply
14.9 - 24 8 ply +)	18.4 R 34	8 ply
	16.9 R 38	8 ply
9.5 - 32 10 ply +)	16.9 R 38	8 ply
	9.5 R 48	8 ply
	11.2 - 48	8 ply

+) also allowed as radial-ply tyres

Running-time
meter

Electrical, counts real operating hours,
if alternator is working


COMPULSORY TESTS
(1) MAIN POWER TAKE-OFF PERFORMANCE (1000 1/min)

Date of tests: 4th December 1984
 Location of tests: DLG-Testing-Station Groß-Umstadt
 Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power kW	engine 1/min	Speed	p.t.o. 1/min	Fuel consumption		spec. g/kWh	Specific energy kWh/l
		fl.clutch output 1/min		hourly 1/h	kg/h		
<u>MAXIMUM POWER</u>							
At 2-hour test							
69.2	2300	2253	1016	20.40	17.03	246	3.39
At rated engine speed							
69.2	2300	2253	1016	20.40	17.03	246	3.39
At standard p.t.o. speed							
68.8	2264	2217	1000	20.30	16.95	246	3.39
<u>Part loads</u> , the governor hand lever in the position corresponding to the maximum power at full load (curve a)							
(i) the torque corresponding to maximum power at rated speed							
69.2	2300	2253	1016	20.40	17.03	246	3.39
(ii) 85% of the torque obtained in (i)							
59.8	2330	2289	1032	17.90	14.94	250	3.34
(iii) 75% of the torque defined in (ii)							
45.3	2350	2312	1043	14.39	12.02	265	3.15
(iv) 50% of the torque defined in (ii)							
30.7	2368	2350	1060	11.28	9.42	307	2.72
(v) 25% of the torque defined in (ii)							
15.5	2388	2373	1070	8.25	6.89	444	1.88
(vi) unloaded							
-	2411	2406	1085	5.40	4.51	-	-

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Test No. 84-202

Power kW	engine 1/min	Speed	p.t.o. 1/min	Fuel consumption		Specific energy kWh/l
		fl.clutch output 1/min		hourly 1/h	spec. kg/h	
					g/kWh	

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						
68.8	2264	2217	1000	20.30	16.95	3.39
(ii) 85% of the torque obtained in (i)						
59.5	2300	2256	1017	17.72	14.80	3.36
(iii) 75% of the torque defined in (ii)						
45.1	2316	2282	1029	14.18	11.84	3.18
(iv) 50% of the torque defined in (ii)						
30.6	2336	2316	1045	11.04	9.22	2.77
(v) 25% of the torque defined in (ii)						
15.5	2358	2345	1057	8.10	6.76	1.91
(vi) unloaded						
-	2376	2369	1068	5.28	4.41	-

Standard specific fuel consumption (g/kWh): 250/307/249/301

No load maximum engine speed: 2411 1/min

Equivalent flywheel torque at maximum power (2 hours): 293 Nm

Maximum equivalent flywheel torque: 374 Nm at 1400 1/min
of the engine

Mean atmospheric conditions: temperature 19 °C
pressure 1000 mbar
relative humidity 40 %

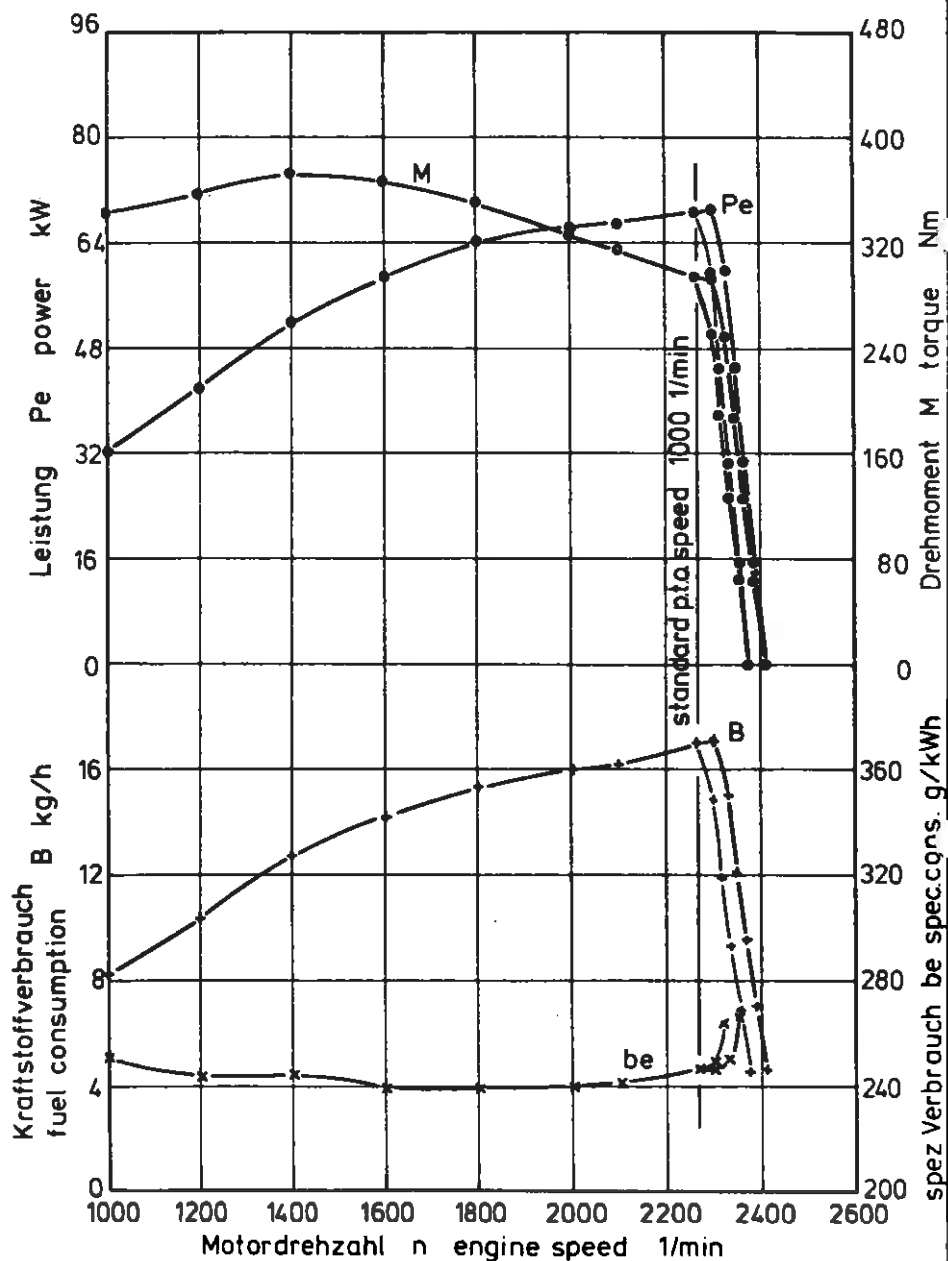
Maximum temperatures: coolant 82 °C
engine oil 100 °C
fuel 16 °C
engine air intake 25 °C

The equivalent flywheel torques are given relative to the output shaft of the fluid clutch



Zapfwellenleistung

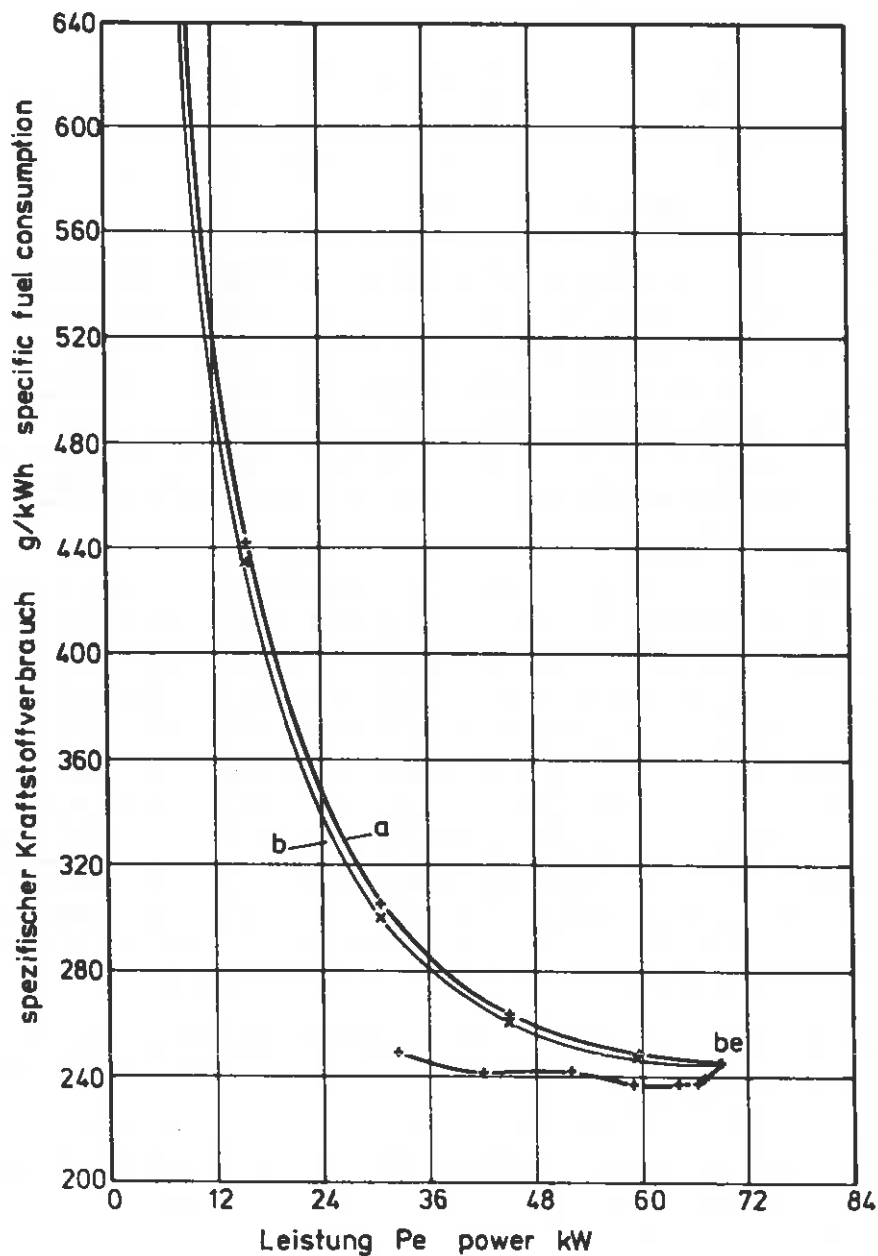
P.T.O. Performance





Zapfwellenleistung

P.T.O. Performance



**PRÜFUNGS-ABTEILUNG**

FENDT FARMER 311 LSA

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(2) DRAWBAR PERFORMANCE

Date of tests: 28th January till 27th February 1985

Type of track: Concrete

Gear	Driving speed km/h	Power kW	Drawbar pull daN	Engine speed 1/min	Slip of wheels %
(1) MAXIMUM POWER (unballasted) height of drawbar above ground 415 mm					
3 A FL	3,03	41,5	4933	2332	14,9
3 A FM	3,61	49,7	4961	2319	15,0
3 A FS	4,54	57,4	4553	2302	9,5
1 S FL	4,94	59,6	4344	2299	8,3
1 S FM	6,10	60,8	3590	2301	5,7
1 S FS	7,43	60,5	2930	2301	4,0
2 S FL	8,30	59,9	2596	2303	3,5
2 S FM	10,06	60,2	2153	2297	2,7
2 S FS	12,10	58,2	1733	2300	2,1

(ii) MAXIMUM POWER (ballasted) height of drawbar above ground 395 mm					
1 A FL	1,20	23,2	6972	2365	15,0
1 A FM	1,43	27,7	6965	2356	14,9
1 A FS	1,70	32,8	6962	2345	15,0
2 A FL	1,89	36,4	6958	2340	14,9
2 A FM	2,26	43,8	6978	2330	14,9
2 A FS	2,67	51,7	6966	2313	15,0
3 A FL	3,11	57,1	6612	2299	11,0
3 A FM	3,95	58,5	5333	2302	6,1
3 A FS	4,79	59,7	4490	2298	4,4
1 S FL	5,14	61,0	4275	2297	4,1
1 S FM	6,28	61,6	3531	2299	3,0
1 S FS	7,53	60,2	2879	2299	2,3
2 S FL	8,38	59,7	2563	2300	2,0

(iii) FIVE-HOUR-TEST at 75% of pull at maximum power in 1 S FM gear					
1 S FM	6,45	47,4	2648	2334	2,2

(iv) FIVE-HOUR-TEST at pull corresponding to 15% wheel slip in test (ii)					
2 A FS	2,67	51,7	6972	2313	-

Total oil consumption during ten hours duration of tests
(iii) and (iv) 80 g/h



Tyre size front: 14.9 R 26 8 ply
rear: 18.4 R 38 8 ply

Tread bar height at the beginning of drawbar tests:
96 % at front, 88 % at rear of the value when new

Specific fuel consumpt. g/kWh	Specific energy kWh/l	Temperatures			Atmospheric conditions		
		Fuel °C	Coolant °C	Engine- oil °C	Tempe- rature °C	Relative humidity %	Pressure mbar

tyre inflation pressure 0,8 bar at front; 1,0 bar at rear

329	2,54	21	78	86	0	60	997
319	2,62	22	77	85	0	64	997
297	2,82	20	79	88	+1	67	997
284	2,94	24	82	90	0	68	997
281	2,97	22	78	84	-2	73	997
280	2,98	22	78	86	-2	72	997
283	2,96	23	77	85	-2	72	956
283	2,96	22	78	86	-1	72	996
290	2,89	22	79	83	+1	72	996

tyre inflation pressure 1,2 bar at front; 1,0 bar at rear

397	2,10	29	74	81	5	63	1002
370	2,26	25	73	84	5	61	1002
345	2,42	23	75	85	3	64	1002
334	2,51	24	76	80	5	60	1000
321	2,61	22	78	83	5	58	1003
318	2,63	24	80	83	5	53	1003
301	2,78	24	80	85	4	63	1002
289	2,89	24	79	86	4	63	1002
286	2,92	28	81	87	5	63	1002
278	3,01	26	81	88	5	62	1002
278	3,01	26	79	86	5	61	1002
281	2,98	27	79	84	5	62	1002
285	2,93	28	80	83	5	63	1002

289	2,89	28	76	89	10	65	1012
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-	-	34	76	91	15	63	1010
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Test (iv) was carried out with additional ballast,
the figures not quoted are therefore irrelevant



(3) TURNING SPACE AND TURNING CIRCLE (front wheel drive disengaged)

Wheel equipment front: 14.9 R 26 8 ply
 rear: 18.4 R 38 8 ply

Track of wheels front: 1698 mm
 rear: 1662 mm

	With brakes		Without brakes	
	left-hand m	right-hand m	left-hand m	right-hand m
Radius of turning space	4,92	4,98	5,57	5,61
Radius of turning circle	4,62	4,68	5,27	5,31

(4) LOCATION OF CENTRE OF GRAVITY

Height above ground	973 mm
Distance forward from rear axle centre	1045 mm
Distance from tractor's median plane, to the right	3 mm



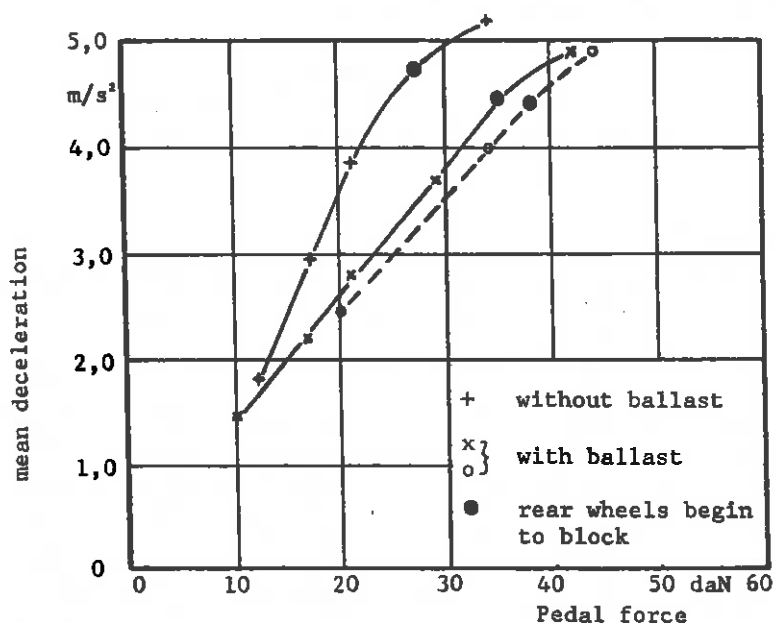
(5) Braking

Date of tests: 5th and 6th February 1985

Tractor masses during tests with driver:	front kg	rear kg	total kg
without ballast	1925	2880	4805
with ballast	2800	4215	7015

A) Service brake

Type-0-test (cold brakes) —, Type-I-(fade)test ---



Speed before application of brakes, without ballast 39,1 km/h
with ballast 38,7 km/h

The brakes were heated by towing of the tractor for 1 km
Comments on deviation and vibration: None

B) Parking brake

	Ballasted tractor on 18%-slope		Unballasted tractor on 12%-slope with trailer of 3000 kg	
	up	down	up	down
Braking device control force daN	20	23	16	19


(6) MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of test: 29th January 1985
 Type of track: Concrete
 Type of sound level meter: BRÜEL AND KJAER model 2203

Results of test

Gear: 3 overdrive *)
 Travelling speed before
 acceleration: 29,4 km/h
 Sound level: 88,5 dB(A)

(7) NOISE MEASUREMENT AT THE DRIVER'S EAR

Date of tests: 29th January 1985
 Type of track: Concrete
 Type of sound level meter: BRÜEL AND KJAER model 2209
 tractor fitted out with FENDT safety cab model 198.500

Results of tests

Gear	Drawbar pull at which the tractor develops the maximum sound level daN	Travelling speed		Sound level dB(A)
		nominal km/h	effective km/h	
1 A FL	4928	1,33	1,18	77,5
1 A FM	4938	1,60	1,42	78,0
1 A FS	4913	1,92	1,70	78,5
2 A FL	4935	2,13	1,87	79,0
2 A FM	4944	2,56	2,26	79,0
2 A FS	4922	3,07	2,67	79,5
3 A FL	4950	3,44	3,00	79,5
3 A FM	4931	4,15	3,62	80,5
3 A FS	4538	4,96	4,55	80,5
1 S FL	4333	5,32	4,95	80,5
1 S FM	3579	6,41	6,10	80,5
1 S FS**)	2924	7,67	7,44	80,5
1 S FS**)	light load	7,67	8,23	76,5
2 S FL	2583	8,51	8,30	80,5
2 S FM	2157	10,26	10,04	80,0
2 S FS	1733	12,27	12,08	80,5
3 S FL	1526	13,78	13,61	80,5
3 S FM	1229	16,61	16,45	80,5
3 overdrive*)	light load	37,72	39,20	78,0

*) front wheel drive disengaged

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



(8) POWER LIFT AND HYDRAULIC PUMP PERFORMANCE

Date of tests: 22nd January 1985

Power Lift

	Height of lower hitch point above ground in down pos. mm	Ver- tical move- ment mm	Max. force exerted through full range daN	Corres- ponding pressure of hydraul. fluid bar	Moment about rear axle daNm	Max. tilt angle of mast over range of lift degrees
At hitch points	200	675	3420	160	-	-
On the frame	200	685	3040	160	5071	4,0

Temperature of hydraulic fluid at start of test 65 °C

Main linkage dimensions see pages 12 and 13

Lifting heights relative to horizontal lower links

mm	-364	-359	-300	-200	-100	0	+100	+200	+300	+316	+321
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Lifting forces at hitch points

daN		3420	3490	3590	3660	3660	3620	3550	3490	3450	
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Lifting forces at test frame

daN	3540		3550	3560	3530	3440	3360	3220	3060		3040
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Hydraulic power test

Measurements at maximum oil flow (see page 10)

Sustained pressure with relief valve open 187 bar

Pump delivery rate at minimum pressure and
maximum engine speed 65,7 l/min

hydraulic power kW	flow rate l/min	pressure bar	oil temperature °C
at 90% of the actual relief valve setting	12,2	43,4	168
maximum	15,4	57,8	160

Tapping point used for test: at rear of tractor


OPTIONAL TESTS
(9) ENGINE PERFORMANCE

Date of tests: 7th November 1984
 Location of tests: DLG-Testing-Station Groß-Umstadt
 Type of dynamometer: SCHENCK eddy-current dynamometer W 400

Power kW	Engine speed 1/min	Fuel consumption hourly l/h	specific kg/h	specific g/kWh	Specific energy kWh/l
<u>Maximum power</u>					
At 2-hour test					
76.2	2300	20.40	17.03	224	3.73
At rated engine speed					
76.2	2300	20.40	17.03	224	3.73
At standard p.t.o. speed (1000 1/min)					
75.9	2264	20.19	16.86	222	3.76
<u>Part loads</u>					
(i) the torque corresponding to maximum power at rated speed					
76.2	2300	20.40	17.03	224	3.73
(ii) 85% of the torque obtained in (i)					
65.4	2324	17.72	14.80	226	3.69
(iii) 75% of the torque defined in (ii)					
49.5	2346	14.02	11.70	236	3.53
(iv) 50% of the torque defined in (ii)					
33.4	2370	10.81	9.03	271	3.09
(v) 25% of the torque defined in (ii)					
16.8	2390	7.59	6.34	377	2.22
(vi) unloaded					
-	2407	4.59	3.84	-	-

Optimum fuel consumption: 210 g/kWh at 39.8 kW and 1265 1/min

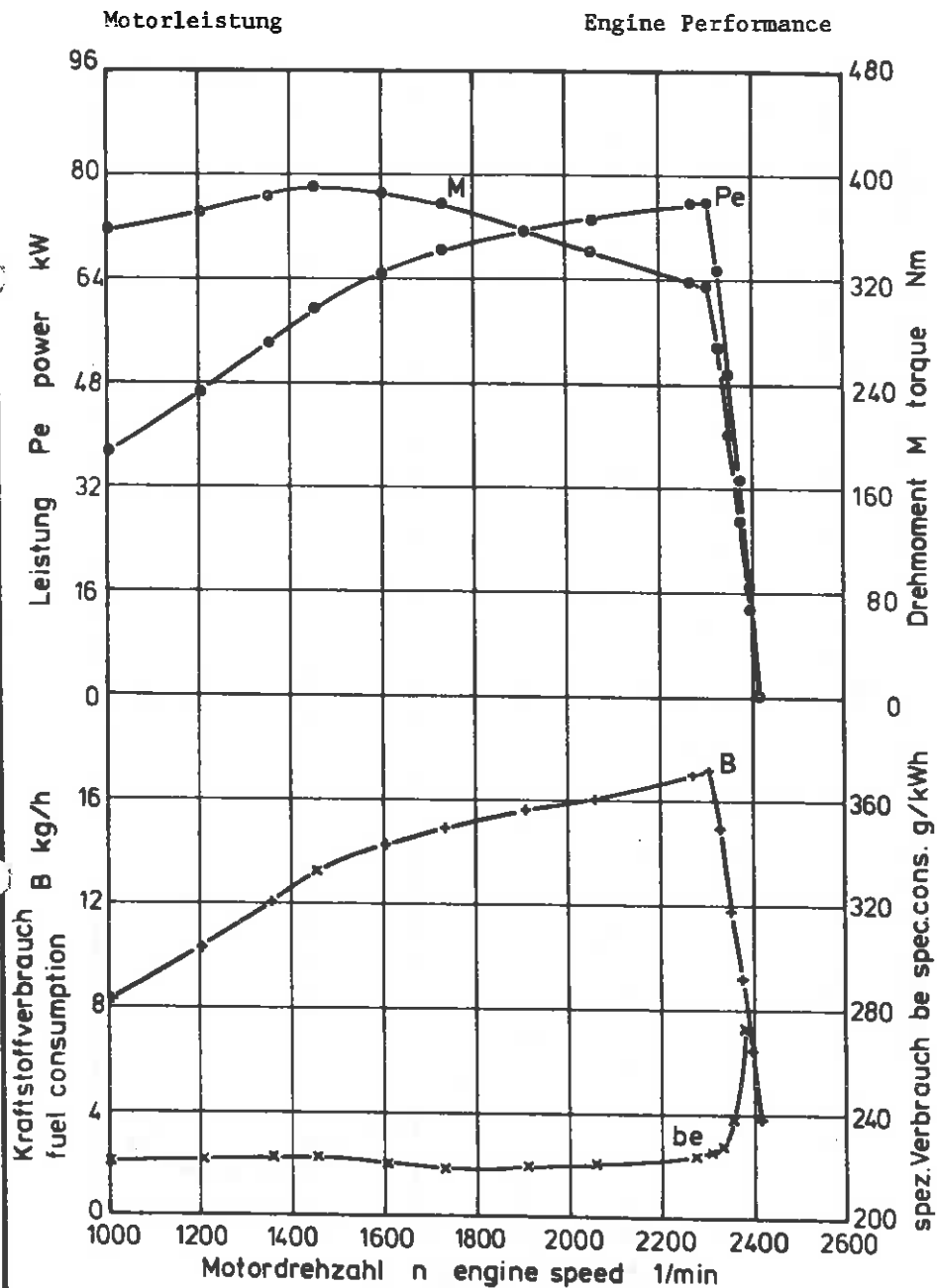
No load maximum engine speed: 2407 1/min

Torque at rated engine speed: 316 Nm

Maximum torque: 392 Nm at 1451 1/min of the engine

Mean atmospheric conditions: temperature 21 °C
 pressure 988 mbar
 relative humidity 40 %

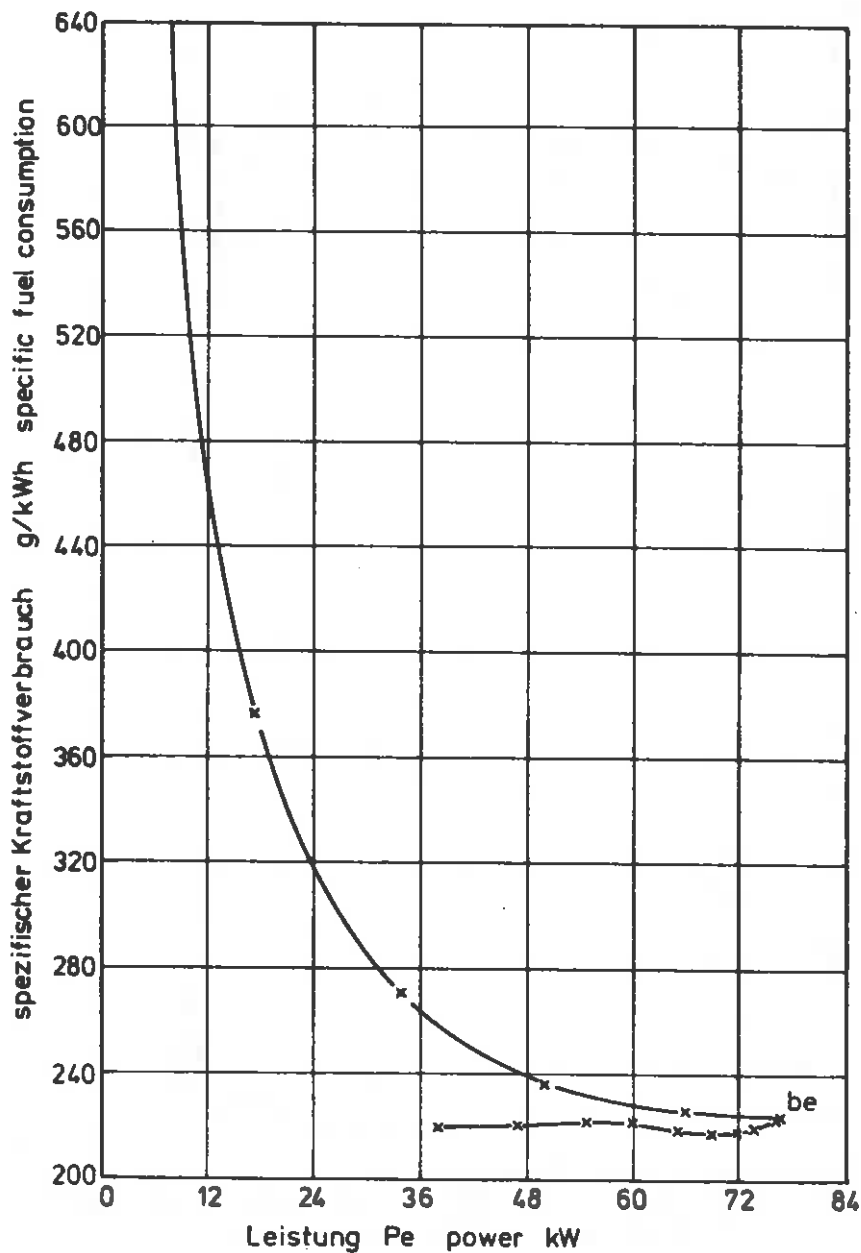
Maximum temperatures: coolant 90 °C
 engine oil 88 °C
 fuel 19 °C
 engine air intake 24 °C





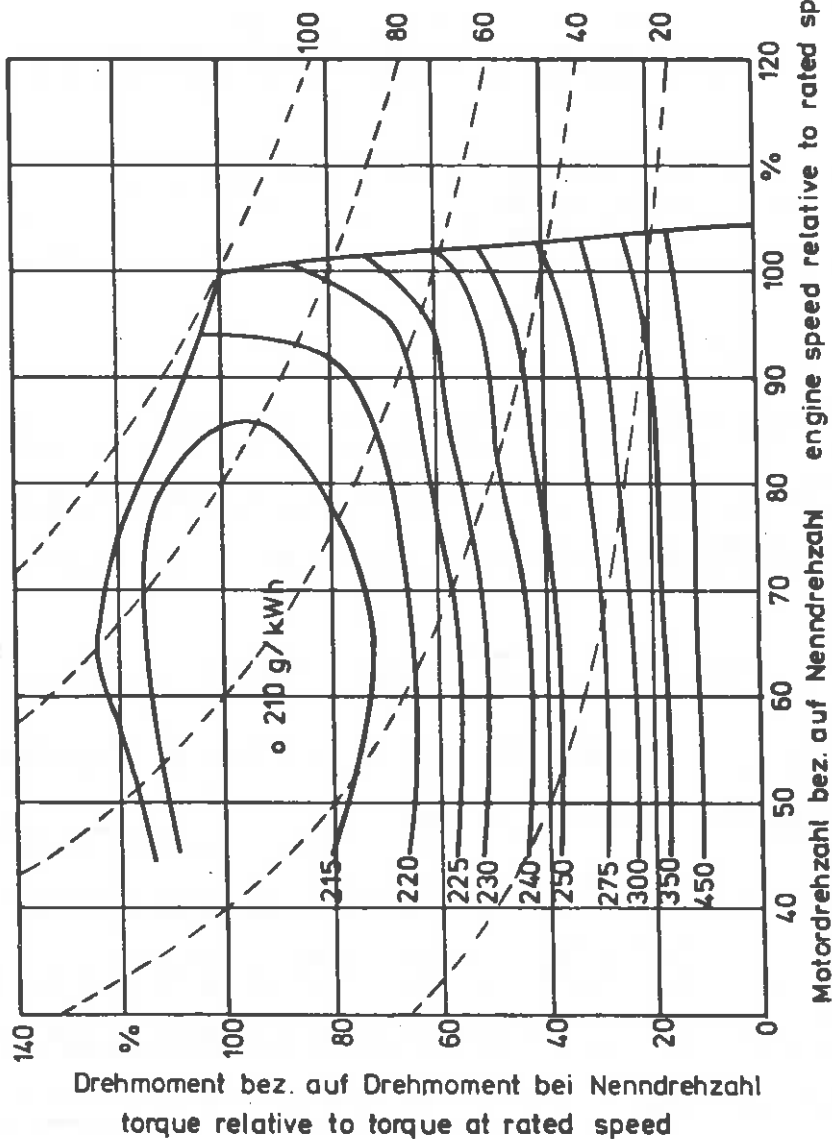
Motorleistung

Engine Performance





Motorleistung in % der Leistung bei Nenndrehzahl
engine power in % of power at rated engine speed





PRÜFUNGS-ABTEILUNG
FENDT FARMER 311 LSA

Test No. 84-202

ADDITIONAL TESTS

(10) MAIN POWER TAKE-OFF PERFORMANCE (750 1/min)

Date of tests: 5th December 1984
Location of tests: DLG-Testing-Station Groß-Umstadt
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power kW	engine 1/min	Speed	p.t.o.	Fuel consumption		spec. g/kWh	Specific energy kWh/l
		fl.clutch output 1/min	1/min	hourly 1/h	kg/h		
<u>MAXIMUM POWER</u>							
At 2-hour test							
69.2	2300	2251	727	20.41	17.04	246	3.39
At rated engine speed							
69.2	2300	2251	727	20.41	17.04	246	3.39
At standard p.t.o. speed							
62.0	1734	1673	540	17.72	14.80	239	3.50
<u>Part loads, the governor hand lever in the position corresponding to the maximum power at full load (curve a)</u>							
(i) the torque corresponding to maximum power at rated speed							
69.2	2300	2251	727	20.41	17.04	246	3.39
(ii) 85% of the torque obtained in (i)							
59.8	2328	2287	738	18.08	15.09	252	3.31
(iii) 75% of the torque defined in (ii)							
45.3	2346	2311	746	14.41	12.04	265	3.15
(iv) 50% of the torque defined in (ii)							
30.6	2368	2345	757	11.33	9.46	309	2.70
(v) 25% of the torque defined in (ii)							
15.5	2390	2377	767	8.32	6.94	447	1.87
(vi) unloaded							
-	2406	2405	777	5.40	4.51	-	-



PRÜFUNGS-ABTEILUNG
FENDT FARMER 311 LSA

Test No. 84-202

Power kW	engine 1/min	Speed fl.clutch output 1/min	p.t.o. 1/min	Fuel consumption hourly		spec. g/kWh	Specific energy kWh/l
				l/h	kg/h		
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							
62.0	1734	1673	540	17.72	14.80	239	3.50
(ii) 85% of the torque obtained in (i)							
54.4	1778	1729	558	15.31	12.78	235	3.56
(iii) 75% of the torque defined in (ii)							
41.6	1800	1760	568	11.96	9.99	240	3.48
(iv) 50% of the torque defined in (ii)							
28.2	1826	1792	579	8.96	7.48	265	3.15
(v) 25% of the torque defined in (ii)							
14.4	1846	1830	591	6.05	5.05	350	2.39
(vi) unloaded							
-	1861	1858	600	3.38	2.82	-	-

Standard specific fuel consumption (g/kWh): 252/309/235/265

No load maximum engine speed: 2406 1/min

Equivalent flywheel torque at maximum power (2 hours): 294 Nm

Maximum equivalent flywheel torque: 373 Nm at 1400 1/min
of the engine

Mean atmospheric conditions: temperature 19 °C
pressure 1005 mbar
relative humidity 40 %

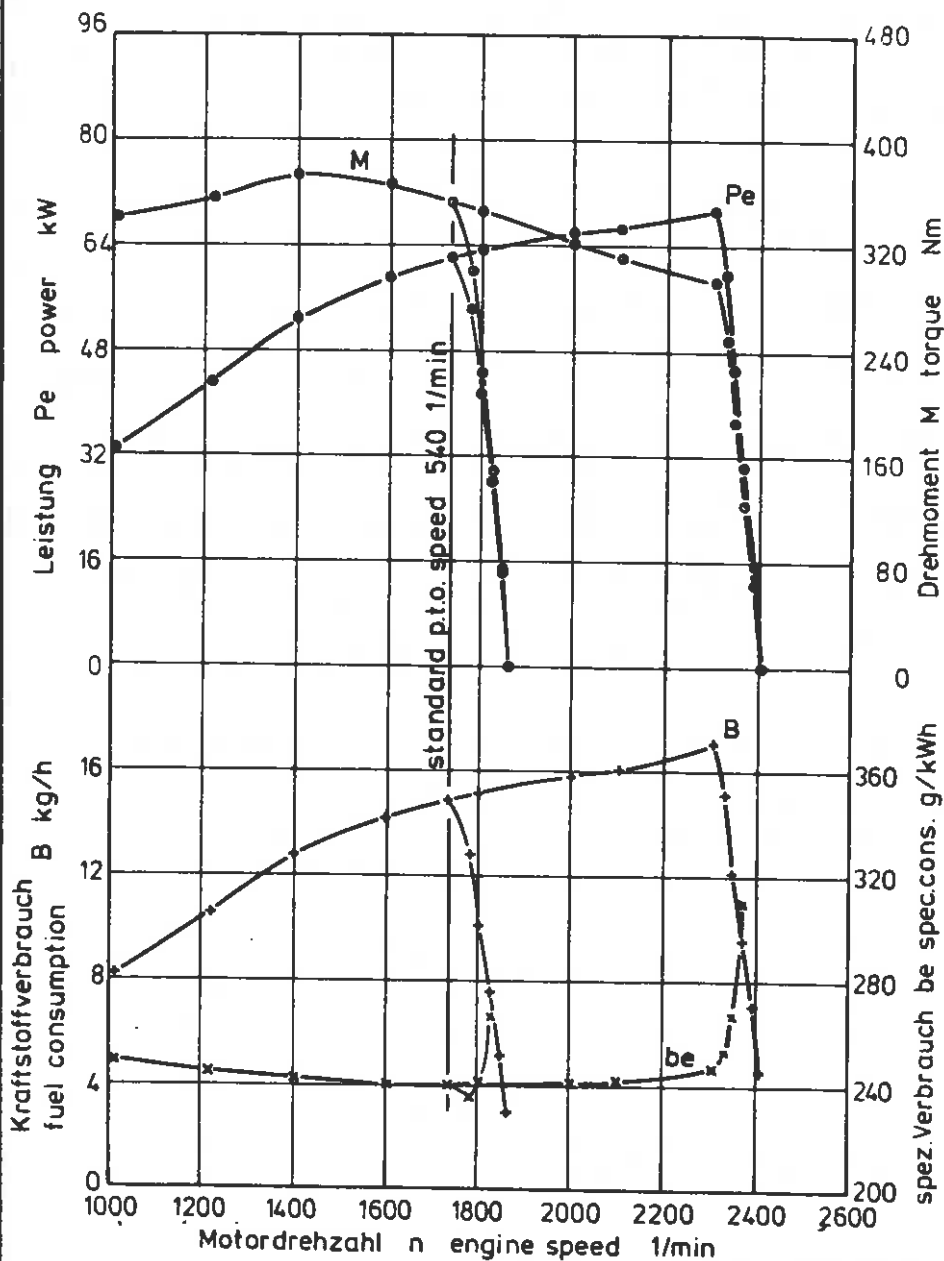
Maximum temperatures: coolant 83 °C
engine oil 99 °C
fuel 18 °C
engine air intake 24 °C

The equivalent flywheel torques are given relative to the
output shaft of the fluid clutch



Zapfwellenleistung

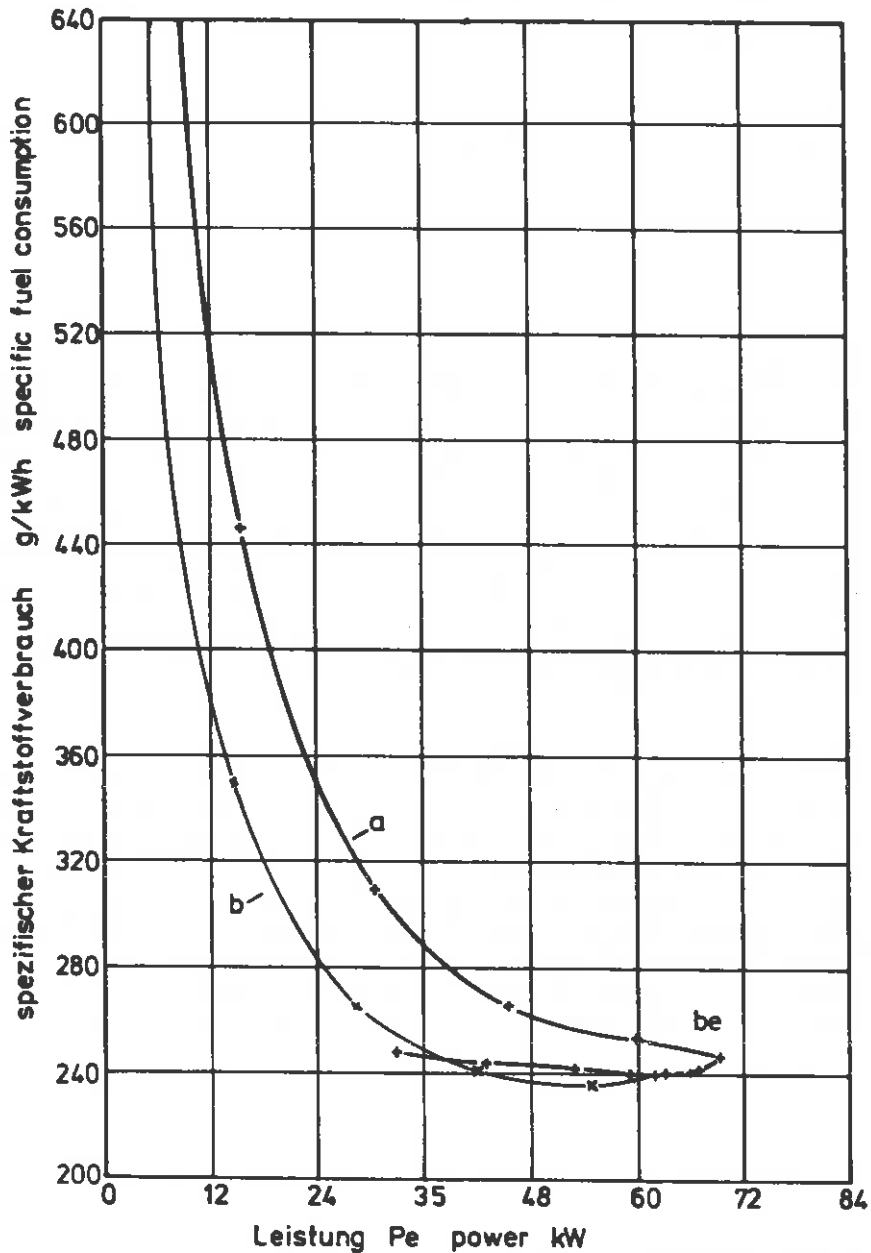
P.T.O. Performance





Zapfwellenleistung

P.T.O. Performance





(11) POWER LIFT TEST

with modified linkage geometry

D = 697 mm

L = 722 mm

Date of tests: 22nd January 1985

Power Lift

	Height of lower hitch point above ground in down pos. mm	Ver- tical move- ment 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	425	505	3845	160	-	-
On the frame	425	545	3070	160	5121	5,5

Temperature of hydraulic fluid at start of test 65 °C

Lifting heights relative to horizontal lower links

mm	-154	-134	-100	0	+100	+200	+300	+371	+391
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Lifting forces at hitch points

daN		5345	5050	4665	4400	4230	4015	3845	
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Lifting forces at test frame

daN	5085		4655	4270	3970	3715	3410		3070
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the 1990s, the number of people with a diagnosis of schizophrenia has increased by 20% (Meltzer 1996).

There is a growing awareness of the need to address the needs of people with mental health problems, and the importance of the role of the community in this. The World Health Organization (WHO) has developed a number of initiatives to address the needs of people with mental health problems, and the importance of the role of the community in this. The WHO has developed a number of initiatives to address the needs of people with mental health problems, and the importance of the role of the community in this.

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