Prüfstelle für Landmaschinen



REPORT on test in accordance with OECD STANDARD CODE 2 for the Official Testing of Agricultural Tractor Performance

OECD No. 2/1838
3rd August 1999

Agricultural Tractor

John Deere 6310 NA SyncroPlus (4WD)

Manufacturer

DEERE & COMPANY
Moline, Illinois, USA

This is a report on a tractor test in accordance with OECD STANDARD CODE for the Official Testing of Agricultural Tractor Performance "Yellow Code", January 1998, Code 2 (Restricted Code).

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

Duration of tests: November 1998 till March 1999

DLG-Testing Station for Agricultural Machinery, Max-Eyth-Weg 1,
D-64823 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: 3rd August 1999 OECD No. 2/1838

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/cm^2
	100 kPa	=	1000 mbar	=	750,10 mm Hg

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TABLE OF CONTENTS

		Page
1	SPECIFICATION OF TRACTOR	4 to17
2	TEST CONDITIONS	18 to 20
3	COMPULSORY TESTS RESULTS	
3.1	MAIN POWER TAKE OFF PERFORMANCE	21 to 24
3.2	HYDRAULIC POWER AND LIFTING FORCE	25
3.3	DRAWBAR PERFORMANCE	26 and 27
4	ADDITIONAL TESTS RESULTS under the responsibility of the DLG Testing Station	28 and 29
5	REPAIRS	30
6	REMARKS	30

Tractor manufacturer:	DEERE & COMPANY Moline, Illinois, USA
Location of tractor assembly:	D-68163 Mannheim
Submitted for test by:	JOHN DEERE Werke Mannheim D-68163 Mannheim
Selected by:	Manufacturer with agreement by DLG
Place of running-in:	Mannheim and Groß-Umstadt
Duration of running-in:	engine 48 h, tractor 29 h
Location of test:	DLG-Testing Station, D-64823 Groß-Umstadt

1 SPECIFICATION OF TRACTOR

1.1 Identification

- Make/Model/Type:	JOHN DEERE / M / 6310 A / wheel tractor, full fra design
- Type denomination:	JOHN DEERE 6310 NA Syncroplus (4WD)
- Number of driving-wheels:	4
- Serial No.:	227340
- 1st serial No.:	202409

1.2 Engine

Make/Model/Type:	JOHN DEERE / 4045TL055 water-cooled 4-stroke Diesel-engine, direct injecti supercharged, antivibration mounted
Serial No.:	532652

1.2.1 Cylinders

Number/disposition:	4 / in line
Bore/stroke:	106.5 / 127 mm
Capacity:	4525 cm^3
Compression ratio:	16.9 : 1
Arrangement of valves:	Overhead valves
Cylinder liners:	Wet

1.2.2 Supercharging

- Make/Model/Type:	GARRETT / MOD T 300 / exhaust driven supercharger
- Pressure	70 ± 1 kPa

1.2.3	Fuel system	
	- Fuel feed system:	VDO electrical vane type fuel supply pump
	- Fuel filter	
	Make:	JOHN DEERE
	Type :	1 replaceable paper element filter
	- Capacity of fuel tank:	164 dm³
	- Injection pump	
	Make/Model:	LUCAS / 8923A001W (JD No. RE 501 442)
	Type :	DP 201, distributor injection pump
	Serial no.:	45504 GRG
	Manufacturer's production setting:	68.9 - 74.8 mm³/stroke at full load and rated speed;
	Flow rate:	18.4 - 19.8 dm³/h at 2300 min^{-1} and full load
	Timing:	Static 0°, dynamic 4.5° before TDC
	- Injectors	
	Make/Model:	STANADYNE / 28485
	Type :	Multi hole
	Injection pressure:	24.5 ± 0.5 MPa
1.2.4	Governor	
	- Make/Model/Type:	LUCAS / - / centrifugal variable speed governor, with supercharge pressure compensating device
	- Governed range of engine speed:	800 ± 50 to 2460 ± 50 min^{-1}
	- Rated engine speed:	2300 min^{-1}
1.2.5	Air cleaner	
	- Pre-cleaner	
	Make/Model:	MANN & HUMMEL
	Type:	Cyclone type, incorporated in housing of main cleaner
	Location of air intake:	In front of engine, below bonnet
	- Main cleaner	
	Make/Model:	MANN & HUMMEL / PIKLON
	Type:	Dry paper element filter with safety cartridge
	- Maintenance indicator:	Warning light on dashboard
1.2.6	Lubrication system:	Pressure lubrication with engine oil/cooling water heat exchanger in engine block
	- Type of feed pump:	Gear pump
	- Type of filter:	Full flow
	- Number of filter:	1

1.2.7	Cooling system	
	- Type of coolant:	Water cooling
	- Type of pump:	Impeller pump
	- Specification of fan	
	Number of fan blades:	7
	Fan diameter:	550 mm
	- Coolant capacity:	17,5 dm³
	- Type of temperature control:	Thermostat and by-pass circuit, EATON viscous drive fan model 610, belt driven, variable fan speed controlled by air flow temper
	- Superpressure system:	70 ± 20 kPa
1.2.8	Starting system	
	- Make/Model/Type:	BOSCH / IF / electrical, solenoid pre-engaged dri starter motor 3.0 kW
	- Cold starting aid:	Heating spiral in air intake manifold
	- Safety device:	Forward/reverse lever in neutral position at engin shut off
1.2.9	Electrical system	
	- Voltage:	12 V
	- Generator	
	Make/Model/Type:	BOSCH / 14V KC 70-115 A / 3-phase alternator
	Power:	1260 W
	- Battery:	1 lead acid battery, 154 Ah at 20 hours rating
1.2.10	Exhaust system	
	- Make/Model/Type:	EBERSPÄCHER / AL82411 / single-chamber absorption type
	- Location:	Above engine, below bonnet, vertical stack at righ A-post of cab, mouth showing upward/forward
1.2.11	Operating hours meter	Electronic, counts real hours when engine is runn
1.3	**Transmission**	Universally-jointed propeller shaft between engine and gearbox
1.3.1	Clutch (travel alone)	
	- Make/Model/Type:	JOHN DEERE / - / wet multi-plate
	- Diameter of discs:	225 mm
	- Method of operation:	By pedal, mechanically, additionally assisted by l pressure hydraulic circuit

1.3.2 Gear box

- Make/Model/Type: JOHN DEERE / Syncroplus, 30 km/h / mechanical
- Description: Synchronized speed change gear with 3 forward speeds and 1 reverse speed, synchronized range gear with 4 ranges (A, B, C, D)
- Number of gears:

	forward	reverse
no. of gears	3	1
no. of ranges	4	4
total	12	4

2 levers

- Available options: PowrQuad (16/16) 30 km/h, with creeper gear (28/28, range D is locked)

  PowrQuad (24/24) 40 km/h identical with PowrQuad (16/16) 30 km/h, but 6 speed range gear without creeper gear, or with creeper gear (36/36),ranges D, E and F are locked

  Syncroplus (12/4) 30 km/h with creeper gear (21/7), range D is locked
- Lubrication: Forced-feed lubrication, oil cooler in front of engine's water cooler

1.3.3 Rear axle and final drives

- Make/Model/Type: JOHN DEERE / - / bevel gear drive with bevel gear differential and planetary final drives
- Differential lock
  - Type: Multi-plate
  - Engagement: By foot switch
  - Disengagement: By pedal of service brake

1.3.4 Front axle and final drives

- Make/Model/Type: ZF / APL 2035 / bevel gear drive with bevel gear differential and planetary final drives, driven by wet multi plate clutch and propeller shaft in tractor's median plane, clutch electro-hydraulically operated by toggle switch through low pressure hydraulic circuit
- Differential lock
  - Type: Limited slip multi-plate type
  - Engagement: Automatic
  - Disengagement: Automatic

1.3.5 Total ratios and travelling speeds

Range	Gear	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed*) at rated engine speed 2300 min^{-1} km/h
Forward Speeds			
A	1	301.95	2.35
	2	215.74	3.30
	3	163.96	4.34
B	1	150.63	4.72
	2	107.63	6.61
	3	81.80	8.69
C	1	92.02	7.73
	2	65.75	10.81
	3	49.97	14.23
D	1	42.94	16.56
	2	30.68	23.17
	3	23.32	30.49
Reverse speeds			
A	R	247.05	2.88
B	R	123.25	5.77
C	R	75.29	9.44
D	R	35.14	20.24

***) calculated with the radius index (ISO 4251-1:1992) 820 mm**

Number of revolutions of front wheels for one revolution of rear wheels: 1.382

1.4 Power take-off

1.4.1 Main power take-off

- Type: Independent
- Method of engagement: Driven by wet multi-plate clutch with 197 mm dia; electrically-hydraulically operated by rotary switch through control valve, response of valve automatically controlled;
- Number of shafts: 1
- Method of changing power take-off shaft ends and speeds: Reversible shaft with 2 different stubs, giving 2 different standard speeds

1.4.1.1 Power take-off proportional to engine speed, 540 and 1000 min^{-1}

- Location: At rear of tractor
- Diameter of p.t.o. shaft end: 35 mm
- Number of splines: 6 (540 min^{-1}), resp.21 (1000 min^{-1}in conformity with ISO 500:1991, type 1resp. type 2
- Height above ground: 750 mm
- Distance from the median plane of the tractor: 0 mm
- Distance behind rear-wheel axis: 530 mm

p.t.o. type	p.t.o. transmission ratio	p.t.o. speed min^{-1}	Engine Speed min^{-1}	power restriction kW
540	3.9681	540 579	2143 2300	-
1000	2.2083	1000 1042	2208 2300	-

- Direction of rotation (viewed from behind tractor): Clockwise

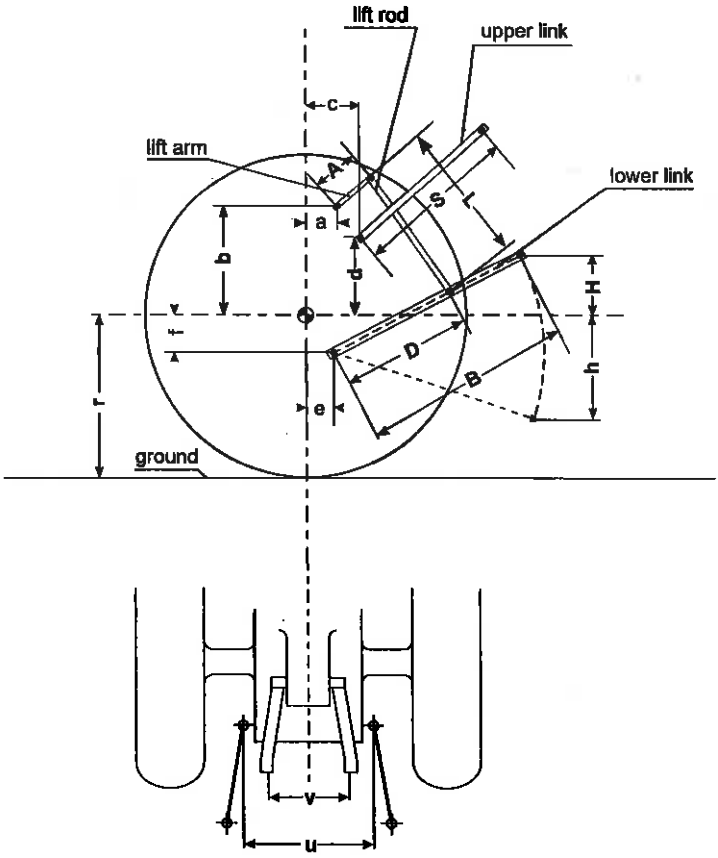
1.4.1.2 Power take-off proportional to ground speed: None

1.5 Hydraulic power lift

- Make/Model/Type:	JOHN DEERE / - / electronically controlled hydraul power lift, lower link sensing
- Type of hydraulic system:	Closed center, load sensing pressure and flow compensated system
- Type and Number of cylinders:	2 external cylinders, single acting, 70 mm bore, 175 mm stroke
- Type of linkage lock for transport:	Hydraulic, lock of valve lever
- Relief valve pressure setting:	19.2 to 20.7 MPa
- Opening pressure of cylinder safety valve:	No safety valve
- Lift pump type:	VICKERS PVE 19 variable displacement axial-piston pump with 96 dm³/min delivery at rate speed, optionally available: axial-piston pump with dm³/min delivery at rated speed
- Transmission between pump and engine:	Gear driven by transmission
- Type and number of filters:	2 filters, 1 in feed line of hydraulic pump, 1 on transmission housing
- Site of oil reservoir:	Transmission housing
- Type, number and location of tapping points:	2, double acting, quick-action couplers at rear of tractor
- Maximum volume of oil available to external cylinders:	20 dm³ stationary 10 dm³ driving

1.6 Three-point linkage:

- Category: 2, in conformity with category 2 of ISO 730-1/1994, lower links extendable
- Category adapter: None



JOHN DEERE 6310 NA SyncroPlus (4WD) **DLG-Test No 98-333**

Dimensions of rear implement linkage			projected lengths in mm dimensions (general)	test-dimension page 25
Rear tyres 18.4 – 38 Front tyres 13.6 – 28		(r) *) (r') *)	820 610	
Length of lift arms		(A)	305	305
Length of lower links		(B)	945	945
Distance of lift arm pivot points from rear wheel axis	horizontal vertical	(a) (b)	170 475	170 475
Horizontal distance between lower link pivot points		(u)	478	478
Horizontal distance between lift arm end points		(v)	535	535
Length of upper link		(S)	530 to 725	650
Distance of upper link pivot point from rear wheel axis	horizontal vertical	(c) (d)	460 188	460 188
Distance of lower link pivot points from rear wheel axis	horizontal vertical	(e) (f)	135 225	135 225
Distance of lower link pivot points from lift rod pivot points on lower links		(D)	503	503
Length of lift rods		(L)	705 to 865	815

Heights (h, H, H') of lower link hitch points relative to rear wheel axis (situated 820 mm above ground), at different adjustments of L

These data are valid for unloaded power lift

Length of lift rods	(L)	705	815	865
Linkage distance of lift rods	(D)	503		
Lowest position	(h)	380	620	710
Highest position	(H)	225	40	-50
Transport position	(H')	225	40	-50

*) Assuming r resp. r' = tyre dynamic radius index of ISO 4251-1/1992

1.7 Swinging drawbar

- Type:	Longitudinally adjustable	
- Height above ground:		530 mm
- Type of height adjustment:	None	
- Distance of hitch point from rear-wheel axle		780, 880, 930, 1080 mm
- Distance of hitch point from power take-off shaft end		
Vertically		220 mm
Horizontally		250, 350, 400, 550 mm
- Lateral adjustment (centre of clevis)		
Right hand:		187 to 259 mm
Left hand:		187 to 259 mm
- Distance of pivot point from rear wheel axis, horizontally		0 mm
- Drawbar pin hole diameter		33 mm
- Maximum vertically permissible load (drawbar fully pushed in)		22.5 kN

1.8 Trailer hitch None

1.9 Holed drawbar None

1.10 Steering

- Make/Model/Type:	JOHN DEERE and DANFOSS / - / hydrostatic
- Method of operation	
Pump:	Steering system connected to main hydraulic circuit
Ram:	1 integrated cylinder of symmetrical design; 224 mm stroke, 70 mm bore, 36 mm piston rod
- Working pressure:	18.5 MPa

1.11 Brakes

1.11.1 Service brake:	
- Make/Model/Type:	JOHN DEERE / - / muscle power braking system, with hydraulic transmission
- Method of operation:	Pedal operated, acting on rear wheels, front axle drive is automatically engaged when braking, oil-immersed disc brake with 1 ring-piston on each differential half shaft, disc 313 mm dia
- Trailer braking take-off:	None
1.11.2 Parking brake	
- Type:	Parking lock of transmission
- Method of operation:	Gear lever in "P"-position

1.12 Wheels

- Number

  Front: 2, driving and steering
  Rear. 2, driving

- Wheelbase: 2400 mm

- Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front	1516	2136	adjustable rims
Rear	1600	2004	adjustable rims

1.12.1 - Possible combinations of tyres sizes

Front	Rear
13.6 – 38 (D)	13.6 – 46 (D)
16.9 – 24 (D/R) 13.6 – 28 (D/R) 14.9 – 24 (D/R) 12.4 – 28 (R)	18.4 – 38 (D/R)
13.6 – 28 (D/R) 12.4 – 28 (R) 14.9 – 24 (D/R)	16.9 – 38 (D/R)
14.9 – 24 (D/R) 13.6 – 24 (D/R) 12.4 – 28 (R) 12.4 – 24 (D)	18.4 – 34 (D/R)
11.2 – 28 (D)	12.4 – 42 (D)
13.6 – 24 (D)	15.5 – 38 (D)
12.4 – 24 (D)	18.4 – 30 (D)
13.6 – 24 (D/R)	16.9 – 34 (D/R)
11.2 – 28 (D)	13.6 – 38 (D)
12.4 – 24 (D)	16.9 – 30 (D)

D: diagonal type, R: radial type

1.13 Protective structure

- Make/Model/Type: JOHN DEERE / SG 048 (1997) with integrated safety frame RG 017 / safety cab
- Manufacturer's name and address: DEERE & COMPANY, Moline, Illinois, USA
- Protective device: Cab, mounted by antivibration silent-blocks, for service (repair) by separate device tiltable to the side
- OECD approval
  - Approval number: 4/0452/1
  - Date of approval: 8th February 1999
  - Minor Modification Certificate: None
- Noise reduction materials

Roof:	Foam with perforated vinyl-coating on carrier board	23 mm
Steering column and instrument panel:	Moulded plastics and sheet metal	
A-posts,C-posts and upper part of rear wall:	Vinyl foam foil with hard foam substrate	9 mm
B-posts:	Plastics	6 mm
Rear wall, sheet metal:	Composite material and sound barrier	9 mm
Floor:	Moulded rubber mat partially	35 mm 8 mm
Seat support:	Moulded rubber mat	8 mm
Bulk head (engine side):	Foam with alu-foil	10 mm
Left hand fender:	Foam with vinyl-coating plus substrate	5 mm
Right hand fender:	Foam with vinyl-coating	25 mm

- Heating/ventilation: Combined heating/ventilation system with air conditioner and 4-step blower, cooling-water heat exchanger below cab's floor, air intake at left and right above side windows
  air outlet jets and defroster louvers in the steering console, 2 recirculation louvers behind the seat

1.14 Seat

1.14.1 Driver's seat

- Make/Model: Grammer / MSG 95 /731
- Type: Upholstered seat with backrest
- Seat and steering wheel reversible: No
- Type of suspension: Pneumatic suspension
- Type of damping: Hydraulic
- Range of adjustment
  - Longitudinally: 195 mm
  - Vertically: above platform 380 to 565 mm
- Safety belt: Yes

1.14.2 Optional driver's seats: Available

1.14.3 Passenger seat: No

1.15 Lighting

Electrical, 12 Volt

	Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlights	1290	162x101	225
Additional upper worklights	2650	135x80	435
Sidelights	-	-	-
Rearlights	1802	210x48	884
Reflectors	SMV-sign		

2. TEST CONDITIONS

2.1 Overall dimensions

Length	Width	Height at top of	
		protective structure	exhaust silencer pipe
mm	mm	mm	mm
4200	2200	2710	2720

2.2 Ground clearance 530 mm

- Clearance-limiting part: Bracket of swinging drawbar

2.3 Tractor mass Unballasted (with cab)

	Without driver kg	With driver kg
Front	1625	1650
Rear	2730	2780
Total	4355	4430

2.5 Tyres and track widths specifications

	Front	Rear
Tyres:	GOODYEAR	GOODYEAR
dimensions	13.6 - 28	18.4 – 38
load index speed index	8 ply	8 ply
type	diagonal ply	diagonal ply
maximum load (tyre manufacturer's)	16.65 kN	27.25 kN
at travelling speed	30 km/h	30 km/h
at tyre inflation pressure	200 kPa	140 kPa
radius index (ISO 4251-1/1992)	610 mm	820 mm
Chosen track width:	1620 mm	1716 mm
Technically permissible axle load:	35 kN	65 kN
Technically permissible total weight:	80 kN	

2.6 Fuel

- Type: ARAL-Diesel-fuel, in conformity with DIN 51601
- Density at 15°C: At p.t.o. power tests 0.830 g/cm³
  at drawbar tests 0.837 g/cm³

2.7 Oils and lubrication

2.7.1 Capacity and change interval

	Capacity dm³	Oil change h	Filter-change h
Engine	12	250	250
Gear box, rear axle, hydraulic system and steering	49	1500	750
Front axle	5	1500	-
Final drives at front, each	0.8	1500	-

2.7.2 Specifications:

	Recommended	Used during test
Engine oil:		
Type	engine oil	FUCHS TITAN
Viscosity	20W40, 15W40, 10W40, 5W30, 0W40	0W40
Classification	API CG-4 or CF-4	API CF-4
Transmission oil:		
Used in gearbox, rear axle, hydraulic- and steering system		
Type	Transmission oil	JOHN DEERE
Viscosity	SAE 75	HY-GARD
Classification	JDM J 20 C or J 20 D	J 20 C
used in front axle and front final drives		
Type	Transmission oil	JOHN DEERE
Viscosity	SAE 80W/90	HY-GARD
Classification	JDM J 20 C or J 20 D	J 20 C

2.7.3 Grease

- number of lubrication points: 18

3 COMPULSORY TESTS

3.1 MAIN POWER TAKE OFF PERFORMANCE (1000 rev/min)

Date of tests: 16th February 1999
Location of tests: DLG-Testing Station Groß-Umstadt
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power	Speed		Fuel consumption			Specific
	Engine	P.t.o.	hourly		specific	energy
kW	min^{-1}	min^{-1}	dm^3/h	kg/h	g/kWh	kWh/dm^3
Maximum power						
3.1.1 At 2-hour test						
65.1	1800	815	18.01	14.95	230	3.61
3.1.2 At rated speed						
60.8	2300	1042	19.22	15.95	262	3.16
3.1.3 At standard p.t.o. speed						
62.4	2208	1000	19.02	15.79	253	3.28
3.1.4 Part loads, the governor hand lever in the position corresponding to maximum power at full load (curve a)						
3.1.4.1 the torque corresponding to maximum power at rated speed						
60.8	2300	1042	19.22	15.95	262	3.16
3.1.4.2 85% of the torque obtained in 3.1.4.1						
53.7	2391	1083	18.06	14.99	279	2.97
3.1.4.3 75% of the torque defined in 3.1.4.2						
40.6	2413	1093	15.20	12.62	311	2.67
3.1.4.4 50% of the torque defined in 3.1.4.2						
27.4	2433	1102	12.40	10.29	376	2.21
3.1.4.5 25% of the torque defined in 3.1.4.2						
13.7	2434	1102	9.19	7.63	557	1.49
3.1.4.6 unloaded						
-	2455	1112	6.06	5.03	-	-

Power kW	Speed Engine min⁻¹	Speed P.t.o. min⁻¹	Fuel consumption hourly dm³/h	Fuel consumption hourly kg/h	Fuel consumption specific g/kWh	Specific energy kWh/dm³
3.1.5 Part loads, the governor hand lever in the position corresponding to standard p.t.o. speed at full load (curve b)						
3.1.5.1 the torque corresponding to maximum power						
62.4	2208	1000	19.02	15.79	253	3.28
3.1.5.2 85% of the torque obtained in 3.1.5.1						
54.8	2285	1035	17.47	14.50	264	3.14
3.1.5.3 75% of the torque defined in 3.1.5.2						
41.6	2307	1045	14.67	12.18	293	2.83
3.1.5.4 50% of the torque defined in 3.1.5.2						
27.9	2327	1054	11.84	9.83	352	2.36
3.1.5.5 25% of the torque defined in 3.1.5.2						
14.1	2343	1061	8.98	7.45	528	1.57
3.1.5.6 unloaded						
-	2363	1070	5.68	4.72	-	-

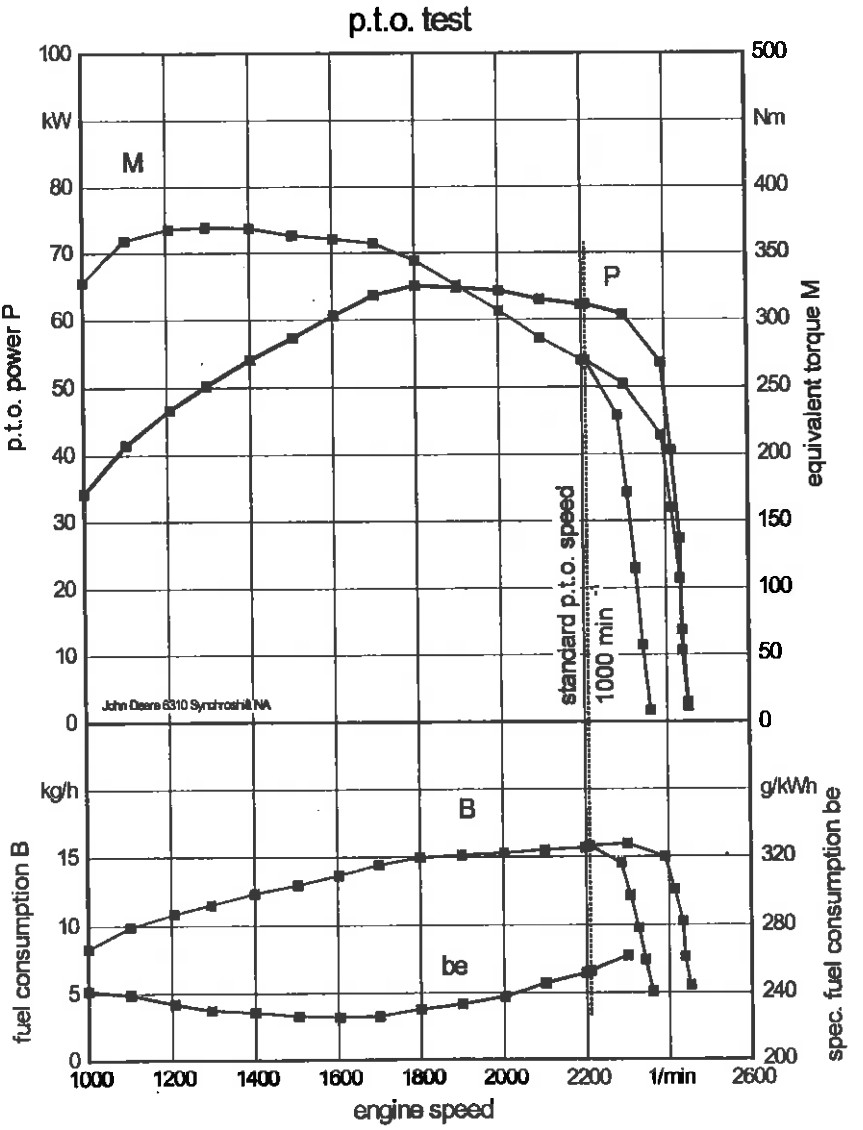
No load maximum engine speed:	2455 min⁻¹
Equivalent flywheel torque at rated engine speed:	252 Nm
Equivalent flywheel torque at 2-hour test:	345 Nm
at engine speed:	1800 min⁻¹
Maximum equivalent flywheel torque:	370 Nm
at engine speed:	1296 min⁻¹

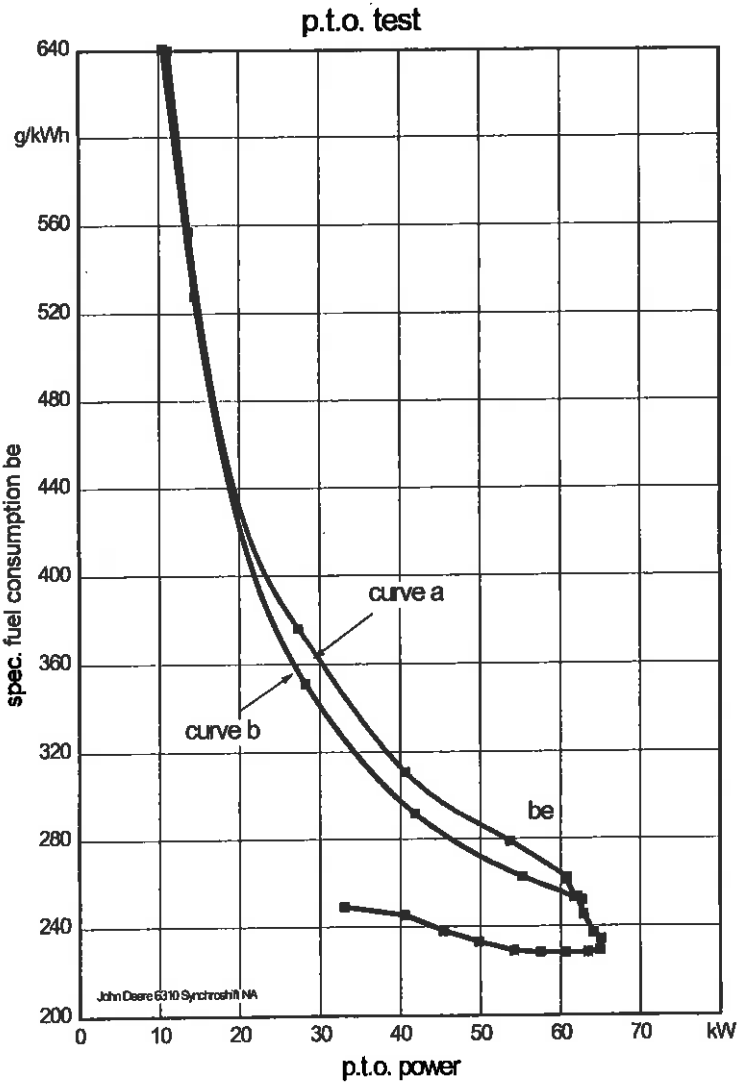
Mean atmospheric conditions

temperature:	20 °C
pressure:	1008 hPa
relative humidity:	33 %

Maximum temperatures

coolant:	84 °C
oil:	98 °C
fuel:	60 °C
air intake:	20 °C


p.t.o. test
p.t.o. power P
kW
M
P
equivalent torque M
Nm
standard p.t.o. speed
1000 min -1
John Deere 6310 Synchroshift NA
fuel consumption B
kg/h
B
be
spec. fuel consumption be
g/kWh
engine speed
1/min


p.t.o. test
640
g/kWh
560
520
480
440
400
360
320
280
240
200
spec. fuel consumption be
curve a
curve b
be
John Deere 6310 Synchroshift NA
0
10
20
30
40
50
60
70
kW
p.t.o. power

3.2 HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 19th March 1999

3.2.1 Hydraulic power test

- Sustained pressure with relief valve open 19.3 MPa
- Pump delivery rate at minimum pressure 111.0 dm^3/min

	Hydraulic power kW	Flow rate dm^3/min	Pressure MPa	Oil Temperature °C
At 90% of the actual relief valve setting	14.3	49.3	17.4	65
Maximum	25.5	102.1	15.0	65

- Tapping point used for test: At rear of tractor

3.2.2 Power lift test

	At the hitch points	On the frame
Height of lower hitch points above ground in down position	200 mm	
Vertical movement without lifting forces with lifting forces	660 mm 635 mm	860 mm 815 mm
Max. corrected force exerted through full range	23.60 kN	21.15 kN
Corresponding pressure	17.4 MPa	
Moment about rear axle	-	35.74 kNm
Max. tilt angle of mast from vertical		11

Lifting heights relative to horizontal lower links

mm	-485	-400	-395	-300	-200	-100	0	100	200	240	330
Lifting forces at hitch points. Corrected to 17.4 MPa											
kN			23.60	27.45	30.95	33.85	36.00	38.15	40.30	41.20	
Lifting forces at standard frame. corrected to 17.4 MPa											
kN	21.15	22.80		24.75	25.85	26.70	27.00	27.00	26.80		26.30

3.3 DRAWBAR PERFORMANCE

- Date of test: 15th and 16th March 1999
- Type of track:: Concrete

Gear number and range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Specific fuel consumption
	kW	kN	km/h	min^{-1}	%	g/kWh
3.3.1	MAXIMUM POWER IN TESTED GEARS (unballasted tractor)					
3 A	46.3	44.70	3.73	2324	15.0	349
1 B	48.0	44.88	3.85	2198	14.8	330
2 B	49.3	38.97	4.56	1803	12.4	301
1 C	50.1	32.85	5.49	1805	9.6	298
3 B	51.5	29.46	6.29	1799	8.0	289
2 C	49.9	22.59	7.96	1798	6.1	297
3 C	49.7	16.68	10.72	1807	4.7	298
1 D	49.1	14.03	12.60	1811	3.3	304
3.3.2	FUEL CONSUMPTION					
3.3.2.1	in selected gear, at maximum power at rated speed					
3 B	48.6	21.30	8.21	2293	5.6	329
3.3.2.1.1	75 % of pull at maximum power at rated speed					
3 B	38.6	15.99	8.70	2402	4.4	372
3.3.2.1.250	% of pull at maximum power at rated speed					
3 B	26.4	10.65	8.92	2421	2.8	451
3.3.2.1.3	next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1					
2 C	38.6	15.92	8.72	1929	4.0	321
3.3.2.1.4	next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2					
2 C	26.5	10.58	9.02	1966	2.6	367
3.3.2.2	in selected gear nearest to 7.50 km/h at rated speed					
1 C	49.3	24.49	7.24	2295	6.2	325
3.3.2.2.175	% of pull at maximum power at rated speed					
1 C	39.1	18.32	7.69	2402	4.8	363
3.3.2.2.250	% of pull at maximum power at rated speed					
1 C	26.8	12.15	7.93	2427	2.9	433
3.3.2.2.3	next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1					
3 B	39.1	18.23	7.72	2139	4.6	332
3.3.2.2.4	next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2					
3 B	26.5	12.04	7.92	2158	3.2	389

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
unballasted	520 mm	80 kPa	80 kPa

Specific energy	Temperature			Atmospheric conditions		
	Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
kWh/dm³	°C	°C	°C	°C	%	kPa
2.39	67	83	101	14	45	100.2
2.53	67	85	97	14	45	100.2
2.78	62	84	98	14	45	100.2
2.81	66	82	98	12	45	100.2
2.90	62	84	96	15	45	100.2
2.82	66	84	98	13	45	100.2
2.81	62	83	98	14	45	100.2
2.75	58	83	98	15	45	100.2
2.54	63	84	100	9	50	101.0
2.25	64	82	100	9	50	101.0
1.85	61	82	97	9	50	101.0
2.61	62	83	96	11	50	101.0
2.28	61	81	94	11	50	101.0
2.57	63	86	102	5	52	101.0
2.30	65	82	100	6	52	101.0
1.93	61	83	98	5	52	101.0
2.52	60	84	98	5	52	101.0
2.15	63	84	98	5	52	101.0

4 **ADDITIONAL TESTS** under the responsibility of the DLG Testing Station
Noise test at the driver's ear level (measured acc. to OECD Code 5)

4.1 **Results of sound level test - "Under load" procedure**
Date of test: 17th March 1999
Type of track: Concrete
Type of sound level meter: BRÜEL & KJAER model 2233

Gear number	Drawbar pull	Engine Speed	Measured travelling speed	Number of driving wheels	Sound level
	kN	min^{-1}	km/h	no	dB(A)
4.1.1	Test with the drawbar pull for which the tractor gives the maximum sound level (gear giving the nearest nominal forward speed to 7.5 km/h and also in any gear with a sound level increase of at least 1 dB(A))				
4.1.1.1	All openings closed				
1 C	23.24	2304	7.35	4	73.0
3 C	13.01	2299	13.75	4	74.0
1 C	24.67	2291	7.00	2	72.5
1 D	9.87	2300	15.71	2	73.5
4.1.1.2	All openings open				
1 C	24.92	2312	7.30	4	80.5
2 C	18.04	2299	10.37	4	81.5
3 C	13.81	2303	13.70	4	82.5
1 D	8.72	2312	16.26	4	83.5
1 C	23.42	2299	7.00	2	80.5
3 C	13.16	2300	13.40	2	82.0
1 D	10.62	2310	16.02	2	82.5
4.1.2	Unloaded test in the gear giving the forward speed nearest to 7.5 km/h				
4.1.2.1	All openings closed				
1 C	0	2440	8.21	4	72.0
1 C	0	2457	8.16	2	72.0

Gear number	Drawbar pull	Engine Speed	Measured travelling speed	Number of driving wheels	Sound level
	kN	min^{-1}	km/h	no	dB(A)
4.1.2.2. All openings open					
1 C	0	2449	8.21	4	80.0
1 C	0	2459	8.06	2	79.0
4.1.3 Unloaded test in the gear giving the maximum forward speed 4.1.3.1 All openings closed					
4 D	0	high idle	32.23	2	72.5
4.1.3.2 All openings open					
4 D	0	high idle	32.23	2	82.5

5	**REPAIRS**	**None**
6	**REMARKS**	**None**

Head of tractor test section

Dipl.-Ing. Manfred Lober

Deutsche Landwirtschafts-Gesellschaft

Test carried out by

Dipl.- Landw. Friedrich Uhlig

Date: 14.09.99



Impulse für den Fortschritt

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