Prüfstelle für Landmaschinen



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

OECD No. 2/1806
27th January 1999

Agricultural Tractor

John Deere 6410 NA PowrQuad(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: May 1998 till June 1998

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: 27th January 1999

OECD No. 2/1806
Restricted Code

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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DLG-No. 303

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Tractor manufacturer:	DEERE & COMPANY Moline, Illinois, USA
Location of tractor assembly:	D-68163 Mannheim
Submitted for test by:	JOHN DEERE Werke Mannheim D-68163Mannheim
Selected by:	Manufacturer with agreement by DLG
Place of running-in:	Mannheim and Groß-Umstadt
Duration of running-in:	engine 20 h, tractor 32 h
Location of test:	DLG-Testing Station, D-64823 Groß-Umstadt

1 SPECIFICATION OF TRACTOR

1.1 Identification

- Make/Model/Type:	JOHN DEERE / M / 6410 A / wheel tractor, full frame design
- Type denomination:	6410 NA PowrQuad (4WD)
- Number of driving- wheels:	4
- Serial No.:	216676
- 1st serial No.:	202409

1.2 Engine

Make/Model/Type:	JOHN DEERE / 4045TL056 water-cooled 4-stroke Diesel-engine, direct injection, supercharged, antivibration mounted
Serial no.:	522357

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	80 ± 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 / 8920A991W (JD No. RE 501 443)
	Type :	DP 201, distributor injection pump
	Serial no.:	25880 DRG
	Manufacturer's production setting:	74.5-82.0 mm³/stroke at full load and rated speed;
	Flow rate:	20.6 - 22.6 dm³/h at 2300 min^{-1} and full load
	Timing:	Static 0°, dynamic 4° 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:	850 ± 25 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 dm^3
	- Type of temperature control:	Thermostat and by-pass circuit, EATON viscous drive fan model 610, belt driven, variable fan speed controlled by air flow temperature
	- Superpressure system:	70 ± 20 kPa
1.2.8	Starting system	
	- Make/Model/Type:	BOSCH / IF / electrical, solenoid pre-engaged drive starter motor 3.0 kW
	- Cold starting aid:	Heating spiral in air intake manifold
	- Safety device:	Forward/reverse lever in neutral position at engine shut off
1.2.9	Electrical system	
	- Voltage:	12 V
	- Generator	
	Make/Model/Type:	BOSCH / 14V KC 45-90 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:	ROTH / AL78267 / single-chamber absorption type
	- Location:	Above engine, below bonnet, vertical stack, mouth showing upwards/forward
1.2.11	Operating hours meter	Electronic, counts real hours when engine is running
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 low pressure hydraulic circuit

1.3.2	Gear box	
	- Make/Model/Type:	JOHN DEERE / PowrQuad, 30 km/h / mechanical
	- Description:	Power shifted speed change gear with 4 speeds, synchronized range gear with 4 ranges (A, B, C, D) and power shifted forward/reverse gear
	- Number of gears:	Total 16 forward, 16 reverse 3 levers
	- Available options:	PowrQuad (28/28) 30 km/h with creeper gear (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 synchronized speed change gear with 3 forward speeds and 1 reverse speed synchronized range gear with 4 ranges (A,B, C, D) without creeper gear or 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 foot 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	289.04	2.46
	2	240.02	2.96
	3	200.41	3.55
	4	163.60	4.35
B	1	143.95	4.94
	2	119.54	5.95
	3	99.81	7.12
	4	81.47	8.73
C	1	88.29	8.05
	2	73.31	9.69
	3	61.22	11.61
	4	49.97	14.23
D	1	41.06	17.31
	2	34.10	20.85
	3	28.47	24.97
	4	23.24	30.59
Reverse speeds			
A	1	243.71	2.92
	2	202.38	3.51
	3	168.98	4.21
	4	137.94	5.15
B	1	121.37	5.86
	2	100.79	7.05
	3	84.16	8.45
	4	68.70	10.35
C	1	74.44	9.55
	2	61.81	11.50
	3	51.62	13.77
	4	42.13	16.87
D	1	34.62	20.54
	2	28.75	24.73
	3	24.01	29.61
	4	19.60	36.28

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

Number of revolutions of front wheels for one revolution of rear wheels: 1.471

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})
- 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	540 580	2143 2300	-
1000	2.2083	1000 1042	2208 2300	-

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

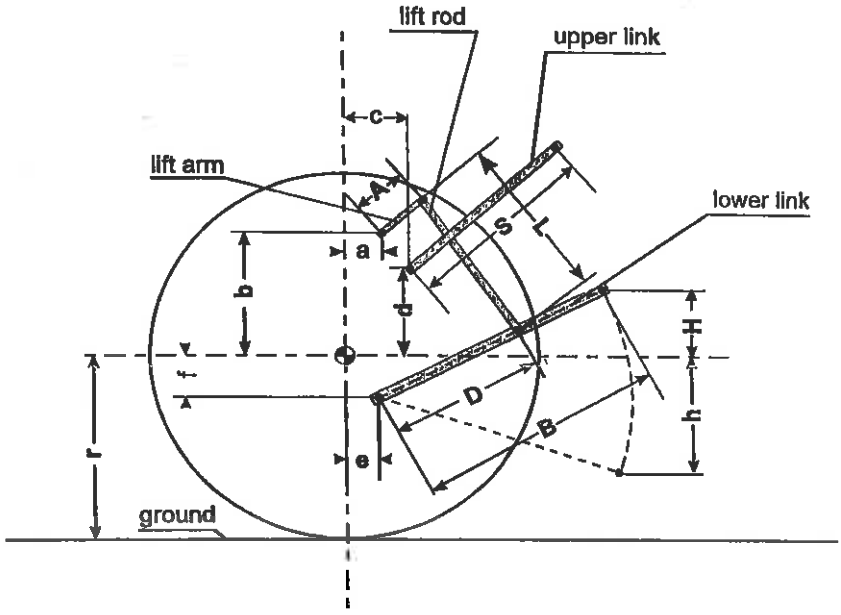
1.4.1.2 Power take-off proportional to ground speed: None

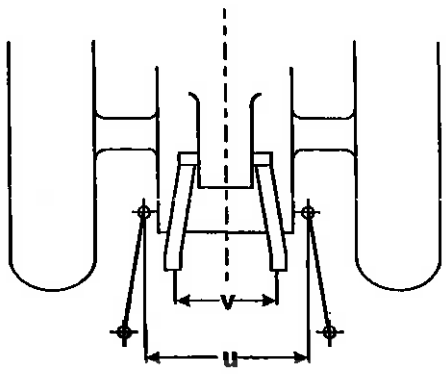
1.5 Hydraulic power lift

- Make/Model/Type:	JOHN DEERE / - / electronically controlled hydraulic 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, 75 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 98 dm^3/min delivery at rated speed; optionally available: axial-piston pump with 60 dm^3/min delivery at rated speed
- Transmission between pump and engine:	Gear driven by transmission
- Type and number of filters:	2 filters, 1 in feeding 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 dm^3stationary 10 dm^3 driving

1.6 Three-point linkage:

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





Dimensions of rear implement linkage			projected lengths in mm: dimensions (general)	projected lengths in mm: test-dimensions page 25
Rear tyres 18.4 – 38 Front tyres 14.9 - 24		(r) *) (r') *)	820 590	
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	830

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	830	865
Linkage distance of lift rods	(D)	503		
Lowest position	(h)	380	620	700
Highest position	(H)	225	30	-42
Transport position	(H')	225	30	-42

*) 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:	Range 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)

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	
- 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 substrat	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 back rest	
- 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	1255	162x101	225
Additional upper headlights	1850	135x80	875
Sidelights	-	-	-
Rearlights	1770	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
4160	2220	2694	2516

2.2 Ground clearance 436 mm

- Clearance-limiting part: Bracket of swinging drawbar

2.3 Tractor mass Unballasted (with cab)

	Without driver kg	With driver kg
Front	1650	1670
Rear	2740	2795
Total	4390	4465

2.5 Tyres and track widths specifications

	Front	Rear
Tyres:	FIRESTONE	FIRESTONE
dimensions	14.9 - 24	18.4 – 38
load index speed index	6 ply	8 ply
type	diagonal ply	diagonal ply
maximum load (tyre manufacturer's)	15.10 kN	27.25 kN
at travelling speed	30 km/h	30 km/h
at tyre inflation pressure	140 kPa	140 kPa
radius index (ISO 4251-1/1992)	590 mm	820 mm
Chosen track width:	1720 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. and drawbar power tests 0,836 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 min^{-1})

Date of tests: 14th May 1998
Location of tests: DLG-Testing Station Groß-Umstadt
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

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
Maximum power						
3.1.1 At 2-hour test						
73.1	1900	861	20.52	17.16	235	3.56
3.1.2 At rated speed						
67.4	2300	1042	20.62	17.24	256	3.27
3.1.3 At standard p.t.o. speed						
69.0	2208	1000	20.73	17.33	251	3.33
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						
67.4	2300	1042	20.62	17.24	256	3.27
3.1.4.2 85% of the torque obtained in 3.1.4.1						
60.0	2404	1089	19.58	16.37	273	3.06
3.1.4.3 75% of the torque defined in 3.1.4.2						
45.6	2435	1103	16.56	13.84	304	2.75
3.1.4.4 50% of the torque defined in 3.1.4.2						
30.5	2442	1106	13.52	11.30	371	2.26
3.1.4.5 25% of the torque defined in 3.1.4.2						
15.6	2460	1114	10.30	8.61	551	1.52
3.1.4.6 unloaded						
-	2475	1121	6.84	5.72	-	-

Power kW	Speed Engine min^{-1}	Speed P.t.o. min^{-1}	Fuel consumption hourly dm^3/h	Fuel consumption hourly kg/h	Fuel consumption specific g/kWh	Specific energy kWh/dm^3

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

69.0	2208	1000	20.73	17.33	251	3.33

3.1.5.2 85% of the torque obtained in 3.1.5.1

61.2	2316	1049	19.41	16.23	265	3.15

3.1.5.3 75% of the torque defined in 3.1.5.2

46.6	2345	1062	16.30	13.63	293	2.86

3.1.5.4 50% of the torque defined in 3.1.5.2

31.3	2358	1068	13.19	11.03	353	2.37

3.1.5.5 25% of the torque defined in 3.1.5.2

15.8	2380	1078	9.75	8.15	516	1.62

3.1.5.6 unloaded

-	2392	1083	6.38	5.33	-	-

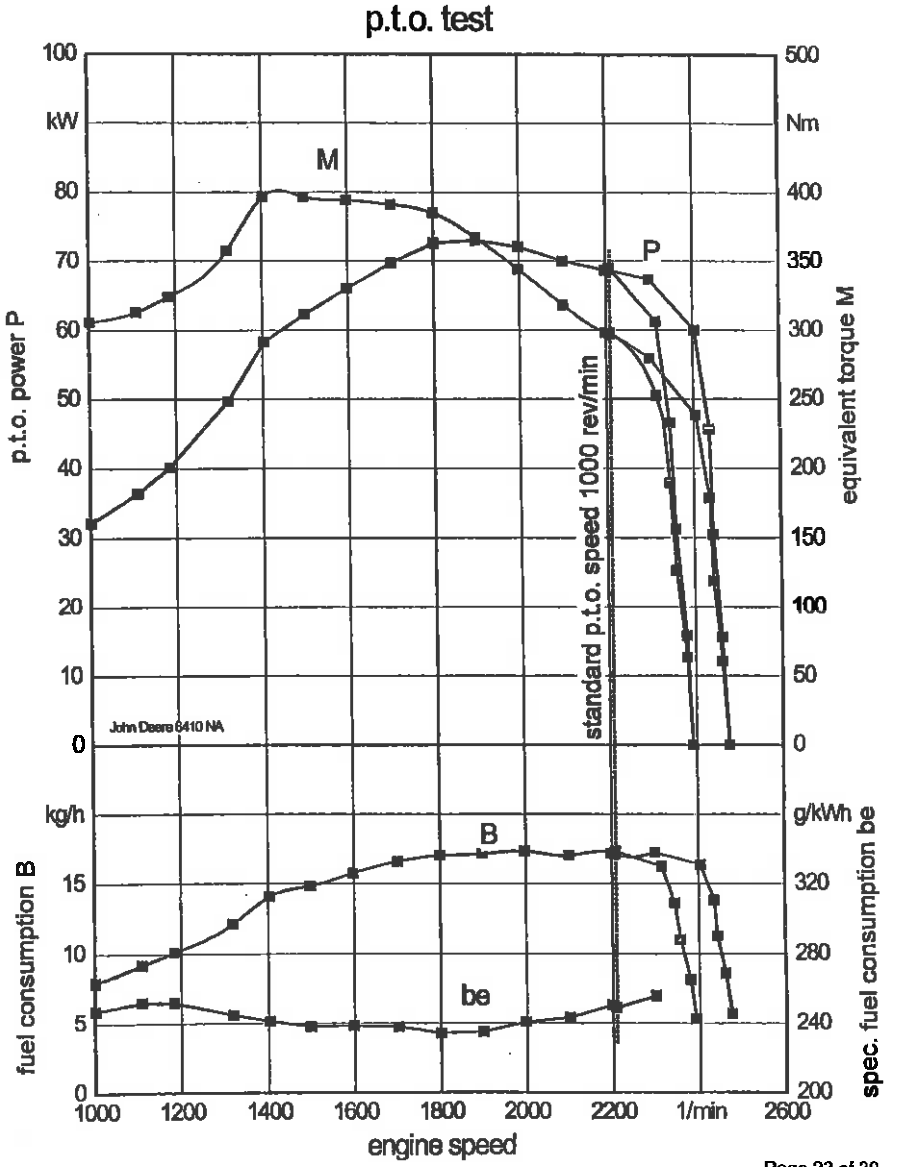
No load maximum engine speed:	2475 min^{-1}
Equivalent flywheel torque at rated engine speed:	279 Nm
Equivalent flywheel torque at 2-hour test:	367 Nm
at engine speed:	1900 min^{-1}
Maximum equivalent flywheel torque:	397 Nm
at engine speed:	1404 min^{-1}

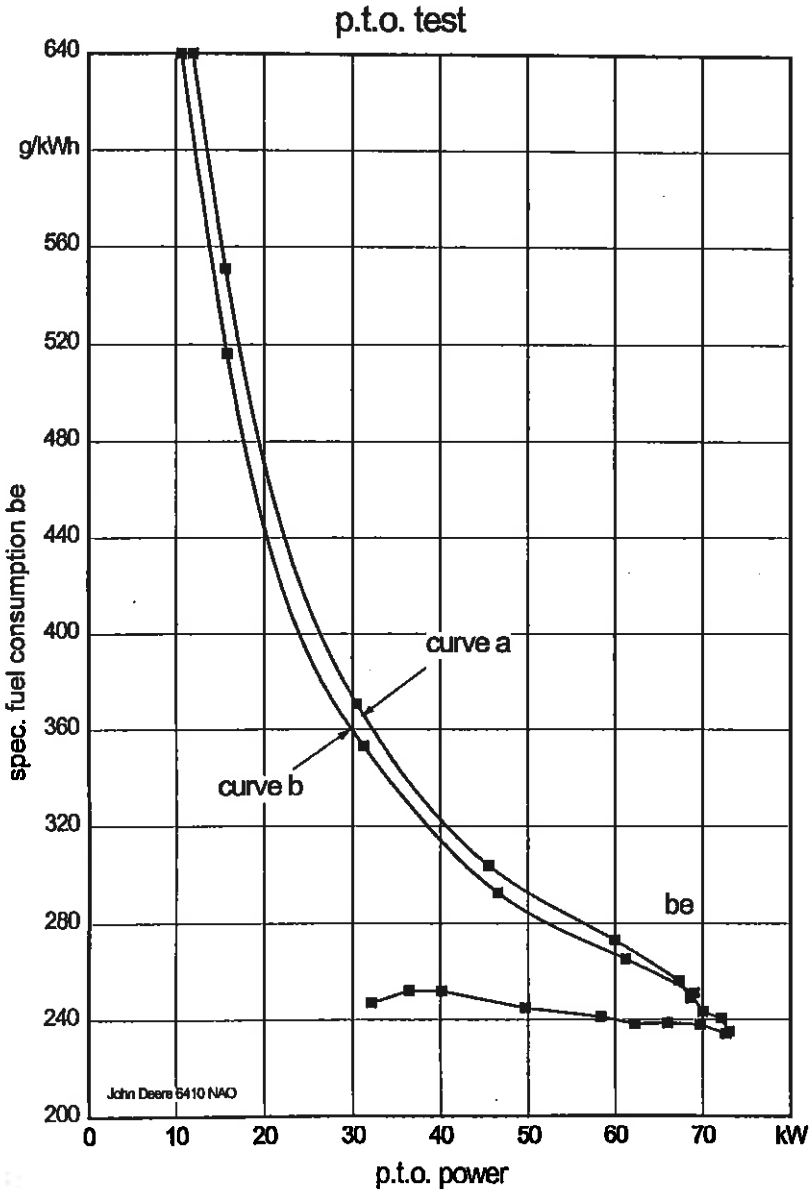
Mean atmospheric conditions

temperature:	20 °C
pressure:	1003 hPa
relative humidity:	33 %

Maximum temperatures

coolant:	86 °C
oil:	100 °C
fuel:	65 °C
air intake:	20 °C


p.t.o. test
p.t.o. power P
kW
100
80
70
60
50
40
30
20
10
0
M
P
equivalent torque M
Nm
500
400
350
300
250
200
150
100
50
0
standard p.t.o. speed 1000 rev/min
John Deere 6410 NA
fuel consumption B
kg/h
15
10
5
0
B
be
spec. fuel consumption be
g/kWh
320
280
240
200
1000
1200
1400
1600
1800
2000
2200
1/min
2600
engine speed


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 6410 NAO
0
10
20
30
40
50
60
70
kW
p.t.o. power

3.2 HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 8th and 9th June 1998

3.2.1 Hydraulic power test

- Sustained pressure with relief valve open 20.3 MPa
- Pump delivery rate at minimum pressure 101.0 dm³/min

	Hydraulic power kW	Flow rate dm³/min	Pressure MPa	Oil Temperature °C
At 90% of the actual relief valve setting	17.1	56.2	18.3	65
Maximum	23.3	90.3	15.5	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	650 mm 625 mm	850 mm 800 mm
Max. corrected force exerted through full range	29.70 kN	25.65 kN
Corresponding pressure	18.3 MPa	
Moment about rear axle	-	43.35 kNm
Max. tilt angle of mast from vertical		10

Lifting heights relative to horizontal lower links											
mm	-490	-400	-395	-300	-200	-100	0	100	200	230	310
Lifting forces at hitch points. Corrected to 18.3 MPa											
kN			29.70	34.20	37.35	40.50	42.75	45.00	46.35	46.80	
Lifting forces at standard frame. corrected to 18.3 MPa											
kN	25.65	27.55		29.70	31.05	31.50	31.50	31.50	31.05		30.15

3.3 DRAWBAR PERFORMANCE

- Date of test: 3rd and 4th June 1998
- 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)					
1 B	51.0	42.66	4.30	2357	15.0	342
2 B	55.2	42.18	4.71	2150	15.0	320
3 B	57.3	40.59	5.08	1903	14.1	301
1 C	58.3	35.94	5.84	1900	12.3	297
4 B	58.1	32.67	6.40	1898	11.2	299
2 C	59.2	29.36	7.26	1910	9.4	292
3 C	59.4	24.15	8.85	1900	7.8	290
4 C	58.9	19.13	11.08	1900	6.2	293
3.3.2	FUEL CONSUMPTION					
3.3.2.1	in selected gear, at maximum power at rated speed					
3 C	54.6	17.94	10.95	2305	5.6	316
3.3.2.1.1	75 % of pull at maximum power at rated speed					
3 C	43.4	13.45	11.62	2410	4.4	361
3.3.2.1.2	50 % of pull at maximum power at rated speed					
3 C	29.7	9.00	11.88	2435	3.2	433
3.3.2.1.3	next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1					
4 C	43.3	13.45	11.58	1959	4.5	319
3.3.2.1.4	next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2					
4 C	29.8	9.00	11.91	1991	3.1	365
3.3.2.2	in selected gear nearest to 7.50 km/h at rated speed					
1 C	55.8	27.29	7.36	2300	8.5	312
3.3.2.2.1	75 % of pull at maximum power at rated speed					
1 C	44.8	20.43	7.90	2412	6.4	342
3.3.2.2.2	50 % of pull at maximum power at rated speed					
1 C	30.8	13.62	8.14	2435	4.3	408
3.3.2.2.3	next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1					
2 C	44.7	20.36	7.91	2009	6.7	310
3.3.2.2.4	next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2					
2 C	30.9	13.62	8.17	2040	4.7	352

DEERE 6410 NA PowrQuad (4WD) **DLG-Test No 98-194**

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
unballasted	530 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
2.43	64	86	97	21	70	100.0
2.61	64	86	100	20	70	100.0
2.76	65	86	99	19	70	100.0
2.80	69	92	104	24	70	100.0
2.79	72	92	105	25	70	100.0
2.86	70	92	104	24	70	100.0
2.87	77	91	102	26	70	100.0
2.86	78	91	101	27	70	100.0
2.66	73	89	102	25	70	100.0
2.31	71	89	103	25	70	100.0
1.93	72	84	101	26	70	100.0
2.63	68	86	97	26	70	100.0
2.29	67	84	96	26	70	100.0
2.68	77	90	104	26	70	100.0
2.44	77	90	104	25	70	100.0
2.05	74	84	99	27	70	100.0
2.70	75	86	98	26	70	100.0
2.38	71	84	96	27	70	100.0

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: 5th June 1998
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	26.35	2300	7.45	4	72.5
4 C	14.79	2307	13.55	4	74.0
1 D	11.31	2311	16.77	4	73.5
1 C	27.05	2313	7.11	2	72.0
1 B	38.96	2402	3.98	2	73.0
4.1.1.2	All openings open				
1 C	27.02	2297	7.31	4	80.0
1 B	42.97	2379	4.35	4	81.5
2 B	37.03	2304	5.15	4	81.5
3 B	32.05	2300	6.40	4	81.0
4 B	23.80	2306	8.11	4	81.5
3 C	18.32	2302	10.96	4	82.0
4 C	13.92	2316	13.51	4	82.5
1 D	10.01	2307	16.77	4	83.5
1 C	26.59	2313	7.11	2	80.5
3 C	20.21	2299	10.56	2	82.0
4 C	14.18	2306	14.18	2	83.5
1 D	12.08	2315	16.46	2	83.0

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 **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	2476	8.56	4	72.0
1 C	0	2470	8.26	2	71.0
4.1.2.2. All openings open					
1 C	0	2474	8.66	4	80.0
1 C	0	2464	8.56	2	79.5
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	32.97	2	73.5
4.1.3.2 All openings open					
4 D	0	high idle	32.97	2	82.5

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

Head of tractor test section

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Deutsche Landwirtschafts-Gesellschaft

Test carried out by

Dipl.-Ing.Heinz Röthemeyer

Date: 29th April 1999



Impulse für den Fortschritt

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