Prüfstelle für Landmaschinen



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

OECD No. 2/2027
22nd November 2002

Agricultural Tractor

John Deere 6220 NA PowrQuad Plus (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 (C(2001)5(FINAL) "Blue Code", Code 2).

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

Duration of tests: February till April 2002

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: 22nd November 2002 OECD No. 2/2027

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Tractor manufacturer's name and address:	DEERE & COMPANY, Moline, Illinois, USA
Location of tractor assembly:	JOHN DEERE Werke Mannheim, D-68163 Mannheim
Submitted for test by:	Manufacturer
Selected for test by:	Manufacturer with agreement by DLG
Place of running-in:	Mannheim and Gross-Umstadt
Duration of running-in:	Engine 20h, tractor 50h
Location of test:	DLG-Testing Station, D-64823 Gross-Umstadt

1 SPECIFICATIONS OF TRACTOR

1.1 Identification

1.1.1	- Make:	JOHN DEERE
	- Model:	6220
	- Type:	4WD, full frame design
1.1.2	Numbers	
	- 1st serial No.:	316456 (1st September 2001)
	- Serial No.:	322490
1.1.3	Other specifications:	
	- Region version:	NA
	- Transmission version:	PowrQuad Plus, 40 km/h

1.2 Engine

	Make/Model/Type:	JOHN DEERE / 4045TL071 (DD16066) / water-cooled 4-stroke Diesel-engine, direct injection, supercharged, antivibration mounted
	Serial No.:	665203
1.2.1	Cylinders	
	Number/disposition:	4 / vertical in line
	Bore/stroke:	106.5 mm / 127mm
	Capacity:	4525 cm^3
	Compression ratio:	16.9 ± 0.5 : 1
	Arrangement of valves:	Overhead valves, 2 per cylinder
	Cylinder liners:	Wet

1.2.2 Supercharging

- Make / Model / Type:	CZECH / K27 37 (RE500287) / exhaust driven supercharger
- Pressure	Max. 70 kPa

1.2.3 Fuel system

- Fuel feed system:	Electrical vane type fuel supply pump
- Fuel filter	
Make/Model:	JOHN DEERE / -
Type :	1 replaceable paper element filter
- Capacity of fuel tank:	165 dm^3
- Injection pump	
Make/Model:	STANADYNE/J1DB4429-5782(RE509003)
Type:	Distributor injection pump with timing device
Serial no.:	10053414
Manufacturer's production setting:	65 ± 3 mm^3/stroke at full load and rated speed;
Flow rate:	17.94 ± 0.8 dm^3/h at 2300 min^{-1} and full load
Timing:	Commencement of delivery: Static 0°, dynamic 6° before TDC
- Injectors	
Make/Model:	STANADYNE / -
Type :	Multi hole
Injection pressure:	25.5 ± 0.5 MPa

1.2.4 Governor

- Make/Model/Type:	STANADYNE / - / centrifugal variable speed governor
- Governed range of engine speed:	850 ± 50 to 2460 ± 50 min^{-1}
- Rated engine speed:	2300 min^{-1}

1.2.5	Air cleaner	
	- Pre-cleaner	
	Make/Model:	DONALDSON / 991220
	Type:	Vacuum aspirated (cooling fan) cyclone type pre-cleaner integrated in front cover of main cleaner housing
	Location of air intake:	Above water cooler, below bonnet
	- Main cleaner	
	Make/Model:	DONALDSON / 991220 /
	Type:	Dry paper element filter with additional 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, replaceable cartridge
	- Number of filters:	1
1.2.7	Cooling system	Water cooling (high temperature section of water cooler)
	- Type of coolant:	Water-anti-freeze mixture
	- Type of pump:	Impeller pump
	- Specification of fan	
	Number of fan blades:	8
	Fan diameter:	600 mm
	- Coolant capacity:	24 dm^3
	- Type of temperature control:	Thermostat and by-pass circuit, BEHR viscous drive fan, belt driven; variable fan speed controlled by air flow temperature
	- Superpressure system:	70 ± 20 kPa

1.2.8	Starting system	
	- Make/Model/Type:	BOSCH / 12V / 0 001 230 003 (RE506589) IF electrical, solenoid pre-engaged drive starter motor
	- Starter motor power rating:	3 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 / 14 V / 70 - 115 A / 3-phase alternator
	Power:	1.6 kW
	- Battery:	1 lead acid battery, 12 V / 110 Ah at 20 hours rating
1.2.10	Exhaust system	
	- Make/Model/Type:	EBERSPÄCHER / AL82411 / single-chamber absorption type, oval 175 mm x 275 mm / 215 mm long
	- Location:	Under bonnet, vertical stack at right A-post of cab, mouth showing upward / forward
1.2.11	Operating hours meter:	Electronic, counts real hours when engine is running

1.3 Transmission

1.3.1	Clutch	
	- Make/Model/Type:	JOHN DEERE /- / wet multi-plate
	- Number of plates:	4
	- Diameter of plates:	225 mm
	- Method of operation:	By pedal and reverse lever, hydraulically, by low pressure hydraulic circuit, operated by valve

1.3.2 Gear box

- Make/Model/Type: JOHN DEERE / PowrQuad Plus, 40 km/h / mechanical, 40 km/h version
- Description: Speed change gear with 6 ranges (A, B, C, D, E, F; synchronized),
4 step power shift (1, 2, 3, 4) with automatic power shifting
power shifted reversing gear

	Forward	Reverse
No. of gears	4	4
No. of ranges	6	6
Total	24	24

2 levers, 2 buttons

- Available options (not fitted): PowrQuad (28/28) 30 km/h with creeper gear; PowrQuad (16/16) 30 km/h without creeper gear; SyncroPlus (12/4) 30 km/h
- Lubrication: Forced-feed lubrication, oil cooler (ring cooler) at the rear end of engine block, (low temperature section of water cooler), 2 filters

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: Wet multi-plate
  - Engagement: Electro-hydraulically by foot switch
  - Disengagement: By pedal of service brake

1.3.4 Front axle and final drives

- Make/Model/Type: ZF/ APL2025 / swing axle, driving and steering; axle driven through wet multi plate clutch, shaft in median plane of tractor, bevel gear; clutch electro-hydraulically operated by rocker switch (two positions: engaged / engaged by service brake operation); planetary final drives
- 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 of 2300 min^{-1} km/h
Forward Speeds			
A	1	421.49	1.43
	2	350.12	1.72
	3	292,37	2.06
	4	238.67	2.52
B	1	172.65	3.49
	2	143.42	4.20
	3	119.76	5.03
	4	97.76	6.16
C	1	105.89	5.69
	2	87.96	6.85
	3	73.45	8.20
	4	59.96	10.05
D	1	64.53	9.34
	2	53.60	11.24
	3	44.76	13.46
	4	36.54	16.49
E	1	39.71	15.18
	2	32.99	18.27
	3	27.55	21.87
	4	22.49	26.80
F	1	29.42	20.48
	2	24.44	24.66
	3	20.40	29.54
	4	16.66	36.17
Reverse Speeds			
A	1	403.78	1.49
	2	335.42	1.80
	3	280.09	2.15
	4	228.64	2.64
B	1	165.40	3.64
	2	137.40	4.39
	3	114.73	5.25
	4	93.66	6.43

C	1	101.45	5.94
	2	84.27	7.15
	3	70.37	8.56
	4	57.44	10.49
D	1	61.82	9.75
	2	51.35	11.74
	3	42.88	14.05
	4	35.01	17.21
E	1	38.04	15.84
	2	31.60	19.07
	3	26.39	22.84
	4	21.54	27.98
F	1	28.18	21.38
	2	23.41	25.74
	3	19.55	30.82
	4	15.96	37.76

*) Calculated with a dynamic radius index of 695 mm
(in conformity with ISO 4251-1:1998)

- Number of revolutions of front wheels for one revolution of rear wheels: 1.2864

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, electro-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 stub giving two different standard speeds

1.4.1.1 Power take-off proportional to engine speed, 540 min^{-1} or 1000 min^{-1} p.t.o.

- Location: At rear of tractor
- Diameter of p.t.o. shaft end: 35 mm
- Number of splines: 6 (540 min^{-1}) in conformity with ISO 500:1991, type 1
  21(1000 min^{-1}) in conformity with ISO 500:1991, type 2
- Height above ground: 615 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	Max. torque transmissible Nm
540	3.9685	540 580	2143 2300	not specified	
1000	2.2082	1000 1042	2208 2300	not specified	

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

1.4.1.2 Power take-off proportional to ground speed: None

1.4.2 Optional power take-off: Front p.t.o. independent, not fitted to tractor

1.5 Hydraulic power lift

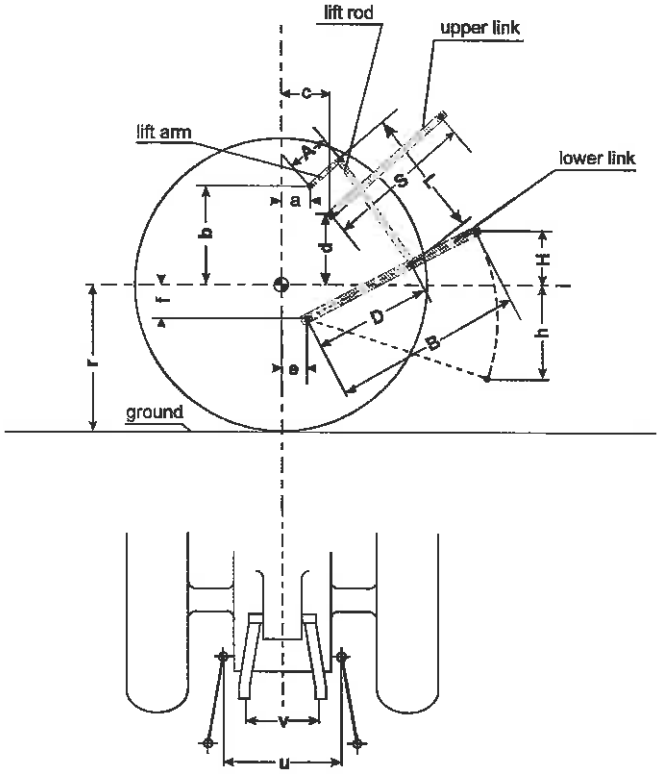
- Make/Model/Type:	JOHN DEERE / - / desintegrated, electronically controlled hydraulic power lift, lower link sensing
- Type of hydraulic system:	Closed center, load sensing pressure and flow compensated system
- Type and number of cylinders:	2 external cylinders, single acting, 65 mm bore, 175 mm stroke,
- Type of linkage lock for transport:	Hydraulic, lock of valve lever
- Relief valve pressure setting:	19.0 to 20.7 MPa
- Opening pressure of cylinder safety valve:	23.5 MPa
- Lift pump:	
- Make:	BRÜNINGHAUS HYDROMATIC
- Model:	A10VNO41
- Type:	41 cm^3 axial-piston pump with 100 dm^3/min delivery at rated speed; optional: 25 cm^3 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 coupler-pairs at rear of tractor
- Maximum volume of oil available to external cylinders:	Stationary 25 dm^3, driving 15 dm^3
- Oil cooler:	Engine cooling water / transmission-hydraulic oil heat exchanger at the rear end of engine block

John Deere 6220 NA PowrQuad Plus (4WD) **DLG-Test No. 2002-061**

1.6 Three-point linkage:

1.6.1 Three-point linkage at rear:

- Category: 2, in conformity with ISO 730-1/1994 + Cor. 1:1995 with extendable lower links
- Category adapter: None



John Deere 6220 NA PowrQuad Plus (4WD) **DLG-Test No. 2002-061**

Dimensions of rear implement linkage			Projected lengths in mm: Dimensions	Projected lengths in mm: Settings used in test-page 25
Rear tyres 16.9 - 30 Front tyres 12.4 - 24		(r) *) (r') *)	695 540	
Length of lift arms		(A)	305	
Length of lower links		(B)	945	
Distance of lift arm pivot points from rear wheel axis	horizontal vertical	(a) (b)	180 475	
Horizontal distance between the 2 lower link pivot points		(u)	480	
Horizontal distance between the 2 lift arm end points		(v)	535	
Length of upper link		(S)	from 535 to 740	650
Distance of upper link pivot point from rear wheel axis	horizontal vertical	(c) (d)	460 175	460 175
Distance of lower link pivot points from rear wheel axis	horizontal vertical	(e) (f)	135 225	
Distance of lower link pivot points from lift rod pivot points on lower links		(D)	505	
Length of lift rods		(L)	from 715 to 860	745

Heights (h, H, H') of lower link hitch points relative to rear wheel axis (situated 695 mm above ground), at different adjustments of L

These data are valid for unloaded power lift

Length of lift rods	(L)	745	715	860
Linkage distance of lift rods	(D)	505		
Lowest position	(h)	495	385	710
Highest position	(H)	150	220	-60
Transport position	(H')	150	220	-60

*) Assuming r resp. r' = tyre dynamic radius index (in conformity with ISO 4251-1:1998)

1.7 Swinging drawbar

- Type:	Adjustable in height and length	
- Height above ground	Maximum:	435 mm
	Minimum:	360 mm
- Type of adjustment:	Turning the drawbar	
- Distance of hitch point from rear wheel axis	Horizontal:	780 / 880 / 930 / 1080 mm
- Distance of hitch point from p.t.o. shaft end	Vertical:	180 / 255 mm
	Horizontal:	250 / 350 / 400 / 550 mm
- Lateral adjustment (centre of clevis)	Right/left hand side:	190 / 210 / 225 / 260 mm
- Distance of pivot point from rear-wheel axis, horizontally:		0 mm
- Diameter of drawbar pin hole:		33 mm
- Maximum permissible vertical load:		27 kN

1.8 Trailer hitch

None

1.9 Holed drawbar

Optional: short bar, category 2, not fitted

1.10 Steering

- Make/Model/Type:	JOHN DEERE and DANFOSS/ / hydrostatic steering, acting on front wheels
- Method of operation	
Pump:	Steering system connected to main hydraulic circuit
Ram:	Integrated cylinder of symmetrical design, 224 mm stroke, 70 mm bore, 36 mm dia of 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 with additional power fill, oil-immersed disc brake with 2 acting faces on each differential half shaft, disc 313 mm diameter
- Method of operation: Pedal operated, acting on rear wheels, front axle drive is automatically engaged when braking
- 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	Maximum	Adjustment method
Front	1520	2010	adjustable rims
Rear	1616	1912	adjustable rims

1.13 Protective structure

- Make/Model/Type: JOHN DEERE / SG068 / Cab
- Manufacturer's name and address: DEERE & COMPANY, Moline, Illinois, USA
- Protective device
  - Cab: Welded and screwed profile steel tube construction, mounted on silent blocks, for service (repair) with separate device tiltable to the side
  - Tiltable / not tiltable: Not tiltable
- OECD approval
  - Approval number: 4/0 694
  - Date of approval: 11th October 2001

1.14 Seat

1.14.1	Driver's seat	Fitted to tractor
	- Make/Model:	Grammer / MSG 95 AL / 731
	- Type:	Air suspended upholstered seat with backrest and armrests
	- Seat and steering wheel reversible:	No
	- Type of suspension:	Pneumatic
	- Type of damping:	Hydraulic
	- Range of adjustment	
	Longitudinal:	195 mm
	Vertical:	380 to 565 mm
	- Safety belt:	Yes
1.14.2	Optional driver's seats	
	- Make/Model/Type:	Grammer/MSG 95A; MSG 93; MSG 85 / mechanical suspension or pneumatic suspension
1.14.3	Passenger seat:	Optional, not fitted to tractor tested

1.15 Lighting

Electrical, 12 Volt, according to US legislation

	Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlights	1220	150 x 90	190
Side Lights	n.a.	n.a.	n.a.
Rearlights	1640	230 x 45	900
Reflectors	1600	160 x 25	865

2. TEST CONDITIONS

2.1 Overall dimensions

	Length mm	Width (track width as in 2.5) mm	Height at top of protective structure mm	Height at top of exhaust silencer pipe mm
Unballasted	4260	2170	2642	2615

2.2 Ground clearance

300 mm

- Clearance-limiting part: Bracket for sway blocks

2.3 Tractor mass

Unballasted (with cab)

	Without driver kg	With driver kg
Front	1700	1725
Rear	2645	2695
Total	4345	4420

2.4 Track specifications

Not applicable

2.5 Tyres and track widths specifications

	Front	Rear
Tyres:	GOODYEAR DynaTorque II	
- Dimensions	12.4 - 24	16.9 - 30
- Load index speed index	6 PR	6 PR
- Type	cross ply	cross ply
- Maximum load (tyre manufacturer's)	12.15 kN*)	19.00 kN*)
- Maximum load (tractor manufacturer's)	15.00 kN	28.00 kN
at travelling speed	30 km/h	30 km/h
at tyre inflation pressure	170 kPa	130 kPa
dynamic radius index	540 mm	695 mm
Chosen track width:	1630 mm	1700 mm

*) With other tyres higher load capacity possible

2.6 Fuel

- Type: ARAL-Diesel-fuel, in conformity with DIN 51601
- Density at 15°C: At p.t.o. tests 0.829 g/cm³
  at drawbar power tests 0.838 g/cm³

2.7 Oils and lubrication

2.7.1 Capacity and change interval

	Capacity dm³	Oil change h	Filter-change h
Engine	16	500	500
Gear box and rear axle	52	1500	750
Front axle	5	1500	-
Rear axle	in common with gearbox		
Final drives (front each)	0.8	1500	-
Final drives rear (each)	in common with gearbox		
Hydraulic system	in common with gearbox		
Steering	in common with gearbox		

2.7.2 Specifications:

	Recommended	Used during test
Engine oil: Used in engine		Fuchs Titan
Type	engine oil	engine oil
Viscosity	SAE 20W40, 15W40, 10W40, JD PLUS-50, JD TORQ-GARD SUPREME	SAE 15W40
Classification	API CG-4 or CF-4; ACEA - E2 or E3;	API CF-4
Transmission oil: Used in gear box, rear axle, hydraulic system and brake system	John Deere HY-GARD John Deere Low Viscosity HY-GARD, John Deere BIO-HY-GARD	John Deere HY-GARD
Type	transmission oil	transmission oil
Viscosity	SAE 75	SAE 75
Classification	JDM J20C or J20D	JDM J20C
Transmission oil: Used in front axle and front final drives	John Deere HY-GARD, John Deere BIO-HY-GARD or transmission oil	Fuchs
Type	transmission oil	transmission oil
Viscosity	SAE 75 or SAE 80W90	SAE 80W90
Classification	JDM J20C	JDM J20C

2.7.3 Grease Multi purpose grease GC-LB

- Number of lubrication points: 18

3 COMPULSORY TESTS

3.1 Main power take off performance

Date of tests: 18th February 2002
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 kg/h	Fuel consumption Hourly dm³/h	Fuel consumption Specific g/kWh	Specific energy kWh/dm³
Maximum power						
3.1.1 At 2-hour test						
59.0	2001	906	14.54	17.54	247	3.36
3.1.2 At rated speed						
56.5	2300	1042	15.21	18.35	269	3.08
3.1.3 At standard p.t.o. speed						
56.9	2208	1000	14.81	17.86	261	3.19
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						
56.5	2300	1042	15.21	18.35	269	3.08
3.1.4.2 85% of the torque obtained in 3.1.4.1						
50.6	2422	1097	14.82	17.88	293	2.83
3.1.4.3 75% of the torque defined in 3.1.4.2						
38.2	2437	1104	12.60	15.20	330	2.51
3.1.4.4 50% of the torque defined in 3.1.4.2						
25.7	2453	1111	10.50	12.67	409	2.03
3.1.4.5 25% of the torque defined in 3.1.4.2						
12.9	2470	1119	8.00	9.65	622	1.34
3.1.4.6 Unloaded						
-	2487	1126	5.73	6.91	-	-

Power kW	Speed Engine min^{-1}	Speed P.t.o. min^{-1}	Fuel consumption Hourly kg/h	Fuel consumption Hourly dm^3/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						
56.9	2208	1000	14.81	17.86	261	3.19
3.1.5.2 85% of the torque obtained in 3.1.5.1						
49.5	2245	1017	13.64	16.45	275	3.01
3.1.5.3 75% of the torque defined in 3.1.5.2						
37.4	2263	1025	11.57	13.96	309	2.68
3.1.5.4 50% of the torque defined in 3.1.5.2						
25.1	2280	1033	9.48	11.44	378	2.19
3.1.5.5 25% of the torque defined in 3.1.5.2						
12.7	2302	1043	7.13	8.60	562	1.48
3.1.5.6 Unloaded						
-	2321	1051	5.12	6.18	-	-

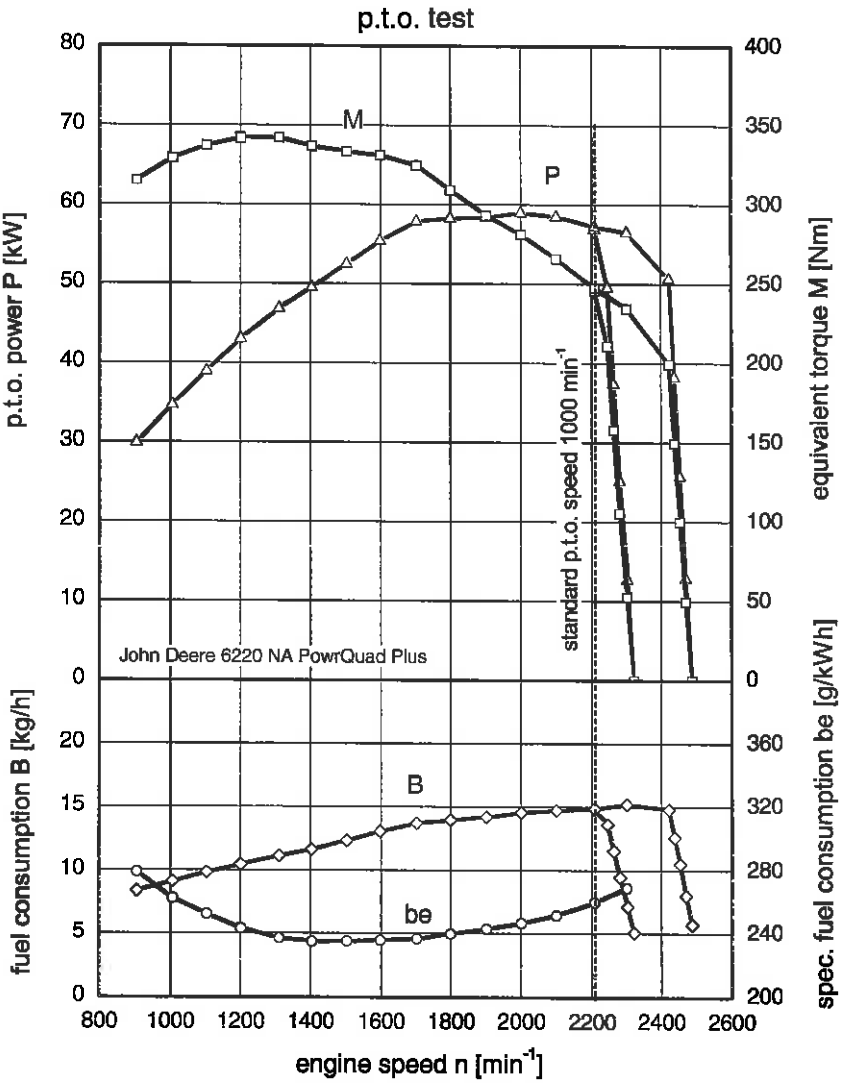
No load maximum engine speed:	2487 min^{-1}
Equivalent flywheel torque at rated engine speed:	235 Nm
Equivalent flywheel torque at 2-hour test:	281 Nm
At engine speed:	2001 min^{-1}
Maximum equivalent flywheel torque:	342 Nm
At engine speed:	1198 min^{-1}

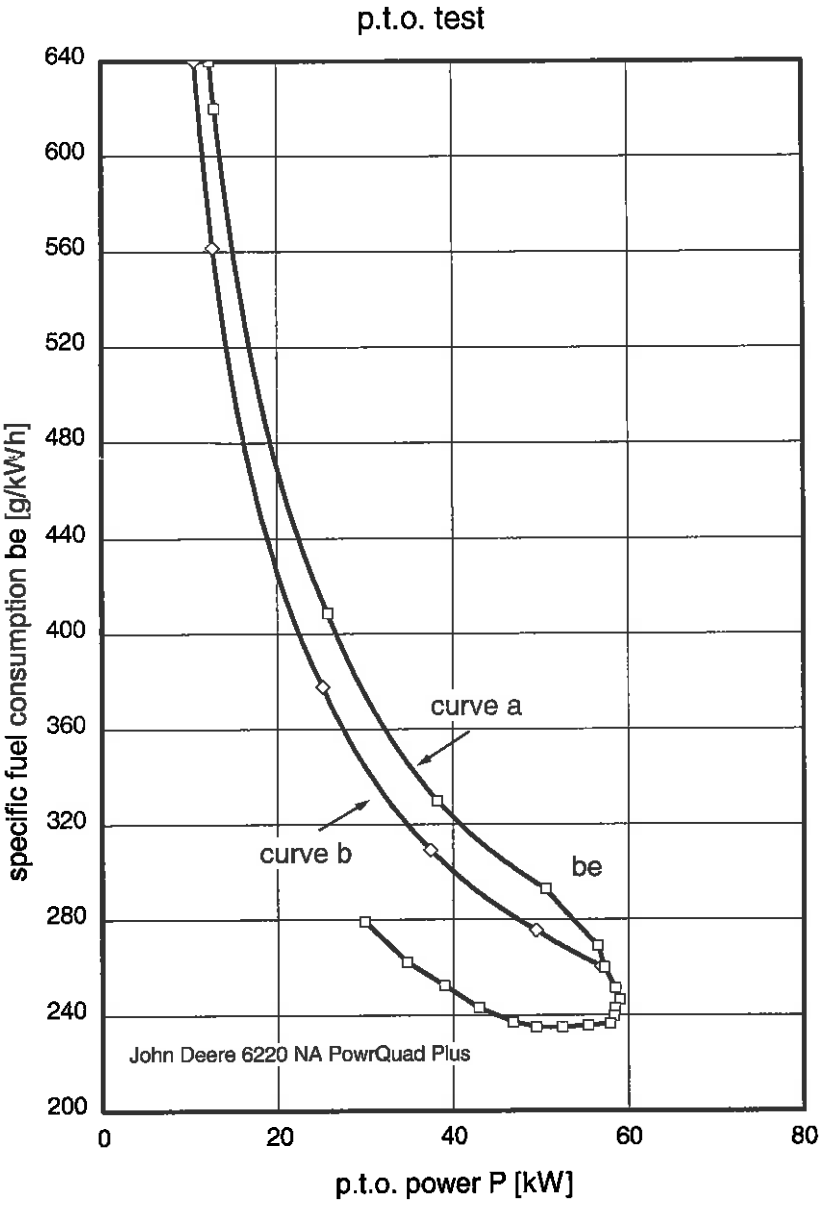
Mean atmospheric conditions

Temperature:	23 °C
Pressure:	99.8 kPa
Relative humidity:	27 %

Maximum temperatures

Coolant:	59 °C
Oil:	109 °C
Fuel:	38 °C
Air intake:	23 °C


p.t.o. test
M
P
B
be
John Deere 6220 NA PowrQuad Plus
standard p.t.o. speed 1000 min-1
p.t.o. power P [kW]
equivalent torque M [Nm]
fuel consumption B [kg/h]
spec. fuel consumption be [g/kWh]
engine speed n [min-1]
80
70
60
50
40
30
20
10
0
400
350
300
250
200
150
100
50
0
20
15
10
5
0
360
320
280
240
200
800
1000
1200
1400
1600
1800
2000
2200
2400
2600


p.t.o. test
640
600
560
520
480
440
400
360
320
280
240
200
specific fuel consumption be [g/kWh]
curve a
curve b
be
John Deere 6220 NA PowrQuad Plus
0
20
40
60
80
p.t.o. power P [kW]

3.2 HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 25th February 2002

3.2.1 Hydraulic power test

- Sustained pressure with relief valve open 20.5 MPa
- Pump stalled: No
- Pump delivery rate at minimum pressure 116.3 dm³/min [1] 117.7 dm³/min [2]

		Flow rate dm³/min	Pressure MPa	Hydraulic power kW	Oil Temperature °C
At 90% of the actual relief valve setting	[1]	93.7	18.5	28.9	65
	[2]	102.8	18.5	31.5	
Maximum	[1]	104.6	18.0	31.4	65
	[2]	101.0	19.0	32.0	

- Tapping point used for test: At rear of tractor, [1] 1 double acting control valve, [2] 2 double acting control valves parallel connection
- Opening/closing pressure of unloading valve: Not applicable

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	645 mm	890 mm
Vertical movement with lifting forces	630 mm	850 mm
Max. corrected force exerted through full range	21.80 kN	18.00 kN
Corresponding pressure	18.5 MPa	
Moment about rear axle	-	30.42 kNm
Max. tilt angle of mast from vertical		18°

Lifting heights relative to horizontal lower links

mm	-330	-300	-270	-200	-100	0	+100	+200	+300	+360	+400	+500	+520
Lifting forces at hitch points, corrected to 18.5 MPa													
kN			21.80	24.65	28.00	30.60	32.95	35.00	36.45	36.90			
Lifting forces at standard frame, corrected to 18.5 MPa													
kN	18.00	19.15		20.95	21.85	22.50	22.95	23.20	22.95		22.30	21.40	21.15

3.3 DRAWBAR POWER TEST (unballasted tractor)

Date of test: 12th till 14th March 2002
Type of track: Concrete

Gear number and range	Power kW	Drawbar pull kN	Speed km/h	Engine speed min^{-1}	Slip of wheels %
3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)					
B3	42.8	36.46	4.23	2224	15.0
C1	44.3	36.10	4.42	2047	15.0
B4	44.3	33.54	4.75	1999	13.5
C2	43.1	28.91	5.37	2001	11.9
C3	45.6	24.70	6.65	2006	9.3
D1	45.9	21.44	7.70	1998	7.7
C4	44.4	19.15	8.36	1997	6.6
D2	46.4	17.64	9.47	2004	5.8
D3	45.6	14.39	11.41	1995	4.8
E1	44.1	12.25	12.96	1997	4.2
FUEL CONSUMPTION					
3.3.2.1 In selected gear, at maximum power at rated speed					
D2	43.7	14.33	10.98	2300	4.9
3.3.2.1.1 75 % of pull at maximum power at rated speed					
D2	34.6	10.70	11.63	2404	3.7
3.3.2.1.2 50 % of pull at maximum power at rated speed					
D2	23.7	7.19	11.85	2421	2.6
3.3.2.1.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1					
D3	34.9	10.87	11.56	2002	3.7
3.3.2.1.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2					
D3	23.7	7.16	11.91	2031	2.3
3.3.2.2 In selected gear nearest to 7.50 km/h at rated speed					
C3	44.4	20.55	7.78	2296	6.9
3.3.2.2.1 75 % of pull at maximum power at rated speed					
C3	35.7	15.40	8.34	2407	4.9
3.3.2.2.2 50 % of pull at maximum power at rated speed					
C3	24.5	10.28	8.57	2424	3.0
3.3.2.2.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1					
D1	35.6	15.45	8.29	2101	5.0
3.3.2.2.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2					
D1	24.4	10.31	8.53	2125	3.3

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	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
Unballasted	370 mm	120 kPa	120 kPa

Specific fuel consumption	Specific energy	Temperature			Atmospheric conditions		
		Fuel	Coolant	Engine oil	Tempe-rature	Relative humidity	Pressure
g/kWh	kWh/dm³	°C	°C	°C	°C	%	kPa
354	2.37	43	57	100	8	60	99.5
331	2.53	42	58	99	6	60	99.5
331	2.53	44	57	100	8	60	99.5
332	2.53	56	59	108	20	38	100.2
320	2.62	50	60	103	17	38	100.2
316	2.66	49	59	102	15	38	100.2
326	2.57	49	59	102	15	38	100.2
314	2.67	49	58	102	17	38	100.2
318	2.64	51	58	103	18	38	100.2
329	2.54	52	59	104	19	38	100.2
349	2.40	43	57	99	11	60	99.5
411	2.04	46	58	99	11	60	99.5
522	1.61	47	58	97	12	60	99.5
353	2.38	43	57	95	11	60	99.5
430	1.95	43	57	93	11	60	99.5
344	2.44	44	57	99	10	60	99.5
389	2.16	45	58	99	10	60	99.5
475	1.76	47	59	97	10	60	99.5
346	2.42	44	58	97	10	60	99.5
417	2.01	45	58	95	10	60	99.5

4 ADDITIONAL TESTS under the responsibility of the DLG Testing Station

4.1 Measurement of noise at the driving position carried out in accordance with OECD CODE 5

Results of sound level test - "Under load" procedure

Date of test: 18th March and 3rd April 2002
Type of track: Concrete
Type of sound level meter: BRÜEL & KJAER model 2233

Gear number and range	Drawbar pull kN	Engine speed min^{-1}	Measured travelling speed km/h	Number of driving wheels	Sound level dB(A)
4.1.1 Test with the drawbar pull for which the tractor gives the maximum sound level (gear ratio giving the nearest nominal forward speed to 7.5 km/h and also in any speed settings with a sound level increase of at least 1 dB(A))					
4.1.1.1 All openings closed					
C 3	20.90	2297	7.81	4	71.5
D 3	11.45	2308	13.21	4	72.5
C 3	20.53	2298	7.45	2	72.0
4.1.1.2 All openings open *)					
C 3	20.20	2320	7.90	4	81.0
C 3	18.04	2386	7.96	2	81.0
4.1.2 Unloaded test in the gear ratio giving the forward speed nearest to 7.5 km/h					
4.1.2.1 All openings closed					
C 3	0	2470	9.02	4	71.0
C 3	0	2464	8.96	2	71.0
4.1.2.2. All openings open *)					
C 3	0	2462	9.02	4	79.0
C 3	0	2463	9.00	2	78.0

Gear number and range	Drawbar pull	Engine speed	Measured travelling speed	Number of driving wheels	Sound level
	kN	min^{-1}	km/h		dB(A)
4.1.3 Unloaded test in the gear ratio giving the maximum forward speed					
4.1.3.1 All openings closed					
F 4	0	2450	37.60	2	75.0
4.1.3.2 All openings open *)					
F 4	0	2450	37.60	2	82.0

*) Openings: 2 side windows, rear window

5 REPAIRS **None**

6 REMARKS **None**

Head of Vehicle Technology/
Safety Division

Test carried out by

Dipl.-Ing. Winfried Gramatte

Dipl.-Landw. Friedrich Uhlig

Date: 28th January 2003



Wir setzen Maßstäbe

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