Prüfstelle für Landmaschinen



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

OECD No. 2/2038
22nd January 2003

Agricultural Tractor

John Deere 6620 AutoQuad (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(2002)17(FINAL) "Red Code", Code 2).

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

Duration of tests: May till July 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) being in accordance with the OECD STANDARD CODE.

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TABLE OF CONTENTS

		Page
1	SPECIFICATIONS OF TRACTOR	4 to 18
2	TEST CONDITIONS	18 to 20
3	COMPULSORY TESTS	
3.1	Main power take-off	21 to 24
3.2	Hydraulic power and lifting force	25
3.3	Drawbar power and fuel consumption of unballasted tractor	26 and 27
4	ADDITIONAL TESTS	
4.1	Measurement of noise at the driving position carried out in accordance with OECD CODE 5	28 and 29
5	REPAIRS	30
6	REMARKS	30

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 30h
Location of test:	DLG-Testing Station, D-64823 Gross-Umstadt

1 SPECIFICATIONS OF TRACTOR

1.1 Identification

1.1.1	- Make:	JOHN DEERE
	- Model:	6620
	- Type:	4WD, full frame design
1.1.2	Numbers	
	- 1st serial No.:	316456 (01.Sep 2001)
	- Serial No.:	321768
1.1.3	Other specifications	
	- Transmission version:	AutoQuad, 40 km/h

1.2 Engine

	Make/Model/Type:	JOHN DEERE / 6068HLA70 (DD20011) / water cooled 4-stroke Diesel-engine, direct injection, supercharged and intercooler, antivibration mounted
	Serial No.:	665003
1.2.1	Cylinders	
	Number/disposition:	6 / vertical in line
	Bore/stroke:	106.5 mm / 127mm
	Capacity:	6788 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 101 (RE509058) / exhaust driven supercharger with SAMSUNG water cooled intercooler (by low temperature section of water cooler)
	- Pressure:	Max. 65 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:	207 dm^3
	- Injection pump	
	Make/Model:	BOSCH / L4 (RE501275)
	Type :	VP44 distributor injection pump with timing device
	Serial no.:	1896381013
	Manufacturer's production setting:	64.0 ± 3 mm^3/stroke at full load and rated speed
	Flow rate:	26.5 ± 1.2 dm^3/h at full load and rated speed
	Timing:	Commencement of delivery: Static 5.3° ± 0.5°, dynamic 5.5° before TDC
	- Injectors	
	Make/Model:	STANADYNE / -
	Type :	Multi hole
	Injection pressure:	25.5 ± 0.5 MPa
1.2.4	Governor	
	- Make/Model/Type:	JOHN DEERE/RE 506664/electric control unit
	- 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 / 0 001 230 002 (RE503226) 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 / 45 - 90 A / 3-phase alternator
	Power:	1.68 kW
	- Battery:	1 lead acid battery, 12 V / 154 Ah at 20 hours rating
1.2.10	Exhaust system	
	- Make/Model/Type:	ROTH / AL153972 / single-chamber absorption type, 300 mm dia / 280 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, electro-hydraulically, by low pressure hydraulic circuit, operated by valve

1.3.2 Gear box

- Make/Model/Type: JOHN DEERE / AutoQuad, 40km/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), automatic power shift selectable, power shifted reversing gear

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

2 levers, 2 buttons and 1 rocker switch for alternative power shifting, 1 rocker switch for automatic speed shifting when ECO- or Power-Mode is selected

- Available options (not fitted): AutoPowr (infinitely variable) 40 and 50 km/h; AutoQuad (36/36) 40 km/h with creeper gear; PowrQuad (16/16) 30km/h without creeper gear; PowrQuad (28/28) 30km/h with creeper gear
- 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/ AS2045 / 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; hydropneumatic suspension
- 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	467.22	1.59
	2	388.13	1.91
	3	324.07	2.29
	4	264.54	2.80
B	1	191.38	3.87
	2	158.98	4.66
	3	132.75	5.58
	4	108.36	6.84
C	1	117.40	6.31
	2	97.52	7.60
	3	81.43	9.10
	4	66.47	11.15
D	1	71.54	10.36
	2	59.42	12.48
	3	49.62	14.94
	4	40.50	18.30
E	1	44.04	16.84
	2	36.58	20.27
	3	30.54	24.27
	4	24.93	29.73
F	1	32.61	22.73
	2	27.09	27.37
	3	22.62	32.78
	4	18.46	40.15
Reverse Speeds			
A	1	447.57	1.66
	2	371.80	1.99
	3	310.49	2.39
	4	253.54	2.93
B	1	183.33	4.04
	2	152.29	4.87
	3	127.16	5.83
	4	103.81	7.14

*) Calculated with a dynamic radius index of 855 mm
(not in conformity with ISO 4251-1:1998)

C	1	112.46	6.59
	2	93.42	7.94
	3	78.02	9.50
	4	63.68	11.64
D	1	68.53	10.82
	2	56.92	13.02
	3	47.52	15.60
	4	38.80	19.10
E	1	42.16	17.58
	2	35.02	21.17
	3	29.25	25.35
	4	23.89	31.03
F	1	31.24	23.73
	2	25.95	28.57
	3	21.68	34.20
	4	17.70	41.88

- Number of revolutions of front wheels for one revolution of rear wheels: 1.2937

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 shaft with two different stubs, speed shiftable by separate lever

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: 770 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	2.2080	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

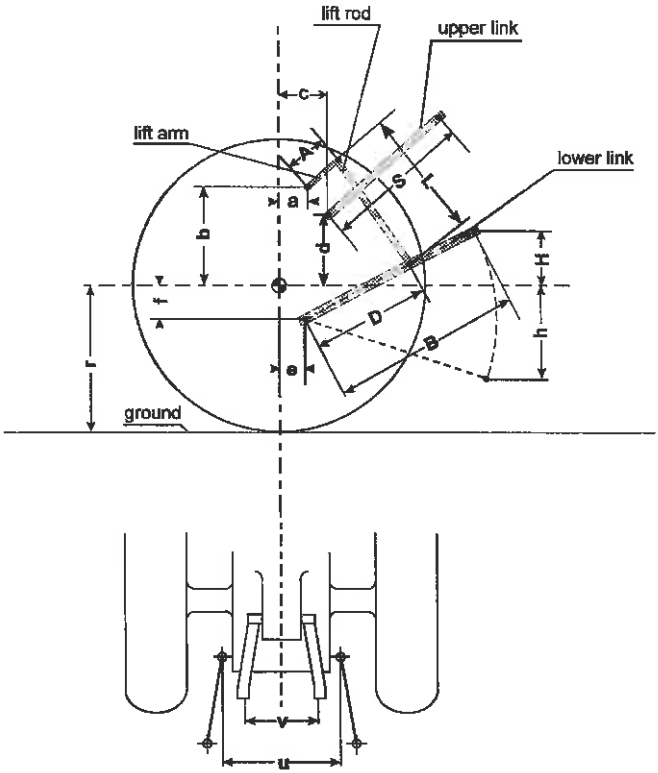
- Make/Model/Type:	JOHN DEERE / - / desintegrated, electronically controlled hydraulic power lift, lower link sensing
- Type of hydraulic system:	Closed center, load sensing pressure and flow compensated system
- Type and number of cylinders:	2 external cylinders, single acting, 90 mm bore, 226.5 mm 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:	20.8 to 22.2 MPa
- Lift pump	
- Make:	BRÜNINGHAUS HYDROMATIC
- Model:	A10VNO25
- Type:	25 cm^3 axial-piston pump with 60 dm^3/min delivery at rated speed; optional: 41 cm^3 axial-piston pump with 100 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 6620 AutoQuad (4WD) **DLG-Test No. 2002-095**

1.6 Three-point linkage:

1.6.1 Three-point linkage at rear:

- Category: 2, in conformity with ISO 730-1/1994 + Corr. 1:1995
  WALTERSCHEID quick couplers
- Category adapter: None



Dimensions of rear implement linkage			Projected lengths in mm	
			Dimensions	Settings used in test-page 25
Rear tyres 650/65 R 38 Front tyres 540/65 R 28		(r) *) (r') *)	855 670	
Length of lift arms		(A)	310	
Length of lower links		(B)	945	
Distance of lift arm pivot points from rear wheel axis	horizontal vertical	(a) (b)	178 475	
Horizontal distance between the 2 lower link pivot points		(u)	485	
Horizontal distance between the 2 lift arm end points		(v)	530	
Length of upper link		(S)	from 535 to 725	645
Distance of upper link pivot point from rear wheel axis	horizontal vertical	(c) (d)	458, 448, 438 175, 245, 315	458 175
Distance of lower link pivot points from rear wheel axis	horizontal vertical	(e) (f)	131 220	
Distance of lower link pivot points from lift rod pivot points on lower links		(D)	500 and 560	500
Length of lift rods		(L)	from 705 to 870	815

Heights (h, H, H') of lower link hitch points relative to rear wheel axis (situated 855 mm above ground), at different adjustments of L and D

These data are valid for unloaded power lift

Length of lift rods	(L)	705		870		815
Linkage distance of lift rods	(D)	500	560	500	560	500
Lowest position	(h)	415	365	745	670	655
Highest position	(H)	215	205	-75	-60	10
Transport position	(H')	215	205	-75	-60	10

*) Assuming r resp. r' = tyre dynamic radius index (not in conformity with ISO 4251-1:1998)

1.7 Swinging drawbar

- Type:	Longitudinally adjustable	
- Height above ground:		537 mm
- Type of height adjustment:	None	
- Distance of hitch point from rear-wheel axle, horizontally:		775, 875, 925, 1075 mm
- Distance of hitch point from power take-off shaft end		
Vertically:		233 mm
Horizontally:		245, 345, 395, 545 mm
- Lateral adjustment (centre of clevis)		
Right hand:		155 to 214 mm
Left hand:		155 to 214 mm
- Distance of pivot point from rear-wheel axle, horizontally:		- 10 mm
- Diameter of drawbar pin hole:		33 mm
- Maximum vertical permissible load (drawbar fully pushed in):		19.0 kN

1.8 Trailer hitch

- Make/Model/Type:	ROCKINGER/860D01/automatic, remote control	
- Pin diameter:		38 mm
- Height above ground:	Centre of clevis adjustable in 9 steps to	483, 525, 577, 637, 694, 809, 866, 920, 977 mm
- Distance of hitch point from rear wheel axis, horizontally:		775 mm
- Distance of hitch point from power take-off shaft end		
vertically:	below	287, 245, 193, 133, 76 mm
	above	39, 96, 150, 207 mm
horizontally:		245 mm
- Maximum permissible vertical load:		20.0 kN

1.9 Holed drawbar

None, available

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, 274 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 335 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 and mechanical separate band brake in gear box, acting on rear axle drive shaft
- Method of operation: Range gear lever in "P" position, resp. hand lever with ratchet

1.12 Wheels

- Number
  - Front: 2, driving and steering
  - Rear: 2, driving
- Wheelbase: 2650 mm
- Track width adjustment:

	Minimum	Maximum	Adjustment method
Front	1827	1827	not adjustable
Rear	1815	1815	not adjustable

John Deere 6620 AutoQuad (4WD) **DLG-Test No. 2002-095**

1.13 Protective structure

- Make/Model/Type:	JOHN DEERE / SG068 / Cab Option 3 (unsuspended)
- 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:	210
	Vertical:	410 to 530 mm
	- Safety belt:	No
1.14.2	Optional driver's seats	
	- Make/Model/Type:	Grammer / MSG 95A; MSG 93; MSG 85, MSG83, MSG 44 / mechanical suspension or pneumatic suspension
1.14.3	Passenger seat:	Optional, fitted to tractor tested, with mechanical suspension
	- Location:	At left mudguard
	- Capacity:	1

1.15 Lighting Electrical, 12 Volt, according to German legislation

	Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlights	1450	162 x 101	200
Side Lights	1870	110 x 35	850
Rearlights	1878	240 x 50	910
Reflectors, 1st pair 2nd pair	1840 900	160 x 25 75 ø	860 520

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	4705	2445	2875	2864

2.2 Ground clearance 460 mm

- Clearance-limiting part: Bracket of trailer hitch

2.3 Tractor mass Unballasted (with cab)

	Without driver kg	With driver kg
Front	2400	2425
Rear	3500	3550
Total	5900	5975

2.4 Track specifications Not applicable

2.5 Tyres and track widths specifications

	Front	Rear
Tyres:	PIRELLI TM 800	
- Dimensions	540/65 R 28	650/65 R 38
- Load index speed index	142 A8	157 A8
- Type	radial ply	radial ply
- Maximum load (tyre manufacturer's)	26.50 kN	41.30 kN
- Maximum load (tractor manufacturer's)	22.00 kN	33.50 kN
at travelling speed	40 km/h	40 km/h
at tyre inflation pressure	160 kPa	160 kPa
dynamic radius index	670 mm	855 mm
Chosen track width:	1827 mm	1815 mm

2.6 Fuel

- Type: ARAL-Diesel-fuel, in conformity with DIN 51601
- Density at 15°C: At p.t.o. tests 0.832 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	19.5	500	500
Gear box and rear axle	58	1500	750
Front axle	8	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: 21

3 COMPULSORY TESTS

3.1 Main power take off performance

Date of tests: 17th May 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						
87.3	2001	906	20.50	24.64	235	3.54
3.1.2 At rated speed						
81.9	2300	1042	21.00	25.24	255	3.24
3.1.3 At standard p.t.o. speed						
86.0	2208	1000	21.04	25.29	245	3.40
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						
81.9	2300	1042	21.00	25.24	255	3.24
3.1.4.2 85% of the torque obtained in 3.1.4.1						
71.4	2371	1074	19.01	22.85	266	3.12
3.1.4.3 75% of the torque defined in 3.1.4.2						
54.0	2393	1084	15.98	19.21	296	2.81
3.1.4.4 50% of the torque defined in 3.1.4.2						
36.3	2418	1095	12.92	15.53	356	2.34
3.1.4.5 25% of the torque defined in 3.1.4.2						
18.4	2440	1105	10.11	12.15	550	1.51
3.1.4.6 Unloaded						
-	2463	1115	6.91	8.30	-	-

John Deere 6620 AutoQuad (4WD) — DLG-Test No. 2002-095

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						
86.0	2208	1000	21.04	25.29	245	3.40
3.1.5.2 85% of the torque obtained in 3.1.5.1						
74.6	2256	1022	19.26	23.15	258	3.22
3.1.5.3 75% of the torque defined in 3.1.5.2						
56.4	2276	1031	16.08	19.33	285	2.92
3.1.5.4 50% of the torque defined in 3.1.5.2						
38.1	2296	1040	12.81	15.40	336	2.47
3.1.5.5 25% of the torque defined in 3.1.5.2						
19.3	2320	1051	9.51	11.43	493	1.69
3.1.5.6 Unloaded						
-	2343	1061	6.53	7.85	-	-

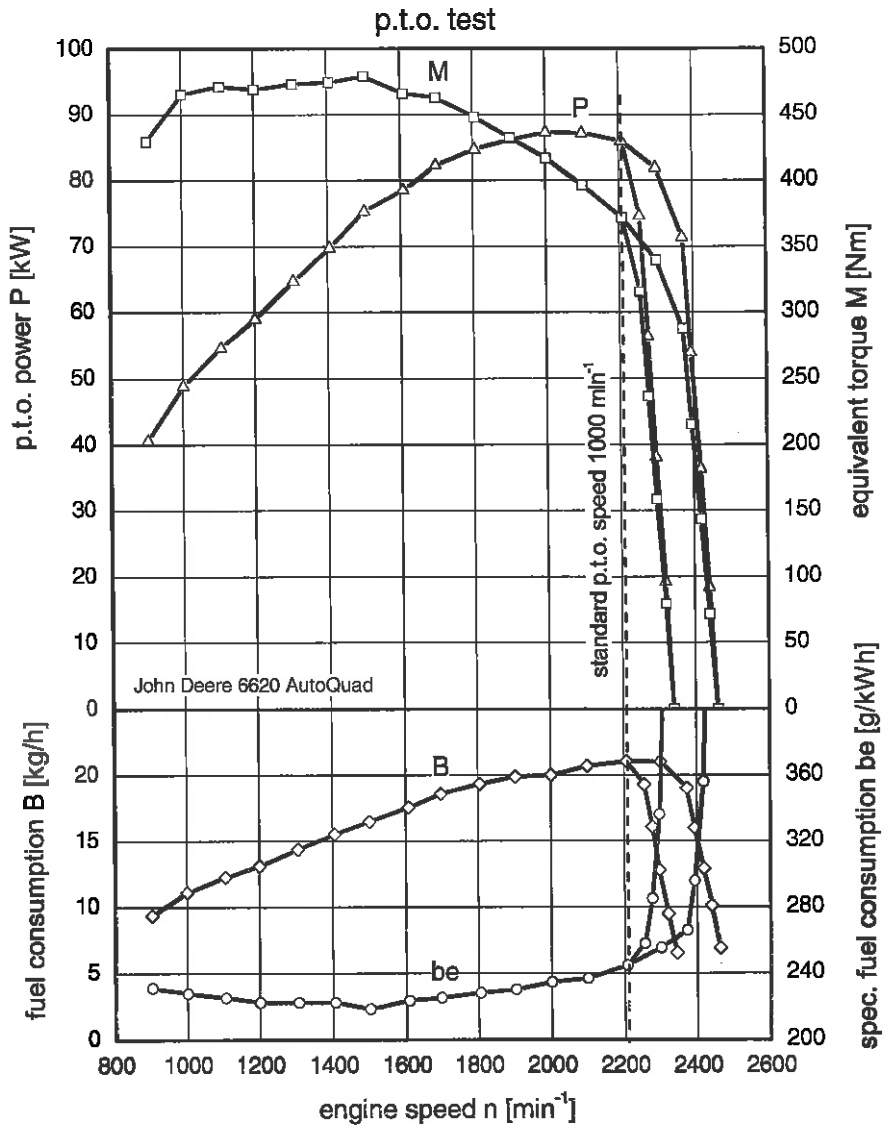
No load maximum engine speed:	2463 min^{-1}
Equivalent flywheel torque at rated engine speed:	340 Nm
Equivalent flywheel torque at 2-hour test:	417 Nm
At engine speed:	2001 min^{-1}
Maximum equivalent flywheel torque:	479 Nm
At engine speed:	1501 min^{-1}

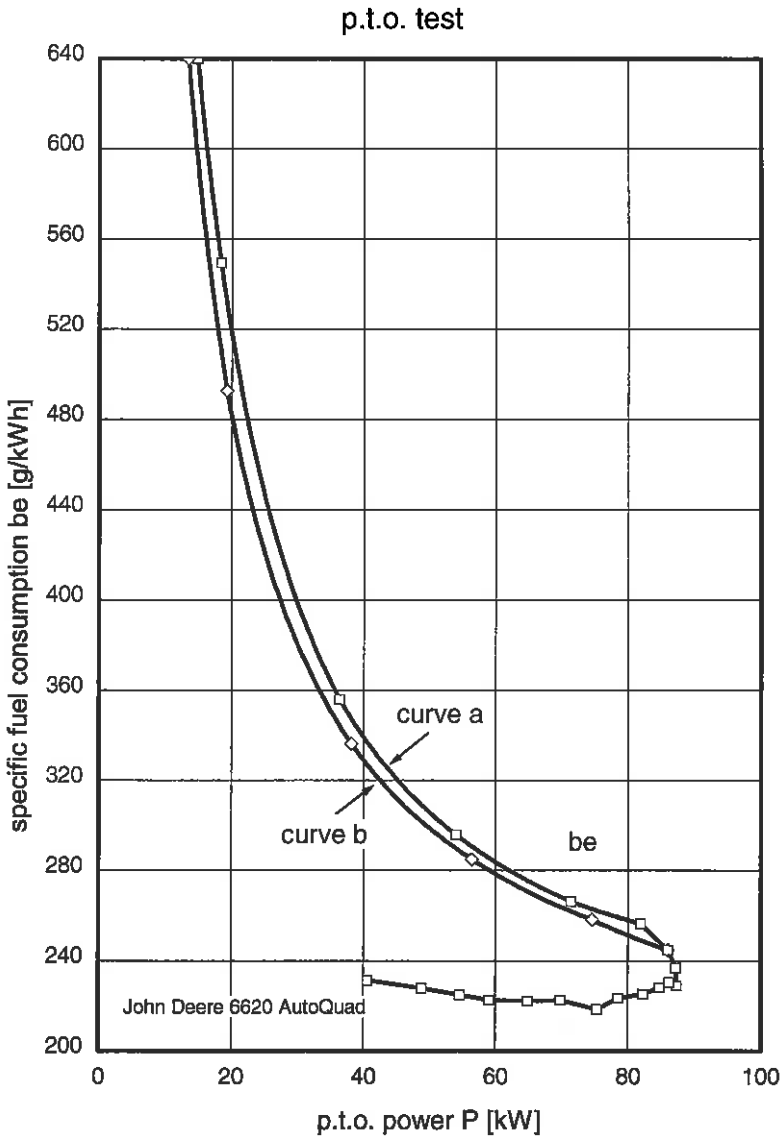
Mean atmospheric conditions

Temperature:	26 °C
Pressure:	99.7 kPa
Relative humidity:	40 %

Maximum temperatures

Coolant:	83 °C
Oil:	110 °C
Fuel:	48 °C
Air intake:	26 °C


p.t.o. test
M
P
B
be
John Deere 6620 AutoQuad
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]
100
90
80
70
60
50
40
30
20
10
0
500
450
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
specific fuel consumption be [g/kWh]
640
600
560
520
480
440
400
360
320
280
240
200
0
20
40
60
80
100
p.t.o. power P [kW]
curve a
curve b
be
John Deere 6620 AutoQuad

John Deere 6620 AutoQuad (4WD) **DLG-Test No. 2002-095**

3.2 HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 15th July 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 70.9 dm³/min [1)]
  71.0 dm³/min [2)]

	Flow rate dm³/min	Pressure Mpa	Hydraulic power kW	Oil Temperature °C
At 90% of the actual relief valve setting [1)]	63.4	18.5	19.5	65
[2)]	60.0	18.5	18.5	
Maximum [1)]	52.3	19.5	17.0	65
[2)]	59.2	19.5	19.2	

- 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 rear power lift

	At the hitch points	On the frame
Height of lower hitch points above ground in down position	200 mm	
Vertical movement without lifting forces	665 mm	856 mm
with lifting forces	636 mm	829 mm
Max. corrected force exerted through full range	41.85 kN	36.45 kN
Corresponding pressure	18.5 MPa	
Moment about rear axle	44.99 kNm	61.42 kNm
Max. tilt angle of mast from vertical	-	10

Lifting heights relative to horizontal lower links

mm	-521	-500	-436	-400	-300	-200	-100	0	+100	+200	+300	+308
Lifting forces at hitch points, corrected to 18.5 MPa												
kN			41.85	44.80	50.65	55.80	59.85	63.45	66.60	69.30		
Lifting forces at standard frame, corrected to 18.5 MPa												
kN	36.45	37.35		40.85	43.10	44.80	45.70	45.90	45.90	45.45	43.90	43.20

3.3 DRAWBAR POWER TEST (unballasted tractor)

Date of test: 28th May till 4th June 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)					
B2	63.6	57.78	3.97	2279	15.0
B3	67.6	58.40	4.17	2006	15.0
C1	70.5	51.28	4.95	1997	10.4
B4	72.4	46.80	5.57	1995	6.9
C2	73.8	42.31	6.28	2001	6.0
C3	73.9	34.90	7.63	2000	4.3
D1	73.8	30.41	8.73	2002	3.7
C4	73.2	27.89	9.45	2003	3.3
D2	73.5	24.98	10.59	1999	3.0
D3	72.8	20.66	12.69	1992	2.6
E1	71.2	17.82	14.38	1995	2.4
D4	71.1	16.33	15.67	1996	2.0
3.3.2.1 FUEL CONSUMPTION In selected gear, at maximum power at rated speed					
C3	69.4	28.34	8.82	2303	4.1
3.3.2.1.1 75 % of pull at maximum power at rated speed					
C3	54.9	21.28	9.24	2382	2.9
3.3.2.1.2 50 % of pull at maximum power at rated speed					
C3	37.9	14.48	9.44	2408	1.8
3.3.2.1.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1					
C4	54.4	21.26	9.21	1940	2.8
3.3.2.1.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2					
C4	37.7	14.41	9.42	1964	1.8
3.3.2.2 In selected gear nearest to 7.50 km/h at rated speed					
C2	69.6	34.30	7.31	2299	4.5
3.3.2.2.1 75 % of pull at maximum power at rated speed					
C2	54.9	25.73	7.68	2382	3.2
3.3.2.2.2 50 % of pull at maximum power at rated speed					
C2	37.4	17.19	7.84	2407	2.2
3.3.2.2.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1					
C3	54.5	25.74	7.62	1977	3.5
3.3.2.2.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2					
C3	37.3	17.18	7.81	2002	2.3

John Deere 6620 AutoQuad (4WD) **DLG-Test No. 2002-095**

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
Unballasted	545 mm	80 kPa	80 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
334	2.51	56	84	106	27	47	99.8
305	2.75	52	84	104	27	47	99.8
294	2.86	55	85	106	27	47	99.8
286	2.93	52	82	106	27	47	99.8
281	2.99	53	84	105	25	52	99.5
279	3.01	49	83	104	21	52	99.5
280	2.99	51	84	105	24	52	99.5
280	2.99	49	82	105	23	52	99.5
281	2.98	52	84	106	26	52	99.5
284	2.95	51	84	107	24	52	99.5
291	2.89	50	84	104	25	52	99.5
290	2.90	51	84	105	26	52	99.5
306	2.74	57	85	108	28	45	99.5
333	2.52	58	83	106	28	45	99.5
382	2.19	59	82	106	28	45	99.5
302	2.77	57	83	102	28	45	99.5
336	2.49	57	81	101	28	45	99.5
302	2.77	55	84	107	27	47	99.8
332	2.52	56	82	106	27	47	99.8
388	2.16	56	80	105	27	47	99.8
294	2.85	54	83	103	27	47	99.8
333	2.52	55	79	101	27	47	99.8

John Deere 6620 AutoQuad (4WD) **DLG-Test No. 2002-095**

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

Tractor fitted with John Deere / SG068 / Cab Option 3 (unsuspended).

Results of sound level test - "Under load" procedure

Date of test: 13th till 18th June 2002
Type of track: Concrete
Type of sound level meter: BRÜEL & KJAER model 2233

Gear number and range	Drawbar pull	Engine speed	Measured travelling speed	Number of driving wheels	Sound level
	kN	min^{-1}	km/h		dB(A)
4.2.1	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))				
4.2.1.1	All openings closed				
C2	30.48	2300	7.36	4	70.0
A4	56.49	2391	2.62	4	71.0
B1	56.14	2373	3.58	4	71.0
C2	32.41	2308	7.21	2	70.0
A1	40.81	2433	1.31	2	71.5
A2	40.69	2429	1.59	2	71.5
A3	40.06	2424	1.86	2	71.5
A4	40.01	2412	2.67	2	71,0
B1	40.67	2394	3.58	2	71.5
B2	40.58	2385	3.98	2	71.5
B3	41.18	2360	5.09	2	71.5
E1	13.81	2300	15.97	2	71.0
4.2.1.2	All openings open *)				
C2	32.72	2302	7.31	4	80.0
B2	56.49	2304	4.08	4	81.0
C4	22.02	2398	10.67	4	81.0
D2	18.41	2296	12.09	4	81.0
D3	14.80	2303	14.66	4	81.5
E1	12.44	2305	16.62	4	82.5
D4	11.81	2301	18.19	4	82.0

Gear number and range	Drawbar pull	Engine speed	Measured travelling speed	Number of driving wheels	Sound level
	kN	min^{-1}	km/h		dB(A)
C2	31.48	2312	7.21	2	80.0
B1	40.31	2395	3.63	2	81.0
B2	38.70	2390	3.99	2	81.0
B3	40.18	2370	4.84	2	81.0
C3	27.99	2299	8.67	2	81.0
D1	23.89	2300	9.98	2	81.0
C4	22.27	2295	10.68	2	81.0
D2	19.53	2302	12.04	2	82.0
D3	15.18	2304	14.61	2	82.0
E1	13.47	2304	16.63	2	82.5
D4	11.69	2312	18.09	2	82.5
4.2.2	Unloaded test in the gear ratio giving the forward speed nearest to 7.5 km/h				
4.2.2.1	All openings closed				
C2	0	2440	8.06	4	70.0
C2	0	2458	8.16	2	69.0
4.2.2.2.	All openings open *)				
C2	0	2449	8.14	4	79.5
C2	0	2453	8.11	2	80.0
4.2.3	Unloaded test in the gear ratio giving the maximum forward speed				
4.2.3.1	All openings closed				
F4	0	high idle	42.0	2	72.0
4.2.3.2	All openings open *)				
F4	0	high idle	42.0	2	81.5

*) Openings: 2 side windows, rear window, roof hatch

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

Head of Vehicle Technology / Safety Division

Dipl.-Ing. Winfried Gramatte

Test carried out by

Dipl.-Ing. (FH) Thomas Feuerstein

Date: 10th February 2003



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