# Prüfstelle für Landmaschinen



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

**OECD No. 2/2033**
***14th January 2003***

**Agricultural Tractor**

**John Deere 6920S 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: June 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.

Date of approval: 14th January 2003 OECD No. 2/2033

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**John Deere 6920S AutoQuad (4WD)** **DLG-Test No. 2002-096**

| | |
|---|---|
| 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 70h |
| Location of test: | DLG-Testing Station, D-64823 Gross-Umstadt |

## 1 SPECIFICATIONS OF TRACTOR

### 1.1 Identification

| | | |
|---|---|---|
| 1.1.1 | - Make: | JOHN DEERE |
| | - Model: | 6920S |
| | - Type: | 4WD, full frame design |
| 1.1.2 | Numbers | |
| | - 1st serial No.: | 316456 (1st September 2001) |
| | - Serial No.: | 321783 |
| 1.1.3 | Other specifications | |
| | - Transmission version: | AutoQuad, 40 km/h |

### 1.2 Engine

| | | |
|---|---|---|
| | Make/Model/Type: | JOHN DEERE / 6068HLA73 (DD20014) / water-cooled 4-stroke Diesel-engine, direct injection, supercharged and intercooler, antivibration mounted |
| | Serial No.: | 661303 |
| 1.2.1 | Cylinders | |
| | Number/disposition: | 6 / vertical in line |
| | Bore/stroke: | 106.5 mm / 127 mm |
| | 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. 87 kPa in "draft mode", resp. 91 kPa in "transport/PTO mode" |

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: | 250 $dm^3$ |
| - Injection pump | |
| Make/Model: | BOSCH / L4 (RE501275) |
| Type : | VP44 distributor injection pump with timing device |
| Serial no.: | 185296040 |
| Manufacturer's production setting*): | Draft mode: 77 ± 3 $mm^3$/stroke at full load and rated speed<br>Transport/PTO mode: 86 ± 3 $mm^3$/stroke at full load and rated speed |
| Flow rate: | Draft mode: 29.1 ± 1.1 $dm^3$/h at full load and rated speed<br>Transport/PTO mode: 32.5 ± 1.1 $dm^3$/h at full load and rated speed |
| Timing: | Commencement of delivery:<br>Static 6.2° ± 0.5°, dynamic 6.5° 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 2240 ± 50 $min^{-1}$ |
| - Rated engine speed: | 2100 $min^{-1}$ |

*) See Remark on page 34

| | | |
|---|---|---|
| 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: | 30 $dm^3$ |
| | - 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 / 60 - 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: | 5 |
| | - 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 5 ranges (A, B, C, D, E; 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 | 5 | 5 |
| Total | 20 | 20 |

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; 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/ AS2060 / 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 2100 $min^{-1}$ km/h |
|---|---|---|---|
| Forward Speeds | | | |
| A | 1 | 269.10 | 2.52 |
| | 2 | 223.48 | 3.03 |
| | 3 | 186.59 | 3.63 |
| | 4 | 152.32 | 4.44 |
| B | 1 | 126.96 | 5.33 |
| | 2 | 105.44 | 6.42 |
| | 3 | 88.04 | 7.69 |
| | 4 | 71.87 | 9.42 |
| C | 1 | 79.78 | 8.48 |
| | 2 | 66.26 | 10.22 |
| | 3 | 55.32 | 12.24 |
| | 4 | 45.16 | 14.99 |
| D | 1 | 43.09 | 15.71 |
| | 2 | 35.79 | 18.91 |
| | 3 | 29.88 | 22.65 |
| | 4 | 24.39 | 27.75 |
| E | 1 | 29.83 | 22.69 |
| | 2 | 24.78 | 27.32 |
| | 3 | 20.69 | 32.72 |
| | 4 | 16.89 | 40.08 |
| Reverse Speeds | | | |
| A | 1 | 257.89 | 2.62 |
| | 2 | 214.17 | 3.16 |
| | 3 | 178.82 | 3.79 |
| | 4 | 145.97 | 4.64 |
| B | 1 | 121.67 | 5.56 |
| | 2 | 101.05 | 6.70 |
| | 3 | 84.37 | 8.02 |
| | 4 | 68.87 | 9.83 |

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

| | | | |
|---|---|---|---|
| C | 1 | 76.46 | 8.85 |
| | 2 | 63.50 | 10.66 |
| | 3 | 53.01 | 12.77 |
| | 4 | 43.28 | 15.64 |
| D | 1 | 41.30 | 16.39 |
| | 2 | 34.30 | 19.73 |
| | 3 | 28.63 | 23.64 |
| | 4 | 23.37 | 28.96 |
| E | 1 | 28.59 | 23.68 |
| | 2 | 23.74 | 28.52 |
| | 3 | 19.82 | 34.15 |
| | 4 | 16.18 | 41.83 |

- Number of revolutions of front wheels for one revolution of rear wheels: 1.2858

## 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 $min^{-1}$, 540 E*) $min^{-1}$ 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: 774 mm
- Distance from the median plane of the tractor: 0 mm
- Distance behind rear wheel axis: 587 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 | 3.6800 | 540<br>571 | 1987<br>2100 | not specified | |
| 540 E*) | 3.2471 | 540<br>647 | 1753<br>2100 | not specified | |
| 1000 | 2.0000 | 1000<br>1050 | 2000<br>2100 | 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

*) "economic speed"

## 1.5 Hydraulic power lift

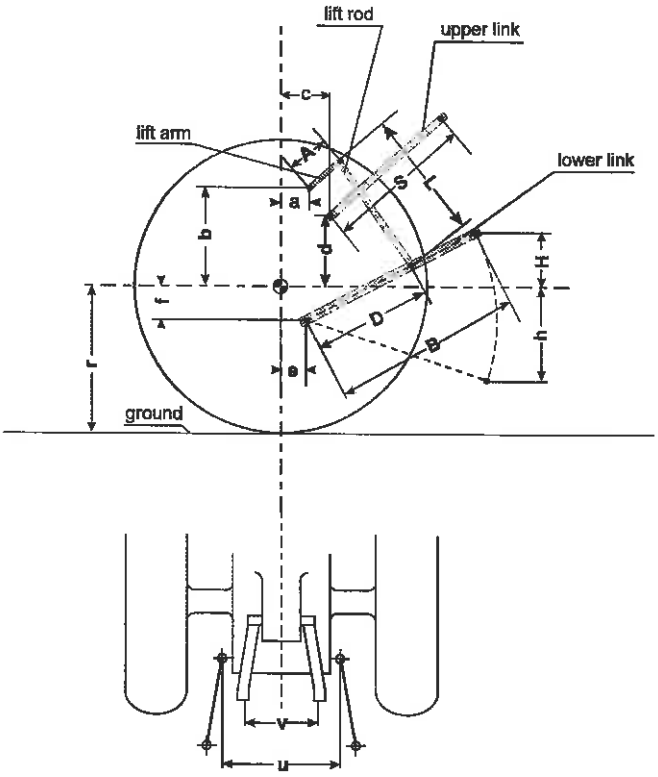
| | |
|---|---|
| - Make/Model/Type: | JOHN DEERE / - / desintegrated, electronically controlled hydraulic power lift, lower link sensing |
| - Type of hydraulic system: | Closed center, load sensing pressure and flow compensated system |
| - Type and number of cylinders: | 2 external cylinders, single acting, 85 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 rea. of tractor |
| - Maximum volume of oil available to external cylinders: | Stationary 30 $dm^3$, driving 20 $dm^3$ |
| - Oil cooler: | Engine cooling water / transmission-hydraulic oil heat exchanger at the rear end of engine block |

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## 1.6 Three-point linkage:

1.6.1 Three-point linkage at rear:

- Category: 3, in conformity with ISO 730-1/1994 + Cor. 1:1995
  WALTERSCHEID quick couplers
- Category adapter: None



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| Dimensions of rear implement linkage | | | Projected lengths in mm: Dimensions | Settings used in test-page 25 |
|---|---|---|---|---|
| Rear tyres 650/65 R 38<br>Front tyres 540/65 R 28 | | (r) *)<br>(r') *) | 855<br>670 | |
| Length of lift arms | | (A) | 400 | |
| Length of lower links | | (B) | 960 | |
| Distance of lift arm pivot points from rear wheel axis | horizontal<br>vertical | (a)<br>(b) | 185<br>535 | |
| Horizontal distance between the 2 lower link pivot points | | (u) | 510 | |
| Horizontal distance between the 2 lift arm end points | | (v) | 644 | |
| Length of upper link | | (S) | from 535 to 725 | 685 |
| Distance of upper link pivot point from rear wheel axis | horizontal<br>vertical | (c)<br>(d) | 465<br>222, 276, 342 | 465<br>222 |
| Distance of lower link pivot points from rear wheel axis | horizontal<br>vertical | (e)<br>(f) | 160<br>245 | |
| Distance of lower link pivot points from lift rod pivot points on lower links | | (D) | 553 and 653 | 553 |
| Length of lift rods | | (L) | from 855 to 1024 | 945 |

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) | 855 | | 1024 | | 945 |
|---|---|---|---|---|---|---|
| Linkage distance of lift rods | (D) | 553 | 653 | 553 | 653 | 553 |
| Lowest position | (h) | 480 | 415 | 751 | 654 | 625 |
| Highest position | (H) | 205 | 191 | -41 | -28 | 77 |
| Transport position | (H') | 205 | 191 | -41 | -28 | 77 |

*) 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: | | 525 mm |
| - Type of height adjustment: | None | |
| - Distance of hitch point from rear-wheel axle, horizontally: | | 834, 934, 984 mm |
| - Distance of hitch point from power take-off shaft end | | |
| Vertically: | | 249 mm |
| Horizontally: | | 247, 347, 397 mm |
| - Lateral adjustment (centre of clevis) | | |
| Right hand: | | 140 to 179 mm |
| Left hand: | | 140 to 179 mm |
| - Distance of pivot point from rear-wheel axle, horizontally: | | - 65 mm |
| - Diameter of drawbar pin hole: | | 33 mm |
| - Maximum vertical permissible load (drawbar fully pushed in): | | 28.0 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 | 487, 529, 579, 642, 700, 815, 871, 928, 982 mm |
| - Distance of hitch point from rear wheel axis, horizontally: | | 780 mm |
| - Distance of hitch point from power take-off shaft end | | |
| vertically: | below | 287, 245, 195, 132, 74 mm |
| | above | 41, 97, 154, 208 mm |
| horizontally: | | 193 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, 270 mm stroke, 80 mm bore, 40 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
- 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 | 1814 | 1814 | not adjustable |
| Rear | 1824 | 1824 | not adjustable |

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## 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: | 195 mm |
| | Vertical: | 380 to 565 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 | 1400 | 162 x 101 | 196 |
| Side Lights | 1860 | 110 x 35 | 850 |
| Rearlights | 1924 | 240 x 50 | 910 |
| Reflectors, 1st pair<br>2nd pair | 1885<br>895 | 160 x 25<br>75 ø | 860<br>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 | 4736 | 2455 | 2920 | 2907 |

### 2.2 Ground clearance 463 mm

- Clearance-limiting part: Bracket of trailer hitch

### 2.3 Tractor mass Unballasted (with cab)

| | Without driver kg | With driver kg |
|---|---|---|
| Front | 2535 | 2560 |
| Rear | 3770 | 3820 |
| Total | 6305 | 6380 |

### 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 | 41.25 kN |
| - Maximum load (tractor manufacturer's) | 25.00 kN | 39.00 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: | 1814 mm | 1824 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 | 59 | 1500 | 750 |
| Front axle | 9 | 1500 | - |
| Rear axle | in common with gearbox | | |
| Final drives (front each) | 1.7 | 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:<br>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;<br>ACEA - E2 or E3; | API CF-4 |
| Transmission oil:<br>Used in gear box, rear axle, hydraulic system and brake system | John Deere HY-GARD<br>John Deere Low Viscosity HY-GARD, John Deere BIO-HY-GARD | John Deere HY-GARD |
| Type<br>Viscosity<br>Classification | transmission oil<br>SAE 75<br>JDM J20C or J20D | transmission oil<br>SAE 75<br>JDM J20C |
| Transmission oil:<br>Used in front axle and front final drives | John Deere HY-GARD,<br>John Deere BIO-HY-GARD<br>or transmission oil | Fuchs |
| Type<br>Viscosity<br>Classification | transmission oil<br>SAE 75 or SAE 80W90<br>JDM J20C | transmission oil<br>SAE 80W90<br>JDM J20C |

2.7.3 Grease Multi purpose grease GC-LB

- Number of lubrication points: 23

## 3 COMPULSORY TESTS

### 3.1 Main power take off performance (1000min$^{-1}$) "Draft mode"

Date of tests: 17th June 2002 and 19th June 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 | | | | | | |
| 111.2 | 1802 | 903 | 25.39 | 30.52 | 228 | 3.64 |
| 3.1.2 At rated speed | | | | | | |
| 99.5 | 2102 | 1054 | 24.12 | 28.99 | 242 | 3.43 |
| 3.1.3 At standard p.t.o. speed | | | | | | |
| 106.7 | 1995 | 1000 | 25.06 | 30.12 | 235 | 3.54 |
| **3.1.4 Part loads, the govemor 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 | | | | | | |
| 99.5 | 2102 | 1054 | 24.12 | 28.99 | 242 | 3.43 |
| 3.1.4.2 85% of the torque obtained in 3.1.4.1 | | | | | | |
| 87.3 | 2164 | 1085 | 22.13 | 26.60 | 254 | 3.28 |
| 3.1.4.3 75% of the torque defined in 3.1.4.2 | | | | | | |
| 66.1 | 2194 | 1100 | 18.19 | 21.86 | 275 | 3.02 |
| 3.1.4.4 50% of the torque defined in 3.1.4.2 | | | | | | |
| 44.8 | 2222 | 1114 | 14.49 | 17.42 | 324 | 2.57 |
| 3.1.4.5 25% of the torque defined in 3.1.4.2 | | | | | | |
| 22.6 | 2242 | 1124 | 10.71 | 12.87 | 473 | 1.76 |
| 3.1.4.6 Unloaded | | | | | | |
| - | 2244 | 1125 | 6.79 | 8.16 | - | - |

## John Deere 6920S AutoQuad (4WD)

**DLG-Test No. 2002-096**

| 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 |
|---|---|---|---|---|---|---|
| 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 | | | | | | |
| 106.7 | 1995 | 1000 | 25.06 | 30.12 | 235 | 3.54 |
| 3.1.5.2 85% of the torque obtained in 3.1.5.1 | | | | | | |
| 92.0 | 2030 | 1018 | 22.14 | 26.61 | 241 | 3.46 |
| 3.1.5.3 75% of the torque defined in 3.1.5.2 | | | | | | |
| 70.0 | 2054 | 1030 | 18.23 | 21.91 | 260 | 3.19 |
| 3.1.5.4 50% of the torque defined in 3.1.5.2 | | | | | | |
| 47.2 | 2074 | 1040 | 14.13 | 16.98 | 300 | 2.78 |
| 3.1.5.5 25% of the torque defined in 3.1.5.2 | | | | | | |
| 23.8 | 2094 | 1050 | 10.10 | 12.14 | 425 | 1.96 |
| 3.1.5.6 Unloaded | | | | | | |
| - | 2120 | 1063 | 6.11 | 7.35 | - | - |

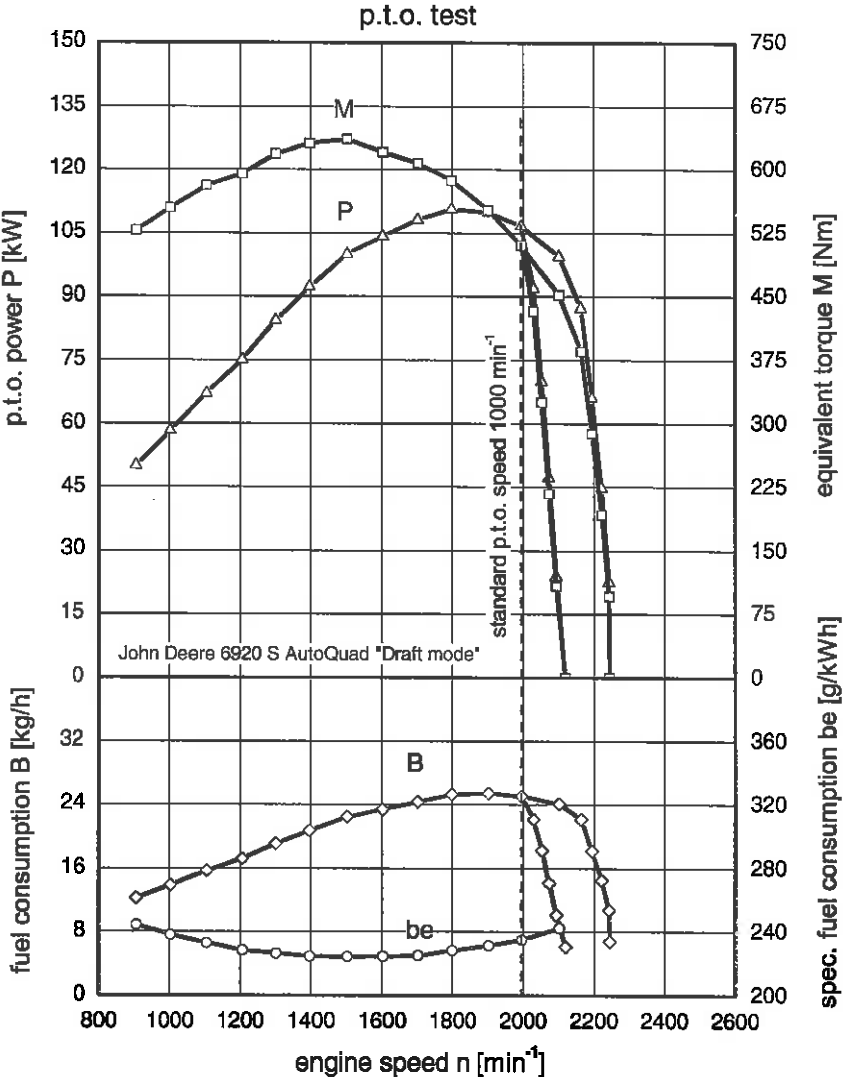
| | |
|---|---|
| No load maximum engine speed: | 2244 min$^{-1}$ |
| Equivalent flywheel torque at rated engine speed: | 452 Nm |
| Equivalent flywheel torque at 2-hour test: | 589 Nm |
| At engine speed: | 1802 min$^{-1}$ |
| Maximum equivalent flywheel torque: | 636 Nm |
| At engine speed: | 1502 min$^{-1}$ |

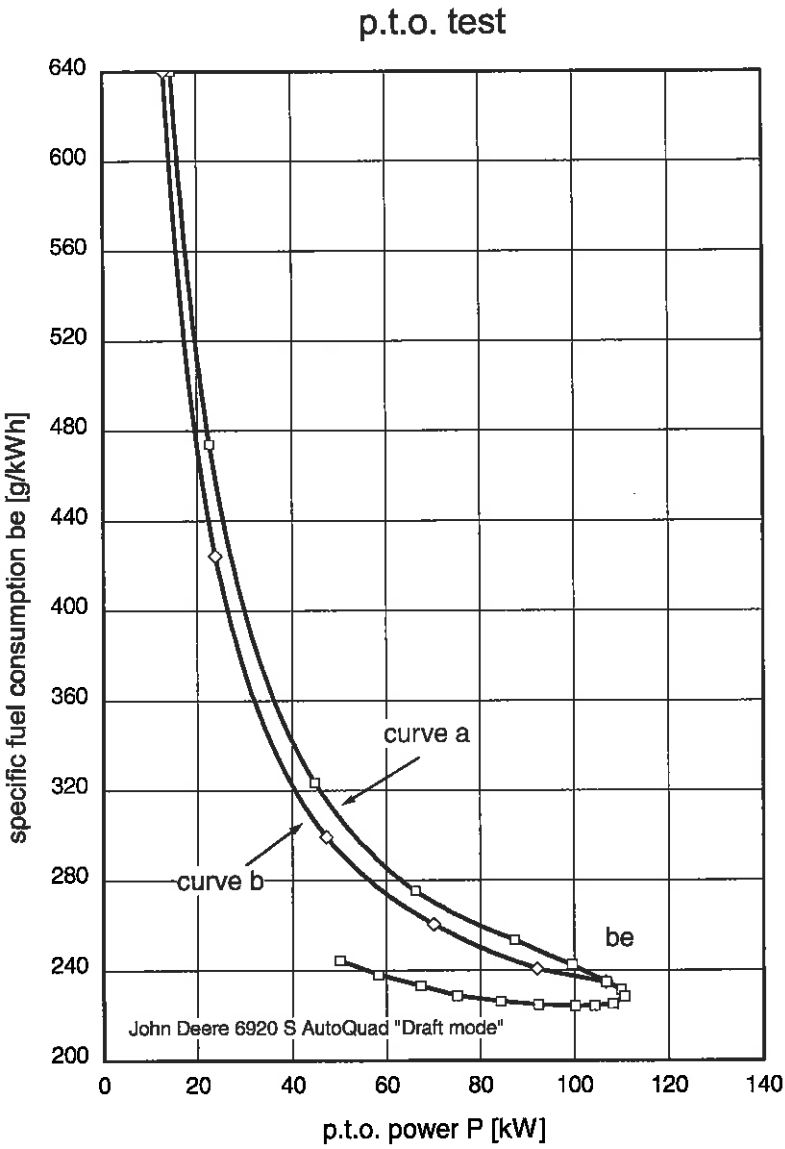
Mean atmospheric conditions

| | |
|---|---|
| Temperature: | 29 °C |
| Pressure: | 100.1 kPa |
| Relative humidity: | 62 % |

Maximum temperatures

| | |
|---|---|
| Coolant: | 84 °C |
| Oil: | 105 °C |
| Fuel: | 40 °C |
| Air intake: | 29 °C |


p.t.o. test
M
P
B
be
John Deere 6920 S AutoQuad "Draft mode"
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]
150
135
120
105
90
75
60
45
30
15
0
750
675
600
525
450
375
300
225
150
75
0
32
24
16
8
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
120
140
p.t.o. power P [kW]
curve a
curve b
be
John Deere 6920 S AutoQuad "Draft mode"

## 3.2 HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 18th July and 19th July 2002

### 3.2.1 Hydraulic power test

- Sustained pressure with relief valve open 20.1 MPa
- Pump stalled: No
- Pump delivery rate at minimum pressure 68.6 dm³/min [1]
  68.8 dm³/min [2]

| | Flow rate dm³/min | Pressure MPa | Hydraulic power kW | Oil temperature °C |
|---|---|---|---|---|
| At 90% of the actual relief valve setting [1] | 65.2 | 18.1 | 19.7 | 65 |
| [2] | 65.3 | 18.1 | 19.7 | |
| Maximum [1] | 65.2 | 18.1 | 19.7 | 65 |
| [2] | 64.3 | 19.2 | 20.6 | |

- 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 | 230 mm | |
| Vertical movement without lifting forces | 700 mm | 700 mm |
| with lifting forces | 686 mm | 892 mm |
| Max. corrected force exerted through full range | 60.50 kN | 43.20 kN |
| Corresponding pressure | 18.1 MPa | |
| Moment about rear axle | 67.76 kNm | 74.74 kNm |
| Max. tilt angle of mast from vertical | - | 13° |

Lifting heights relative to horizontal lower links

| mm | -466 | -400 | -384 | -300 | -200 | -100 | 0 | +100 | +200 | +300 | +400 | +426 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lifting forces at hitch points, corrected to 18.1 MPa | | | | | | | | | | | | |
| kN | | | 60.50 | 61.00 | 62.20 | 63.20 | 64.40 | 65.70 | 67.30 | 68.90 | | |
| Lifting forces at standard frame, corrected to 18.1 MPa | | | | | | | | | | | | |
| kN | 51.50 | 50.90 | | 50.40 | 50.00 | 49.50 | 48.60 | 47.50 | 46.60 | 45.50 | 43.90 | 43.20 |

## 3.3 DRAWBAR POWER TEST (unballasted tractor)

Date of test: 2nd till 5th July 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) | | | | | |
| B1 | 78.8 | 60.64 | 4.68 | 2112 | 14.9 |
| B2 | 87.2 | 60.94 | 5.15 | 1937 | 15.1 |
| B3 | 93.3 | 55.59 | 6.04 | 1801 | 10.6 |
| C1 | 94.3 | 49.89 | 6.81 | 1798 | 8.7 |
| B4 | 94.6 | 44.12 | 7.72 | 1804 | 6.8 |
| C2 | 96.0 | 41.46 | 8.34 | 1794 | 6.7 |
| C3 | 96.8 | 34.21 | 10.18 | 1801 | 5.2 |
| C4 | 96.9 | 27.81 | 12.54 | 1795 | 4.3 |
| D1 | 94.8 | 25.79 | 13.24 | 1802 | 4.1 |
| D2 | 96.3 | 22.17 | 15.65 | 1798 | 4.6 |
| D3 | 96.3 | 18.33 | 18.90 | 1799 | 3.8 |
| FUEL CONSUMPTION | | | | | |
| 3.3.2.1 In selected gear, at maximum power at rated speed | | | | | |
| C3 | 85.5 | 25.52 | 12.06 | 2103 | 3.6 |
| 3.3.2.1.1 75 % of pull at maximum power at rated speed | | | | | |
| C3 | 67.3 | 19.20 | 12.62 | 2178 | 2.7 |
| 3.3.2.1.2 50 % of pull at maximum power at rated speed | | | | | |
| C3 | 45.2 | 12.58 | 12.93 | 2211 | 1.7 |
| 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 | 67.5 | 19.31 | 12.58 | 1771 | 2.7 |
| 3.3.2.1.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2 | | | | | |
| C4 | 45.4 | 12.68 | 12.88 | 1797 | 1.8 |
| 3.3.2.2 In selected gear nearest to 7.50 km/h at rated speed | | | | | |
| B3 | 86.9 | 42.52 | 7.36 | 2104 | 6.8 |
| 3.3.2.2.1 75 % of pull at maximum power at rated speed | | | | | |
| B3 | 69.3 | 32.12 | 7.77 | 2178 | 4.9 |
| 3.3.2.2.2 50 % of pull at maximum power at rated speed | | | | | |
| B3 | 48.2 | 21.60 | 8.03 | 2212 | 3.2 |
| 3.3.2.2.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1 | | | | | |
| B4 | 69.1 | 32.23 | 7.72 | 1767 | 4.8 |
| 3.3.2.2.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2 | | | | | |
| B4 | 48.4 | 21.82 | 7.98 | 1795 | 3.1 |

**John Deere 6920S AutoQuad (4WD)** **DLG-Test No. 2002-096**

| | Height of drawbar above ground | Tyre inflation pressure | |
|---|---|---|---|
| | | Front | Rear |
| Unballasted | 530 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 |
| | | | | | | | |
| 310 | 2.70 | 46 | 76 | 105 | 23 | 60 | 99.4 |
| 296 | 2.83 | 44 | 77 | 106 | 21 | 60 | 99.4 |
| 276 | 3.04 | 43 | 77 | 103 | 19 | 60 | 99.4 |
| 272 | 3.08 | 43 | 77 | 104 | 20 | 75 | 99.3 |
| 272 | 3.04 | 43 | 77 | 103 | 19 | 75 | 99.3 |
| 269 | 3.13 | 42 | 76 | 103 | 19 | 75 | 99.3 |
| 265 | 3.16 | 43 | 77 | 103 | 20 | 75 | 99.3 |
| 266 | 3.16 | 43 | 77 | 103 | 21 | 75 | 99.3 |
| 273 | 3.07 | 43 | 77 | 103 | 21 | 75 | 99.3 |
| 268 | 3.12 | 44 | 78 | 104 | 22 | 75 | 99.3 |
| 269 | 3.11 | 42 | 77 | 102 | 21 | 75 | 99.3 |
| | | | | | | | |
| 285 | 2.94 | 42 | 75 | 104 | 23 | 60 | 99.4 |
| | | | | | | | |
| 308 | 2.73 | 44 | 74 | 104 | 23 | 60 | 99.4 |
| | | | | | | | |
| 357 | 2.35 | 45 | 65 | 100 | 23 | 60 | 99.4 |
| | | | | | | | |
| 279 | 3.01 | 43 | 74 | 101 | 23 | 60 | 99.4 |
| | | | | | | | |
| 323 | 2.59 | 44 | 67 | 99 | 23 | 60 | 99.4 |
| | | | | | | | |
| 283 | 2.96 | 43 | 74 | 102 | 22 | 60 | 99.4 |
| | | | | | | | |
| 299 | 2.80 | 45 | 74 | 104 | 22 | 60 | 99.4 |
| | | | | | | | |
| 338 | 2.48 | 47 | 69 | 102 | 22 | 60 | 99.4 |
| | | | | | | | |
| 277 | 3.02 | 47 | 75 | 101 | 24 | 60 | 99.4 |
| | | | | | | | |
| 307 | 2.73 | 48 | 67 | 100 | 24 | 60 | 99.4 |

## 4 ADDITIONAL TESTS under the responsibility of the DLG Testing Station

### 4.1 Main power take off performance (1000 min$^{-1}$) "Transport/PTO mode"

Date of tests: 20th June 2002
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$^{-1}$ | kg/h | dm³/h | g/kWh | kWh/dm³ |

Maximum power

4.1.1 At 2-hour test

| | | | | | | |
|---|---|---|---|---|---|---|
| 114.5 | 1957 | 981 | 26.53 | 31.89 | 232 | 3.59 |

4.1.2 At rated speed

| | | | | | | |
|---|---|---|---|---|---|---|
| 108.6 | 2100 | 1053 | 25.98 | 31.23 | 239 | 3.48 |

4.1.3 At standard p.t.o. speed

| | | | | | | |
|---|---|---|---|---|---|---|
| 114.5 | 1995 | 1000 | 26.60 | 31.97 | 232 | 3.58 |

4.1.4 Part loads, the governor hand lever in the position corresponding to maximum power at full load (curve a)

4.1.4.1 The torque corresponding to maximum power at rated speed

| | | | | | | |
|---|---|---|---|---|---|---|
| 108.6 | 2100 | 1053 | 25.98 | 31.23 | 239 | 3.48 |

4.1.4.2 85% of the torque obtained in 3.1.4.1

| | | | | | | |
|---|---|---|---|---|---|---|
| 94.7 | 2154 | 1080 | 23.33 | 28.04 | 247 | 3.38 |

4.1.4.3 75% of the torque defined in 3.1.4.2

| | | | | | | |
|---|---|---|---|---|---|---|
| 72.1 | 2186 | 1096 | 19.22 | 23.10 | 267 | 3.12 |

4.1.4.4 50% of the torque defined in 3.1.4.2

| | | | | | | |
|---|---|---|---|---|---|---|
| 48.7 | 2216 | 1111 | 15.08 | 18.13 | 310 | 2.69 |

4.1.4.5 25% of the torque defined in 3.1.4.2

| | | | | | | |
|---|---|---|---|---|---|---|
| 24.7 | 2243 | 1124 | 10.83 | 13.02 | 439 | 1.90 |

4.1.4.6 Unloaded

| | | | | | | |
|---|---|---|---|---|---|---|
| - | 2245 | 1125 | 6.62 | 7.95 | - | - |

## John Deere 6920S AutoQuad (4WD)

**DLG-Test No. 2002-096**

| 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/$dm^3$ |
|---|---|---|---|---|---|---|
| 4.1.5 Part loads, the governor hand lever in the position corresponding to standard p.t.o. speed at full load (curve b) | | | | | | |
| 4.1.5.1 The torque corresponding to maximum power | | | | | | |
| 114.5 | 1995 | 1000 | 26.60 | 31.97 | 232 | 3.58 |
| 4.1.5.2 85% of the torque obtained in 3.1.5.1 | | | | | | |
| 98.4 | 2022 | 1014 | 23.50 | 28.25 | 239 | 3.48 |
| 4.1.5.3 75% of the torque defined in 3.1.5.2 | | | | | | |
| 74.8 | 2048 | 1027 | 19.03 | 22.87 | 255 | 3.27 |
| 4.1.5.4 50% of the torque defined in 3.1.5.2 | | | | | | |
| 50.4 | 2070 | 1038 | 14.54 | 17.48 | 288 | 2.88 |
| 4.1.5.5 25% of the torque defined in 3.1.5.2 | | | | | | |
| 25.5 | 2092 | 1049 | 10.25 | 12.32 | 402 | 2.07 |
| 4.1.5.6 Unloaded | | | | | | |
| - | 2121 | 1063 | 5.97 | 7.17 | - | - |

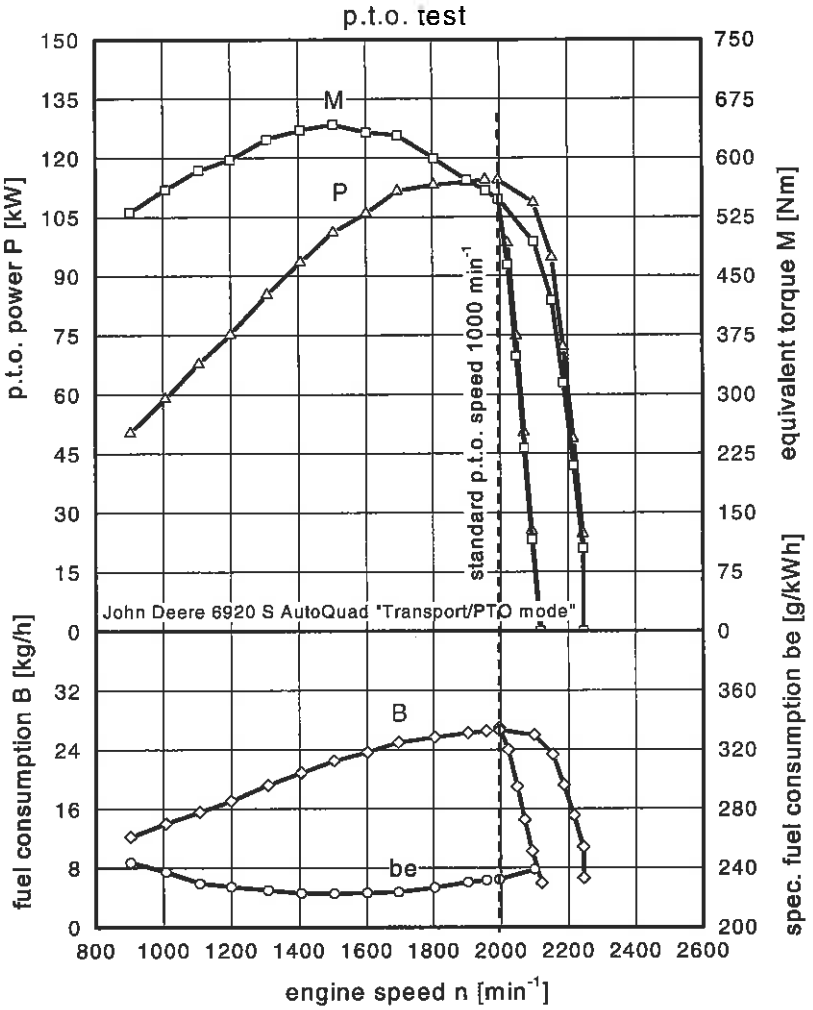
| | |
|---|---|
| No load maximum engine speed: | 2245 $min^{-1}$ |
| Equivalent flywheel torque at rated engine speed: | 494 Nm |
| Equivalent flywheel torque at 2-hour test: | 559 Nm |
| At engine speed: | 1957 $min^{-1}$ |
| Maximum equivalent flywheel torque: | 642 Nm |
| At engine speed: | 1504 $min^{-1}$ |

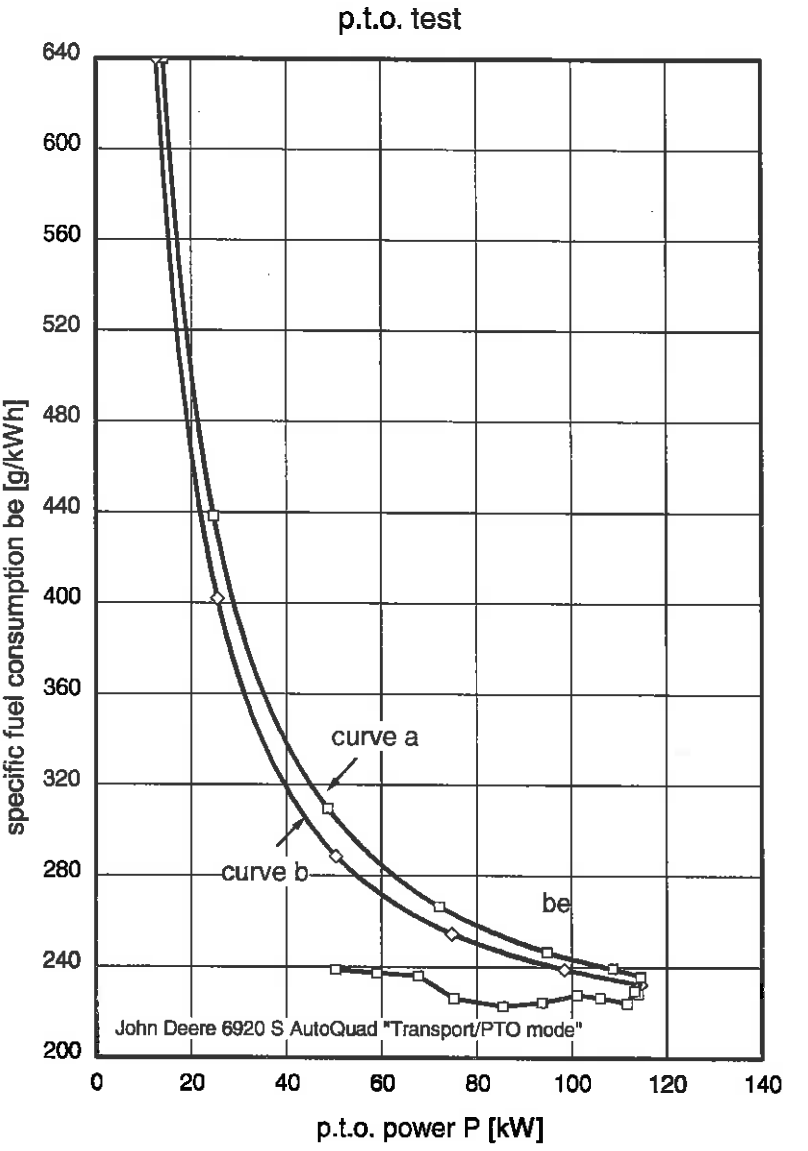
Mean atmospheric conditions

| | |
|---|---|
| Temperature: | 27 °C |
| Pressure: | 99.7 kPa |
| Relative humidity: | 60 % |

Maximum temperatures

| | |
|---|---|
| Coolant: | 83 °C |
| Oil: | 105 °C |
| Fuel: | 40 °C |
| Air intake: | 27 °C |


p.t.o. test
M
P
B
be
standard p.t.o. speed 1000 min-1
John Deere 6920 S AutoQuad "Transport/PTO mode"
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]
150
135
120
105
90
75
60
45
30
15
0
750
675
600
525
450
375
300
225
150
75
0
32
24
16
8
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
120
140
p.t.o. power P [kW]
curve a
curve b
be
John Deere 6920 S AutoQuad "Transport/PTO mode"

## 4.2 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: 9th till 11th July 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 | | | | |
| B3 | 39.81 | 2106 | 7.41 | 4 | 71.0 |
| A4 | 59.97 | 2173 | 3,88 | 4 | 72.0 |
| B1 | 57.89 | 2153 | 4.48 | 4 | 72.5 |
| B3 | 43.17 | 2150 | 6.95 | 2 | 72.0 |
| C1 | 38.07 | 2147 | 8.01 | 2 | 73.0 |
| C2 | 30.11 | 2141 | 9.82 | 2 | 73.0 |
| C 3 | 24.26 | 2150 | 12.04 | 2 | 73.0 |
| C 4 | 17.79 | 2164 | 15.02 | 2 | 73.0 |
| 4.2.1.2 | All openings open *) | | | | |
| B3 | 38.48 | 2106 | 7.53 | 4 | 81.0 |
| C4 | 19.53 | 2099 | 14.82 | 4 | 82.0 |
| D1 | 20.40 | 2105 | 15.62 | 4 | 82.5 |
| B3 | 43.67 | 2109 | 6.95 | 2 | 81.5 |
| C1 | 38.69 | 2107 | 7.76 | 2 | 82.5 |
| D1 | 19.53 | 2108 | 15.31 | 2 | 83.0 |
| 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 | | | | |
| B3 | 0 | 2245 | 8.42 | 4 | 70.5 |
| B3 | 0 | 2243 | 8.31 | 2 | 71.0 |

| Gear number and range | Drawbar pull | Engine speed | Measured travelling speed | Number of driving wheels | Sound level |
|---|---|---|---|---|---|
| | kN | $min^{-1}$ | km/h | | dB(A) |
| 4.2.2.2. All openings open *) | | | | | |
| B3 | 0 | 2245 | 8.42 | 4 | 79.0 |
| B3 | 0 | 2245 | 8.31 | 2 | 80.5 |
| 4.2.3 Unloaded test in the gear ratio giving the maximum forward speed | | | | | |
| 4.2.3.1 All openings closed | | | | | |
| E4 | 0 | 2243 | 43.46 | 2 | 74.0 |
| 4.2.3.2 All openings open *) | | | | | |
| E4 | 0 | 2245 | 43.46 | 2 | 81.0 |

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

| | | |
|---|---|---|
| **5** | **REPAIRS** | **None** |
| **6** | **REMARKS** | The engine of the tractor John Deere 6920S AutoQuad has two different injection pump characteristics:<br>- Standard setting, "draft mode", for heavy drawbar work and also for PTO-operation with standing tractor;<br>- Application tailored engine performance setting, "transport/PTO mode", for transport work at forward speeds higher than about 14 km/h and for PTO work at forward speeds higher than about 2 km/h. In this mode the max. fuel injection at high engine speeds is increased.<br>The test of PTO-power for the additional test reported on pages 28 to 31 was provided by a special modification of the electronic control of the injection pump. |

Head of Vehicle Technology / Safety Division

Dipl.-Ing. Winfried Gramatte

Test carried out by

Dipl.-Ing. (FH) Thomas Feuerstein

Date: 10th February 2003




Wir setzen Maßstäbe

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