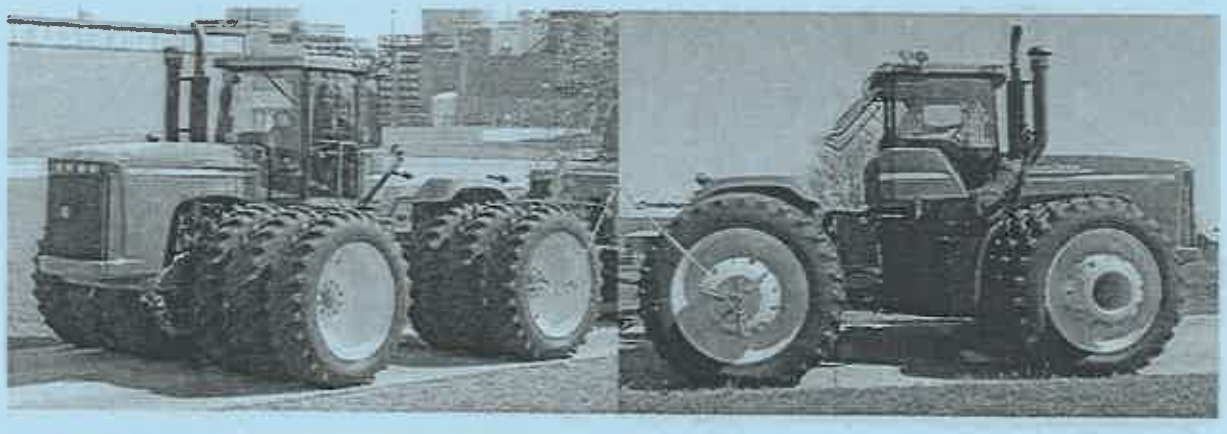
OECD APPROVAL NO. 2/2 040
CODE 2
DATE OF APPROVAL: 5 February 2003

NEBRASKA TRACTOR TEST LABORATORY
DEPARTMENT OF BIOLOGICAL SYSTEMS ENGINEERING
INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF NEBRASKA - EAST CAMPUS
LINCOLN, NEBRASKA 68583-0832, USA

REPORT ON TEST IN ACCORDANCE WITH OECD STANDARD CODE 2 FOR THE OFFICIAL TESTING OF AGRICULTURAL TRACTORS



JOHN DEERE 9520
Powershift
Articulated 4 Wheel Drive with Triple Wheels

MANUFACTURED BY:	**John Deere Tractor Works** **3500 East Donald Street** **P.O. Box 270** **Waterloo, Iowa 50704-0270**
NEBRASKA TEST NO.	**1805**
TEST DATES:	**March 28 – May 31, 2002**

TABLE OF CONTENTS

Page

1. **SPECIFICATIONS** 1

2. **TEST CONDITIONS** 15

3. **COMPULSORY TESTS**
   - **3.1** Main Power Take-Off Performance (Standard Power) 18
   - **3.2** Hydraulic Power and Lifting Forces 19
   - **3.3** Drawbar Performance 21

4. **OPTIONAL TESTS**
   - **4.1** Drawbar Power (Unballasted – 2100 rev/min) 22
   - **4.2** Drawbar Power (Ballasted – 1800 rev/min) 23
   - **4.3** Power Lift Test (Category IV) 24
   - **4.4** Measurement of External Noise Level 25
   - **4.5** Measurement of Noise Level at Operator's Ear 25

5. **REPAIRS** 25

6. **REMARKS** 25

7. **PTO PERFORMANCE CURVES (Standard Power)** 26

8. **PTO PERFOMANCE DATA AND CURVES (Full Power)** 29

This test report provides the results of the tests conducted in accordance with the OECD Standard Test Code for the Official Testing of Agricultural Tractor Performance - C(87)53 Final, Code 2.

This report has been approved by the OECD Coordinating Centre in Paris on 5 February 2003 for the John Deere 9520 Powershift, articulated four-wheel drive tractor with OECD Number 2/2 040.

No reproduction of this report or any part of it can be made without prior approval by the Nebraska Tractor Test Laboratory, Lincoln, Nebraska USA.

Dr. Leonard L. Bashford, Director
Nebraska Tractor Test Laboratory and
Chair, Nebraska Tractor Test Board

David L. Morgan, Assistant Director
Nebraska Tractor Test Laboratory

Brent T. Sampson, Test Engineer
Nebraska Tractor Test Laboratory

Date MAR 2 1 2003

SPECIMEN TEST REPORT

Note: Units shown below, which appear in ISO 1000:1992, shall be stated and followed by national units in parentheses, if necessary.

- Tractor manufacturer's name and address:	John Deere Tractor Works 3500 East Donald St. P.O. Box 270 Waterloo, IA 50704-0270
- Location of tractor assembly:	Same
- Submitted for test by:	The Manufacturer
- Selected for test by:	The Manufacturer in agreement with the Nebraska Tractor Test Laboratory
- Place of running-in:	John Deere Product Engineering Center, Waterloo, Iowa
- Duration of running-in:	182 hours
- Location of test:	Nebraska Tractor Test Laboratory, Lincoln, Nebraska U.S.A.

1. SPECIFICATIONS OF TRACTOR

1.1 Identification

1.1.1 Make of the tractor:	John Deere
- Model:	9520
- Type:	Articulated frame, four-wheel drive
- Number of driving wheels:	4; 8; 12
1.1.2 *Numbers*	
- 1st Serial N :	CONFIDENTIAL
- Serial N :	RW9520P001254
1.1.3 *Other specifications:*	
- Transmission type	Powershift

1.2 Engine

- Make:	John Deere
- Model:	6125HRW15
- Type:	4-stroke diesel; direct injection; turbocharged; air-to-air aftercooled
- Serial N:	RG6125H031903
1.2.1 *Cylinders*	
- Number/disposition:	6, in-line, vertical
- Bore/stroke:	127 mm/ 165 mm
- Capacity:	12536 cm^3
- Compression ratio:	17.0:1
- Arrangement of valves:	Overhead
- Cylinder liners (wet or dry):	Wet; replaceable

1.2.2 *Supercharging*

- Make:	Borg Warner
- Model:	RE506332
- Type:	Exhaust Driven
- Pressure:	168 kPa at rated engine speed and full load

1.2.3 *Fuel system*

-Fuel feed system:	Engine Driven Transfer pump
-Type of fuel filter(s):	Multi-layer-water-separating
-Make:	Haldex - Barnes
-Model:	RE508282
-Capacity of fuel tank:	1022 dm^3
-Type of injection pump:	Unit Injector (with John Deere Focus controller); EUI, electronic
-Make:	Parker
-Model:	Delphi EUI 200
-Serial N:	NA
-Manufacturer's production setting of injection pump	
· Flow rate (rated engine speed and full load):	72.63 ± 3.56 dm^3/h at 279.6 kW 84.25 ± 4.15 dm^3/h at 335.5 kW
· Timing:	Variable
-Type of injectors:	Unit Injector
-Make:	EUI Delphi
-Model:	RE505207
-Injection pressure:	170 Mpa
-Type of carburetor:	NA
-Make:	NA
-Model:	NA

1.2.4 *Governor*

- Make:	John Deere
- Model:	Focus
- Type:	Electronic Control
- Governed range of engine speed	900 rpm to 2255 rpm
- Rated engine speed:	2100 min^{-1}(rev/min)

1.2.5 *Air cleaner*

-Pre-cleaner	
· Make:	Donaldson
· Model:	RE63932
· Type:	Strato-tube pre-cleaner with aspirator
·Location of air intake:	Top of Air Stack, right front corner of cab
-Main cleaner	
· Make:	Donaldson
· Model:	RE63931
· Type:	Pleated Paper

·Location of air intake (in case of no pre cleaner):	Right Front
-Maintenance indicator:	Dash mounted warning light and audible signal

1.2.6 *Lubrication system*

- Type of feed pump:	Full pressure; positive displacement
- Type of filter(s):	Full flow
- Number of filters:	One; top load
- Oil Cooler:	Heat exchanger with engine coolant

1.2.7 *Cooling system*

- Type of coolant:	Liquid
- Type of pump:	Centrifugal, Gear-driven
- Specification of fan or blower	Belt driven; suction type; variable speed
·Number of fan blades:	8
·Fan diameter:	711 mm
- Coolant capacity:	60 dm^3
- Type of temperature control:	2 thermostats and variable speed fan
- Superpressure system:	69 ± 5 kPa

1.2.8 *Starting system*

- Make:	Delco-Remy
- Model:	RE61547
- Type:	Solenoid engaged
- Starter motor power rating:	6.9 kW
- Cold starting aid:	Ether spray in intake manifold
- Safety device:	Electrical lockout on gearshift lever

1.2.9 *Electrical system*

- Voltage:	12 V DC; neg ground
- Generator	
·Make:	Nippondenso
· Model:	RE46608
· Type:	Belt-driven
·Power:	1.9 kW
- Battery of accumulators	
·Number:	Three; 12-volt batteries in parallel
·Rating:	925 cold crank amp/battery, 175 Ah/battery at 20 hour rating

1.2.10 *Exhaust system*

- Make:	Nelson (muffler)
- Model:	RE71295
- Type:	Expansion Chamber
- Location:	Vertical muffler, right front corner of cab

1.3 Transmission

1.3.1 *Clutch (travel and power take-off/travel alone)*

- Make:	John Deere
- Model:	Multiple Plate
- Type:	Oil Cooled
- Number of plates:	7
- Diameter of plates:	279 mm
- Method of operation:	Hydraulic, pedal actuated

1.3.2 *Gear box*

- Make:	John Deere
- Model:	Full Powershift
- Type:	Mechanical
- Description:	Countershaft design consisting of 8 multi-disk hydraulically cooled clutches and multi-disk hydraulically cooled planetary brake.

	Forward	Reverse
Number of gears	18	6
Number of ranges/groups	NA	NA
Total of arrangements	18	6

1.3.3 *Rear axle and final drives*

- Make:	John Deere
- Model:	NA
- Type:	Spiral bevel gear and pinion, differential and inboard planetary reduction
- Differential lock	
· Type:	Electro/Hydraulic
· Method of engagement:	Foot operated switch
· Method of disengagement:	Self-disengaging w/ brake operation

1.3.4 *Front axle and final drives*

- Make:	John Deere
- Model:	NA
- Type:	Spiral bevel gear and pinion, differential and inboard planetary reduction
- Differential lock	
· Type:	Limited slip
· Method of engagement:	Self-engaging
· Method of disengagement:	Self-disengaging

1.3.5 *Total ratios and traveling speeds*

GearNo.	Number of engine revolutions for one revolution of the driving wheels	Nominal traveling speed (*) at rated engine speed of 2100 min-1 (rev/min) km/h
1	192.5600	3.72
2	156.4343	4.58
3	141.2714	5.07
4	126.5228	5.66
5	114.7985	6.25
6	102.7842	6.97
7	92.8414	7.72
8	83.1471	8.62
9	75.4414	9.49
10	67.5700	10.60
11	61.0242	11.74
12	55.2242	12.97
13	49.5900	14.45
14	44.8671	15.97
15	36.2914	19.74
16	29.4971	24.29
17	23.8628	30.03
18	19.3885	36.96
1R	192.5600	3.72
2R	141.2714	5.07
3R	126.5228	5.66
4R	92.8414	7.72
5R	83.1471	8.62
6R	61.0242	11.74
	Tire Rolling Radius	905 mm

-Number of revolutions of front wheels for one revolution of rear-wheels: 1.000

1.4 Power take-off (Optional; installed on tested version)

1.4.1 *Main power take-off*

-Type (independent, semi-independent or not independent):	Independent
-Method of engagement (if necessary describe the type of clutch):	Electro-Hydraulically actuated multi-plate wet clutch operated by single hand control switch
-Number of shafts:	One, 1000 RPM only
-Method of changing power take-off shaft ends and speeds:	None

1.4.1.1 Power take-off proportional to engine speed

Power take-off at 1000 min^{-1} (rev/min)

- Location:	Rear of tractor, center plane
- Diameter of power take-off shaft end:	44.5 mm
- Number of splines:	20; in conformity with ISO 500:1991
- Height above ground:	817 mm
- Distance from the median plane of the tractor:	0 mm
- Distance behind rear-wheel axis:	760 mm
- PTO speed at rated engine speed (2100 rev/min):	1108 min^{-1} (rev/min)
- Engine speed at standard power take-off speed:	1895 min^{-1} (rev/min)
- Ratio of rotation speeds (engine speed/p.t.o. speed):	1.895:1
- Power restriction:	Maximum power available
- Maximum torque transmissible:	Maximum torque available
- Direction of rotation (viewed from behind tractor):	Clockwise

1.4.1.2 Power take-off proportional to ground speed — Not Available

1.5 Hydraulic power lift

- Make:	John Deere
- Model:	NA
- Type:	Electro-Hydraulic lower link sensing; variable mix of draft and position control; adjustable rate of drop
-Type of hydraulic system:	Closed center, pressure and flow compensated
-Type and number of cylinders (single or double-acting):	2 external/ single acting Category III: Two; 90 x 276 Category IV: One 90 x 276 mm and one 100 x 276 mm
-Type of linkage lock for transport:	Electro-hydraulic
-Relief valve pressure setting (tolerance):	20.20 ± 0.40 Mpa
-Opening pressure of cylinder safety valve (if fitted):	23.25 ± 0.50 Mpa
-Lift pump type:	Axial piston, variable pressure and flow; Pressure and flow compensated
-Transmission between pump and engine:	Direct drive from transmission
-Type and number of filters:	Spin-on canister/ one
-Site of oil reservoir:	Under hood; engine compartment
-Type, number and location of tapping points:	4 pairs of ISO standard couplings at rear of tractor; 5th coupler optional. Additional inlet/outlet pair for externally controlled implements
-Maximum volume of oil available to external cylinders:	31.81 dm^3

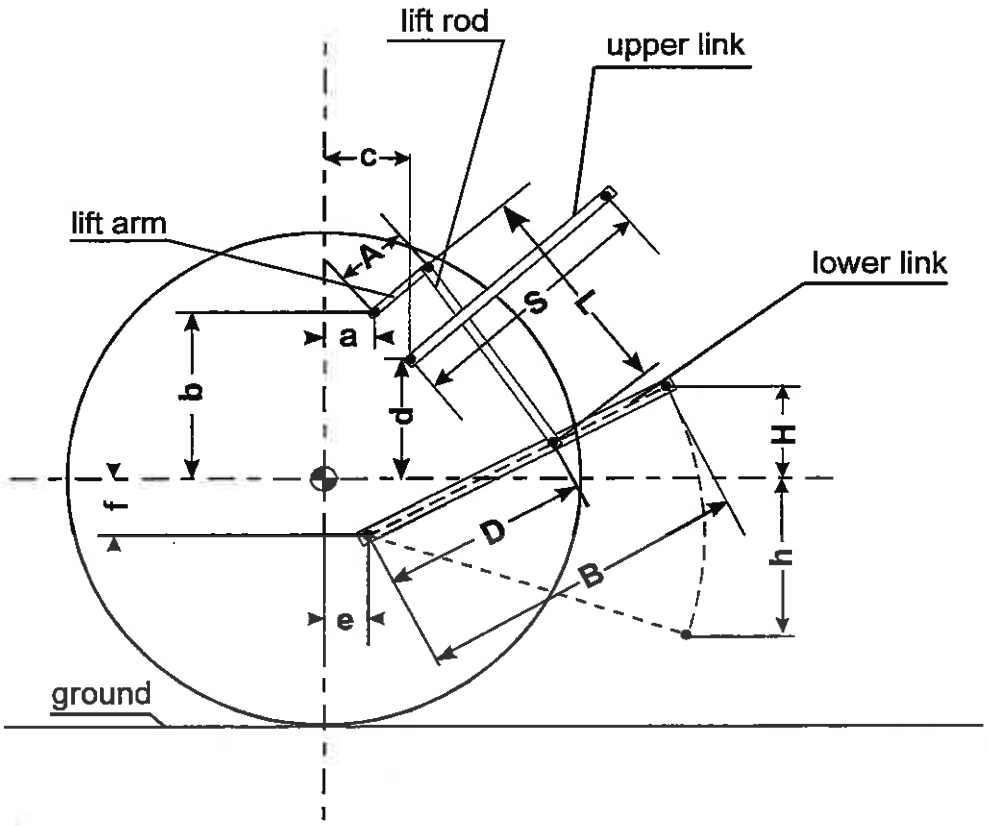


Figure 2.1
Lift test - Linkage Geometry

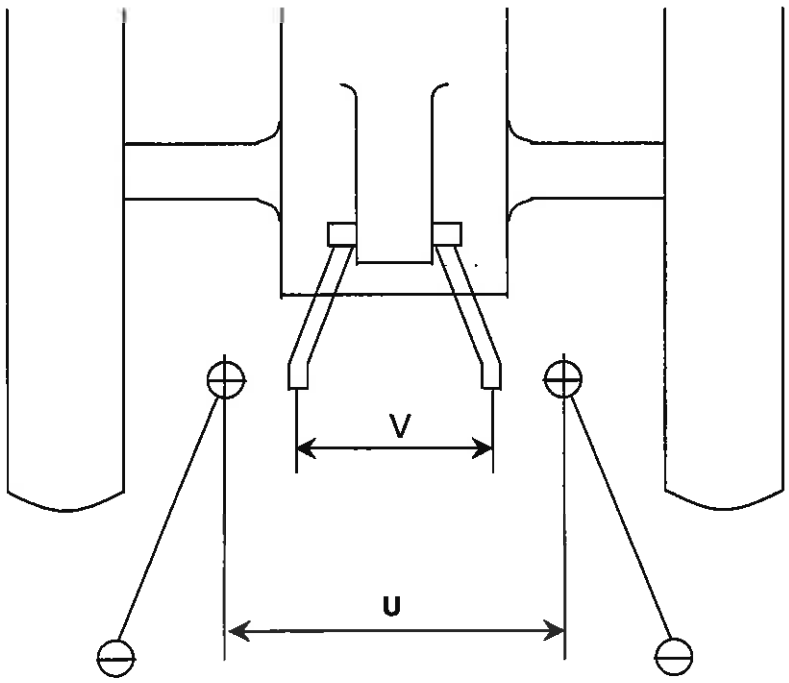


Figure 2.2
Lift test - Linkage Geometry

1.6.1 Three point linkage (Optional – not fitted on the tested tractor)

-Category: 3, in conformity with ISO 730-1:1994 +Cor. 1:1995 and ISO 730-2:1979.
-Category adapter: -Quick attaching coupler

		Dimension or range	Settings used in test
		mm	mm
Lift category:		3	3
Rear Tire – Radius Index:	(r)	905	same
Front Tire – Radius Index:	(r')	905	same
Length of lift arms:	(A)	472	same
Length of lower links:	(B)	1117	same
Distance of lift arm pivot point from rear-wheel axis:			
- horizontally	(a)	244	same
- vertically	(b)	620	same
Horizontal distance between the 2 lower link points:	(u)	640	same
Horizontal distance between the 2 lift arm end points:	(v)	750	same
Length of upper link:	(S)	705 to 825	781
Distance of upper link pivot point from rear wheel axis:			
- horizontally	(c)	577	same
- vertically	(d)	288	same
Distance of lower link pivot point from rear wheel axis:			
- horizontally	(e)	288	same
- vertically	(f)	350	same
Distance of lower link pivot points to lift rod pivot points on lower links:	(D)	731	same
Length of lift rods:	(L)	1030 to 1150	1121
Height of lower hitch points relative to the rear-wheel axis:			
- in low position	(h)	521 to 724	676
- in high position	(H)	89 to 284	118
Height above ground of lower hitch points when locked in transport position (*)		1005 to 1201	1022
(*) Assuming r = 905 mm tyre dynamic radius index (pneumatic tyred tractors only)			

1.6.2 Three point linkage (Optional – not fitted on the tested tractor)

- Category: 4, in conformity with ISO 730-1:1994 +Cor. 1:1995 and ISO 730-2:1979.
- Category adapter: -Quick attaching coupler

		Dimension or range	Settings used in test
		mm	mm
Lift category:		4	4
Rear Tire – Radius Index:	(r)	905	same
Front Tire – Radius Index:	(r')	905	same
Length of lift arms:	(A)	472	same
Length of lower links:	(B)	1097	same
Distance of lift arm pivot point from rear-wheel axis:			
- horizontally	(a)	244	same
- vertically	(b)	620	same
Horizontal distance between the 2 lower link points:	(u)	640	same
Horizontal distance between the 2 lift arm end points:	(v)	750	same
Length of upper link:	(S)	705 to 825	770
Distance of upper link pivot point from rear wheel axis:			
- horizontally	(c)	577	same
- vertically	(d)	288	same
Distance of lower link pivot point from rear wheel axis:			
- horizontally	(e)	288	same
- vertically	(f)	350	same
Distance of lower link pivot points to lift rod pivot points on lower links:	(D)	718	same
Length of lift rods:	(L)	1030 to 1150	1124
Height of lower hitch points relative to the rear-wheel axis:			
- in low position	(h)	521 to 724	669
- in high position	(H)	89 to 284	118
Height above ground of lower hitch points when locked in transport position (*)		1005 to 1201	1023
(*) Assuming r = 905 mm tyre dynamic radius index (pneumatic tyred tractors only)			

1.7 Swinging drawbar

-Type:	Oscillating
-Height above ground	
· Maximum:	489 mm
· Minimum:	464 mm
-Type of adjustment:	Invert drawbar; removable clevis
-Distance of hitch point from rear-wheel axis, horizontally:	1268 mm
-Distance of hitch point from power take-off shaft end	
· Vertically:	300 mm
· Horizontally:	508 mm
-Lateral adjustment (centre of clevis)	
· Right hand	200 mm
· Left hand	200 mm
-Distance of pivot point from rear-wheel axis, horizontally:	585 mm
-Diameter of drawbar pin hole:	52.5 mm
-Maximum vertical permissible load:	20 kN

1.8 Trailer hitch

Not available

1.9 Holed drawbar

Not available

1.10 Steering

- Make:	Eaton
- Model:	RE61112
- Type:	Hydrostatic
- Method of operation	Steering wheel
· Pump(s):	Same as main hydraulic pump
· Ram(s):	Two external; double acting
- Working pressure:	18.4 ± 0.4 Mpa

1.11 Brakes

1.11.1 *Service brake*

- Make:	Vickers-John Deere
- Model:	RE175393
- Type:	Load sensing power with manual backup
- Method of operation:	Hydraulic oil immersed disc operated by one pedal
- Trailer braking take-off (hydraulic or air brake):	None

1.11.2 *Parking brake*

- Type: Spring applied, Hydraulic release
- Method of operation: Gear selector lever

1.12 Wheels

- Number
  - · Front: 2; 4; 6; driving and steering
  - · Rear: 2; 4; 6; driving and steering
- Wheelbase: 3500 mm

- Track width adjustment:

	Minimum	Maximum	Adjustment
	mm	mm	method
Inner wheels	1460	1910	Rack axle, reversing wheels and offset rims
Center wheels	2610	2820	Same as inner wheels
Outer wheels	3950	4160	Spacer between center and outer wheels

1.13 Protective structure

- Make: John Deere
- Model: SG-079
- Type: Sound-Gard body
- Manufacturer's name and address: John Deere Tractor Works
  Waterloo, Iowa, USA

- Protective device
  - · Cab/frame/ rollguard/ other: Cab
  - · Tiltable/not tiltable: Not tiltable

- OECD approval
  - · Approval number: 4/0 717
  - · Date of approval: 4 April 2002
  - · Nos. of minor modification certificates, if any: None

1.14 Seat

1.14.1 *Driver's seat*

- Make:	John Deere
- Model:	Comfort Command
- Type:	Air Cushion Suspension
- Seat and steering wheel reversible: Yes/No	No
- Type of suspension:	Air
- Type of damping:	Adjustable, viscous damping
- Range of adjustment	
· Longitudinally:	178 mm
· Vertically	172 mm
- Safety belt Yes/No	Yes

1.14.2 *Optional driver's seat(s)*

- Make:	John Deere
- Model:	John Deere Active Seat ™
- Type of suspension:	Air/Hydraulic
- Type of damping:	Active Position Control
- Range of adjustment	
· Longitudinally:	178 mm
· Vertically:	172 mm travel; 92 mm adjustment range

1.14.3 *Instructional seat*

- Location:	Optional Instructional Seat located left of drivers seat
- Capacity (number):	One

1.15 Lighting

	Height above ground of centre	Size	Distance from outside edge of lights to median plane of tractor
	mm	mm	mm
Headlights			
Outside	2185	135 x 90	445
Inside	2185	155 x 115	270
Center	2185	130 x 85	65
Sidelights			
Front	3480	160 x 110	955
Rear	3480	160 x 110	955
Rear lights			
Outside	2050	160 x 110	980
Inside	2050	160 x 110	785
Hazard Lights			
Roof Front	3380	82 x 240(*)	715
Roof Rear	3340	82 x 240(*)	715
Extremity Lights		110 dia	
Tail lights	1855	210 x 95	900

(*) Wrap-around lights

2. TEST CONDITIONS

Separate tables may be added to report other test conditions or equipments.

2.1 Overall dimensions

	Length	Width		Height at top of	
		minimum	maximum	protective structure	exhaust pipe
	mm	mm	mm	mm	mm
Unballasted	7315	3437	3815	3530	3896
Ballasted	7315	5138	5826	3530	3896

2.2 Ground clearance (unballasted tractor): 315 mm

- Clearance-limiting part: Drawbar rear support

2.3 Tractor mass

Mass (with cab, full fuel tank):

	Without driver	With driver
	kg	kg
Unballasted		
Front	10149	10194
Rear	7234	7264
Total	17383	17458
Ballasted		
Front	11576	11621
Rear	8652	8682
Total	20228	20303

Ballast Added	Number of Weights	Total Mass	Liquid
		kg	kg
Front (weights)	6	1267	-
Front (weights)	2	155	-
Rear (weights)	6	1267	-
Rear (weights)	2	156	-

2.5 Tyres and track width specifications

		Front	Rear
Tyres:		Goodyear	Goodyear
- dimensions		480/80R46	480/80R46
- load index		158	158
- type		Radial DT – 712	Radial DT – 712
- maximum load (tyre manufacturer's)		4250 kg/tire	4250 kg/tire
- maximum load (tractor manufacturer's)		4250 kg/tire	4250 kg/tire
- inflation pressure (tyre manufacturer's)		240 kPa	240 kPa
- dynamic radius index		905 mm	905 mm
Chosen track width with triple wheels	Inner	1460 mm	1460 mm
	Center	2680 mm	2680 mm
	Outer	4020 mm	4020 mm

2.6 Fuel

-Type: No. 2 diesel in conformity with national standard

- Density at 15°C: 0.844 g/cm^3

2.7 Oils and lubricants

2.7.1 *Capacity and change interval*

	Capacity	Oil change	Filter change
	dm3	h	h
Engine	42	250 (375 with John Deere PLUS-50 oil and John Deere filter)	250
Transmission with front axle and rear axle	174 (PST)	1500	750
Hydraulic system combined and steering system	102	1500	750

2.7.2 *Specifications (SAE, API, CCMC, ACEA, Mil.L, ISO)*

	Recommended	Used during test
Engine oil · Type: · Viscosity: · Classification:	John Deere; Torq-Gard Supreme, PLUS-50 SAE 15W40 or 10W-40 12.5 - 16.3 cSt @ 100 C API CF-4; CH-4; ACEA E2	SAE 15W40
Transmission oils · Type: · Viscosity: · Classification:	John Deere HY-GARD; J20C SAE 10W-30 58 cSt at 43 C NA	same
Hydraulic fluid	Same as Transmission	same
Steering oil	Same as Transmission	same
Grease	John Deere Moly High Temperature EP Grease	same

2.7.3 *Grease*

- Number of lubrication points: 20

3. COMPULSORY TESTS RESULTS

3.1 Main power take-off

- Date and location of tests: 28-Mar-02 Nebraska Tractor Test Laboratory, Lincoln, NE, USA
- Type of dynamometer bench: Eaton

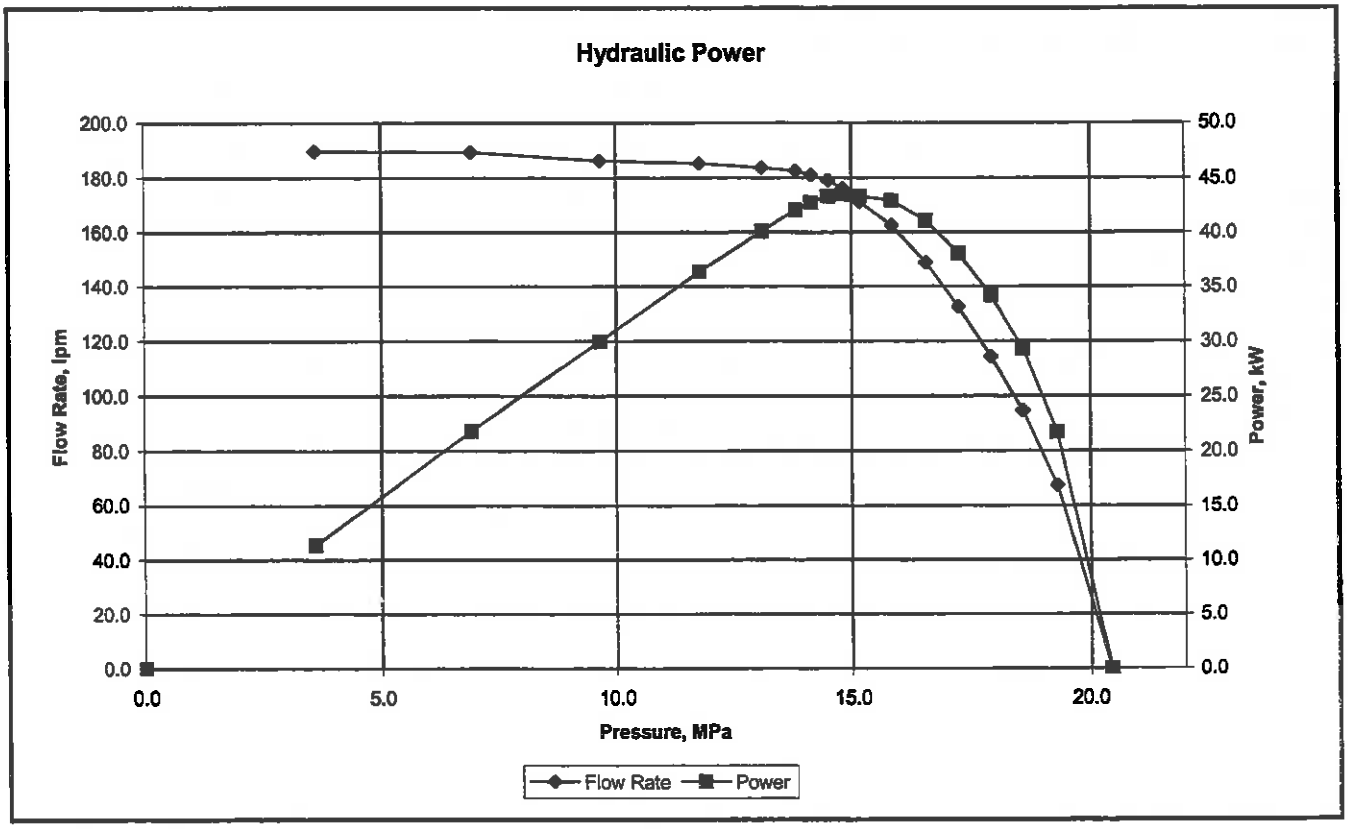
Power	Speed		Fuel consumption			Specific energy
	Engine	PTO	Hourly		Specific	
kW	rev/min		kg/h	l/h	g/kWh	kW-h/l
3.1 MAXIMUM POWER - TWO HOUR TEST						
276.31	1800	950	63.46	75.20	230	3.67
3.1.2 POWER AT RATED ENGINE SPEED						
248.52	2100	1108	61.98	73.46	249	3.38
3.1.3 STANDARD POWER TAKE-OFF SPEED (1000 +/- 25 rev/min)						
267.81	1896	1000	61.86	73.31	231	3.65
3.1.4 PART LOADS						
3.1.4.1 the torque corresponding to maximum power at rated engine speed						
248.52	2100	1108	61.98	73.46	249	3.38
3.1.4.2 85% of torque obtained in 3.1.4.1						
216.91	2156	1138	56.88	67.41	262	3.22
3.1.4.3 75% of torque defined in 3.1.4.2						
164.07	2173	1147	48.04	56.93	293	2.88
3.1.4.4 50% of torque defined in 3.1.4.2						
110.16	2195	1158	37.29	44.19	338	2.49
3.1.4.5 25% of torque defined in 3.1.4.2						
55.65	2217	1170	26.54	31.45	477	1.77
3.1.4.6 unloaded						
0.84	2237	1180	15.79	18.71	18844	0.04
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED (1000 +/- 25 rev/min)						
3.1.5.1 the torque corresponding to maximum power						
267.81	1896	1000	61.86	73.31	231	3.65
3.1.5.2 85% of torque obtained in 3.1.5.1						
232.78	1937	1022	55.11	65.31	237	3.56
3.1.5.3 75% of torque defined in 3.1.5.2						
176.65	1959	1034	45.59	54.02	258	3.27
3.1.5.4 50% of torque defined in 3.1.5.2						
119.18	1982	1046	36.20	42.90	304	2.78
3.1.5.5 25% of torque defined in 3.1.5.2						
60.20	2010	1060	24.09	28.54	400	2.11
3.1.5.6 unloaded						
0.76	2031	1072	13.20	15.64	17345	0.05

- No load maximum engine speed: 2237 rev/min
- Torque (equivalent crankshaft) at rated speed:
  - At rated engine speed 1130 Nm
  - At 2-hour test 1466 Nm
- Maximum torque (equivalent crankshaft) 1670 Nm
  (engine speed: 1150 rev/min)

Mean atmospheric conditions:		
Dry bulb	24	°C
Pressure	96.8	kPa
Relative Humidity	21	%
Maximum temperatures:		
Coolant	96	°C
Engine oil	118	°C
Fuel	65	°C
Engine air intake	53	°C

3.2.1 Hydraulic Power (two outlets)

Date of Test:	11-Apr-02	John Deere 9520	
Location of Test-City-State:		Tractor Test Lab, Lincoln, NE, USA	
Tapping point used for test:		Remote hydraulic outlets	
I.	Sustained pressure with pump stalled:		
	20.44 MPa		
	2964 psig		
II.	Pump delivery rate at minimum pressure:		
	189.6 l/min		
	50.1 gpm		
III.	Flow rate, pressure, power:		
	90% of relief valve setting		
	94.6 l/min	18.60 MPa	29.3 kW
	25.0 gpm	*2697 psig*	*39.3 hp*
	Maximum hydraulic power:		
	176.0 l/min	14.82 MPa	43.5 kW
	46.5 gpm	*2150 psig*	*58.3 hp*
IV.	Hydraulic fluid temperature at flow meter:		
	83 °C		
	181 °F		
	This hydraulic system does not use an accumulator. Opening and closing pressures of the unloading valve could not be measured.		



3.2.2 POWER LIFT TEST Category III, Quick attach linkage, 90 mm cylinders
Date of test: 23 June 1997. Test conducted on John Deere 9400 which is technically equivalent.

	Hitch points	Frame
Lower hitch points above ground - down position:	229 mm	231 mm
Vertical movement - without load:	793 mm	861 mm
with load:	774 mm	841 mm
Maximum corrected force exerted through full range:	62.2 kN	58.3 kN
Corresponding pressure:	18.3 MPa	18.3 MPa
Moment about rear axle:	97.6 kNm	127.0 kNm
Maximum mast tilt angle	--	6.7 degrees

Lifting height relative to horizontal position of lower links.

mm	-318	-300	-201	-99	0	99	201	300	401	455	526
Corrected lift forces											
At the Hitch point kN	63.6	62.2	64.6	66.6	68.6	70.2	71.5	72.6	73.6	73.7	--
at the frame kN	63.8	63.0	63.3	63.9	63.9	63.6	62.9	61.6	--	59.8	58.3
Corresponding pressure 18.3 MPa											

OECD Drawbar Data (SI)

Date of tests: 26,29-May-02							**Fuel density:**	0.844 kg/l						
Type of track: Concrete							**Test number:**	1805						
3.3.1 Maximum power in tested gears (unballasted, 4wd)							**Tire pressure:**	48 kPa, rear		83 kPa, front		**Drawbar Height:**	495 mm	
Gear	Gear Designation	Power	Drawbar pull	Speed	Engine speed	Slip	Fuel		Temperature			Atmospheric conditions		
							SFC	SFE	Fuel	Coolant	Oil	Temperature	Relative humidity	Pressure
		kW	kN	km/h	rev/min	%	kg/kW.h	kW.h/l	°C	°C	°C	°C	%	kPa
*1	1	175.65	179.55	3.52	2164	9	0.310	2.72	65	83	108	9	56	98.3
*2	2	212.28	178.50	4.28	2118	8	0.276	3.06	65	83	110	9	56	98.3
3	3	224.84	173.08	4.68	2074	7	0.276	3.06	64	84	112	10	63	98.3
4	4	234.52	169.22	4.99	1972	7	0.261	3.24	65	86	113	10	69	98.4
5	5	252.38	168.91	5.38	1930	7	0.260	3.24	65	84	113	11	76	98.3
6	6	259.61	162.43	5.75	1830	6	0.258	3.27	65	87	115	11	70	98.4
7	7	277.85	158.95	6.29	1801	5	0.257	3.29	66	89	117	11	70	98.4
8	8	302.26	154.55	7.04	1798	5	0.260	3.25	65	87	118	11	76	98.3
9	9	304.11	139.32	7.86	1801	4	0.256	3.30	64	85	116	11	76	98.2
10	10	303.97	123.97	8.83	1800	3	0.257	3.29	65	88	119	11	82	98.1
11	11	305.05	111.85	9.82	1801	3	0.257	3.29	64	88	117	11	82	98.1
12	12	307.21	101.76	10.87	1799	3	0.253	3.34	65	89	118	11	82	98.0
13	13	300.19	89.00	12.14	1799	2	0.258	3.28	65	87	118	11	76	98.0
14	14	305.70	81.85	13.44	1800	2	0.257	3.28	64	90	119	12	77	98.0
* Note: Pull limited to avoid excessive bouncing.														
3.3.2 Fuel consumption														
3.3.2.1			In selected gear at maximum power at rated engine speed.											
10	10	274.65	95.12	10.39	2101	2	0.261	3.24	65	88	110	11	76	98.1
3.3.2.1.1			75% of pull at maximum power at rated engine speed											
10	10	213.95	71.43	10.78	2167	2	0.289	2.92	66	87	116	17	66	97.7
3.3.2.1.2			50% of pull at maximum power at rated engine speed											
10	10	145.26	47.76	10.95	2188	1	0.333	2.53	66	84	111	18	62	97.7
3.3.2.1.3			Higher gear at reduced engine speed, same pull and travel speed as 3.3.2.1.1											
11	11	213.84	71.30	10.80	1959	2	0.266	3.17	64	85	113	18	62	97.7
3.3.2.1.4			Higher gear at reduced engine speed, same pull and travel speed as 3.3.2.1.2											
11	11	144.92	47.60	10.96	1978	1	0.304	2.78	65	83	109	18	63	97.7
3.3.2.1.5			Higher gear at reduced engine speed, same pull and travel speed as 3.3.2.1.1											
12	12	213.53	71.28	10.78	1772	2	0.262	3.23	63	85	111	18	62	97.7
3.3.2.1.6			Higher gear at reduced engine speed, same pull and travel speed as 3.3.2.1.2											
12	12	145.10	47.69	10.95	1790	1	0.291	2.90	63	82	106	18	63	97.7
3.3.2.2			In selected gear nearest to 7.5 km/h at rated engine speed.											
7	7	261.05	125.57	7.48	2099	3	0.256	3.30	65	86	113	11	76	98.3
3.3.2.2.1			75% of pull at maximum power at rated engine speed											
7	7	203.81	94.04	7.80	2167	3	0.284	2.98	67	87	114	19	59	97.7
3.3.2.2.2			50% of pull at maximum power at rated engine speed											
7	7	138.77	62.92	7.94	2188	2	0.329	2.57	68	84	111	20	60	97.7
3.3.2.2.3			Higher gear at reduced engine speed, same pull and travel speed as 3.3.2.2.1											
8	8	203.66	94.02	7.80	1940	3	0.263	3.21	68	87	114	19	59	97.7
3.3.2.2.4			Higher gear at reduced engine speed, same pull and travel speed as 3.3.2.2.2											
8	8	138.59	62.88	7.93	1958	2	0.299	2.82	67	83	53	21	57	97.7
3.3.2.2.5			Higher gear at reduced engine speed, same pull and travel speed as 3.3.2.2.1											
9	9	204.17	94.05	7.82	1765	2	0.264	3.20	66	86	111	19	59	97.7
3.3.2.2.6			Higher gear at reduced engine speed, same pull and travel speed as 3.3.2.2.2											
9	9	138.53	62.90	7.93	1775	2	0.290	2.92	65	82	105	22	58	97.7

4.1 Drawbar Power (Unballasted - 2100 rev/min)

OECD Drawbar Data (SI)

Date of tests: 29-Apr-02							Fuel density:	0.844 kg/l						
Type of track: Concrete							Test number:	1805						
4.1.1 Maximum power in tested gears (unballasted, 4wd)							Tire pressure:	48 kPa, rear	83 kPa, front			Drawbar Height:	495 mm	
Gear	Gear Designation	Power	Drawbar pull	Speed	Engine speed	Slip	Fuel		Temperature			Atmospheric conditions		
							SFC	SFE	Fuel	Coolant	Oil	Temperature	Relative humidity	Pressure
		kW	kN	km/h	rev/min	%	kg/kW.h	kW.h/l	°C	°C	°C	°C	%	kPa
1	1	175.76	179.37	3.53	2164	8	0.307	2.75	65	83	110	9	56	98.3
2	2	211.41	177.95	4.28	2120	8	0.282	2.99	65	84	111	9	56	98.3
3	3	223.49	168.18	4.78	2101	6	0.269	3.13	65	84	111	10	57	98.3
4	4	226.02	149.58	5.44	2102	5	0.269	3.14	64	85	111	10	63	98.4
5	5	242.87	145.55	6.01	2100	4	0.265	3.19	65	85	113	11	70	98.4
6	6	241.93	128.91	6.76	2099	3	0.265	3.18	65	86	114	11	70	98.4
7	7	261.05	125.57	7.48	2099	3	0.256	3.30	65	86	113	11	76	98.3
8	8	275.82	118.37	8.39	2101	3	0.258	3.27	66	89	118	11	76	98.2
9	9	274.93	106.72	9.27	2100	3	0.258	3.27	66	88	116	11	76	98.2
10	10	274.65	95.12	10.39	2101	2	0.261	3.24	65	88	110	11	76	98.1
11	11	274.33	85.72	11.52	2098	2	0.262	3.22	65	89	114	11	82	98.0
12	12	274.50	77.38	12.77	2102	2	0.259	3.26	65	89	114	11	82	98.0
13	13	269.14	68.15	14.22	2095	2	0.263	3.21	66	89	115	11	76	98.0
* Note:		Slip within operating procedures of testing station.												

4.2 Drawbar Power (Ballasted - 1800 rev/min)

OECD Drawbar Data (SI)

Date of tests: 03-May-02 | Fuel density: 0.844 kg/l

Type of track: Concrete | Test number: 1805

4.2.1 Maximum power in tested gears (ballasted, 4wd) | Tire pressure: 62 kPa, rear 97 kPa, front | Drawbar Height: 495 mm

Gear	Gear Designation	Power	Drawbar pull	Speed	Engine speed	Slip	Fuel		Temperature			Atmospheric conditions		
							SFC	SFE	Fuel	Coolant	Oil	Temperature	Relative humidity	Pressure
		kW	kN	km/h	rev/min	%	kg/kW.h	kW.h/l	°C	°C	°C	°C	%	kPa
*1	1	199.62	205.46	3.50	2154	9	0.301	2.80	66	83	108	12	56	97.5
2	2	224.52	195.86	4.13	2030	7	0.273	3.10	66	85	111	13	57	97.5
3	3	234.61	193.61	4.36	1945	7	0.261	3.23	66	86	113	13	57	97.5
4	4	234.86	178.66	4.73	1892	7	0.261	3.23	65	87	112	18	42	97.6
5	5	252.89	174.46	5.22	1892	7	0.261	3.23	66	86	114	19	43	97.6
6	6	258.76	163.60	5.69	1820	6	0.260	3.25	66	88	111	19	44	97.6
7	7	276.41	158.14	6.29	1809	5	0.257	3.28	66	88	117	19	44	97.6
8	8	306.90	155.05	7.13	1804	4	0.255	3.31	65	88	116	16	51	97.5
9	9	306.24	139.68	7.89	1807	4	0.254	3.32	64	87	111	18	42	97.6
10	10	305.93	124.74	8.83	1797	3	0.256	3.29	66	90	119	17	48	97.5
11	11	304.60	111.39	9.84	1805	3	0.255	3.31	65	87	117	18	41	97.5
12	12	308.78	102.13	10.88	1802	2	0.252	3.35	65	91	115	17	45	97.5
13	13	301.76	89.50	12.14	1797	2	0.260	3.25	65	88	118	17	45	97.5
14	14	303.66	81.17	13.47	1801	2	0.256	3.30	65	89	117	18	41	97.5

* Note: Pull limited to avoid excessive bouncing

4.3 POWER LIFT TEST Category IV, Quick attach linkage, 90 & 100 mm cylinders
Date of test: 22 June 1997. Test conducted on John Deere 9400 which is technically equivalent.

	Hitch points	Frame
Lower hitch points above ground - down position:	236 mm	216 mm
Vertical movement - without load:	787 mm	861 mm
with load:	765 mm	831 mm
Maximum corrected force exerted through full range:	68.6 kN	64.0 kN
Corresponding pressure:	18.3 MPa	18.3 MPa
Moment about rear axle:	105.4 kNm	137.3 kNm
Maximum mast tilt angle	--	5.3 degrees

Lifting height relative to horizontal position of lower links.

mm	-330	-310	-300	-201	-99	0	99	201	300	401	455	511
Corrected lift forces												
At the Hitch point kN	--	69.5	68.6	70.8	73.6	75.8	77.6	79.0	80.3	81.2	81.4	--
at the frame kN	70.1	69.0	--	69.4	70.3	70.4	70.0	69.2	67.8	--	65.7	64.0
Corresponding pressure 18.3 MPa												

4.4 Measurement of External Noise Level – John Deere 9520

-- Date of Test	April 17, 2002
-- Location of Test	Nebraska Tractor Test Laboratory
-- Sound Level Meter	Bruel and Kjaer 2236
-- Type of Track	Concrete Oval
-- Gear Number	18
-- Speed Prior to Acceleration	27.72 km/h
-- Noise Level	91.1 dB(A)

4.5 Measurement of Noise Level at Operator's Ear*

-- Date of Test	April 15, 2002
-- Location of Test	Nebraska Tractor Test Laboratory
-- Sound Level Meter	Bruel and Kjaer 2236
-- Type of Track	Concrete Oval
-- Gear Number	7
-- Drawbar Load	None
-- Noise at Operator Ear	77.1 dB(A)

* Note: Nebraska tractor test station guidelines.

5. Repairs and Adjustments: None

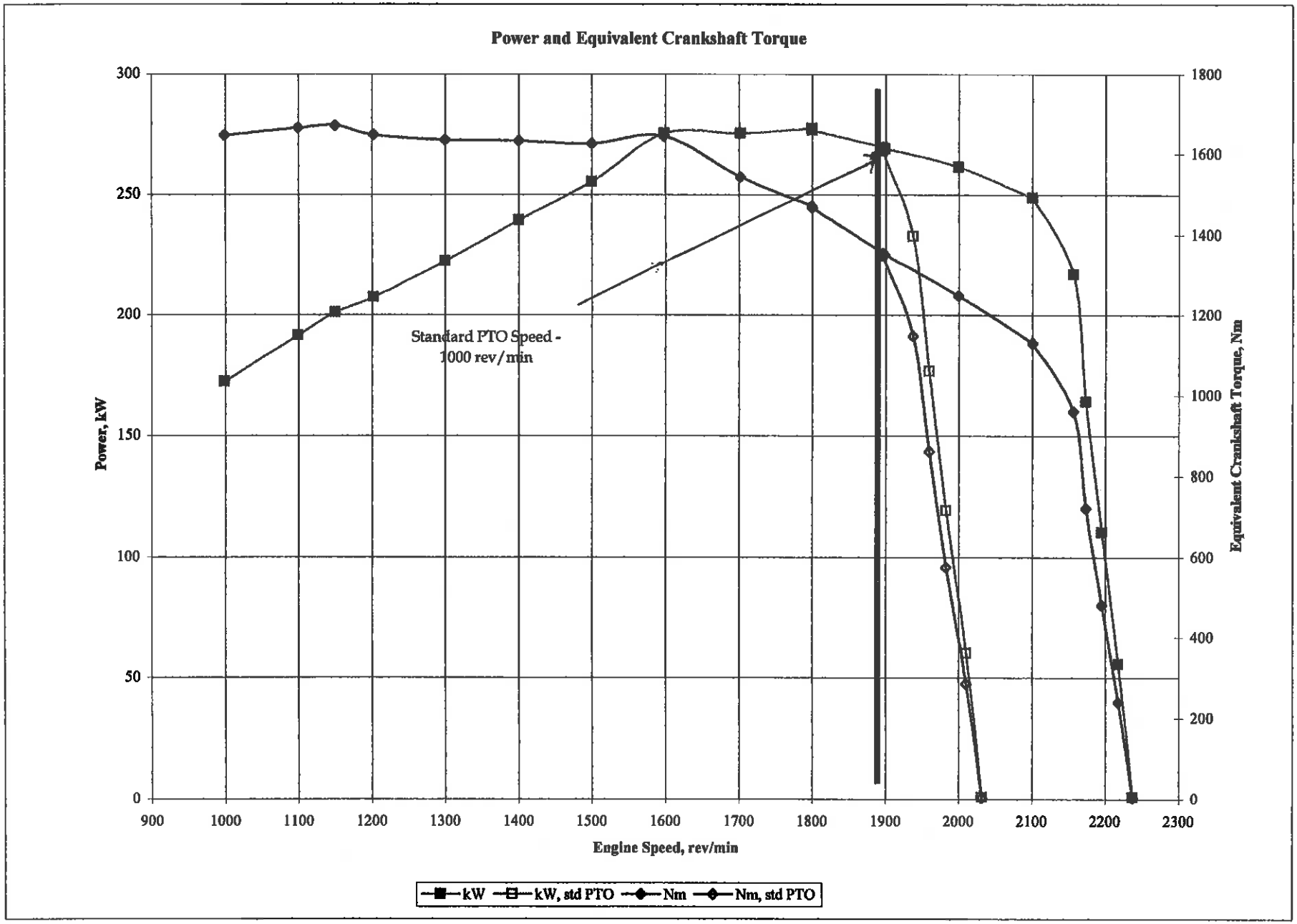
6. Remarks:

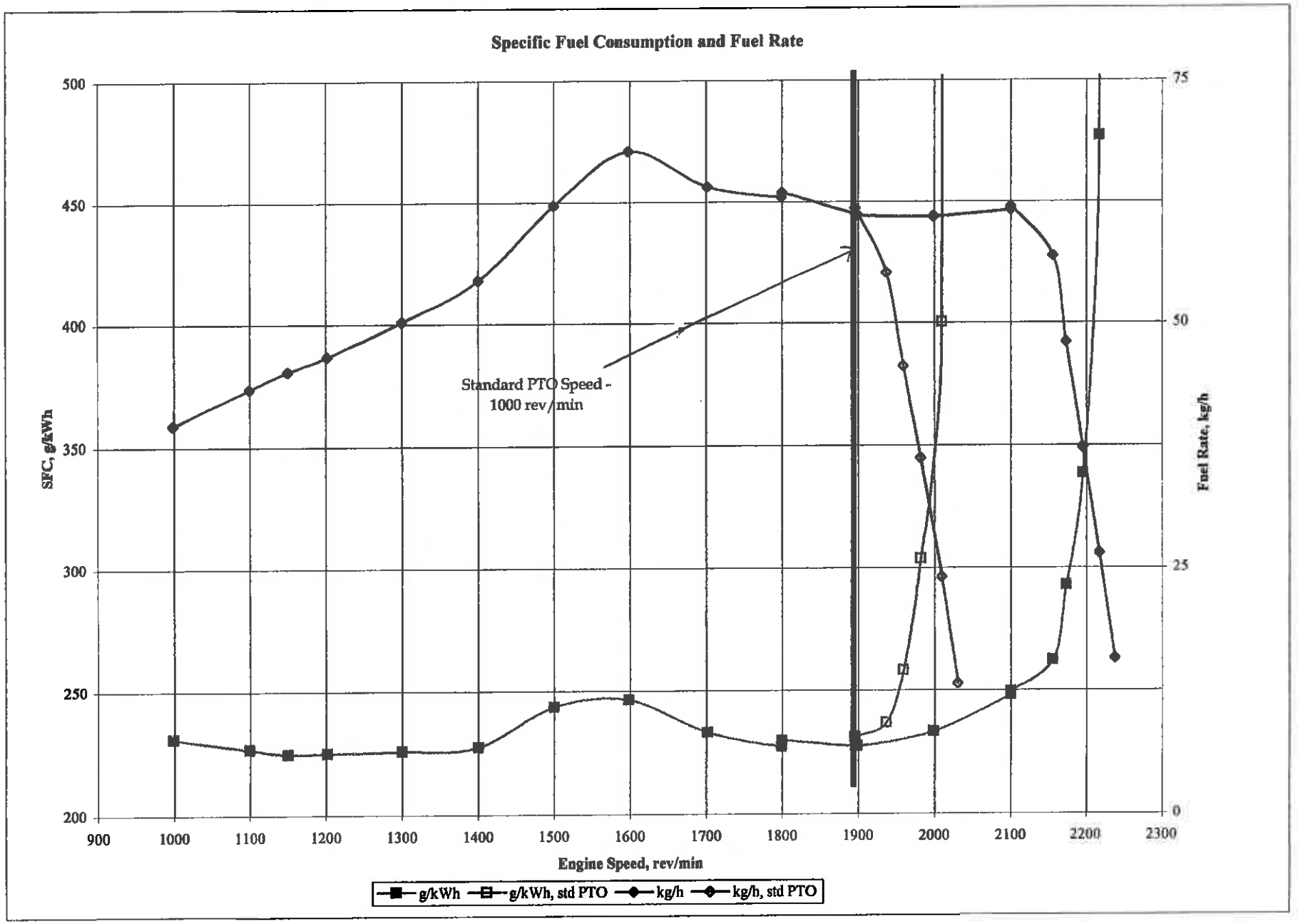
POWER LEVELS FOR JOHN DEERE 9520 TRACTORS:

The John Deere 9520 PowerShift tractor is equipped with an electronic engine power control system which provides the following engine performance levels in various conditions:

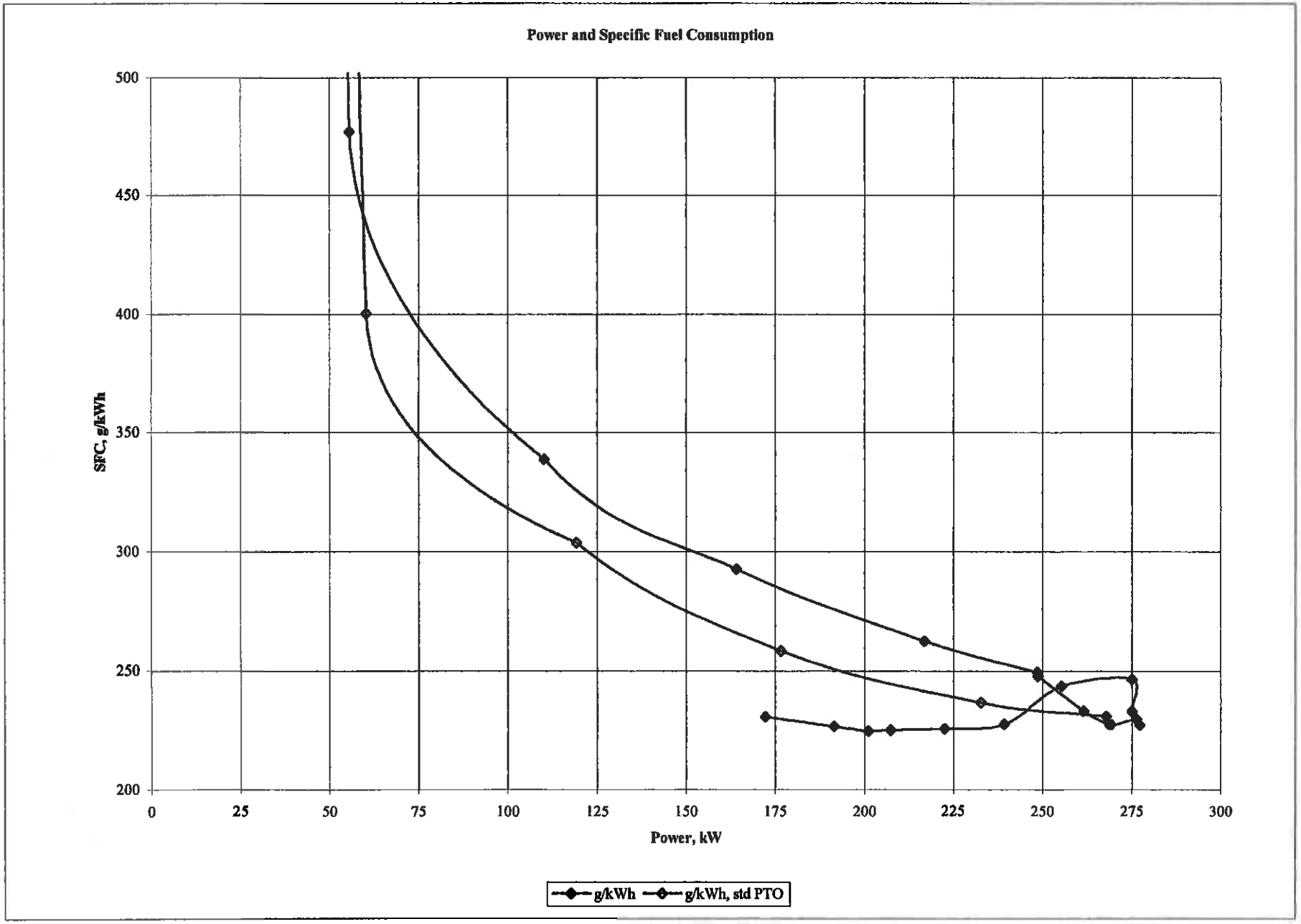
	Maximum Engine Power at 2100 rpm
a) Performance Level A In gears 1-4, and Stationary PTO operations	375 Hp (279.6 kW)
b) Performance Level B In gears 5-6	400 Hp (298.3 kW)
c) Performance Level C In gear 7	425 Hp (316.9 kW)
d) Performance Level D All other conditions.	450 Hp (335.5 kW)

John Deere 9520
Standard Power




Specific Fuel Consumption and Fuel Rate
SFC, g/kWh
Fuel Rate, kg/h
Engine Speed, rev/min
Standard PTO Speed - 1000 rev/min
g/kWh
g/kWh, std PTO
kg/h
kg/h, std PTO
500
450
400
350
300
250
200
75
50
25
0
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300

John Deere 9520
Standard Power



8. COMPULSORY TESTS RESULTS

8.1 Main power take-off

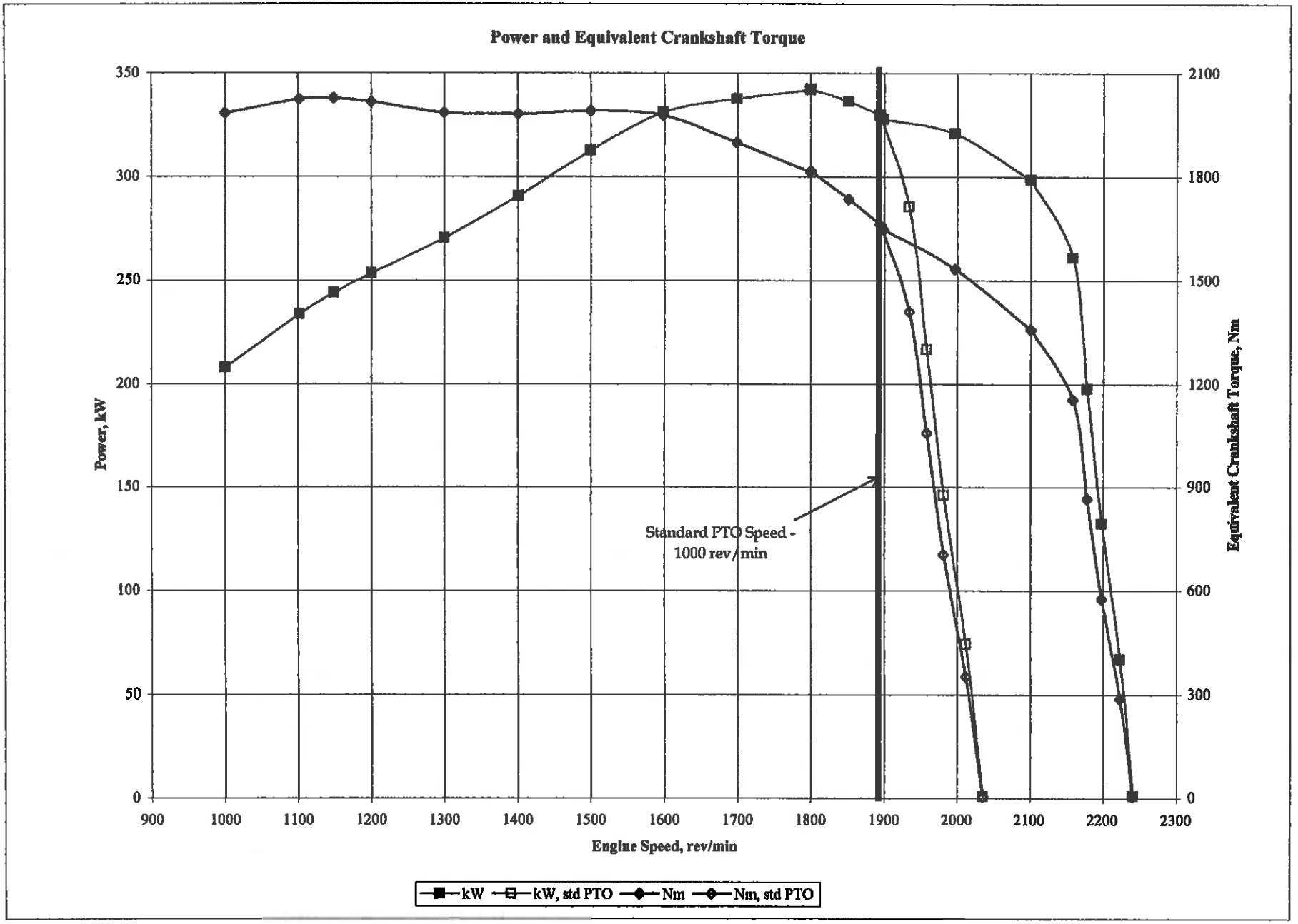
- Date and location of tests: 29-Mar-02 Nebraska Tractor Test Laboratory, Lincoln, NE, USA
- Type of dynamometer bench: Eaton

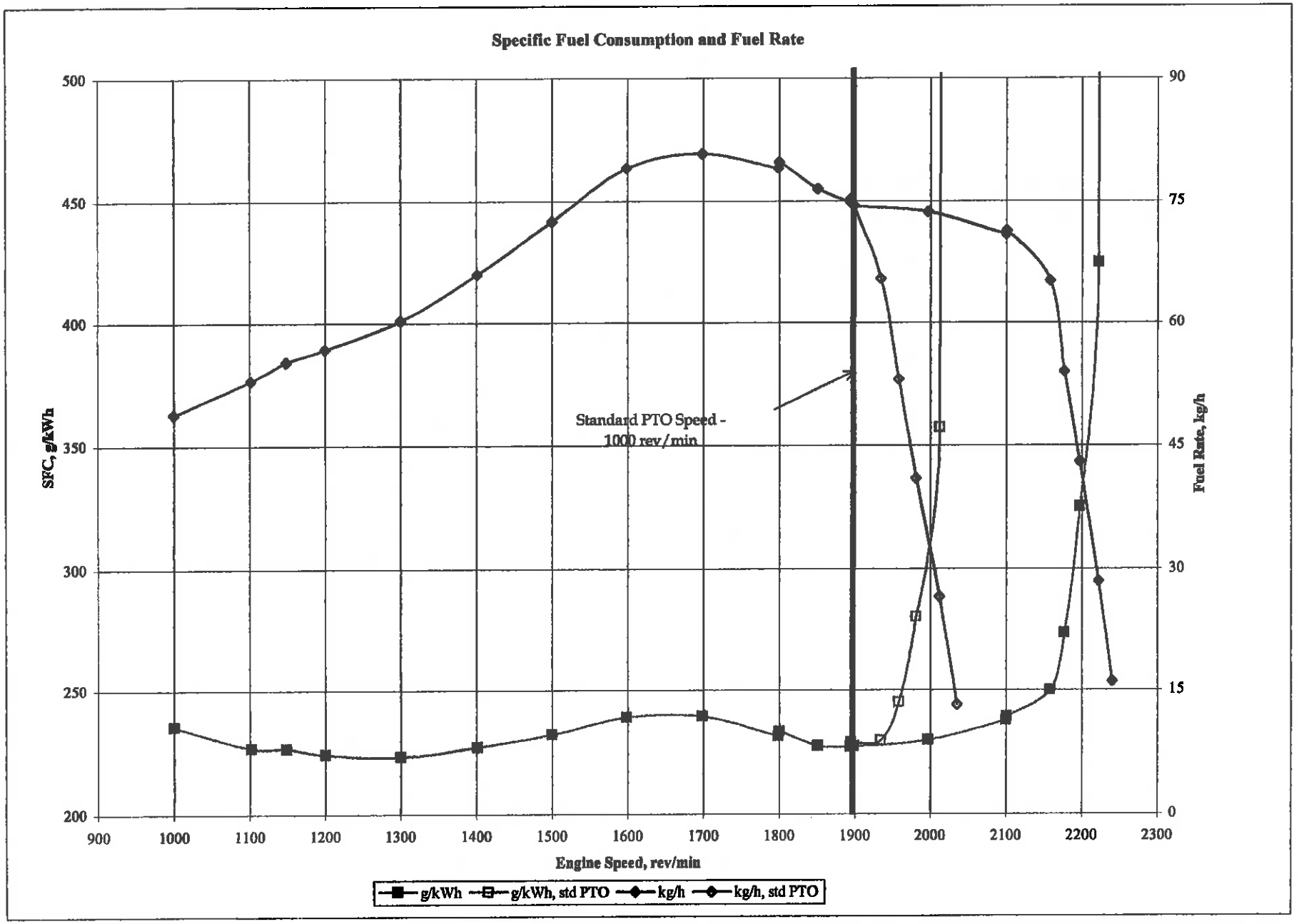
	Speed		Fuel consumption			Specific
Power	Engine	PTO	Hourly		Specific	energy
kW	rev/min		kg/h	l/h	g/kWh	kW-h/l
3.1 MAXIMUM POWER - TWO HOUR TEST						
342.20	1800	950	79.81	94.58	233	3.62
3.1.2 POWER AT RATED ENGINE SPEED						
298.40	2100	1108	71.36	84.57	239	3.53
3.1.3 STANDARD POWER TAKE-OFF SPEED (1000 +/- 25 rev/min)						
329.04	1895	1000	75.25	89.17	229	3.69
3.1.4 PART LOADS						
3.1.4.1 the torque corresponding to maximum power at rated engine speed						
298.40	2100	1108	71.36	84.57	239	3.53
3.1.4.2 85% of torque obtained in 3.1.4.1						
260.77	2158	1139	65.18	77.25	250	3.38
3.1.4.3 75% of torque defined in 3.1.4.2						
197.39	2177	1149	54.02	64.02	274	3.08
3.1.4.4 50% of torque defined in 3.1.4.2						
132.26	2197	1159	43.00	50.96	325	2.60
3.1.4.5 25% of torque defined in 3.1.4.2						
66.98	2222	1172	28.44	33.70	425	1.99
3.1.4.6 unloaded						
0.84	2240	1182	16.06	19.03	19136	0.04
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED (1000 +/- 25 rev/min)						
3.1.5.1 the torque corresponding to maximum power						
329.04	1895	1000	75.25	89.17	229	3.69
3.1.5.2 85% of torque obtained in 3.1.5.1						
285.26	1934	1020	65.45	77.57	229	3.68
3.1.5.3 75% of torque defined in 3.1.5.2						
216.66	1958	1033	53.07	62.89	245	3.44
3.1.5.4 50% of torque defined in 3.1.5.2						
146.11	1981	1045	40.96	48.54	280	3.01
3.1.5.5 25% of torque defined in 3.1.5.2						
74.26	2012	1062	26.54	31.45	357	2.36
3.1.5.6 unloaded						
0.76	2035	1074	13.20	15.64	17312	0.05

- No load maximum engine speed: 2240 rev/min
- Torque (equivalent crankshaft) at rated speed:
  - At rated engine speed 1357 Nm
  - At 2-hour test 1815 Nm
- Maximum torque (equivalent crankshaft) 2026 Nm
  (engine speed: 1149 rev/min)

Mean atmospheric conditions:		
Dry bulb	24	°C
Pressure	97.3	kPa
Relative Humidity	18	%
Maximum temperatures:		
Coolant	98	°C
Engine oil	124	°C
Fuel	65	°C

John Deere 9520
Full Power




Specific Fuel Consumption and Fuel Rate
SFC, g/kWh
Fuel Rate, kg/h
Engine Speed, rev/min
Standard PTO Speed - 1000 rev/min
500
450
400
350
300
250
200
90
75
60
45
30
15
0
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
g/kWh
g/kWh, std PTO
kg/h
kg/h, std PTO

John Deere 9520
Full Power

