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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 8400T POWERSHIFT
Rubber Tracked - 30 km/h Version

MANUFACTURED BY:	John Deere Tractor Works 3500 East Donald Street, P.O. Box 270 Waterloo, Iowa 50704-0270
NEBRASKA TEST NO.	1747
TEST DATES:	April 8 - May 1, 1998

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 25 September 1998 for the John Deere 8400T Powershift, Rubber Tracked - 30 km/h version, 16-speed transmission with OECD Number 2/1783.

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- Manufacturers Name/Address	John Deere Tractor Works 3500 East Donald St. P.O. Box 270 Waterloo, Iowa 50704-0270
- Location of tractor assembly	Same
- Submitted for test by	The Manufacturer
- Selected for test by	The Manufacturer in agreement with the Tractor Test Lab
- Place of running in	John Deere Product Engineering Center, Waterloo, Iowa
- Duration of running in	143 hr
- Location of test	Nebraska Tractor Test Laboratory Lincoln, Nebraska U.S.A.

1. SPECIFICATIONS OF TRACTOR

1.1 IDENTIFICATION

- Make	John Deere
- Model	8400T Powershift
- Type	Rubber Tracked - 30 km/h Version
- Number of driving wheels	2 tracks (rubber belts)
- Serial Number	*RW8400T902165*
- 1st Serial number	*RW8400T901001*

1.2 ENGINE

- Make	John Deere
- Model	6081HRW03
- Type	4-stroke Diesel; turbocharged, air-to-air aftercooled, direct injection
- Serial Number	*RG6081H040198*

1.2.1 Cylinders

- Number and Disposition	6, in-line, vertical
- Bore x Stroke	115.8 mm x 128.5 mm
- Cubic Capacity	8132 cm^3
- Compression Ratio	16.5:1
- Arrangement of Valves	Overhead
- Cylinder Liner (wet or dry)	Wet; replaceable

1.2.2 Supercharging

- Make	Schwitzer
- Model	RE56488
- Type	Exhaust gas driven
- Pressure	151 ± 15 kPa (at rated engine speed and load)

1.2.3 Fuel System

- Fuel Feed System		Transfer pump integral with injection pump
- Make/Model/Type of Filter(s)	primary	Stanadyne/RE65432/Water coalescing nylon
	secondary	Stanadyne/AR86745/Paper element
- Fuel Tank Capacity		492 liters
- Fuel Cooler		Heat exchanger with air in fuel return line
- Make/Model/Type of Injection Pump		Bosch/RE61658/In-line; electric shut off
- Injection Pump Serial Number		7692900610
- Production setting of injection Pump		
· Flow Rate (at rated engine speed and full load)		40.4 ± 1.7 kg/h
· Fuel Density		0.845 g/cm^3
- Make/Model/Type of Injectors		Bosch/RE61593/P-type nozzle
- Injection Pressure		29.0 +1.2/-0.0 MPa
- Timing		19.5° ± 1° BTDC

1.2.4 Governor

- Make/Model/Type	John Deere Focus/Electronic Control
- Governed engine speed range	800 - 2400 rev/min
- Rated engine speed	2200 rev/min
- High idle speed range	2300 ± 25 rev/min

1.2.5 Air Cleaner

- Pre-cleaner	
· Make/Model/Type	Donaldson/RE51631/Strato-tube pre-cleaner with aspirator
· Air intake location	Under hood, front of tractor
- Main Cleaner	
· Make/Model/Type	Donaldson/RE51629/pleated paper
· Location	Under hood, engine compartment
- Secondary element	
· Make/Model/Type	Donaldson/RE51630/pleated paper
- 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; spin-on
- Oil Cooler	Heat exchanger with engine coolant

1.2.7 Cooling System

- Type of coolant:	Liquid
- Type of pump	Centrifugal, gear driven
- Fan specification	Belt driven; suction type; variable speed
- Number of Fan Blades	8
- Fan Diameter	711 mm
- Coolant system capacity	34 liters
- Type of temperature control	Two thermostats and variable speed fan
- System pressure	69 ± 5 kPa

1.2.8 Starting System

- Make/Model/Type of starter	Nippondenso/RE69704/Solenoid engaged
- Power rating	4.0 kW
- Cold starting aid	Ether spray in intake manifold
- Safety device	Electrical lockout on gearshift lever

1.2.9 Electrical System

- Voltage and grounding	12 Volt DC; negative ground
- Alternator	
· Make/Model/Type	Nippondenso/RE46608/Belt driven
· Power rating	140 Amp at rated engine speed and 25 °C
- Batteries	
· Number and connection	Two; 12 Volt batteries in parallel; SAE tapered post
· Rating	925 Cold Cranking Amps/battery 175 Ah/battery at 20 hour rating

1.2.10 Exhaust System

- Muffler Make/Model/Type	Nelson/RE44716/Expansion Chamber
- Location	Vertical muffler
- Exhaust stack location	Vertical; right front corner of cab

1.3 TRANSMISSION

1.3.1 Clutch (travel)

- Make/Model/Type	John Deere/Multiple plate/Oil cooled
- Number of plates	7
- Plate diameter	232 mm
- Method of operation	Hydraulic; pedal actuated

1.3.2 Gear Box

- Make/Model/Type	John Deere/Full Powershift/Mechanical
- Arrangement	Countershaft design consisting of 8 multidisc hydraulically cooled clutches and 1 multidisc hydraulically cooled planetary brake
- Number of Gears	16 forward and 4 (SM: 5) reverse gears controlled by one lever
- Oil cooler	Heat exchanger with air
- Available options	None available

1.3.3 Rear axle and final drives

- Make/Model/Type	John Deere/Outboard planetary final drives with electronically controlled hydrostatic differential steering
- Differential lock	Not applicable

1.3.4 Front axle and final drives — Not applicable

1.3.4 Differential lock — Not applicable

1.3.5 Total ratios and traveling speeds

Gear Number	Number of engine revolutions for one revolution of the driving wheels	Nominal travel speed (*) at rated engine speed of 2200 rev/min (km/h)
Forward		
1	346.0220	1.87
2	270.8786	2.39
3	212.8132	3.04
4	166.5978	3.88
5	137.5825	4.70
6	121.9316	5.31
7	107.7045	6.01
8	95.4524	6.78
9	84.6171	7.65
10	74.9913	8.63
11	66.2413	9.77
12	58.7059	11.02
13	46.1282	14.02
14	36.1109	17.91
15	28.3701	22.80
16	22.2092	29.13
Reverse		
1	-396.6818	-1.63
2	-157.7254	-4.10
3 (**)	-139.7831	-4.63
4 (***)	-52.8817	-8.90
5 (****)	-52.8817	-12.23

(*) Calculated with a rear track dynamic radius index of 780 mm
(**) Engine speed is adjustable to 2400 RPM in the Reverse Gear Number 3
(***) Engine speed is limited to 1600 RPM in the Reverse Gear Number 4
(****) Available in Specialty Markets only

1.4 POWER-TAKE-OFF

1.4.1 Main Power-Take-Off

- Type	Independent
- Method of engagement	Electro-hydraulically actuated multi-plate wet clutch operated by single hand control switch
- Number of shafts	1, Single Speed
- Method of changing speeds	None

1.4.1.1 Standard Single Speed PTO-1000 rev/min

- Location	Rear of tractor; center plane
- Diameter of PTO shaft end	44.5 mm
- Number of splines, in conformity with ISO 500/1991	20; conforms to ISO 500/1991
- Height above ground	772.4 mm
- Distance from median plane of tractor	0 mm
- Distance behind rear axle	583.6 mm
- PTO speed at rated engine speed (2200 rev/min)	1009 rev/min
- Engine speed at Standard PTO speed	2180 rev/min
- Ratio of Engine rev/min to PTO rev/min	2.18 : 1
- Power restriction	None
- Direction of rotation(viewed facing driving end)	Clockwise

1.4.2 Optional Power-Take-Off

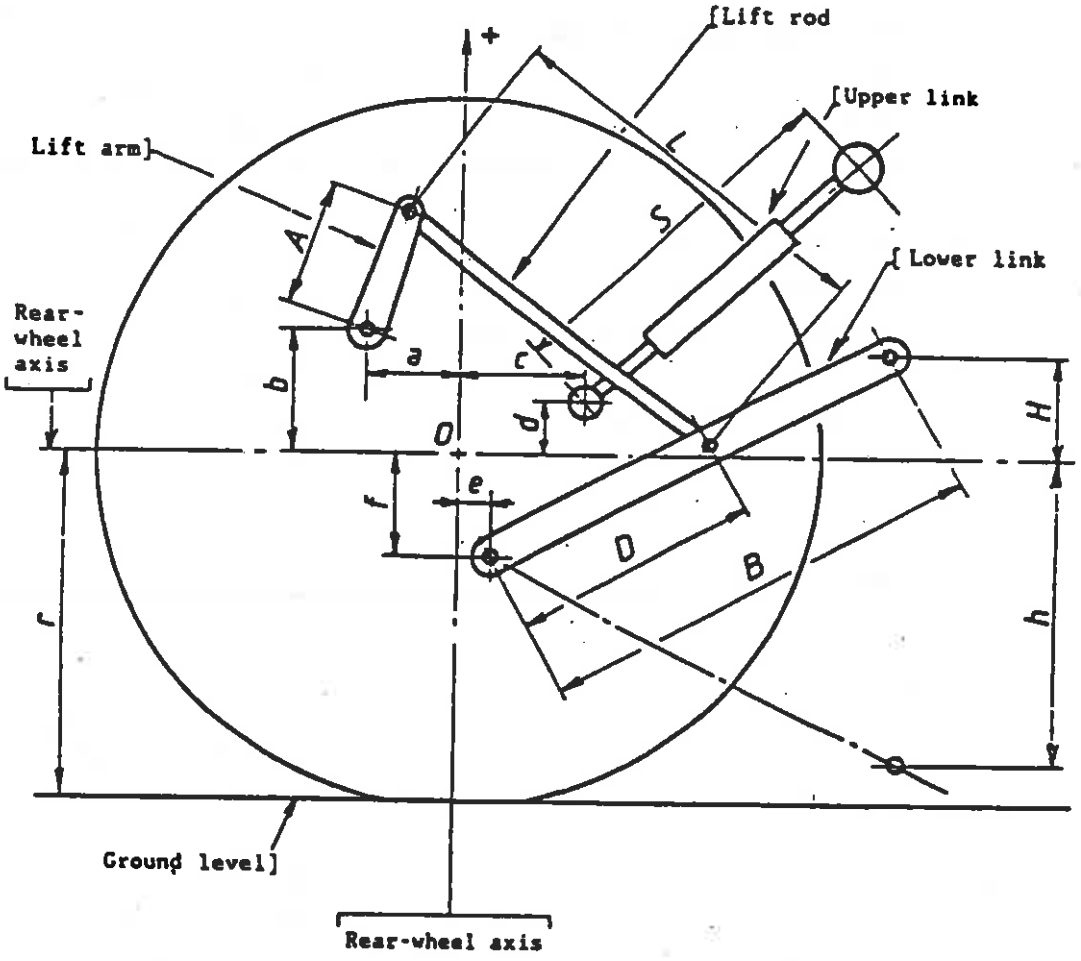
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1.5 POWER LIFT

- Make/Model/Type	John Deere/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
- Number/Type of cylinders	Two external/Single acting
- Type of linkage lock for transport	Electro-hydraulic
- Relief valve pressure setting	20.30 ± 0.3 MPa (Pump Stall Pressure)
- Opening pressure of cylinder safety valve	23.25 ± 0.5 MPa
- Lift Pump type	Axial piston, variable pressure and flow, pressure and flow compensated
- Transmission between pump and engine	Direct spur gear drive
- Type/Number of filters	Synthetic media, screw-on canister/one
- Location of oil reservoir	Differential case housing
- Type/Number/Location of tapping points	ISO standard breakaway couplers/3 standard with 4th, 5th and additional inlet/outlet pair for externally controlled implements/rear of tractor
- Maximum oil volume available for external cylinders	20 liters; additional 10 liters allowable overfill for total of 30 liters.

1.6 THREE POINT LINKAGE

- Category 3, in conformity with ISO 730/1-1990



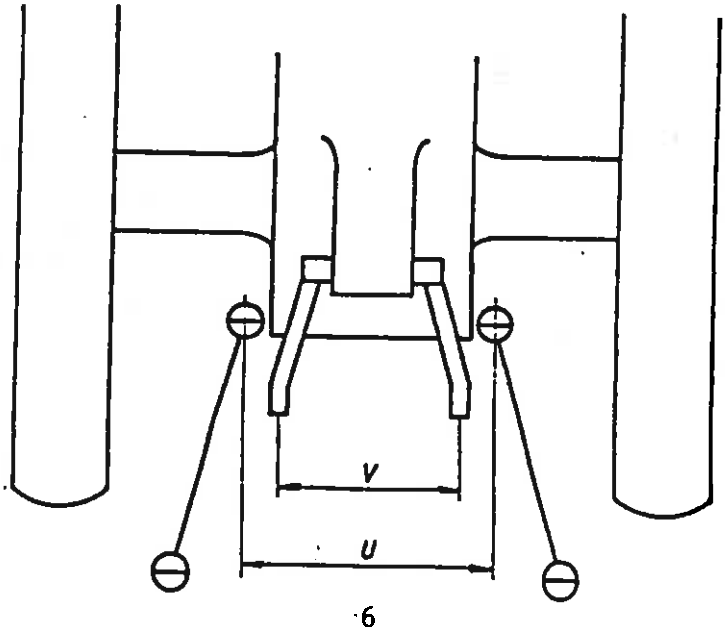


Table 1.6.1 - Linkage Geometry Dimensions - SM version

Category adapter: Walterscheid lower links		Dimension or range (mm)	Setting used on test (mm)
Lift category		III	III
Rear Wheel-Radius Index	r	852.55	same
Front Wheel-Radius Index	r'	NA	--
Length of lift arms	(A)	495	same
Length of lower links	(B)	1066	same
Distance of lift arm pivot point from rear-wheel axis:			
horizontally	(a)	-140	same
vertically	(b)	565	same
Horizontal distance between the two lower link points	(U)	600	same
Horizontal distance between the two lift arm ends points	(V)	750	same
Length of upper link	(S)	748 to 889.9	822
Distance of upper link pivot point from rear-wheel axis:			
horizontally	(c)	395, 395, 424	424
vertically	(d)	192.5, 259.5, 321.1	321
Distance of lower link pivot point from rear-wheel axis:			
horizontally	(e)	175	same
vertically	(f)	280	same
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	723.2	same
Length of lift rods	(L)	968.5 to 1072	1072
Height of lower hitch points relative to rear wheel axis:			
In low position	(h)	500 to 650	650
In high position	(H)	206 to 339	206
Height above ground of lower hitch points when locked in transport position		1059 to 1191	1059

Rear track static radius index of 852.55 mm

Table 1.6.2 - Linkage Geometry Dimensions - North American version

Category adapter: Quick Attach linkage		Dimension or range (mm)	Setting used on test (mm)
Lift category		III	III
Rear Wheel-Radius Index	r	852.55	same
Front Wheel-Radius Index	r'	NA	--
Length of lift arms	(A)	495	same
Length of lower links	(B)	1055.6	same
Distance of lift arm pivot point from rear-wheel axis:			
horizontally	(a)	-140	same
vertically	(b)	565	same
Horizontal distance between the two lower link points	(U)	600	same
Horizontal distance between the two lift arm ends points	(V)	750	same
Length of upper link	(S)	686 to 958	733
Distance of upper link pivot point from rear-wheel axis:			
horizontally	(c)	395	same
vertically	(d)	192.5, 259.5	259.5
Distance of lower link pivot point from rear-wheel axis:			
horizontally	(e)	175	same
vertically	(f)	280	same
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	718.1	same
Length of lift rods	(L)	968 to 1089	1089
Height of lower hitch points relative to rear wheel axis:			
In low position	(h)	482 to 650	650
In high position	(H)	140 to 299	140
Height above ground of lower hitch points when locked in transport position		993 to 1161	993

Rear track static radius index of 852.55 mm

1.7 SWINGING DRAWBAR

	NA Option Tested Version	SM Option Not Tested
- Type	Oscillating	same
- Height above ground · Maximum (offset flipped up) · Minimum (offset flipped down)	 565.4 mm 467.4 mm	 same same
- Type of adjustment	Removable Clevis	same
- Distance of hitch point from rear wheel axis, horizontally	1040.7, 1091.5 mm	1090, 1178 mm
- Distance of hitch point from PTO shaft end		
· Vertically · Horizontally (shaft diameter)	305, 207 mm 457, 508 mm	same 506, 595 mm
- Lateral adjustment:		
· Right side · Left side	203.75, 211.4 mm 203.75, 211.4 mm	212, 225.5 mm 212, 225.5 mm
- Distance of pivot point from rear wheel axis, horizontally	290.5 mm (forward)	same
- Diameter of drawbar pin hole	40 mm	33 mm
- Maximum vertical static permissible load:		
· Short position · Extended position	17.35 kN 17.35 kN	23.58 kN 16.24 kN

1.8 TRAILER HITCH

Not available

1.9 HOLED DRAWBAR

Not available

1.10 STEERING

- Make/Model/Type: John Deere Hydrostatic Differential Steering/Pump and motor/Electro-Hydraulic Differential steering controlled by steering wheel
- Method of operation: Steering wheel angle determines difference in speed between the 2 rubber track drive wheels
- Pump(s): Axial Piston Variable Displacement Pump and Axial Piston Fixed Displacement Motor
- Ram(s): None
- Working pressure: Up to 45.0 MPa +0.5/+2.5 MPa
- Filter Make/Model/Type: Donaldson/RE69054/Paper Element

1.11 BRAKE SYSTEM

1.11.1 Service Brakes

- Make/Model/Type: Vickers-John Deere/ Load sensing power with manual backup
- Method of operation: Hydraulically actuated oil immersed disc operated by one pedal
- Trailer Brake type: Not available

1.11.2 Parking Brake

- Type	Spring applied, hydraulically released multi-disc
- Method of operation	Gear selector lever

1.12 WHEELS

- Number	
· Front	None
· Rear	Two; Driving and steering
- Wheelbase	Not applicable

- Track width adjustment

	Minimum mm	Maximum mm	Adjustment method
Rear	1676	2235	6 positions available by adjusting track frame and rear wheel:

* Requires exchange of right and left track frames

1.13 PROTECTIVE STRUCTURE

- Make/Model/Type	John Deere/SG-058/SG-058 (CommandView™ cab)
- Manufactures Name/Address	John Deere Waterloo Works Waterloo, Iowa, USA
- Protective device	
· Cab/frame/rollguard/other	Cab
· Tiltable/not tiltable	Not Tiltable
- OECD Approval Number	4/0 547 (Certified to SAE-J2194 and CSA-B352.0, including OSHA #1928.51)
- Date of Approval	2 September 1998
- Nos. of Minor Modification Certificates, if any	None

1.14.1 DRIVER'S SEAT

- Make/Model/Type	Sears Mfg/RE70299 (SM: RE70300)/Air cushion suspensio (Personal-Posture™)
- Seat and steering wheel reversible	No
- Type of suspension	Air
- Type of damping	Three position damper, viscous damping
- Range of adjustment	
· Longitudinal	167 mm
· Vertical	140 mm
· Right Rotation	20°
· Left Rotation	14°
- Safety Belt	Yes

1.14.2 OPTIONAL DRIVER'S SEAT

Not available

1.14.3 PASSENGER SEAT

Not available

1.15 LIGHTING

	Height above ground of center (mm)	Size (mm)	Distance from outside edge to median plane of tractor (mm)
Headlights			
Hood inner	1800	70 x 127	200
outer	1800	70 x 127	335
Roof inner	3040	51 x 127	350
outer	3040	51 x 127	500
Upper mid body	2195	70 x 127	930
Lower mid body			
left	1380	70 x 127	1400
right	1300	70 x 127	1010
Rearlights			
roof	3050	70 x 127	640
fender	2100	70 x 127	890
Tail lights	1920	89 x 210	870
Reflectors			
roof front	3040	82 x 240 (*)	770
roof rear	3050	82 x 240 (*)	790

(*) Wrap-around lights

2. TEST CONDITIONS

2.1 OVERALL DIMENSIONS

Length-Overall:	without front weights	5487 mm
	with front weights	6012 mm
Width:	minimum	2591 mm
	maximum	2870 mm
Height at top of:	protective structure	3135 mm
	exhaust	3245 mm

2.2 GROUND CLEARANCE

360 mm

Clearance-limiting part: Drawbar rear support (Rear hitch frame)

2.3 TRACTOR MASS

With cab, full fuel tank

	Unballasted		Ballasted	
	Without driver (kg)	With driver (kg)	Without driver (kg)	With driver (kg)
Total	11340	11415	12322	12397

Note: Maximum tractor dry weight must be less than 31500 lb (14288 kg)

Ballast Added

	Number of weights	Weight mass (kg)	Liquid (kg)
Front Weight Support	1	70	0
Front Weights	20	44	0
Additional test equipment	1	32	0

Note: Maximum front tractor weight must be less than 2200 lb (998 kg), or 20 weights w/ support

2.4 TRACK SPECIFICATIONS

Make	Goodyear (Trackman™)
Track Materials	Rubber with steel reinforcement
Track width and base	609.6 mm and 2235 mm
Dynamic rolling radius under drive wheel	780 mm
Static distance of rear axle to ground	852.55 mm
Track support system	Oscillating front idler & three mid-rollers supported by midframe and rear wheel attached to drive axle
Treadbars	
Total per track	54
Number per meter	6.56 per meter
Bar length at top	282 mm
Bar width at top	40 mm
Bar width at center	53 mm
Bar height	48 mm
Track length	8230 mm
Track ground contact length	2261 mm

2.5 TIRE AND TRACK WIDTH SPECIFICATIONS

2.6 FUEL

- Type/grade	Grade 2-D, in conformity with the national standard
- Density at 15C:	
(PTO tests)	0.845 g/cm^3
(Drawbar tests)	same as PTO tests

2.7 OILS AND LUBRICATION

2.7.1 Capacity and change interval

	Capacity	Oil Change	Filter(s) Change
	liters	hours	hours
Engine (with filter)	28.0	250 (300 with John Deere PLUS-50 oil and filter)	Same as Oil Change
Transmission, rear axle, Hydraulics and Steering	246	1500	As required or 750
Wheel Hubs	50	1500	No filter

2.7.2 Specifications (SAE, API, Mil.L, ISO)

Engine Oil:	Recommended	Used During Test
Type	John Deere, Torq-Gard Supreme Plus 50; SAE 15W-40	same
Viscosity	12.8 cSt at 100° C	
Classification	API CE or CD; CCMD specification D5 or D4	
Transmission oils		
Type	John Deere, HY-GARD (J20C); SAE 10W-30	same
Viscosity	58 cSt at 43° C	
Classification	NA	
Hydraulic Fluid		
Type	Same as transmission	same
Viscosity		
Classification		
Steering oil		
Type	Same as transmission	same
Viscosity		
Classification		
Grease	John Deere MOLY HIGH TEMPERATURE EP GREASE	same
Number of lube points	13	

3. COMPULSORY TESTS RESULTS

3.1 Main power take-off

- Date and location of tests: 08-Apr-98 Nebraska Tractor Test Laboratory, Lincoln, NE, USA
- Type of dynamometer bench: Eaton eddy current

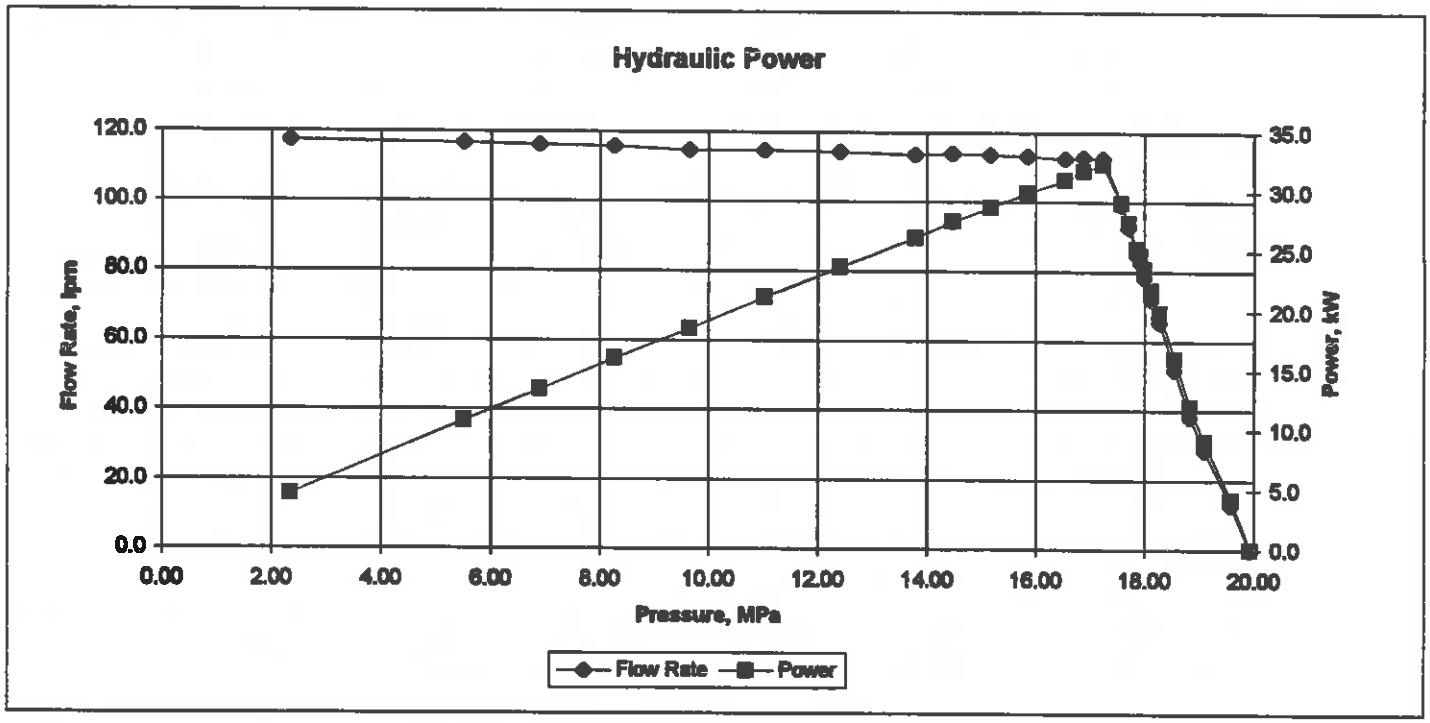
Power	Speed		Fuel consumption			Specific energy
			Hourly		Specific	
kW	Engine	PTO	kg/h	l/h	g/kWh	kWh/l
3.1 MAXIMUM POWER - TWO HOUR TEST						
190.27	2000	916	43.49	51.47	229	3.70
3.1.2 POWER AT RATED ENGINE SPEED						
169.08	2200	1007	41.59	49.21	246	3.44
3.1.3 STANDARD POWER TAKE-OFF SPEED						
169.08	2200	1007	41.59	49.21	246	3.44
3.1.4 PART LOADS						
3.1.4.1 the torque corresponding to maxiimum power at rated engine speed						
169.08	2200	1007	41.59	49.21	246	3.44
3.1.4.2 85% of torque obtained in 3.1.4.1						
147.47	2258	1035	37.96	44.92	257	3.28
3.1.4.3 75% of torque defined in 3.1.4.2						
111.00	2269	1040	30.07	35.58	271	3.12
3.1.4.4 50% of torque defined in 3.1.4.2						
74.48	2280	1044	22.32	26.41	300	2.82
3.1.4.5 25% of torque defined in 3.1.4.2						
37.05	2290	1049	15.37	18.19	415	2.04
3.1.4.6 unloaded						
0.75	2299	1053	8.98	10.63	12014	0.07
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED						
3.1.5.1 the torque corresponding to maximum power						
169.08	2200	1007	41.59	49.21	246	3.44
3.1.5.2 85% of torque obtained in 3.1.5.1						
147.47	2258	1035	37.96	44.92	257	3.28
3.1.5.3 75% of torque defined in 3.1.5.2						
111.00	2269	1040	30.07	35.58	271	3.12
3.1.5.4 50% of torque defined in 3.1.5.2						
74.48	2280	1044	22.32	26.41	300	2.82
3.1.5.5 25% of torque defined in 3.1.5.2						
37.05	2290	1049	15.37	18.19	415	2.04
3.1.5.6 unloaded						
0.75	2299	1053	8.98	10.63	12014	0.07

- No load maximum engine speed: 2299 rev/min
- Torque (equivalent crankshaft) at rated speed:
  - At rated engine speed 734 Nm
  - At 2-hour test 908 Nm
- Maximum torque (equivalent crankshaft): 1078 Nm
  (engine speed: 1199 rev/min)

Mean atmospheric conditions:		
Dry bulb	24	°C
Pressure	97.0	kPa
Relative Humidity	43	%
Maximum temperatures:		
Coolant	93	°C
Engine oil	109	°C
Fuel	64	°C
Engine air intake	34	°C

3.2 Hydraulic power and lifting forces

Date of Test: 10-Apr-98		
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:		
19.93 MPa		
2890 psig		
II. Pump delivery rate at minimum pressure and rated engine speed:		
117.3 l/min		
31.0 gpm		
III. Flow rate, pressure, power:		
90% of relief valve setting		
82.5 l/min	17.93 MPa	24.7 kW
21.8 gpm	*2600 psig*	*33.1 hp*
Maximum hydraulic power:		
112.4 l/min	17.24 MPa	32.3 kW
29.7 gpm	*2500 psig*	*43.3 hp*
IV. Hydraulic fluid temperature at flow meter:		
62.2 °C		
144 °F		



3.2.2 POWER LIFT TEST. Cat III, ISO hook type lower link arms
Date of test: 17 March 1998

		Hitch points	Frame
Lower hitch points above ground - down position:	[mm/in]	199/7.8	185/7.3
Vertical movement:			
without load:	[mm/in]	856/33.7	953/37.5
with load:	[mm/in]	841/33.1	917/36.1
Maximum corrected force through full range:	[kN/lb]	56.7/12757	55.8/12535
Corresponding pressure:	[kPa/psi]	18000/2610	
Moment about rear axle:	[kN.m/lb.ft]	70.5/51983	103.2/76148
Maximum mast tilt angle:	[deg]	--	6.1

Lifting height relative to horizontal position of lower links.

	[mm]	-385	-373	-296	-198	-98	1
	[in]	-15.2	-14.7	-11.7	-7.8	-3.9	0.1
Corrected lift forces							
Hitch point.	[kN]	--	56.7	59.7	64.0	67.7	71.2
	[lb]	--	12757	13415	14378	15228	16017
at frame	[kN]	55.8	57.7	--	60.3	62.6	64.1
	[lb]	12535	12977	--	13564	14068	14412

Lifting height relative to horizontal position of lower links.

	[mm]	100	201	301	402	469	532
	[in]	4.0	7.9	11.9	15.8	18.5	21.0
Corrected lift forces							
Hitch point	[kN]	74.3	77.1	80.5	84.0	86.3	--
	[lb]	16694	17333	18105	18877	19411	--
at frame	[kN]	65.2	65.8	66.1	--	65.5	64.6
	[lb]	14656	14785	14865	--	14719	14532

3.3.1 Drawbar power test(unballasted tractor)

OECD Drawbar Data (SI)

Date of tests 24-Apr-98				Fuel density:	0.845 kg/l									
Type of trac Concrete				Test number	1747									
Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, ° C					Rel humidity	Barom. Press
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet		kPa
I. Maximum Power (unballasted, track at 2000 rev/min)						Tire pressure:		track				Drawbar height:		457 mm
2	62.33	107.07	2.10	2263	15%	0.382	2.21	59	83	101	21	16	61%	97.43
3	82.21	111.30	2.66	2254	15%	0.351	2.41	59	83	102	17	13	70%	97.46
4	97.89	101.33	3.48	2173	9%	0.315	2.69	60	85	104	18	14	71%	97.43
5	115.49	98.92	4.20	2156	9%	0.299	2.83	60	84	104	22	17	61%	97.43
6	128.92	98.60	4.71	2143	9%	0.295	2.86	61	86	105	22	17	62%	97.39
7	145.99	98.37	5.34	2155	9%	0.291	2.90	62	84	105	22	18	66%	97.39
8	153.89	98.16	5.64	2023	9%	0.283	2.98	61	86	106	24	19	63%	97.26
9	160.37	88.62	6.52	1999	6%	0.271	3.11	61	87	109	23	18	63%	97.32
10	161.30	77.35	7.51	1997	4%	0.270	3.13	60	88	106	24	19	63%	97.29
11	161.05	67.39	8.60	1999	3%	0.269	3.14	62	90	108	24	19	63%	97.26
12	160.91	59.08	9.81	2004	2%	0.271	3.12	61	90	108	24	19	63%	97.22
13	159.60	45.73	12.56	1999	1%	0.272	3.11	62	89	108	24	19	63%	97.19
II. Part loads (unballasted, track)														
II.1 in selected gear at maximum power at rated engine speed.														
10	145.80	62.45	8.40	2198	3%	0.286	2.96	61	88	106	24	19	63%	97.29
II.1.1 75% of pull at maximum power at rated engine speed														
10	113.63	46.84	8.73	2260	2%	0.305	2.77	61	87	105	24	19	60%	97.12
II.1.2 50% of pull at maximum power at rated engine speed														
10	76.55	31.19	8.83	2272	1%	0.345	2.45	57	86	102	24	19	60%	97.12
II.1.3 higher gear at reduced engine speed, same pull and travel speed as II.1.1														
11	113.56	46.93	8.71	1991	2%	0.280	3.02	58	86	106	24	19	60%	97.12
II.1.4 higher gear at reduced engine speed, same pull and travel speed as II.1.2														
11	76.60	31.15	8.85	2011	1%	0.315	2.69	55	86	103	24	19	60%	97.12
II.1.5 higher gear at reduced engine speed, same pull and travel speed as II.1.3														
12	113.55	46.83	8.73	1768	2%	0.270	3.13	56	89	106	24	19	60%	97.12
II.1.6 higher gear at reduced engine speed, same pull and travel speed as II.1.4														
12	76.52	31.13	8.85	1782	1%	0.293	2.89	54	87	103	24	19	60%	97.12
II.2 in selected gear nearest to 7.5 km/h at rated engine speed.														
9	145.97	70.84	7.42	2208	3%	0.284	2.97	61	87	108	23	18	66%	97.36
II.2.1 75% of pull at maximum power at rated engine speed														
9	113.62	53.05	7.71	2261	2%	0.299	2.83	60	86	103	24	19	60%	97.16
II.2.2 50% of pull at maximum power at rated engine speed														
9	76.85	35.39	7.82	2272	1%	0.342	2.47	58	84	103	24	19	60%	97.12
II.2.3 higher gear at reduced engine speed, same pull and travel speed as II.2.1														
10	113.60	53.00	7.72	2005	2%	0.274	3.09	58	85	105	24	19	60%	97.12
II.2.4 higher gear at reduced engine speed, same pull and travel speed as II.2.2														
10	76.81	35.41	7.81	2011	1%	0.313	2.70	56	86	103	24	19	60%	97.12
II.2.5 higher gear at reduced engine speed, same pull and travel speed as II.2.3														
11	113.61	53.08	7.71	1768	2%	0.261	3.23	56	87	105	24	19	60%	97.12
II.2.6 higher gear at reduced engine speed, same pull and travel speed as II.2.4														
11	76.85	35.33	7.83	1782	1%	0.287	2.95	54	86	103	24	19	60%	97.12

3.3 Drawbar power test(unballasted tractor)

OECD Drawbar Data (US)

Date of test 24-Apr-98 | Fuel density 7.053 lb/gal
Type of tra Concrete | Test number 1747

Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, °F					Rel hum-idity	Baro. Pres in Hg
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		
I. Maximum Power (unballasted, track at 2000 rev/min)						Tire pressure:	track					Drawbar height:	18.0 in	
2	83.58	24071	1.30	2263	15%	0.628	11.24	138	181	214	69	60	61%	28.77
3	110.25	25021	1.65	2254	15%	0.577	12.23	138	182	216	62	56	70%	28.78
4	131.27	22780	2.16	2173	9%	0.517	13.64	140	185	219	64	58	71%	28.77
5	154.88	22238	2.61	2156	9%	0.491	14.35	139	184	220	71	62	61%	28.77
6	172.89	22167	2.92	2143	9%	0.485	14.54	142	187	221	72	63	62%	28.76
7	195.78	22114	3.32	2155	9%	0.479	14.72	143	183	221	72	64	66%	28.76
8	206.36	22068	3.51	2023	9%	0.466	15.15	142	188	224	75	66	63%	28.72
9	215.06	19922	4.05	1999	6%	0.446	15.80	142	189	228	74	65	63%	28.74
10	216.31	17389	4.67	1997	4%	0.444	15.88	141	191	224	75	66	63%	28.73
11	215.97	15151	5.35	1999	3%	0.443	15.92	143	195	227	75	66	63%	28.72
12	215.78	13282	6.09	2004	2%	0.446	15.82	142	194	226	75	66	63%	28.71
13	214.03	10282	7.81	1999	1%	0.447	15.79	144	192	227	75	66	63%	28.70
II. Part loads (unballasted, track)														
II.1 in selected gear at maximum power at rated engine speed.														
10	195.52	14040	5.22	2198	3%	0.470	15.02	142	190	224	75	66	63%	28.73
II.1.1 75% of pull at maximum power at rated engine speed														
10	152.38	10530	5.43	2260	2%	0.502	14.05	142	189	222	76	66	60%	28.68
II.1.2 50% of pull at maximum power at rated engine speed														
10	102.65	7013	5.49	2272	1%	0.568	12.43	134	186	216	76	66	60%	28.68
II.1.3higher gear at reduced engine speed, same pull and travel speed as II.1.1														
11	152.28	10551	5.41	1991	2%	0.460	15.34	136	188	223	76	66	60%	28.68
II.1.4 higher gear at reduced engine speed, same pull and travel speed as II.1.2														
11	102.72	7004	5.50	2011	1%	0.517	13.63	132	187	218	76	66	60%	28.68
II.1.5 higher gear at reduced engine speed, same pull and travel speed as II.1.3														
12	152.27	10528	5.42	1768	2%	0.444	15.89	132	193	223	76	66	60%	28.68
II.1.6 higher gear at reduced engine speed, same pull and travel speed as II.1.4														
12	102.62	6999	5.50	1782	1%	0.481	14.66	129	189	217	76	66	60%	28.68
II.2 in selected gear nearest to 4.6 mph at rated engine speed.														
9	195.75	15925	4.61	2208	3%	0.468	15.09	142	188	226	73	65	66%	28.75
II.2.1 75% of pull at maximum power at rated engine speed														
9	152.36	11926	4.79	2261	2%	0.491	14.35	139	188	217	76	66	60%	28.69
II.2.2 50% of pull at maximum power at rated engine speed														
9	103.06	7955	4.86	2272	1%	0.563	12.54	137	184	218	76	66	60%	28.68
II.2.3 higher gear at reduced engine speed, same pull and travel speed as II.2.1														
10	152.35	11915	4.79	2005	2%	0.450	15.66	136	185	221	76	66	60%	28.68
II.2.4 higher gear at reduced engine speed, same pull and travel speed as II.2.2														
10	103.01	7961	4.85	2011	1%	0.515	13.70	132	187	218	76	66	60%	28.68
II.2.5 higher gear at reduced engine speed, same pull and travel speed as II.2.3														
11	152.36	11933	4.79	1768	2%	0.430	16.41	132	189	222	76	66	60%	28.68
II.2.6 higher gear at reduced engine speed, same pull and travel speed as II.2.4														

4.1 Drawbar power test(ballasted tractor, 2200 rev/min)

OECD Drawbar Data (SI)

Date of test 30-Apr-98, 01-May-98 — Fuel density: 0.845 kg/l
Type of trac Concrete — Test number: 1747

Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, °C					Rel hum-	Baro. Pres
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet	idity	kPa
I. Maximum Power (ballasted, track at 2200 rev/min)						Tire pressure:	Track	kPa, rear	Track	kPa, front	Drawbar height:		470 mm	
3	91.40	124.52	2.64	2212	14%	0.332	2.54	58	84	102	14	13	89%	97.19
4	100.28	98.07	3.68	2198	5%	0.305	2.77	59	85	104	14	13	89%	97.19
5	117.30	94.24	4.48	2201	5%	0.289	2.92	60	85	104	19	16	76%	97.19
6	130.13	92.70	5.05	2202	5%	0.287	2.95	62	84	106	20	17	77%	97.19
7	146.19	92.24	5.71	2202	5%	0.284	2.98	62	85	106	22	18	66%	97.19
8	150.25	82.31	6.57	2201	3%	0.275	3.07	61	86	106	17	15	85%	97.39
9	150.20	72.23	7.49	2202	2%	0.276	3.06	61	86	108	14	13	89%	97.53
10	149.37	63.29	8.50	2205	2%	0.278	3.04	61	86	108	16	14	89%	97.53
11	149.01	55.76	9.62	2196	2%	0.277	3.05	62	86	107	16	14	84%	97.53
12	147.58	48.79	10.89	2197	1%	0.281	3.01	61	87	108	17	15	85%	97.46
13	144.24	37.25	13.94	2203	1%	0.286	2.95	61	86	108	16	14	84%	97.43

OECD Drawbar Data (US)

Date of test 30-Apr-98, 01-May-98 — Fuel density: 7.053 lb/gal
Type of trac Concrete — Test number: 1747

Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, °F					Rel hum-	Baro. Pres
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet	idity	in Hg
I. Maximum Power (ballasted, track at 2200 rev/min)						Tire pressure:	Track	psig, rear	Track	psig, front	Drawbar height:		18.5 in	
3	122.57	27993	1.64	2212	14%	0.546	12.92	137	183	216	57	55	89%	28.70
4	134.47	22048	2.29	2198	5%	0.501	14.07	138	185	219	58	56	89%	28.70
5	157.31	21186	2.78	2201	5%	0.476	14.83	140	186	220	66	61	76%	28.70
6	174.50	20841	3.14	2202	5%	0.471	14.97	143	184	223	68	63	77%	28.70
7	196.04	20738	3.55	2202	5%	0.467	15.11	144	185	223	72	64	66%	28.70
8	201.48	18504	4.08	2201	3%	0.453	15.58	142	187	223	62	59	85%	28.76
9	201.43	16238	4.65	2202	2%	0.454	15.55	142	188	226	58	56	89%	28.80
10	200.31	14229	5.28	2205	2%	0.456	15.45	143	188	227	60	58	89%	28.80
11	199.83	12535	5.98	2196	2%	0.455	15.50	143	188	224	61	58	84%	28.80
12	197.91	10969	6.77	2197	1%	0.462	15.26	141	188	227	62	59	85%	28.78
13	193.43	8375	8.66	2203	1%	0.470	14.99	143	187	226	61	58	84%	28.77

4.2 Drawbar power test(ballasted tractor , 2000 rev/min)

OECD Drawbar Data (SI)

Date of test 30-Apr-98, 01-May-98 — Fuel density: 0.845 kg/l
Type of trac Concrete — Test number: 1747

Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, °C					Rel hum-	Baro. Pres
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet	idity	kPa
I. Maximum Power (ballasted, track at 2000 rev/min)						Tire pressure:	Track	kPa, rear	Track	kPa, front		Drawbar height:	470 mm	
3	88.67	120.82	2.64	2226	14%	0.341	2.48	59	84	103	14	13	89%	97.19
4	103.48	111.22	3.35	2074	9%	0.301	2.81	59	85	104	17	14	80%	97.19
5	122.19	111.01	3.96	2037	9%	0.286	2.95	58	84	105	19	17	77%	97.19
6	135.16	108.03	4.50	2046	9%	0.284	2.97	61	86	106	21	17	69%	97.19
7	153.15	106.40	5.18	2087	9%	0.285	2.96	62	85	107	22	18	66%	97.19
8	163.82	100.99	5.84	2005	6%	0.265	3.19	61	86	108	16	15	90%	97.39
9	167.20	89.81	6.70	2002	4%	0.259	3.26	61	86	109	15	13	84%	97.53
10	167.57	79.06	7.63	2001	3%	0.259	3.26	61	87	109	15	14	89%	97.53
11	166.52	68.70	8.73	2006	2%	0.260	3.24	62	88	109	17	15	85%	97.49
12	165.52	60.31	9.88	2003	2%	0.261	3.24	61	89	110	17	15	85%	97.49
13	163.82	46.75	12.61	1998	1%	0.264	3.21	61	89	108	16	14	84%	97.43

OECD Drawbar Data (US)

Date of test 30-Apr-98, 01-May-98 — Fuel density: 7.053 lb/gal
Type of trac Concrete — Test number: 1747

Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, °F					Rel hum-	Baro. Pres
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet	idity	in Hg
I. Maximum Power (ballasted, track at 2000 rev/min)						Tire pressure:	Track	psig, rear	Track	psig, front		Drawbar height:	18.5 in	
3	118.91	27163	1.64	2226	14%	0.560	12.60	138	183	217	57	55	89%	28.70
4	138.77	25003	2.08	2074	9%	0.494	14.27	138	186	219	62	58	80%	28.70
5	163.86	24955	2.46	2037	9%	0.470	14.99	137	183	221	67	62	77%	28.70
6	181.26	24287	2.80	2046	9%	0.467	15.10	142	187	224	70	63	69%	28.70
7	205.38	23920	3.22	2087	9%	0.469	15.03	144	185	224	72	64	66%	28.70
8	219.68	22703	3.63	2005	6%	0.435	16.21	141	188	226	61	59	90%	28.76
9	224.21	20190	4.16	2002	4%	0.426	16.57	141	186	228	59	56	84%	28.80
10	224.72	17774	4.74	2001	3%	0.426	16.57	142	188	229	59	57	89%	28.80
11	223.31	15444	5.42	2006	2%	0.428	16.47	143	190	228	62	59	85%	28.79
12	221.96	13558	6.14	2003	2%	0.429	16.43	142	193	230	62	59	85%	28.79
13	219.69	10511	7.84	1998	1%	0.433	16.28	142	193	227	61	58	84%	28.77

4.3 MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of test	April 23, 1998
Location of test	Nebraska Tractor Test Laboratory
Sound level meter	Bruel and Kjaer 2236
Type of track	Concrete oval
Gear number	16th
Speed prior to acceleration	22.8 km/h
Noise Level	88.8 dB(A)

4.4 POWER LIFT TEST. Cat III,N.A. Quick attach linkage
Date of test: 18 March 1998

		Hitch points	Frame
Lower hitch points above ground - down position:	[mm/in]	203/8.0	220/8.7
Vertical movement:			
without load:	[mm/in]	826/32.5	820/32.3
with load:	[mm/in]	813/32.0	801/31.5
Maximum corrected force through full range:	[kN/lb]	61.9/13909	70.1/15749
Corresponding pressure:	[kPa/psi]	17850/2590	
Moment about rear axle:	[kN.m/lb.ft]	76.2/56214	129.0/95151
Maximum mast tilt angle:	[deg]	--	4.0

Lifting height relative to horizontal position of lower links.

	[mm]	-369	-352	-299	-201	-98	1
	[in]	-14.5	-13.8	-11.8	-7.9	-3.9	0.0
Corrected lift forces							
Hitch point.	[kN]	61.9	--	64.6	68.9	72.7	76.1
	[lb]	13909	--	14528	15484	16355	17115
at frame	[kN]	--	71.0	70.0	70.9	71.7	72.4
	[lb]	--	15964	15744	15936	16111	16279

Lifting height relative to horizontal position of lower links.

	[mm]	99	201	300	382	407	449
	[in]	3.9	7.9	11.8	15.0	16.0	17.7
Corrected lift forces							
Hitch point	[kN]	78.8	81.6	84.5	86.9	87.5	--
	[lb]	17717	18338	19002	19536	19674	--
at frame	[kN]	72.7	72.7	--	72.1	70.8	70.1
	[lb]	16352	16349	--	16206	15925	15749

Tabulated Drawbar Performance as per Code 2, Paragraph 3.3.3

	Unballasted
Maximum drawbar pull	111.30 kN
Slip	15%
Corresponding to 7%	88.62 kN

	Ballasted
Maximum drawbar pull	124.52 kN
Slip	14%
Corresponding to 7%	100.99 kN

5. REPAIRS

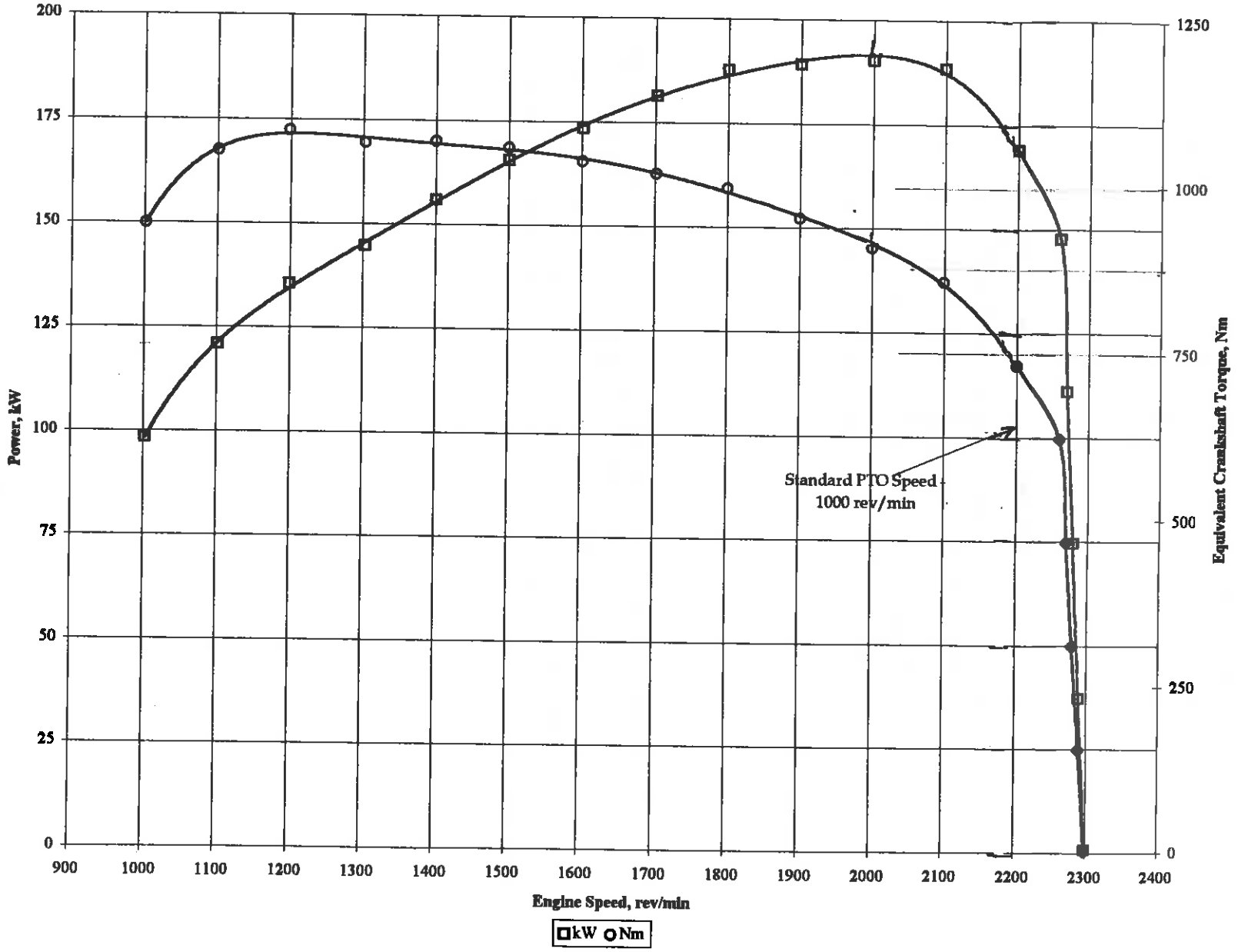
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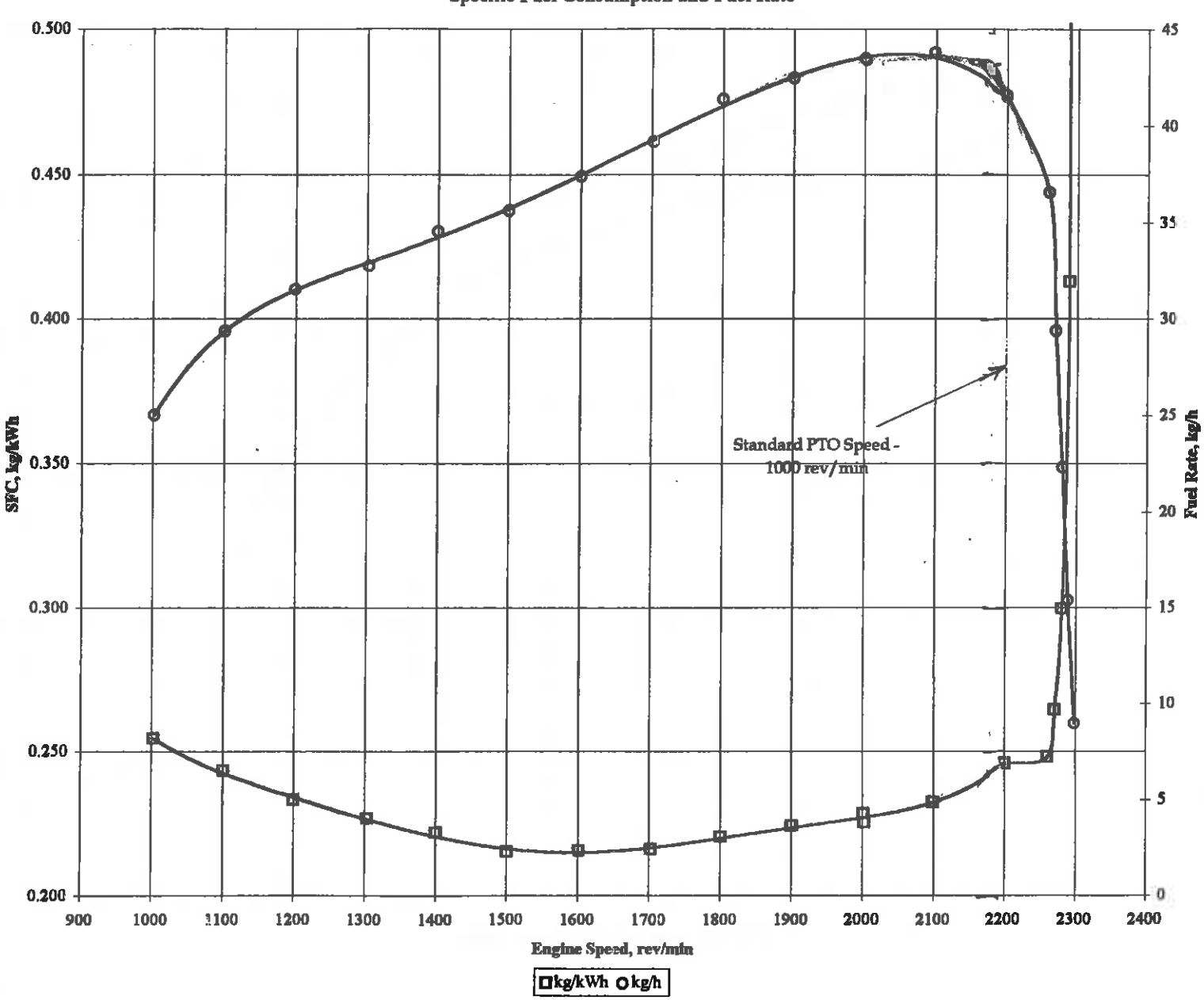
6. REMARKS

The 8400T engine has an electronic control system which provides a vehicle protection system to avoid overloading the drive train. This system provides four different engine power levels. The engine produces up to 160 PTO hp when the transmission is in forward gears 1 through 4 and the PTO is not engaged. The engine produces up to 180 PTO hp when the transmission is in the 5th forward gear and the PTO is not engaged. The engine produces up to 200 PTO hp when the transmission is in the 6th forward gear and the PTO is not engaged. The engine produces up to 225 PTO hp in all other applications.

John Deere 8400T

Power and Equivalent Crankshaft Torque




Specific Fuel Consumption and Fuel Rate
SFC, kg/kWh
Fuel Rate, kg/h
Engine Speed, rev/min
Standard PTO Speed - 1000 rev/min
kg/kWh
kg/h
0.500
0.450
0.400
0.350
0.300
0.250
0.200
45
40
35
30
25
20
15
10
5
0
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400

John Deere 8400T

