OECD APPROVAL # 1714 (Restricted code)
Date of approval: 4 December, 1997

NEBRASKA TRACTOR TESTING 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 RESTRICTED CODE (CODE II) FOR THE OFFICIAL TESTING OF AGRICULTURAL TRACTORS

JOHN DEERE 7810 POWERSHIFT MFWD - 40 km/h

MANUFACTURED BY	John Deere Waterloo Tractor Works Tractor Division P.O. Box 270 Waterloo, Iowa 50704-0270
NEBRASKA TEST NUMBER	1729
TEST DATES	May 30 through June 18, 1997

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 - Annex II, Restricted Code.

This report has been approved by the OECD Coordinating Centre in Paris (CEMAGREF) on 4 December, 1997 for the **John Deere 7810 Powershift MFWD - 40 km/h** with OECD number 1714 .

Associate Director

Dr. Louis I. Leviticus

Senior Test Engineer

Chairman, Tractor Test Board

Dr. Leonard L. Bashford

Members, Tractor Test Board

David L. Morgan

Test Engineer

Dr. Michael F. Kocher

Brent T. Sampson

Dr. Robert D. Grisso

Date: DEC 5 1997

LINCOLN, NEBRASKA 68583-0832,USA

TABLE OF CONTENTS.

SPECIFICATIONS OF TRACTOR.

Manufacturers name/address	John Deere Tractor Works, 3500 East Donald Street, P.O. Box 270, Waterloo, Iowa, USA
Location of tractor assembly	Same
Submitted for test by	The manufacturer
Selected for test by	The manufacturer in agreement with the test station.
Place of running in	John Deere Product Eng. Ctr., Waterloo, Iowa, USA
Duration of running in	228 hours
Location of Test	Nebraska Power Laboratory, Tractor Testing Laboratory Lincoln, Nebraska,USA.

TRACTOR SPECIFICATIONS.

Make	John Deere
Model	7810 Powershift MFWD
Type	Unit construction, mechanical front wheel drive (MFWD)
Number of driving wheels	2 or 4
Serial Number	RW7810P002932
1st Serial number	RW7810P001001

ENGINE.

Make	John Deere
Model	6081TRW02
Type	Diesel; 4-stroke; turbocharged, direct injection
Serial Number	RG6081T014115

Cylinders

Number/Disposition	6, in-line, vertical
Bore/stroke	115.9 mm x 128.5.0 mm
Capacity	8132 cm^3
Compression Ratio	16.5 : 1
Arrangement of valves	Overhead
Cylinder liners	Wet; replaceable

Super charging

Make/Model/Type	Schwitzer/RE63773/Exhaust gas driven
Pressure	129 ± 15 kPa at rated speed and load

Fuel System

Feed system	Transfer pump integral with injection pump
Make/Type/Model of filters	Stanadyne/AR86745/paper element
Fuel tank capacity	344 l

Fuel Cooler	Heat exchanger with air
Make/Model/Type Injection Pump	Nippondenso/RE64421/In-line; electric shutoff
Pump Serial number	092000-213110R0092
Production setting of pump	
Flow Rate (Rated Eng.Spd & Full Load)	29.0 ± 1.0 kg/h
Fuel Density	0.841 kg/l
Make/Model/Type Injectors	Nippondenso/RE64266/P-tip nozzle
Injection pressure	29 +/- 1.5 MPa
Timing	8.45 degrees BTDC
Governor	
Make/Model/Type	Nippondenso/RSV200/Mechanical
Governed engine speed range	From 850 to 2275 rev/min
Rated engine speed	2100 rev/min
High-idle speed range	2275 ± 50 rpm
Air Cleaner.	
Pre-cleaner	
Make/Model/type	Donaldson/RE63908/Strato-tube precleaner with aspirator
Air intake location	Under hood, front of tractor
Main Cleaner	
Make/Model/Type	Donaldson/RE65880/Pleated paper
Location	Under hood, front of tractor
Secondary element	Donaldson/RE34967/Pleated paper
Maintenance indicator	Dash mounted warning light and audio signal
Lubrication system.	
Type of feed pump	Full pressure; positive displacement
Type of filters	Full flow
Number	One spin-on.
Oil cooler	Heat exchanger with engine coolant
Cooling system.	
Type of coolant	Liquid
Type of pump	Centrifugal, belt driven
Fan specification	Belt driven; Suction type; Variable speed
Number of fan blades	6
Fan diameter	582 mm
Coolant system capacity	26 l
Type of temperature control	Two thermostats and variable speed fan
System pressure	69 kPa

Starting system.	
Make/Model/Type of starter	Nippondenso/RE65100/Solenoid engaged
Power Rating	4.0 kW
Cold starting aid	Ether spray in air intake manifold
Safety device	Electrical lockout on gearshift
Electrical system.	
Voltage & grounding.	12 Volt DC; negative ground
Alternator	
Make/Model/Type	Nippondenso/RE46608/Belt driven
Power rating	140 Amp at rated engine speed and 25^{0}C ambient
Batteries	
Number & connection	Two; 12 Volt batteries in parallel; SAE tapered post
Rating	925 cold cranking amps/battery 175 Ah/battery at 20 hour rating
Exhaust system.	
Muffler Make/Model/Type	Nelson/RE65767/Expansion chamber
Location	Horizontal muffler; under hood
Exhaust stack location	Vertical; right front of cab

TRANSMISSION (tested version)

Clutch. (travel)	
Make/Model/Type	John Deere/Multiple plate/oil cooled
Number of plates	3, 5 or 8 depnding on gear selection
Plate diameter	225 mm
Method of operation	Hydraulic; pedal actuated
Gear Box.	
Make/Model/Type	John Deere/Full Powershift/Mechanical
Arrangement (tested version)	Planetary design; Two traction and range clutches; One 2-speed planetary gearset; Two compound planetary gearsets. One single planetary reverse brake; All with multiple wet disc clutches and brakes.
Number of gears	19 forward and 7 reverse operated one lever
Oil cooler	Heat exchanger with air
Other Available options	None

Rear axle and final drives.	
Make/Model/Type	John Deere/RE66320/Spiral bevel and pinion, differential and inboard planetary reduction
Differential Lock	
Type	Electro-Hydraulic
Method of engagement	Pedal operated switch
Method of disengagement	Self-disengaging with brake pedal operation
Front Axle and final drives.	
Make/Model/Type	John Deere/MFWD 1100 Series/Spiral Bevel and pinion, differential and outboard planetary reduction
Differential Lock	
Type	Limited slip
Method of engagement	Self-engaging
Method of disengagement	Self-disengaging

GEAR RATIOS AND TRAVEL SPEEDS.

(Tire dynamic radius of 870 mm - ISO 4251/1-1992)

Gear Number	Number of engine revolutions for one revolution of the driving wheels	Nominal travel speed at rated engine speed of 2100 rev/min [km/h]
Forward		
1	429.48	1.60
2	300.03	2.30
3	239.49	2.88
4	197.60	3.49
5	171.52	4.02
6	151.13	4.56
7	131.18	5.25
8	110.19	6.25
9	95.84	7.20
10	84.27	8.17
11	73.15	9.42
12	63.74	10.81
13	55.33	12.45
14	48.75	14.13
15	42.32	16.26
16	37.78	18.23
17	30.53	22.56
18	21.85	31.52
19	17.66	38.99
Reverse		
1	267.31	2.68
2	186.74	3.69
3	122.99	5.50
4	106.75	6.45
5	94.07	7.32
6	81.65	8.44
7	42.17	16.33

Number of front wheel revolutions for one rear wheel revolution: 1.3188

*Note: Dynamic index of 870 mm was on tractor supplied for test. European market will have tires with 905 mm dynamic radius.

POWER - TAKE - OFF.

Main Power-Take-Off.

Type	Independent
Method of engagement	Electro-hydraulically actuated multi-plate wet clutch operated by hand control switch
Number of shafts	One
Method of changing speeds	Reversible shaft
SM-Option	Reversible shaft with 2 speeds selectable by hand lever

1. PTO Proportional to Engine speed - reversible shaft (tested version)

Standard PTO - 540 rev/min.

Location	Rear of tractor; center plane
Diameter of shaft	35 mm
Number of splines	6; conforms to ISO 500/1991
Height above ground	765 mm
Distance from median plane of tractor	0 mm
Distance behind rear axle	620 mm
PTO Speed at rated engine spd	547 rev/min
Engine speed at Std. PTO spd	2072 rev/min
Engine speed/PTO speed ratio	3.837 : 1
Power restriction	56 kW
Direction of rotation when viewed from shaft end	Clockwise.

Standard PTO-1000 rev/min.

Location	Rear of tractor; center plane
Diameter of shaft	35 mm
Number of splines	21; conforms to ISO 500/1991
Height above ground	765 mm
Distance from median plane of tractor	0 mm
Distance behind rear axle	620 mm
PTO Speed at rated engine spd	1007 rev/min
Engine speed at Std. PTO spd	2086 rev/min
Engine speed/PTO speed ratio	2.086 : 1
Power restriction	None
Direction of rotation when viewed from shaft end	Clockwise.

2. PTO Proportional to Engine speed - reversible two-speed shaft (SM-option)

Standard PTO - 540 rev/min.

Location	Rear of tractor; center plane
Diameter of shaft	35 mm
Number of splines	6 or 21 splines - conforms to ISO 500/1991
Height above ground	765 mm
Distance from median plane of tractor	0 mm
Distance behind rear axle	620 mm
PTO Speed at rated engine spd	656 rev/min
Engine speed at Std. PTO spd	1730 rev/min
Engine speed/PTO speed ratio	3.204 : 1
Power restriction	56 kW
Direction of rotation when viewed from shaft end	Clockwise.

Standard PTO-1000 rev/min.

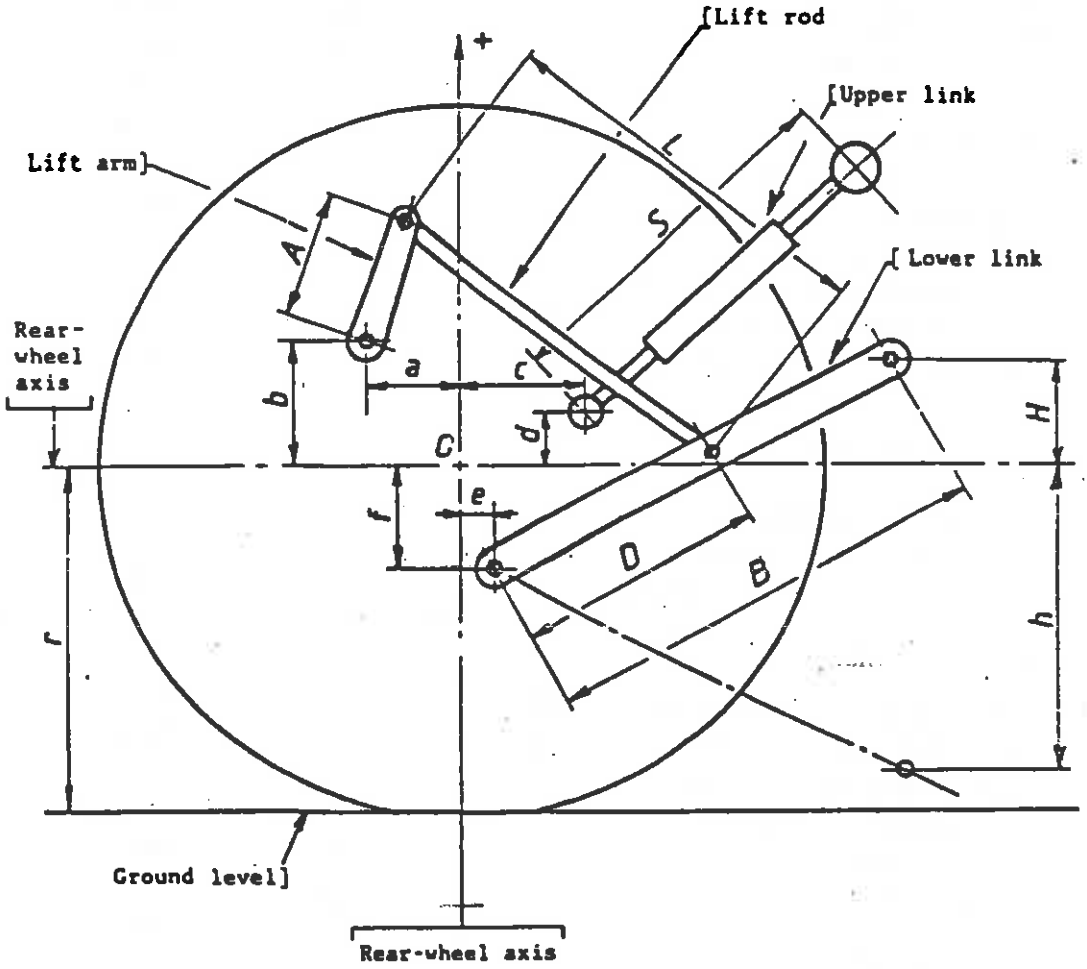
Location	Rear of tractor; center plane
Diameter of shaft	35 mm
Number of splines	6 or 21 splines; conforms to ISO 500/1991
Height above ground	765 mm
Distance from median plane of tractor	0 mm
Distance behind rear axle	620 mm
PTO Speed at rated engine spd	1064 rev/min
Engine speed at Std. PTO spd	1973 rev/min
Engine speed/PTO speed ratio	1.973 : 1
Power restriction	None
Direction of rotation when viewed from shaft end	Clockwise.

POWER LIFT.

Make/Model/Type	John Deere/10050 Lb system/Electronic 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	20.3 +0.4/-0.6 MPa
Opening pressure of cylinder safety valve	24.0 ± 1.0 MPa
Lift pump type	Axial piston, variable delivery and flow, pressure and flow compensated
Power transmission to pump	Spiral bevel gear drive
Type/Number of filters	Synthetic media; screw-on canister/one
Location of oil reservoir	Differential case housing
Number/Type/Location of tapping points.	ISO standard breakaway couplers at rear; 2 standard, 3rd and 4th optional. Additional inlet/outlet pair for externally controlled implements
Max. oil volume available for external cylinders.	19.0 liters; additional 11 liters allowable overfill for total of 30 liters

THREE POINT LINKAGE.

- Category 3N/2 or 2 in conformity with ISO 730/1-1990
- Category adaptor None



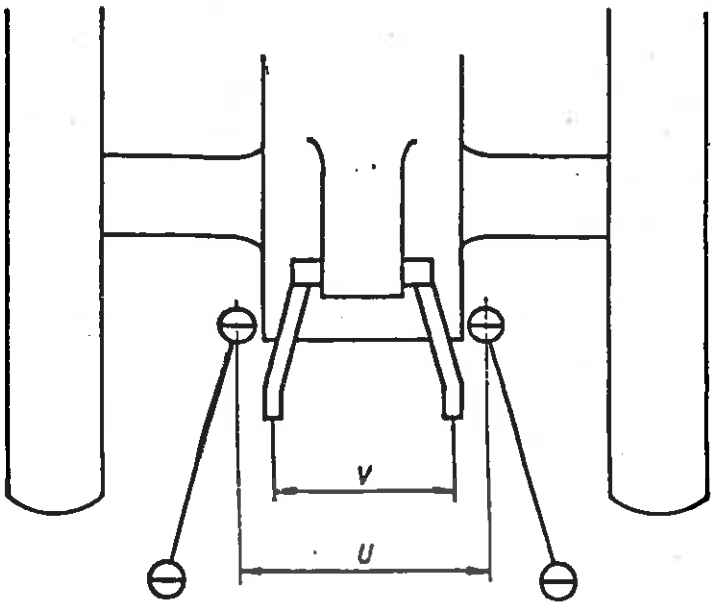


Table 1.1 - LINKAGE GEOMETRY DIMENSIONS.
ISO Category III Hook Type Draft Link Ends

		Dimension or range [mm]	Settings used on test [mm]
Rear Tire - Radius Index	(r)	870*	905*
Front Tire - Radius Index	(r')	665*	695*
Length of lift arms	(A)	375	same
Length of lower links	(B)	1011	same
Distance of lift arm pivot from: horizontal	(a)	205	same
rear wheel axis: vertical	(b)	588	same
Horizontal distance between the 2 lower link points	(U)	520	same
Horizontal distance between the 2 lift arm end points	(V)	647	same
Length of upper link	(S)	609 to 808	692
Distance of upper link pivot point from rear wheel axis			
- horizontal	(c)	504	same
- vertical	(d)	353, 283,200	283
Distance of lower link pivot from: horizontal	(e)	195	same
rear wheel axis: vertical	(f)	275	same
Distance of lower link pivot points to lift rod pivot pts on lower links.	(D)	612, 688	612
Length of lift rods	(L)	842 to 1051	968
Height of lower hitch points below rear wheel axis			
In low position	(h)	409 to 802	654
In high position	(H)	281 to 49	103
Height above ground of lower hitch points when locked in transport position		888 to 1123	1008

* Tire dynamic index of 870 mm, ISO 4251/1-1992

*Note: Dynamic index of 870 mm was on tractor supplied for test. European market will have tires with 905 mm dynamic radius.

SWINGING DRAWBAR.

Type		Oscillating
Height above ground	Maximum	551 mm
	Minimum	487 mm
Adjustments		Invert drawbar; reposition clevis
Distance of hitch point from rear wheel axis-	Horizontal	920, 970, 1020 mm
Distance of hitch point from PTO shaft end:	Vertical	250 mm
	Horizontal	250, 350, 400 mm
Lateral adjustment	Right side	190 mm
	Left side	190 mm
Distance of pivot point from rear wheel axis	Horizontal	27 mm
Diameter of drawbar pin hole		33 mm
Maximum vertical static permissible load		28 kN -short position
		21 kN -intermediate position
		14 kN -extended position

STEERING.

Make/Model/Type	Eaton/RE34138/Hydrostatic
Method of operation	Steering wheel
Pump(s)	Power Mode - Same as main pump Manual Mode - Ground driven pump
Ram(s)	Two external; double acting
Working pressure	17.0 ± 0.5 MPa

BRAKE SYSTEM.

Service brake.

Make/Model/Type	Vickers/RE67321/John Deere oil immersed disc
Method of operation	Hydraulic; operated by two pedals which can be locked together.

Parking brake.

Type	Transmission lock.
Method of operation	Gear selector lever

Trailer Brake — None

WHEELS.

Number	Front	Two; Driving and steering
	Rear	Two or four; Driving
Wheel base		2800 mm

TRACK WIDTH ADJUSTMENT

	Minimum [mm]	Maximum [mm]	Adjustment method
Front	1524	2235	Reversing wheels and offset lug rims
Rear Singles	1525	2752	Rack and Pinion axle; Reversing wheels
Duals	2810	3318	and offset lug rims

PROTECTIVE STRUCTURE.

Make/Model/Type	John Deere/Sound Gard SG-060/Cab
Manufacturer's name/address	John Deere Tractor Works, Waterloo, Iowa, USA
Protective device	Cab; not tiltable
OECD approval number	CSS 0394/3
Approval date	27 September, 1996

DRIVER'S SEAT.

Make/Model/Type	Sears/RE35125/Air suspension; Personal posture cushioning
Type of suspension	Air
Type of damping	Three position viscous damper
Range of adjustment	
Longitudinal	167 mm
Vertical	80 mm
Rotation	20 degrees left & right

LIGHTING.

	Height above ground of center [mm]	Size [mmxmm]	Distance from outside edge to median plane of tractor. [mm]
Head lights	1165	162 x 102	232
Side lights	1165	152 x 102	277
Rear lights	1980	127 x 76	892
Reflectors-rear - Outside	1980	43 x 70	934
- Inside	1980	43 x 70	807

TEST CONDITIONS.

Overall dimensions.

Length	Overall	4755	mm
	With front ballast	5205	mm
Width	Singles	3012	mm
	Duals	3635	mm
Height	Top protective structure	3023	mm
	Top of exhaust	2958	mm
Ground clearance		515	mm
Clearance-limiting part		Drawbar	

Tractor Mass (with cab,full fuel tank).

		Without driver [kg]	With driver [kg]
Unballasted	Front	2503	2513
	Rear	4557	4622
	Total	7060	7135
Ballasted	Front	2739	2749
	Rear	6081	6146
	Total	8820	8895

Added ballast			
	Dual Tires	691	kg per set (two duals)
	Rear weights	884	kg (4 weights of 221 kg each)
	Front weights	135	kg (3 weights of 45 kg each)
	Front bracket	50	kg
Max. permissible load	front	4800	kg
	rear	10000	kg

Tire Specifications.	Front Wheels		Rear Wheels	
Make	Goodyear		Goodyear	
Dimensions	14.9R30		18.4R42	
Number/Ply rating	3 star		2 star	
Type	Radial		Radial	
Max.load - Tire mfr - 40 km/hour.	1980	kg/tire	3000	kg/tire
- Tire mfr - 30 km/hour	2120	kg/tire	3200	kg/tire
Inflation pressure - tire mfr - max	210	kPa	160	kPa
- min	40	kPa	40	kPa
as tested - unballasted	85	kPa	90	kPa
as tested - ballasted	95	kPa	60	kPa
Dynamic Radius Index *	665	mm	870	mm
Chosen track width - Singles	1930	mm	1600	mm
Duals			3135	mm

*Note: Dynamic index of 870 mm was on tractor supplied for test. European market will have tires with 905 mm dynamic radius.

OILS AND LUBRICATION

Capacity and change interval:

	Capacity liter	Oil change hours	Filter change hours
Engine	25.0	250	250
Front axle	8.5	1500	750
Transmission, final drive, rear axle and hydraulics	102.3	1500	Annually or as required
Final drive, front	1.9	1500	

Oil and Lubricant specifications:

	Recommended	Used during test
Engine oil		
Type	John Deere, TORQ-GARD Supreme Plus 50; SAE 15W-40	same
Viscosity	12.8 cSt at 100°C	
Classification	API CE or CD; CCMC specification D5 or D6	
Transmission		
Type	John Deere HY-GARD (J20C) SAE 10W-30	same
Viscosity	58 cSt at 40°C	
Classification	NA	
Hydraulic fluid	Same as transmission	same
Front axle hubs		
Type	John Deere GL5 Gear Lubricant SAE 85W-140	same
Viscosity	13.5 cSt at 100°C	
Classification	API GL-5	
Front axle differential		
Type	John Deere HY-GARD J20C; SAE 10W-30	same
Viscosity	58 cSt at 40° C	
Classification	NA	
Steering system	Same as transmission	same
Grease	John Deere Moly High Temperature EP Grease	same
Number of lube points	19	

FUEL

Type/grade	Premier; Grade 2-D, in conformity with the national standard
Density (Pto test)	0.841 kg/l at 15^0 C
(Drawbar test)	same as Pto test.
Cetane number	50.6
Viscosity	2.51 cSt at 38^0 C

COMPULSORY TESTS

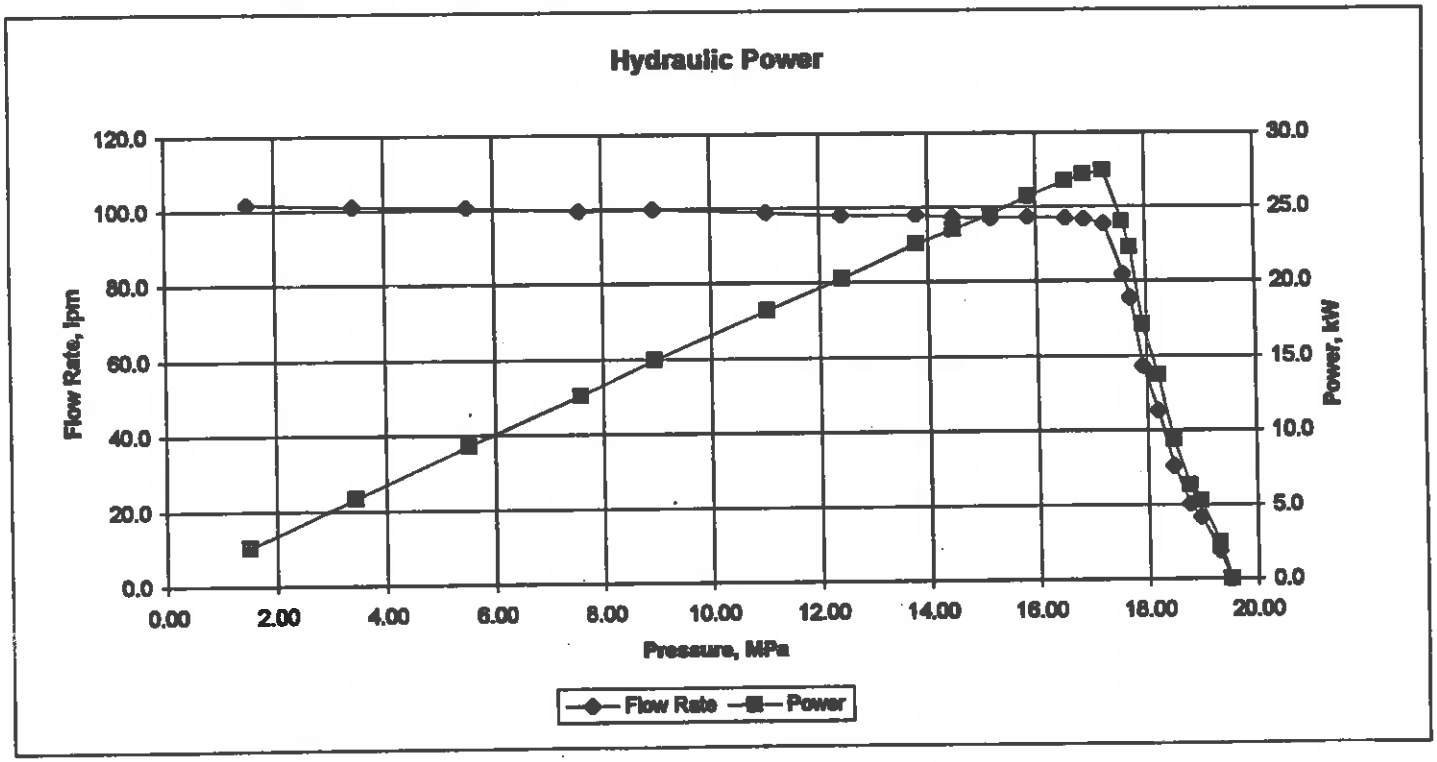
1. MAIN POWER TAKE OFF

Date: 2-Jun-97 Location: UNL Tractor Test Lab, Lincoln, NE, USA
Type of dynamometer: Eddy current, Eaton
Fuel Density 0.841 kg/l

Power kW / *hp*	Engine rev/min	PTO rev/min	l/h / *gal/h*	kg/h / *lb/hr*	kg/kW-h / *lb/hp-h*	kW-h/l / *hp-h/gal*
1.1 Maximum Power - 2 Hours						
123.35 / *165.42*	1750	839	34.35 / *9.07*	28.88 / *63.67*	0.234 / *0.385*	3.59 / *18.23*
1.2 Power at Rated Engine Speed - 1 hour						
111.98 / *150.17*	2100	1007	34.01 / *8.99*	28.60 / *63.05*	0.255 / *0.420*	3.29 / *16.71*
1.3 Power at Standard Power Take Off Speed - 1 hour						
111.98 / *150.17*	2100	1007	34.01 / *8.99*	28.60 / *63.05*	0.255 / *0.420*	3.29 / *16.71*
1.4 Part Loads						
1.4.1 Torque at maximum power at rated engine speed						
111.98 / *150.17*	2100	1007	34.01 / *8.99*	28.60 / *63.05*	0.255 / *0.420*	3.29 / *16.71*
1.4.2 85% of torque obtained in 1.4.1						
97.14 / *130.27*	2138	1025	31.23 / *8.25*	26.26 / *57.90*	0.270 / *0.444*	3.11 / *15.79*
1.4.3 75% of torque defined in 1.4.2						
73.76 / *98.91*	2166	1039	25.73 / *6.80*	21.64 / *47.70*	0.293 / *0.482*	2.87 / *14.55*
1.4.4 50% of torque defined in 1.4.2						
49.90 / *66.92*	2203	1057	19.91 / *5.26*	16.74 / *36.90*	0.335 / *0.551*	2.51 / *12.72*
1.4.5 25% of torque defined in 1.4.2						
25.49 / *34.19*	2236	1072	15.05 / *3.98*	12.66 / *27.90*	0.496 / *0.816*	1.69 / *8.60*
1.4.6 unloaded						
0.77 / *1.03*	2266	1086	10.03 / *2.65*	8.44 / *18.60*	10.943 / *17.991*	0.08 / *0.39*
1.5 Part Loads at Standard Power Take Off Speed						
1.5.1 Torque at maximum power						
111.98 / *150.17*	2100	1007	34.01 / *8.99*	28.60 / *63.05*	0.255 / *0.420*	3.29 / *16.71*
1.5.2 85% of torque obtained in 1.5.1						
97.14 / *130.27*	2138	1025	31.23 / *8.25*	26.26 / *57.90*	0.270 / *0.444*	3.11 / *15.79*
1.5.3 75% of torque defined in 1.5.2						
73.76 / *98.91*	2166	1039	25.73 / *6.80*	21.64 / *47.70*	0.293 / *0.482*	2.87 / *14.55*
1.5.4 50% of torque defined in 1.5.2						
49.90 / *66.92*	2203	1057	19.91 / *5.26*	16.74 / *36.90*	0.335 / *0.551*	2.51 / *12.72*
1.5.5 25% of torque defined in 1.5.2						
25.49 / *34.19*	2236	1072	15.05 / *3.98*	12.66 / *27.90*	0.496 / *0.816*	1.69 / *8.60*
1.5.6 unloaded						
0.77 / *1.03*	2266	1086	10.03 / *2.65*	8.44 / *18.60*	10.943 / *17.991*	0.08 / *0.39*

No load maximum engine speed:	2266	rev/min		
Equivalent torque at rated speed:	509	N.m	*376*	*lb-ft*
Equivalent torque at maximum power:	673	N.m	*496*	*lb-ft*
(engine speed:	1750	rev/min)		
Maximum equivalent crankshaft torque:	764	N.m	*563*	*lb-ft*
(engine speed:	1300	rev/min)		
Mean Dry bulb:	26	deg C	*78*	*deg F*
Wet bulb:	18	deg C	*65*	*deg F*
Relative Humidity	51	%		
Pressure:	97.7	kPa	*28.84*	*in Hg*
Maximum Coolant:	105	deg C	*221*	*deg F*
Engine Oil:	126	deg C	*258*	*deg F*
Fuel:	56	deg C	*133*	*deg F*
Air Intake:	29	deg C	*85*	*deg F*
Transmission/hydraulic oil:	57	deg C	*134*	*deg F*
Intake manifold pressure at rated speed:	133	kPa	*19.2*	*psig*
Intake manifold pressure at maximum power:	126	kPa	*18.3*	*psig*

Date of Test: 18-Jun-97	John Deere 7810 PS	
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:		
19.51 MPa		
2830 psig		
II. Pump delivery rate at minumum pressure and rated engine speed:		
101.8 l/min		
26.9 gpm		
III. Flow rate, pressure, power:		
90% of relief valve setting		
81.8 l/min	17.58 MPa	23.9 kW
21.6 gpm	*2550 psig*	*32.1 hp*
Maximum hydraulic power:		
95.4 l/min	17.24 MPa	27.4 kW
25.2 gpm	*2500 psig*	*36.8 hp*
IV. Hydraulic fluid temperature at flow meter:		
63.1 °C		
146 °F		
This hydraulic system does not use an accumulator. Opening and closing pressures of the unloading valve could not be measured.		



2.2 POWER LIFT TEST. Test A-Upper link in middle hole on tractor

Date of test: 15 June 1993
(Data taken from OECD test 1489 done on the John Deere 7600 Powershift which has the same mechanical lifting system and pressure settings)

		Hitch points	Frame
Lower hitch points above ground - down position:	[mm/in]	251/9.9	201/7.9
Vertical movement: without load:	[mm/in]	757/29.8	889/35.0
Vertical movement: with load:	[mm/in]	729/28.7	879/34.6
Maximum corrected force through full range:	[kN/lb]	49.4/11111	45.2/10161
Corresponding pressure:	[kPa/psi]	18.0/2610	
Moment about rear axle:	[kN.m/lb.ft]	59.6/43979	82.1/60543
Maximum mast tilt angle:	[deg]	--	9.4

Lifting height relative to horizontal position of lower links.

	[mm]	-424	-373	-300	-201	-99
	[in]	-16.7	-14.7	-11.8	-7.9	-3.9
Corrected lift forces						
Hitch point.	[kN]	--	49.4	52.8	56.5	59.0
	[lb]	--	11111	11867	12704	13523
at frame	[kN]	48.6	--	49.8	51.5	52.4
	[lb]	10935	--	11196	11583	11772

Lifting height relative to horizontal position of lower links.

	[mm]	0	99	201	290	356	454
	[in]	0	3.9	7.9	11.4	14.0	17.9
Corrected lift forces							
Hitch point	[kN]	61.4	62.9	64.8	66.8	67.7	--
	[lb]	13793	14144	14558	15026	15215	--
at frame	[kN]	52.4	51.7	50.4	49.8	48.7	45.2
	[lb]	11772	11619	11340	11196	10944	10161

OECD Drawbar Data (SI)

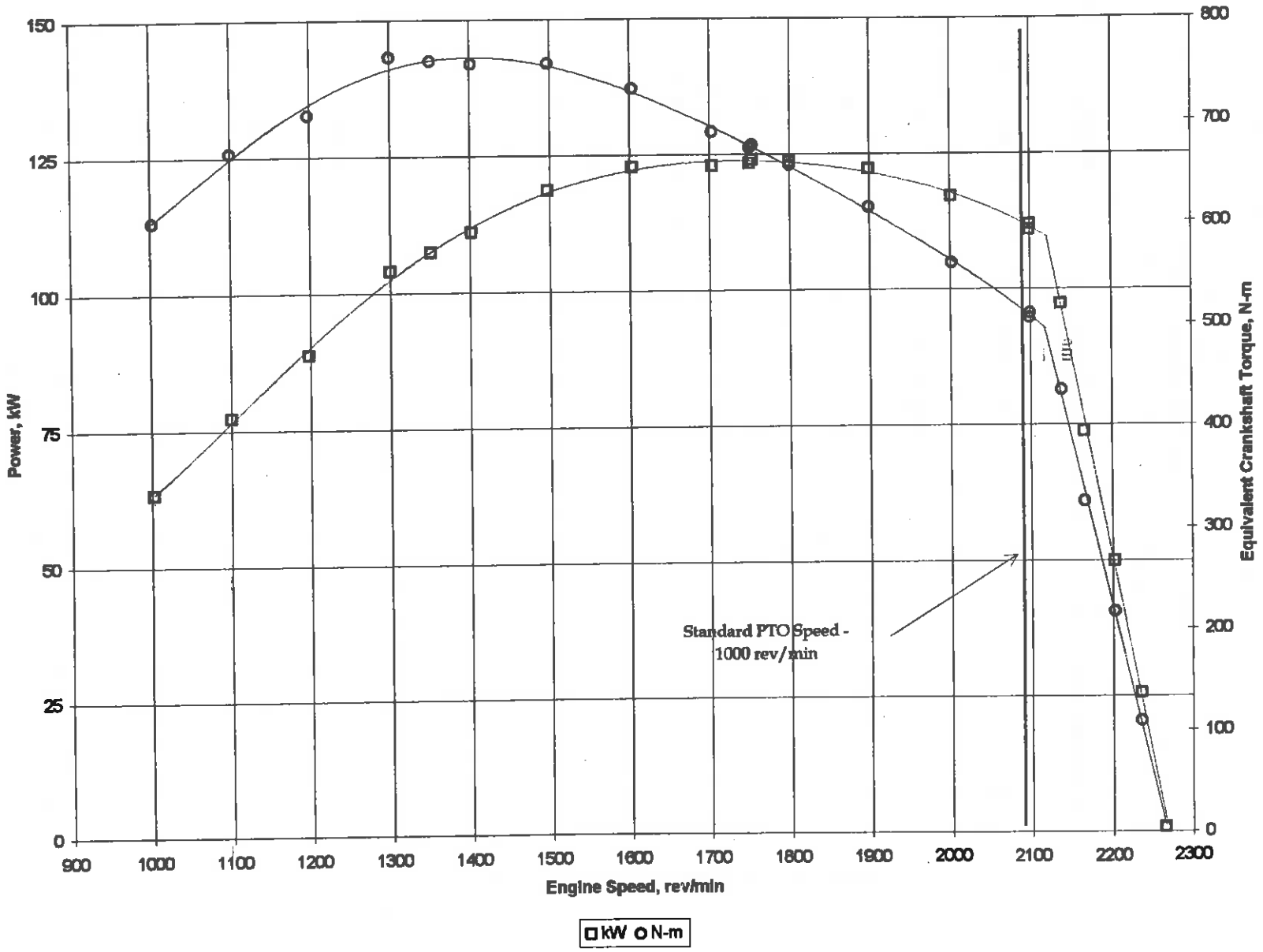
Date of test	04-Jun-97			Fuel density:	0.841 kg/l										
Type of trac	Concrete			Test number	1729										
Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, deg C						Rel humidity	Baro. Pres
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet			kPa
I. Maximum Power (unballasted, 4wd at 1750 rev/min)						Tire pressure:		90 kPa, rear		83 kPa, front		Drawbar height:		533 mm	
[illegible]	67.31	67.85	3.57	2151	13%	0.355	2.37	53	87	114	22	18		68%	98.10
[illegible]	81.25	70.00	4.18	2141	10%	0.326	2.58	53	89	115	20	16		68%	97.52
[illegible]	89.65	66.09	4.88	2120	8%	0.310	2.71	54	93	119	21	17		69%	98.14
[illegible]	97.58	64.29	5.46	1971	7%	0.299	2.81	54	95	121	21	17		69%	98.10
9	101.44	63.69	5.73	1810	8%	0.288	2.91	52	99	124	22	18		66%	98.10
10	104.11	57.98	6.46	1750	5%	0.279	3.01	54	99	123	22	18		69%	98.14
11	106.16	50.47	7.57	1750	4%	0.274	3.07	54	101	124	22	18		66%	98.10
12	105.71	43.51	8.75	1748	3%	0.275	3.06	54	102	124	22	18		69%	98.14
13	105.89	37.62	10.13	1748	2%	0.273	3.08	55	103	128	22	18		69%	98.14
[illegible]	105.64	32.94	11.55	1748	2%	0.275	3.06	54	102	126	22	17		65%	98.17
[illegible]	105.12	28.38	13.34	1746	2%	0.276	3.05	54	103	127	22	17		62%	98.17
* Note:	Slip within operating procedures of testing station.														
II. Part loads (unballasted, 4wd)															
II.1 in selected gear at maximum power at rated engine speed															
11	94.26	36.83	9.21	2099	2%	0.303	2.78	53	93	121	22	18		69%	98.14
II.1.1 75% of pull at maximum power at rated engine speed															
11	72.42	27.55	9.46	2141	2%	0.321	2.62	53	94	118	23	18		62%	98.14
II.1.2 50% of pull at maximum power at rated engine speed															
11	49.35	18.34	9.69	2179	1%	0.380	2.21	52	86	111	24	18		53%	98.14
II.1.3 higher gear at reduced engine speed, same pull and travel speed as II.1.1															
12	72.37	27.53	9.46	1865	2%	0.304	2.77	53	90	114	23	18		59%	98.14
II.1.4 higher gear at reduced engine speed, same pull and travel speed as II.1.2															
12	49.32	18.37	9.66	1894	1%	0.344	2.44	52	84	109	25	18		50%	98.14
II.1.5 higher gear at reduced engine speed, same pull and travel speed as II.1.3															
13	72.46	27.51	9.48	1622	2%	0.284	2.96	53	91	113	24	18		56%	98.14
II.1.6 higher gear at reduced engine speed, same pull and travel speed as II.1.4															
13	49.30	18.36	9.67	1645	1%	0.315	2.67	51	85	106	26	18		47%	98.14
II.2 in selected gear nearest to 7.5 km/h at rated engine speed.															
9	96.51	50.00	6.95	2098	4%	0.298	2.82	51	95	114	22	18		66%	98.10
II.2.1 75% of pull at maximum power at rated engine speed															
9	75.08	37.49	7.21	2149	2%	0.322	2.61	53	91	109	26	18		48%	98.14
II.2.2 50% of pull at maximum power at rated engine speed															
9	51.28	25.00	7.39	2181	2%	0.371	2.27	55	88	112	26	19		51%	98.14
II.2.3 higher gear at reduced engine speed, same pull and travel speed as II.2.1															
10	74.87	37.47	7.19	1889	3%	0.300	2.80	54	91	116	26	18		48%	98.14
II.2.4 higher gear at reduced engine speed, same pull and travel speed as II.2.2															
10	51.28	25.03	7.38	1919	2%	0.334	2.52	54	87	109	26	19		51%	98.14
II.2.5 higher gear at reduced engine speed, same pull and travel speed as II.2.3															
11	75.11	37.51	7.21	1644	3%	0.284	2.96	54	91	113	26	18		48%	98.14
II.2.6 higher gear at reduced engine speed, same pull and travel speed as II.2.4															
11	51.09	25.09	7.33	1656	2%	0.310	2.72	52	85	106	26	19		51%	98.14

OECD Drawbar Data (US)

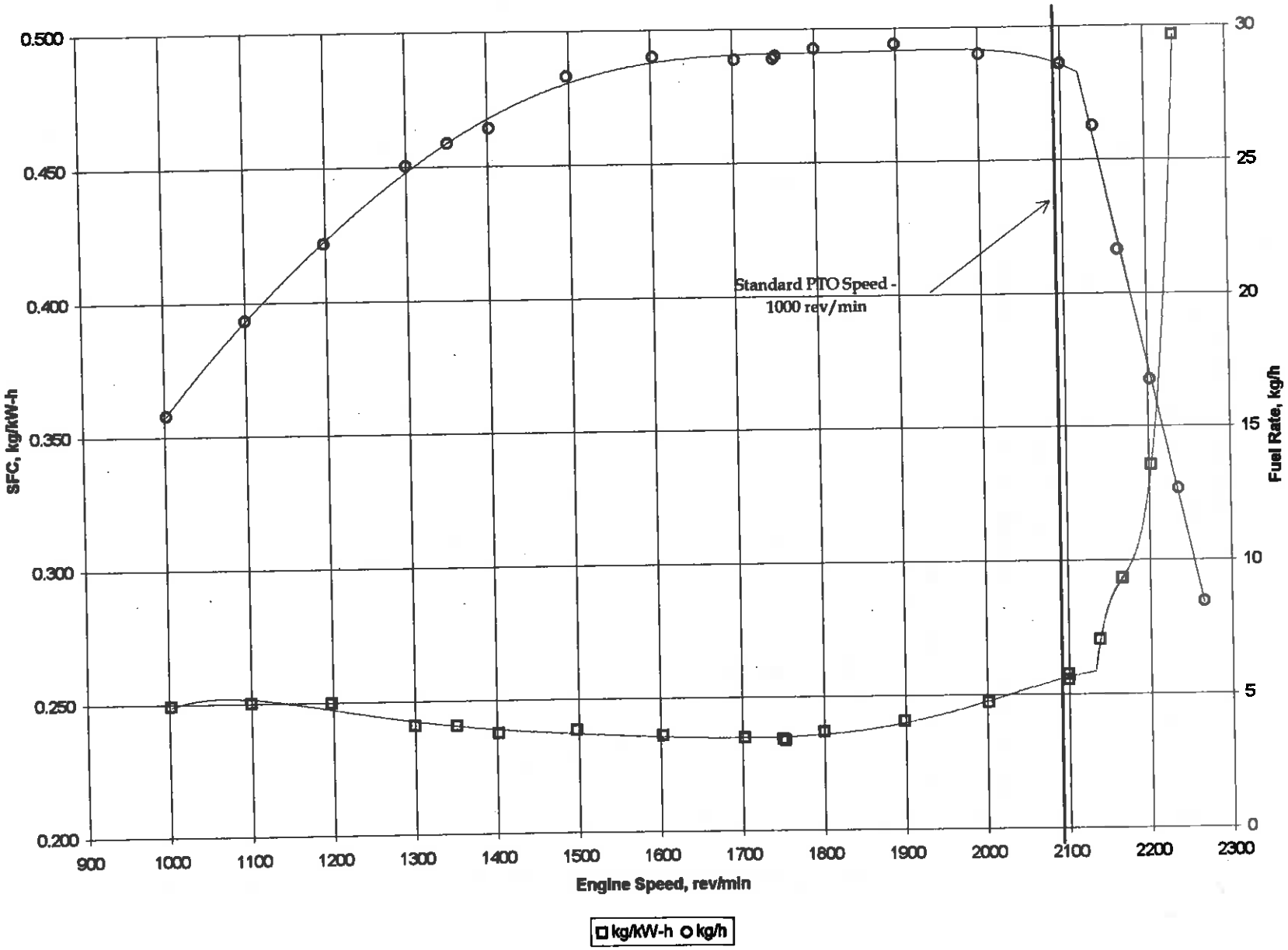
Date of test 04-Jun-97 | Fuel density: 7.017 lb/gal
Type of trac Concrete | Test number 1729

Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, deg F					Rel humidity	Barom. Press
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		in Hg
I. Maximum Power (unballasted, 4wd at 1750 rev/min)						Tire pressure:		13 psig, rear		12 psig, front		Drawbar height:	21.0 in	
*5	90.27	15253	2.22	2151	13%	0.583	12.04	128	189	237	72	64	66%	28.97
6	108.96	15737	2.60	2141	10%	0.536	13.09	128	193	239	68	61	68%	28.74
7	120.22	14858	3.03	2120	8%	0.510	13.75	129	200	246	69	62	69%	28.98
8	130.86	14452	3.40	1971	7%	0.492	14.27	129	203	250	70	63	69%	28.97
9	136.04	14319	3.56	1810	8%	0.474	14.79	126	210	256	72	64	66%	28.97
10	139.61	13034	4.02	1750	5%	0.459	15.30	129	210	254	71	64	69%	28.98
11	142.36	11347	4.71	1750	4%	0.450	15.59	129	214	256	72	64	66%	28.97
12	141.75	9783	5.43	1748	3%	0.451	15.55	130	216	256	71	64	69%	28.98
13	142.00	8458	6.30	1748	2%	0.449	15.61	131	218	262	71	64	69%	28.98
14	141.67	7405	7.17	1748	2%	0.452	15.53	130	216	258	71	63	65%	28.99
15	140.97	6380	8.29	1746	2%	0.453	15.49	130	217	261	72	63	62%	28.99
* Note: Slip within operating procedures of testing station.														
II. Part loads (unballasted, 4wd)														
II.1 in selected gear at maximum power at rated engine speed.														
11	126.41	8279	5.73	2099	2%	0.497	14.11	127	200	249	71	64	69%	28.98
II.1.1 75% of pull at maximum power at rated engine speed														
11	97.12	6193	5.88	2141	2%	0.528	13.30	128	202	245	73	64	62%	28.98
II.1.2 50% of pull at maximum power at rated engine speed														
11	66.18	4123	6.02	2179	1%	0.624	11.24	125	187	232	76	64	53%	28.98
II.1.3higher gear at reduced engine speed, same pull and travel speed as II.1.1														
12	97.05	6190	5.88	1865	2%	0.499	14.06	127	194	238	74	64	59%	28.98
II.1.4 higher gear at reduced engine speed, same pull and travel speed as II.1.2														
12	66.14	4131	6.00	1894	1%	0.566	12.41	125	184	229	77	64	50%	28.98
II.1.5 higher gear at reduced engine speed, same pull and travel speed as II.1.3														
13	97.17	6185	5.89	1622	2%	0.467	15.01	127	196	235	75	64	56%	28.98
II.1.6 higher gear at reduced engine speed, same pull and travel speed as II.1.4														
13	66.12	4128	6.01	1645	1%	0.518	13.55	124	185	224	78	64	47%	28.98
II.2 in selected gear nearest to 4.6 mph at rated engine speed.														
9	129.42	11241	4.32	2098	4%	0.490	14.33	124	203	238	72	64	66%	28.97
II.2.1 75% of pull at maximum power at rated engine speed														
9	100.69	8428	4.48	2149	2%	0.529	13.27	127	195	229	79	65	48%	28.98
II.2.2 50% of pull at maximum power at rated engine speed														
9	68.77	5620	4.59	2181	2%	0.610	11.51	131	191	234	79	66	51%	28.98
II.2.3 higher gear at reduced engine speed, same pull and travel speed as II.2.1														
10	100.40	8424	4.47	1889	3%	0.494	14.22	130	196	241	79	65	48%	28.98
II.2.4 higher gear at reduced engine speed, same pull and travel speed as II.2.2														
10	68.77	5628	4.58	1919	2%	0.549	12.78	130	188	228	79	66	51%	28.98
II.2.5 higher gear at reduced engine speed, same pull and travel speed as II.2.3														
11	100.73	8433	4.48	1644	3%	0.467	15.02	129	195	235	79	65	48%	28.98
II.2.6 higher gear at reduced engine speed, same pull and travel speed as II.2.4														
11	68.51	5640	4.56	1656	2%	0.509	13.78	125	185	223	79	66	51%	28.98

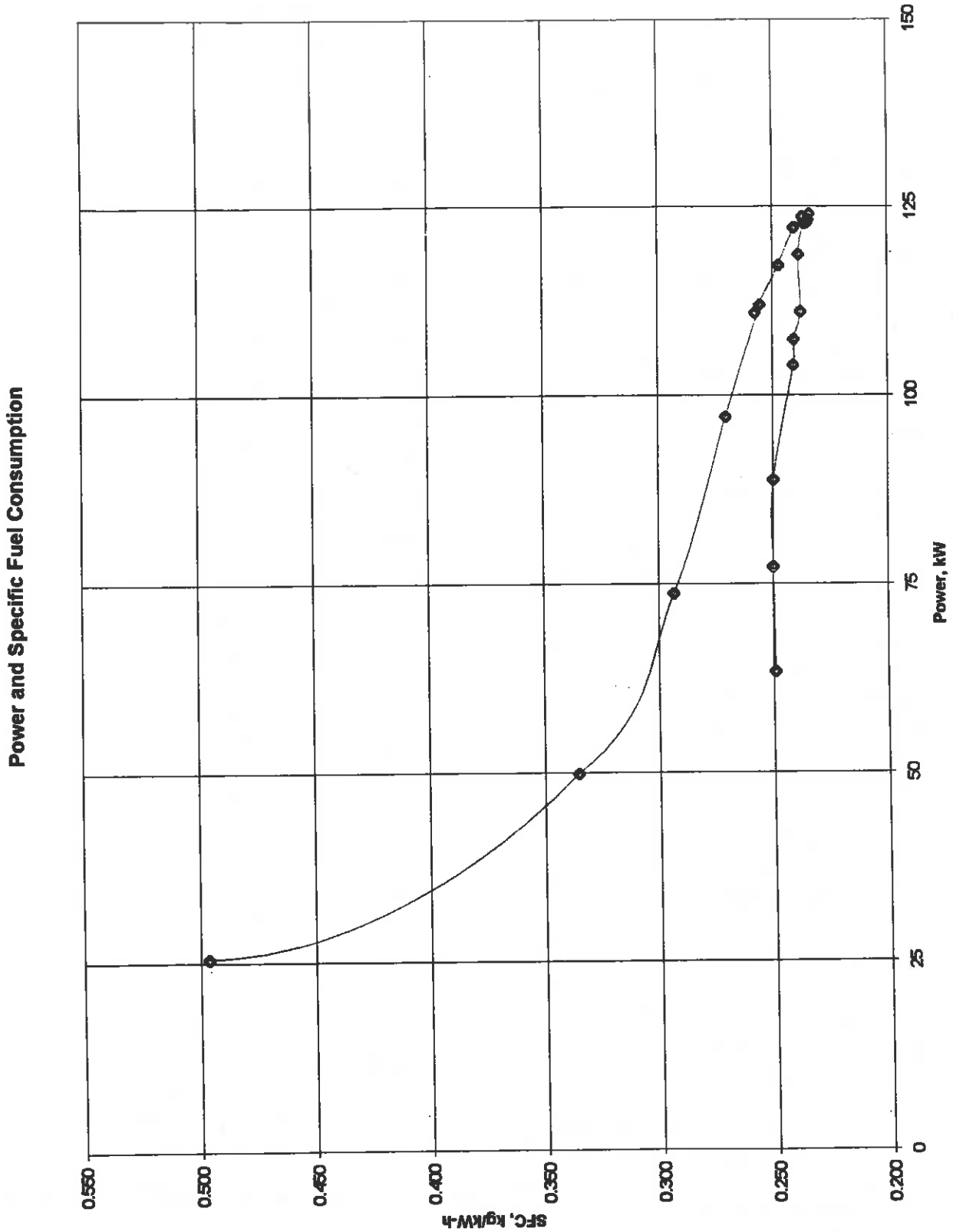
Power and Equivalent Crankshaft Torque



Specific Fuel Consumption and Fuel Rate



John Deere 7810 Power Shift



ÿÿLINKAGE GEOMETRY DIMENSIONS - alternative setting -

ISO Category III Hook Type Draft Link Ends

		Dimension or range [mm]	Settings used on test [mm]
Rear Tire - Radius Index	(r)	870*	905*
Front Tire - Radius Index	(r')	665	695*
Length of lift arms	(A)	375	same
Length of lower links	(B)	1011	same
Distance of lift arm pivot from: horizontal	(a)	205	same
rear wheel axis: vertical	(b)	588	same
Horizontal distance between the 2 lower link points	(U)	520	same
Horizontal distance between the 2 lift arm end points	(V)	647	same
Length of upper link	(S)	609 to 808	670
Distance of upper link pivot point from rear wheel axis			
- horizontal	(c)	504	same
- vertical	(d)	353, 283,200	353
Distance of lower link pivot from: horizontal	(e)	195	same
rear wheel axis: vertical	(f)	275	same
Distance of lower link pivot points to lift rod pivot pts on lower links.	(D)	612, 688	688
Length of lift rods	(L)	842 to 1051	1022
Height of lower hitch points below rear wheel axis			
In low position	(h)	409 to 802	651
In high position	(H)	281 to 49	41
Height above ground of lower hitch points when locked in transport position		888 to 1123	946

* Tire dynamic index of 870 mm, ISO 4251/1-1992

*Note: Dynamic index of 870 mm was on tractor supplied for test. European market will have tires with 905 mm dynamic radius.

2.2 POWER LIFT TEST. Test B-Upper link in top hole on tractor

Date of test: 15 June 1993
(Data taken from OECD test 1489 done on the John Deere 7600 Powershift which has the same mechanical lifting system and pressure settings)

		Hitch points	Frame
Lower hitch points above ground - down position:	[mm/in]	254/10.0	257/10.1
Vertical movement: without load:	[mm/in]	692/27.3	740/29.1
Vertical movement: with load:	[mm/in]	665/26.2	713/28.1
Maximum corrected force through full range:	[kN/lb]	55.5/12488	57.4/12915
Corresponding pressure:	[kPa/psi]	18.0/2610	
Moment about rear axle:	[kN.m/lb.ft]	67.0/49430	104.3/76952
Maximum mast tilt angle:	[deg]	--	4.3

Lifting height relative to horizontal position of lower links.

[mm]	-371	-300	-201	-99
[in]	-14.6	-11.8	-7.9	-3.9
Corrected lift forces				
Hitch point. [kN]	55.5	59.2	63.0	65.4
Hitch point. [lb]	12488	13316	14162	14702
at frame [kN]	63.3	63.0	63.5	63.4
at frame [lb]	14229	14153	14270	14256

Lifting height relative to horizontal position of lower links.

[mm]	0	99	201	295	343
[in]	0	3.9	7.9	11.6	13.5
Corrected lift forces					
Hitch point [kN]	68.0	69.3	70.8	72.0	--
Hitch point [lb]	15278	15575	15908	16187	--
at frame [kN]	62.9	61.8	60.1	58.6	57.4
at frame [lb]	14148	13887	13509	13176	12915

OPTIONAL TESTS - BALLASTED, FRONT DRIVE DISENGAGED

Tests conducted under the responsibility of
the Nebraska Tractor Testing Laboratory

OECD (SI) BAL 2WD

OECD Drawbar Data (SI)

Date of test 11-Jun-97 | Fuel density: 0.841 kg/l
Type of trac Concrete | Test number 1729

Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, deg C					Rel humidity	Baro. Pres
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet		kPa
I. Maximum Power (ballasted, 2wd at 2100 rev/min)						Tire pressure:		62 kPa, rear		97 kPa, front		Drawbar height:		559 mm
*5	79.26	79.51	3.59	2134	12%	0.336	2.51	53	94	120	21	17	65%	97.90
6	91.59	78.96	4.18	2100	8%	0.311	2.70	53	92	115	21	17	65%	97.90
7	93.56	67.90	4.96	2100	5%	0.305	2.76	52	92	119	23	17	58%	97.87
8	93.79	55.95	6.03	2099	3%	0.304	2.77	53	96	120	23	17	58%	97.87
9	94.08	48.35	7.00	2098	3%	0.304	2.77	52	93	120	23	17	52%	97.80
10	94.49	42.68	7.97	2095	2%	0.300	2.80	53	97	123	23	17	55%	97.80
11	94.01	36.68	9.23	2097	2%	0.304	2.77	52	95	122	23	18	59%	97.77
12	92.08	31.15	10.64	2102	1%	0.310	2.72	53	95	122	23	19	66%	97.73
13	90.86	26.65	12.27	2099	1%	0.314	2.68	53	98	125	23	20	78%	97.70
14	90.75	23.46	13.93	2096	1%	0.315	2.67	53	100	127	23	19	70%	97.66
* Note: Slip within operating procedures of testing station.														
II. Part loads (ballasted, 2wd)														
II.1 in selected gear at maximum power at rated engine speed.														
9	94.08	48.35	7.00	2098	3%	0.304	2.77	52	93	120	23	17	52%	97.80
II.1.1 75% of pull at maximum power at rated engine speed														
9	72.99	36.22	7.25	2155	2%	0.325	2.58	53	93	113	24	18	53%	97.60
II.1.2 50% of pull at maximum power at rated engine speed														
9	49.63	24.12	7.41	2188	1%	0.380	2.21	52	88	112	24	18	56%	97.46
II.1.3 higher gear at reduced engine speed, same pull and travel speed as II.1.1														
11	73.01	36.11	7.28	1654	2%	0.286	2.94	53	90	113	24	18	53%	97.53
II.1.4 higher gear at reduced engine speed, same pull and travel speed as II.1.2														
11	49.63	24.07	7.42	1679	2%	0.316	2.66	49	85	105	24	18	56%	97.46

OECD (U.S.) BALLASTED 2WD

OECD Drawbar Data (US)

Date of test 11-Jun-97 | Fuel density: 7.017 lb/gal
Type of trac Concrete | Test number 1729

Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, deg F					Rel humidity	Baro. Pres
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		in Hg
I. Maximum Power (ballasted, 2wd at 2100 rev/min)						Tire pressure:		9 psig, rear		14 psig, front		Drawbar height:		22.0 in
*5	106.28	17874	2.23	2134	12%	0.552	12.72	128	201	248	70	62	65%	28.91
6	122.83	17752	2.59	2100	8%	0.512	13.71	128	198	239	69	62	65%	28.91
7	125.46	15265	3.08	2100	5%	0.501	14.02	125	198	247	73	63	58%	28.90
8	125.78	12578	3.75	2099	3%	0.499	14.06	127	204	248	73	63	58%	28.90
9	126.16	10871	4.35	2098	3%	0.499	14.06	126	199	248	74	62	52%	28.88
10	126.71	9596	4.95	2095	2%	0.493	14.23	127	207	254	74	63	55%	28.88
11	126.07	8247	5.73	2097	2%	0.499	14.05	125	203	252	74	64	59%	28.87
12	123.48	7003	6.61	2102	1%	0.509	13.79	127	203	251	74	66	66%	28.86
13	121.85	5992	7.63	2099	1%	0.515	13.61	127	208	257	73	68	78%	28.85
14	121.69	5274	8.65	2096	1%	0.518	13.54	128	212	261	74	67	70%	28.84
* Note: Slip within operating procedures of testing station.														
II. Part loads (ballasted, 2wd)														
II.1 in selected gear at maximum power at rated engine speed.														
9	126.16	10871	4.35	2098	3%	0.499	14.06	126	199	248	74	62	52%	28.88
II.1.1 75% of pull at maximum power at rated engine speed														
9	97.88	8143	4.51	2155	2%	0.535	13.12	128	200	236	76	64	53%	28.82
II.1.2 50% of pull at maximum power at rated engine speed														
9	66.55	5422	4.60	2188	1%	0.624	11.24	126	190	233	76	65	56%	28.78
II.1.3higher gear at reduced engine speed, same pull and travel speed as II.1.1														
11	97.90	8117	4.52	1654	2%	0.471	14.90	127	195	236	76	64	53%	28.80
II.1.4 higher gear at reduced engine speed, same pull and travel speed as II.1.2														
11	66.56	5411	4.61	1679	2%	0.520	13.50	120	185	224	76	65	56%	28.78

OPTIONAL TESTS - BALLASTED, FRONT DRIVE ENGAGED

Tests conducted under the responsibility of
the Nebraska Tractor Testing Laboratory

OECD Drawbar Data (SI)

Date of test	11-Jun-97			Fuel density:	0.841 kg/l									
Type of trac	Concrete			Test number	1729									
Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, deg C					Rel humidity	Baro. Pres
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet		kPa
I. Maximum Power (ballasted, 4wd at 1750 rev/min)						Tire pressure:		62 kPa, rear		90 kPa, front		Drawbar height:		559 mm
*5	92.25	89.85	3.70	2106	8%	0.309	2.72	54	91	117	19	16	72%	97.87
*6	96.14	86.84	3.99	2011	9%	0.302	2.79	53	95	119	22	17	61%	97.90
7	101.89	82.52	4.45	1903	7%	0.286	2.94	53	95	120	22	17	58%	97.90
8	103.93	75.44	4.96	1750	5%	0.280	3.01	53	98	123	23	17	52%	97.87
9	105.45	65.32	5.81	1752	3%	0.274	3.07	53	99	125	23	17	52%	97.83
10	106.92	58.05	6.63	1750	3%	0.272	3.09	53	100	124	23	17	52%	97.73
11	107.42	50.32	7.69	1751	2%	0.270	3.11	53	102	125	23	17	55%	97.80
12	106.17	43.22	8.84	1749	2%	0.274	3.07	53	102	125	23	18	63%	97.77
13	105.84	37.42	10.18	1743	1%	0.273	3.08	53	100	122	23	19	70%	97.73
14	104.36	32.34	11.62	1749	1%	0.277	3.04	53	98	122	23	20	78%	97.70
15	103.52	27.81	13.40	1748	1%	0.279	3.01	54	103	126	23	19	70%	97.66

* Note: Slip limited to prevent excessive bouncing

OECD Drawbar Data (US)

Date of test	11-Jun-97			Fuel density:	7.017 lb/gal									
Type of trac	Concrete			Test number	1729									
Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, deg F					Rel humidity	Baro. Pres
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		in Hg
I. Maximum Power (ballasted, 4wd at 1750 rev/min)						Tire pressure:		9 psig, rear		13 psig, front		Drawbar height:		22.0 in
*5	123.71	20200	2.30	2106	8%	0.509	13.79	129	196	243	67	61	72%	28.90
*6	128.92	19522	2.48	2011	9%	0.496	14.15	128	203	247	71	62	61%	28.91
7	136.64	18551	2.76	1903	7%	0.470	14.94	128	204	248	72	62	58%	28.91
8	139.38	16960	3.08	1750	5%	0.460	15.26	127	208	253	74	62	52%	28.90
9	141.41	14684	3.61	1752	3%	0.450	15.58	128	211	258	74	62	52%	28.89
10	143.38	13050	4.12	1750	3%	0.448	15.68	127	212	256	74	62	52%	28.86
11	144.06	11312	4.78	1751	2%	0.445	15.78	127	216	257	74	63	55%	28.88
12	142.38	9716	5.50	1749	2%	0.450	15.58	128	216	257	74	65	63%	28.87
13	141.94	8413	6.33	1743	1%	0.450	15.61	127	212	252	74	67	70%	28.86
14	139.95	7271	7.22	1749	1%	0.455	15.43	128	208	252	73	68	78%	28.85
15	138.83	6253	8.33	1748	1%	0.459	15.28	129	218	260	74	67	70%	28.84

* Note: Slip limited to prevent excessive bouncing

MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of Test	June 6, 1997
Sound Level Meter Make/Model/Type	Bruel and Kjaer 2236
Type of track	Concrete oval
Gear number	19th
Travel speed before acceleration	29.2 km/h
Sound Level	84.4 dB(A)

Remarks : None
Repairs : None