OECD APPROVAL NUMBER 1710 (Restricted code)
Date of approval: 26 November, 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 7710 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	1727
TEST DATES	May 15 through June18, 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 26 November, 1997 for the **John Deere 7710 Powershift MFWD - 40 km/h** with **OECD number 1710** .

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

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.

	PAGE
1. SPECIFICATIONS	1
2. TEST CONDITIONS	13
3. COMPULSORY TESTS	
Main Power Take-Off Performance	16
Hydraulic Pump Performance	17
Power Lift Performance	18
Drawbar Performance	19
4. GRAPHS	21
5. OPTIONAL TESTS	
Power lift with alternative setting	25
Drawbar Performance - ballasted	26
Front wheel drive disengaged and at rated engine speed	27
Measurement of external noise level	28

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	170 hours
Location of Test	Nebraska Power Laboratory, Tractor Testing Laboratory Lincoln, Nebraska,USA.

TRACTOR SPECIFICATIONS.

Make	John Deere
Model	7710P Powershift MFWD
Type	Unit construction, mechanical front wheel drive (MFWD)
Number of driving wheels	2 or 4
Serial Number	RW7710P001637
1st Serial number	RW7710P001001

ENGINE.

Make	John Deere
Model	6081TRW02
Type	Diesel; 4-stroke; turbocharged, direct injection
Serial Number	RG6081T014113

Cylinders

Number/Disposition	6, in-line, vertical
Bore/stroke	115.9 mm x 128.5 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	105 ± 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/RE64420/In-line; electric shutoff
Pump Serial number	092000-2121 07R0151
Production setting of pump	
Flow Rate (Rated Eng.Spd & Full Load)	25.5 ± 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 into 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°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 Method of engagement Method of disengagement	 Electro-Hydraulic Pedal operated switch 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 Method of engagement Method of disengagement	 Limited slip Self-engaging 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.

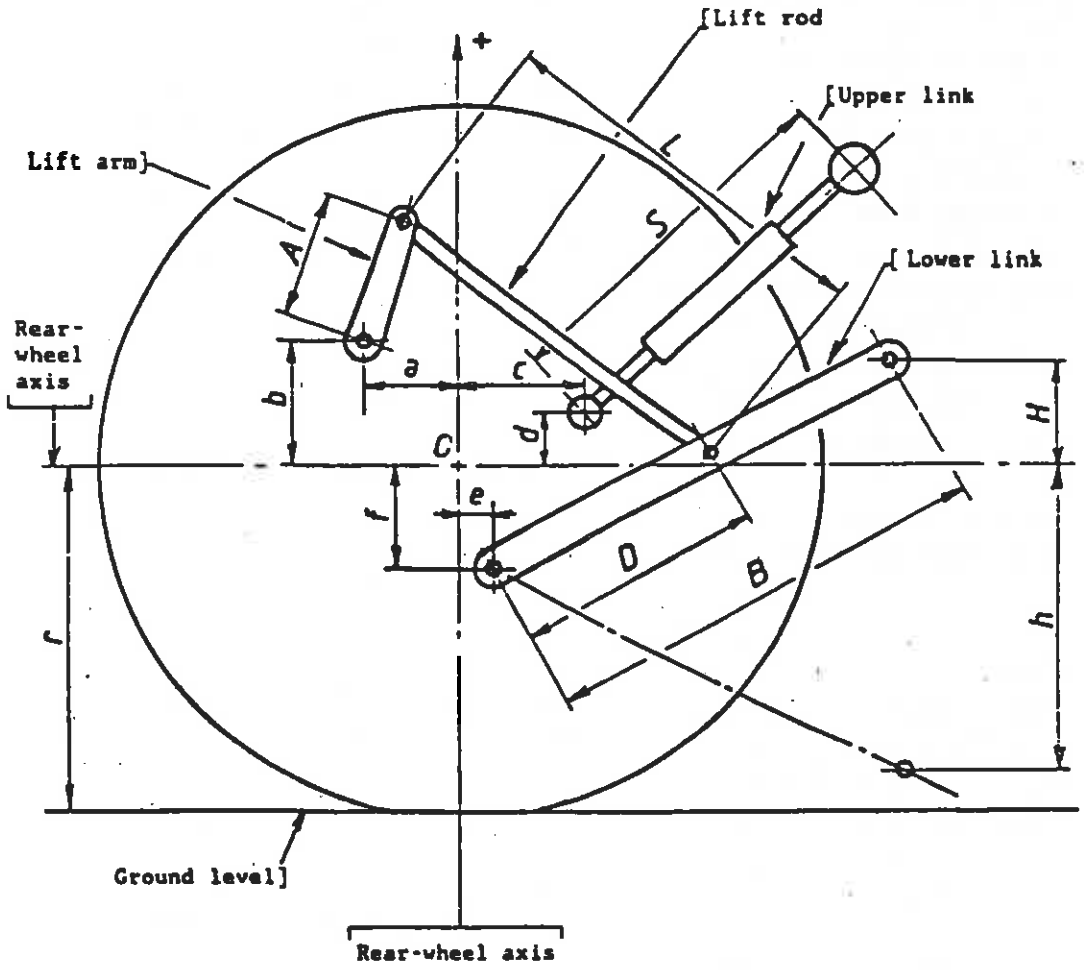
Location	Rear of tractor; center plane
Diameter of shaft	35 mm
Number of splines	6 or 21 splines; conforms to ISO 500/1991
Height above ground	765 mm
Distance from median plane of tractor	0 mm
Distance behind rear axle	620 mm
PTO Speed at rated engine spd	1064 rev/min
Engine speed at Std. PTO spd	1973 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



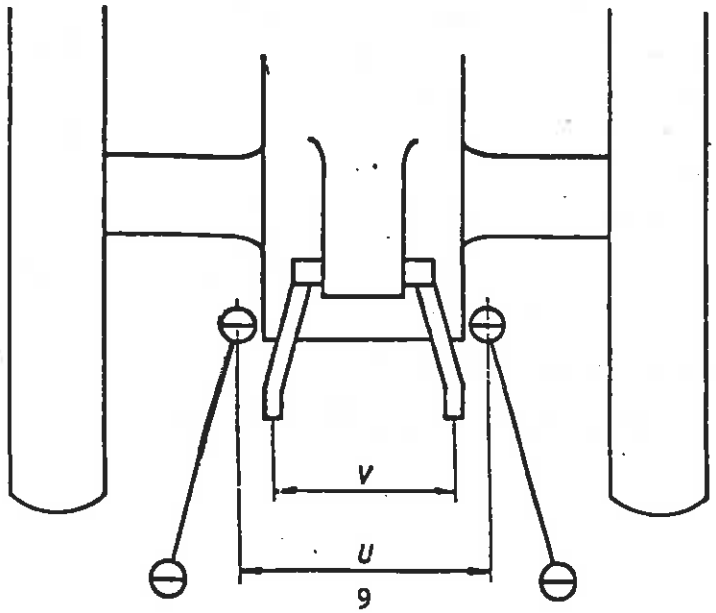


Table 1.1 - LINKAGE GEOMETRY DIMENSIONS.
ISO Category III Hook Type Draft Link Ends

		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 and
duals	2810	3318	offset lug rims

PROTECTIVE STRUCTURE.

Make/Model/Type	John Deere/SG-060/ComfortGard
Manufacturer's name/address	John Deere Tractor Works, Waterloo, Iowa, USA
Protective device	Cab; not tiltable
OECD approval number	CSS 0394/31
Approval date	27 Sept. 1996

DRIVER'S SEAT.

Make/Model/Type	Sears/RE35125/Air suspension; Personal posture cushioning
Type of suspension	Air
Type of damping	Three position viscous damping system
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
Width	Singles	3012	mm
	Duals	3505	mm
Height	Top protective structure	3023	mm
	Top of exhaust	2956	mm
Ground clearance		515	mm
Clearance-limiting part		Drawbar	

Tractor Mass (with cab,full fuel tank).

		Without driver [kg]	With driver [kg]
Unballasted	Front	2489	2499
	Rear	4518	4583
	Total	7007	7082
Ballasted	Front	2489	2499
	Rear	5700	5765
	Total	8189	8264

Added Ballast

Dual tires	691	kg per set (two duals)
Weights	491	kg (two weights of 245.5 kg each)

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	170 kPa
- min	40 kPa	40 kPa
as tested - unballasted	85 kPa	90 kPa
as tested - ballasted	85 kPa	55 kPa
Dynamic Radius Index	665 mm	870 mm
Chosen track width singles	1930 mm	1575 mm
duals		3005 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)	0.842 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

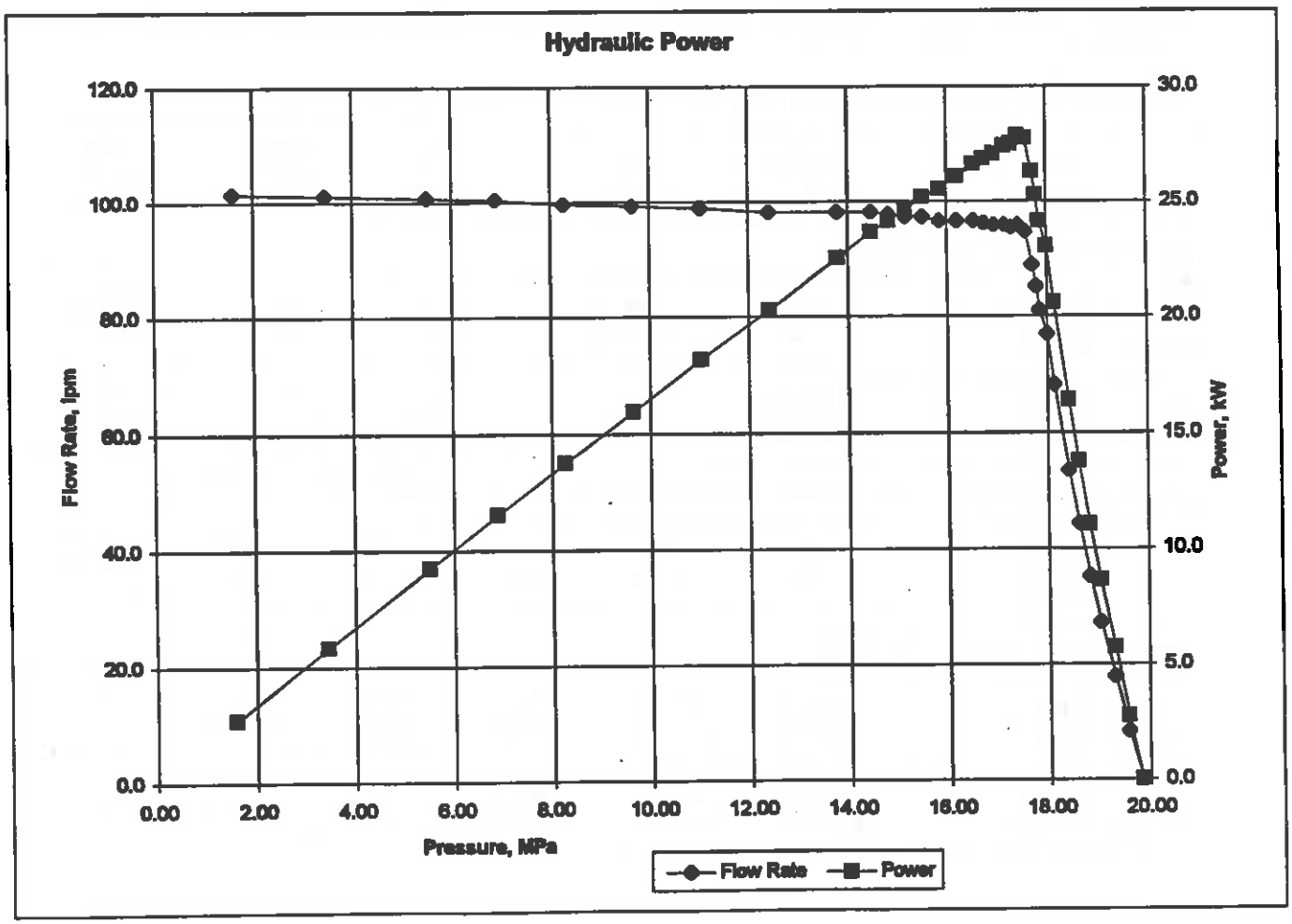
1. MAIN POWER TAKE OFF

Date: 14-May-97 Location: UNL Tractor Test Lab, Lincoln, NE, USA
Type of dynamometer: Eddy current, Eaton
Fuel Density 0.842 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						
109.07 / 146.26	1700	815	30.23 / 7.99	25.44 / 56.09	0.233 / 0.383	3.61 / 18.31
1.2 Power at Rated Engine Speed - 1 hour						
97.62 / 130.91	2100	1007	30.05 / 7.94	25.29 / 55.76	0.259 / 0.426	3.25 / 16.49
1.3 Power at Standard Power Take Off Speed - 1 hour						
97.62 / 130.91	2100	1007	30.05 / 7.94	25.29 / 55.76	0.259 / 0.426	3.25 / 16.49
1.4 Part Loads						
1.4.1 Torque at maximum power at rated engine speed						
97.62 / 130.91	2100	1007	30.05 / 7.94	25.29 / 55.76	0.259 / 0.426	3.25 / 16.49
1.4.2 85% of torque obtained in 1.4.1						
85.55 / 114.73	2166	1038	27.97 / 7.39	23.54 / 51.90	0.275 / 0.452	3.06 / 15.52
1.4.3 75% of torque defined in 1.4.2						
64.91 / 87.05	2191	1051	23.12 / 6.11	19.46 / 42.90	0.300 / 0.493	2.81 / 14.25
1.4.4 50% of torque defined in 1.4.2						
43.93 / 58.92	2226	1067	16.92 / 5.00	15.92 / 35.10	0.362 / 0.596	2.32 / 11.79
1.4.5 25% of torque defined in 1.4.2						
22.30 / 29.90	2259	1083	14.88 / 3.93	12.52 / 27.60	0.561 / 0.923	1.50 / 7.61
1.4.6 unloaded						
0.78 / 1.04	2287	1097	10.35 / 2.73	8.71 / 19.20	11.183 / 18.385	0.08 / 0.38
1.5 Part Loads at Standard Power Take Off Speed						
1.5.1 Torque at maximum power						
97.62 / 130.91	2100	1007	30.05 / 7.94	25.29 / 55.76	0.259 / 0.426	3.25 / 16.49
1.5.2 85% of torque obtained in 1.5.1						
85.55 / 114.73	2166	1038	27.97 / 7.39	23.54 / 51.90	0.275 / 0.452	3.06 / 15.52
1.5.3 75% of torque defined in 1.5.2						
64.91 / 87.05	2191	1051	23.12 / 6.11	19.46 / 42.90	0.300 / 0.493	2.81 / 14.25
1.5.4 50% of torque defined in 1.5.2						
43.93 / 58.92	2226	1067	16.92 / 5.00	15.92 / 35.10	0.362 / 0.596	2.32 / 11.79
1.5.5 25% of torque defined in 1.5.2						
22.30 / 29.90	2259	1083	14.88 / 3.93	12.52 / 27.60	0.561 / 0.923	1.50 / 7.61
1.5.6 unloaded						
0.78 / 1.04	2287	1097	10.35 / 2.73	8.71 / 19.20	11.183 / 18.385	0.08 / 0.38

No load maximum engine speed:	2287	rev/min		
Equivalent torque at rated speed:	444	N.m	327	lb-ft
Equivalent torque at maximum power:	613	N.m	452	lb-ft
(engine speed:	1700	rev/min)		
Maximum equivalent crankshaft torque:	672	N.m	496	lb-ft
(engine speed:	1250	rev/min)		
Mean Dry bulb:	26	deg C	79	deg F
Wet bulb:	20	deg C	67	deg F
Relative Humidity	51	%		
Pressure:	97.6	kPa	28.81	in Hg
Maximum Coolant:	97	deg C	206	deg F
Engine Oil:	116	deg C	241	deg F
Fuel:	54	deg C	130	deg F
Air Intake:	32	deg C	90	deg F
Transmission/hydraulic oil:	57	deg C	134	deg F
Intake manifold pressure at rated speed:	116	kPa	16.8	psig
Intake manifold pressure at maximum power:	107	kPa	15.5	psig

Date of Test: 18-Jun-97			
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:			
19.86 MPa			
2880 psig			
II. Pump delivery rate at minumum pressure and rated engine speed:			
101.4 l/min			
26.8 gpm			
III. Flow rate, pressure, power:			
90% of relief valve setting			
81.0 l/min	17.86 MPa	24.1 kW	
21.4 gpm	*2590 psig*	*32.3 hp*	
Maximum hydraulic power:			
95.8 l/min	17.44 MPa	27.8 kW	
25.3 gpm	*2530 psig*	*37.3 hp*	
IV. Hydraulic fluid temperature at flow meter:			
60.5 °C			
141 °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
Hitch point. [lb]	--	11111	11867	12704	13523
at frame [kN]	48.6	--	49.8	51.5	52.4
at frame [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	--
Hitch point [lb]	13793	14144	14558	15026	15215	--
at frame [kN]	52.4	51.7	50.4	49.8	48.7	45.2
at frame [lb]	11772	11619	11340	11196	10944	10161

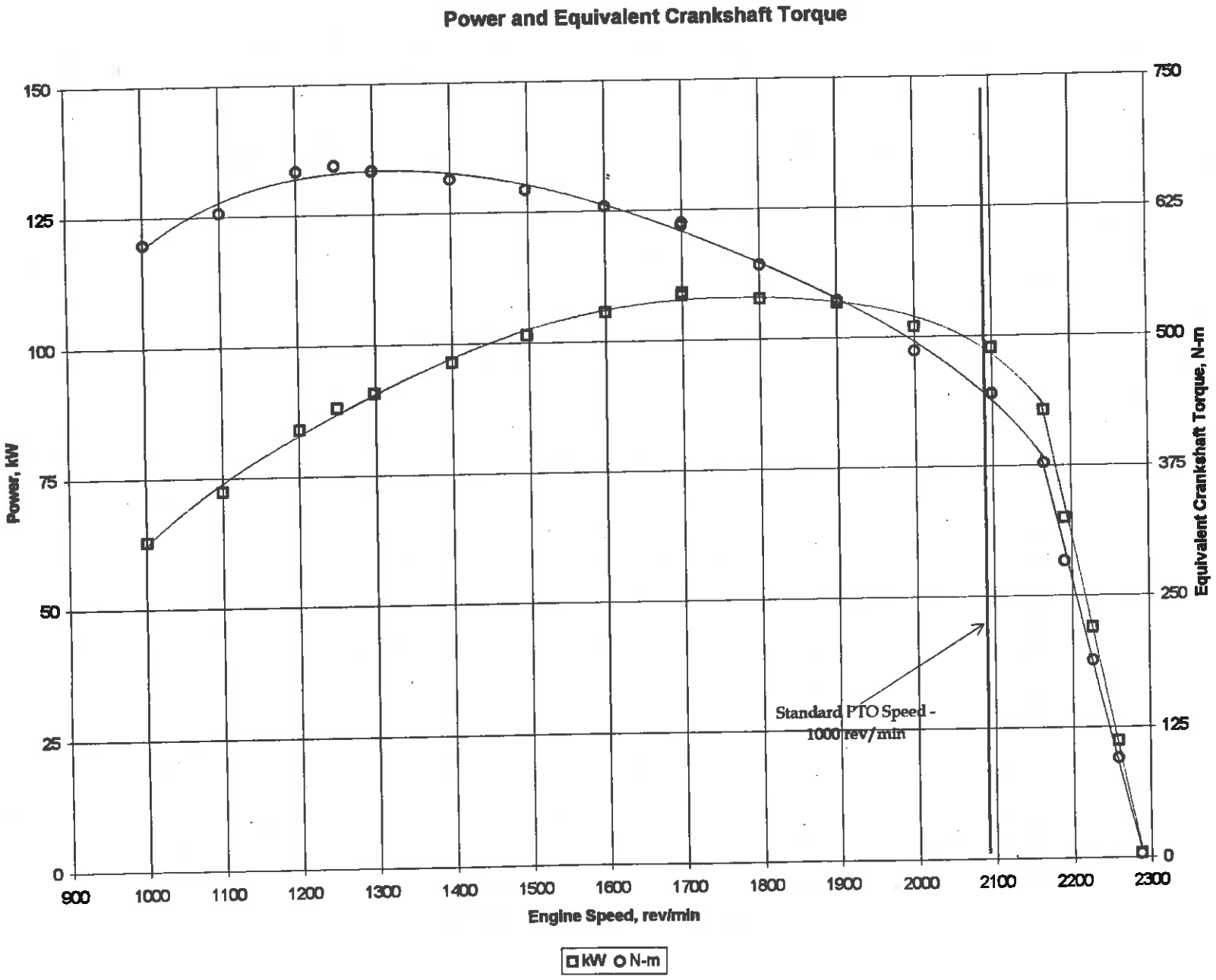
OECD Drawbar Data (SI)

e of test	20-May-97			Fuel density:	0.842 kg/l									
e of trac	Concrete			Test number	1727									
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
Maximum Power (unballasted, 4wd at 1700 rev/min)						Tire pressure:		90 kPa, rear		83 kPa, front		Drawbar height:	533 mm	
*4	60.92	68.32	3.21	2169	12%	0.358	2.35	52	84	108	16	10	47%	98.65
*5	72.58	70.02	3.73	2154	10%	0.333	2.53	53	84	108	13	8	51%	98.61
6	79.65	67.20	4.27	2120	8%	0.315	2.67	54	86	111	14	9	49%	98.61
7	84.73	65.16	4.68	2022	8%	0.300	2.80	52	88	110	17	10	44%	98.68
8	90.04	63.70	5.09	1833	8%	0.288	2.93	52	89	111	17	10	40%	98.68
9	92.25	60.39	5.50	1699	6%	0.278	3.03	53	93	117	18	10	37%	98.68
10	94.30	53.34	6.36	1700	5%	0.271	3.10	53	93	115	18	10	34%	98.65
11	95.38	46.40	7.40	1698	4%	0.268	3.14	52	93	115	18	10	34%	98.65
12	94.09	39.69	8.53	1694	3%	0.271	3.10	53	94	117	19	11	35%	98.61
13	94.37	34.27	9.91	1699	3%	0.270	3.11	52	94	116	19	11	35%	98.61
14	94.00	30.02	11.27	1696	2%	0.271	3.10	52	96	119	19	11	35%	98.61
15	93.57	25.88	13.02	1698	2%	0.273	3.08	52	96	119	19	11	39%	98.61
Note: Slip limited to prevent excessive bouncing.														
Part loads (unballasted, 2wd)														
1 in selected gear at maximum power at rated engine speed.														
11	83.34	32.33	9.28	2101	2%	0.302	2.79	53	93	117	19	11	35%	98.61
1.1 75% of pull at maximum power at rated engine speed														
11	64.79	24.21	9.64	2167	2%	0.334	2.52	52	87	107	20	11	33%	98.61
1.2 50% of pull at maximum power at rated engine speed														
11	44.31	16.16	9.87	2208	1%	0.394	2.13	51	86	107	21	12	32%	98.65
1.3 higher gear at reduced engine speed, same pull and travel speed as II.1.1														
12	64.67	24.18	9.63	1888	2%	0.308	2.73	52	88	111	21	12	34%	98.61
1.4 higher gear at reduced engine speed, same pull and travel speed as II.1.2														
12	44.39	16.14	9.90	1930	1%	0.355	2.37	51	84	107	21	12	32%	98.65
1.5 higher gear at reduced engine speed, same pull and travel speed as II.1.3														
13	64.71	24.19	9.63	1639	2%	0.290	2.90	51	85	108	21	12	32%	98.61
1.6 higher gear at reduced engine speed, same pull and travel speed as II.1.4														
13	44.44	16.09	9.94	1682	1%	0.326	2.58	50	83	104	21	12	32%	98.65
2 in selected gear nearest to 7.5 km/h at rated engine speed.														
9	83.05	42.52	7.03	2100	3%	0.305	2.76	53	89	115	18	10	37%	98.68
2.1 75% of pull at maximum power at rated engine speed														
9	64.68	31.89	7.30	2160	2%	0.328	2.57	50	88	109	19	11	36%	98.61
2.2 50% of pull at maximum power at rated engine speed														
9	44.32	21.25	7.51	2204	2%	0.393	2.14	53	85	107	20	12	37%	98.61
2.3 higher gear at reduced engine speed, same pull and travel speed as II.2.1														
10	64.70	31.83	7.32	1907	2%	0.305	2.76	54	88	111	20	12	37%	98.61
2.4 higher gear at reduced engine speed, same pull and travel speed as II.2.2														
10	44.32	21.28	7.50	1939	2%	0.352	2.39	52	85	106	20	11	33%	98.58
2.5 higher gear at reduced engine speed, same pull and travel speed as II.2.3														
11	64.69	31.98	7.28	1648	2%	0.285	2.95	52	84	108	20	12	37%	98.61
2.6 higher gear at reduced engine speed, same pull and travel speed as II.2.4														
11	44.24	21.26	7.49	1682	2%	0.318	2.65	51	83	103	20	11	33%	98.58

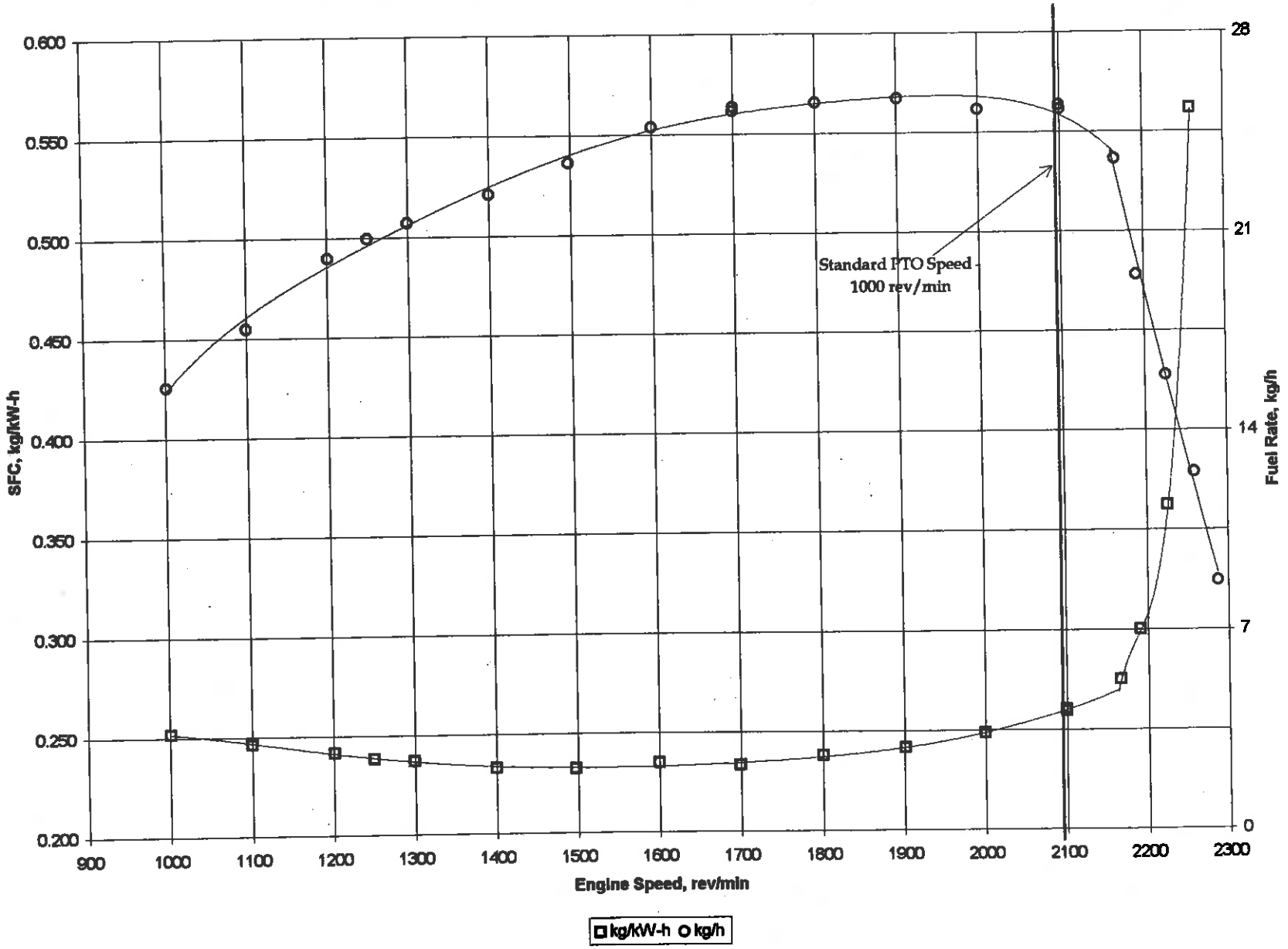
OECD Drawbar Data (US)

Date of test 20-May-97 | Fuel density: 7.023 lb/gal
Type of trac Concrete | Test number 1727

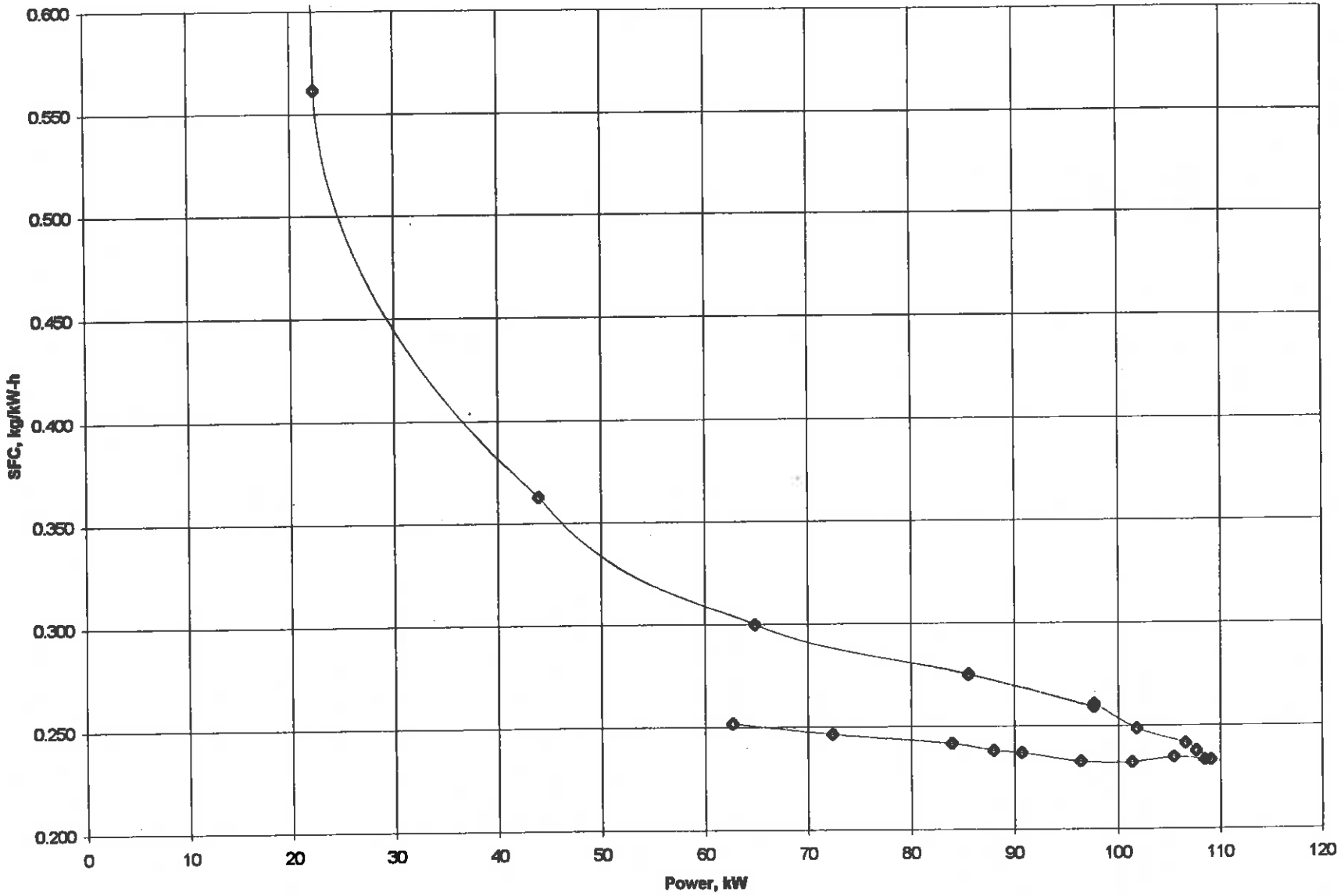
Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, deg F					Rel humidity	B
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		
I. Maximum Power (unballasted, 4wd at 1700 rev/min)						Tire pressure:		13 psig, rear		12 psig, front		Drawbar height:	21.0 in	
*4	81.70	15360	1.99	2169	12%	0.589	11.92	125	184	227	61	50	47%	2
*5	97.33	15741	2.32	2154	10%	0.547	12.84	128	183	227	55	46	51%	2
6	106.81	15108	2.65	2120	8%	0.518	13.57	129	188	233	58	48	49%	2
7	113.62	14649	2.91	2022	8%	0.493	14.24	126	190	230	62	50	44%	2
8	120.75	14321	3.16	1833	8%	0.473	14.85	126	193	231	63	50	40%	2
9	123.70	13577	3.42	1699	6%	0.456	15.39	127	199	242	64	50	37%	2
10	126.46	11992	3.95	1700	5%	0.446	15.75	127	199	239	65	50	34%	2
11	127.91	10431	4.60	1698	4%	0.440	15.95	126	200	240	65	50	34%	2
12	126.17	8923	5.30	1694	3%	0.446	15.75	128	201	242	66	51	35%	2
13	126.55	7705	6.16	1699	3%	0.445	15.80	126	201	241	66	51	35%	2
14	126.06	6750	7.00	1696	2%	0.446	15.75	126	206	246	66	51	35%	2
15	125.47	5817	8.09	1698	2%	0.449	15.63	126	205	247	66	52	39%	2
* Note: Slip limited to prevent excess bouncing.														
II. Part loads (unballasted, 4wd)														
II.1 in selected gear at maximum power at rated engine speed.														
11	111.76	7267	5.77	2101	2%	0.496	14.16	127	199	243	66	51	35%	2
II.1.1 75% of pull at maximum power at rated engine speed														
11	86.88	5442	5.99	2167	2%	0.549	12.78	126	189	224	68	52	33%	2
II.1.2 50% of pull at maximum power at rated engine speed														
11	59.42	3634	6.13	2208	1%	0.648	10.83	124	186	225	70	53	32%	2
II.1.3higher gear at reduced engine speed, same pull and travel speed as II.1.1														
12	86.73	5436	5.98	1888	2%	0.506	13.87	126	191	231	69	53	34%	2
II.1.4 higher gear at reduced engine speed, same pull and travel speed as II.1.2														
12	59.53	3630	6.15	1930	1%	0.584	12.03	124	184	224	70	53	32%	2
II.1.5 higher gear at reduced engine speed, same pull and travel speed as II.1.3														
13	86.77	5438	5.98	1639	2%	0.477	14.72	125	185	227	70	53	32%	2
II.1.6 higher gear at reduced engine speed, same pull and travel speed as II.1.4														
13	59.60	3618	6.18	1682	1%	0.536	13.09	122	182	219	70	53	32%	2
II.2 in selected gear nearest to 4.6 mph at rated engine speed.														
9	111.37	9560	4.37	2100	3%	0.501	14.01	128	193	239	64	50	37%	2
II.2.1 75% of pull at maximum power at rated engine speed														
9	86.74	7169	4.54	2160	2%	0.539	13.04	122	190	229	67	52	36%	2
II.2.2 50% of pull at maximum power at rated engine speed														
9	59.43	4778	4.67	2204	2%	0.647	10.86	127	185	225	68	53	37%	2
II.2.3 higher gear at reduced engine speed, same pull and travel speed as II.2.1														
10	86.76	7157	4.55	1907	2%	0.501	14.02	129	190	231	68	53	37%	
II.2.4 higher gear at reduced engine speed, same pull and travel speed as II.2.2														
10	59.43	4785	4.66	1939	2%	0.579	12.12	126	185	223	68	52	33%	
II.2.5 higher gear at reduced engine speed, same pull and travel speed as II.2.3														
11	86.75	7189	4.53	1648	2%	0.468	15.00	126	184	227	68	53	37%	
II.2.6 higher gear at reduced engine speed, same pull and travel speed as II.2.4														
11	59.33	4780	4.65	1682	2%	0.522	13.45	124	181	217	68	52	33%	


Power and Equivalent Crankshaft Torque
Power, kW
Equivalent Crankshaft Torque, N-m
Engine Speed, rev/min
Standard PTO Speed - 1000 rev/min
kW
N-m
150
125
100
75
50
25
0
750
625
500
375
250
125
0
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300

Specific Fuel Consumption and Fuel Rate



Power and Specific Fuel Consumption



LINKAGE GEOMETRY DIMENSIONS - alternative setting - top link in top hole.

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 Drawbar Data (SI)

Date of test 28-May-97 — Fuel density: 0.842 kg/l
Type of trac Concrete — Test number 1727

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:		55 kPa, rear		83 kPa, front		Drawbar height:		533 mm
*5	76.31	77.22	3.56	2110	12%	0.331	2.54	54	86	112	12	11	47%	98.31
6	82.49	68.78	4.32	2098	5%	0.308	2.73	54	87	112	12	11	51%	98.31
7	84.37	60.03	5.06	2097	4%	0.299	2.81	54	89	116	13	11	49%	98.27
8	82.75	48.89	6.09	2099	3%	0.306	2.75	53	89	113	13	11	44%	98.27
9	82.69	42.20	7.05	2100	2%	0.305	2.76	54	90	116	13	11	40%	98.31
10	83.40	37.46	8.02	2098	2%	0.305	2.76	52	90	114	13	11	37%	98.27
11	82.29	31.94	9.27	2101	2%	0.307	2.74	55	91	118	13	11	34%	98.21
12	79.49	26.89	10.64	2095	2%	0.317	2.66	54	90	113	13	11	34%	98.21
13	78.73	23.02	12.31	2101	2%	0.321	2.62	54	89	114	13	11	35%	98.17
14	77.95	20.10	13.96	2095	1%	0.322	2.61	54	90	114	13	11	35%	98.10
* Note: Slip limited to prevent excessive bouncing														
II. Part loads (ballasted, 2wd)														
II.1 in selected gear at maximum power at rated engine speed.														
9	82.69	42.20	7.05	2100	2%	0.305	2.76	54	90	116	13	11	83%	98.31
II.1.1 75% of pull at maximum power at rated engine speed														
9	63.99	31.52	7.31	2164	2%	0.335	2.51	53	87	111	13	11	78%	98.07
II.1.2 50% of pull at maximum power at rated engine speed														
9	43.80	21.03	7.50	2211	1%	0.405	2.08	51	85	109	13	11	78%	98.07
II.1.3 higher gear at reduced engine speed, same pull and travel speed as II.1.1														
11	63.96	31.64	7.28	1649	2%	0.286	2.94	51	85	107	13	11	78%	98.07
II.1.4 higher gear at reduced engine speed, same pull and travel speed as II.1.2														
11	43.80	21.01	7.50	1692	1%	0.324	2.60	51	84	107	13	11	78%	98.07

OECD Drawbar Data (US)

Date of test 28-May-97 — Fuel density: 7.023 lb/gal
Type of trac Concrete — Test number 1727

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:		8 psig, rear		12 psig, front		Drawbar height:		21.0 in
*5	102.34	17360	2.21	2110	12%	0.544	12.91	130	187	234	54	51	47%	29.03
6	110.62	15463	2.68	2098	5%	0.507	13.85	129	188	234	54	51	51%	29.03
7	113.14	13496	3.14	2097	4%	0.491	14.29	130	193	240	55	52	49%	29.02
8	110.97	10990	3.79	2099	3%	0.503	13.97	127	192	235	55	52	44%	29.02
9	110.89	9488	4.38	2100	2%	0.501	14.02	129	194	241	55	52	40%	29.03
10	111.84	8421	4.98	2098	2%	0.501	14.02	126	194	238	55	52	37%	29.02
11	110.35	7181	5.76	2101	2%	0.505	13.92	131	197	244	55	52	34%	29.00
12	106.59	6046	6.61	2095	2%	0.521	13.49	130	194	236	55	52	34%	29.00
13	105.58	5175	7.65	2101	2%	0.528	13.30	129	193	237	55	52	35%	28.99
14	104.53	4520	8.67	2095	1%	0.530	13.25	129	194	238	55	52	35%	28.97
* Note: Slip limited to prevent excessive bouncing														
II. Part loads (ballasted, 2wd)														
II.1 in selected gear at maximum power at rated engine speed.														
9	110.89	9488	4.38	2100	2%	0.501	14.02	129	194	241	55	52	83%	29.03
II.1.1 75% of pull at maximum power at rated engine speed														
9	85.81	7086	4.54	2164	2%	0.550	12.76	127	189	232	56	52	78%	28.96
II.1.2 50% of pull at maximum power at rated engine speed														
9	58.74	4727	4.66	2211	1%	0.666	10.55	125	186	228	56	52	78%	28.96
II.1.3higher gear at reduced engine speed, same pull and travel speed as II.1.1														
11	85.77	7114	4.52	1649	2%	0.470	14.93	124	185	224	56	52	78%	28.96
II.1.4 higher gear at reduced engine speed, same pull and travel speed as II.1.2														
11	58.73	4723	4.66	1692	1%	0.532	13.19	123	183	224	56	52	78%	28.96

OPTIONAL TESTS - BALLASTED, FRONT DRIVE ENGAGED

Tests conducted under the responsibility of
the Nebraska Tractor Testing Laboratory

OECD Drawbar Data (SI)

Date of test: 28-May-97 | Fuel density: 0.842 kg/l
Type of trac: Concrete | Test number: 1727

Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, deg C					Rel humidity	Bar Pre
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet		kPa
I. Maximum Power (ballasted, 4wd at 1700 rev/min)						Tire pressure:		55 kPa, rear		83 kPa, front		Drawbar height:		559 mm
*4	76.44	83.58	3.29	2139	8%	0.324	2.59	54	85	111	12	10	82%	98.3
5	82.72	80.36	3.71	2056	6%	0.304	2.77	54	87	112	12	10	82%	98.3
6	88.44	78.07	4.08	1978	5%	0.291	2.89	54	88	113	12	10	82%	98.3
7	94.21	77.56	4.37	1840	5%	0.277	3.04	54	91	114	12	11	83%	98.3
8	94.72	69.74	4.89	1702	4%	0.271	3.10	53	93	117	13	11	83%	98.3
9	95.45	60.53	5.68	1700	3%	0.269	3.13	55	96	119	13	11	83%	98.3
10	95.69	53.10	6.49	1703	3%	0.267	3.15	54	93	116	13	11	83%	98.2
11	96.08	46.18	7.49	1700	2%	0.267	3.15	54	95	119	13	11	83%	98.2
12	94.27	39.26	8.64	1705	2%	0.272	3.10	53	93	115	13	11	83%	98.1
13	93.97	33.86	9.99	1706	2%	0.272	3.09	53	94	116	13	11	83%	98.1
14	93.26	29.70	11.31	1698	2%	0.274	3.07	53	94	117	13	11	83%	98.1
15	92.21	25.44	13.05	1699	1%	0.278	3.03	53	94	116	13	11	83%	98.1

* Note: Slip limited to prevent excessive bouncing

OECD Drawbar Data (US)

Date of test: 28-May-97 | Fuel density: 7.023 lb/gal
Type of trac: Concrete | Test number: 1727

Gear	Power	Pull	Speed	Engine speed	Slip	SFC	SFE	Temperature, deg F					Rel humidity	Bar Pre
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		in
I. Maximum Power (ballasted, 4wd at 1700 rev/min)						Tire pressure:		8 psig, rear		12 psig, front		Drawbar height:		22.0 in
*4	102.51	18789	2.05	2139	8%	0.533	13.17	129	185	232	53	50	82%	29.(
5	110.93	18067	2.30	2056	6%	0.500	14.05	130	188	234	53	50	82%	29.(
6	118.60	17552	2.53	1978	5%	0.478	14.68	130	191	235	53	50	82%	29.(
7	126.34	17436	2.72	1840	5%	0.455	15.42	129	196	238	54	51	83%	29.(
8	127.02	15678	3.04	1702	4%	0.446	15.75	128	200	242	55	52	83%	29.(
9	128.00	13609	3.53	1700	3%	0.442	15.88	131	205	247	55	52	83%	29.(
10	128.32	11938	4.03	1703	3%	0.440	15.98	129	200	241	55	52	83%	29.(
11	128.84	10381	4.65	1700	2%	0.439	16.01	130	203	246	55	52	83%	29.(
12	126.42	8827	5.37	1705	2%	0.446	15.73	128	199	240	55	52	83%	28.(
13	126.01	7612	6.21	1706	2%	0.447	15.70	128	201	241	55	52	83%	28.(
14	125.06	6676	7.02	1698	2%	0.451	15.58	128	202	243	55	52	83%	28.(
15	123.66	5719	8.11	1699	1%	0.457	15.37	128	201	241	55	52	83%	28.(

* Note: Slip limited to prevent excessive bouncing

MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of Test	May 21, 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	83.7 dB(A)

Remarks : None
Repairs : None