OECD APPROVAL # 1264
Date of approval: May 2, 1990

CENTER FOR AGRICULTURAL EQUIPMENT
DEPARTMENT OF AGRICULTURAL 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 FOR THE OFFICIAL TESTING OF AGRICULTURAL TRACTOR PERFORMANCE

RESTRICTED TEST-CODE II

JOHN DEERE 8960 POWERSHIFT SYNCHROMESH ARTICULATED 4WD TRACTOR.



MANUFACTURED BY: John Deere Waterloo Works
P.O.Box 3500
Waterloo, Iowa 50706, USA

NEBRASKA TEST NO.1625

Test date: May-June 1989

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 May 2 ,1990

John Deere 8960 Powrshift Synchromesh OECD # 1264

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SPECIFICATIONS OF TRACTOR.

Manufacturers name/address	:	John Deere Tractor Works P.O. Box 3500 Waterloo, Iowa
Submitted for test by	:	The manufacturer
Selected for test by	:	The manufacturer in agreement with the test station.
Place of running in	:	John Deere P.E.C. Waterloo , Iowa
Duration of running in	:	70.0 hours
Location of Test	:	Center for Agricultural Equipment, Lincoln, Nebraska, USA.

TRACTOR.

Make	John Deere
Model	8960 Powershift Synchromesh
Type	Articulated frame, four-wheel drive (4WD)
Number of driving wheels	8
Serial Number	*RW8960H001019*
1st Serial number	*RW8960H001001*

ENGINE.

Make	Cummins
Model	NTA-855-A370
Type	Diesel, turbocharged, and intercooled
Serial Number	11511016
Cylinders	
Number & Disposition	6, in-line, vertical
Bore x stroke	139.7 mm x 152.4 mm (5.50 in x 6.00 in)
Cubic capacity	14011 cm (855 in)
Compression ratio	14.0 - 1
Arrangement of valves	Overhead
Cylinder liners	Wet, replacable
Super charging	
Make/Model/Type	Holset/BHT3B/ exhaust gas driven
Pressure	130-160 kPa (19-23 psi) at rated speed and load.
Fuel System	
Feed system	Engine driven transfer pump
Make/Type/Model of filters	Fleetguard/replaceable/FS1212
Fuel Tank capacity	835 liter (220 US gallons)

Make/Model/Type Injection Pump	Cummins/PTG/AFC
Pump Serial number	1160525
Production setting of pump Flow Rate (Rated Eng.Spd & Full Load)	61.7 +/- 2.8 kg/hr 28.0 +/- 1.3 lb/hr
Make/Model/Type of injectors	Cummins/PT Type D
Injection pressure	82.7 MPa (12000 psi)
Timing	14 degrees before TDC
Governor	
Make/Model/Type	Cummins/variable speed/ mechanical
Governed engine speed range	From 800 to 2180 rev/min
Rated engine speed	1900 rev/min
High-idle speed range	2130 +/- 50 rev/min
Air Cleaner.	
Pre-cleaner Make/Model/Type	Donaldson/plastic mesh chaff screen
Air intake location	top of air stack
Main Cleaner Make/Model/Type	Donaldson/AR95758/ pleated paper
Secondary element	Donaldson/AR95759/ pleated paper
Maintenance indicator	Dash mounted light and horn
Lubrication system.	
Type of feed pump	Full pressure, positive displacement.
Type of filters	Full flow with bypass
Number	2
Oil cooler	Heat exchanger with engine coolant
Cooling system.	
Type of coolant	Liquid
Type of pump	Centrifugal
Fan specification	Belt driven, variable speed
Number of fan blades	8
Fan diameter	813 mm (32.0 in.)
Coolant system capacity	68 liter (72 qt)
Type of temperature control	1 thermostat and variable speed fan
Superpressure system	103 kPa (15 psi)
Starting system.	
Make/Model/Type of starter	Delco Remy/RE24305/electric
Power Rating	6.9 kW (9.3 hp)
Cold starting aid	Ether spray in intake manifold.
Safety device	Electrical lockout on gearshift

Electrical system.	
Voltage & grounding.	12 Volt DC;negative ground
Generator	
Make/Model/Type	Nippondenso/RE37201/belt drive
Power rating	120 Ampere at 1900 engine rpm.
Batteries	
Number & connection	3-12 V batteries in parallel
Rating	175 Ampere-hours per battery at 20 hour rating 925 Cold crank amp/battery
Exhaust system.	
Make/Model/Type	Donaldson/RE25444/expansion chamber
Location	Vertical, right front corner of cab

TRANSMISSION.

Clutch. (travel)	
Make/Type	John Deere/multiple plate oil cooled
Number of plates	7
Plate diameter	279 mm (11.0 in)
Method of operation	hydraulically actuated by foot pedal
Gear Box.	
Make/Type	John Deere/Powrsync
Arrangement	countershaft and planetary design consisting of: one 12 speed gearbox with 4 synchronized ranges and 3 synchronized speeds in each range one 2 speed planetary gearset with a multiple wet disc clutch and brake
Number of gears	24 forward, 6 reverse controlled by 2 hand levers
Oil cooler	Heat exchanger with air
Available options	12 forward, 3 reverse
Rear axle and final drives.	
Make/Type	John Deere/crown wheel and pinion, differential and inboard planetary reduction
Differential Lock	
Type	Hydraulic
Method of engagement	Depressing foot pedal
Method of disengagement	Releasing foot pedal

Front Axle and final drives.

Make/Model/Type	John Deere/crown wheel and pinion, differential and inboard planetary reduction.
Differential lock	
Type	Hydraulic
Method of engagement	depressing foot pedal
Method of disengagement	releasing foot pedal

Gear ratios and travel speeds.

(Tire dynamic radius of 918 mm (36.1 in) ISO 4251/1-1984)

Gear Number	Number of engine revolutions for one revolution of the driving wheels	Nominal travel speed at rated engine speed of 1900 rev/min [km/h]	[mph]
Forward			
A1	186.46	3.53	2.19
A2	155.48	4.23	2.63
A3	144.82	4.54	2.82
A4	120.71	5.45	3.38
A5	105.79	6.22	3.86
A6	88.21	7.45	4.63
B1	87.44	7.52	4.67
C1	79.33	8.29	5.15
B2	72.94	9.01	5.60
B3	67.93	9.68	6.01
C2	66.16	9.94	6.18
C3	61.63	10.67	6.63
B4	56.67	11.60	7.21
C4	51.39	12.79	7.95
B5	49.63	13.25	8.23
C5	45.02	14.60	9.08
B6	41.39	15.89	9.87
C6	37.55	17.51	10.88
D1	37.23	17.66	10.97
D2	31.05	21.18	13.16
D3	28.91	22.74	14.13
D4	24.11	27.27	16.95
D5	21.13	31.12	19.34
D6	17.62	37.32	23.19
Reverse			
A1	155.48	4.23	2.63
A2	129.60	5.07	3.15
B1	72.94	9.01	5.60
C1	66.16	9.94	6.18
B2	60.82	10.81	6.72
C2	55.17	11.92	7.41

Number of front wheel revolutions for one rear wheel revolution 1.000

POWER - TAKE - OFF.

Main Power-Take-Off.

Type	Independent
Method of engagement	Hand lever, independent of main drive clutch. Hydraulically actuated multi-plate wet clutch operated by one
Number of shafts	

Standard PTO, 1000 rev/min.

Location	Rear of tractor, vertical center plane.
Diameter of shaft	44.5 mm (1.75 in)
Number of splines	20; conforms to ISO 500/1979.
Height above ground	795 mm (31.3 in)
Distance from median plane of tractor	0 mm
Distance behind rear axle	760 mm (29.9 in)
PTO Speed @ rated engine speed	1003 rev/min
Engine speed @ Std. PTO Speed	1895 rev/min
Ratio of Engine rpm to PTO rpm	1.895
Direction of rotation (viewed facing driving end)	Clockwise.

POWER LIFT.

Make	John Deere
Type of hydraulic system	Hydraulic lift with electronic position control and adjustable speed of drop, closed center
Number/Type of cylinders	Two external,both single acting
Type of linkage lock for transport	Hydraulic
Relief valve setting	17.5 +/-0.3 MPa (2535 +/- 45 psi)
Opening pressure of cylinder safety valve	19.7 - 21.8 MPa (2857 - 3162 psi)
Lift pump type	Radial piston, variable delivery, constant pressure
Power transmission to pump	Direct drive
Type/Number of filters	spin on cartridge/one
Location of oil reservoir	Integral with right side fuel tank
Number/Type/Location of tapping points.	3 pairs of ISO standard coup - lings at rear of tractor. (A fourth set is optional)
Max. oil volume available for external cylinders.	19 l (20 qt) 32 l (34 qt) with 13 l (14 qt) allowable overfill

THREE POINT LINKAGE.
==========

- Category 4 in conformity with ISO 730/1-1977
- Category adaptor - Quick attach

THREE POINT LINKAGE
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Figure 1.1

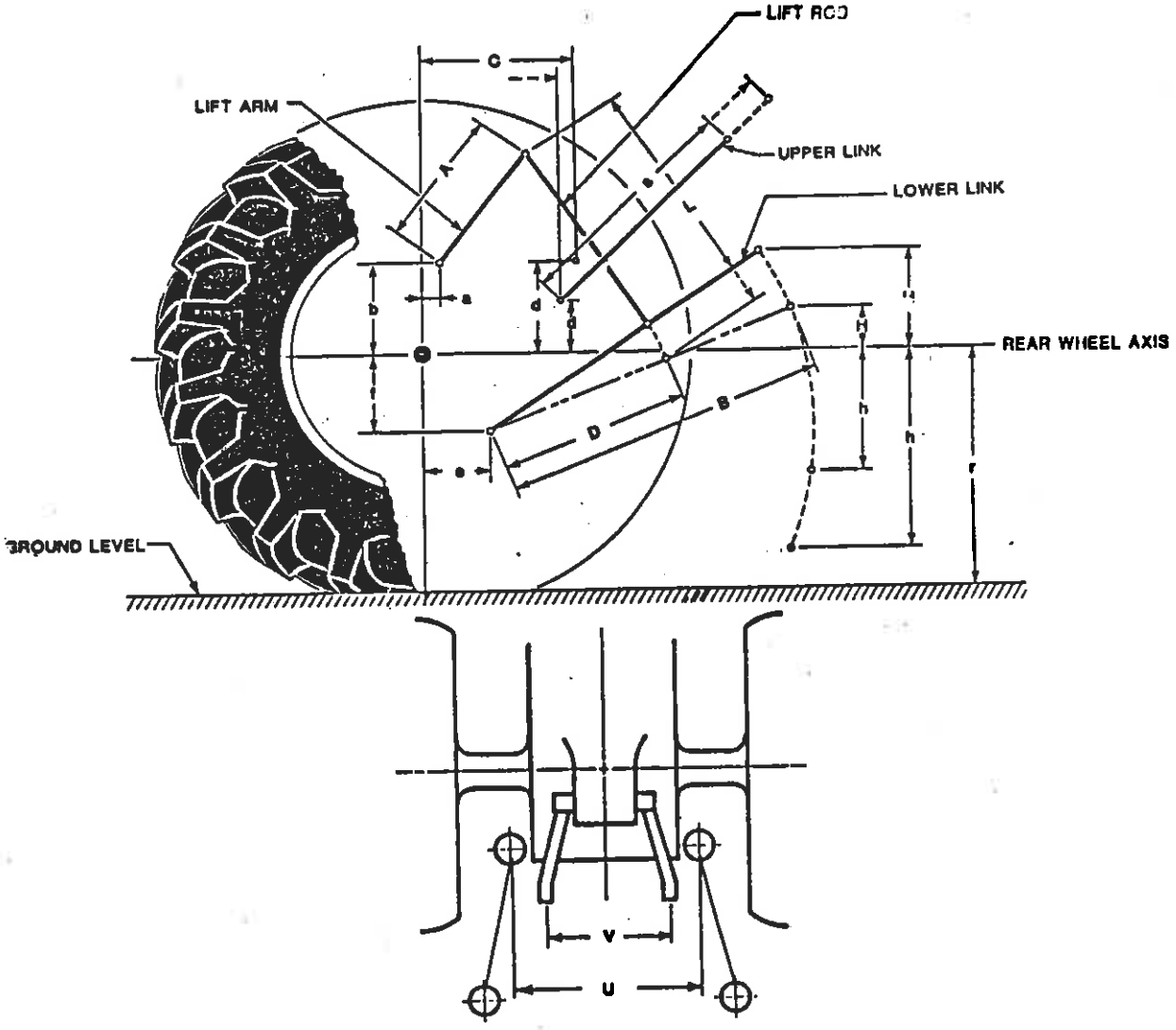


Figure 1.2

Table 1.1 -*Linkage geometry dimensions.

		Dimension or range [mm]	Dimension or range [in]	Settings used on test [mm]	Settings used on test [in]
Lift category		IV			
Rear Tire - Radius Index	(r)	918	36.1		
Front Tire - Radius Index	(r')	918	36.1		
Length of lift arms	(A)	472	18.6	same	
Length of lower links	(B)	1097	43.2	same	
Distance of lift arm pivot from: horizontal	(a)	244	9.6	same	
rear wheel axis: vertical	(b)	620	24.4	same	
Horizontal distance between the 2 lower link points	(u)	640	25.2	same	
Horizontal distance between the 2 lift arm end points	(v)	750	29.5	same	
Length of upper link	(S)	747 to 868	29.4 to 34.2	787	31.0
Distance of upper link pivot from: horizontal	(c)	577	22.7	same	
rear wheel axis: vertical	(d)	288	11.3	same	
Distance of lower link pivot from: horizontal	(e)	288	11.3	same	
rear wheel axis: vertical	(f)	350	13.8	same	
Distance of lower link pivot points to lift rod pivot pts on lower links.	(D)	718	28.3	same	
Length of lift rods	(L)	1030 to 1150	40.6 to 45.3	1133	44.6
Height of lower hitch points relative to rear wheel axis In low position	(h)	521 to 724	20.5 to 28.5	690	27.2
In high position	(H)	89 to 284	3.5 to 11.2	123	4.9
Height above ground of lower hitch points when locked in transport position.		1006 to 1201	39.6 to 47.3	1040	41.0

*Assuming (r) with a dynamic tire index of 918 mm (35.1 in)
ISO 4251/1-1984

SWINGING DRAWBAR.

Type	Oscillating
Height above ground:	Minimum: 445 mm (17.5 in) Maximum: 546 mm (21.5 in)
Adjustments	Removable clevis
Distance of hitch point from rear wheel axis, horizontal	1118 mm (44.0 in) 1268 mm (49.9 in)
Distance of hitch point from PTO shaft end Vertical Horizontal	 300 mm (11.8 in) 358 mm (14.1 in) 508 mm (20.0 in)
Lateral adjustment; Right side Left side	200 mm (7.9 in) 200 mm (7.9 in)
Distance of pivot point from rear wheel axle; horizontal	435 mm (17.1 in) 585 mm (23.0 in)
Diamater of drawbar pin hole	40 mm (1.6 in)
Maximum vertical static permissible load	20.0 kN (4500 lb)

STEERING

Make/Model/Type	John Deere/Hydrostatic
Method of operation	Steering wheel
Pump(s)	Same as main hydraulic pump
Ram(s)	Two external with feedback
Working pressure	Same as main hydraulic pressure

BRAKE SYSTEM.

Service brake.	
Make/Model/Type	John Deere/Oil immersed disc
Method of operation	Hydraulically actuated from main system; operated by one foot pedal.
Parking brake.	
Type	Transmission lock
Method of operation	Gear selector lever.
Trailer brake(optional)	
Type	Hydraulic

WHEELS.

Number.	
Front	Four; Driving and steering
Rear	Four; Driving and steering
Wheelbase	3400 mm (133.9 in)

Track width adjustment

	Minimum [mm]	Minimum [in]	Maximum [mm]	Maximum [in]	Adjustment method
Inner	2002	78.8	2317	91.2	Rack and pinion axle, reversing wheels and offset lug rims
Outer	3344	131.6	3659	144.1	same as inner wheels

(Front and rear wheels have same dimensions and adjustment methods)

PROTECTIVE STRUCTURE.

Make/Model/Type	John Deere/SG041/ Sound-Gard Cab
Manufacturer's name/address	John Deere Tractor Works Waterloo, Iowa
Protective device	Cab, not tiltable.
OECD approval number	CSS 0141/1

DRIVER'S SEAT.

Make/Model/Type	John Deere/HydraCushioned
Type of suspension and damping	Gas charged accumulator and spring-loaded attenuator
Range of adjustment	
Longitudinal	150 mm (5.9 in)
Vertical	64 mm (2.5 in)
Rotation	30 degrees each way

LIGHTING.

	Height above ground of center [mm]	Height above ground of center [in]	Size [mm]	Distance from outside edge to median plane of tractor. [mm]	Distance from outside edge to median plane of tractor. [in]
Headlights	2040	80.3	100 dia.	483	19.0
Rearlights	1996	78.6	100 dia.	845	33.3
Reflectors					
front	3536	139.2	50 x 197	533	21.0
rear	3536	139.2	50 x 197	554	21.8

TEST CONDITIONS.

Overall dimensions.

Length		7266 mm (286.0 in)
Width	- Minimum	3870 mm (152.4 in)
	- Maximum	4190 mm (164.9 in)
Height	- Top of cab	3505 mm (138.0 in)
	- Top of exhaust	4125 mm (162.4 in)
Ground clearance (unballasted)		378 mm (14.9 in)
Clearance-limiting part		Drawbar rear support

Tractor Mass (with Cab, full fuel tank)

		Without driver [kg]	Without driver [lb]	With driver [kg]	With driver [lb]
Unballasted	Front	8999	19840	9036	19920
	Rear	7135	15730	7173	15815
	Total	16134	35570	16209	35735

Tire Specifications.

	Front wheels	Rear wheels
Make	Goodyear	Goodyear
Dimensions	20.8R42	20.8R42
Ply rating	2 star (10 ply)	2 star (10 ply)
Type	Radial	Radial
Max.load (tire manufacturer)	3630 kg/tire (8000 lb/tire)	3630 kg/tire (8000 lb/tire)
Max.load(tractor manufacturer)	same	same
Inflation pressure (tire mfr)	165 kPa (24 psi)	165 kPa (24 psi)
Dynamic Radius Index	918 mm (36.1 in)	918 mm (36.1 in)
Chosen track width - inner	2100 mm (82.6 in)	2100 mm (82.6 in)
- outer	3640 mm(143.3 in)	3640 mm(143.3 in)

Oils and Lubrication.

Capacity and change interval:

	Capacity liter	Capacity quart	Oil change hrs	Filter change hrs
Engine (w/o filter)	34	36	250	250
Gear Box + rear axle	37.8	40	1500	750
Hydraulic system (includes steering, front and rear axle, and PTO)	178	188	1500	750

Oil and Lubricant specifications:

	Recommended	Used during test
Engine oil		
Type	John Deere Torq-Gard Supreme	same
Viscosity	102 cSt	
Classification	API - CD MIL-L-2104D	
Transmission		
Type	John Deere Hy-Gard	same
Viscosity	58 cSt	
Classification	NA	
Hydraulic fluid		
Type	John Deere Hy-Gard	same
Viscosity	58 cSt	
Classification	NA	
Steering oil	same as hydraulic	same
Front and rear axle	same as hydraulic	
Grease		
Number of lubrication points	24	

Fuel

Type/grade	Diesel Fuel "Premier";grade 2-D
Density (Pto test)	0.828 g/cubic-cm (6.912 lbs/gallon) at 15 °C (59 °F)
(Drawbar test)	same as Pto test.
Cetane number	51.1
Viscosity	2.31 cSt at 38 °C (100 °F)

Remarks: This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperatures.

COMPULSORY TESTS.

(1) MAIN POWER TAKE-OFF PERFORMANCE (1000 rev/min).

Date of tests : 11 May 1989
Location of tests : Center for Agricultural Equipment, University of Nebraska, Lincoln, Nebraska.
Type of Dynamometer: Eaton Dynamatic 2025 D.G.

Power kW (hp)	Speeds engine rev/min	Speeds PTO rev/min	Fuel Consumption hourly l/h (gal/h)	Fuel Consumption hourly kg/h (lb/h)	Fuel Consumption specific kg/kW.h (lb/hp.h)	Specific energy kW.h/l (hp.h/gal)
1.1 Maximum Power- 2 hour test.						
250.06 (335.34)	1800	950	72.84 (19.24)	60.33 (133.01)	0.241 (0.397)	3.43 (17.43)
1.2 Power at rated engine speed. (1 hour)						
248.61 (333.40)	1900	1002	73.88 (19.52)	61.19 (134.91)	0.246 (0.405)	3.36 (17.08)
1.3 Maximum power at standard PTO speed.(1000 rev/min)						
248.61 (333.40)	1900	1002	73.88 (19.52)	61.19 (134.91)	0.246 (0.405)	3.36 (17.08)

1.4 Part Loads – governor hand lever set for maximum power at rated engine speed

Power kW (hp)	Speeds engine rev/min	Speeds PTO rev/min	Fuel Consumption hourly l/h (gal/h)	Fuel Consumption hourly kg/h (lb/h)	Fuel Consumption specific kg/kW.h (lb/hp.h)	Specific energy kW.h/l (hp.h/gal)
(i) Torque obtained at maximum power at rated engine speed.						
248.61 (333.40)	1900	1002	73.88 (19.52)	61.19 (134.91)	0.246 (0.405)	3.36 (17.08)
(ii) 85% of the torque obtained in (i)						
224.05 (300.45)	2016	1063	70.48 (18.62)	58.38 (128.70)	0.261 (0.428)	3.18 (16.14)
(iii) 75% of the torque defined in (ii)						
171.56 (230.06)	2059	1086	58.33 (15.41)	48.31 (106.50)	0.282 (0.463)	2.94 (14.93)
(iv) 50% of the torque defined in (ii)						
115.67 (155.12)	2077	1096	43.54 (11.50)	36.06 (79.50)	0.312 (0.513)	2.66 (13.49)
(v) 25% of the torque defined in (ii)						
58.32 (78.21)	2099	1107	33.02 (8.72)	27.35 (60.30)	0.469 (0.771)	1.77 (8.97)
(vi) Unloaded						
0.40 (0.54)	2139	1129	20.04 (5.30)	16.60 (36.60)	41.427 (68.105)	0.02 (0.10)

1.5 Part Loads - governor hand lever set for maximum power at standard pto speed.

Power kW (hp)	Speeds engine rev/min	Speeds PTO rev/min	Fuel Consumption hourly l/h (gal/h)	Fuel Consumption hourly kg/h (lb/h)	Fuel Consumption specific kg/kW.h (lb/hp.h)	Specific energy kW.h/l (hp.h/gal)
(i) Torque obtained at standard pto speed.						
248.61 (333.40)	1900	1002	73.88 (19.52)	61.19 (134.91)	0.246 (0.405)	3.36 (17.08)
(ii) 85% of the torque obtained in (i)						
224.05 (300.45)	2016	1063	70.48 (18.62)	58.38 (128.70)	0.261 (0.428)	3.18 (16.14)
(iii) 75% of the torque defined in (ii)						
171.56 (230.06)	2059	1086	58.33 (15.40)	48.31 (106.50)	0.282 (0.463)	2.94 (14.93)
(iv) 50% of the torque defined in (ii)						
115.67 (155.12)	2077	1096	43.54 (11.50)	36.06 (79.50)	0.312 (0.513)	2.66 (13.49)
(v) 25% of the torque defined in (ii)						
58.32 (78.21)	2099	1107	33.02 (8.72)	27.35 (60.30)	0.469 (0.771)	1.77 (8.97)
(vi) Unloaded						
0.40 (0.54)	2139	1139	20.04 (5.30)	16.60 (36.60)	41.427 (68.105)	0.02 (0.10)

No-load maximum engine speed	2139 rev/min
Equivalent engine torque:	
at rated engine speed	1250 Nm(1900 rev/min)
at maximum power	1326 Nm(1800 rev/min)
at maximum torque	1719 Nm(1248 rev/min)
Mean atmospheric conditions:	
Temperature-dry bulb	25 °C (77 °F)
Relative Humidity	48 %
Barometer -	98.50 kPa (29.09 in Hg)

Maximum Temperatures:		
Thermostat housing	91 °C	(196 °F)
Engine oil pan	119 °C	(247 °F)
Fuel at injection pump	55 °C	(131 °F)
Engine air intake	50 °C	(123 °F)
Hydraulic Oil	58 °C	(137 °F)
Turbocharger boost pressure		
at rated engine speed	148 kPa	(21.5 psi)
at maximum power	147 kPa	(21.3 psi)

2. HYDRAULIC POWER AND LIFTING FORCE.

Date of test: 18 May 1989
Location: CAE/UNL, Lincoln, Nebr.

2.1 HYDRAULIC POWER TEST - Hydraulic pump performance

i. Sustained pressure with pump stalled	17.51 MPa (2540 psi)
ii. Pump delivery rate @ minimum pressure & rated engine speed	151.0 l/m (39.9 gpm)

iii.

	Flow Rate l/min (gal/min)	Pressure MPa (psi)	Power kW (hp)
At 90% of relief valve setting.	81.4 (21.5)	15.86 (2300)	21.5 (28.9)
At maximum hydraulic power.	144.6 (38.2)	13.44 (1950)	32.4 (43.5)

Tapping point(s)	Two hydraulic outlets combined
Hydraulic fluid temperature	
in oil reservoir	37 °C (99 °F)
at flow meter	65 °C (149 °F)

2.2 POWER LIFT TEST.

		Hitch Points	Frame
Lower hitch points above ground - down position.	[mm/in]	250/10.0	238/9.4
Vertical movement without load	[mm/in]	813/32.0	886/34.9
Vertical movement with load	[mm/in]	746/29.4	828/32.6
Maximum corrected force through full range	[kN/lbf]	53.8/12096	53.4/12009
Corresponding pressure	[kPa/psi]	13445/1950	
Moment about rear axle	[kN.m/ft.lb]	82.6/60946	114.6/84521
Maximum mast tilt angle	[degrees]	--	6.2

Lifting height relative to the horizontal position of lower links

[mm]	-330	-314	-233	-131	1
[in]	-13.0	-12.4	-9.2	-5.2	0

Corrected lifting forces.

hitch points	[kN]	--	53.8	56.2	58.8	61.7
	[lb]	--	12096	12624	13212	13876
at frame	[kN]	55.7	--	56.2	57.0	57.6
	[lb]	12513	--	12643	12818	12956

Lifting height relative to the horizontal position of lower links

[mm]	128	229	331	432	498
[in]	5.0	9.0	13.0	17.0	19.6

Corrected lift forces.

hitch points	[kN]	64.0	65.7	67.0	67.9	--
	[lb]	14396	14778	15068	15274	--
at frame	[kN]	57.5	56.8	55.7	--	53.4
	[lb]	12933	12780	12520	--	12009

3. DRAWBAR POWER AND FUEL CONSUMPTION (UNBALLASTED TRACTOR)

OECD Drawbar Data (SI)

Date of tests: 12-May-89 16-May-89 Fuel density: 0.828 kg/l
Type of track: Concrete Test # 1625

Gear	Power	Pull	Speed	Engine Speed	Slip	SFC		Temperature, deg C					Rel hum	Pressure
	kW	kN	km/h	rev/min	%	kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet	%	kPa
I. Maximum Power (unballasted @ 1800 rev/min) Drawbar height: 508 mm								Tire pressure:			97 kPa, rear (inner) 97 kPa, rear (outer)		97 kPa, front (inner) 97 kPa, front (outer)	
3rd(A3)*	185.73	153.25	4.36	2025	9.87%	0.304	2.73	53	85	106	21	16	60%	97.97
4th(A4)*	207.94	153.29	4.88	1883	9.25%	0.287	2.88	52	85	110	21	15	53%	98.00
5th(A5)	213.56	134.28	5.73	1861	5.87%	0.277	2.99	53	86	111	23	16	48%	97.93
6th(A6)	219.21	116.93	6.75	1799	4.34%	0.269	3.08	53	86	111	24	17	49%	97.93
7th(B1)	224.85	118.37	6.84	1800	3.90%	0.263	3.16	53	85	111	21	16	60%	97.77
8th(C1)	223.80	106.63	7.56	1796	3.47%	0.264	3.14	52	86	111	24	14	49%	97.53
9th(B2)	227.23	98.78	8.28	1800	3.02%	0.260	3.19	52	88	110	24	14	49%	97.56
10th(B3)	231.53	93.36	8.93	1799	2.40%	0.257	3.22	52	86	112	20	12	37%	97.93
11th(C2)	225.06	88.33	9.17	1800	2.58%	0.261	3.18	52	86	112	21	13	39%	97.80
12th(C3)	229.31	83.50	9.89	1803	2.22%	0.257	3.22	52	86	111	22	13	34%	97.77
13th(B4)	227.51	75.98	10.78	1803	2.04%	0.259	3.20	52	87	111	23	13	30%	97.70
14th(C4)	227.47	68.87	11.89	1799	1.86%	0.260	3.19	52	88	110	23	14	36%	97.66
15th(B5)	228.55	66.66	12.34	1802	1.68%	0.259	3.20	51	87	109	23	14	36%	97.63
16th(C5)	227.21	59.96	13.64	1803	1.49%	0.260	3.19	52	87	111	24	14	49%	97.60

Note: *Pull limited due to tractor bouncing.

Date of tests: 12-May-89 16-May-89 Fuel density: 6.912 lb/gal
Type of track: Concrete Test # 1625

Gear	Power	Pull	Speed	Engine Speed	Slip	SFC		Temperature, deg F					Rel hum	Pressure
	hp	lb	mph	rpm	%	lb/hp-hr	hp-hr/gal	Fuel	Coolant	Oil	Dry	Wet	%	in Hg
I. Maximum Power (unballasted @ 1800 rev/min) Drawbar height: 20 in								Tire pressure: 14 psi, rear (inner) 14 psi, rear (outer) 14 psi, front (inner) 14 psi, front (outer)						
3rd(A3)*	249.07	34453	2.71	2025	9.87%	0.499	13.84	127	185	224	70	60	60%	28.93
4th(A4)*	278.85	34462	3.03	1883	9.25%	0.472	14.64	126	186	230	69	59	53%	28.94
5th(A5)	286.38	30187	3.56	1861	5.87%	0.456	15.16	128	186	232	73	61	48%	28.92
6th(A6)	293.96	26288	4.19	1799	4.34%	0.442	15.63	128	187	232	76	63	49%	28.92
7th(B1)	301.53	26611	4.25	1800	3.90%	0.432	16.02	127	186	232	70	61	60%	28.87
8th(C1)	300.12	23972	4.69	1796	3.47%	0.434	15.94	126	187	233	76	58	49%	28.80
9th(B2)	304.72	22208	5.15	1800	3.02%	0.427	16.18	126	190	231	76	58	49%	28.81
10th(B3)	310.49	20988	5.55	1799	2.40%	0.423	16.35	126	188	234	68	54	37%	28.92
11th(C2)	301.82	19858	5.70	1800	2.58%	0.429	16.12	125	187	234	70	55	39%	28.88
12th(C3)	307.52	18772	6.14	1803	2.22%	0.423	16.34	125	187	232	72	56	34%	28.87
13th(B4)	305.09	17080	6.70	1803	2.04%	0.425	16.25	125	188	232	73	56	30%	28.85
14th(C4)	305.04	15482	7.39	1799	1.86%	0.427	16.18	126	190	230	74	57	36%	28.84
15th(B5)	306.49	14986	7.67	1802	1.68%	0.425	16.25	125	188	228	74	57	36%	28.83
16th(C5)	304.70	13481	8.48	1803	1.49%	0.427	16.17	126	188	232	76	58	49%	28.82

Note: *Pull limited due to tractor bouncing.

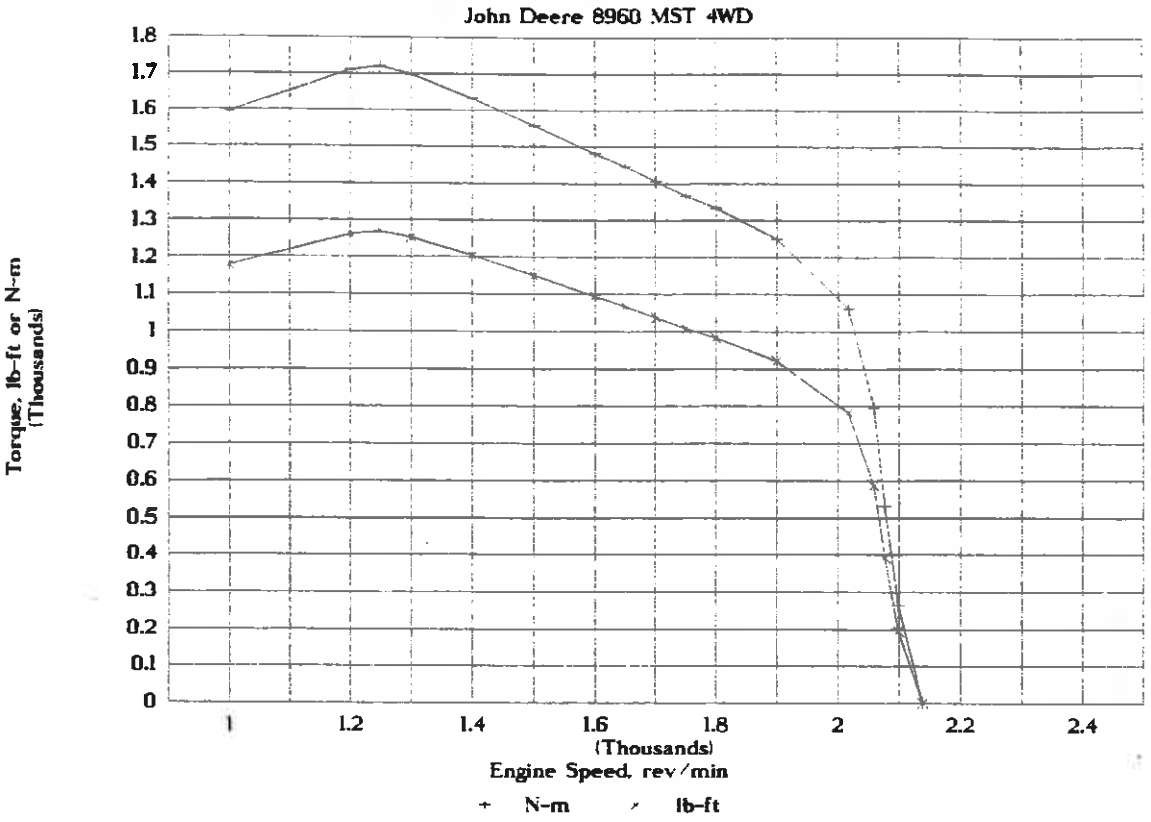
Date of tests: 12-May-89 16-May-89 Fuel density: 0.828 kg/l
Type of track: Concrete Test # 1625

Gear	Power	Pull	Speed	Engine Speed	Slip	SFC		Temperature, deg C					Rel hum	Pressure
	kW	kN	km/h	rev/min	%	kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet	%	kPa
II. Part Loads (unballasted)						Tire pressure:		97 kPa, rear (inner)			97 kPa, front (inner)			
			Drawbar height:	508 mm				97 kPa, rear (outer)			97 kPa, front (outer)			
II.1 in selected gear at maximum power														
10th(B3)	231.53	93.36	8.93	1799	2.40%	0.257	3.22	52	86	112	20	12	37%	97.93
II.1.1 75% of pull at maximum power at rated speed														
10th(B3)	186.71	65.80	10.22	2044	1.86%	0.295	2.81	46	86	109	25	18	44%	97.66
II.1.2 50% of pull at maximum power at rated speed														
10th(B3)	127.02	43.82	10.44	2075	1.22%	0.335	2.47	47	83	107	25	18	44%	97.60
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1														
13th(B4)	186.22	65.68	10.21	1703	1.68%	0.263	3.15	45	86	108	25	18	44%	97.66
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2														
13th(B4)	127.24	43.86	10.45	1732	1.31%	0.297	2.79	47	83	104	26	18	40%	97.56
II.2 in selected gear nearest to 7.5 km/h														
7th(B1)	224.85	118.37	6.84	1800	3.90%	0.263	3.16	53	85	111	21	16	60%	97.77
II.2.1 75% of pull at maximum power at rated speed														
7th(B1)	184.91	84.28	7.90	2046	2.31%	0.287	2.88	47	86	110	25	18	50%	97.70
II.2.2 50% of pull at maximum power at rated speed														
7th(B1)	126.37	56.19	8.10	2079	1.49%	0.327	2.53	45	82	107	25	18	50%	97.63
II.2.3 next higher gear at reduced engine speed, same pull and travel speed as II.2.1														
10th(B3)	184.58	84.29	7.88	1587	2.31%	0.250	3.32	46	87	108	25	18	50%	97.70
II.2.4 next higher gear at reduced engine speed, same pull and travel speed as II.2.2														
10th(B3)	126.78	56.29	8.11	1618	1.58%	0.285	2.91	45	83	105	25	18	50%	97.63

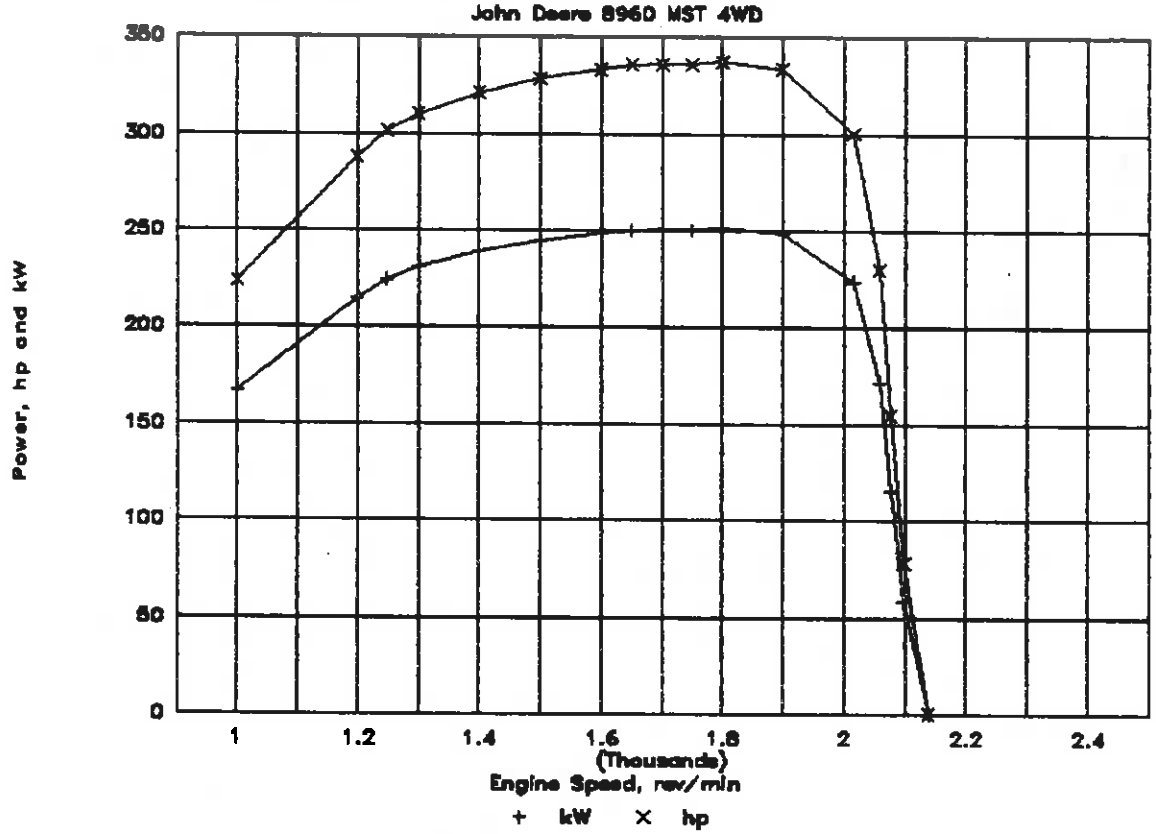
Date of tests: 12-May-89 16-May-89 Fuel density: 6.912 lb/gal
Type of track: Concrete Test # 1625

Gear	Power	Pull	Speed	Engine Speed	Slip	SFC		Temperature, deg F					Rel hum	Pressure
	hp	lb	mph	rpm	%	lb/hp-hr	hp-hr/gal	Fuel	Coolant	Oil	Dry	Wet	%	in Hg
II. Part Loads (unballasted) Drawbar height: 20 in								Tire pressure: 14 psi, rear (inner) 14 psi, rear (outer)			14 psi, front (inner) 14 psi, front (outer)			
II.1 in selected gear at maximum power														
10th(B3)	310.49	20988	5.55	1799	2.40%	0.423	16.35	126	188	234	68	54	37%	28.92
II.1.1 75% of pull at maximum power at rated speed														
10th(B3)	250.39	14792	6.35	2044	1.86%	0.485	14.26	114	186	229	77	64	44%	28.84
II.1.2 50% of pull at maximum power at rated speed														
10th(B3)	170.33	9851	6.48	2075	1.22%	0.551	12.55	117	181	224	77	64	44%	28.82
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1														
13th(B4)	249.73	14765	6.34	1703	1.68%	0.432	16.01	113	186	226	77	64	44%	28.84
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2														
13th(B4)	170.63	9859	6.49	1732	1.31%	0.488	14.16	116	182	220	79	65	40%	28.81
II.2 in selected gear nearest to 4.6 mph														
7th(B1)	301.53	26611	4.25	1800	3.90%	0.432	16.02	127	186	232	70	61	60%	28.87
II.2.1 75% of pull at maximum power at rated speed														
7th(B1)	247.97	18947	4.91	2046	2.31%	0.472	14.63	116	187	230	77	64	50%	28.85
II.2.2 50% of pull at maximum power at rated speed														
7th(B1)	169.46	12632	5.03	2079	1.49%	0.538	12.86	114	180	224	77	64	50%	28.83
II.2.3 next higher gear at reduced engine speed, same pull and travel speed as II.2.1														
10th(B3)	247.52	18950	4.90	1587	2.31%	0.411	16.83	114	188	227	77	64	50%	28.85
II.2.4 next higher gear at reduced engine speed, same pull and travel speed as II.2.2														
10th(B3)	170.02	12655	5.04	1618	1.58%	0.468	14.78	113	181	221	77	64	50%	28.83

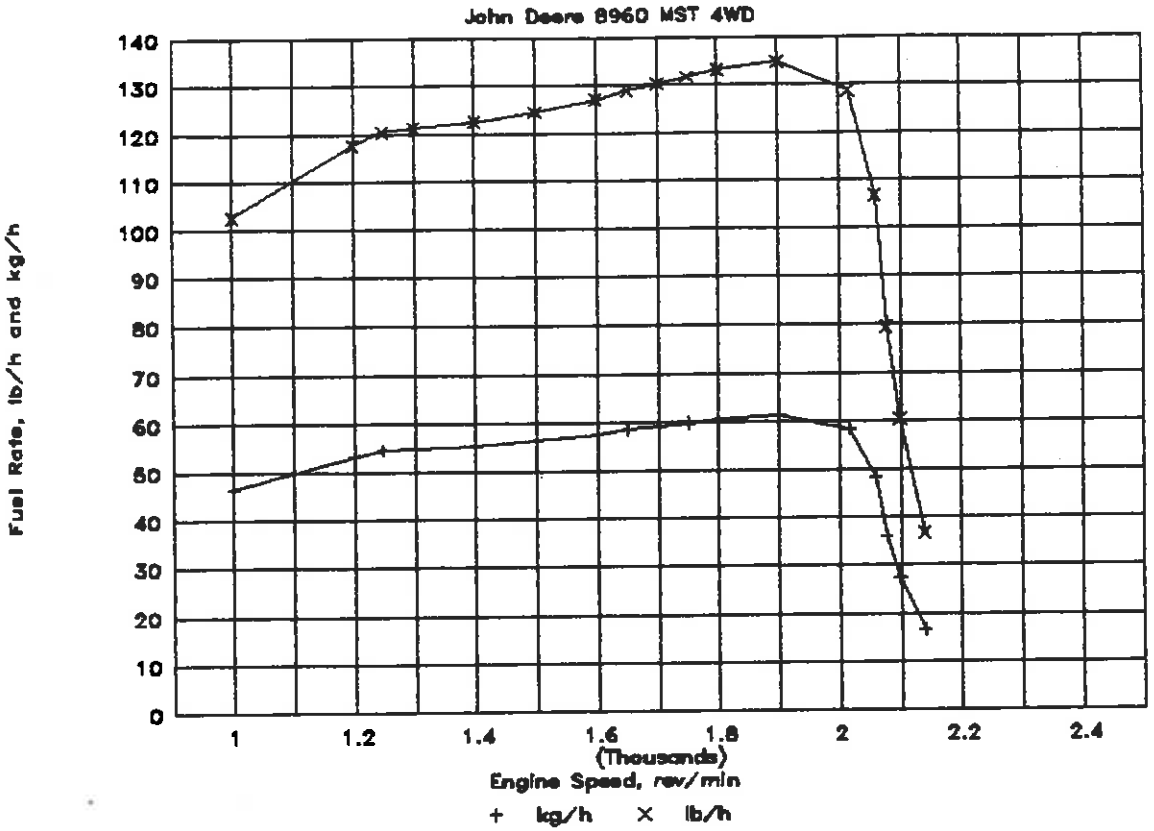
Equivalent Crankshaft Torque



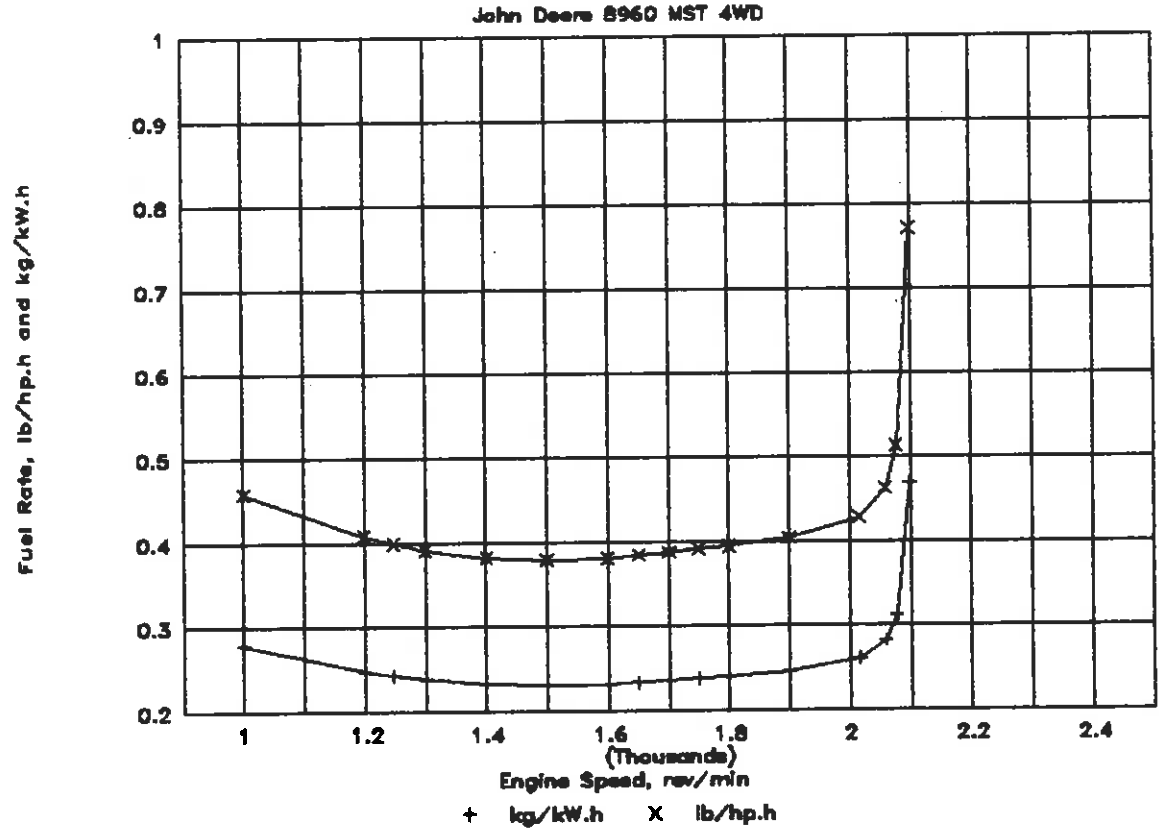
PTO Power



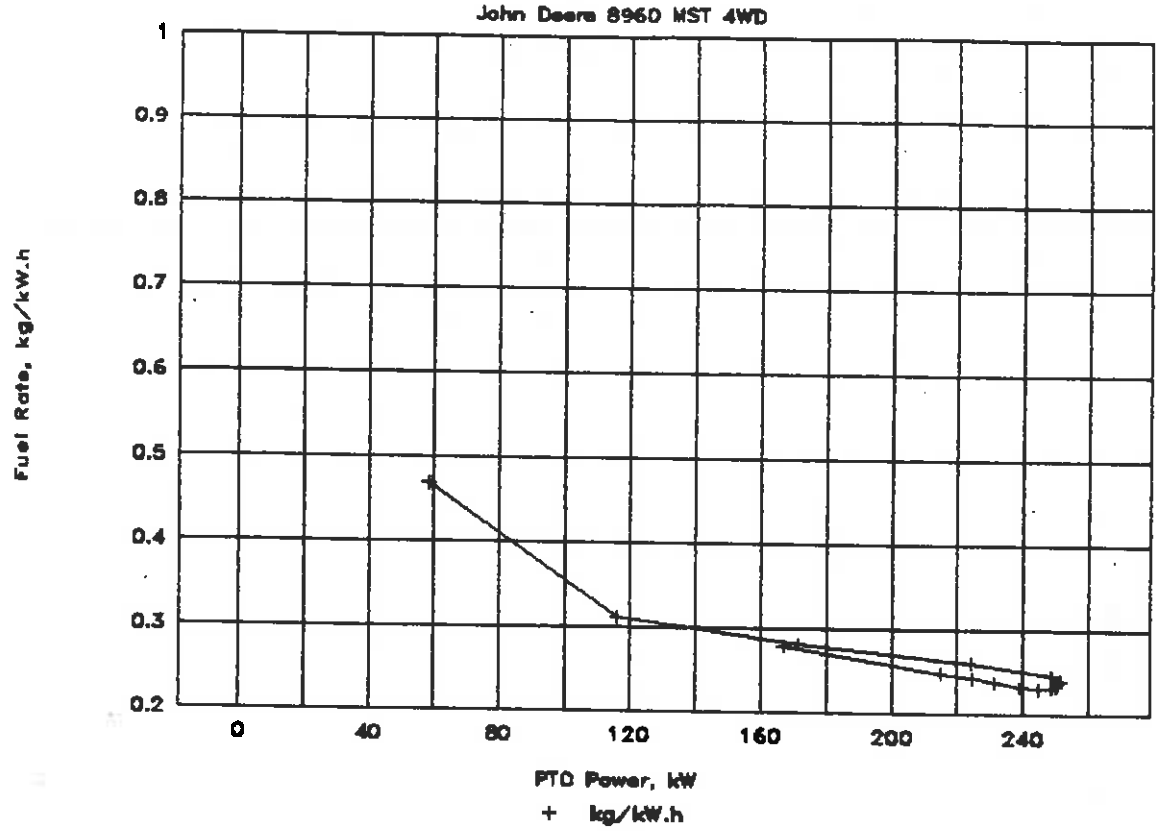
PTO Fuel Consumption



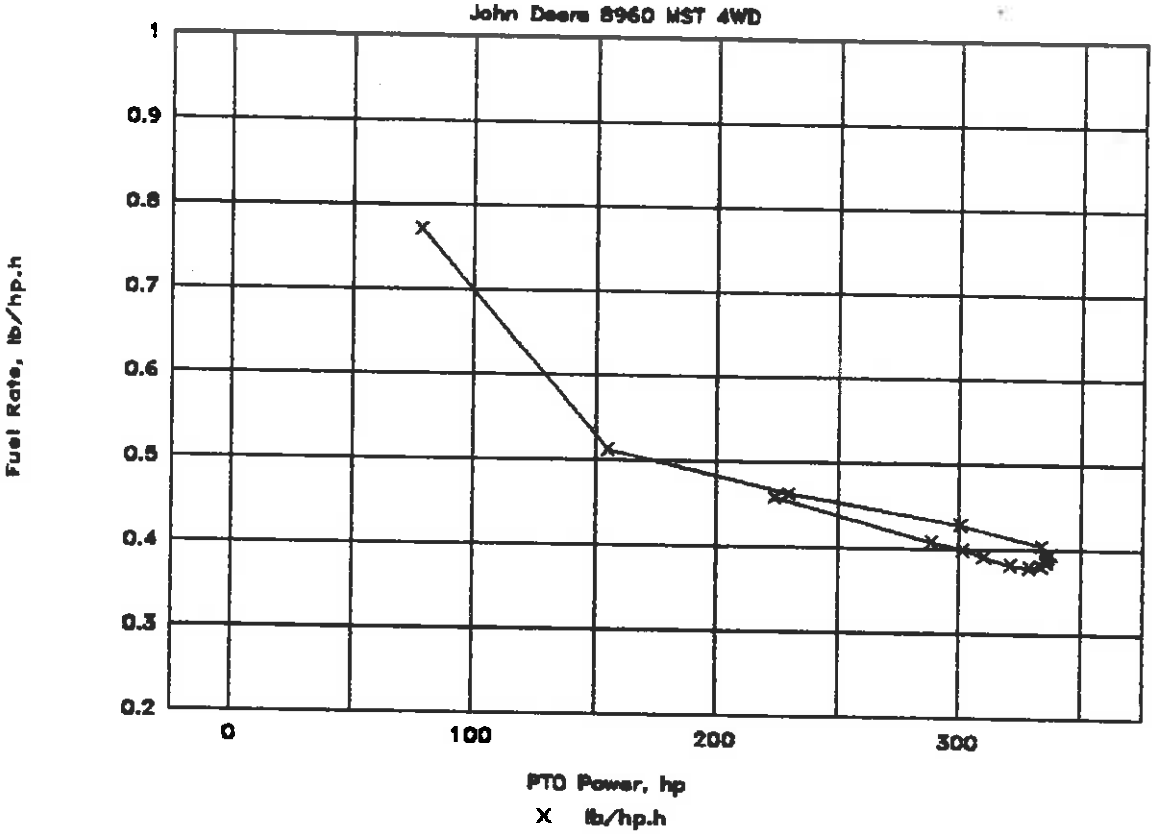
PTO Specific Fuel Consumption



SFC vs PTO Power



SFC vs PTO Power



5. OPTIONAL TESTS.

5.1 MEASUREMENT OF EXTERNAL NOISE LEVEL.

Date of test	:	May 16, 1989
Location of test	:	CAE/UNL, Lincoln, Nebr.
Sound level meter	:	B & K 2203
Type of track	:	Concrete oval
Gear number	:	24th (D6)
Speed prior to acceleration	:	30.5 km/h (19.0 mph)
Sound level	:	87.0 dB(A)

5.2 MAXIMUM POWER AT 1900 REV/MIN (UNBALLASTED TRACTOR)

OECD Drawbar Data (SI)

Date of tests: 12-May-89 16-May-89 Fuel density: 0.828 kg/l
Type of track: Concrete Test # 1625

Gear	Power	Pull	Speed	Engine Speed	Slip	SFC		Temperature, deg C					Rel hum	Pressure
	kW	kN	km/h	rev/min	%	kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet	%	kPa
Ia. Maximum Power (unballasted @ 1900 rev/min) Drawbar height: 508 mm								Tire pressure: 97 kPa, rear (inner) 97 kPa, rear (outer)			97 kPa, front (inner) 97 kPa, front (outer)			
3rd(A3)*	184.93	152.64	4.36	2025	9.87%	0.304	2.72	53	85	108	21	16	60%	97.97
4th(A4)	209.62	149.34	5.05	1898	7.02%	0.286	2.89	52	85	109	18	14	65%	98.00
5th(A5)	214.43	131.57	5.87	1898	5.45%	0.283	2.93	53	85	110	22	16	54%	97.97
6th(A6)	218.53	110.16	7.14	1895	3.82%	0.276	3.00	54	86	111	23	16	48%	97.93
7th(B1)	226.31	112.37	7.25	1898	3.47%	0.267	3.10	52	85	111	23	17	55%	97.73
8th(C1)	223.31	100.27	8.02	1899	3.20%	0.270	3.07	53	86	112	25	14	28%	97.53
9th(B2)	225.45	92.64	8.76	1897	2.40%	0.267	3.10	52	86	112	20	12	37%	97.90
10th(B3)	229.87	87.63	9.44	1898	2.22%	0.262	3.16	52	86	112	20	12	37%	97.93
11th(C2)	222.72	82.52	9.72	1901	2.13%	0.270	3.07	52	86	111	21	13	39%	97.83
12th(C3)	225.19	77.72	10.43	1898	2.13%	0.266	3.11	52	86	112	22	13	34%	97.73
13th(B4)	222.37	70.35	11.38	1900	1.77%	0.270	3.06	52	86	112	23	14	36%	97.66
14th(C4)	223.36	63.92	12.58	1901	1.68%	0.270	3.07	52	86	112	23	14	36%	97.63
15th(B5)	223.98	61.93	13.02	1898	1.49%	0.269	3.08	52	86	112	23	14	36%	97.60

Note: *Pull limited due to tractor bouncing.

OECD Drawbar Data (US)

Date of tests: 12-May-89 16-May-89 Fuel density: 6.912 lb/gal
Type of track: Concrete Test # 1625

Gear	Power	Pull	Speed	Engine Speed	Slip	SFC		Temperature, deg F					Rel hum	Pressure
	hp	lb	mph	rpm	%	lb/hp-hr	hp-hr/gal	Fuel	Coolant	Oil	Dry	Wet	%	in Hg
Ia. Maximum Power (unballasted @ 1900 rev/min) Drawbar height: 20 in								Tire pressure: 14 psi, rear (inner) 14 psi, rear (outer)			14 psi, front (inner) 14 psi, front (outer)			
3rd(A3)*	248.00	34316	2.71	2025	9.87%	0.500	13.83	127	185	227	70	60	60%	28.93
4th(A4)	281.10	33574	3.14	1898	7.02%	0.471	14.69	125	186	229	64	57	65%	28.94
5th(A5)	287.55	29577	3.65	1898	5.45%	0.465	14.88	128	186	230	71	60	54%	28.93
6th(A6)	293.06	24764	4.44	1895	3.82%	0.453	15.25	129	187	232	73	61	48%	28.92
7th(B1)	303.49	25262	4.51	1898	3.47%	0.440	15.72	126	186	232	74	62	55%	28.86
8th(C1)	299.47	22541	4.98	1899	3.20%	0.444	15.58	127	187	234	77	58	28%	28.80
9th(B2)	302.33	20826	5.44	1897	2.40%	0.439	15.74	126	187	233	68	54	37%	28.91
10th(B3)	308.26	19700	5.87	1898	2.22%	0.431	16.03	125	186	234	68	54	37%	28.92
11th(C2)	298.67	18552	6.04	1901	2.13%	0.444	15.57	125	187	233	70	55	39%	28.89
12th(C3)	301.98	17472	6.48	1898	2.13%	0.437	15.80	126	187	234	72	56	34%	28.86
13th(B4)	298.20	15815	7.07	1900	1.77%	0.444	15.55	126	187	234	74	57	36%	28.84
14th(C4)	299.52	14369	7.82	1901	1.68%	0.444	15.58	126	187	234	74	57	36%	28.83
15th(B5)	300.37	13922	8.09	1898	1.49%	0.442	15.63	125	187	234	74	57	36%	28.82

Note: *Pull limited due to tractor bouncing.

Repairs: None
Remarks: None