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Test 1393: John Deere 2040 Diesel 8-Speed TSS Transmission

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1393 — JOHN DEERE 2040 DIESEL 8 SPEED TSS TRANSMISSION (WITH MECHANICAL FRONT WHEEL DRIVE)

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption		Temperature °F (°C)				Barometer inch Hg (kPa)
		gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cooling medium	Air wet bulb	Air dry bulb	

MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—Two Hours (PTO Speed—567 rpm)								
40.44 (30.46)	2500	2.774 (10.501)	0.481 (0.293)	14.58 (2.872)	184 (84.6)	67 (19.6)	75 (23.8)	28.810 (97.287)

Standard Power take-off Speed (540 rpm)—One Hour								
40.22 (29.99)	2382	2.705 (10.240)	0.471 (0.287)	14.87 (2.929)	185 (85.0)	67 (19.4)	75 (23.7)	28.810 (97.287)

VARYING POWER AND FUEL CONSUMPTION—Two Hours

35.35 (26.36)	2568	2.547 (9.641)	0.505 (0.307)	13.88 (2.734)	182 (83.1)	67 (19.4)	75 (23.6)	.....
0.00 (0.00)	2662	1.156 (4.376)	.....	.....	173 (78.3)	67 (19.4)	74 (23.3)	.....
18.01 (13.43)	2623	1.777 (6.727)	0.691 (0.420)	10.14 (1.996)	176 (80.0)	68 (19.7)	75 (23.9)	.....
40.37 (30.10)	2499	2.791 (10.565)	0.485 (0.295)	14.46 (2.849)	184 (84.2)	68 (19.7)	75 (23.9)	.....
9.08 (6.77)	2640	1.447 (5.477)	1.117 (0.680)	6.27 (1.236)	175 (79.2)	68 (20.0)	75 (23.9)	.....
26.71 (19.92)	2592	2.128 (8.055)	0.558 (0.340)	12.55 (2.473)	179 (81.7)	68 (19.7)	76 (24.2)	.....
Av 21.59 Av (16.10)	2597	1.974 (7.472)	0.641 (0.390)	10.93 (2.155)	178 (81.1)	67 (19.7)	75 (23.8)	28.810 (97.287)

DRAWBAR PERFORMANCE

(Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			Barom. inch Hg (kPa)
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cool- ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 4th Gear											
31.90 (23.79)	2325 (10.34)	5.14 (8.28)	2501	4.20	2.729 (10.330)	0.600 (0.365)	11.69 (2.303)	187 (85.8)	63 (16.9)	80 (26.4)	28.835 (97.371)
75% of Pull at Maximum Power—Ten Hours 4th Gear											
25.67 (19.14)	1812 (8.06)	5.31 (8.55)	2551	2.94	2.397 (9.075)	0.654 (0.398)	10.71 (2.109)	186 (85.6)	70 (21.1)	85 (29.4)	28.797 (97.243)
50% of Pull at Maximum Power—Two Hours 4th Gear											
17.50 (13.05)	1212 (5.39)	5.42 (8.72)	2581	2.22	1.998 (7.562)	0.800 (0.487)	8.76 (1.726)	181 (82.5)	66 (18.9)	79 (25.8)	28.825 (97.340)
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
17.68 (13.19)	1221 (5.43)	5.43 (8.74)	1460	2.05	1.409 (5.334)	0.558 (0.340)	12.55 (2.472)	183 (83.6)	67 (19.4)	83 (28.3)	28.785 (97.203)

MAXIMUM POWER IN SELECTED GEARS

25.70 (19.16)	5541 (24.65)	1.74 (2.80)	2550	14.94	1st Gear			177 (80.3)	57 (13.9)	64 (17.8)	28.820 (97.321)
31.78 (23.70)	4818 (21.43)	2.47 (3.98)	2499	10.68	2nd Gear			185 (85.0)	64 (17.8)	75 (23.9)	28.850 (97.422)
32.95 (24.57)	3301 (14.68)	3.74 (6.02)	2499	6.03	3rd Gear			185 (84.7)	64 (17.8)	74 (23.3)	28.850 (97.422)
33.21 (24.76)	2415 (10.74)	5.16 (8.30)	2500	3.97	4th Gear			184 (84.4)	64 (17.8)	72 (22.2)	28.850 (97.420)
32.80 (24.46)	1847 (8.22)	6.66 (10.72)	2500	3.14	5th Gear			186 (85.6)	65 (18.3)	76 (24.4)	28.850 (97.420)
31.15 (23.23)	1256 (5.58)	9.30 (14.97)	2500	2.02	6th Gear			185 (85.0)	65 (18.3)	77 (25.0)	28.840 (97.390)

Department of Agricultural Engineering

Dates of Test: May 26 to June 6, 1981

Manufacturer: JOHN DEERE WERKE

MANNHEIM, Mannheim, West Germany

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8417 **Fuel weight** 7.008 lbs/gal (0.840 kg/l) **Oil SAE 30 API service classification** CD/SD **To motor** 1.920 gal (7.268 l) **Drained from motor** 1.855 gal (7.022 l) **Transmission and final drive lubricant** John Deere Hy Gard Fluid **Front axle lubricant** EP SAE 90 transmission oil **Total time engine was operated** 38.5 hours.

ENGINE: Make John Deere Diesel **Type** three cylinder vertical **Serial No.** 3179DL06 482980CD **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 4.19" × 4.33" (106.5 mm × 110 mm) **Compression ratio** 16.8 to 1 **Displacement** 179 cu in (2934 ml) **Starting system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil **Fuel filter** one paper element and one mesh strainer **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** front wheel assist **Serial No.** 2040-400244L **Tread width** rear 53.5" (1360 mm) to 73.2" (1860 mm) front 53" (1350 mm) to 77" (1950 mm) **Wheel base** 81" (2060 mm) **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 33.3" (845 mm) Vertical distance above roadway 29.8" (757 mm) Horizontal distance from center of rear wheel tread 0" (0 mm) to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph (km/h)** first 1.9 (3.1) second 2.6 (4.2) third 3.8 (6.1) fourth 5.1 (8.2) fifth 6.5 (10.5) sixth 9.0 (14.5) seventh 13.0 (20.9) eighth 17.5 (28.2) reverse 2.9 (4.7), 4.0 (6.5), 5.8 (9.4), 7.8 (12.6) **Clutch** single dry disc operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 142" (3.60 m) left 142" (3.60 m) (on concrete surface without brake) right 177" (4.50 m) left 177" (4.50 m) **Turning space diameter** (on concrete surface with brake applied) right 308" (7.82 m) left 308" (7.82 m) (on concrete surface without brake) right 378" (9.60 m) left 378" (9.60 m) **Power take-off** 540 rpm at 2382 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

LUGGING ABILITY IN 4th GEAR

Crankshaft Speed rpm	2500	2254	1999	1749	1500	1255
Pull—lbs (kN)	2415 (10.74)	2624 (11.67)	2753 (12.25)	2818 (12.53)	2861 (12.73)	2817 (12.53)
Increase in Pull %	0	9	14	17	18	17
Power—Hp (kW)	33.21 (24.76)	32.38 (24.15)	30.02 (22.38)	26.83 (20.01)	23.35 (17.41)	19.23 (14.34)
Speed—Mph (km/h)	5.16 (8.30)	4.63 (7.45)	4.09 (6.58)	3.57 (5.75)	3.06 (4.93)	2.56 (4.12)
Slip %	3.97	4.29	4.67	4.80	5.05	4.92

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Engaged dB (A)
Maximum Available Power—Two Hours	95.0	95.0
75% of Pull at Maximum Power—Ten Hours		94.0
50% of Pull at Maximum Power—Two Hours		95.0
50% of Pull at Reduced Engine Speed—Two Hours		88.5
Bystander in 7th gear	85.5	

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			Barom. inch Hg (kPa)
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cool- ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 4th Gear											
31.11 (23.20)	2304 (10.25)	5.06 (8.15)	2500	5.69	2.676 (10.128)	0.603 (0.367)	11.63 (2.290)	189 (87.2)	64 (17.5)	85 (29.2)	28.820 (97.321)

MAXIMUM POWER IN SELECTED GEARS

27.36 (20.40)	4282 (19.05)	2.40 (3.86)	2538	14.84	2nd Gear	180 (82.2)	60 (15.6)	71 (21.7)	28.840 (97.388)
32.35 (24.13)	2387 (10.62)	5.08 (8.18)	2503	5.54	4th Gear	184 (84.4)	64 (17.8)	73 (22.8)	28.850 (97.420)

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 16.9-28; 6; 16 (110)	Two 16.9-28; 6; 16 (110)
Ballast	—Liquid (each)	None	None
	—Test Equip. (each)	85 lb (38 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 9.5-24; 6; 16 (110)	Two 9.5-24; 6; 16 (110)
Ballast	—Liquid (each)	None	None
	—Test Equip. (each)	48 lb (22 kg)	None
Height of Drawbar		16.5 in (420 mm)	16.5 in (420 mm)
Static Weight with Operator—Rear		3645 lb (1653 kg)	3475 lb (1576 kg)
Front		2395 lb (1086 kg)	2300 lb (1043 kg)
Total		6040 lb (2739 kg)	5775 lb (2619 kg)



John Deere 2040 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
Roy G. Arnold, Director

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 148°F (64.4°C). Six gears were chosen between 15% slip and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1393.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

W. E. SPLINTER

L. L. BASHFORD

Board of Tractor Test Engineers