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## Test 1470: John Deere 2350 Diesel 16-Speed

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1470 — JOHN DEERE 2350 DIESEL

## 16 SPEED

### 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)								
56.18 (41.89)	2500	3.669 (13.889)	0.458 (0.279)	15.31 (3.016)	184 (84.2)	54 (12.5)	75 (23.8)	28.850 (97.422)
Standard Power Take-off Speed (540 rpm)—One Hour								
55.69 (41.53)	2382	3.555 (13.457)	0.447 (0.272)	15.67 (3.086)	184 (84.4)	53 (11.4)	74 (23.4)	28.855 (97.439)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
48.73 (36.34)	2552	3.312 (12.537)	0.477 (0.290)	14.71 (2.899)	182 (83.6)	56 (13.1)	78 (25.3)	..... .....
0.00 (0.00)	2636	1.412 (5.345)	..... .....	..... .....	179 (81.7)	54 (12.5)	76 (24.4)	..... .....
24.77 (18.47)	2594	2.358 (8.926)	0.667 (0.406)	10.51 (2.069)	180 (82.5)	52 (10.8)	73 (22.8)	..... .....
56.95 (42.47)	2498	3.693 (13.980)	0.455 (0.277)	15.42 (3.038)	184 (84.4)	52 (11.1)	75 (23.9)	..... .....
12.47 (9.30)	2612	1.845 (6.984)	1.037 (0.631)	6.76 (1.332)	180 (81.9)	54 (11.9)	76 (24.2)	..... .....
36.89 (27.51)	2576	2.799 (10.595)	0.532 (0.324)	13.18 (2.597)	182 (83.3)	54 (12.5)	76 (24.4)	..... .....
Av	29.97	2.570	0.601	11.66	181	54	76	28.890
Av	(22.35)	(9.729)	(0.366)	(2.297)	(82.9)	(12.0)	(24.2)	(97.557)

### DRAWBAR PERFORMANCE

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 9th (5L) Gear											
46.66 (34.80)	3674 (16.34)	4.76 (7.67)	2499	7.60	3.602 (13.635)	0.541 (0.329)	12.96 (2.552)	185 (85.0)	47 (8.1)	56 (13.3)	28.885 (97.540)
75% of Pull at Maximum Power—Ten Hours 9th (5L) Gear											
37.26 (27.78)	2789 (12.41)	5.01 (8.06)	2567	5.47	3.138 (11.880)	0.590 (0.359)	11.87 (2.339)	185 (84.8)	51 (10.4)	61 (16.0)	28.760 (97.118)
50% of Pull at Maximum Power—Two Hours 9th (5L) Gear											
25.53 (19.04)	1860 (8.27)	5.15 (8.28)	2589	3.63	2.586 (9.788)	0.710 (0.432)	9.87 (1.945)	184 (84.4)	49 (9.4)	61 (16.1)	28.885 (97.540)
50% of Pull at Reduced Engine Speed—Two Hours 12th (6H) Gear											
25.51 (19.02)	1861 (8.28)	5.14 (8.27)	1469	3.56	1.801 (6.818)	0.495 (0.301)	14.16 (2.790)	184 (84.2)	52 (10.8)	65 (18.3)	28.870 (97.490)
MAXIMUM POWER IN SELECTED GEARS											
39.25 (29.27)	5688 (25.30)	2.59 (4.16)	2541	14.76	5th (3L) Gear			184 (84.2)	43 (6.1)	47 (8.3)	28.870 (97.490)
44.98 (33.54)	5005 (22.26)	3.37 (5.42)	2500	11.39	6th (3H) Gear			184 (84.4)	45 (7.2)	51 (10.6)	28.880 (97.523)
46.22 (34.46)	4817 (21.43)	3.60 (5.79)	2499	10.66	7th (4L) Gear			185 (85.0)	44 (6.7)	48 (8.9)	28.690 (96.882)
46.75 (34.86)	3692 (16.42)	4.75 (7.64)	2499	7.32	8th (4H) Gear			186 (85.3)	45 (7.2)	49 (9.4)	28.680 (96.848)
47.35 (35.31)	3719 (16.54)	4.77 (7.68)	2500	7.44	9th (5L) Gear			186 (85.3)	45 (7.2)	48 (8.9)	28.680 (96.848)
47.26 (35.24)	2860 (12.72)	6.20 (9.97)	2498	5.46	10th (5H) Gear			185 (85.0)	45 (7.2)	49 (9.4)	28.680 (96.848)
47.53 (35.44)	2634 (11.72)	6.77 (10.89)	2499	5.08	11th (6L) Gear			185 (85.0)	44 (6.7)	48 (8.9)	28.690 (96.882)
46.94 (35.00)	2016 (8.97)	8.73 (14.05)	2500	3.86	-12th (6H) Gear			185 (85.0)	44 (6.7)	48 (8.9)	28.690 (96.882)

Department of Agricultural Engineering

Dates of Test: April 12 to May 5, 1983

Manufacturer: JOHN DEERE WERKE MANN-HEIM, Mannheim, West Germany

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel Cetane No. 47.0 (rating taken from oil company's inspection data) Specific gravity converted to 60°/60° (15°/15°) 0.8420 Fuel weight 7.010 lbs/gal (0.840 kg/l) Oil SAE 15W-40 API service classification CD, CC, SD To motor 1.718 gal (6.502 l) Drained from motor 1.334 gal (5.048 l) Transmission and final drive lubricant John Deere Hy-Gard transmission and hydraulic fluid Total time engine was operated 39.5 hours.

**ENGINE:** Make John Deere Diesel Type four cylinder vertical Serial No. 4239DL07557761CD Crankshaft lengthwise Rated rpm 2500 Bore and stroke 4.19" x 4.33" (106.5 mm x 110 mm) Compression ratio 16.8 to 1 Displacement 239 cu in (3920 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, radiator for hydraulic and transmission oil Fuel filter one paper element and one mesh strainer Muffler underhood Exhaust vertical Cooling medium temperature control one thermostat.

**CHASSIS:** Type standard Serial No. \*L02350T466897\* Tread width rear 59.8" (1519 mm) to 96.1" (2440 mm) front 57.6" (1462 mm) to 79.1" (2008 mm) Wheel base 89.2" (2266 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 29.2" (741 mm) Vertical distance above roadway 33.5" (851 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 with partial (2) range operator controlled powershift Advertised speeds mph (km/h) first 1.5 (2.4) second 1.9 (3.1) third 2.1 (3.4) fourth 2.7 (4.3) fifth 3.0 (4.9) sixth 3.8 (6.2) seventh 4.1 (6.6) eighth 5.2 (8.3) ninth 5.2 (8.4) tenth 6.6 (10.7) eleventh 7.2 (11.6) twelfth 9.2 (14.8) thirteenth 10.4 (16.7) fourteenth 13.2 (21.2) fifteenth 14.0 (22.5) sixteenth 17.8 (28.6) reverse 2.3 (3.8), 3.0 (4.8), 3.2 (5.2), 4.1 (6.6), 4.6 (7.5), 5.9 (9.5), 6.3 (10.1), 8.0 (12.8) Clutch single dry disc operated by foot pedal Brakes wet disc hydraulically actuated and operated by two foot pedals which can be locked together Steering hydrostatic Turning radius (on concrete surface with brake applied) right 131.0" (3.33 m) left 131.0" (3.33 m) (on concrete surface without brake) right 147.0" (3.73 m) left 147.0" (3.73 m) Turning space diameter (on concrete surface with brake applied) right 271.0" (6.88 m) left 271.0" (6.88 m) (on concrete surface without brake) right 303.0" (7.70 m) left 303.0" (7.70 m) Power take-off 540 rpm at 2382 engine rpm.

# **LUGGING ABILITY IN 9th (5L) GEAR**

Crankshaft Speed rpm	2500	2251	2004	1749	1501	1249	1003
Pull—lbs (kN)	3719 (16.54)	3960 (17.61)	4243 (18.87)	4471 (19.89)	4650 (20.68)	4719 (20.99)	4570 (20.33)
Increase in Pull %	0	6	14	20	25	27	23
Power—Hp (kW)	47.35 (35.31)	45.10 (33.63)	42.69 (31.84)	38.94 (29.03)	34.50 (25.73)	29.03 (21.64)	22.69 (16.92)
Speed—Mph (km/h)	4.77 (7.68)	4.27 (6.87)	3.77 (6.07)	3.27 (5.26)	2.78 (4.48)	2.31 (3.71)	1.86 (3.00)
Slip %	7.44	7.99	8.70	9.40	10.09	10.32	9.86

## **TRACTOR SOUND LEVEL WITHOUT CAB**

	<b>dB(A)</b>
Maximum Available Power—Two Hours	94.5
75% of Pull at Maximum Power—Ten Hours	93.5
50% of Pull at Maximum Power—Two Hours	93.0
50% of Pull at Reduced Engine Speed—Two Hours	88.5
Bystander in 16th (8H) gear	86.5

## **TIRES, BALLAST AND WEIGHT**

		<b>With Ballast</b>	<b>Without Ballast</b>
<b>Rear Tires</b>	—No., size, ply & psi (kPa)	Two 16.9-30; 6; 16 (110)	Two 16.9-30; 6; 16 (110)
<b>Ballast</b>	—Liquid (each)	170 lb (77 kg)	None
	—Cast Iron (each)	None	None
<b>Front Tires</b>	—No., size, ply & psi (kPa)	Two 7.50-16; 6; 44 (305)	Two 7.50-16; 6; 44 (305)
<b>Ballast</b>	—Liquid (each)	None	None
	—Cast Iron (each)	20 lb (9 kg)	None
<b>Height of Drawbar</b>		19 in (485 mm)	19 in (485 mm)
<b>Static Weight with Operator—Rear</b>		4980 lb (2259 kg)	4640 lb (2105 kg)
	—Front	2210 lb (1002 kg)	1270 lb (584 kg)
	—Total	7190 lb (3261 kg)	6810 lb (3089 kg)

**REPAIRS and ADJUSTMENTS:** No repairs or adjustments.

**REMARKS:** All test results were determined from observed data obtained in accordance with SAE and ASAE test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 141°F (60.6°C). Eight 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 **1470**.

LOUIS I. LEVITICUS

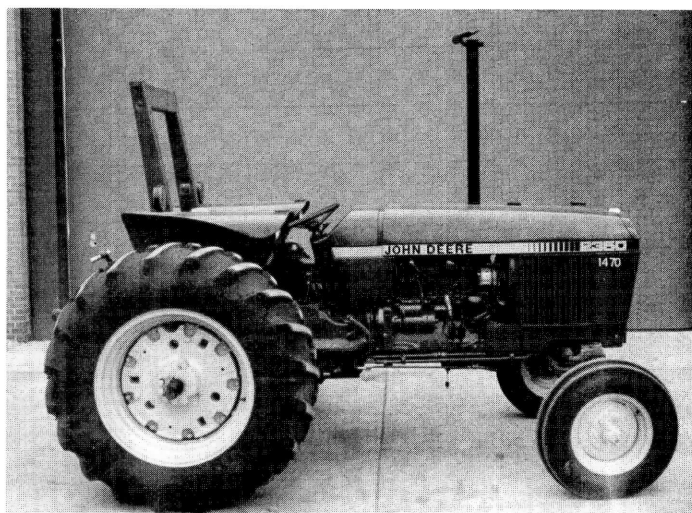
Engineer-in-Charge

K. VON BARGEN

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Board of Tractor Test Engineers



**John Deere 2350 Diesel**

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Institute of Agriculture and Natural Resources  
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