

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

1-1-1983

Test 1505: John Deere 1450 Diesel 9-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

Nebraska Tractor Test Lab, "Test 1505: John Deere 1450 Diesel 9-Speed" (1983). *Nebraska Tractor Tests*. 1816.

<https://digitalcommons.unl.edu/tractormuseumlit/1816>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

NEBRASKA TRACTOR TEST 1505 — JOHN DEERE 1450 DIESEL 9 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—579 rpm)								
51.39 (38.32)	2400	2.958 (11.197)	0.403 (0.245)	17.38 (3.422)	186 (85.6)	61 (16.0)	75 (23.9)	28.740 (97.051)
Standard Power Take-off Speed (540 rpm) — One hour								
50.93 (37.98)	2237	2.893 (10.951)	0.398 (0.242)	17.60 (3.468)	186 (85.6)	61 (16.1)	75 (23.7)	28.715 (96.966)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
44.73 (33.36)	2458	2.666 (10.092)	0.417 (0.254)	16.78 (3.306)	184 (84.4)	61 (16.1)	75 (23.9)	..... .....
0.00 (0.00)	2556	0.862 (3.263)	..... .....	..... .....	179 (81.7)	60 (15.8)	74 (23.1)	..... .....
22.77 (16.98)	2503	1.732 (6.556)	0.532 (0.324)	13.15 (2.590)	182 (83.1)	59 (15.0)	74 (23.3)	..... .....
51.10 (38.11)	2400	2.945 (11.148)	0.403 (0.245)	17.35 (3.419)	187 (86.1)	59 (15.0)	75 (23.9)	..... .....
11.56 (8.62)	2537	1.286 (4.868)	0.779 (0.474)	8.99 (1.771)	180 (82.2)	58 (14.7)	74 (23.6)	..... .....
33.83 (25.23)	2478	2.216 (8.388)	0.459 (0.279)	15.26 (3.008)	183 (83.9)	58 (14.4)	74 (23.6)	..... .....
Av 27.33 Av (20.38)	2489	1.951 (7.385)	0.500 (0.304)	14.01 (2.760)	182 (83.6)	59 (15.2)	74 (23.6)	28.720 (96.983)

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 6th (II-3) Gear											
43.17 (32.19)	2951 (13.12)	5.49 (8.83)	2400	5.35	2.929 (11.087)	0.475 (0.289)	14.74 (2.903)	188 (86.7)	63 (17.2)	69 (20.3)	29.020 (97.996)
75% of Pull at Maximum Power—Ten Hours 6th (II-3) Gear											
34.68 (25.86)	2244 (9.98)	5.79 (9.33)	2497	3.87	2.538 (9.606)	0.512 (0.312)	13.67 (2.692)	177 (80.5)	42 (5.3)	43 (5.9)	29.171 (98.506)
50% of Pull at Maximum Power—Two Hours 6th (II-3) Gear											
23.36 (17.42)	1496 (6.65)	5.86 (9.43)	2494	2.70	2.007 (7.599)	0.601 (0.366)	11.64 (2.293)	179 (81.4)	63 (17.2)	66 (18.6)	28.960 (97.794)
50% of Pull at Reduced Engine Speed—Two Hours 7th (III-1) Gear											
23.35 (17.41)	1496 (6.65)	5.85 (9.42)	1809	2.64	1.643 (6.220)	0.493 (0.300)	14.21 (2.799)	184 (84.2)	61 (16.1)	66 (18.6)	28.975 (97.844)

MAXIMUM POWER IN SELECTED GEARS

36.28 (27.06)	5321 (23.67)	2.56 (4.12)	2441	14.88	4th (II-1) Gear			186 (85.6)	63 (17.2)	70 (21.1)	29.010 (97.962)
43.31 (32.30)	4060 (18.06)	4.00 (6.44)	2398	7.98	5th (II-2) Gear			188 (86.4)	63 (17.2)	70 (21.1)	29.010 (97.962)
43.75 (32.62)	2992 (13.31)	5.48 (8.83)	2401	5.38	6th (II-3) Gear			188 (86.7)	63 (17.2)	70 (21.1)	29.020 (97.996)
43.79 (32.66)	2137 (9.51)	7.68 (12.37)	2401	3.72	7th (III-1) Gear			188 (86.7)	63 (17.2)	70 (21.1)	29.020 (97.996)

LUGGING ABILITY IN 6th (II-3) GEAR

Crankshaft Speed rpm		2401	2162	1916	1676	1437	1197
Pull—lbs (kN)		2992 (13.31)	3330 (14.81)	3604 (16.03)	3736 (16.62)	3810 (16.95)	3736 (16.62)
Increase in Pull %		0	11	20	25	27	25
Power—Hp (kW)		43.75 (32.62)	43.53 (32.46)	41.43 (30.90)	37.46 (27.93)	32.67 (24.36)	26.73 (19.93)
Speed—Mph (km/h)		5.48 (8.83)	4.90 (7.89)	4.31 (6.94)	3.76 (6.05)	3.22 (5.17)	2.68 (4.32)
Slip %		5.38	6.11	6.82	7.17	7.29	7.05

Department of Agricultural Engineering

Dates of Test: October 31 to November 9, 1983

Manufacturer: YANMAR DIESEL ENGINE COMPANY, LTD., Osaka, Japan

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°)** 0.8406 **Fuel weight** 6.999 lbs/gal (0.839 kg/l) **Oil SAE 15W-40 API service classification** CD, CC, SD **To motor** 2.320 gal (8.784 l) **Drained from motor** 2.093 gal (7.922 l) **Transmission and final drive lubricant** John Deere Hy-Gard transmission and hydraulic oil **Total time engine was operated** 47.0 hours.

ENGINE: Make Yanmar Diesel **Type** four cylinder vertical **Serial No.** *CH4078D000106* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.74" × 4.33" (95 mm × 110 mm) **Compression ratio** 18.1 to 1 **Displacement** 190 cu in (3118 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 cartridge and prestrainer **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** standard **Serial No.** *CH1450A001010* **Tread width** rear 51.2" (1300 mm) to 78.7" (2000 mm) front 55.9" (1420 mm) to 80.7" (2050 mm) **Wheel base** 82.8" (2102 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 30.3" (769 mm) Vertical distance above roadway 31.8" (808 mm) Horizontal distance from center of rear wheel tread 0.2" (5 mm) to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph (km/h)** first 1.3 (2.1) second 1.9 (3.1) third 2.5 (4.1) fourth 3.0 (4.9) fifth 4.4 (7.2) sixth 5.9 (9.6) seventh 8.2 (13.1) eighth 12.0 (19.4) ninth 16.0 (25.8) reverse 1.9 (3.1), 4.5 (7.2) **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 118" (3.0 m) left 118" (3.0 m) (on concrete surface without brake) right 138" (3.5 m) left 138" (3.5 m) **Turning space diameter** (on concrete surface with brake applied) right 244" (6.2 m) left 244" (6.2 m) (on concrete surface without brake) right 284" (7.2 m) left 284" (7.2 m) **Power take-off** 540 rpm at 2237 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	94.5
75% of Pull at Maximum Power—Ten Hours	95.5
50% of Pull at Maximum Power—Two Hours	94.0
50% of Pull at Reduced Engine Speed—Two Hours	90.0
Bystander in 9th (III-3) gear	87.0

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)	482 lb (219 kg)	None
	—Cast Iron (each)	150 lb (68 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 7.50-16; 6; 36 (250)	Two 7.50-16; 6; 36 (250)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	38 lb (17 kg)	None
Height of Drawbar		18.5 in (470 mm)	18.5 in (470 mm)
Static Weight with Operator—Rear		4625 lb (2098 kg)	3360 lb (1524 kg)
	—Front	1945 lb (882 kg)	1870 lb (848 kg)
	—Total	6570 lb (2980 kg)	5230 lb (2372 kg)

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 return was maintained at 139°F (59.6°C). Four 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. 1505.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD

Board of Tractor Test Engineers



John Deere 1450 Diesel