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Test 1506: John Deere 1650 Diesel 9-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1506 — JOHN DEERE 1650 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—555 rpm)									
62.22 (46.40)	2300	3.338 (12.636)	0.376 (0.228)	18.64 (3.672)	187 (86.1)	64 (17.6)	75 (23.8)	29.027 (98.019)	
Standard Power Take-off Speed (540 rpm) — One hour									
62.70 (46.76)	2237	3.333 (12.617)	0.372 (0.226)	18.81 (3.706)	188 (86.8)	63 (17.2)	75 (24.1)	29.020 (97.996)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
53.92 (40.21)	2344	2.975 (11.262)	0.386 (0.235)	18.13 (3.570)	184 (84.4)	63 (17.2)	75 (23.9)	..... .....
0.00 (0.00)	2476	0.827 (3.131)	..... .....	..... .....	177 (80.6)	63 (17.2)	75 (23.9)	..... .....
27.82 (20.75)	2417	1.907 (7.219)	0.480 (0.292)	14.58 (2.874)	178 (80.8)	62 (16.9)	74 (23.6)	..... .....
62.71 (46.76)	2300	3.343 (12.655)	0.373 (0.227)	18.76 (3.695)	186 (85.8)	63 (17.2)	74 (23.6)	..... .....
14.11 (10.52)	2453	1.363 (5.160)	0.676 (0.411)	10.35 (2.039)	178 (81.4)	64 (17.8)	75 (23.9)	..... .....
41.20 (30.72)	2388	2.447 (9.263)	0.416 (0.253)	16.83 (3.316)	180 (81.9)	63 (17.2)	74 (23.1)	..... .....
Av Av	33.29 (24.82)	2396	2.144 (8.116)	0.451 (0.274)	15.53 (3.058)	181 (82.5)	63 (17.3)	75 (23.7)	29.010 (97.962)

DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			
					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	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 6th (II-3) Gear											
53.13 (39.62)	3583 (15.94)	5.56 (8.95)	2299	6.07	3.329 (12.602)	0.439 (0.267)	15.96 (3.144)	183 (83.9)	51 (10.3)	54 (11.9)	28.915 (97.642)
75% of Pull at Maximum Power—Ten Hours 6th (II-3) Gear											
42.77 (31.89)	2733 (12.16)	5.87 (9.44)	2387	4.52	2.856 (10.812)	0.467 (0.284)	14.97 (2.950)	178 (80.9)	34 (1.2)	37 (2.8)	29.058 (98.125)
50% of Pull at Maximum Power—Two Hours 6th (II-3) Gear											
29.24 (21.81)	1822 (8.10)	6.02 (9.69)	2419	3.35	2.257 (8.545)	0.540 (0.329)	12.95 (2.552)	173 (78.1)	30 (-1.4)	31 (-0.8)	29.100 (98.266)
50% of Pull at Reduced Engine Speed—Two Hours 7th (III-1) Gear											
29.24 (21.80)	1822 (8.10)	6.02 (9.69)	1757	3.32	1.922 (7.274)	0.460 (0.280)	15.21 (2.997)	174 (78.9)	31 (-0.6)	33 (0.6)	29.065 (98.148)
MAXIMUM POWER IN SELECTED GEARS											
45.94 (34.26)	6572 (29.23)	2.62 (4.22)	2337	14.60	4th (II-1) Gear			175 (79.2)	29 (-1.7)	30 (-1.1)	29.090 (98.233)
53.66 (40.01)	4970 (22.11)	4.05 (6.52)	2302	9.08	5th (II-2) Gear			184 (84.4)	46 (7.8)	48 (8.9)	29.000 (97.929)
54.03 (40.29)	3644 (16.21)	5.56 (8.95)	2302	6.23	6th (II-3) Gear			184 (84.4)	47 (8.3)	49 (9.4)	28.990 (97.895)
54.06 (40.31)	2602 (11.57)	7.79 (12.54)	2301	4.42	7th (III-1) Gear			184 (84.4)	45 (7.2)	48 (8.9)	29.000 (97.929)
LUGGING ABILITY IN 6th (II-3) GEAR											
Crankshaft Speed rpm				2302	2073	1838	1613	1383	1148		
Pull—lbs (kN)				3644 (16.21)	4015 (17.86)	4293 (19.10)	4361 (19.40)	4366 (19.42)	4105 (18.26)		
Increase in Pull %				0	10	18	20	20	13		
Power—Hp (kW)				54.03 (40.29)	53.26 (39.72)	50.20 (37.43)	44.64 (33.29)	38.29 (28.55)	30.03 (22.39)		
Speed—Mph (km/h)				5.56 (8.95)	4.97 (8.01)	4.38 (7.06)	3.84 (6.18)	3.29 (5.29)	2.74 (4.41)		
Slip %				6.23	6.84	7.32	7.56	7.56	7.32		

Department of Agricultural Engineering

Dates of Test: October 31 to November 11, 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** 1.927 gal (7.296 l) **Drained from motor** 1.565 gal (5.922 l) **Transmission and final drive lubricant** John Deere Hy-Gard transmission and hydraulic oil **Total time engine was operated** 35.5 hours.

ENGINE: Make Yanmar Diesel Type four cylinder vertical with turbocharger **Serial No.** *CH4078T000109* **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 3.74" × 4.33" (95 mm × 110 mm) **Compression ratio** 16.8 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.** *CH1650A001016* **Tread width** rear 63.0" (1600 mm) to 75.0" (1905 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 30.0" (763 mm) Vertical distance above roadway 32.3" (820 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 (4.8) fifth 4.4 (7.1) sixth 5.9 (9.5) seventh 8.1 (13.1) eighth 11.9 (19.2) ninth 15.9 (25.6) reverse 1.9 (3.1), 4.4 (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	93.5
75% of Pull at Maximum Power—Ten Hours	92.5
50% of Pull at Maximum Power—Two Hours	92.5
50% of Pull at Reduced Engine Speed—Two Hours	90.5
Bystander in 9th (III-3) gear	86.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (<i>kPa</i>)	Two 18.4-26; 6; 16 (<i>110</i>)	Two 18.4-26; 6; 16 (<i>110</i>)
Ballast	—Liquid (each)	812 lb (<i>368 kg</i>)	None
	—Cast Iron (each)	380 lb (<i>173 kg</i>)	None
Front Tires	—No., size, ply & psi (<i>kPa</i>)	Two 7.50-16; 6; 36 (<i>250</i>)	Two 7.50-16; 6; 36 (<i>250</i>)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	25 lb (<i>11 kg</i>)	None
Height of Drawbar		19.5 in (<i>495 mm</i>)	19.5 in (<i>495 mm</i>)
Static Weight with Operator—Rear		5835 lb (<i>2647 kg</i>)	3450 lb (<i>1565 kg</i>)
—Front		1950 lb (<i>884 kg</i>)	1900 lb (<i>862 kg</i>)
—Total		7785 lb (<i>3531 kg</i>)	5350 lb (<i>2427 kg</i>)

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 136°F (57.9°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. 1506.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers



John Deere 1650 Diesel