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1-1-1982

## Test 1459: John Deere 4450 Powershift Diesel 15-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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NEBRASKA TRACTOR TEST 1459  
JOHN DEERE 4450 POWERSHIFT DIESEL  
15 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—1002 rpm)									
140.43 (104.72)	2200	8.694 (32.910)	0.432 (0.263)	16.15 (3.182)	188 (86.9)	62 (16.8)	75 (23.8)	28.837 (97.377)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
122.44 (91.30)	2256	7.945 (30.075)	0.453 (0.275)	15.41 (3.036)	184 (84.2)	60 (15.6)	74 (23.3)	..... .....	
0.00 (0.00)	2334	2.562 (9.698)	..... .....	..... .....	170 (76.7)	59 (15.0)	74 (23.1)	..... .....	
62.38 (46.52)	2300	5.181 (19.612)	0.580 (0.353)	12.04 (2.372)	180 (82.2)	59 (15.0)	74 (23.3)	..... .....	
141.95 (105.85)	2200	8.736 (33.069)	0.429 (0.261)	16.25 (3.201)	188 (86.9)	60 (15.6)	74 (23.3)	..... .....	
31.37 (23.39)	2314	3.844 (14.551)	0.855 (0.520)	8.16 (1.607)	173 (78.3)	59 (15.0)	74 (23.3)	..... .....	
92.50 (68.98)	2274	6.561 (24.836)	0.495 (0.301)	14.10 (2.777)	183 (83.9)	59 (15.0)	74 (23.3)	..... .....	
Av Av	75.11 (56.01)	2280 (21.974)	5.805 (0.328)	0.539 (0.328)	12.94 (2.549)	180 (82.1)	59 (15.2)	74 (23.3)	28.880 (97.523)

DRAWBAR PERFORMANCE WITH BIAS PLY TIRES

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 10th Gear											
117.46 (87.59)	7134 (31.73)	6.17 (9.94)	2200	4.10	8.616 (32.616)	0.512 (0.311)	13.63 (2.686)	184 (84.4)	55 (12.5)	61 (15.8)	28.675 (96.831)
75% of Pull at Maximum Power—Ten Hours 10th Gear											
94.34 (70.35)	5457 (24.27)	6.48 (10.43)	2287	3.16	7.499 (28.385)	0.555 (0.337)	12.58 (2.478)	179 (81.5)	33 (0.5)	38 (3.4)	29.150 (98.435)
50% of Pull at Maximum Power—Two Hours 10th Gear											
64.00 (47.73)	3638 (16.18)	6.60 (10.62)	2300	2.12	6.037 (22.852)	0.658 (0.400)	10.60 (2.088)	178 (80.8)	47 (8.1)	54 (11.9)	28.945 (97.743)
50% of Pull at Reduced Engine Speed—Two Hours 13th Gear											
63.86 (47.62)	3638 (16.18)	6.58 (10.59)	1442	2.20	4.586 (17.359)	0.501 (0.305)	13.92 (2.743)	177 (80.3)	43 (5.8)	48 (8.9)	28.980 (97.861)
MAXIMUM POWER IN SELECTED GEARS											
100.25 (74.76)	15014 (66.79)	2.50 (4.03)	2251	14.13	4th Gear			179 (81.7)	50 (10.0)	52 (11.1)	28.730 (97.017)
111.19 (82.91)	14361 (63.88)	2.90 (4.67)	2199	11.48	5th Gear			182 (83.1)	52 (11.1)	56 (13.3)	28.710 (96.949)
117.53 (87.64)	13005 (57.85)	3.39 (5.45)	2200	9.02	6th Gear			183 (83.6)	54 (12.2)	59 (15.0)	28.700 (96.916)
118.97 (88.72)	11156 (49.62)	4.00 (6.44)	2201	6.77	7th Gear			185 (84.7)	54 (12.2)	58 (14.4)	28.690 (96.882)
117.28 (87.45)	9449 (42.03)	4.65 (7.49)	2200	5.53	8th Gear			185 (85.0)	54 (12.2)	60 (15.6)	28.690 (96.882)
117.58 (87.68)	8151 (36.26)	5.41 (8.71)	2200	4.56	9th Gear			184 (84.4)	54 (12.2)	60 (15.6)	28.680 (96.848)
119.78 (89.32)	7276 (32.36)	6.17 (9.94)	2201	4.10	10th Gear			184 (84.4)	54 (12.2)	60 (15.6)	28.670 (96.814)
117.04 (87.28)	6132 (27.28)	7.16 (11.52)	2201	3.49	11th Gear			181 (82.8)	44 (6.7)	46 (7.8)	28.900 (97.591)
121.94 (90.93)	5695 (25.33)	8.03 (12.92)	2200	3.18	12th Gear			181 (82.8)	45 (7.2)	48 (8.9)	28.910 (97.625)

LUGGING ABILITY IN 10th GEAR

Crankshaft Speed rpm	2201	1982	1765	1540	1323	1099
Pull—lbs (kN)	7276 (32.36)	8374 (37.25)	9125 (40.59)	9401 (41.82)	9130 (40.61)	8594 (38.23)
Increase in Pull %	0	15	25	29	25	18
Power—Hp (kW)	119.78 (89.32)	123.44 (92.05)	119.11 (88.82)	106.85 (79.68)	89.09 (66.43)	70.05 (52.23)
Speed—Mph (km/h)	6.17 (9.94)	5.53 (8.90)	4.89 (7.88)	4.26 (6.86)	3.66 (5.89)	3.06 (4.92)
Slip %	4.10	4.63	5.23	5.38	5.38	4.93

TRACTOR SOUND LEVEL WITH CAB	Radial Ply	Bias Ply
	2000 RPM dB(A)	2200 RPM dB(A)
Maximum Available Power—Two Hours	74.5	74.0
75% of Pull at Maximum Power—Ten Hours		74.0
50% of Pull at Maximum Power—Two Hours		74.0
50% of Pull at Reduced Engine Speed—Two Hours		72.0
Bystander in 15th gear		86.0

Department of Agricultural Engineering

Dates of Test: October 13 to November 4, 1982

Manufacturer: JOHN DEERE TRACTOR  
WORKS, P.O. Box 270, Waterloo, Iowa 50702

FUEL, OIL AND TIME: Fuel No. 2 Diesel  
Cetane No. 46.6 (rating taken from oil company's  
inspection data) Specific gravity converted to 60°/  
60° (15°/15°) 0.8381 Fuel weight 6.978 lbs/gal  
(0.836 kg/l) Oil SAE 15W-40 API service classi-  
fication CD, CC, SD To motor 3.664 gal  
(13.870 l) Drained from motor 3.468 gal  
(13.129 l) Transmission and hydraulic lubricant  
John Deere Hy-Gard transmission and hydraulic  
fluid Total time engine was operated 70.0 hours.

ENGINE: Make John Deere Diesel Type six  
cylinder vertical with turbocharger Serial No.  
\*RG6466T230932\* Crankshaft lengthwise  
Rated rpm 2000 to 2200 Bore and stroke 4.57" ×  
4.75" (116.0 mm × 120.6 mm) Compression ratio  
15.8 to 1 Displacement 466 cu in (7636 ml) Start-  
ing system 12 volt Lubrication pressure Air  
cleaner two paper elements Oil filter one full  
flow paper cartridge Oil cooler engine coolant  
heat exchanger for crankcase oil, radiator for hy-  
draulic and transmission oil Fuel filter two paper  
elements with prestrainer Muffler vertical Cool-  
ing medium temperature control two thermostats  
and variable speed fan.

CHASSIS: Type standard with duals Serial  
No. \*RW4450P001406\* Tread width rear 60.0"  
(1524 mm) to 130" (3300 mm) front 58" (1470 mm)  
to 82.6" (2099 mm) Wheel base 106.7" (2710 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 28.0" (711  
mm) Vertical distance above roadway 41.9" (1064  
mm) Horizontal distance from center of rear wheel  
tread 0.5" (13 mm) to the left Hydraulic control  
system direct engine drive Transmission selec-  
tive gear fixed ratio with full range operator con-  
trolled powershift Advertised speeds mph (km/h)  
first 1.4 (2.2) second 2.0 (3.2) third 2.3 (3.7) fourth  
3.0 (4.8) fifth 3.4 (5.5) sixth 3.9 (6.3) seventh 4.5  
(7.2) eighth 5.0 (8.1) ninth 5.8 (9.3) tenth 6.6  
(10.6) eleventh 7.6 (12.2) twelfth 8.7 (14.0) thir-  
teenth 10.8 (17.3) fourteenth 14.7 (23.6) fifteenth  
18.2 (29.3) reverse 1.7 (2.7), 2.4 (3.9), 3.6 (5.9), 5.5  
(8.8) Clutch wet multiple disc hydraulically power  
actuated and operated by foot pedal Brakes wet  
disc hydraulically power actuated and operated by  
two foot pedals which can be locked together  
Steering hydrostatic Turning radius (on concrete  
surface with brake applied) right 146" (3.7 m) left  
146" (3.7 m) (on concrete surface without brake)  
right 157" (4.0 m) left 157" (4.0 m) Turning space  
diameter (on concrete surface with brake applied)  
right 302" (7.67 m) left 302" (7.67 m) (on concrete  
surface without brake) right 338" (8.58 m) left 338"  
(8.58 m) Power take-off 540 rpm at 2201 engine  
rpm and 1002 rpm at 2200 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or  
adjustments.

SUPPLEMENTAL TESTS											
DRAWBAR PERFORMANCE WITH RADIAL PLY TIRES											
POWER AND FUEL CONSUMPTION AT 2200 RPM											
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 10th Gear											
118.71 (88.52)	6737 (29.97)	6.61 (10.63)	2200	2.33	8.688 (32.888)	0.511 (0.311)	13.66 (2.692)	189 (87.2)	53 (11.7)	66 (18.9)	28.900 (97.591)
MAXIMUM POWER IN SELECTED GEARS											
94.39 (70.39)	16154 (71.85)	2.19 (3.53)	2267	10.59		3rd Gear		182 (83.1)	49 (9.4)	57 (13.9)	28.630 (96.679)
115.13 (85.85)	15916 (70.80)	2.71 (4.37)	2201	9.33		4th Gear		184 (84.2)	49 (9.4)	57 (13.9)	28.640 (96.713)
118.62 (88.45)	13760 (61.21)	3.23 (5.20)	2201	6.07		5th Gear		185 (84.7)	50 (10.0)	58 (14.4)	28.620 (96.645)
121.14 (90.33)	12210 (54.31)	3.72 (5.99)	2199	4.99		6th Gear		189 (87.2)	60 (15.6)	71 (21.7)	28.530 (96.342)
122.09 (91.05)	10578 (47.05)	4.33 (6.97)	2199	4.04		7th Gear		189 (87.2)	59 (15.0)	69 (20.6)	28.540 (96.375)
119.75 (89.29)	8956 (39.84)	5.01 (8.07)	2200	3.07		8th Gear		190 (87.5)	57 (13.9)	67 (19.4)	28.560 (96.443)
119.40 (89.03)	7704 (34.27)	5.81 (9.35)	2200	2.74		9th Gear		190 (87.8)	56 (13.3)	67 (19.4)	28.570 (96.477)
120.27 (89.68)	6837 (30.41)	6.60 (10.62)	2199	2.41		10th Gear		189 (87.2)	56 (13.3)	67 (19.4)	28.580 (96.510)
118.67 (88.49)	5826 (25.91)	7.64 (12.29)	2199	2.08		11th Gear		191 (88.1)	60 (15.6)	71 (21.7)	28.530 (96.342)
122.51 (91.36)	5355 (23.82)	8.58 (13.81)	2200	1.91		12th Gear		191 (88.3)	60 (15.6)	71 (21.7)	28.520 (96.308)

LUGGING ABILITY IN 10th GEAR						
Crankshaft Speed rpm		2199	1980	1761	1537	1321
Pull—lbs (kN)		6837 (30.41)	7892 (35.11)	8500 (37.81)	8884 (39.52)	9007 (40.07)
Increase in Pull %		0	15	24	30	32
Power—Hp (kW)		120.27 (89.68)	124.40 (92.77)	118.91 (88.67)	108.25 (80.72)	94.28 (70.30)
Speed—Mph (km/h)		6.60 (10.62)	5.91 (9.51)	5.25 (8.44)	4.57 (7.35)	3.93 (6.32)
Slip %		2.41	2.91	3.07	3.23	3.39

POWER AND FUEL CONSUMPTION AT 2000 RPM									
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—One Hour (PTO Speed—911 rpm)									
144.35 (107.64)	2000	8.497 (32.165)	0.411 (0.250)	16.99 (3.346)	189 (87.2)	61 (16.3)	75 (23.7)		28.855 (97.439)

DRAWBAR PERFORMANCE WITH RADIAL PLY TIRES											
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 10th Gear											
124.03 (92.49)	7774 (34.58)	5.98 (9.63)	2001	2.86	8.527 (32.277)	0.480 (0.292)	14.55 (2.865)	190 (87.5)	53 (11.7)	62 (16.4)	29.105 (98.283)
MAXIMUM POWER IN SELECTED GEARS											
125.59 (93.65)	12047 (53.59)	3.91 (6.29)	2003	4.75		7th Gear		192 (88.6)	59 (15.0)	70 (21.1)	28.540 (96.375)
125.42 (93.52)	7852 (34.93)	5.99 (9.64)	2001	2.74		10th Gear		190 (87.8)	56 (13.3)	67 (19.4)	28.570 (96.477)
128.10 (95.52)	6173 (27.46)	7.78 (12.52)	1999	2.08		12th Gear		192 (88.6)	60 (15.6)	71 (21.7)	28.520 (96.308)

Bias Ply Tires						Radial Ply Tires					
TIRES, BALLAST AND WEIGHT			With Ballast			With Ballast			Without Ballast		
Rear Tires	—No., size, ply & psi (kPa)		Four 18.4R38; 6; 14 (95)			Four 18.4R38; 6; 14 (95)			Inner Two 18.4R38; 8; 12 (85) Outer Two 18.4R38; 6; 12 (85)		
Ballast	—Liquid (each inner) —Cast Iron (each)		858 lb (389 kg) None			None None			572 lb (260 kg) None		
Front Tires	—No., size, ply & psi (kPa)		Two 11.00-16; 8; 40 (275)			Two 11.00-16; 8; 40 (275)			Two 11.00-16; 8; 40 (275)		
Ballast	—Liquid (each) —Test Equip. (each)		None 40 lb (18 kg)			None None			None 40 lb (18 kg)		
Height of Drawbar			22 in (560 mm)			22 in (560 mm)			20.5 in (520 mm)		
Static Weight with Operator—Rear			12875 lb (5840 kg)			11160 lb (5062 kg)			12745 lb (5781 kg)		
Front			3870 lb (1755 kg)			3790 lb (1719 kg)			3880 lb (1760 kg)		
Total			16745 lb (7595 kg)			14950 lb (6781 kg)			16625 lb (7541 kg)		
									16000 lb (5262 kg)		
									3800 lb (1724 kg)		
									15400 lb (6985 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 122°F (50.0°C). Nine gears were chosen between stability limit and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1459.

LOUIS I. LEVITICUS  
Engineer-in-Charge

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



John Deere 4450 Powershift Diesel