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Test 1324: John Deere 8640 Diesel 16-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1324 — JOHN DEERE 8640 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—993 rpm)									
228.75 (170.58)	2100	14.657 (55.481)	0.450 (0.274)	15.61 (3.075)	189 (87.1)	59 (15.2)	75 (24.0)	29.053 (98.109)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
199.53 (148.79)	2156	13.421 (50.803)	0.472 (0.287)	14.87 (2.929)	187 (86.1)	59 (15.0)	75 (23.9)	..... (98.109)
0.00 (0.00)	2290	4.424 (16.746)	..... (0.287)	..... (2.929)	176 (80.0)	59 (15.0)	75 (23.9)	..... (98.109)
102.85 (76.69)	2224	9.027 (34.171)	0.616 (0.375)	11.39 (2.244)	181 (82.8)	59 (15.0)	76 (24.2)	..... (98.109)
232.88 (173.66)	2100	14.840 (56.174)	0.447 (0.272)	15.69 (3.091)	190 (87.8)	59 (15.0)	75 (23.9)	..... (98.109)
52.56 (38.97)	2255	6.727 (25.466)	0.904 (0.550)	7.77 (1.530)	178 (81.1)	58 (14.4)	75 (23.9)	..... (98.109)
152.19 (113.49)	2192	11.211 (42.438)	0.517 (0.315)	13.58 (2.674)	184 (84.2)	58 (14.7)	76 (24.2)	..... (98.109)
Av Av	123.29 (91.93)	2203 (37.633)	9.942 (0.344)	0.566 (2.443)	12.40 (2.443)	183 (83.7)	59 (14.9)	75 (24.0)	29.033 (98.041)

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 (C-1) Gear											
203.34 (151.63)	13670 (60.81)	5.58 (8.98)	2099	3.35	14.461 (54.740)	0.499 (0.304)	14.06 (2.770)	187 (86.1)	58 (14.4)	77 (24.7)	29.100 (98.266)
75% of Pull at Maximum Power—Ten Hours 6th (C-1) Gear											
163.04 (121.58)	10515 (46.77)	5.81 (9.36)	2168	2.40	12.406 (46.960)	0.534 (0.325)	13.14 (2.589)	184 (84.6)	59 (15.2)	77 (24.8)	28.966 (97.814)
50% of Pull at Maximum Power—Two Hours 6th (C-1) Gear											
111.08 (82.83)	6990 (31.09)	5.96 (9.59)	2207	1.71	9.955 (37.684)	0.629 (0.383)	11.16 (2.198)	181 (82.5)	56 (13.1)	66 (18.9)	29.100 (98.266)
50% of Pull at Reduced Engine Speed—Two Hours 9th (B-3) Gear											
111.48 (83.13)	7002 (31.15)	5.97 (9.61)	1462	1.63	7.943 (30.066)	0.500 (0.304)	14.04 (2.765)	182 (83.3)	59 (14.7)	76 (24.4)	29.125 (98.351)
MAXIMUM POWER IN SELECTED GEARS											
175.50 (130.87)	27782 (123.58)	2.37 (3.81)	2140	14.82	2nd (A-2) Gear			183 (83.9)	53 (11.7)	59 (15.0)	29.090 (98.233)
201.17 (150.01)	20191 (89.81)	3.74 (6.01)	2100	5.29	3rd (A-3) Gear			186 (85.6)	57 (13.9)	72 (22.2)	29.120 (98.334)
208.38 (155.39)	16887 (75.11)	4.63 (7.45)	2100	4.11	4th (B-1) Gear			186 (85.6)	55 (12.8)	67 (19.4)	29.120 (98.334)
200.31 (149.37)	15836 (70.44)	4.74 (7.63)	2100	3.79	5th (A-4) Gear			186 (85.3)	55 (12.8)	66 (18.9)	29.120 (98.334)
208.21 (155.26)	13998 (62.27)	5.58 (8.98)	2099	3.15	6th (C-1) Gear			186 (85.6)	54 (12.2)	64 (17.8)	29.130 (98.368)
205.39 (153.16)	13190 (58.67)	5.84 (9.40)	2100	2.99	7th (B-2) Gear			187 (85.8)	56 (13.3)	68 (20.0)	29.120 (98.334)
205.21 (153.02)	10960 (48.75)	7.02 (11.30)	2100	2.42	8th (C-2) Gear			186 (85.6)	56 (13.3)	69 (20.6)	29.120 (98.334)
205.03 (152.89)	9002 (40.04)	8.54 (13.75)	2098	2.09	9th (B-3) Gear			186 (85.6)	57 (13.9)	70 (21.1)	29.120 (98.334)

Department of Agricultural Engineering

Dates of Test: September 11-18, 1979

Manufacturer: JOHN DEERE WATERLOO
TRACTOR WORKS, P.O. Box 270, Waterloo,
Iowa 50704

FUEL, OIL AND TIME: Fuel No. 2 Diesel
Cetane No. 49.0 (rating taken from oil company's
typical inspection data) **Specific gravity converted**
to 60°/60° (15°/15°) 0.8430 **Fuel weight** 7.019 lbs/
gal (0.841 kg/l) **Oil SAE 30 API service classifi-**
cation SD-CC/CD To motor 5.581 gal (21.124 l)
Drained from motor 5.043 gal (19.088 l) **Trans-**
mission and final drive lubricant John Deere
Hy-Gard **Total time engine was operated** 33.0
hours

ENGINE: Make John Deere Diesel **Type** six
cylinder vertical with turbocharger and inter-
cooler **Serial No.** 6619AR-08 032071RG
Crankshaft lengthwise **Rated rpm** 2100 **Bore**
and stroke 5.125" × 5.00" (130.2 mm × 127.0 mm)
Compression ratio 15.2 to 1 **Displacement** 619 cu
in (10143 ml) **Cranking system** 12 volt **Lubrica-**
tion pressure **Air cleaner** two paper elements
with aspirator **Oil filter** one paper cartridge **Oil**
cooler engine coolant heat exchanger for crank-
case oil, radiator for hydraulic and transmission
oil **Fuel filter** two paper elements **Muffler** verti-
cal **Cooling medium temperature control** three
thermostats.

CHASSIS: **Type** Four wheel drive with duals
Serial No. 8640H-002277R **Tread width** rear 63"
(1600 mm) to 130" (3302 mm) front 63" (1600 mm)
to 130" (3302 mm) **Wheel base** 125" (3175 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 65.2"
(1656 mm) Vertical distance above roadway 40.6"
(1030 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 2.1 (3.4) second 2.6 (4.2)
third 3.8 (6.1) fourth 4.6 (7.4) fifth 4.7 (7.6) sixth
5.5 (8.9) seventh 5.8 (9.3) eighth 6.9 (11.1) ninth
8.4 (13.4) tenth 9.0 (14.4) eleventh 10.0 (16.1)
twelfth 10.4 (16.8) thirteenth 11.2 (18.0) four-
teenth 12.5 (20.1) fifteenth 16.2 (26.1) sixteenth
20.2 (32.5) reverse 4.1 (6.6), 5.1 (8.2), 9.1 (14.6),
10.8 (17.4), 11.3 (18.2), 13.5 (21.7) **Clutch** multi-
ple wet disc hydraulically operated by foot pedal
Brakes single wet disc hydraulically operated by
foot pedal **Steering** hydrostatic and articulated
Turning radius (on concrete surface without
brake applied) right 240" (6.11 m) left 240" (6.11
m) **Turning space diameter** (on concrete surface
without brake applied) right 504" (12.80 m) left
504" (12.80 m) **Power take-off** 993 rpm at 2100
engine rpm.

LUGGING ABILITY IN 6th (C-1) GEAR

Crankshaft Speed rpm	2099	1885	1676	1471	1259	1044
Pull—lbs (<i>kN</i>)	13998 (62.27)	16311 (72.55)	17660 (78.55)	17296 (79.74)	17233 (76.66)	15116 (67.24)
Increase in Pull %	0	17	26	28	23	8
Power—Hp (<i>kW</i>)	208.21 (155.26)	216.51 (161.45)	207.56 (154.78)	184.69 (137.72)	152.27 (113.55)	111.37 (83.05)
Speed—Mph (<i>km/h</i>)	5.58 (8.98)	4.98 (8.01)	4.41 (7.09)	3.86 (6.22)	3.31 (5.33)	2.76 (4.45)
Slip %	3.15	3.71	4.19	4.51	4.19	3.71

TRACTOR SOUND LEVEL WITH CAB

	dB(A)
Maximum Available Power—Two Hours	81.0
75% of Pull at Maximum Power—Ten Hours	80.0
50% of Pull at Maximum Power—Two Hours	80.5
50% of Pull at Reduced Engine Speed—Two Hours	76.0
Bystander in 15th (D-3) gear	90.0

TIRES, BALLAST AND WEIGHT

Rear Tires —No., size, ply & psi (*kPa*)
Ballast —Liquid (each)
—Cast Iron (each)

Front Tires —No., size, ply & psi (*kPa*)
Ballast —Liquid (each)
—Cast Iron (each)

Height of Drawbar

Static Weight with Operator—Rear
Front
Total

Tested Without Ballast

Four 23.1-34; 8; 12 (85)
None
None

Four 23.1-34; 8; 12 (85)
None
None

16 in (405 mm)

13610 lb (6173 kg)
14660 lb (6650 kg)
28270 lb (12823 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 code or official Nebraska test procedure. Temperature at injection pump return was 157°F (69.2°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 **1324**.

LOUIS I. LEVITICUS

Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

K. VON BARGEN

Board of Tractor Test Engineers



John Deere 8640 Diesel