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## Test 1357: John Deere 4440 Power Shift Diesel 8-Speed

Nebraska Tractor Test Lab

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

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# NEBRASKA TRACTOR TEST 1357 — JOHN DEERE 4440 POWER SHIFT DIESEL 8 SPEED

## POWER TAKE-OFF PERFORMANCE

| Power<br>Hp<br>(kW)                               | Crank<br>shaft<br>speed<br>rpm | Fuel Consumption  |                       |                       | Temperature °F (°C) |                    |                    | Barometer<br>inch Hg<br>(kPa) |                    |
|---|--------------------------------|-------------------|-----------------------|-----------------------|---------------------|--------------------|--------------------|-------------------------------|--------------------|
|   |                                | gal/hr<br>(l/h)   | lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | Cooling<br>medium   | Air<br>wet<br>bulb | Air<br>dry<br>bulb |                               |                    |
| MAXIMUM POWER AND FUEL CONSUMPTION                |                                |                   |                       |                       |                     |                    |                    |                               |                    |
| Rated Engine Speed—Two Hours (PTO Speed—1010 rpm) |                                |                   |                       |                       |                     |                    |                    |                               |                    |
| 130.41<br>(97.25)                                 | 2200                           | 8.508<br>(32.206) | 0.461<br>(0.280)      | 15.32<br>(3.020)      | 191<br>(88.5)       | 65<br>(18.3)       | 76<br>(24.3)       | 29.013<br>(97.974)            |                    |
| VARYING POWER AND FUEL CONSUMPTION—Two Hours      |                                |                   |                       |                       |                     |                    |                    |                               |                    |
| 114.04<br>(85.04)                                 | 2262                           | 7.862<br>(29.761) | 0.487<br>(0.296)      | 14.50<br>(2.857)      | 189<br>(86.9)       | 65<br>(18.3)       | 76<br>(24.2)       | .....<br>.....                |                    |
| 0.00<br>(0.00)                                    | 2346                           | 2.884<br>(10.917) | .....<br>.....        | .....<br>.....        | 177<br>(80.6)       | 65<br>(18.1)       | 75<br>(23.6)       | .....<br>.....                |                    |
| 58.13<br>(43.35)                                  | 2310                           | 5.356<br>(20.275) | 0.651<br>(0.396)      | 10.85<br>(2.138)      | 185<br>(84.7)       | 64<br>(17.8)       | 75<br>(23.6)       | .....<br>.....                |                    |
| 130.53<br>(97.34)                                 | 2199                           | 8.520<br>(32.252) | 0.461<br>(0.281)      | 15.32<br>(3.018)      | 193<br>(89.2)       | 64<br>(17.8)       | 75<br>(23.9)       | .....<br>.....                |                    |
| 29.26<br>(21.82)                                  | 2326                           | 4.133<br>(15.645) | 0.998<br>(0.607)      | 7.08<br>(1.395)       | 179<br>(81.7)       | 65<br>(18.1)       | 75<br>(23.9)       | .....<br>.....                |                    |
| 86.50<br>(64.50)                                  | 2286                           | 6.609<br>(25.018) | 0.540<br>(0.328)      | 13.09<br>(2.578)      | 187<br>(86.1)       | 65<br>(18.1)       | 75<br>(23.9)       | .....<br>.....                |                    |
| Av<br>Av  | 69.74<br>(52.01)               | 2288              | 5.894<br>(22.311)     | 0.597<br>(0.363)      | 11.83<br>(2.331)    | 185<br>(84.9)      | 64<br>(18.0)       | 75<br>(23.8)                  | 29.020<br>(97.996) |

## DRAWBAR PERFORMANCE

| Power<br>Hp<br>(kW)                                    | Drawbar<br>pull<br>lbs<br>(kN) | Speed<br>mph<br>(km/h) | Crank-<br>shaft<br>speed<br>rpm | Slip<br>%         | Fuel Consumption  |                       |                       | Temp. °F (°C)       |                    |                    | Barom.<br>inch Hg<br>(kPa) |
|--|--------------------------------|------------------------|---------------------------------|-------------------|-------------------|-----------------------|-----------------------|---------------------|--------------------|--------------------|----------------------------|
|  |                                |                        |                                 |                   | gal/hr<br>(l/h)   | lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | Cool-<br>ing<br>med | Air<br>wet<br>bulb | Air<br>dry<br>bulb |                            |
| Maximum Available Power—Two Hours 4th Gear             |                                |                        |                                 |                   |                   |                       |                       |                     |                    |                    |                            |
| 111.23<br>(82.95)                                      | 9212<br>(40.98)                | 4.53<br>(7.29)         | 2200                            | 6.69              | 8.460<br>(32.023) | 0.537<br>(0.327)      | 13.15<br>(2.590)      | 194<br>(90.0)       | 73<br>(22.8)       | 85<br>(29.2)       | 28.945<br>(97.743)         |
| 75% of Pull at Maximum Power—Ten Hours 4th Gear        |                                |                        |                                 |                   |                   |                       |                       |                     |                    |                    |                            |
| 90.52<br>(67.50)                                       | 7093<br>(31.55)                | 4.79<br>(7.70)         | 2285                            | 5.13              | 7.408<br>(28.044) | 0.578<br>(0.352)      | 12.22<br>(2.407)      | 186<br>(85.7)       | 61<br>(16.3)       | 64<br>(17.9)       | 29.041<br>(98.067)         |
| 50% of Pull at Maximum Power—Two Hours 4th Gear        |                                |                        |                                 |                   |                   |                       |                       |                     |                    |                    |                            |
| 62.26<br>(46.43)                                       | 4733<br>(21.05)                | 4.93<br>(7.94)         | 2305                            | 3.03              | 5.876<br>(22.242) | 0.667<br>(0.405)      | 10.60<br>(2.087)      | 189<br>(87.2)       | 77<br>(24.7)       | 91<br>(32.8)       | 28.935<br>(97.709)         |
| 50% of Pull at Reduced Engine Speed—Two Hours 6th Gear |                                |                        |                                 |                   |                   |                       |                       |                     |                    |                    |                            |
| 62.14<br>(46.34)                                       | 4730<br>(21.04)                | 4.93<br>(7.93)         | 1364                            | 2.95              | 4.389<br>(16.614) | 0.499<br>(0.303)      | 14.16<br>(2.789)      | 187<br>(86.1)       | 73<br>(22.8)       | 81<br>(26.9)       | 28.930<br>(97.692)         |
| MAXIMUM POWER IN SELECTED GEARS                        |                                |                        |                                 |                   |                   |                       |                       |                     |                    |                    |                            |
| 81.38<br>(60.68)                                       | 13738<br>(61.11)               | 2.22<br>(3.58)         | 2276                            | 13.48             | 2nd Gear          |                       |                       | 184<br>(84.2)       | 67<br>(19.4)       | 70<br>(21.1)       | 28.950<br>(97.760)         |
| 109.86<br>(81.92)                                      | 12172<br>(54.14)               | 3.38<br>(5.45)         | 2199                            | 10.08             | 3rd Gear          |                       |                       | 192<br>(88.9)       | 71<br>(21.7)       | 76<br>(24.4)       | 28.960<br>(97.794)         |
| 114.16<br>(85.13)                                      | 9449<br>(42.03)                | 4.53<br>(7.29)         | 2200                            | 6.69              | 4th Gear          |                       |                       | 193<br>(89.2)       | 69<br>(20.6)       | 74<br>(23.3)       | 28.960<br>(97.794)         |
| 112.11<br>(83.60)                                      | 6948<br>(30.90)                | 6.05<br>(9.74)         | 2199                            | 4.86              | 5th Gear          |                       |                       | 194<br>(89.7)       | 72<br>(22.2)       | 78<br>(25.6)       | 28.950<br>(97.760)         |
| 112.20<br>(83.67)                                      | 5320<br>(23.67)                | 7.91<br>(12.73)        | 2201                            | 3.49              | 6th Gear          |                       |                       | 193<br>(89.4)       | 72<br>(22.2)       | 80<br>(26.7)       | 28.950<br>(97.760)         |
| LUGGING ABILITY IN 4th GEAR                            |                                |                        |                                 |                   |                   |                       |                       |                     |                    |                    |                            |
| Crankshaft Speed rpm                                   |                                |                        |                                 | 2200              | 1982              | 1750                  | 1545                  | 1314                | 1093               |                    |                            |
| Pull—lbs<br>(kN)                                       |                                |                        |                                 | 9449<br>(42.03)   | 10755<br>(47.84)  | 11915<br>(53.00)      | 12706<br>(56.52)      | 12584<br>(55.98)    | 11242<br>(50.01)   |                    |                            |
| Increase in Pull %                                     |                                |                        |                                 | 0                 | 14                | 26                    | 34                    | 33                  | 19                 |                    |                            |
| Power—Hp<br>(kW)                                       |                                |                        |                                 | 114.16<br>(85.13) | 115.53<br>(86.15) | 111.16<br>(82.89)     | 102.88<br>(76.72)     | 86.77<br>(64.70)    | 65.94<br>(49.17)   |                    |                            |
| Speed—Mph<br>(km/h)                                    |                                |                        |                                 | 4.53<br>(7.29)    | 4.03<br>(6.48)    | 3.50<br>(5.63)        | 3.04<br>(4.89)        | 2.59<br>(4.16)      | 2.20<br>(3.54)     |                    |                            |
| Slip %   |                                |                        |                                 | 6.69              | 7.89              | 9.54                  | 10.87                 | 10.87               | 8.86               |                    |                            |

## Department of Agricultural Engineering

**Dates of Test:** August 18-29, 1980, Cab sound test No. 80-6, November 20, 1980

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

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel Cetane No. 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8482 **Fuel weight** 7.063 lbs/gal (0.846 kg/l) **Oil SAE 30 API service classification** CD, CC and SD **To motor** 4.377 gal (16.569 l) **Drained from motor** 3.847 gal (14.562 l) **Transmission and final drive lubricant** John Deere Hy-Gard **Total time engine was operated** 37.0 hours

**ENGINE:** Make John Deere Diesel **Type** six cylinder vertical with turbocharger **Serial No.** 6466TR-04 139264RG **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.56" × 4.75" (115.9 mm × 120.7 mm) **Compression ratio** 15.8 to 1 **Displacement** 466 cu in (7636 ml) **Starting system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements with dust evacuator **Oil filter** one paper cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

**CHASSIS:** **Type** standard with duals **Serial No.** 4440P-041136R **Tread width** rear 60" (1524 mm) to 130" (3302 mm) front 56" (1422 mm) to 82" (2083 mm) **Wheel base** 106.6" (2709 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 32.5" (826 mm) Vertical distance above roadway 39.9" (1014 mm) Horizontal distance from center of rear wheel tread 0.3" (7.5 mm) to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range power shift **Advertised speeds mph (km/h)** first 1.8 (2.7) second 2.5 (4.0) third 3.8 (6.1) fourth 4.9 (8.0) fifth 6.4 (10.5) sixth 8.2 (13.7) seventh 11.0 (17.5) eighth 18.6 (29.8) reverse 2.2 (3.6), 3.0 (5.1), 4.6 (7.6), 5.9 (9.8) **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" (3.71 m) left 146" (3.71 m) (on concrete surface without brake applied) right 163" (4.14 m) left 163" (4.14 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** 1010 rpm at 2200 engine rpm and 540 rpm at 2182 engine rpm.

| <b>TRACTOR SOUND LEVEL</b>                    | <b>With Cab<br/>dB(A)</b> | <b>W/O Cab<br/>dB(A)</b> |
|---|---------------------------|--------------------------|
| Maximum Available Power—Two Hours             | 77.0                      | 93.5                     |
| 75% of Pull at Maximum Power—Ten Hours        | 77.0                      | 93.0                     |
| 50% of Pull at Maximum Power—Two Hours        | 77.5                      | 93.0                     |
| 50% of Pull at Reduced Engine Speed—Two Hours | 74.5                      | 89.0                     |
| Bystander in 8th gear                         | 87.0                      | 85.0                     |

| <b>TIRES, BALLAST AND WEIGHT</b>        |                             | <b>With Ballast</b>       | <b>Without Ballast</b>    |
|---|-----------------------------|---------------------------|---------------------------|
| <b>Rear Tires</b>                       | —No., size, ply & psi (kPa) | Four 18.4-38; 6; 12 (85)  | Four 18.4-38; 6; 12 (85)  |
|   | Ballast                     | 1328 lb (602 kg)          | None                      |
|   | —Liquid (each inner)        | None                      | None                      |
| <b>Front Tires</b>                      | —Cast Iron (each)           | None                      | None                      |
|   | —No., size, ply & psi (kPa) | Two 11.00-16; 8; 40 (275) | Two 11.00-16; 8; 40 (275) |
|   | Ballast                     | None                      | None                      |
|   | —Liquid (each)              | None                      | None                      |
|   | —Cast Iron (each)           | None                      | None                      |
| <b>Height of Drawbar</b>                |                             | 22.5 in (570 mm)          | 22.5 in (570 mm)          |
| <b>Static Weight with Operator—Rear</b> |                             | 12125 lb (5500 kg)        | 9470 lb (4296 kg)         |
| —Front                                  |                             | 3650 lb (1656 kg)         | 3650 lb (1656 kg)         |
| —Total                                  |                             | 15775 lb (7156 kg)        | 13120 lb (5952 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 150°F (65.6°C). Five 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 **1357**.

LOUIS I. LEVITICUS  
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman  
W. E. SPLINTER  
K. VON BARGEN  
Board of Tractor Test Engineers



**John Deere 4440 Power Shift Diesel**