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Test 1280: John Deere 850 Diesel

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1280 — JOHN DEERE 850 DIESEL

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—622 rpm) | | | | | | | | |
| 22.27 (16.61) | 2600 | 1.620 (6.131) | 0.505 (0.307) | 13.75 (2.709) | 199 (92.6) | 63 (17.2) | 75 (23.8) | 28.955 (97.777) |
| Standard Power Take-off Speed (540 rpm)—One Hour | | | | | | | | |
| 20.66 (15.41) | 2257 | 1.449 (5.486) | 0.487 (0.296) | 14.26 (2.809) | 202 (94.4) | 64 (17.6) | 75 (24.0) | 28.940 (97.726) |
| VARYING POWER AND FUEL CONSUMPTION—Two Hours | | | | | | | | |
| 19.49 (14.54) | 2676 | 1.386 (5.246) | 0.494 (0.301) | 14.07 (2.771) | 187 (86.1) | 65 (18.3) | 76 (24.4) | |
| 0.00 (0.00) | 2740 | 0.527 (1.994) | | | 158 (70.0) | 66 (18.9) | 77 (25.0) | |
| 9.89 (7.37) | 2714 | 0.872 (3.301) | 0.613 (0.373) | 11.34 (2.233) | 167 (75.0) | 67 (19.4) | 78 (25.6) | |
| 22.83 (17.02) | 2600 | 1.679 (6.357) | 0.511 (0.311) | 13.59 (2.677) | 198 (92.2) | 68 (20.0) | 80 (26.4) | |
| 4.96 (3.70) | 2728 | 0.665 (2.517) | 0.931 (0.566) | 7.46 (1.470) | 162 (72.5) | 68 (20.0) | 80 (26.9) | |
| 14.72 (10.97) | 2695 | 1.118 (4.233) | 0.528 (0.321) | 13.16 (2.593) | 176 (79.7) | 69 (20.6) | 82 (27.5) | |
| Av Av | 11.98 (8.93) | 2692 (3.941) | 1.041 (0.367) | 0.604 (2.267) | 11.51 (79.3) | 175 (19.5) | 67 (26.0) | 79 (97.737) |

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 Gear | | | | | | | | | | | |
| 17.77 (13.25) | 1358 (6.04) | 4.91 (7.90) | 2601 | 6.11 | 1.583 (5.992) | 0.619 (0.377) | 11.23 (2.211) | 203 (95.0) | 71 (21.7) | 84 (28.6) | 28.825 (97.338) |
| 75% of Pull at Maximum Power—Ten Hours 6th Gear | | | | | | | | | | | |
| 14.81 (11.04) | 1085 (4.83) | 5.12 (8.24) | 2678 | 4.81 | 1.320 (4.998) | 0.619 (0.377) | 11.22 (2.210) | 175 (79.7) | 57 (13.8) | 64 (18.0) | 28.995 (97.912) |
| 50% of Pull at Maximum Power—Two Hours 6th Gear | | | | | | | | | | | |
| 10.10 (7.53) | 719 (3.20) | 5.27 (8.48) | 2704 | 2.89 | 0.989 (3.745) | 0.681 (0.414) | 10.21 (2.011) | 179 (81.7) | 77 (25.0) | 88 (31.1) | 28.750 (97.084) |
| 50% of Pull at Reduced Engine Speed—Two Hours 7th Gear | | | | | | | | | | | |
| 10.03 (7.48) | 715 (3.18) | 5.26 (8.47) | 1827 | 2.89 | 0.863 (3.268) | 0.598 (0.364) | 11.62 (2.289) | 192 (88.9) | 81 (27.2) | 91 (32.8) | 28.700 (96.916) |

MAXIMUM POWER IN SELECTED GEARS

| | | | | | | | | | | |
|------------------|-----------------|-----------------|------|-------|----------|--|---------------|--------------|--------------|--------------------|
| 15.24 (11.37) | 2699 (12.01) | 2.12 (3.41) | 2670 | 14.99 | 4th Gear | | 187 (85.8) | 72 (22.2) | 83 (28.3) | 28.620 (96.645) |
| 18.76 (13.99) | 2132 (9.49) | 3.30 (5.31) | 2598 | 9.70 | 5th Gear | | 199 (92.5) | 68 (20.0) | 81 (27.2) | 28.870 (97.490) |
| 18.92 (14.11) | 1448 (6.44) | 4.90 (7.88) | 2601 | 6.18 | 6th Gear | | 194 (90.0) | 64 (17.8) | 71 (21.7) | 28.880 (97.523) |
| 18.32 (13.66) | 926 (4.12) | 7.42 (11.94) | 2600 | 3.90 | 7th Gear | | 197 (91.7) | 66 (18.9) | 76 (24.4) | 28.870 (97.490) |

LUGGING ABILITY IN RATED GEAR 6th

| | | | | | | |
|----------------------|------------------|------------------|------------------|------------------|-----------------|-----------------|
| Crankshaft Speed rpm | 2601 | 2334 | 2078 | 1822 | 1560 | 1296 |
| Pull—lbs (kN) | 1448 (6.44) | 1498 (6.66) | 1626 (7.23) | 1681 (7.48) | 1658 (7.37) | 1581 (7.03) |
| Increase in Pull % | 0 | 3 | 12 | 16 | 14 | 9 |
| Power—Hp (kW) | 18.92 (14.11) | 17.51 (13.06) | 16.84 (12.55) | 15.20 (11.34) | 12.85 (9.58) | 10.23 (7.63) |
| Speed—Mph (km/h) | 4.90 (7.88) | 4.38 (7.06) | 3.88 (6.25) | 3.39 (5.46) | 2.91 (4.68) | 2.43 (3.91) |
| Slip % | 6.18 | 6.50 | 6.87 | 7.23 | 7.14 | 6.78 |

Department of Agricultural Engineering

Dates of Test: June 12-21, 1978

Manufacturer: YANMAR DIESEL CO., LTD.,
Osaka, Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 50.4 (rating taken from oil company's typical inspection data) Specific gravity converted to 60°/60° (15°/15°) 0.8346 Fuel weight 6.949 lbs/gal (0.835 kg/l) Oil SAE 30 API service classification CC CD SD To motor 1.202 gal (4.550 l) Drained from motor 1.004 gal (3.801 l) Transmission and final drive lubricant John Deere Hy Gard Total time engine was operated 34.0 hours.

ENGINE: Make Yanmar Diesel Type 3 cylinder vertical Serial No. 3T80J-81519 Crankshaft lengthwise Rated rpm 2600 Bore and stroke 3.15" x 3.35" (80 mm x 85 mm) Compression ratio 21.2 to 1 Displacement 78 cu in (1281 ml) Cranking System 12 volt Lubrication pressure Air cleaner one paper element Oil filter one screw on paper cartridge Fuel filter one paper element Muffler vertical Cooling medium temperature control thermostat.

CHASSIS: Type standard Serial No. 850 S002580 Tread width rear 42" (1070 mm) to 58" (1470 mm) front 42" (1070 mm) to 50" (1270 mm) Wheel base 64.2" (1630 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 25.4" (645 mm) Vertical distance above roadway 26.3" (668 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 Advertised speeds mph (km/h) first 0.8 (1.3) second 1.1 (1.8) third 1.7 (2.7) fourth 2.5 (4.0) fifth 3.8 (6.0) sixth 5.4 (8.6) seventh 8.0 (12.7) eighth 11.7 (18.7) reverse 1.1 (1.8), 5.4 (8.6) Clutch single dry disc operated by foot pedal Brakes internal expanding shoe operated by two foot pedals which can be locked together Steering mechanical Turning radius (on concrete surface with brake applied) right 94.9" (2.41 m) left 94.5" (2.40 m) (on concrete surface without brake) right 101.6" (2.58 m) left 102.4" (2.60 m) Turning space diameter (on concrete surface with brake applied) right 194.8" (4.95 m) left 194" (4.93 m) (on concrete surface without brake) right 208.2" (5.29 m) left 209.8" (5.33 m) Power take-off 540 rpm at 2257 engine rpm.

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 was 152°F (66.6°C). Four gears were chosen between 15% slip and 10 mph (16.1 km/h).

| TRACTOR SOUND LEVEL WITHOUT CAB | dB(A) |
|---|--------------|
| Maximum Available Power—Two Hours | 89.0 |
| 75% of Pull at Maximum Power—Ten Hours | 88.5 |
| 50% of Pull at Maximum Power—Two Hours | 88.0 |
| 50% of Pull at Reduced Engine Speed—Two Hours | 83.5 |
| Bystander in 8th gear | 77.0 |

| TIRES, BALLAST AND WEIGHT | | With Ballast | Without Ballast |
|---------------------------------------|-----------------------------|--------------------------|--------------------------|
| Rear Tires | —No., size, ply & psi (kPa) | Two 11.2-24; 4; 14 (95) | Two 11.2-24; 4; 14 (95) |
| Ballast | —Liquid (each) | 250 lb (113 kg) | None |
| | —Cast Iron (each) | 200 lb (91 kg) | None |
| Front Tires | —No., size, ply & psi (kPa) | Two 5.00-15; 4; 44 (305) | Two 5.00-15; 4; 44 (305) |
| Ballast | —Liquid (each) | None | None |
| | —Cast Iron (each) | 46 lb (21 kg) | None |
| Height of Drawbar | | 12.5 in (315 mm) | 12.5 in (315 mm) |
| Static Weight of Operator—Rear | | 2448 lb (1110 kg) | 1548 lb (702 kg) |
| | —Front | 1080 lb (490 kg) | 988 lb (448 kg) |
| | —Total | 3528 lb (1600 kg) | 2536 lb (1150 kg) |

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1280**.

L. I. LEVITICUS
Engineer-in-Charge

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



John Deere 850 Diesel