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Test 1387: International 284 Diesel 8-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1387 — INTERNATIONAL 284 DIESEL 8 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—650 rpm) | | | | | | | | | |
| 27.47 (20.48) | 2600 | 1.963 (7.431) | 0.500 (0.304) | 14.00 (2.756) | 177 (80.7) | 62 (16.6) | 75 (23.9) | 29.090 (98.233) | |
| Standard Power take-off Speed (540 rpm)—One Hour | | | | | | | | | |
| 23.92 (17.84) | 2160 | 1.661 (6.288) | 0.486 (0.296) | 14.40 (2.837) | 178 (80.9) | 62 (16.7) | 75 (24.1) | 29.075 (98.182) | |
| VARYING POWER AND FUEL CONSUMPTION—Two Hours | | | | | | | | | |
| 23.53 (17.55) | 2622 | 1.744 (6.602) | 0.519 (0.316) | 13.49 (2.658) | 171 (77.2) | 62 (16.7) | 76 (24.2) | | |
| 0.00 (0.00) | 2719 | 0.724 (2.741) | | | 154 (67.8) | 62 (16.7) | 76 (24.4) | | |
| 12.03 (8.97) | 2676 | 1.183 (4.478) | 0.688 (0.419) | 10.17 (2.003) | 160 (70.8) | 61 (16.1) | 75 (23.6) | | |
| 28.16 (21.00) | 2599 | 1.997 (7.559) | 0.497 (0.302) | 14.10 (2.778) | 182 (83.1) | 62 (16.4) | 75 (23.9) | | |
| 6.04 (4.50) | 2695 | 0.934 (3.536) | 1.082 (0.658) | 6.47 (1.273) | 155 (68.3) | 62 (16.4) | 75 (23.6) | | |
| 17.95 (13.39) | 2666 | 1.457 (5.515) | 0.568 (0.346) | 12.32 (2.428) | 161 (71.7) | 61 (16.1) | 75 (23.6) | | |
| Av Av | 14.62 (10.90) | 2663 (5.072) | 1.340 (0.642) | 0.642 (0.390) | 10.91 (2.149) | 164 (73.2) | 62 (16.4) | 75 (23.9) | 29.047 (98.086) |

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 7th (H-3) Gear | | | | | | | | | | | |
| 21.98 (16.39) | 1448 (6.44) | 5.69 (9.16) | 2596 | 8.35 | 2.000 (7.570) | 0.637 (0.387) | 10.99 (2.165) | 171 (77.2) | 48 (8.6) | 57 (13.6) | 28.985 (97.880) |
| 75% of Pull at Maximum Power—Ten Hours 7th (H-3) Gear | | | | | | | | | | | |
| 18.32 (13.66) | 1163 (5.17) | 5.91 (9.51) | 2636 | 6.32 | 1.739 (6.583) | 0.665 (0.404) | 10.53 (2.075) | 170 (76.4) | 55 (12.9) | 62 (16.7) | 28.740 (97.050) |
| 50% of Pull at Maximum Power—Two Hours 7th (H-3) Gear | | | | | | | | | | | |
| 12.78 (9.53) | 785 (3.49) | 6.11 (9.83) | 2673 | 4.50 | 1.393 (5.272) | 0.763 (0.464) | 9.18 (1.808) | 167 (75.0) | 50 (9.7) | 58 (14.4) | 28.930 (97.690) |
| 50% of Pull at Reduced Engine Speed—Two Hours 8th (H-4) Gear | | | | | | | | | | | |
| 12.73 (9.49) | 780 (3.47) | 6.12 (9.85) | 1799 | 4.43 | 1.125 (4.258) | 0.619 (0.376) | 11.32 (2.229) | 166 (74.4) | 50 (10.0) | 57 (13.9) | 28.910 (97.620) |
| MAXIMUM POWER IN SELECTED GEARS | | | | | | | | | | | |
| 20.05 (14.95) | 2523 (11.22) | 2.98 (4.80) | 2633 | 14.91 | 5th (H-1) Gear | | | 169 (75.8) | 45 (7.2) | 56 (13.3) | 28.960 (97.790) |
| 22.73 (16.95) | 2181 (9.70) | 3.91 (6.29) | 2597 | 12.59 | 6th (H-2) Gear | | | 170 (76.4) | 45 (7.2) | 52 (11.1) | 29.020 (98.000) |
| 23.52 (17.54) | 1545 (6.87) | 5.71 (9.19) | 2602 | 8.30 | 7th (H-3) Gear | | | 169 (75.8) | 44 (6.7) | 50 (10.0) | 29.030 (98.030) |
| 22.84 (17.03) | 978 (4.35) | 8.76 (14.09) | 2599 | 5.31 | 8th (H-4) Gear | | | 170 (76.7) | 46 (7.8) | 53 (11.7) | 29.020 (98.000) |
| LUGGING ABILITY IN 7th (H-3) GEAR | | | | | | | | | | | |
| Crankshaft Speed rpm | | | | 2602 | 2349 | 2081 | 1824 | 1559 | 1300 | | |
| Pull—lbs (kN) | | | | 1545 (6.87) | 4636 (7.28) | 1690 (7.52) | 1701 (7.57) | 1698 (7.55) | 1641 (7.30) | | |
| Increase in Pull % | | | | 0 | 6 | 9 | 10 | 10 | 6 | | |
| Power—Hp (kW) | | | | 23.52 (17.54) | 22.35 (16.66) | 20.40 (15.21) | 17.99 (13.41) | 15.34 (11.44) | 12.40 (9.25) | | |
| Speed—Mph (km/h) | | | | 5.71 (9.19) | 5.12 (8.24) | 4.53 (7.28) | 3.97 (6.38) | 3.39 (5.45) | 2.83 (4.56) | | |
| Slip % | | | | 8.30 | 8.88 | 9.05 | 9.32 | 9.23 | 8.88 | | |

Department of Agricultural Engineering

Dates of Test: April 30 to May 12, 1981

Manufacturer: INTERNATIONAL HARVESTER CO., 401 North Michigan Avenue, Chicago, Illinois 60611

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 46.3 (rating taken from oil company's inspection data) Specific gravity converted to 60°/60° (15°/15°) 0.8408 Fuel weight 7.001 lbs/gal (0.839 kg/l) Oil SAE 30 API service classification CA/CD-SC/SE To motor 0.994 gal (3.763 l) Drained from motor 0.890 gal (3.369 l) Transmission and final drive lubricant I.H. Hytran fluid Total time engine was operated 46.0 hours

ENGINE Make Nissan Diesel **Type** three cylinder vertical **Serial No.** SD 16-003704 **Crankshaft** lengthwise **Rated rpm** 2600 **Bore and stroke** 3.27" × 3.94" (83 mm × 100 mm) **Compression ratio** 20.8 to 1 **Displacement** 99 cu in (1622 ml) **Starting system** 12 volt **Lubrication pressure** **Air cleaner** one paper element **Oil filter** one full flow paper cartridge **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** 2020002J001906* **Tread width** rear 41.5" (1055 mm) to 57.9" (1470 mm) front 39.4" (1000 mm) to 61.8" (1570 mm) **Wheel base** 63.0" (1600 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 22.8" (579 mm) Vertical distance above roadway 26.0" (660 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 1.0 (1.6) second 1.3 (2.0) third 1.8 (2.8) fourth 2.6 (4.2) fifth 3.5 (5.6) sixth 4.5 (7.2) seventh 6.2 (10.0) eighth 9.3 (14.9) reverse 1.8 (2.8), 6.2 (10.0) **Clutch** single dry disc operated by foot pedal **Brakes** single 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 98.4" (2.50 m) left 98.4" (2.50 m) (on concrete surface without brake) right 113.1" (2.87 m) left 113.1" (2.87 m) **Turning space diameter** (on concrete surface with brake applied) right 202.3" (5.14 m) left 202.3" (5.14 m) (on concrete surface without brake) right 231.7" (5.88 m) left 231.7" (5.88 m) **Power take-off** 540 rpm at 2160 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

TRACTOR SOUND LEVEL WITHOUT CAB

| | dB(A) |
|---|-------|
| Maximum Available Power—Two Hours | 94.5 |
| 75% of Pull at Maximum Power—Ten Hours | 92.0 |
| 50% of Pull at Maximum Power—Two Hours | 91.5 |
| 50% of Pull at Reduced Engine Speed—Two Hours | 88.5 |
| Bystander in 8th (H-4) gear | 80.0 |

TIRES, BALLAST AND WEIGHT

| | With Ballast | Without Ballast |
|---|----------------------------|----------------------------|
| Rear Tires | | |
| —No., size, ply & psi (kPa) | Two 11.2/10-24; 4; 14 (95) | Two 11.2/10-24; 4; 14 (95) |
| Ballast | | |
| —Liquid (each) | 295 lb (134 kg) | None |
| —Cast Iron (each) | 98 lb (44 kg) | None |
| Front Tires | | |
| —No., size, ply & psi (kPa) | Two 5.00-15; 4; 40 (275) | Two 5.00-15; 4; 40 (275) |
| Ballast | | |
| —Liquid (each) | None | None |
| —Test Equip. (each) | 37 lb (17 kg) | None |
| Height of drawbar | 15.5 in (395 mm) | 15.5 in (395 mm) |
| Static Weight with Operator—Rear | 2595 lb (1177 kg) | 1810 lb (821 kg) |
| Front | 1005 lb (456 kg) | 930 lb (422 kg) |
| Total | 3600 lb (1633 kg) | 2740 lb (1243 kg) |

procedure. Temperature at injection pump return was 135°F (57.3°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. 1387.

LOUIS I. LEVITICUS
Engineer-in Charge

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



International 284 Diesel