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## Test 1338: International 886 Diesel 16-Speed

Nebraska Tractor Test Lab

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

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# NEBRASKA TRACTOR TEST 1338 — INTERNATIONAL 886 DIESEL 16 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—1159 rpm) |      |                   |                  |                  |               |              |              |                    |
|---|------|-------------------|------------------|------------------|---------------|--------------|--------------|--------------------|
| 86.57<br>(64.55)                                  | 2400 | 5.774<br>(21.856) | 0.471<br>(0.287) | 14.99<br>(2.954) | 191<br>(88.3) | 54<br>(12.2) | 75<br>(23.9) | 28.860<br>(97.456) |

| Standard Power Take-Off Speed (1000 rpm)—One Hour |      |                   |                  |                  |               |              |              |                    |
|---|------|-------------------|------------------|------------------|---------------|--------------|--------------|--------------------|
| 83.91<br>(62.57)                                  | 2071 | 5.241<br>(19.838) | 0.441<br>(0.268) | 16.01<br>(3.154) | 195<br>(90.7) | 54<br>(12.2) | 75<br>(23.9) | 28.825<br>(97.338) |

### VARYING POWER AND FUEL CONSUMPTION—Two Hours

|                                   |             |                                 |                                |                                |                             |                            |                            |                                  |
|-----------------------------------|-------------|---------------------------------|--------------------------------|--------------------------------|-----------------------------|----------------------------|----------------------------|----------------------------------|
| 78.38<br>(58.45)                  | 2554        | 5.535<br>(20.953)               | 0.499<br>(0.303)               | 14.16<br>(2.790)               | 188<br>(86.7)               | 54<br>(12.2)               | 75<br>(23.9)               | .....                            |
| 0.00<br>(0.00)                    | 2643        | 2.048<br>(7.751)                | .....                          | .....                          | 177<br>(80.6)               | 54<br>(12.2)               | 75<br>(23.9)               | .....                            |
| 39.79<br>(29.67)                  | 2604        | 3.573<br>(13.524)               | 0.634<br>(0.386)               | 11.14<br>(2.194)               | 183<br>(83.9)               | 54<br>(12.2)               | 75<br>(23.9)               | .....                            |
| 86.61<br>(64.59)                  | 2400        | 5.765<br>(21.822)               | 0.470<br>(0.286)               | 15.02<br>(2.960)               | 192<br>(89.2)               | 54<br>(12.2)               | 75<br>(23.9)               | .....                            |
| 20.20<br>(15.06)                  | 2622        | 2.766<br>(10.469)               | 0.967<br>(0.588)               | 7.30<br>(1.439)                | 178<br>(81.1)               | 54<br>(12.2)               | 75<br>(23.9)               | .....                            |
| 59.29<br>(44.21)                  | 2580        | 4.469<br>(16.917)               | 0.532<br>(0.324)               | 13.27<br>(2.613)               | 186<br>(85.8)               | 54<br>(12.2)               | 75<br>(23.9)               | .....                            |
| <b>Av 47.38</b><br><b>(35.33)</b> | <b>2567</b> | <b>4.026</b><br><b>(15.239)</b> | <b>0.600</b><br><b>(0.365)</b> | <b>11.77</b><br><b>(2.318)</b> | <b>184</b><br><b>(84.5)</b> | <b>54</b><br><b>(12.2)</b> | <b>75</b><br><b>(23.9)</b> | <b>28.780</b><br><b>(97.186)</b> |

## 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 8th (1Hi TA) Gear

|                  |                 |                |      |      |                   |                  |                  |               |              |              |                    |
|------------------|-----------------|----------------|------|------|-------------------|------------------|------------------|---------------|--------------|--------------|--------------------|
| 75.08<br>(55.99) | 5995<br>(26.67) | 4.70<br>(7.56) | 2400 | 5.05 | 5.788<br>(21.910) | 0.544<br>(0.331) | 12.97<br>(2.555) | 189<br>(86.9) | 50<br>(10.0) | 63<br>(16.9) | 28.850<br>(97.422) |
|------------------|-----------------|----------------|------|------|-------------------|------------------|------------------|---------------|--------------|--------------|--------------------|

### 75% of Pull at Maximum Power—Ten Hours 8th (1Hi TA) Gear

|                  |                 |                |      |      |                   |                  |                  |               |             |             |                    |
|------------------|-----------------|----------------|------|------|-------------------|------------------|------------------|---------------|-------------|-------------|--------------------|
| 61.45<br>(45.83) | 4580<br>(20.37) | 5.03<br>(8.10) | 2536 | 3.70 | 5.034<br>(19.056) | 0.578<br>(0.352) | 12.21<br>(2.405) | 180<br>(82.4) | 41<br>(4.9) | 50<br>(9.9) | 28.856<br>(97.442) |
|------------------|-----------------|----------------|------|------|-------------------|------------------|------------------|---------------|-------------|-------------|--------------------|

### 50% of Pull at Maximum Power—Two Hours 8th (1Hi TA) Gear

|                  |                 |                |      |      |                   |                  |                  |               |             |             |                    |
|------------------|-----------------|----------------|------|------|-------------------|------------------|------------------|---------------|-------------|-------------|--------------------|
| 41.75<br>(31.13) | 3049<br>(13.56) | 5.13<br>(8.26) | 2552 | 2.31 | 3.929<br>(14.875) | 0.665<br>(0.404) | 10.62<br>(2.093) | 178<br>(80.8) | 42<br>(5.3) | 48<br>(8.9) | 28.815<br>(97.304) |
|------------------|-----------------|----------------|------|------|-------------------|------------------|------------------|---------------|-------------|-------------|--------------------|

### 50% of Pull at Reduced Engine Speed—Two Hours 12th (2Hi DD) Gear

|                  |                 |                |      |      |                   |                  |                  |               |             |             |                    |
|------------------|-----------------|----------------|------|------|-------------------|------------------|------------------|---------------|-------------|-------------|--------------------|
| 41.89<br>(31.24) | 3055<br>(13.59) | 5.14<br>(8.27) | 1499 | 2.35 | 3.115<br>(11.793) | 0.525<br>(0.319) | 13.45<br>(2.649) | 180<br>(82.2) | 42<br>(5.3) | 48<br>(8.9) | 28.850<br>(97.422) |
|------------------|-----------------|----------------|------|------|-------------------|------------------|------------------|---------------|-------------|-------------|--------------------|

### MAXIMUM POWER IN SELECTED GEARS

|                  |                  |                 |      |       |                    |  |  |               |              |              |                    |
|------------------|------------------|-----------------|------|-------|--------------------|--|--|---------------|--------------|--------------|--------------------|
| 62.89<br>(46.89) | 10807<br>(48.07) | 2.18<br>(3.51)  | 2549 | 14.83 | 4th (2Lo DD) Gear  |  |  | 179<br>(81.4) | 42<br>(5.6)  | 49<br>(9.4)  | 28.850<br>(97.422) |
| 73.32<br>(54.67) | 9280<br>(41.28)  | 2.96<br>(4.77)  | 2400 | 9.36  | 5th (3Lo TA) Gear  |  |  | 185<br>(85.0) | 45<br>(7.2)  | 53<br>(11.7) | 28.940<br>(97.726) |
| 74.15<br>(55.30) | 7081<br>(31.50)  | 3.93<br>(6.32)  | 2399 | 6.14  | 6th (3Lo DD) Gear  |  |  | 188<br>(86.4) | 44<br>(6.7)  | 52<br>(11.1) | 28.940<br>(97.726) |
| 74.76<br>(55.75) | 6837<br>(30.41)  | 4.10<br>(6.60)  | 2400 | 5.93  | 7th (4Lo TA) Gear  |  |  | 187<br>(85.8) | 44<br>(6.7)  | 51<br>(10.6) | 28.950<br>(97.760) |
| 76.25<br>(56.86) | 6095<br>(27.11)  | 4.69<br>(7.55)  | 2398 | 5.02  | 8th (1Hi TA) Gear  |  |  | 190<br>(87.5) | 51<br>(10.6) | 64<br>(17.8) | 28.840<br>(97.388) |
| 74.79<br>(55.77) | 5245<br>(23.33)  | 5.35<br>(8.61)  | 2400 | 4.30  | 9th (4Lo DD) Gear  |  |  | 188<br>(86.4) | 45<br>(7.2)  | 54<br>(12.2) | 28.930<br>(97.692) |
| 75.74<br>(56.48) | 4657<br>(20.71)  | 6.10<br>(9.82)  | 2399 | 3.79  | 10th (1Hi DD) Gear |  |  | 188<br>(86.4) | 46<br>(7.8)  | 56<br>(13.3) | 28.930<br>(97.692) |
| 76.22<br>(56.84) | 4511<br>(20.07)  | 6.34<br>(10.20) | 2398 | 3.57  | 11th (2Hi TA) Gear |  |  | 188<br>(86.7) | 46<br>(7.8)  | 57<br>(13.9) | 28.920<br>(97.659) |
| 74.31<br>(55.41) | 3396<br>(15.10)  | 8.21<br>(13.21) | 2399 | 2.61  | 12th (2Hi DD) Gear |  |  | 188<br>(86.7) | 47<br>(8.3)  | 58<br>(14.4) | 28.910<br>(97.625) |

Department of Agricultural Engineering

Dates of Test: March 26 to April 10, 1980

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

**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 7.062 lbs/gal (0.846 kg/l) Oil SAE 30 API service classification CA/CD-SC/SE To motor 2.606 gal (9.865 l) Drained from motor 2.505 gal (9.482 l) Transmission and final drive lubricant I.H. Hy-Tran Fluid Total time engine was operated 38.0 hours.

**ENGINE** Make International Diesel Type 6 cylinder vertical Serial No. 358DT2D050083\* Crankshaft lengthwise Rated rpm 2400 Bore and stroke 3.875" × 5.0625" (98.4 mm × 128.6 mm) Compression ratio 14.8 to 1 Displacement 358 cu in (5868 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements with automatic dust unloader Oil filter one full flow cartridge Oil cooler engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil Fuel filter two paper cartridges Muffler underhood Exhaust vertical Cooling medium temperature control one thermostat

**CHASSIS:** Type standard with duals Serial No. 2490206U15954\* Tread width rear 66" (1676 mm) to 113.5" (2883 mm) front 60" (1520 mm) to 84" (2130 mm) Wheel base 104.8" (2662 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 31.4" (798 mm) Vertical distance above roadway 40.5" (1029 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 1.4 (2.2) second 1.8 (2.8) third 1.8 (3.0) fourth 2.4 (3.8) fifth 3.2 (5.1) sixth 4.1 (6.6) seventh 4.2 (6.8) eighth 4.8 (7.8) ninth 5.4 (8.8) tenth 6.2 (10.0) eleventh 6.4 (10.3) twelfth 8.2 (13.2) thirteenth 11.1 (17.9) fourteenth 14.3 (23.0) fifteenth 14.9 (23.9) sixteenth 19.1 (30.7) reverse 2.4 (3.8), 3.0 (4.9), 3.2 (5.1), 4.0 (6.5), 5.5 (8.8), 7.0 (11.3), 7.3 (11.7), 9.4 (15.1) Clutch single dry disc hydraulically actuated and operated by foot pedal Brakes multiple wet disc hydraulically operated by two foot pedals which can be locked together Steering hydrostatic Turning radius (on concrete surface with brake applied) right 138" (3.51 m) left 138" (3.51 m) (on concrete surface without brake) right 175" (4.44 m) left 175" (4.44 m) Turning space diameter (on concrete surface with brake applied) right 286" (7.26 m) left 286" (7.26 m) (on concrete surface without brake) right 360" (9.14 m) left 360" (9.14 m) Power take-off 1000 rpm at 2071 engine rpm and 540 rpm at 2106 engine rpm.

# LUGGING ABILITY IN 8th (1Hi TA) GEAR

|                      |                  |                  |                  |                  |                  |                  |
|----------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Crankshaft Speed rpm | 2398             | 2158             | 1916             | 1678             | 1444             | 1200             |
| Pull—lbs<br>(kN)     | 6095<br>(27.11)  | 6803<br>(30.26)  | 7380<br>(32.83)  | 7889<br>(35.09)  | 8014<br>(35.65)  | 7874<br>(35.03)  |
| Increase in Pull %   | 0                | 12               | 21               | 29               | 31               | 29               |
| Power—Hp<br>(kW)     | 76.25<br>(56.86) | 75.92<br>(56.61) | 72.70<br>(54.21) | 67.57<br>(50.39) | 58.88<br>(43.91) | 48.17<br>(35.92) |
| Speed—Mph<br>(km/h)  | 4.69<br>(7.55)   | 4.18<br>(6.73)   | 3.69<br>(5.94)   | 3.21<br>(5.17)   | 2.76<br>(4.43)   | 2.29<br>(3.69)   |
| Slip %               | 5.02             | 5.93             | 6.35             | 7.03             | 7.30             | 7.17             |

# TRACTOR SOUND LEVEL WITH CAB dB(A)

|   |      |
|---|------|
| Maximum Available Power—Two Hours             | 80.0 |
| 75% of Pull at Maximum Power—Ten Hours        | 79.0 |
| 50% of Pull at Maximum Power—Two Hours        | 79.5 |
| 50% of Pull at Reduced Engine Speed—Two Hours | 80.0 |
| Bystander in 16th (4Hi DD) gear               | 88.0 |

# TIRES, BALLAST AND WEIGHT

|   |                             | With Ballast             | Without Ballast          |
|---|-----------------------------|--------------------------|--------------------------|
| <b>Rear Tires</b>                       | —No., size, ply & psi (kPa) | Four 18.4-34; 6; 12 (80) | Four 18.4-34; 6; 12 (80) |
| Ballast                                 | —Liquid (each inner)        | 815 lb (370 kg)          | None                     |
|   | —Cast Iron (each)           | None                     | None                     |
| <b>Front Tires</b>                      | —No., size, ply & psi (kPa) | Two 9.5L-15; 6; 36 (250) | Two 9.5L-15; 6; 36 (250) |
| Ballast                                 | —Liquid (each)              | None                     | None                     |
|   | —Cast Iron (each)           | 40 lb (18 kg)            | None                     |
| <b>Height of drawbar</b>                |                             | 19 in (485 mm)           | 19 in (485 mm)           |
| <b>Static Weight with Operator—Rear</b> |                             | 10130 lb (4595 kg)       | 8500 lb (3855 kg)        |
| Front                                   |                             | 3320 lb (1506 kg)        | 3240 lb (1470 kg)        |
| Total                                   |                             | 13450 lb (6101 kg)       | 11740 lb (5325 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 130°F (54.4°C). Nine 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 **1338**.

LOUIS I. LEVITICUS

Engineer-in Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

K. VON BARGEN

Board of Tractor Test Engineers



International 886 Diesel