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January 1979

## Test 1316: International Hydro 84 Utility / Row Crop Diesel

Nebraska Tractor Test Lab

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

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NEBRASKA TRACTOR TEST 1316  
INTERNATIONAL HYDRO 84 UTILITY DIESEL  
ALSO INTERNATIONAL HYDRO 84 ROWCROP DIESEL

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—584 rpm) |                                |                   |                       |                       |                     |                    |                    |                               |
| 58.73<br>(43.80)                                 | 2401                           | 4.307<br>(16.302) | 0.513<br>(0.312)      | 13.64<br>(2.687)      | 180<br>(82.5)       | 60<br>(15.8)       | 75<br>(23.8)       | 29.007<br>(97.951)            |
| Standard Power Take-off Speed (540 rpm)—One Hour |                                |                   |                       |                       |                     |                    |                    |                               |
| 56.68<br>(42.27)                                 | 2222                           | 4.044<br>(15.309) | 0.499<br>(0.304)      | 14.01<br>(2.761)      | 180<br>(82.1)       | 60<br>(15.3)       | 75<br>(23.8)       | 29.010<br>(97.962)            |
| VARYING POWER AND FUEL CONSUMPTION—Two Hours     |                                |                   |                       |                       |                     |                    |                    |                               |
| 51.56<br>(38.45)                                 | 2479                           | 3.903<br>(14.774) | 0.530<br>(0.322)      | 13.21<br>(2.602)      | 172<br>(77.8)       | 60<br>(15.3)       | 75<br>(23.9)       | .....<br>.....                |
| 0.00<br>(0.00)                                   | 2622                           | 1.643<br>(6.218)  | .....<br>.....        | .....<br>.....        | 156<br>(68.6)       | 59<br>(15.0)       | 75<br>(23.9)       | .....<br>.....                |
| 26.58<br>(19.82)                                 | 2560                           | 2.741<br>(10.374) | 0.721<br>(0.439)      | 9.70<br>(1.911)       | 161<br>(71.7)       | 60<br>(15.3)       | 76<br>(24.2)       | .....<br>.....                |
| 59.18<br>(44.13)                                 | 2400                           | 4.327<br>(16.381) | 0.512<br>(0.311)      | 13.67<br>(2.694)      | 178<br>(81.1)       | 59<br>(15.0)       | 75<br>(23.9)       | .....<br>.....                |
| 13.45<br>(10.03)                                 | 2590                           | 2.209<br>(8.361)  | 1.149<br>(0.699)      | 6.09<br>(1.200)       | 161<br>(71.7)       | 59<br>(15.0)       | 75<br>(23.9)       | .....<br>.....                |
| 39.38<br>(29.36)                                 | 2526                           | 3.285<br>(12.436) | 0.584<br>(0.355)      | 11.99<br>(2.361)      | 168<br>(75.3)       | 59<br>(15.0)       | 75<br>(23.9)       | .....<br>.....                |
| Av 31.69<br>Av (23.63)                           | 2529                           | 3.018<br>(11.424) | 0.666<br>(0.405)      | 10.50<br>(2.069)      | 166<br>(74.4)       | 59<br>(15.1)       | 75<br>(23.9)       | 29.000<br>(97.929)            |

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)  |                    |                    |                            |
|---|--------------------------------|------------------------|---------------------------------|-----------|-------------------|-----------------------|-----------------------|----------------|--------------------|--------------------|----------------------------|
|   |                                |                        |                                 |           | gal/hr<br>(l/h)   | lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | Cooling<br>med | Air<br>wet<br>bulb | Air<br>dry<br>bulb | Barom.<br>inch Hg<br>(kPa) |
| Maximum Available Power—Two Hours, Speed Setting—6.0 MPH Hi Range   |                                |                        |                                 |           |                   |                       |                       |                |                    |                    |                            |
| 42.90<br>(31.99)  | 2733<br>(12.16)                | 5.89<br>(9.47)         | 2401                            | 4.43      | 4.235<br>(16.032) | 0.691<br>(0.420)      | 10.13<br>(1.995)      | 195<br>(90.3)  | 65<br>(18.3)       | 78<br>(25.3)       | 28.530<br>(96.342)         |
| 75% of Pull at Maximum Power—Two Hours, Speed Setting—6.0 MPH Hi Range  |                                |                        |                                 |           |                   |                       |                       |                |                    |                    |                            |
| 35.15<br>(26.21)  | 2032<br>(9.04)                 | 6.49<br>(10.44)        | 2495                            | 2.99      | 3.581<br>(13.556) | 0.713<br>(0.433)      | 9.82<br>(1.934)       | 177<br>(80.3)  | 65<br>(18.1)       | 83<br>(28.6)       | 28.679<br>(96.845)         |
| 50% of Pull at Maximum Power—Two Hours, Speed Setting—6.0 MPH Hi Range  |                                |                        |                                 |           |                   |                       |                       |                |                    |                    |                            |
| 25.50<br>(19.01)  | 1365<br>(6.07)                 | 7.01<br>(11.27)        | 2538                            | 1.94      | 3.056<br>(11.567) | 0.838<br>(0.510)      | 8.34<br>(1.644)       | 189<br>(87.2)  | 70<br>(21.1)       | 89<br>(31.7)       | 28.640<br>(96.713)         |
| 50% of Pull at Reduced Engine Speed—Two Hours,<br>Speed Setting—11.1 MPH Hi Range at 2400 Engine RPM            |                                |                        |                                 |           |                   |                       |                       |                |                    |                    |                            |
| 25.24<br>(18.82)  | 1361<br>(6.06)                 | 6.95<br>(11.19)        | 1496                            | 1.81      | 2.448<br>(9.267)  | 0.678<br>(0.413)      | 10.31<br>(2.031)      | 210<br>(98.6)  | 68<br>(19.7)       | 92<br>(33.1)       | 28.620<br>(96.645)         |
| MAXIMUM POWER IN SELECTED GEARS<br>(The variable drive control was set by mfr. to give the travel speeds shown) |                                |                        |                                 |           |                   |                       |                       |                |                    |                    |                            |
| 41.41<br>(30.88)  | 6572<br>(29.23)                | 2.36<br>(3.80)         | 2402                            | 13.71     | Lo Range          |                       |                       | 184<br>(84.4)  | 64<br>(17.8)       | 71<br>(21.7)       | 28.560<br>(96.443)         |
| 41.57<br>(31.00)  | 5145<br>(22.89)                | 3.03<br>(4.88)         | 2401                            | 9.52      | Lo Range          |                       |                       | 210<br>(98.9)  | 68<br>(20.0)       | 80<br>(26.7)       | 28.660<br>(96.781)         |
| 41.53<br>(30.97)  | 4371<br>(19.44)                | 3.56<br>(5.73)         | 2400                            | 7.64      | Lo Range          |                       |                       | 209<br>(98.1)  | 67<br>(19.4)       | 79<br>(26.1)       | 28.660<br>(96.781)         |
| 41.14<br>(30.68)  | 3822<br>(17.00)                | 4.04<br>(6.50)         | 2400                            | 6.41      | Lo Range          |                       |                       | 210<br>(98.6)  | 67<br>(19.4)       | 78<br>(25.6)       | 28.660<br>(96.781)         |
| 37.28<br>(27.80)  | 3134<br>(13.94)                | 4.46<br>(7.18)         | 2400                            | 5.20      | Hi Range          |                       |                       | 208<br>(97.5)  | 66<br>(18.9)       | 76<br>(24.4)       | 28.660<br>(96.781)         |
| 41.24<br>(30.75)  | 3073<br>(13.67)                | 5.03<br>(8.10)         | 2399                            | 4.89      | Hi Range          |                       |                       | 202<br>(94.4)  | 64<br>(17.8)       | 74<br>(23.3)       | 28.660<br>(96.781)         |
| 42.67<br>(31.82)  | 2904<br>(12.92)                | 5.51<br>(8.87)         | 2399                            | 4.71      | Hi Range          |                       |                       | 197<br>(91.7)  | 63<br>(17.2)       | 71<br>(21.7)       | 28.660<br>(96.781)         |
| 43.35<br>(32.32)  | 2699<br>(12.01)                | 6.02<br>(9.69)         | 2401                            | 4.27      | Hi Range          |                       |                       | 195<br>(90.6)  | 60<br>(15.6)       | 67<br>(19.4)       | 28.660<br>(96.781)         |
| 43.14<br>(32.17)  | 2490<br>(11.07)                | 6.50<br>(10.46)        | 2401                            | 3.90      | Hi Range          |                       |                       | 207<br>(97.2)  | 69<br>(20.6)       | 82<br>(27.8)       | 28.650<br>(96.747)         |
| 43.49<br>(32.43)  | 2337<br>(10.40)                | 6.98<br>(11.23)        | 2403                            | 3.58      | Hi Range          |                       |                       | 207<br>(96.9)  | 70<br>(21.1)       | 84<br>(28.9)       | 28.650<br>(96.747)         |
| 43.59<br>(32.51)  | 2152<br>(9.57)                 | 7.60<br>(12.23)        | 2401                            | 3.20      | Hi Range          |                       |                       | 206<br>(96.7)  | 70<br>(21.1)       | 85<br>(29.4)       | 28.650<br>(96.747)         |
| 43.37<br>(32.34)  | 1977<br>(8.79)                 | 8.23<br>(13.24)        | 2399                            | 2.88      | Hi Range          |                       |                       | 207<br>(97.2)  | 71<br>(21.7)       | 87<br>(30.6)       | 28.650<br>(96.747)         |

Department of Agricultural Engineering

Dates of Test: May 25 to June 6, 1979

Manufacturer: INTERNATIONAL HARVESTER CO., 401 North Michigan Ave., Chicago, Ill. 60611

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°) 0.8401 Fuel weight 6.995 lbs/gal (0.838 kg/l) Oil SAE 30 API service classification SC-SE/CA-CD To motor 2.273 gal (8.603 l) Drained from motor 1.952 gal (7.388 l) Transmission and final drive lubricant I. H. Hytran fluid Total time engine was operated 38.5 hours

EINGINE: Make International Diesel Type Four cylinder vertical Serial No. 246DT20114054\* Crankshaft lengthwise Rated rpm 2400 Bore and stroke 3.937" × 5.062" (100 mm × 128.6 mm) Compression ratio 15.5 to 1 Displacement 246 cu in (4031 ml) Cranking system 12 volt Lubrication pressure Air cleaner two paper elements Oil filter one paper cartridge Oil cooler radiator for hydraulic and transmission fluid Fuel filter two paper elements Muffler vertical Cooling medium temperature control one thermostat

CHASSIS: Type standard Serial No. B600003B000719-X- Tread width rear 52" (1321 mm) to 76" (1930 mm) front 54" (1372 mm) to 74" (1880 mm) Wheel base 88" (2235 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 30.1" (764 mm) Vertical distance above roadway 30.2" (767 mm) Horizontal distance from center of rear wheel tread 0" (0 mm) to the right/left Hydraulic control system direct engine drive Transmission Infinitely variable hydrostatic using variable displacement pump and motor. A range transmission provides Hi and Lo range Advertised speeds mph (km/h) Lo range 0-6.9 (0-11.1), Hi range 0-18.9 (0-30.4); reverse Lo range 0-3.0 (0-4.8), Hi range 0-8.0 (0-12.9) Clutch none—hydrostatic drive can be controlled by foot pedal Brakes single wet disc hydraulically operated by two foot pedals which can be locked together Steering hydrostatic Turning radius (on concrete surface with brake applied) right 134" (3.40 m) left 134" (3.40 m) (on concrete surface without brake) right 153" (3.88 m) left 153" (3.88 m) Turning space diameter (on concrete surface with brake applied) right 278" (7.06 m) left 278" (7.06 m) (on concrete surface without brake) right 316" (8.03 m) left 316" (8.03 m) Power take-off 540 rpm at 2222 engine rpm.

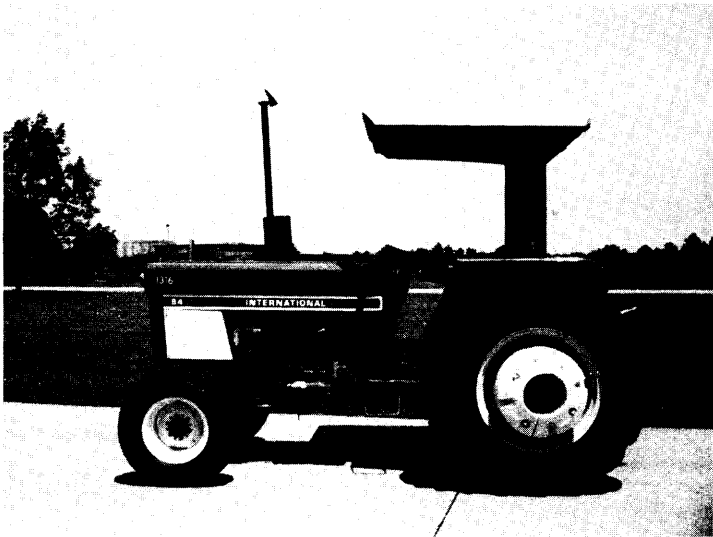
REPAIRS and ADJUSTMENTS: No repairs or adjustments.

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 return was 152°F (66.5°C). Twelve travel speeds were chosen between tire tangential pull limit and 10 mph (16.1 km/h).

| LUGGING ABILITY IN SPEED SETTING—6.0 MPH HI RANGE |         |         |         |         |         |         |
|---|---------|---------|---------|---------|---------|---------|
| Crankshaft Speed rpm                              | 2401    | 2159    | 1921    | 1676    | 1439    | 1198    |
| Pull—lbs  | 2699    | 2884    | 2991    | 3188    | 3168    | 3124    |
| (kN)  | (12.01) | (12.83) | (13.31) | (14.18) | (14.09) | (13.90) |
| Increase in Pull %                                | 0       | 7       | 11      | 18      | 17      | 16      |
| Power—Hp  | 43.35   | 40.88   | 37.04   | 33.01   | 27.79   | 21.71   |
| (kW)  | (32.32) | (30.49) | (27.62) | (24.61) | (20.72) | (16.19) |
| Speed—Mph   | 6.02    | 5.32    | 4.64    | 3.88    | 3.29    | 2.61    |
| (km/h)  | (9.69)  | (8.55)  | (7.47)  | (6.25)  | (5.29)  | (4.19)  |
| Slip %  | 4.27    | 4.77    | 4.89    | 5.26    | 5.26    | 5.26    |

| TRACTOR SOUND LEVEL WITHOUT CAB               |  | dB(A) |
|---|--|-------|
| Maximum Available Power—Two Hours             |  | 99.0  |
| 75% of Pull at Maximum Power—Ten Hours        |  | 98.5  |
| 50% of Pull at Maximum Power—Two Hours        |  | 99.5  |
| 50% of Pull at Reduced Engine Speed—Two Hours |  | 95.5  |
| Bystander in Hi Range                         |  | 88.0  |

| TIRES, BALLAST AND WEIGHT        |                             | With Ballast             | Without Ballast          |
|----------------------------------|-----------------------------|--------------------------|--------------------------|
| Rear Tires                       | —No., size, ply & psi (kPa) | Two 16.9-28; 6; 16 (110) | Two 16.9-28; 6; 16 (110) |
|                                  | —Liquid (each)              | 900 lb (408 kg)          | None                     |
|                                  | —Cast Iron (each)           | 625 lb (284 kg)          | None                     |
| Front Tires                      | —No., size, ply & psi (kPa) | Two 9.5L-15; 6; 36 (250) | Two 9.5L-15; 6; 36 (250) |
|                                  | —Liquid (each)              | None                     | None                     |
|                                  | —Cast Iron (each)           | 32 lb (15 kg)            | None                     |
| Height of Drawbar                |                             | 14.5 in (370 mm)         | 14.5 in (370 mm)         |
| Static Weight with Operator—Rear |                             | 7030 lb (3189 kg)        | 3980 lb (1805 kg)        |
|                                  | Front                       | 2090 lb (948 kg)         | 2025 lb (919 kg)         |
|                                  | Total                       | 9120 lb (4137 kg)        | 6005 lb (2724 kg)        |



International Hydro 84 Utility Diesel

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1316**.

LOUIS I. LEVITICUS  
Engineer-in-Charge

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

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