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## Test 1378: Case 1190 and 1194 Manual Diesel 12-Speed

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1378 — CASE 1190 MANUAL DIESEL ALSO CASE 1194 DIESEL 12 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—650 rpm) |                                |                   |                       |                       |                     |                    |                    |                               |                    |
| 43.09<br>(32.13)                                 | 2200                           | 2.932<br>(11.099) | 0.477<br>(0.290)      | 14.70<br>(2.895)      | 200<br>(93.5)       | 54<br>(12.4)       | 75<br>(23.9)       | 28.950<br>(97.760)            |                    |
| Standard Power take-off Speed (540 rpm)—One Hour |                                |                   |                       |                       |                     |                    |                    |                               |                    |
| 38.54<br>(28.74)                                 | 1827                           | 2.570<br>(9.729)  | 0.467<br>(0.284)      | 14.99<br>(2.954)      | 208<br>(98.0)       | 54<br>(12.1)       | 75<br>(23.7)       | 28.945<br>(97.743)            |                    |
| VARYING POWER AND FUEL CONSUMPTION—Two Hours     |                                |                   |                       |                       |                     |                    |                    |                               |                    |
| 37.60<br>(28.04)                                 | 2259                           | 2.488<br>(9.418)  | 0.464<br>(0.282)      | 15.12<br>(2.977)      | 188<br>(86.4)       | 54<br>(12.2)       | 76<br>(24.2)       | .....<br>.....                |                    |
| 0.00<br>(0.00)                                   | 2352                           | 0.698<br>(2.642)  | .....<br>.....        | .....<br>.....        | 171<br>(76.9)       | 54<br>(12.2)       | 75<br>(23.9)       | .....<br>.....                |                    |
| 19.22<br>(14.33)                                 | 2310                           | 1.434<br>(5.428)  | 0.523<br>(0.318)      | 13.40<br>(2.640)      | 176<br>(80.0)       | 54<br>(12.2)       | 75<br>(23.9)       | .....<br>.....                |                    |
| 42.84<br>(31.95)                                 | 2199                           | 2.950<br>(11.167) | 0.483<br>(0.294)      | 14.52<br>(2.861)      | 200<br>(93.3)       | 54<br>(12.2)       | 76<br>(24.2)       | .....<br>.....                |                    |
| 9.70<br>(7.23)                                   | 2332                           | 1.058<br>(4.005)  | 0.764<br>(0.465)      | 9.17<br>(1.805)       | 175<br>(79.4)       | 54<br>(12.2)       | 76<br>(24.2)       | .....<br>.....                |                    |
| 28.47<br>(21.23)                                 | 2280                           | 1.901<br>(7.196)  | 0.468<br>(0.285)      | 14.98<br>(2.950)      | 180<br>(81.9)       | 54<br>(12.2)       | 75<br>(23.9)       | .....<br>.....                |                    |
| Av<br>Av   | 22.97<br>(17.13)               | 2289<br>(6.643)   | 1.755<br>(0.326)      | 0.535<br>(0.326)      | 13.09<br>(2.579)    | 181<br>(83.0)      | 54<br>(12.2)       | 75<br>(24.1)                  | 28.910<br>(97.625) |

## 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 (4-1) Gear              |                                |                        |                                 |           |                   |                       |                       |                     |                    |                    |                            |
| 34.65<br>(25.84)  | 2512<br>(11.17)                | 5.17<br>(8.32)         | 2200                            | 6.88      | 2.836<br>(10.735) | 0.574<br>(0.349)      | 12.22<br>(2.407)      | 213<br>(100.6)      | 59<br>(15.0)       | 80<br>(26.7)       | 28.630<br>(96.680)         |
| 75% of Pull at Maximum Power—Ten Hours 8th (4-1) Gear         |                                |                        |                                 |           |                   |                       |                       |                     |                    |                    |                            |
| 28.62<br>(21.34)  | 1969<br>(8.76)                 | 5.45<br>(8.77)         | 2271                            | 4.98      | 2.273<br>(8.604)  | 0.556<br>(0.338)      | 12.59<br>(2.480)      | 191<br>(88.3)       | 62<br>(16.7)       | 68<br>(20.0)       | 28.103<br>(94.900)         |
| 50% of Pull at Maximum Power—Two Hours 8th (4-1) Gear         |                                |                        |                                 |           |                   |                       |                       |                     |                    |                    |                            |
| 19.71<br>(14.70)  | 1313<br>(5.84)                 | 5.63<br>(9.06)         | 2309                            | 3.51      | 1.730<br>(6.549)  | 0.615<br>(0.374)      | 11.39<br>(2.244)      | 188<br>(86.7)       | 37<br>(2.8)        | 42<br>(5.6)        | 28.675<br>(96.830)         |
| 50% of Pull at Reduced Engine Speed—Two Hours 10th (3-3) Gear |                                |                        |                                 |           |                   |                       |                       |                     |                    |                    |                            |
| 19.67<br>(14.67)  | 1315<br>(5.85)                 | 5.61<br>(9.03)         | 1602                            | 3.42      | 1.445<br>(5.470)  | 0.515<br>(0.313)      | 13.61<br>(2.681)      | 183<br>(83.9)       | 39<br>(3.9)        | 45<br>(7.2)        | 28.735<br>(97.030)         |
| MAXIMUM POWER IN SELECTED GEARS                               |                                |                        |                                 |           |                   |                       |                       |                     |                    |                    |                            |
| 33.74<br>(25.16)  | 4620<br>(20.55)                | 2.74<br>(4.41)         | 2246                            | 14.67     | 5th (1-3) Gear    |                       |                       | 188<br>(86.7)       | 40<br>(4.4)        | 47<br>(8.3)        | 28.780<br>(97.190)         |
| 33.93<br>(25.30)  | 3980<br>(17.70)                | 3.20<br>(5.15)         | 2199                            | 11.94     | 6th (2-2) Gear    |                       |                       | 205<br>(96.1)       | 53<br>(11.7)       | 67<br>(19.4)       | 28.660<br>(96.780)         |
| 36.08<br>(26.90)  | 3212<br>(14.29)                | 4.21<br>(6.78)         | 2199                            | 8.82      | 7th (3-2) Gear    |                       |                       | 203<br>(95.0)       | 53<br>(11.7)       | 66<br>(18.9)       | 28.660<br>(96.780)         |
| 36.21<br>(27.00)  | 2632<br>(11.71)                | 5.16<br>(8.30)         | 2200                            | 7.07      | 8th (4-1) Gear    |                       |                       | 201<br>(93.9)       | 52<br>(11.1)       | 65<br>(18.3)       | 28.670<br>(96.810)         |
| 35.89<br>(26.76)  | 2285<br>(10.16)                | 5.89<br>(9.48)         | 2200                            | 5.98      | 9th (2-3) Gear    |                       |                       | 203<br>(95.0)       | 53<br>(11.7)       | 69<br>(20.6)       | 28.660<br>(96.780)         |
| 36.60<br>(27.29)  | 1807<br>(8.04)                 | 7.60<br>(12.23)        | 2200                            | 4.69      | 10th (3-3) Gear   |                       |                       | 203<br>(95.0)       | 54<br>(12.2)       | 71<br>(21.7)       | 28.660<br>(96.780)         |
| 35.60<br>(26.55)  | 1510<br>(6.72)                 | 8.84<br>(14.23)        | 2197                            | 3.94      | 11th (4-2) Gear   |                       |                       | 203<br>(95.0)       | 55<br>(12.8)       | 73<br>(22.8)       | 28.660<br>(96.780)         |

Department of Agricultural Engineering

Dates of Test: March 27 to April 9, 1981

Manufacturer: J. I. CASE COMPANY, Racine,  
Wisconsin 53404

**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°) 0.8416 Fuel weight 7.007 lbs/gal (0.840 kg/l) Oil SAE 30 API service classification CD-SE To motor 1.658 gal (6.276 l) Drained from motor 1.470 gal (5.565 l) Transmission lubricant Case TFD fluid Final drive lubricant Case ETHB fluid Total time engine was operated 38.0 hours.

**ENGINE:** Make Case Diesel Type three cylinder vertical Serial No. 16500311310852 Crankshaft lengthwise Rated rpm 2200 Bore and stroke 3.939" × 4.500" (100 mm × 114.3 mm) Compression ratio 17 to 1 Displacement 165 cu in (2705 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements with centrifugal precleaner Oil filter one full flow cartridge Fuel filter two paper elements with sediment bowl and screen Muffler vertical Cooling medium temperature control one thermostat.

**CHASSIS:** Type standard Serial No. 1190/00/11030782 Tread width rear 56" (1422 mm) to 76" (1930 mm) front 52" (1321 mm) to 72" (1829 mm) Wheel base 77" (1956 mm) Center of gravity (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 29.4" (747 mm) Vertical distance above roadway 28.8" (732 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 1.1 (1.8) second 1.8 (2.9) third 2.2 (3.5) fourth 2.8 (4.5) fifth 3.2 (5.1) sixth 3.7 (5.9) seventh 4.7 (7.5) eighth 5.6 (9.0) ninth 6.3 (10.2) tenth 8.1 (13.0) eleventh 9.3 (15.0) twelfth 16.1 (25.9) reverse 1.8 (2.9), 3.6 (5.9), 4.6 (7.3), 9.2 (14.6) Clutch single dry disc in combination with PTO clutch operated by foot pedal Brakes drum and shoe operated by two foot pedals which can be locked together and hand lever Steering hydrostatic Turning radius (on concrete surface with brake applied) right 114" (2.90 m) left 114" (2.90 m) (on concrete surface without brake) right 128" (3.25 m) left 128" (3.25 m) Turning space diameter (on concrete surface with brake applied) right 236" (5.99 m) left 236" (5.99 m) (on concrete surface without brake) right 264" (6.71 m) left 264" (6.71 m) Power take-off 540 rpm at 1827 engine rpm.

# LUGGING ABILITY IN 8th (4-1) GEAR

|                      |                  |                  |                  |                  |                  |                  |
|----------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Crankshaft Speed rpm | 2200             | 1978             | 1757             | 1548             | 1311             | 1090             |
| Pull—lbs<br>(kN)     | 2632<br>(11.71)  | 2801<br>(12.46)  | 2944<br>(13.10)  | 3007<br>(13.38)  | 2977<br>(13.24)  | 2801<br>(12.46)  |
| Increase in Pull %   | 0                | 6                | 12               | 14               | 13               | 6                |
| Power—Hp<br>(kW)     | 36.21<br>(27.00) | 34.51<br>(25.73) | 32.06<br>(23.91) | 28.82<br>(21.49) | 24.15<br>(18.01) | 19.01<br>(14.18) |
| Speed—Mph<br>(km/h)  | 5.16<br>(8.30)   | 4.62<br>(7.44)   | 4.08<br>(6.57)   | 3.59<br>(5.78)   | 3.04<br>(4.89)   | 2.54<br>(4.09)   |
| Slip %               | 7.07             | 7.56             | 7.88             | 7.98             | 8.19             | 7.66             |

| TRACTOR SOUND LEVEL WITHOUT CAB               |  | dB(A) |
|---|--|-------|
| Maximum Available Power—Two Hours             |  | 97.5  |
| 75% of Pull at Maximum Power—Ten Hours        |  | 94.5  |
| 50% of Pull at Maximum Power—Two Hours        |  | 93.0  |
| 50% of Pull at Reduced Engine Speed—Two Hours |  | 91.0  |
| Bystander in 12th (4-3) gear                  |  | 85.5  |

## TIRES, BALLAST AND WEIGHT

|                                  |                             | With Ballast             | Without Ballast          |
|----------------------------------|-----------------------------|--------------------------|--------------------------|
| Rear Tires                       | —No., size, ply & psi (kPa) | Two 13.6-28; 6; 20 (140) | Two 13.6-28; 6; 20 (140) |
|                                  | —Liquid (each)              | 470 lb (213 kg)          | None                     |
|                                  | —Cast Iron (each)           | 605 lb (274 kg)          | None                     |
| Front Tires                      | —No., size, ply & psi (kPa) | Two 6:00-16; 6; 32 (220) | Two 6:00-16; 6; 32 (220) |
|                                  | —Liquid (each)              | None                     | None                     |
|                                  | —Cast Iron (each)           | 5 lb (2 kg)              | None                     |
| Height of drawbar                |                             | 17.5 in (445 mm)         | 17.5 in (445 mm)         |
| Static Weight with Operator—Reat |                             | 5060 lb (2295 kg)        | 2910 lb (1320 kg)        |
|                                  |                             | 1720 lb (780 kg)         | 1710 lb (776 kg)         |
|                                  |                             | 6780 lb (3075 kg)        | 4620 lb (2096 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 was 134°F (56.7°C). Seven gears were chosen between 15% slip and 10 mph (16.1 km/h).

**NOTE:** Supplemental permit for Case 1194 granted January 1984.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1378.

LOUIS I. LEVITICUS  
Engineer-in-Charge

K. VON BARGEN  
W. E. SPLINTER  
L. L. BASHFORD

Board of Tractor Test Engineers



Case 1190 Manual Diesel