2011

# Test 1992: Case IH Magnum 180

Nebraska Tractor Test Lab
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# NEBRASKA OECD TRACTOR TEST 1992–SUMMARY 767
# CASE IH MAGNUM 180 DIESEL
# 19 SPEED

## CHASSIS SERIAL NUMBERS ZARH06086 AND HIGHER

### POWER TAKE-OFF PERFORMANCE

| Power HP *(kW)* | Crank shaft speed rpm | Diesel Consumption Gal/hr *(l/h)* | lb/hp.hr *(kg/kW.h)* | D.E.F. Consumption Hp.hr/gal *(kW.h/l)* | D.E.F. Consumption Gal/hr *(l/h)* | Mean Atmospheric Conditions |
|---|---|---|---|---|---|---|
| **MAXIMUM POWER AND FUEL CONSUMPTION** | | | | | | |
| **Rated Engine Speed—(PTO speed—1109 rpm)** | | | | | | |
| 173.54 *(129.41)* | 2099 | 9.42 *(35.65)* | 0.383 *(0.233)* | 18.43 *(3.63)* | 0.56 *(2.13)* | |
| **Standard Power Take-off Speed (1000 rpm)** | | | | | | |
| 185.77 *(138.53)* | 1893 | 9.64 *(36.49)* | 0.366 *(0.223)* | 19.27 *(3.80)* | 0.54 *(2.04)* | |
| **Maximum Power (1 hour)** | | | | | | |
| 187.92 *(140.14)* | 1800 | 9.55 *(36.15)* | 0.359 *(0.218)* | 19.68 *(3.88)* | 0.57 *(2.14)* | |
| **VARYING POWER AND FUEL CONSUMPTION** | | | | | | |
| 173.54 *(129.41)* | 2099 | 9.42 *(35.65)* | 0.383 *(0.233)* | 18.43 *(3.63)* | 0.56 *(2.13)* | Air temperature |
| 151.51 *(112.98)* | 2159 | 8.53 *(32.28)* | 0.397 *(0.242)* | 17.77 *(3.50)* | 0.49 *(1.84)* | 74°F *(23°C)* |
| 114.64 *(85.49)* | 2174 | 6.89 *(26.09)* | 0.424 *(0.258)* | 16.64 *(3.28)* | 0.33 *(1.24)* | Relative humidity |
| 76.82 *(57.28)* | 2188 | 5.34 *(20.20)* | 0.490 *(0.298)* | 14.39 *(2.84)* | 0.19 *(0.73)* | 63% |
| 38.79 *(28.92)* | 2202 | 3.61 *(13.68)* | 0.657 *(0.400)* | 10.73 *(2.11)* | 0.10 *(0.37)* | Barometer |
| 4.02 *(3.00)* | 2215 | 2.14 *(8.08)* | 3.752 *(2.282)* | 1.88 *(0.37)* | 0.01 *(0.02)* | 28.53" Hg *(96.61 kPa)* |

Maximum torque - 599 lb.-ft. *(812 Nm)* at 1450 rpm
Maximum torque rise - 38.0%
Torque rise at 1700 engine rpm - 32%
Power increase at 1800 engine rpm - 8.3%

### DRAWBAR PERFORMANCE
#### UNBALLASTED - FRONT DRIVE ENGAGED
#### FUEL CONSUMPTION CHARACTERISTICS

| Power Hp *(kW)* | Drawbar pull lbs *(kN)* | Speed mph *(km/h)* | Crank-shaft speed rpm | Slip % | Fuel Consumption lb/hp.hr *(kg/kW.h)* | Fuel Consumption Hp.hr/gal *(kW.h/l)* | Temp.°F cool-ing med | *(°C)* Air dry bulb | Barom. inch Hg *(kPa)* |
|---|---|---|---|---|---|---|---|---|---|
| **Maximum Power—9th Gear** | | | | | | | | | |
| 151.22 *(112.76)* | 12071 *(53.69)* | 4.70 *(7.56)* | 2101 | 3.1 | 0.443 *(0.270)* | 15.92 *(3.14)* | 187 *(86)* | 63 *(17)* | 28.87 *(97.77)* |
| **75% of Pull at Maximum Power—9th Gear** | | | | | | | | | |
| 115.79 *(86.34)* | 9062 *(40.31)* | 4.79 *(7.71)* | 2124 | 2.1 | 0.471 *(0.287)* | 14.97 *(2.95)* | 187 *(86)* | 67 *(19)* | 28.82 *(97.60)* |
| **50% of Pull at Maximum Power—9th Gear** | | | | | | | | | |
| 78.67 *(58.66)* | 6042 *(26.88)* | 4.89 *(7.86)* | 2148 | 1.3 | 0.541 *(0.329)* | 13.03 *(2.57)* | 187 *(86)* | 67 *(19)* | 28.82 *(97.60)* |
| **75% of Pull at Reduced Engine Speed—11th Gear** | | | | | | | | | |
| 115.98 *(86.49)* | 9006 *(40.06)* | 4.83 *(7.77)* | 1507 | 2.1 | 0.419 *(0.255)* | 16.85 *(3.32)* | 184 *(84)* | 68 *(20)* | 28.80 *(97.53)* |
| **50% of Pull at Reduced Engine Speed—11th Gear** | | | | | | | | | |
| 78.46 *(58.51)* | 6054 *(26.93)* | 4.86 *(7.82)* | 1505 | 1.3 | 0.460 *(0.280)* | 15.36 *(3.02)* | 183 *(84)* | 67 *(19)* | 28.81 *(97.56)* |

**Location of tests:** Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832

**Dates of tests:** May 24 - June 13, 2011

**Manufacturer:** CNH America LLC, 700 State St. Racine, Wi. 53404 USA

**CONSUMABLE Fluids, OIL and TIME: Fuel** No. 2 Diesel **Specific gravity converted to 60°/60°F *(15°/15°C)*** 0.8476 **Fuel weight** 7.057 lbs/gal *(0.846 kg/l)* **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal *(1.087 kg/l)* **Oil SAE** 15W40 **API service classification** CI-4 **Transmission and hydraulic lubricant** Case IH Akcela Nexplore fluid **Front axle lubricant** SAE 85W-140 API GL-5 **Total time engine was operated:** 24.5 hours

**ENGINE: Make** F.P.T. Diesel **Type** six cylinder vertical with turbocharger, air to air intercooler and D.E.F. (diesel exhaust fluid) exhaust treatment. **Serial No.** *000754950* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.094" x 5.197" *(104.0 mm x 132.0 mm)* **Compression ratio** 17.5 to 1 **Displacement** 410 cu in *(6728 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Fuel cooler** radiator for pump return fuel **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate**: 62.8 - 67.2 lb/h *(28.5 - 30.5 kg/h)* **High idle:** 2160 - 2210 rpm, 2190 - 2240 rpm (PTO engaged) **Turbo boost:** nominal 23.2 - 26.1 psi *(160 - 180 kPa)* as measured 24.7 psi *(170 kPa)*

**CHASSIS: Type** front wheel assist **Serial No.** *ZARH06386* **Tread width** rear 64.0" *(1626 mm)* to 129.0" *(3277 mm)* front 60.0" *(1524 mm)* to 88.0" *(2235 mm)* **Wheelbase** 118.3" *(3005 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph *(km/h)*** first 1.15 *(1.85)* second 1.37 *(2.20)* third 1.65 *(2.65)* fourth 1.97 *(3.17)* fifth 2.34 *(3.77)* sixth 2.80 *(4.50)* seventh 3.32 *(5.35)* eighth 3.98 *(6.40)* ninth 4.78 *(7.69)* tenth 5.71 *(9.19)* eleventh 6.80 *(10.94)* twelfth 8.12 *(13.06)* thirteenth 9.61 *(15.46)* fourteenth 11.48 *(18.48)* fifteenth 13.79 *(22.20)* sixteenth 16.49 *(26.54)* seventeenth 19.64 *(31.60)* eighteenth 24.56 *(39.52)* nineteenth 26.22 *(42.20)* (1850 engine rpm) reverse 2.54 *(4.08)*, 3.03 *(4.88)*, 3.65 *(5.87)*, 4.36 *(7.01)*, 5.19 *(8.35)*, 6.19 *(9.96)*

## DRAWBAR PERFORMANCE

### UNBALLASTED - FRONT DRIVE ENGAGED
### MAXIMUM POWER IN SELECTED GEARS

| Power Hp *(kW)* | Drawbar pull lbs *(kN)* | Speed mph *(km/h)* | Crank-shaft speed rpm | Slip % | Fuel Consumption lb/hp.hr *(kg/kW.h)* | Hp.hr/gal *(kW.h/l)* | Temp.°F *(°C)* cool-ing med | Air dry bulb | Barom. inch Hg *(kPa)* |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 6th Gear | | | | |
| 123.62 | 17960 | 2.59 | 2105 | 9.2 | 0.493 | 14.30 | 188 | 68 | 28.78 |
| *(92.18)* | *(79.89)* | *(4.16)* | | | *(0.300)* | *(2.82)* | *(87)* | *(20)* | *(97.46)* |
| | | | | | 7th Gear | | | | |
| 140.78 | 16849 | 3.14 | 2101 | 7.1 | 0.462 | 15.26 | 187 | 61 | 28.87 |
| *(104.98)* | *(74.95)* | *(5.05)* | | | *(0.281)* | *(3.01)* | *(86)* | *(16)* | *(97.77)* |
| | | | | | 8th Gear | | | | |
| 149.95 | 14580 | 3.86 | 2101 | 4.4 | 0.448 | 15.76 | 188 | 61 | 28.87 |
| *(111.82)* | *(64.85)* | *(6.20)* | | | *(0.272)* | *(3.10)* | *(87)* | *(16)* | *(97.77)* |
| | | | | | 9th Gear | | | | |
| 151.22 | 12071 | 4.70 | 2101 | 3.1 | 0.443 | 15.92 | 187 | 63 | 28.87 |
| *(112.76)* | *(53.69)* | *(7.56)* | | | *(0.270)* | *(3.14)* | *(86)* | *(17)* | *(97.77)* |
| | | | | | 10th Gear | | | | |
| 150.68 | 9997 | 5.65 | 2101 | 2.4 | 0.442 | 15.98 | 188 | 65 | 28.87 |
| *(112.36)* | *(44.47)* | *(9.09)* | | | *(0.269)* | *(3.15)* | *(86)* | *(18)* | *(97.77)* |
| | | | | | 11th Gear | | | | |
| 149.72 | 8299 | 6.77 | 2102 | 2.0 | 0.439 | 16.08 | 188 | 65 | 28.87 |
| *(111.64)* | *(36.92)* | *(10.89)* | | | *(0.267)* | *(3.17)* | *(86)* | *(18)* | *(97.77)* |
| | | | | | 12th Gear | | | | |
| 147.45 | 6829 | 8.10 | 2098 | 1.6 | 0.451 | 15.64 | 188 | 65 | 28.87 |
| *(109.95)* | *(30.37)* | *(13.03)* | | | *(0.275)* | *(3.08)* | *(87)* | *(18)* | *(97.77)* |

**Clutch** multiple wet disc electrohydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1950 engine rpm or 1000 rpm at 1892 engine rpm **Unladen tractor mass** 18850 lb *(8550 kg)*

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments.

**Note:** The performance figures on this report apply to tractors with chassis serial numbers ZARH06086 and higher.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests the fuel temperature at the primary fuel filter was maintained at 104°F *(40°C)*. The pull in 6th gear was limited to avoid excessive tractor power hop. The performance results on this summary were taken from OECD tests conducted under the Code 2 Test Code Procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1992**, Nebraska Summary 767, January 13, 2012.

Roger M. Hoy
Director

M.F. Kocher
D.R. Keshwani
P.J. Jasa
Board of Tractor Test Engineers

| TRACTOR SOUND LEVEL WITH CAB | Front Wheel Drive Engaged dB(A) | Disengaged dB(A) |
|---|---|---|
| At no load in 9th gear | 67.1 | 67.1 |
| Bystander in 18th gear | | 83.0 |

| TIRES, BALLAST AND WEIGHT | With Ballast | Without Ballast |
|---|---|---|
| **Rear Tires -** No., size, ply & psi *(kPa)* | Four 520/85R42;**;8*(55)* | Two 520/85R42;**;16*(110)* |
| **Ballast** - Duals (total) | 1950 lb *(885 kg)* | None |
| - Test Equip (total) | 75 lb *(34 kg)* | None |
| **Front Tires -** No., size, ply & psi *(kPa)* | Two 420/90R30;**;15*(105)* | Two 420/90R30;**;15*(105)* |
| **Ballast** - Liquid (total) | None | None |
| - Cast Iron (total) | None | None |
| **Height of Drawbar** | 19.5 in *(495 mm)* | 19.0 in *(485 mm)* |
| **Static Weight with operator** - Rear | 13200 lb *(5987 kg)* | 11140 lb *(5053 kg)* |
| - Front | 7850 lb *(3561 kg)* | 7885 lb *(3577 kg)* |
| - Total | 21050 lb *(9548 kg)* | 19025 lb *(8630 kg)* |

## DRAWBAR PERFORMANCE AT 1800 ENGINE RPM

### UNBALLASTED - FRONT DRIVE ENGAGED

### MAXIMUM POWER IN SELECTED GEARS

| Power Hp *(kW)* | Drawbar pull lbs *(kN)* | Speed mph *(km/h)* | Crank-shaft speed rpm | Slip % | Fuel Consumption lb/hp.hr *(kg/kW.h)* | Hp.hr/gal *(kW.h/l)* | Temp.°F *(°C)* cool-ing med | Air dry bulb | Barom. inch Hg *(kPa)* |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 6th Gear | | | | |
| 123.86 *(92.36)* | 18049 *(80.28)* | 2.58 *(4.14)* | 2105 | 9.4 | 0.498 *(0.303)* | 14.17 *(2.79)* | 188 *(87)* | 68 *(20)* | 28.78 *(97.46)* |
| | | | | | 7th Gear | | | | |
| 141.17 *(105.27)* | 16956 *(75.42)* | 3.13 *(5.03)* | 2101 | 7.5 | 0.463 *(0.282)* | 15.24 *(3.00)* | 188 *(86)* | 61 *(16)* | 28.87 *(97.77)* |
| | | | | | 8th Gear | | | | |
| 153.98 *(114.82)* | 16224 *(72.17)* | 3.56 *(5.73)* | 1972 | 6.0 | 0.443 *(0.269)* | 15.95 *(3.14)* | 187 *(86)* | 62 *(17)* | 28.87 *(97.77)* |
| | | | | | 9th Gear | | | | |
| 161.18 *(120.19)* | 15310 *(68.10)* | 3.95 *(6.36)* | 1801 | 4.9 | 0.422 *(0.257)* | 16.71 *(3.29)* | 187 *(86)* | 64 *(18)* | 28.87 *(97.77)* |
| | | | | | 10th Gear | | | | |
| 162.03 *(120.83)* | 12679 *(56.40)* | 4.79 *(7.71)* | 1801 | 3.3 | 0.418 *(0.254)* | 16.88 *(3.32)* | 186 *(86)* | 65 *(18)* | 28.87 *(97.77)* |
| | | | | | 11th Gear | | | | |
| 164.36 *(122.56)* | 10735 *(47.75)* | 5.75 *(9.25)* | 1801 | 2.6 | 0.411 *(0.250)* | 17.18 *(3.38)* | 187 *(86)* | 65 *(18)* | 28.87 *(97.77)* |
| | | | | | 12th Gear | | | | |
| 162.36 *(121.07)* | 8798 *(39.14)* | 6.93 *(11.15)* | 1801 | 2.0 | 0.415 *(0.252)* | 16.99 *(3.35)* | 187 *(86)* | 66 *(19)* | 28.87 *(97.77)* |
| | | | | | 13th Gear | | | | |
| 165.43 *(123.36)* | 7562 *(33.64)* | 8.21 *(13.20)* | 1801 | 1.7 | 0.408 *(0.248)* | 17.32 *(3.41)* | 188 *(86)* | 66 *(19)* | 28.87 *(97.77)* |

## DRAWBAR PERFORMANCE AT 1800 ENGINE RPM

### BALLASTED - FRONT DRIVE ENGAGED

### MAXIMUM POWER IN SELECTED GEARS

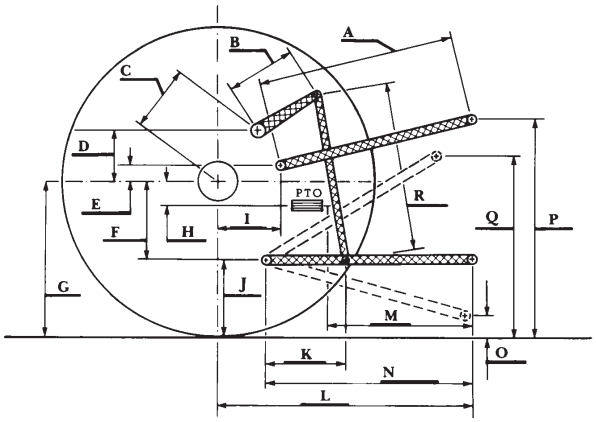
| Power Hp *(kW)* | Drawbar pull lbs *(kN)* | Speed mph *(km/h)* | Crank-shaft speed rpm | Slip % | Fuel Consumption lb/hp.hr *(kg/kW.h)* | Hp.hr/gal *(kW.h/l)* | Temp.°F *(°C)* cool-ing med | Air dry bulb | Barom. inch Hg *(kPa)* |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 6th Gear | | | | | |
| 141.95 *(105.85)* | 20282 *(90.22)* | 2.63 *(4.22)* | 2100 | 7.1 | 0.470 *(0.286)* | 15.01 *(2.96)* | 188 *(86)* | 68 *(20)* | 29.10 *(98.54)* |
| | | | | 7th Gear | | | | | |
| 153.04 *(114.12)* | 19063 *(84.79)* | 3.01 *(4.84)* | 2006 | 6.2 | 0.446 *(0.271)* | 15.82 *(3.12)* | 187 *(86)* | 59 *(15)* | 29.09 *(98.51)* |
| | | | | 8th Gear | | | | | |
| 161.77 *(120.63)* | 18414 *(81.91)* | 3.30 *(5.30)* | 1820 | 5.3 | 0.423 *(0.258)* | 16.67 *(3.28)* | 186 *(86)* | 60 *(16)* | 29.09 *(98.51)* |
| | | | | 9th Gear | | | | | |
| 164.05 *(122.33)* | 15340 *(68.23)* | 4.01 *(6.45)* | 1801 | 3.1 | 0.415 *(0.253)* | 17.00 *(3.35)* | 186 *(86)* | 62 *(17)* | 29.09 *(98.51)* |
| | | | | 10th Gear | | | | | |
| 162.47 *(121.15)* | 12617 *(56.12)* | 4.83 *(7.77)* | 1800 | 2.3 | 0.416 *(0.253)* | 16.97 *(3.34)* | 186 *(86)* | 63 *(17)* | 29.08 *(98.48)* |
| | | | | 11th Gear | | | | | |
| 164.70 *(122.81)* | 10708 *(47.63)* | 5.77 *(9.28)* | 1799 | 1.9 | 0.412 *(0.251)* | 17.12 *(3.37)* | 186 *(86)* | 64 *(18)* | 29.09 *(98.51)* |
| | | | | 12th Gear | | | | | |
| 160.33 *(119.56)* | 8688 *(38.64)* | 6.93 *(11.14)* | 1800 | 1.5 | 0.423 *(0.257)* | 16.69 *(3.29)* | 186 *(86)* | 66 *(19)* | 29.09 *(98.51)* |
| | | | | 13th Gear | | | | | |
| 163.86 *(122.19)* | 7487 *(33.30)* | 8.21 *(13.21)* | 1799 | 1.3 | 0.417 *(0.253)* | 16.94 *(3.34)* | 186 *(86)* | 67 *(19)* | 29.09 *(98.51)* |

## HYDRAULIC PERFORMANCE

CATEGORY: IIIN
Quick Attach: No, Yes
OECD Static test

| | |
|---|---|
| Maximum force exerted through whole range: | 12204 lbs *(54.3 kN)*(100 mm cylinders) |
| | 14269 lbs *(63.5 kN)*(110 mm cylinders w/QC) |
| | **two outlet sets combined** |
| i) Sustained pressure at compensator cutoff: | 2856 psi *(197 bar)* |
| ii) Pump delivery rate at minimum pressure and 2200 engine rpm: | 35.8 GPM *(135.6 l/min)* |
| iii)Pump delivery rate at maximum hydraulic power: | 31.5 GPM *(119.2 l/min)* |
| Delivery pressure: | 2528 psi *(174 bar)* |
| Power: | 46.4 HP *(34.6 kW)* |
| | **single outlet set** |
| i) Sustained pressure at compensator cutoff: | 2857 psi *(197 bar)* |
| ii) Pump delivery rate at minimum pressure and 2200 engine rpm: | 32.4 GPM *(122.7 l/min)* |
| iii)Pump delivery rate at maximum hydraulic power: | 28.8 GPM *(109.1 l/min)* |
| Delivery pressure: | 2385 psi *(164 bar)* |
| Power: | 40.1 HP *(29.9 kW)* |

## HITCH DIMENSIONS AS TESTED—NO LOAD




| | 100 mm cylinders | | 110 mm cylinders w/QC | |
|---|---|---|---|---|
| | inch | *mm* | inch | *mm* |
| A | 29.5 | *750* | 26.8 | *680* |
| B | 17.9 | *454* | 17.9 | *454* |
| C | 15.1 | *383* | 15.1 | *383* |
| D | 14.6 | *372* | 14.6 | *372* |
| E | 10.9 | *277* | 10.9 | *277* |
| F | 10.6 | *270* | 10.6 | *270* |
| G | 36.4 | *925* | 36.4 | *925* |
| H | 2.8 | *71* | 2.8 | *71* |
| I | 19.7 | *500* | 19.7 | *500* |
| J | 25.8 | *655* | 25.8 | *655* |
| K | 26.9 | *682* | 26.9 | *682* |
| L | 48.2 | *1224* | 48.1 | *1223* |
| *L' | -- | -- | 53.1 | *1349* |
| M | 22.4 | *570* | 22.4 | *570* |
| N | 38.3 | *974* | 38.3 | *974* |
| O | 9.0 | *229* | 9.1 | *230* |
| P | 47.8 | *1215* | 52.6 | *1335* |
| Q | 40.2 | *1022* | 37.7 | *957* |
| R | 36.6 | *930* | 37.7 | *957* |

*L' to Quick Attach ends


## CASE IH MAGNUM 180 DIESEL

**Institute of Agriculture and Natural Resources**
**University of Nebraska–Lincoln**