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2011

## Test 1993: CASE IH Magnum 190

Nebraska Tractor Test Laboratory

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# NEBRASKA OECD TRACTOR TEST 1993–SUMMARY 768

## CASE IH MAGNUM 190 DIESEL

### 19 SPEED

#### CHASSIS SERIAL NUMBERS ZARH06086 AND HIGHER

#### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption		Mean Atmospheric Conditions
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)	
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>						
<b>Rated Engine Speed—(PTO speed—1109 rpm)</b>						
189.90 (141.61)	2099	10.08 (38.18)	0.375 (0.228)	18.83 (3.71)	0.63 (2.38)	
<b>Standard Power Take-off Speed (1000 rpm)</b>						
204.49 (152.49)	1892	10.40 (39.38)	0.359 (0.218)	19.65 (3.87)	0.69 (2.61)	
<b>Maximum Power (1 hour)</b>						
204.49 (152.49)	1892	10.40 (39.38)	0.359 (0.218)	19.65 (3.87)	0.69 (2.61)	

#### VARYING POWER AND FUEL CONSUMPTION

189.90 (141.61)	2099	10.08 (38.18)	0.375 (0.228)	18.83 (3.71)	0.63 (2.38)	Air temperature
166.12 (123.88)	2162	9.10 (34.43)	0.386 (0.235)	18.26 (3.60)	0.58 (2.20)	73°F (23°C)
125.58 (93.64)	2179	7.32 (27.71)	0.411 (0.250)	17.16 (3.38)	0.39 (1.45)	Relative humidity
84.37 (62.92)	2194	5.55 (21.02)	0.464 (0.282)	15.20 (2.99)	0.23 (0.86)	52%
42.48 (31.67)	2209	3.71 (14.05)	0.617 (0.375)	11.44 (2.25)	0.10 (0.39)	Barometer
4.25 (3.17)	2223	2.05 (7.77)	3.406 (2.072)	2.07 (0.41)	0.00 (0.00)	28.51" Hg (96.55 kPa)

Maximum torque - 660 lb.-ft. (895 Nm) at 1450 rpm

Maximum torque rise - 38.9%

Torque rise at 1700 engine rpm - 32%

Power increase at 1893 engine rpm - 7.6%

#### 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 (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—9th Gear</b>									
165.67 (123.54)	13263 (58.99)	4.69 (7.54)	2099	3.0	0.430 (0.261)	16.43 (3.24)	188 (86)	62 (17)	28.89 (97.83)
<b>75% of Pull at Maximum Power—9th Gear</b>									
127.68 (95.21)	10002 (44.49)	4.79 (7.71)	2125	2.1	0.452 (0.275)	15.61 (3.08)	189 (87)	73 (23)	28.93 (97.97)
<b>50% of Pull at Maximum Power—9th Gear</b>									
86.79 (64.72)	6663 (29.64)	4.89 (7.86)	2149	1.3	0.520 (0.317)	13.56 (2.67)	188 (87)	73 (23)	28.94 (98.00)
<b>75% of Pull at Reduced Engine Speed—11th Gear</b>									
127.37 (94.98)	9985 (44.41)	4.78 (7.69)	1494	2.1	0.410 (0.249)	17.22 (3.39)	186 (86)	75 (24)	28.95 (98.04)
<b>50% of Pull at Reduced Engine Speed—11th Gear</b>									
86.63 (64.60)	6628 (29.48)	4.90 (7.89)	1517	1.3	0.445 (0.271)	15.85 (3.12)	185 (85)	74 (23)	28.95 (98.04)

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

**Dates of tests:** May 25 - 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)** 30% 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 Nexlore fluid **Front axle lubricant** SAE 85W-140 API GL-5 **Total time engine was operated:** 22.5 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.** \*000754951\* **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:** 67.2 - 71.9 lb/h (30.5 - 32.6 kg/h) **High idle:** 2175 - 2225 rpm, 2200-2250 rpm (PTO engaged) **Turbo boost:** nominal 22.5 - 25.4 psi (155 - 175 kPa) as measured 24.0 psi (165 kPa)

**CHASSIS: Type** front wheel assist **SerialNo.** \*ZARH06196\* **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)	Consumption Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
7th Gear									
148.50 (110.73)	18066 (80.36)	3.08 (4.96)	2104	8.5	0.460 (0.280)	15.34 (3.02)	189 (87)	72 (22)	28.91 (97.90)
8th Gear									
161.88 (120.71)	15844 (70.48)	3.83 (6.16)	2099	4.6	0.440 (0.268)	16.02 (3.16)	188 (86)	60 (15)	28.89 (97.83)
9th Gear									
165.67 (123.54)	13263 (58.99)	4.69 (7.54)	2099	3.0	0.430 (0.261)	16.43 (3.24)	188 (86)	62 (17)	28.89 (97.83)
10th Gear									
165.14 (123.14)	10980 (48.84)	5.64 (9.08)	2099	2.2	0.431 (0.262)	16.38 (3.23)	188 (86)	64 (18)	28.90 (97.87)
11th Gear									
164.53 (122.69)	9160 (40.74)	6.74 (10.84)	2098	1.8	0.433 (0.264)	16.29 (3.21)	188 (87)	66 (19)	28.90 (97.87)
12th Gear									
160.17 (119.44)	7425 (33.03)	8.09 (13.02)	2099	1.4	0.444 (0.270)	15.91 (3.13)	188 (87)	68 (20)	28.91 (97.90)

**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 6<sup>th</sup> gear (ballasted tractor) was limited to avoid excessive tractor bouncing. 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. **1993**, Nebraska Summary 768, 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	67.5	67.5
Bystander in 18th gear		83.4

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Rear Tires</b> -No., size, ply & psi (kPa)	Four 520/85R42;**,8(55)	Two 520/85R42;**,16(110)
<b>Ballast</b> - Duals (total)	1950 lb (885 kg)	None
- Cast Iron (total)	1460 lb (661 kg)	None
<b>Front Tires</b> -No., size, ply & psi (kPa)	Two 420/90R30;**,17(115)	Two 420/90R30;**,15(105)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	850 lb (386 kg)	None
<b>Height of Drawbar</b>	19.0 in (455 mm)	19.0 in (455 mm)
<b>Static Weight with operator</b> - Rear	14295 lb (6484 kg)	11115 lb (5042 kg)
- Front	8990 lb (4078 kg)	7910 lb (3588 kg)
- Total	23285 lb (10562 kg)	19025 lb (8630 kg)

**DRAWBAR PERFORMANCE AT 1895 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)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
7th Gear									
151.05 (112.64)	18276 (81.29)	3.10 (4.99)	2107	8.0	0.457 (0.278)	15.46 (3.05)	189 (87)	72 (22)	28.92 (97.93)
8th Gear									
162.72 (121.34)	17266 (76.80)	3.54 (5.69)	1996	7.5	0.444 (0.270)	15.89 (3.13)	188 (86)	61 (16)	28.90 (97.87)
9th Gear									
175.23 (130.67)	15835 (70.44)	4.15 (6.68)	1893	4.7	0.418 (0.254)	16.87 (3.32)	187 (86)	63 (17)	28.90 (97.87)
10th Gear									
177.69 (132.50)	13202 (58.73)	5.05 (8.12)	1891	2.9	0.412 (0.251)	17.13 (3.37)	187 (86)	64 (18)	28.91 (97.90)
11th Gear									
178.50 (133.10)	11070 (49.24)	6.05 (9.73)	1892	2.3	0.413 (0.251)	17.08 (3.36)	187 (86)	67 (19)	28.90 (97.87)
12th Gear									
175.19 (130.64)	9030 (40.17)	7.28 (11.71)	1895	1.8	0.421 (0.256)	16.77 (3.30)	188 (86)	68 (20)	28.91 (97.90)
13th Gear									
178.59 (133.17)	7761 (34.52)	8.63 (13.89)	1893	1.5	0.411 (0.250)	17.15 (3.38)	188 (86)	69 (20)	28.90 (97.87)

**DRAWBAR PERFORMANCE AT 1895 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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F cool- ing med	Temp. °C Air dry bulb	Barom. inch Hg (kPa)
6th Gear									
151.57 (113.02)	22045 (98.06)	2.58 (4.15)	2094	8.3	0.472 (0.287)	14.96 (2.95)	189 (87)	79 (26)	28.75 (97.36)
7th Gear									
164.02 (122.31)	20609 (91.67)	2.99 (4.80)	1989	6.1	0.443 (0.269)	15.94 (3.14)	188 (87)	71 (22)	28.77 (97.43)
8th Gear									
173.68 (129.51)	18820 (83.72)	3.46 (5.57)	1894	4.2	0.426 (0.259)	16.58 (3.27)	187 (86)	72 (22)	28.77 (97.43)
9th Gear									
178.12 (132.82)	15810 (70.32)	4.23 (6.80)	1893	2.7	0.415 (0.252)	17.02 (3.35)	187 (86)	75 (24)	28.76 (97.39)
10th Gear									
176.91 (131.92)	13057 (58.08)	5.08 (8.18)	1892	2.1	0.417 (0.253)	16.94 (3.34)	187 (86)	75 (24)	28.76 (97.39)
11th Gear									
177.36 (132.25)	10946 (48.69)	6.08 (9.78)	1893	1.6	0.415 (0.253)	17.00 (3.35)	188 (86)	76 (25)	28.76 (97.39)
12th Gear									
172.64 (128.73)	8903 (39.60)	7.27 (11.70)	1893	1.4	0.427 (0.260)	16.53 (3.26)	188 (87)	77 (25)	28.76 (97.39)
13th Gear									
176.45 (131.58)	7647 (34.01)	8.66 (13.93)	1893	1.2	0.419 (0.255)	16.85 (3.32)	186 (86)	78 (26)	28.75 (97.36)

## HYDRAULIC PERFORMANCE

CATEGORY: IHN

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/QA)

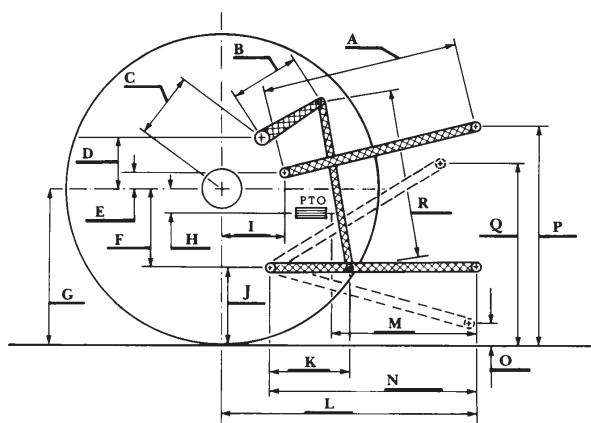
**two outlet sets combined**

- i) Sustained pressure at compensator cutoff: 2838 psi (196 bar)
- ii) Pump delivery rate at minimum pressure and rated engine speed: 36.4 GPM (137.8 l/min)
- iii) Pump delivery rate at maximum hydraulic power: 33.5 GPM (126.6 l/min)
- Delivery pressure: 2528 psi (174 bar)
- Power: 49.3 HP (36.8 kW)

**single outlet set**

- i) Sustained pressure at compensator cutoff: 2833 psi (195 bar)
- ii) Pump delivery rate at minimum pressure and 2200 engine rpm: 33.2 GPM (125.6 l/min)
- iii) Pump delivery rate at maximum hydraulic power: 30.2 GPM (114.3 l/min)
- Delivery pressure: 2256 psi (155 bar)
- Power: 39.7 HP (29.6 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 190 DIESEL**