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2012

Test 2019: Case IH Magnum 290

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2019–SUMMARY 818

CASE IH MAGNUM 290 DIESEL

18 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	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)						
248.43 (185.26)	2000	13.22 (50.03)	0.374 (0.228)	18.80 (3.70)	0.94 (3.56)	
Standard Power Take-off Speed (998 rpm)						
300.90 (224.38)	1800	14.99 (56.73)	0.350 (0.213)	20.08 (3.96)	1.30 (4.91)	
Maximum Power (1 hour)						
300.90 (224.38)	1800	14.99 (56.73)	0.350 (0.213)	20.08 (3.96)	1.30 (4.91)	

VARYING POWER AND FUEL CONSUMPTION

248.43 (185.26)	2000	13.22 (50.03)	0.374 (0.228)	18.80 (3.70)	0.94 (3.56)	Air temperature
219.65 (163.79)	2081	12.07 (45.67)	0.386 (0.235)	18.20 (3.59)	0.79 (2.98)	72°F (22°C)
167.75 (125.09)	2119	9.83 (37.21)	0.412 (0.251)	17.07 (3.36)	0.61 (2.29)	Relative humidity
112.90 (84.19)	2144	7.24 (23.13)	0.451 (0.275)	15.59 (3.03)	0.37 (1.39)	11%
57.30 (42.73)	2177	4.95 (18.73)	0.607 (0.369)	11.58 (2.28)	0.11 (0.42)	Barometer
3.15 (2.35)	2211	2.89 (10.93)	6.448 (3.922)	1.09 (0.21)	0.00 (0.00)	29.01" Hg (98.24 kPa)

Maximum torque - 974 lb.-ft. (1320 Nm) at 1501 rpm

Maximum torque rise - 49.1%

Torque rise at 1600 engine rpm - 43%

Power increase at 1800 engine rpm - 21.1%

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)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—8th Gear									
213.64 (159.31)	16012 (71.22)	5.00 (8.05)	2001	3.1	0.439 (0.267)	16.02 (3.16)	186 (86)	50 (10)	29.08 (98.48)
75% of Pull at Maximum Power—8th Gear									
169.59 (126.46)	12027 (53.50)	5.29 (8.51)	2091	2.0	0.470 (0.286)	14.97 (2.95)	185 (85)	60 (16)	28.98 (98.14)
50% of Pull at Maximum Power—8th Gear									
115.76 (86.32)	8010 (35.63)	5.42 (8.72)	2129	1.3	0.532 (0.323)	13.23 (2.61)	183 (84)	60 (16)	28.98 (98.14)
75% of Pull at Reduced Engine Speed—11th Gear									
169.79 (126.61)	12005 (53.40)	5.31 (8.54)	1383	2.0	0.406 (0.247)	17.31 (3.41)	186 (85)	61 (16)	28.96 (98.07)
50% of Pull at Reduced Engine Speed—11th Gear									
115.99 (86.49)	7981 (35.50)	5.45 (8.77)	1409	1.2	0.446 (0.271)	15.78 (3.11)	185 (85)	61 (16)	28.97 (98.10)

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

Dates of tests: April 9 -18, 2012

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)** 0.8448 **Fuel weight** 7.034 lbs/gal (0.843 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 Hy-Tran Ultra fluid **Front axle lubricant** SAE 85W-140 API GL-5 **Total time engine was operated:** 19.0 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.** 11H00020698 **Crankshaft** lengthwise **Rated engine speed** 2000 **Bore and stroke** 4.606" x 5.315" (117.0 mm x 135.0 mm) **Compression ratio** 15.9 to 1 **Displacement** 531 cu in (8704 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** thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 90.3 - 95.7 lb/h (41.0 - 43.4 kg/h) **High idle:** 2200-2250 rpm **Turbo boost:** nominal 23.2 - 27.6 psi (160 -190 kPa) as measured 25.2 psi (178 kPa)

CHASSIS: Type front wheel assist **Serial No.** *ZCRD02479* **Tread width** rear 64.0" (1626 mm) to 129.0" (3277 mm) front 60.0" (1524 mm) to 88.0" (2235 mm) **Wheelbase** 120.3" (3055 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 1.96 (3.15) second 2.24 (3.61) third 2.58 (4.16) fourth 2.96 (4.77) fifth 3.41 (5.48) sixth 3.90 (6.28) seventh 4.55 (7.33) eighth 5.23 (8.41) ninth 6.02 (9.69) tenth 6.91 (11.12) eleventh 7.92 (12.75) twelfth 9.09 (14.63) thirteenth 11.33 (18.23) fourteenth 12.99 (20.91) fifteenth 14.98 (24.11) sixteenth 17.19 (27.66) seventeenth 19.72 (31.73) eighteenth 22.61 (36.39) reverse 2.81 (4.53), 3.23 (5.20), 6.56 (10.55), 7.52 (12.10) **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 1808 engine rpm or 1000 rpm at 1803 engine rpm **Unladen tractor mass** 24145 lb (10952 kg)

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)	Temp.°F (°C)	cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
5th Gear									
183.55 (136.87)	23521 (104.62)	2.93 (4.72)	2028	14.1	0.509 (0.309)	13.83 (2.72)	183 (84)	47 (8)	29.09 (98.51)
6th Gear									
202.56 (151.05)	21043 (93.60)	3.61 (5.81)	2000	6.4	0.463 (0.282)	15.18 (2.99)	184 (84)	48 (9)	29.10 (98.54)
7th Gear									
212.33 (158.33)	18462 (82.12)	4.31 (6.94)	2001	4.1	0.445 (0.270)	15.82 (3.12)	186 (85)	52 (11)	29.08 (98.48)
8th Gear									
213.64 (159.31)	16012 (71.22)	5.00 (8.05)	2001	3.1	0.439 (0.267)	16.02 (3.16)	186 (86)	50 (10)	29.08 (98.48)
9th Gear									
212.56 (158.50)	13748 (61.15)	5.80 (9.33)	2001	2.5	0.445 (0.270)	15.82 (3.12)	187 (86)	54 (12)	29.05 (98.37)
10th Gear									
211.79 (157.93)	11867 (52.79)	6.70 (10.77)	2000	2.0	0.442 (0.269)	15.91 (3.13)	187 (86)	56 (13)	29.03 (98.31)
11th Gear									
209.29 (156.07)	10183 (45.30)	7.71 (12.40)	2001	1.7	0.446 (0.271)	15.77 (3.11)	188 (87)	58 (14)	29.03 (98.31)
12th Gear									
202.68 (151.14)	8573 (38.13)	8.87 (14.27)	2001	1.4	0.461 (0.280)	15.26 (3.01)	189 (87)	58 (14)	29.01 (98.23)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

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). This tractor did not meet the manufacturer's 3 point lift claim of 14900 lbs (6758 kg). The manufacturer's 3 point hitch lift claim of 17950 lbs (8142 kg), with 2 x 105 mm lift cylinders, was not verified. 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. **2019**, Nebraska Summary 818, May 17, 2012.

Roger M. Hoy
Director

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

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 7th gear	66.9	66.5
Bystander in 18th gear		84.1

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires -No., size, ply & psi (kPa)	Four 520/85R42;**,13(90)	Two 520/85R42;**,18(125)
Ballast - Duals (total)	1950 lb (885 kg)	None
- Cast Iron (total)	4790 lb (2173 kg)	None
Front Tires -No., size, ply & psi (kPa)	Two 420/90R30;**,23(160)	Two 420/90R30;**,20(135)
Ballast - Liquid (total)	None	None
- Cast Iron (total)	940 lb (426 kg)	None
Height of Drawbar	20.5 in (520 mm)	19.5 in (495 mm)
Static Weight with operator - Rear	20440 lb (9271 kg)	14170 lb (6427 kg)
- Front	11560 lb (5244 kg)	10150 lb (4604 kg)
- Total	32000 lb(14515 kg)	24320 lb(11031 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)	Consumption Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
5th Gear									
185.25 (138.14)	23521 (104.62)	2.96 (4.76)	2031	13.5	0.500 (0.304)	14.07 (2.77)	186 (85)	46 (8)	29.10 (98.54)
6th Gear									
209.86 (156.49)	22586 (100.47)	3.49 (5.61)	1967	8.2	0.460 (0.280)	15.29 (3.01)	185 (85)	49 (9)	29.09 (98.51)
7th Gear									
235.88 (175.90)	21962 (97.69)	4.03 (6.49)	1927	7.1	0.437 (0.266)	16.09 (3.17)	187 (86)	52 (11)	29.07 (98.44)
8th Gear									
250.70 (186.95)	21082 (93.78)	4.46 (7.18)	1841	6.1	0.422 (0.257)	16.66 (3.28)	188 (86)	54 (12)	29.06 (98.41)
9th Gear									
256.96 (191.62)	18806 (83.65)	5.13 (8.25)	1801	4.3	0.416 (0.253)	16.92 (3.33)	191 (88)	55 (13)	29.05 (98.37)
10th Gear									
259.46 (193.48)	16389 (72.90)	5.94 (9.56)	1800	3.3	0.413 (0.251)	17.03 (3.36)	190 (88)	56 (13)	29.03 (98.31)
11th Gear									
259.11 (193.21)	14165 (63.01)	6.86 (11.04)	1798	2.6	0.414 (0.252)	16.99 (3.35)	192 (89)	57 (14)	29.02 (98.27)
12th Gear									
254.43 (189.72)	11982 (53.30)	7.96 (12.81)	1810	2.0	0.418 (0.254)	16.85 (3.32)	194 (90)	58 (14)	29.01 (98.24)

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)	Consumption Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
184.64 (137.69)	30885 (137.38)	2.25 (3.61)	2024	13.6	0.512 (0.311)	13.74 (2.71)	190 (87)	62 (17)	28.95 (98.04)
4th Gear									
208.73 (155.65)	29613 (131.72)	2.64 (4.25)	1963	8.4	0.467 (0.284)	15.08 (2.97)	192 (89)	65 (18)	28.94 (98.00)
5th Gear									
231.19 (172.39)	28967 (128.85)	3.00 (4.82)	1917	7.4	0.447 (0.272)	15.72 (3.10)	201 (94)	66 (19)	28.92 (97.93)
6th Gear									
246.98 (184.17)	28182 (125.36)	3.29 (5.29)	1813	6.3	0.429 (0.261)	16.40 (3.23)	207 (97)	69 (21)	28.89 (97.83)
7th Gear									
256.18 (191.04)	24732 (110.01)	3.89 (6.25)	1800	4.3	0.417 (0.254)	16.87 (3.32)	210 (99)	68 (20)	28.90 (97.87)
8th Gear									
258.29 (192.61)	21505 (95.66)	4.51 (7.25)	1802	3.3	0.412 (0.251)	17.07 (3.36)	206 (96)	68 (20)	28.91 (97.90)
9th Gear									
259.14 (193.24)	18578 (82.64)	5.24 (8.42)	1801	2.7	0.413 (0.251)	17.05 (3.36)	206 (96)	72 (22)	28.86 (97.73)
10th Gear									
257.88 (192.30)	16055 (71.41)	6.03 (9.70)	1802	2.3	0.413 (0.251)	17.04 (3.36)	211 (99)	72 (22)	28.86 (97.73)
11th Gear									
254.93 (190.10)	13784 (61.31)	6.94 (11.16)	1802	1.9	0.417 (0.254)	16.88 (3.32)	205 (96)	73 (23)	28.85 (97.70)
12th Gear									
252.08 (187.98)	11823 (52.59)	8.00 (12.87)	1801	1.6	0.422 (0.257)	16.68 (3.29)	211 (99)	73 (23)	28.84 (97.66)

HYDRAULIC PERFORMANCE

CATEGORY: III/IVN

Quick Attach: Yes

OECD Static test

Maximum force exerted through whole range:	14812 lbs (65.9 kN) (2 x 95 mm cylinders)	19559 lbs (87.0 kN) (2 x 115 mm cylinders)
	Standard pump	High flow pump
	three outlet sets combined	
i) Sustained pressure at compensator cutoff:	2848 psi (196 bar)	2899 psi (200 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	44.8 GPM (169.7 l/min)	60.0 GPM (226.9 l/min)
iii) Pump delivery rate at maximum hydraulic power:	43.7 GPM (165.3 l/min)	59.7 GPM (226.0 l/min)
Delivery pressure:	2576 psi (178 bar)	2569 psi (177 bar)
Power:	65.6 HP (48.9 kW)	89.5 hp (66.7 kW)
	single outlet set	
i) Sustained pressure at compensator cutoff:	2841 psi (196 bar)	2890 psi (199 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	42.8 GPM (162.2 l/min)	44.9 GPM (170.0 l/min)
iii) Pump delivery rate at maximum hydraulic power:	36.1 GPM (136.5 l/min)	38.7 GPM (146.6 l/min)
Delivery pressure:	2287 psi (158 bar)	2170 psi (150 bar)
Power:	48.1 HP (35.9 kW)	49.0 hp (36.6 kW)

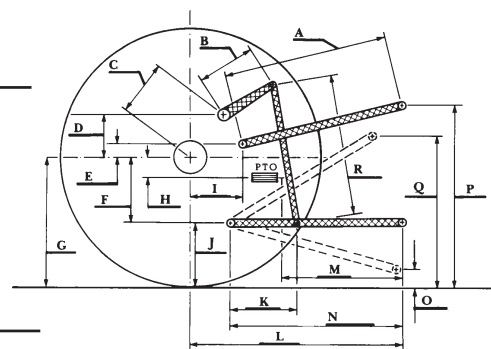
HITCH DIMENSIONS AS TESTED—NO LOAD

	Category III		Category IVN	
	inch	mm	inch	mm
A	25.0	634	24.0	610
B	20.5	520	20.5	520
C	22.9	581	22.9	581
D	20.7	525	20.7	525
E	10.5	266	10.5	266
F	15.7	400	15.7	400
G	36.6	930	36.6	930
H	3.5	90	3.5	90
I	20.9	530	20.9	530
J	20.9	530	20.9	530
K	30.2	768	30.2	768
L	51.0	1295	51.0	1295
*L'	55.9	1420	58.1	1475
M	25.0	636	25.0	636
N	43.1	1095	43.1	1095
O	9.0	230	9.0	230
P	47.8	1215	48.4	1230
Q	37.3	948	37.4	951
R	40.4	1025	39.6	1005

*L' to Quick Attach ends

TwinFlow system

	Main pump	TwinFlow pump
i) Sustained pressure at compensator cutoff:	3090 psi (213 bar)	2935 psi (202 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.6 GPM (164.9 l/min)	33.5 GPM (126.7 l/min)
Combined flow:	77.1 GPM (291.6 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	36.3 GPM (137.4 l/min)	34.5 GPM (130.7 l/min)
Delivery pressure:	2797 psi (193 bar)	2764 psi (191 bar)
Power:	59.2 HP (44.1 kW)	55.7 Hp (41.5 kW)



CASE IH MAGNUM 290 DIESEL