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2012

## Test 2020: Case IH Magnum 315

Nebraska Tractor Test Lab

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# NEBRASKA OECD TRACTOR TEST 2020–SUMMARY 819

## CASE IH MAGNUM 315 DIESEL

### 18 SPEED

#### 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>						
271.45 (202.42)	1999	14.38 (54.44)	0.373 (0.227)	18.87 (3.72)	1.00 (3.78)	
<b>Standard Power Take-off Speed (998 rpm)</b>						
315.72 (235.43)	1800	15.85 (59.99)	0.353 (0.215)	19.92 (3.92)	1.28 (4.86)	
<b>Maximum Power (1 hour)</b>						
315.72 (235.43)	1800	15.85 (59.99)	0.353 (0.215)	19.92 (3.92)	1.28 (4.86)	

#### VARYING POWER AND FUEL CONSUMPTION

271.45 (202.42)	1999	14.38 (54.44)	0.373 (0.227)	18.87 (3.72)	1.00 (3.78)	Air temperature
241.40 (180.01)	2083	13.16 (49.81)	0.383 (0.233)	18.34 (3.61)	0.87 (3.30)	73°F (23°C)
184.55 (137.62)	2132	10.70 (40.50)	0.408 (0.248)	17.25 (3.40)	0.63 (2.40)	Relative humidity
123.65 (92.21)	2144	7.96 (30.15)	0.453 (0.276)	15.53 (3.06)	0.44 (1.67)	22%
62.70 (46.76)	2180	5.27 (19.96)	0.592 (0.360)	11.89 (2.34)	0.15 (0.58)	Barometer
2.40 (1.79)	2213	2.86 (10.83)	8.383 (5.099)	0.84 (0.17)	0.00 (0.01)	28.88" Hg (97.80 kPa)

Maximum torque - 1060 lb.-ft. (1437 Nm) at 1450 rpm  
 Maximum torque rise - 48.8%  
 Torque rise at 1600 engine rpm - 40%  
 Power increase at 1800 engine rpm - 16.3%

#### 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)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—8th Gear</b>									
231.39 (172.55)	17193 (76.48)	5.05 (8.12)	1999	3.0	0.439 (0.267)	16.04 (3.16)	192 (89)	54 (12)	28.81 (97.56)
<b>75% of Pull at Maximum Power—8th Gear</b>									
184.01 (137.22)	12907 (57.41)	5.35 (8.61)	2099	2.1	0.466 (0.283)	15.10 (2.97)	189 (87)	61 (16)	28.87 (97.77)
<b>50% of Pull at Maximum Power—8th Gear</b>									
125.90 (93.88)	8619 (38.34)	5.48 (8.81)	2136	1.4	0.527 (0.321)	13.35 (2.63)	183 (84)	60 (16)	28.87 (97.77)
<b>75% of Pull at Reduced Engine Speed—11th Gear</b>									
184.10 (137.28)	12881 (57.30)	5.36 (8.63)	1386	2.1	0.408 (0.248)	17.23 (3.39)	196 (91)	60 (16)	28.87 (97.77)
<b>50% of Pull at Reduced Engine Speed—11th Gear</b>									
125.91 (93.89)	8644 (38.45)	5.46 (8.79)	1403	1.4	0.439 (0.267)	16.03 (3.16)	184 (84)	60 (16)	28.87 (97.77)

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

**Dates of tests:** April 12 -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:** 19.5 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.** \*11H00011756\* **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:** 98.3 - 104.1 lb/h (44.6 - 47.2 kg/h) **High idle:** 2200-2250 rpm **Turbo boost:** nominal 23.2 - 27.6 psi (160 - 190 kPa) as measured 25.7 psi (177 kPa)

**CHASSIS: Type** front wheel assist with duals **Serial No.** \*ZBRD05254\* **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** 26500 lb (12020 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									
207.29 (154.57)	24551 (109.21)	3.17 (5.09)	2055	9.0	0.473 (0.288)	14.87 (2.93)	191 (88)	49 (9)	28.77 (97.43)
6th Gear									
223.45 (166.62)	22809 (101.46)	3.68 (5.91)	2000	5.5	0.450 (0.274)	15.63 (3.08)	192 (89)	50 (10)	28.78 (97.46)
7th Gear									
230.99 (172.25)	19819 (88.16)	4.37 (7.03)	2000	3.7	0.438 (0.266)	16.08 (3.17)	190 (88)	55 (13)	28.83 (97.63)
8th Gear									
231.39 (172.55)	17193 (76.48)	5.05 (8.12)	1999	3.0	0.439 (0.267)	16.04 (3.16)	192 (89)	54 (12)	28.81 (97.56)
9th Gear									
231.42 (172.57)	14851 (66.06)	5.84 (9.40)	1998	2.5	0.438 (0.266)	16.07 (3.17)	194 (90)	58 (14)	28.84 (97.66)
10th Gear									
228.25 (172.21)	12704 (56.51)	6.74 (10.85)	2001	2.1	0.447 (0.272)	15.74 (3.10)	204 (95)	59 (15)	28.84 (97.66)
11th Gear									
226.28 (168.73)	10961 (48.76)	7.74 (12.46)	2000	1.8	0.445 (0.270)	15.82 (3.12)	196 (91)	59 (15)	28.84 (97.66)
12th Gear									
223.86 (166.93)	9419 (41.90)	8.91 (14.34)	2000	1.6	0.451 (0.274)	15.59 (3.07)	203 (95)	60 (16)	28.85 (97.70)

**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). The manufacturer's 3 point hitch lift claims of 16550 lbs (7507 kg) with lift cylinders 1 x 95 mm and 1 x 105 mm and 17950 lbs (8142 kg) with 2 x 105 mm lift cylinders, were not verified. The pull in 5<sup>th</sup> 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. **2020**, Nebraska Summary 819, 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	66.8	66.6
Bystander in 18th gear		86.0

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Rear Tires</b> -No., size, ply & psi (kPa)	Six 520/85R42; **;9(60)	Four 520/85R42; **;12(85)
<b>Ballast</b> - Triples (total)	2060 lb (934 kg)	None
- Cast Iron (total)	4320 lb (1960 kg)	None
<b>Front Tires</b> -No., size, ply & psi (kPa)	Four 420/90R30; **;14(95)	Two 420/90R30; **;20(140)
<b>Ballast</b> - Duals (total)	1140 lb (517 kg)	None
- Cast Iron (total)	480 lb (218 kg)	None
<b>Height of Drawbar</b>	20.5 in (520 mm)	20.0 in (510 mm)
<b>Static Weight with operator</b> - Rear	22235 lb(10086 kg)	16070 lb (7289 kg)
- Front	12440 lb (5642 kg)	10605 lb (4810 kg)
- Total	34675 lb(15728 kg)	26675 lb(12099 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									
208.10 (155.18)	24659 (109.69)	3.17 (5.09)	2052	9.0	0.472 (0.287)	14.91 (2.94)	191 (88)	49 (9)	28.77 (97.43)
6th Gear									
229.06 (170.81)	24314 (108.15)	3.54 (5.69)	1965	7.5	0.458 (0.279)	15.35 (3.02)	188 (87)	51 (11)	28.79 (97.49)
7th Gear									
254.55 (189.81)	23442 (104.28)	4.07 (6.55)	1905	5.8	0.426 (0.259)	16.49 (3.25)	192 (89)	56 (13)	28.83 (97.63)
8th Gear									
268.74 (200.40)	22649 (100.75)	4.45 (7.16)	1800	5.1	0.415 (0.252)	16.96 (3.34)	195 (91)	56 (13)	28.83 (97.63)
9th Gear									
272.06 (202.87)	19579 (87.09)	5.21 (8.38)	1801	3.6	0.413 (0.251)	17.02 (3.35)	201 (94)	58 (14)	28.84 (97.66)
10th Gear									
273.27 (203.77)	17020 (75.71)	6.03 (9.70)	1800	2.9	0.408 (0.248)	17.22 (3.39)	206 (97)	58 (14)	28.84 (97.66)
11th Gear									
271.45 (202.42)	14676 (65.28)	6.94 (11.16)	1800	2.4	0.410 (0.250)	17.14 (3.38)	206 (97)	60 (16)	28.84 (97.66)
12th Gear									
268.39 (200.14)	12537 (55.77)	8.03 (12.91)	1808	2.1	0.414 (0.252)	17.00 (3.35)	209 (98)	60 (16)	28.84 (97.66)

**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)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
3rd Gear									
202.89 (151.30)	34657 (154.16)	2.20 (3.53)	1997	14.0	0.500 (0.304)	14.07 (2.77)	202 (94)	66 (19)	28.76 (97.39)
4th Gear									
230.99 (172.25)	32995 (146.77)	2.63 (4.23)	1950	8.2	0.466 (0.283)	15.10 (2.97)	206 (96)	66 (19)	28.76 (97.39)
5th Gear									
249.23 (185.85)	31987 (142.28)	2.92 (4.70)	1872	7.1	0.436 (0.265)	16.15 (3.18)	207 (97)	67 (19)	28.75 (97.36)
6th Gear									
260.81 (194.49)	29770 (132.42)	3.29 (5.29)	1800	5.4	0.426 (0.259)	16.50 (3.25)	213 (100)	68 (20)	28.74 (97.32)
7th Gear									
267.47 (199.45)	25709 (114.36)	3.90 (6.28)	1800	3.6	0.416 (0.253)	16.90 (3.33)	212 (100)	69 (20)	28.74 (97.32)
8th Gear									
270.28 (201.55)	22420 (99.73)	4.52 (7.27)	1800	2.7	0.413 (0.251)	17.02 (3.35)	205 (96)	68 (20)	28.74 (97.32)
9th Gear									
268.27 (200.05)	19178 (85.31)	5.25 (8.44)	1801	2.1	0.417 (0.254)	16.86 (3.32)	212 (100)	69 (21)	28.73 (97.29)
10th Gear									
267.10 (199.17)	16567 (73.69)	6.05 (9.73)	1801	1.7	0.418 (0.254)	16.83 (3.32)	213 (100)	70 (21)	28.73 (97.29)
11th Gear									
266.10 (198.43)	14338 (63.78)	6.96 (11.20)	1801	1.4	0.420 (0.255)	16.75 (3.30)	209 (98)	70 (21)	28.72 (97.26)
12th Gear									
262.09 (195.44)	12249 (54.48)	8.03 (12.91)	1808	1.2	0.426 (0.259)	16.51 (3.25)	215 (102)	70 (21)	28.71 (97.22)

## HYDRAULIC PERFORMANCE

CATEGORY: 4N

Quick Attach: Yes

OECD Static test

Maximum force exerted through whole range: 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:	2994 psi (206 bar)	2899 psi (200 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	44.7 GPM (169.1 l/min)	60.0 GPM (226.9 l/min)
iii) Pump delivery rate at maximum hydraulic power:	42.7 GPM (161.6 l/min)	59.7 GPM (226.0 l/min)
Delivery pressure:	2797 psi (193 bar)	2569 psi (177 bar)
Power:	69.7 HP (51.9 kW)	89.5 hp (66.7 kW)
<u>single outlet set</u>		
i) Sustained pressure at compensator cutoff:	2992 psi (206 bar)	2890 psi (199 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.9 GPM (166.3 l/min)	44.9 GPM (170.0 l/min)
iii) Pump delivery rate at maximum hydraulic power:	41.5 GPM (156.9 l/min)	38.7 GPM (146.6 l/min)
Delivery pressure:	2329 psi (161 bar)	2170 psi (150 bar)
Power:	56.3 HP (42.0 kW)	49.0 hp (36.6 kW)

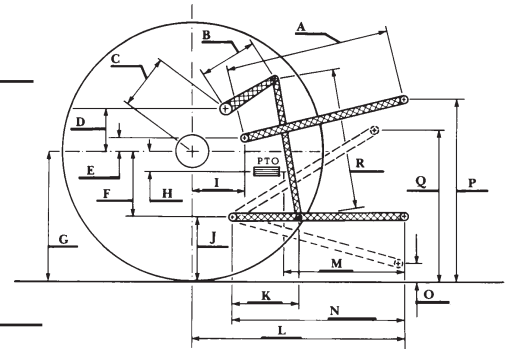
## HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	24.0	610
B	20.5	520
C	22.9	581
D	20.7	525
E	10.5	266
F	15.7	400
G	36.6	930
H	3.5	90
I	20.9	530
J	20.9	530
K	30.2	768
L	51.0	1295
*L'	58.1	1475
M	25.0	636
N	43.1	1095
O	9.0	230
P	48.4	1230
Q	37.4	951
R	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 315 DIESEL**