

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F.  
Larsen

---

January 2007

## Test 1898: Case-IH MX 215 and Magnum 215 Diesel 19-Speed

Tractor Museum

University of Nebraska-Lincoln, [TractorMuseumArchives@unl.edu](mailto:TractorMuseumArchives@unl.edu)

Follow this and additional works at: <http://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Applied Mechanics Commons](#)

---

Museum, Tractor, "Test 1898: Case-IH MX 215 and Magnum 215 Diesel 19-Speed" (2007). *Nebraska Tractor Tests*. 2073.  
<http://digitalcommons.unl.edu/tractormuseumlit/2073>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

# NEBRASKA OECD TRACTOR TEST 1898A—SUMMARY 565A

## CASE IH MAGNUM 215 DIESEL

## ALSO CASE IH MX 215 DIESEL

### 19 SPEED

#### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
<b>Rated Engine Speed—(PTO speed—1109 rpm)</b>					
177.50 (132.36)	2000	11.53 (43.66)	0.456 (0.277)	15.39 (3.03)	
<b>Maximum Power (1 hour)</b>					
215.81 (160.93)	1800	13.06 (49.42)	0.424 (0.258)	16.53 (3.26)	
<b>Standard Power Take-off Speed (998 rpm)</b>					
215.81 (160.93)	1800	13.06 (49.42)	0.424 (0.258)	16.53 (3.26)	

#### VARYING POWER AND FUEL CONSUMPTION

177.50 (132.36)	2000	11.53 (43.66)	0.456 (0.277)	15.39 (3.03)	Air temperature
156.91 (117.01)	2076	10.78 (40.82)	0.482 (0.293)	14.55 (2.87)	80°F (27°C)
119.42 (89.05)	2116	9.51 (36.01)	0.559 (0.340)	12.55 (2.47)	Relative humidity
81.82 (61.01)	2158	8.03 (30.40)	0.688 (0.419)	10.19 (2.01)	29%
41.39 (30.86)	2206	6.02 (19.14)	1.020 (0.620)	6.88 (1.35)	Barometer
1.71 (1.28)	2236	3.79 (14.36)	15.540 (9.453)	0.45 (0.09)	28.97" Hg (98.10 kPa)

Maximum torque - 721 lb.-ft. (978 Nm) at 1403 rpm  
 Maximum torque rise - 54.7%  
 Torque rise at 1599 engine rpm - 49%  
 Power increase at 1800 engine rpm - 21.6%

#### 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)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—7th Gear</b>									
151.54 (113.01)	12944 (37.58)	4.39 (7.07)	2000	3.12	0.536 (0.326)	13.09 (2.58)	187 (86)	66 (19)	28.91 (97.90)
<b>75% of Pull at Maximum Power—7th Gear</b>									
119.61 (89.19)	9716 (43.22)	4.63 (7.43)	2084	2.20	0.608 (0.370)	11.54 (2.27)	187 (86)	74 (23)	28.93 (97.97)
<b>50% of Pull at Maximum Power—7th Gear</b>									
82.34 (61.40)	6473 (28.79)	4.77 (7.68)	2135	1.32	0.753 (0.458)	9.31 (1.83)	187 (86)	75 (24)	28.93 (97.97)
<b>75% of Pull at Reduced Engine Speed—9th Gear</b>									
119.52 (89.12)	9681 (43.06)	4.63 (7.45)	1580	2.15	0.501 (0.305)	13.98 (2.75)	184 (85)	77 (25)	28.93 (97.97)
<b>50% of Pull at Reduced Engine Speed—9th Gear</b>									
82.51 (61.53)	6472 (28.79)	4.78 (7.69)	1617	1.29	0.579 (0.352)	12.12 (2.39)	184 (84)	76 (24)	28.93 (97.97)

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

**Dates of tests:** May 8 - 18, 2007

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

**FUEL, OIL and TIME:** Fuel No. 2 Diesel Specific gravity converted to 60°/60°F (15°/15°C) 0.8432 Fuel weight 7.011 lbs/gal (0.840 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: 27.5 hours

**ENGINE: Make** CNH Engine Corporation Diesel **Type** six cylinder vertical with turbocharger and air to air intercooler **Serial No.** \*46694080\* **Crankshaft** lengthwise **Rated engine speed** 2000 **Bore and stroke** 4.488" x 5.315" (114.0 mm x 135.0 mm) **Compression ratio** 17.5 to 1 **Displacement** 505 cu in (8268 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:** 76.7 - 84.3 lb/h (34.8 - 38.2 kg/h) **High idle:** 2220-2260 rpm **Turbo boost:** nominal 19.6 - 23.9 psi (135 - 165 kPa) as measured 21.9 psi (151 kPa)

**CHASSIS: Type** front wheel assist **Serial No.** \*Z7RZ01446\* **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 1.97 (3.17) second 2.26 (3.64) third 2.60 (4.19) fourth 2.99 (4.81) fifth 3.43 (5.52) sixth 3.93 (6.33) seventh 4.59 (7.38) eighth 5.26 (8.47) ninth 6.06 (9.77) tenth 6.96 (11.20) eleventh 7.98 (12.85) twelfth 9.16 (14.74) thirteenth 11.41 (18.37) fourteenth 13.09 (21.07) fifteenth 15.10 (24.30) sixteenth 17.32 (27.87) seventeenth 19.87 (31.97) eighteenth 22.79 (36.67) nineteenth 24.86 (40.00) (1750 engine rpm) reverse 2.83 (4.56), 3.26 (5.24), 6.61 (10.63), 7.57 (12.19) **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 1806 engine rpm or 1000 rpm at 1803 engine rpm **Unladen tractor mass** 21035 lb (9541 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	Barom. inch Hg (kPa)		
4th Gear									
139.11 (103.74)	20102 (89.42)	2.60 (4.18)	1989	11.59	0.586 (0.357)	11.96 (2.36)	188 (87)	62 (17)	28.80 (97.53)
5th Gear									
153.66 (114.58)	19130 (85.10)	3.01 (4.85)	1932	7.85	0.556 (0.338)	12.61 (2.48)	188 (87)	66 (19)	28.81 (97.56)
6th Gear									
166.26 (123.98)	18467 (82.15)	3.38 (5.43)	1873	7.14	0.539 (0.328)	13.02 (2.56)	188 (87)	70 (21)	28.82 (97.60)
7th Gear									
181.11 (135.05)	17582 (78.21)	3.86 (6.22)	1803	5.37	0.507 (0.308)	13.83 (2.73)	188 (87)	65 (18)	28.91 (97.90)
8th Gear									
183.40 (136.76)	15314 (68.12)	4.49 (7.23)	1803	4.08	0.499 (0.304)	14.04 (2.77)	188 (87)	67 (19)	28.91 (97.90)
9th Gear									
183.62 (136.92)	13188 (58.66)	5.22 (8.40)	1802	3.25	0.499 (0.303)	14.06 (2.77)	188 (87)	68 (20)	28.92 (97.93)
10th Gear									
183.37 (136.74)	11420 (50.80)	6.02 (9.69)	1801	2.66	0.500 (0.304)	14.02 (2.76)	188 (87)	72 (22)	28.92 (97.93)
11th Gear									
181.96 (135.68)	9832 (43.73)	6.94 (11.17)	1801	2.21	0.502 (0.305)	13.98 (2.75)	188 (87)	72 (22)	28.92 (97.93)
12th Gear									
178.80 (133.33)	8370 (37.23)	8.01 (12.89)	1806	1.83	0.512 (0.311)	13.70 (2.70)	188 (87)	73 (23)	28.92 (97.93)

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

**NOTE:** Report reprinted, supplemental permit for Case IH Magnum 215 Diesel, April, 2008.

**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 remote hydraulic flow claims of 59 GPM (223 lpm), with high flow pump, nor 75 GPM (282 lpm), with twinflow pump. The pull in 2<sup>nd</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 II Test Code Procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1898A**, Nebraska Summary 565A, May 21, 2008.

Roger M. Hoy  
 Director

M.F. Kocher  
 V.I. Adamchuk  
 J.A. Smith  
 Board of Tractor Test Engineers

**TRACTOR SOUND LEVEL WITH CAB**

**dB(A)**

At no load in 7th gear	70.3
Bystander in 18th gear	86.4

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Rear Tires</b> -No., size, ply & psi (kPa)	Four 520/85R42;**,10(70)	Two 520/85R42;**,16(110)
<b>Ballast</b> - Duals (total)	1950 lb (885 kg)	None
- Cast Iron (total)	610 lb (277 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)	300 lb (136 kg)	None
<b>Height of Drawbar</b>	18.0 in (455 mm)	18.0 in(455 mm)
<b>Static Weight with operator</b> - Rear	15390 lb (6981 kg)	12970 lb(5883 kg)
- Front	8680 lb (3937 kg)	8240 lb(3737 kg)
- Total	24070 lb(10918 kg)	21210 lb(9620 kg)

**DRAWBAR PERFORMANCE**  
**BALLASTED - 1800 ENGINE RPM**  
**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)
2nd Gear									
132.22 (98.60)	23650 (105.20)	2.10 (3.37)	2062	8.73	0.581 (0.354)	12.06 (2.38)	188 (87)	59 (15)	28.94 (98.00)
3rd Gear									
145.67 (108.63)	22875 (101.75)	2.39 (3.84)	2004	7.25	0.553 (0.337)	12.67 (2.50)	188 (87)	59 (15)	28.94 (98.00)
4th Gear									
158.71 (118.35)	22368 (99.50)	2.66 (4.28)	1932	6.54	0.537 (0.326)	13.07 (2.57)	188 (87)	59 (15)	28.94 (98.00)
5th Gear									
171.40 (127.81)	21639 (96.25)	2.97 (4.78)	1864	5.77	0.521 (0.317)	13.46 (2.65)	188 (87)	59 (15)	28.95 (98.04)
6th Gear									
180.25 (134.41)	20319 (90.38)	3.33 (5.35)	1801	4.71	0.507 (0.308)	13.83 (2.72)	188 (87)	59 (15)	28.95 (98.04)
7th Gear									
184.41 (137.52)	17546 (78.05)	3.94 (6.34)	1804	3.43	0.491 (0.299)	14.27 (2.81)	188 (86)	59 (15)	28.96 (98.07)
8th Gear									
184.25 (137.40)	15177 (67.51)	4.55 (7.33)	1805	2.77	0.491 (0.299)	14.28 (2.81)	188 (87)	59 (15)	28.97 (98.10)
9th Gear									
184.26 (137.40)	13137 (58.44)	5.26 (8.46)	1800	2.30	0.494 (0.301)	14.18 (2.79)	188 (87)	59 (15)	28.97 (98.10)
10th Gear									
182.48 (136.07)	11289 (50.21)	6.06 (9.76)	1801	1.95	0.500 (0.304)	14.02 (2.76)	188 (87)	59 (15)	28.98 (98.14)
11th Gear									
179.14 (133.59)	9652 (42.93)	6.96 (11.20)	1798	1.62	0.514 (0.312)	13.65 (2.69)	188 (87)	59 (15)	28.99 (98.17)
12th Gear									
175.19 (130.64)	8195 (36.45)	8.02 (12.90)	1799	1.36	0.522 (0.318)	13.43 (2.64)	188 (87)	59 (15)	29.00 (98.21)

### THREE POINT HITCH PERFORMANCE(OECD Static Test)

CATEGORY: III

Quick Attach: Yes

Maximum force exerted through whole range: 14070 lb (62.6 kN) High Lift Option  
 16375 lb (72.8 kN)

**The following data applies after tractor chassis S/N Z7RZ05000**

	<u>Twinflow pump</u>	
i) Sustained pressure at compensator cutoff:	3183 psi (219 bar)	2982 psi (206 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	44.0 GPM (166.6 l/min)	30.0 GPM (113.6 l/min)
Combined flow:	74.0 GPM (280.2 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	42.3 GPM (160.1 l/min)	32.1 GPM (121.5 l/min)
Delivery pressure:	3005 psi (207 bar)	2757 psi (190 bar)
Power:	74.2 HP (55.3 kW)	51.6 Hp (38.5 kW)

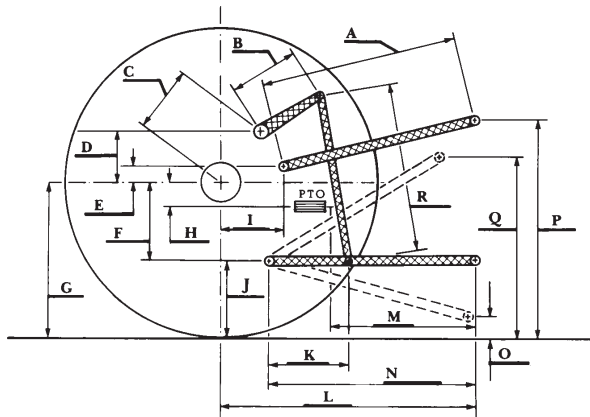
**three outlet sets combined**

	<u>High Flow Option</u>
i) Sustained pressure at compensator cutoff:	3106 psi (214 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	58.1 GPM (219.9 l/min)
iii) Pump delivery rate at maximum hydraulic power:	57.0 GPM (215.8 l/min)
Delivery pressure:	2710 psi (187 bar)
Power:	90.1 Hp (67.2 kW)

**HITCH DIMENSIONS AS TESTED—NO LOAD**

	inch	mm
A	28.2	718
B	20.5	520
C	22.9	581
D	20.7	525
E	10.5	266
F	15.7	400
G	36.4	925
H	3.5	90
I	20.9	530
J	20.7	525
K	30.2	768
L	46.1	1170
*L'	50.7	1287
M	20.1	511
N	38.2	970
O	9.0	230
P	47.6	1210
Q	40.7	1035
R	39.2	995

\*L' to Quick Attach ends



**CASE IH MAGNUM 215 DIESEL**