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2015

Test 2120: Case IH Magnum 220

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2120—SUMMARY 980

CASE IH MAGNUM 220 DIESEL

19 SPEED

CHASSIS SERIAL NUMBERS ZERH02500 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)	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—1110 rpm)						
191.22 (142.59)	2101	10.25 (38.81)	0.376 (0.229)	18.65 (3.67)	0.74 (2.79)	
Standard Power Take-off Speed (1000 rpm)						
209.04 (155.88)	1893	10.70 (40.50)	0.359 (0.218)	19.54 (3.85)	0.79 (2.97)	
Maximum Power (1 hour)						
209.36 (156.12)	1800	10.58 (40.07)	0.354 (0.215)	19.78 (3.90)	0.79 (2.99)	

VARYING POWER AND FUEL CONSUMPTION

191.22 (142.59)	2101	10.25 (38.81)	0.376 (0.229)	18.65 (3.67)	0.74 (2.79)	Air temperature
168.76 (125.85)	2181	9.31 (35.26)	0.387 (0.235)	18.12 (3.57)	0.67 (2.54)	73°F (23°C)
127.37 (94.98)	2193	7.49 (28.35)	0.412 (0.251)	17.01 (3.35)	0.50 (1.88)	Relative humidity
85.44 (63.71)	2206	5.63 (21.31)	0.462 (0.281)	15.18 (2.99)	0.31 (1.19)	30%
43.12 (32.15)	2217	3.85 (14.56)	0.625 (0.380)	11.21 (2.21)	0.20 (0.76)	Barometer
1.77 (1.32)	2229	2.33 (8.83)	9.255 (5.630)	0.76 (0.15)	0.12 (0.46)	29.04" Hg (98.34 kPa)

Maximum torque - 691 lb.-ft. (937 Nm) at 1400 rpm

Maximum torque rise - 44.6%

Torque rise at 1681 engine rpm - 36%

Power increase at 1800 engine rpm - 9.5%

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)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—9th Gear										
168.13 (125.37)	13359 (59.42)	4.72 (7.60)	2100	4.3	0.429 (0.261)	16.32 (3.21)	0.037 (0.022)	186 (86)	68 (20)	28.76 (97.39)
75% of Pull at Maximum Power—9th Gear										
130.01 (96.95)	9993 (44.45)	4.88 (7.85)	2140	2.9	0.449 (0.273)	15.61 (3.07)	0.040 (0.024)	185 (85)	71 (21)	28.75 (97.36)
50% of Pull at Maximum Power—9th Gear										
88.51 (66.00)	6657 (29.61)	4.99 (8.03)	2164	1.8	0.499 (0.304)	14.04 (2.77)	0.041 (0.025)	186 (86)	71 (22)	28.74 (97.33)
75% of Pull at Reduced Engine Speed—11th Gear										
130.00 (96.94)	9992 (44.45)	4.88 (7.85)	1505	3.0	0.403 (0.245)	17.40 (3.43)	0.038 (0.023)	183 (84)	71 (22)	28.75 (97.36)
50% of Pull at Reduced Engine Speed—11th Gear										
88.62 (66.08)	6698 (29.79)	4.96 (7.98)	1514	1.8	0.439 (0.267)	15.96 (3.14)	0.036 (0.022)	183 (84)	72 (22)	28.74 (97.33)

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

Dates of tests: May 18 to June 8, 2015

Manufacturer: CNH Industrial 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)** 0.8415 **Fuel weight** 7.007 lbs/gal (0.840 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil** SAE 10W40 **API service classification** CJ-4 **Transmission and hydraulic lubricant** Case IH Akcel-Hy-tran Ultration fluid **Front axle lubricant** SAE 85W-140 API GL-5 **Total time engine was operated:** 16.0 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.** *001218625* **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 **Exhaust** DOC (diesel oxidation catalyst) and SCR (selective catalyst reduction) integrated within a vertical muffler **Cooling medium temperature control** 2 thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 69.7 - 73.9 lb/h (31.6 - 33.5 kg/h) **High idle:** 2175 - 2225 rpm, 2200-2250 rpm (PTO engaged) **Turbo boost:** nominal 18.6-21.0 psi (128-145 kPa) as measured 19.7 psi (136 kPa)

CHASSIS: Type front wheel assist **Serial No.** *ZERH04562* **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 1.18 (1.90) second 1.41 (2.27) third 1.69 (2.72) fourth 2.02 (3.25) fifth 2.40 (3.87) sixth 2.87 (4.62) seventh 3.42 (5.50) eighth 4.08 (6.57) ninth 4.91 (7.90) tenth 5.87 (9.44) eleventh 6.98 (11.24) twelfth 8.34 (13.42) thirteenth 9.87 (15.89) fourteenth 11.80 (18.99) fifteenth 14.18 (22.82) sixteenth 16.95 (27.27) seventeenth 20.17 (32.46) eighteenth 24.09 (38.77) nineteenth 26.10 (42.00) (electronically limited)

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)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp.°F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
135.43 (100.99)	19983 (88.89)	2.55 (4.10)	2130	13.5	6th Gear 0.492 (0.299)	14.25 (2.81)	0.043 (0.026)	185 (85)	68 (20)	28.67 (97.09)
160.31 (119.54)	19569 (87.04)	3.07 (4.94)	2100	10.6	7th Gear 0.450 (0.274)	15.56 (3.06)	0.038 (0.023)	185 (85)	68 (20)	28.67 (97.09)
166.26 (123.98)	16269 (72.37)	3.83 (6.16)	2100	6.6	8th Gear 0.434 (0.264)	16.13 (3.18)	0.037 (0.023)	186 (85)	69 (21)	28.67 (97.09)
168.13 (125.37)	13359 (59.42)	4.72 (7.60)	2100	4.3	9th Gear 0.429 (0.261)	16.32 (3.21)	0.037 (0.022)	186 (86)	68 (20)	28.76 (97.39)
167.40 (124.83)	11023 (49.03)	5.70 (9.17)	2100	3.4	10th Gear 0.429 (0.261)	16.32 (3.21)	0.038 (0.023)	186 (86)	69 (20)	28.75 (97.36)
168.14 (125.38)	9240 (41.10)	6.82 (10.98)	2100	2.6	11th Gear 0.428 (0.260)	16.36 (3.22)	0.040 (0.024)	186 (86)	69 (21)	28.75 (97.36)
164.32 (122.53)	7511 (33.41)	8.21 (13.20)	2100	2.0	12th Gear 0.438 (0.266)	16.00 (3.15)	0.039 (0.024)	185 (85)	71 (21)	28.75 (97.36)

reverse 2.61 (4.20), 3.12 (5.02), 3.75 (6.03), 4.47 (7.20), 5.33 (8.58), 6.36 (10.24) **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 1893 engine rpm **Unladen tractor mass** 21750 lb (9866 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE: The performance figures on this report apply to tractors with chassis serial numbers ZERH02500 and higher.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. The manufacturer's 3 point lift claim of 13600 lbs (6170 kg) without Quick Coupler was not verified. The performance results on this summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2120**, Nebraska Summary 980, December 20,2015.

Roger M. Hoy
Director

M.F. Kocher
J.D. Luck
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	64.7	64.9
Bystander in 18th gear		80.5

TIRES AND WEIGHT

Rear Tires - No., size, ply & psi(kPa)
Front Tires - No., size, ply & psi(kPa)
Height of Drawbar
Static Weight with operator - Rear
- Front
- Total

Tested Without Ballast
Two 480/80R46;***;17(115)
Two 420/90R30;***;18(125)
19.5 in (495 mm)
12135 lb (5504 kg)
9790 lb (4441 kg)
21925 lb (9945 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)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
135.33 (100.92)	19995 (88.94)	2.54 (4.09)	2129	13.5	6th Gear 0.492 (0.299)	14.25 (2.81)	0.043 (0.026)	186 (85)	68 (20)	28.67 (97.09)
160.50 (119.68)	19555 (86.98)	3.08 (4.95)	2100	10.5	7th Gear 0.449 (0.273)	15.61 (3.08)	0.038 (0.023)	185 (85)	68 (20)	28.67 (97.09)
172.44 (128.59)	18142 (80.70)	3.57 (5.74)	1997	8.8	8th Gear 0.433 (0.263)	16.20 (3.19)	0.038 (0.023)	185 (85)	70 (21)	28.67 (97.09)
178.91 (133.41)	17173 (76.39)	3.91 (6.29)	1800	7.7	9th Gear 0.415 (0.252)	16.90 (3.33)	0.038 (0.023)	185 (85)	69 (21)	28.66 (97.05)
179.63 (133.95)	14067 (62.57)	4.79 (7.71)	1800	5.4	10th Gear 0.413 (0.251)	16.98 (3.35)	0.038 (0.023)	185 (85)	69 (21)	28.67 (97.09)
185.38 (138.23)	12015 (53.45)	5.79 (9.32)	1800	3.8	11th Gear 0.402 (0.244)	17.45 (3.44)	0.037 (0.022)	185 (85)	69 (21)	28.76 (97.39)
181.89 (135.64)	9778 (43.49)	6.98 (11.23)	1800	2.8	12th Gear 0.408 (0.248)	17.16 (3.38)	0.040 (0.024)	186 (85)	70 (21)	28.75 (97.36)
189.61 (141.39)	8573 (38.13)	8.30 (13.35)	1801	2.4	13th Gear 0.390 (0.238)	17.95 (3.54)	0.039 (0.024)	186 (86)	70 (21)	28.75 (97.36)

HYDRAULIC PERFORMANCE

CATEGORY: III

Quick Attach: Yes

OECD Static test

Maximum force exerted through whole range: 14269 lbs (63.5 kN) (110 mm cylinders w/QA)

two outlet sets combined

i) Sustained pressure at compensator cutoff:

2869 psi (198 bar)

ii) Pump delivery rate at minimum pressure

and rated engine speed:

39.3 GPM (148.8 l/min)

at 2200 engine rpm:

41.2 GPM (156.1 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

38.8 GPM (146.7 l/min)

Delivery pressure:

2485 psi (171 bar)

Power:

56.2 HP (41.9 kW)

i) Sustained pressure at compensator cutoff:

2857 psi (197 bar)

ii) Pump delivery rate at minimum pressure

and rated engine speed:

36.8 GPM (139.4 l/min)

at 2200 engine rpm:

36.8 GPM (139.3 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

31.5 GPM (119.3 l/min)

Delivery pressure:

2329 psi (161 bar)

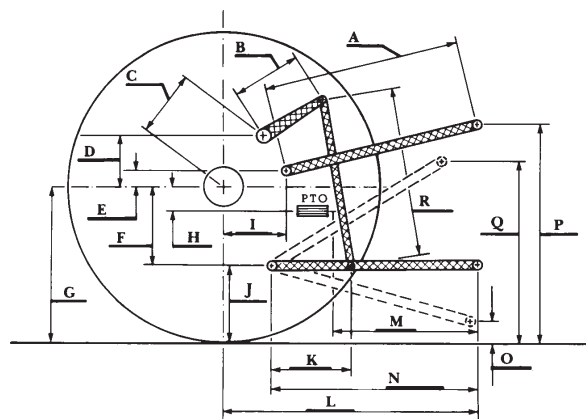
Power:

42.8 HP (31.9 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	26.8	680
B	17.9	454
C	15.1	383
D	14.6	372
E	10.9	277
F	10.6	270
G	36.4	925
H	2.8	71
I	19.7	500
J	25.8	655
K	26.9	682
L	48.1	1223
*L'	53.1	1349
M	22.4	570
N	38.3	974
O	9.1	230
P	52.6	1335
Q	37.7	957
R	37.7	957

*L' to Quick Attach ends



CASE IH MAGNUM 220 DIESEL