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2015

Test 2123: Case IH Magnum 280

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2123–SUMMARY 986

CASE IH MAGNUM 280 DIESEL

19 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)						
242.08 (180.52)	2000	12.99 (49.18)	0.375 (0.228)	18.63 (3.67)	1.18 (4.47)	
Standard Power Take-off Speed (998 rpm)						
296.56 (221.15)	1800	15.12 (57.23)	0.356 (0.217)	19.62 (3.86)	1.56 (5.90)	
Maximum Power (1 hour)						
296.56 (221.15)	1800	15.12 (57.23)	0.356 (0.217)	19.62 (3.86)	1.56 (5.90)	

VARYING POWER AND FUEL CONSUMPTION

242.08 (180.52)	2000	12.99 (49.18)	0.375 (0.228)	18.63 (3.67)	1.18 (4.47)	Air temperature
216.84 (161.70)	2108	12.21 (46.20)	0.393 (0.239)	17.77 (3.50)	1.04 (3.94)	74°F (23°C)
166.36 (124.05)	2152	10.07 (38.11)	0.423 (0.257)	16.52 (3.26)	0.67 (2.53)	Relative humidity
111.80 (83.37)	2170	7.63 (28.88)	0.477 (0.290)	14.66 (2.89)	0.45 (1.69)	51%
56.95 (42.47)	2204	5.33 (20.16)	0.653 (0.397)	10.69 (2.11)	0.26 (0.98)	Barometer
0.54 (0.40)	2224	3.16 (11.97)	40.894 (24.875)	0.17 (0.03)	0.11 (0.42)	28.91" Hg (97.90 kPa)

Maximum torque - 950 lb.-ft. (1287 Nm) at 1300 rpm

Maximum torque rise - 49.4%

Torque rise at 1600 engine rpm - 48%

Power increase at 1800 engine rpm - 22.5%

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—8th Gear										
213.10 (158.91)	14852 (66.06)	5.38 (8.66)	2000	3.0	0.427 (0.260)	16.36 (3.22)	0.048 (0.029)	212 (100)	68 (20)	28.53 (96.61)
75% of Pull at Maximum Power—8th Gear										
171.21 (127.67)	11148 (49.59)	5.76 (9.27)	2124	2.2	0.458 (0.279)	15.25 (3.00)	0.047 (0.029)	200 (93)	73 (23)	28.56 (96.72)
50% of Pull at Maximum Power—8th Gear										
117.10 (87.32)	7441 (33.10)	5.90 (9.50)	2160	1.5	0.521 (0.317)	13.41 (2.64)	0.047 (0.028)	207 (97)	73 (23)	28.56 (96.72)
75% of Pull at Reduced Engine Speed—11th Gear										
171.24 (127.69)	11147 (49.58)	5.76 (9.27)	1400	2.2	0.404 (0.246)	17.28 (3.40)	0.057 (0.035)	199 (93)	76 (24)	28.56 (96.72)
50% of Pull at Reduced Engine Speed—11th Gear										
117.58 (87.68)	7519 (33.44)	5.86 (9.43)	1415	1.5	0.439 (0.267)	15.93 (3.14)	0.060 (0.036)	199 (93)	75 (24)	28.57 (96.74)

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

Dates of tests: September 11 - 17, 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)** 0.8390 **Fuel weight** 6.986 lbs/gal (0.838 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 Hy-Tran Ultra fluid **Front axle lubricant** SAE 85W-140 API GL-5 **Total time engine was operated:** 18.0 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.** *14H00061268* **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 **Exhaust** DOC (diesel oxidation catalyst) and SCR (selective catalyst reduction) integrated within a vertical muffler **Cooling medium temperature control** thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 87.5 - 93.0 lb/h (39.7 - 42.2 kg/h) **High idle:** 2200 - 2250 rpm **Turbo boost:** nominal 18.1 - 21.0 psi (125 - 145 kPa) as measured 19.5 psi (134 kPa)

CHASSIS: Type front wheel assist with duals **Serial No.** *ZERF06296* **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 2.06 (3.32) second 2.36 (3.80) third 2.73 (4.39) fourth 3.13 (5.03) fifth 3.59 (5.77) sixth 4.11 (6.62) seventh 4.80 (7.72) eighth 5.51 (8.86) ninth 6.35 (10.22) tenth 7.28 (11.72) eleventh 8.35 (13.44) twelfth 9.58 (15.42) thirteenth 11.94 (19.21) fourteenth 13.70 (22.04) fifteenth 15.80 (25.42) sixteenth 18.11 (29.15) seventeenth 20.79 (33.45) eighteenth 23.84 (38.37) nineteenth 26.10 (42.00) electronically limited reverse 2.96 (4.77), 3.40 (5.48), 6.91 (11.12), 7.92 (12.75)

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)	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)
4th Gear										
199.08 (148.45)	26131 (116.23)	2.86 (4.60)	2000	9.3	0.456 (0.277)	15.33 (3.02)	0.053 (0.032)	213 (100)	72 (22)	28.57 (96.75)
5th Gear										
205.24 (153.05)	22592 (100.49)	3.41 (5.49)	2000	5.8	0.442 (0.269)	15.80 (3.11)	0.052 (0.031)	212 (100)	73 (23)	28.57 (96.75)
6th Gear										
206.57 (154.04)	19582 (87.11)	3.96 (6.37)	2000	4.6	0.440 (0.268)	15.87 (3.13)	0.052 (0.031)	212 (100)	76 (24)	28.58 (96.78)
7th Gear										
211.74 (157.89)	17028 (75.74)	4.66 (7.50)	1999	3.5	0.429 (0.261)	16.28 (3.21)	0.049 (0.030)	213 (101)	71 (22)	28.54 (96.65)
8th Gear										
213.10 (158.91)	14852 (66.06)	5.38 (8.66)	2000	3.0	0.427 (0.260)	16.36 (3.22)	0.048 (0.029)	212 (100)	68 (20)	28.53 (96.61)
9th Gear										
210.85 (157.23)	12687 (56.43)	6.23 (10.03)	2000	2.6	0.432 (0.263)	16.19 (3.19)	0.049 (0.030)	213 (101)	68 (20)	28.52 (96.58)
10th Gear										
208.49 (155.47)	10901 (48.49)	7.17 (11.54)	2000	2.3	0.436 (0.265)	16.02 (3.16)	0.050 (0.030)	213 (100)	68 (20)	28.53 (96.61)
11th Gear										
206.50 (153.98)	9384 (41.74)	8.25 (13.28)	2000	1.9	0.440 (0.268)	15.87 (3.13)	0.050 (0.031)	212 (100)	70 (21)	28.54 (96.64)

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** 1000 rpm at 1803 engine rpm **Unladen tractor mass** 27530 lb (12487 kg)

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. This tractor did not meet the manufacturer's remote hydraulic flow claims of 44 GPM (166 l/min) nor 59 GPM (225 l/min). The manufacturer's remote hydraulic flow claim of 75 GPM (282 l/min) 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. **2123**, Nebraska Summary 986, January 22, 2016.

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	66.8
Bystander in 18th gear		83.2

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

Four 480/80R50;***;12(85)
Two 420/85R34;***;23(160)
21.0 in (535 mm)
16085 lb (7296 kg)
11620 lb (5271 kg)
27705 lb(12567 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)
197.13 (147.00)	27021 (120.20)	2.74 (4.40)	1985	12.6	4th Gear 0.471 (0.286)	14.84 (2.92)	0.056 (0.034)	213 (101)	71 (22)	28.57 (96.75)
215.11 (160.41)	25469 (113.29)	3.17 (5.10)	1923	9.0	5th Gear 0.445 (0.271)	15.70 (3.09)	0.056 (0.034)	213 (101)	74 (24)	28.57 (96.75)
233.00 (173.75)	24564 (109.27)	3.56 (5.73)	1859	7.8	6th Gear 0.432 (0.263)	16.18 (3.19)	0.056 (0.034)	213 (101)	75 (24)	28.58 (96.78)
254.40 (189.71)	23508 (104.57)	4.06 (6.53)	1800	6.7	7th Gear 0.415 (0.253)	16.83 (3.31)	0.054 (0.033)	213 (100)	77 (25)	28.59 (96.82)
258.90 (193.06)	20467 (91.04)	4.75 (7.64)	1800	5.0	8th Gear 0.408 (0.248)	17.10 (3.37)	0.053 (0.032)	212 (100)	78 (25)	28.58 (96.78)
258.85 (193.02)	17552 (78.08)	5.53 (8.90)	1800	3.9	9th Gear 0.408 (0.248)	17.14 (3.38)	0.053 (0.032)	212 (100)	78 (26)	28.58 (96.78)
260.48 (194.24)	15261 (67.88)	6.40 (10.30)	1800	3.1	10th Gear 0.406 (0.247)	17.21 (3.39)	0.051 (0.031)	212 (100)	69 (20)	28.52 (96.58)
257.92 (192.33)	13121 (58.37)	7.37 (11.86)	1800	2.6	11th Gear 0.408 (0.248)	17.12 (3.37)	0.052 (0.031)	212 (100)	73 (23)	28.53 (96.61)
256.26 (191.09)	11322 (50.36)	8.49 (13.66)	1800	2.3	12th Gear 0.411 (0.250)	17.00 (3.35)	0.052 (0.031)	212 (100)	72 (22)	28.54 (96.63)

HYDRAULIC PERFORMANCE

CATEGORY: 3

Quick Attach: Yes

OECD Static test

Maximum force exerted through whole range: 14301 lbs (63.6 kN)

Standard pump **High flow pump**
three outlet sets combined

i) Sustained pressure at compensator cutoff: 2849 psi (196 bar) 2938 psi (203 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed: 42.5 GPM (161.0 l/min) 57.9 GPM (219.1 l/min)

iii) Pump delivery rate at maximum hydraulic power: 42.1 GPM (159.4 l/min) 58.2 GPM (220.2 l/min)

Delivery pressure: 2622 psi (181 bar) 2524 psi (174 bar)

Power: 64.4 HP (48.0 kW) 85.7 hp (63.9 kW)

single outlet set

i) Sustained pressure at compensator cutoff: 2837 psi (196 bar) 2885 psi (199 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed: 42.1 GPM (159.5 l/min) 42.0 GPM (159.1 l/min)

iii) Pump delivery rate at maximum hydraulic power: 39.5 GPM (149.6 l/min) 36.9 GPM (139.9 l/min)

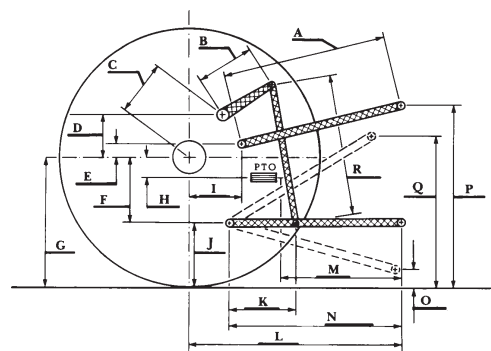
Delivery pressure: 2231 psi (154 bar) 2169 psi (150 bar)

Power: 51.5 HP (38.4 kW) 46.8 hp (34.9 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	30.3	770
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'	55.9	1420
M	25.0	636
N	43.1	1095
O	9.0	230
P	47.8	1215
Q	42.7	1085
R	38.6	980

*L' to Quick Attach ends



CASE IH MAGNUM 280 DIESEL