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2016

Test 2148: Case IH Magnum 310 Rowtrac

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2148—SUMMARY 1011

CASE IH MAGNUM 310 ROWTRAC DIESEL

17 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)						
275.92 (205.75)	2000	14.40 (54.52)	0.366 (0.223)	19.16 (3.77)	1.52 (5.74)	
Standard Power Take-off Speed (998 rpm)						
317.66 (236.88)	1800	16.01 (60.61)	0.353 (0.215)	19.84 (3.91)	1.73 (6.55)	
Maximum Power (1 hour)						
317.66 (236.88)	1800	16.01 (60.61)	0.353 (0.215)	19.84 (3.91)	1.73 (6.55)	

VARYING POWER AND FUEL CONSUMPTION

275.92 (205.75)	2000	14.40 (54.52)	0.366 (0.223)	19.16 (3.77)	1.52 (5.74)	Air temperature
246.84 (184.07)	2103	13.34 (50.51)	0.379 (0.230)	18.50 (3.64)	1.30 (4.93)	73°F (23°C)
189.52 (141.33)	2153	10.86 (41.10)	0.402 (0.244)	17.45 (3.44)	0.88 (3.34)	Relative humidity
127.26 (94.90)	2172	8.05 (30.48)	0.443 (0.270)	15.80 (3.11)	0.61 (2.31)	37%
64.84 (48.35)	2210	5.43 (20.57)	0.587 (0.357)	11.93 (2.35)	0.36 (1.36)	Barometer
1.51 (1.13)	2225	3.07 (11.64)	14.233 (8.658)	0.49 (0.10)	0.13 (0.48)	28.90" Hg (97.87 kPa)

Maximum torque - 1077 lb.-ft. (1565 Nm) at 1399 rpm

Maximum torque rise - 48.7%

Torque rise at 1599 engine rpm - 40%

Power increase at 1800 engine rpm - 15.1%

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)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Power at Rated Engine Speed—7th Gear										
227.28 (169.48)	17057 (75.87)	5.00 (8.05)	2000	3.4	0.444 (0.270)	15.77 (3.11)	0.059 (0.036)	213 (101)	56 (14)	28.44 (96.31)
75% of Pull at Rated Engine Speed—7th Gear										
183.07 (136.52)	12796 (56.92)	5.37 (8.63)	2122	2.2	0.478 (0.291)	14.67 (2.89)	0.054 (0.033)	206 (97)	66 (19)	28.44 (96.31)
50% of Pull at Rated Engine Speed—7th Gear										
125.58 (93.65)	8527 (37.93)	5.52 (8.88)	2164	1.3	0.545 (0.332)	12.85 (2.53)	0.051 (0.031)	205 (96)	69 (21)	28.46 (96.38)
75% of Pull at Reduced Engine Speed—9th Gear										
183.01 (136.47)	12772 (56.81)	5.37 (8.64)	1606	2.2	0.441 (0.268)	15.91 (3.13)	0.052 (0.032)	196 (91)	67 (19)	28.45 (96.34)
50% of Pull at Reduced Engine Speed—9th Gear										
125.87 (93.86)	8543 (38.00)	5.53 (8.89)	1636	1.3	0.487 (0.296)	14.40 (2.84)	0.049 (0.030)	208 (98)	70 (21)	28.43 (96.28)

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

Dates of tests: April 21 to May 3, 2016

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) 0.8417 **Fuel weight** 7.008 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
Akcelia Hy-Tran Ultratraction fluid **Front axle**
lubricant SAE 85W-140 API GL-5 **Total time engine**
was operated: 17.5 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. *15H00120736* **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: 98.1 - 104.3 lb/h (44.5 - 47.3 kg/h) **High idle:**
2215 - 2265 rpm **Turbo boost:** nominal 21.0 - 23.8
psi (145 - 165 kPa) as measured 22.4 psi (155 kPa)

CHASSIS: Type Half track drive, front wheel
assist with rear rubber tracks **Serial No.** *ZGRF01260*
Tread width rear 87.0" (2210 mm) front 68.0" (1725
mm) to 88.0" (2235 mm) **Wheelbase** 124.2" (3155
mm) **Length of track on ground** 29.4" (748 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 2.23 (3.59) second
2.56 (4.12) third 2.95 (4.75) fourth 3.39 (5.45) fifth
3.88 (6.25) sixth 4.46 (7.17) seventh 5.20 (8.37)
eighth 5.97 (9.60) ninth 6.88 (11.07) tenth 7.89
(12.69) eleventh 9.05 (14.56) twelfth 10.38 (16.70)
thirteenth 12.93 (20.81) fourteenth 14.83 (23.87)
fifteenth 17.11 (27.53) sixteenth 19.01 (30.60)
seventeenth 19.01 (30.60) electronically limited
reverse 3.21 (5.17), 3.68 (5.93), 7.48 (12.04), 8.58
(13.81)

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)
2nd Gear										
192.33 (143.42)	32087 (142.73)	2.25 (3.62)	2068	14.8	0.504 (0.307)	13.90 (2.74)	0.065 (0.039)	205 (96)	53 (11)	28.88 (97.80)
3rd Gear										
208.17 (155.23)	30316 (134.85)	2.58 (4.14)	1998	12.3	0.486 (0.296)	14.41 (2.84)	0.064 (0.039)	215 (101)	55 (13)	28.41 (96.21)
4th Gear										
217.27 (162.01)	26220 (116.63)	3.11 (5.01)	1999	7.8	0.466 (0.283)	15.05 (2.96)	0.060 (0.037)	214 (101)	56 (13)	28.46 (96.38)
5th Gear										
217.98 (162.55)	22431 (99.78)	3.65 (5.87)	2000	5.7	0.463 (0.282)	15.13 (2.98)	0.061 (0.037)	214 (101)	63 (17)	28.46 (96.38)
6th Gear										
222.86 (166.18)	19701 (87.63)	4.24 (6.82)	2000	4.3	0.453 (0.276)	15.47 (3.05)	0.061 (0.037)	214 (101)	57 (14)	28.44 (96.31)
7th Gear										
227.28 (169.48)	17057 (75.87)	5.00 (8.05)	2000	3.4	0.444 (0.270)	15.77 (3.11)	0.059 (0.036)	213 (101)	56 (14)	28.44 (96.31)
8th Gear										
224.72 (167.57)	14593 (64.91)	5.78 (9.29)	2000	2.6	0.448 (0.273)	15.63 (3.08)	0.060 (0.037)	213 (101)	58 (15)	28.47 (96.41)
9th Gear										
220.40 (164.35)	12339 (54.88)	6.70 (10.78)	1999	2.0	0.458 (0.279)	15.29 (3.01)	0.060 (0.036)	213 (101)	59 (15)	28.47 (96.41)
10th Gear										
217.44 (162.14)	10570 (47.02)	7.72 (12.42)	1999	1.6	0.467 (0.284)	15.02 (2.96)	0.061 (0.037)	213 (101)	60 (16)	28.47 (96.41)
11th Gear										
213.17 (158.96)	9001 (40.04)	8.88 (14.29)	2000	1.3	0.474 (0.288)	14.79 (2.91)	0.063 (0.038)	211 (99)	61 (16)	28.47 (96.41)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 6th gear	67.3	67.2
Bystander in 15th gear		87.8

TIRES AND WEIGHT

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

Tested Without Ballast
 2 x 18 in (455 mm)
 Two 420/85R38;***;20(140)
 22.5 in (570 mm)
 25405 lb (11523 kg)
 10630 lb (4822 kg)
 36035 lb (16345 kg)

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** 35860 lb (16266 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. The manufacturer's remote flow claims of 59 GPM (224 l/min), with High flow system, and 75 GPM (282 l/min), with TwinFlow system, were 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. **2148**, Nebraska Summary 1011, June 10, 2016.

Roger M. Hoy
 Director

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

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)
2nd Gear										
192.77 (143.75)	32066 (142.63)	2.26 (3.63)	2069	14.5	0.504 (0.306)	13.91 (2.74)	0.065 (0.040)	203 (95)	53 (12)	28.89 (97.82)
3rd Gear										
208.74 (155.65)	31386 (139.61)	2.50 (4.02)	1977	14.1	0.494 (0.300)	14.20 (2.80)	0.066 (0.040)	215 (102)	55 (13)	28.45 (96.34)
4th Gear										
225.06 (167.82)	29549 (131.44)	2.86 (4.60)	1921	11.8	0.477 (0.290)	14.69 (2.89)	0.064 (0.039)	215 (101)	56 (13)	28.44 (96.31)
5th Gear										
240.61 (179.42)	27449 (122.10)	3.29 (5.29)	1875	9.3	0.460 (0.280)	15.24 (3.00)	0.061 (0.037)	215 (101)	56 (13)	28.44 (96.31)
6th Gear										
249.91 (186.35)	25512 (113.48)	3.68 (5.91)	1800	8.0	0.450 (0.274)	15.57 (3.07)	0.061 (0.037)	213 (101)	63 (17)	28.45 (96.34)
7th Gear										
260.34 (194.13)	22174 (98.63)	4.40 (7.08)	1800	5.4	0.432 (0.263)	16.21 (3.19)	0.059 (0.036)	214 (101)	57 (14)	28.44 (96.31)
8th Gear										
262.46 (195.72)	19235 (85.56)	5.12 (8.24)	1800	4.2	0.430 (0.261)	16.32 (3.21)	0.059 (0.036)	213 (101)	59 (15)	28.45 (96.34)
9th Gear										
261.69 (195.14)	16464 (73.24)	5.96 (9.59)	1800	3.1	0.431 (0.262)	16.27 (3.21)	0.059 (0.036)	213 (101)	60 (15)	28.45 (96.34)
10th Gear										
259.59 (193.58)	14137 (62.88)	6.89 (11.08)	1800	2.5	0.433 (0.263)	16.18 (3.19)	0.058 (0.035)	214 (101)	60 (16)	28.45 (96.34)
11th Gear										
256.90 (191.57)	12133 (53.97)	7.94 (12.78)	1800	1.9	0.437 (0.266)	16.03 (3.16)	0.060 (0.036)	214 (101)	61 (16)	28.47 (96.41)
12th Gear										
250.10 (186.50)	10247 (45.58)	9.15 (14.73)	1801	1.5	0.449 (0.273)	15.61 (3.08)	0.061 (0.037)	213 (100)	62 (17)	28.45 (96.34)

HYDRAULIC PERFORMANCE

CATEGORY: 4N

Quick Attach: Yes

OECD Static test

Maximum force exerted through whole range: 20012 lbs (89.0 kN)

Standard pump

three outlet sets combined

- i) Sustained pressure at compensator cutoff: 2798 psi (193 bar)
 ii) Pump delivery rate at minimum pressure and rated engine speed: 44.2 GPM (167.4 l/min)

- iii) Pump delivery rate at maximum hydraulic power: 44.6 GPM (169.0 l/min)
 Delivery pressure: 2587 psi (178 bar)
 Power: 67.4 HP (50.3 kW)

single outlet set

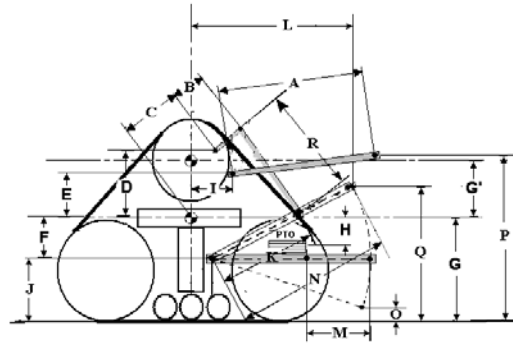
- i) Sustained pressure at compensator cutoff: 2790 psi (192 bar)
 ii) Pump delivery rate at minimum pressure and rated engine speed: 42.6 GPM (161.1 l/min)
 iii) Pump delivery rate at maximum hydraulic power: 39.9 GPM (151.2 l/min)
 Delivery pressure: 2230 psi (154 bar)
 Power: 52.0 HP (38.8 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	29.7	755
B	20.5	520
C	22.9	581
D	23.4	595
E	13.2	336
F	11.6	295
G	33.8	860
*G'	14.6	370
H	0.8	20
I	20.9	530
J	22.2	565
K	30.2	768
L	53.1	1350
*L'	60.4	1534
M	27.2	691
N	38.2	970
O	10.4	265
P	49.8	1265
Q	42.3	1075
R	40.7	1035

*G' to undercarriage pivot point

*L' to Quick coupler ends



CASE IH MAGNUM 310 ROWTRAC DIESEL

Institute of Agriculture and Natural Resources
 University of Nebraska–Lincoln