

# NEBRASKA OECD TRACTOR TEST 2124-SUMMARY 987

## CASE IH MAGNUM 310 DIESEL

### 19 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>						
274.72 (204.86)	2000	14.45 (54.70)	0.367 (0.224)	19.01 (3.74)	1.37 (5.19)	
<b>Standard Power Take-off Speed (998 rpm)</b>						
313.71 (233.94)	1800	16.02 (60.63)	0.357 (0.217)	19.59 (3.86)	1.60 (6.07)	
<b>Maximum Power (1 hour)</b>						
313.71 (233.94)	1800	16.02 (60.63)	0.357 (0.217)	19.59 (3.86)	1.60 (6.07)	

#### VARYING POWER AND FUEL CONSUMPTION

274.72 (204.86)	2000	14.45 (54.70)	0.367 (0.224)	19.01 (3.74)	1.37 (5.19)	Air temperature
246.95 (184.15)	2113	13.52 (51.18)	0.383 (0.233)	18.26 (3.60)	1.19 (4.49)	75°F (27°C)
188.38 (140.48)	2151	10.94 (41.41)	0.406 (0.247)	17.22 (3.39)	0.79 (3.00)	Relative humidity
127.00 (94.70)	2173	8.26 (31.27)	0.454 (0.276)	15.37 (3.03)	0.54 (2.05)	60%
64.57 (48.15)	2209	5.68 (21.50)	0.615 (0.374)	11.37 (2.24)	0.40 (1.50)	Barometer
1.58 (1.18)	2225	3.05 (11.56)	13.491 (8.206)	0.52 (0.10)	0.27 (1.01)	28.75" Hg (97.36 kPa)

Maximum torque - 1067 lb.-ft. (1447 Nm) at 1300 rpm

Maximum torque rise - 47.9%

Torque rise at 1600 engine rpm - 40%

Power increase at 1800 engine rpm - 14.2%

#### 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)	D.E.F. Consumption Hp.hr/gal (kg/kW.h)	Temp. °F(°C) cool- ing dry med	Air bulb	Barom. inch Hg (kPa)	
<b>Maximum Power—7th Gear</b>										
234.51 (174.87)	19062 (84.79)	4.61 (7.42)	2000	4.3	0.431 (0.262)	16.22 (3.20)	0.051 (0.031)	211 (99)	72 (22)	28.71 (97.22)
<b>75% of Pull at Maximum Power—7th Gear</b>										
189.47 (141.29)	14259 (63.43)	4.98 (8.01)	2124	2.8	0.454 (0.276)	15.38 (3.03)	0.047 (0.029)	212 (100)	75 (24)	28.70 (97.19)
<b>50% of Pull at Maximum Power—7th Gear</b>										
130.20 (97.09)	9500 (42.26)	5.14 (8.27)	2165	2.0	0.510 (0.310)	13.69 (2.70)	0.043 (0.026)	208 (98)	75 (24)	28.70 (97.19)
<b>75% of Pull at Reduced Engine Speed—10th Gear</b>										
189.45 (141.27)	14126 (62.84)	5.03 (8.10)	1413	2.8	0.399 (0.243)	17.50 (3.45)	0.052 (0.032)	211 (99)	77 (25)	28.67 (97.09)
<b>50% of Pull at Reduced Engine Speed—10th Gear</b>										
130.39 (97.23)	9505 (42.28)	5.14 (8.27)	1428	2.0	0.431 (0.262)	16.23 (3.20)	0.053 (0.032)	199 (93)	75 (24)	28.69 (97.16)

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

**Dates of tests:** September 4 - 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:** 21.0 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.** \*14H00078164\* **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 - 104.1 lb/h (44.5 - 47.2 kg/h) **High idle:** 2200 - 2250 rpm **Turbo boost:** nominal 19.6 - 22.5 psi (135 - 155 kPa) as measured 20.8 psi (143 kPa)

**CHASSIS: Type** front wheel assist with duals **Serial No.** \*ZFRF01306\* **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)
5th Gear										
204.39 (152.41)	24097 (107.19)	3.18 (5.12)	2062	14.4	0.489 (0.297)	14.30 (2.82)	0.061 (0.037)	213 (101)	63 (17)	28.79 (97.49)
6th Gear										
226.88 (169.18)	22060 (98.13)	3.86 (6.21)	2000	6.7	0.446 (0.272)	15.65 (3.08)	0.054 (0.033)	212 (100)	66 (19)	28.80 (97.53)
7th Gear										
234.51 (174.87)	19062 (84.79)	4.61 (7.42)	2000	4.3	0.431 (0.262)	16.22 (3.20)	0.051 (0.031)	211 (99)	72 (22)	28.71 (97.22)
8th Gear										
234.36 (174.76)	16420 (73.04)	5.35 (8.61)	2000	3.4	0.433 (0.263)	16.13 (3.18)	0.051 (0.031)	212 (100)	72 (22)	28.70 (97.19)
9th Gear										
236.65 (176.47)	14296 (63.59)	6.21 (9.99)	2000	2.7	0.428 (0.260)	16.32 (3.21)	0.051 (0.031)	213 (100)	73 (23)	28.70 (97.19)
10th Gear										
234.32 (174.73)	12281 (54.63)	7.16 (11.51)	1999	2.4	0.433 (0.264)	16.12 (3.18)	0.051 (0.031)	213 (101)	72 (22)	28.70 (97.19)
11th Gear										
232.15 (173.11)	10565 (46.99)	8.24 (13.26)	1999	2.0	0.438 (0.267)	15.94 (3.14)	0.051 (0.031)	212 (100)	73 (23)	28.70 (97.19)

**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** 1000 rpm at 1803 engine rpm **Unladen tractor mass** 25215 lb (11437 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 claims of 67.0 dB(A) cab sound level nor remote hydraulic flow claims of 44 GPM (166 l/min) and 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. **2124**, Nebraska Summary 987, 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	67.7	67.8
Bystander in 18th gear		84.4

**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)  
 21.5 in (545 mm)  
 14110 lb (6400 kg)  
 11280 lb (5117 kg)  
 25390 lb(11517 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)	Fuel 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)
5th Gear										
208.24 (155.28)	24098 (107.19)	3.24 (5.21)	2059	12.7	0.483 (0.294)	14.47 (2.85)	0.059 (0.036)	213 (101)	63 (17)	28.79 (97.49)
6th Gear										
230.25 (171.69)	23124 (102.86)	3.74 (6.01)	1973	8.4	0.450 (0.274)	15.53 (3.06)	0.056 (0.034)	212 (100)	67 (19)	28.80 (97.53)
7th Gear										
254.15 (189.52)	22232 (98.89)	4.29 (6.90)	1912	6.9	0.428 (0.260)	16.34 (3.22)	0.054 (0.033)	212 (100)	69 (21)	28.79 (97.49)
8th Gear										
269.64 (201.07)	21167 (94.15)	4.78 (7.69)	1836	5.9	0.416 (0.253)	16.81 (3.31)	0.053 (0.032)	212 (100)	71 (21)	28.79 (97.49)
9th Gear										
271.65 (202.57)	18573 (82.62)	5.49 (8.83)	1800	4.4	0.410 (0.249)	17.05 (3.36)	0.053 (0.032)	213 (100)	72 (22)	28.79 (97.49)
10th Gear										
272.79 (203.42)	16101 (71.62)	6.35 (10.22)	1800	3.4	0.409 (0.249)	17.08 (3.36)	0.053 (0.032)	212 (100)	73 (23)	28.79 (97.49)
11th Gear										
271.31 (202.32)	13869 (61.69)	7.34 (11.81)	1800	2.8	0.411 (0.250)	17.02 (3.35)	0.052 (0.032)	212 (100)	74 (23)	28.79 (97.49)
12th Gear										
269.67 (201.09)	11953 (53.17)	8.46 (13.62)	1800	2.3	0.414 (0.252)	16.88 (3.33)	0.052 (0.032)	212 (100)	75 (24)	28.79 (97.49)

## HYDRAULIC PERFORMANCE

CATEGORY: 3

Quick Attach: Yes

OECD Static test

Maximum force exerted through whole range: 16037 lbs (71.3 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)

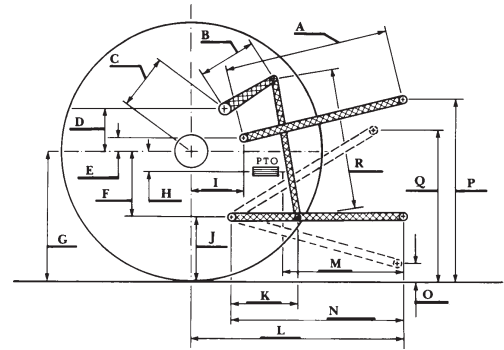
ii) Pump delivery rate at minimum pressure and rated engine speed: 42.1 GPM (159.5 l/min)      42.0 GPM (159.1 l/min)

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 310 DIESEL**