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2012

## Test 2046: Case IH Steiger 400

Nebraska Tractor Test Lab

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

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# NEBRASKA OECD TRACTOR TEST 2046 - SUMMARY 846

## CASE IH STEIGER 400 DIESEL

### 16 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)	
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1051 rpm)						
354.77 (264.55)	2100	20.63 (78.11)	0.408 (0.248)	17.19 (3.39)	1.24 (4.70)	
Standard Power Take-off Speed (1000 rpm)						
390.47 (291.17)	1998	21.65 (81.94)	0.388 (0.236)	18.04 (3.55)	1.51 (5.73)	
Maximum Power (1 hour)						
400.10 (298.35)	1900	21.70 (82.13)	0.380 (0.231)	18.44 (3.63)	1.50 (5.67)	

#### VARYING POWER AND FUEL CONSUMPTION

354.77 (264.55)	2100	20.63 (78.11)	0.408 (0.248)	17.19 (3.39)	1.24 (4.70)	Air temperature
305.50 (227.81)	2130	18.68 (70.72)	0.429 (0.261)	16.35 (3.22)	1.11 (4.20)	73°F (23°C)
230.50 (171.88)	2143	15.24 (57.70)	0.463 (0.282)	15.12 (2.98)	0.85 (3.23)	Relative humidity
154.60 (115.29)	2156	11.35 (42.97)	0.515 (0.313)	13.62 (2.68)	0.54 (2.03)	20%
77.40 (57.72)	2165	7.97 (30.16)	0.721 (0.439)	9.71 (1.91)	0.34 (1.29)	Barometer
1.20 (0.89)	2179	4.74 (17.95)	27.692 (16.844)	0.25 (0.05)	0.25 (0.92)	28.78" Hg (97.46 kPa)

Maximum torque - 1308 lb.-ft. (1773 Nm) at 1401 rpm

Maximum torque rise - 47.4%

Torque rise at 1681 engine rpm - 39%

Power increase at 1900 engine rpm - 12.7%

#### DRAWBAR PERFORMANCE

##### 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—5th Gear</b>									
328.56 (245.00)	21421 (95.28)	5.75 (9.25)	2101	2.5	0.440 (0.268)	15.92 (3.14)	189 (87)	55 (13)	28.85 (97.70)
<b>75% of Pull at Maximum Power—5th Gear</b>									
251.91 (187.85)	16039 (71.34)	5.89 (9.48)	2136	2.0	0.476 (0.290)	14.72 (2.90)	189 (87)	62 (17)	28.65 (97.02)
<b>50% of Pull at Maximum Power—5th Gear</b>									
169.52 (126.41)	10686 (47.53)	5.95 (9.58)	2144	1.3	0.536 (0.326)	13.06 (2.57)	183 (84)	64 (18)	28.63 (96.95)
<b>75% of Pull at Reduced Engine Speed—9th Gear</b>									
251.48 (187.53)	15931 (70.86)	5.92 (9.53)	1474	1.9	0.407 (0.247)	17.23 (3.40)	182 (83)	63 (17)	28.65 (97.02)
<b>50% of Pull at Reduced Engine Speed—9th Gear</b>									
169.29 (126.24)	10615 (47.22)	5.98 (9.62)	1483	1.3	0.438 (0.267)	16.00 (3.15)	180 (82)	65 (18)	28.62 (96.92)

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

**Dates of tests:** November 6-12, 2012

**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 15W40 API service classification** CI-4 **Transmission lubricant** Hytran Ultra transmission fluid **Hydraulic and axle lubricant** Akcela Nex explore hydraulic fluid **Total time engine was operated:** 14.0 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.** \*A000192977\* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.315" x 5.906" (135.0 mm x 150.0 mm) **Compression ratio** 16.5 to 1 **Displacement** 786 cu in (12880 ml) **Starting system** 24 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, separate radiators for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** thermostat and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** 136.7 - 146.4 lb/h (62.0 - 66.4 kg/h) **High idle:** 2165 - 2215 rpm **Turbo boost:** nominal 21.0 - 23.9 psi (145 - 165 kPa) as measured 22.4 psi (154 kPa)

**CHASSIS: Type** four wheel drive with duals **Serial No.** \*ZCF130784\* **Tread width** rear 60.0" (1524 mm) to 130.0" (3302 mm) front 60.0" (1524 mm) to 130.0" (3302 mm) **Wheelbase** 148.0" (3759 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 2.85 (4.59) second 3.43 (5.52) third 4.15 (6.68) fourth 5.00 (8.05) fifth 5.74 (9.24) sixth 6.30 (10.14) seventh 6.91 (11.12) eighth 7.59 (12.21) ninth 8.34 (13.42) tenth 9.17 (14.75) eleventh 10.05 (16.17) twelfth 11.04 (17.77) thirteenth 12.68 (20.41) fourteenth 15.27 (24.57) fifteenth 18.44 (29.68) sixteenth 22.22 (35.76) reverse 4.32 (6.95), 8.85 (14.24) **Clutch** multiple wet disc electrohydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Power take-off** 1000 rpm at 1999 engine rpm **Unladen tractor mass** 39975 lb (18132 kg)

## DRAWBAR PERFORMANCE AT 2100 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)
285.62 (212.99)	39843 (177.23)	2.69 (4.32)	2113	8.9	1st Gear 0.477 (0.290)	14.70 (2.90)	187 (86)	56 (13)	28.66 (97.05)
322.16 (240.23)	36424 (162.02)	3.32 (5.33)	2100	6.1	2nd Gear 0.453 (0.276)	15.46 (3.05)	194 (90)	58 (14)	28.66 (97.05)
328.75 (245.15)	30126 (134.00)	4.09 (6.58)	2100	4.1	3rd Gear 0.441 (0.268)	15.91 (3.13)	203 (95)	58 (14)	28.78 (97.46)
328.40 (244.88)	24711 (109.92)	4.99 (8.02)	2100	3.1	4th Gear 0.442 (0.269)	15.84 (3.12)	190 (88)	56 (13)	28.84 (97.66)
328.56 (245.00)	21421 (95.28)	5.75 (9.25)	2101	2.5	5th Gear 0.440 (0.268)	15.92 (3.14)	189 (87)	55 (13)	28.85 (97.70)
331.43 (247.14)	19605 (87.21)	6.34 (10.20)	2101	2.3	6th Gear 0.436 (0.265)	16.06 (3.16)	205 (96)	57 (14)	28.82 (97.60)
327.84 (244.47)	17643 (78.48)	6.97 (11.22)	2100	2.0	7th Gear 0.441 (0.268)	15.91 (3.13)	195 (91)	58 (14)	28.79 (97.49)
329.15 (245.45)	16089 (71.57)	7.68 (12.35)	2101	1.8	8th Gear 0.440 (0.267)	15.94 (3.14)	206 (96)	57 (14)	28.79 (97.49)
325.61 (242.80)	14455 (64.30)	8.45 (13.59)	2101	1.6	9th Gear 0.444 (0.270)	15.78 (3.11)	206 (97)	58 (14)	28.79 (97.49)

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

**Note:** This tractor has a driveline protection system that limits the maximum engine torque in gears 1 through 3.

**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 110°F (43°C). The performance figures 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. **2046**, Nebraska Summary 846, December 21, 2012.

Roger M. Hoy  
Director

M.R. Riley  
P.J. Jasa  
J.D. Luck  
Board of Tractor Test Engineers

## TRACTOR SOUND LEVEL WITH CAB dB(A)

At no load in 4th gear	74.9
Bystander in 16th gear	84.2

## 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 480/95R50;\*\*\*;10(70)  
 Four 480/95R50;\*\*\*;12(85)  
 25.5 in (535 mm)  
 17495 lb (7936 kg)  
 22655 lb (10276 kg)  
 40150 lb (18212 kg)

# **DRAWBAR PERFORMANCE AT 1900 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)
261.78 (195.21)	40060 (178.19)	2.45 (3.94)	1923	8.8	1st Gear 0.462 (0.281)	15.17 (2.99)	183 (84)	55 (13)	28.66 (97.05)
330.74 (246.63)	38684 (172.07)	3.21 (5.17)	2058	7.4	2nd Gear 0.450 (0.274)	15.56 (3.07)	199 (93)	59 (15)	28.67 (97.09)
357.71 (266.74)	35967 (159.99)	3.73 (6.00)	1957	6.3	3rd Gear 0.430 (0.261)	16.31 (3.21)	206 (96)	58 (14)	28.77 (97.43)
367.28 (273.88)	30995 (137.87)	4.44 (7.15)	1900	4.4	4th Gear 0.417 (0.254)	16.79 (3.31)	201 (94)	57 (14)	28.83 (97.63)
369.20 (275.31)	26861 (119.48)	5.15 (8.29)	1900	3.4	5th Gear 0.412 (0.251)	17.00 (3.35)	192 (89)	56 (13)	28.84 (97.66)
371.63 (277.12)	24499 (108.98)	5.69 (9.15)	1900	3.0	6th Gear 0.411 (0.250)	17.04 (3.36)	206 (96)	58 (14)	28.81 (97.56)
370.04 (275.94)	22165 (98.59)	6.26 (10.07)	1900	2.6	7th Gear 0.414 (0.252)	16.95 (3.34)	207 (97)	58 (14)	28.79 (97.49)
371.46 (276.99)	20189 (89.80)	6.90 (11.10)	1900	2.4	8th Gear 0.413 (0.251)	16.98 (3.34)	208 (98)	57 (14)	28.79 (97.49)
370.22 (276.07)	18268 (81.26)	7.60 (12.23)	1900	2.1	9th Gear 0.411 (0.250)	17.04 (3.36)	207 (97)	58 (14)	28.79 (97.49)
371.29 (276.87)	16626 (73.96)	8.38 (13.48)	1901	1.9	10th Gear 0.411 (0.250)	17.04 (3.36)	207 (97)	58 (14)	28.79 (97.49)

## HYDRAULIC PERFORMANCE

CATEGORY: IVN

Quick Attach: yes

OECD Static test

Maximum force exerted through whole range: 21903 lbs (97.4 kN)

### Three outlet sets combined

	Standard pump	High flow pump
i) Sustained pressure of the open relief valve:	2877 psi (198 bar)	2901 psi (200 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM (165.8 l/min)	61.0 GPM (230.9 l/min)
iii) Pump delivery rate at maximum hydraulic power:	43.3 GPM (163.7 l/min)	57.1 GPM (216.3 l/min)
Delivery pressure:	2526 psi (174 bar)	2518 psi (174 bar)
Power:	63.7 HP (47.5 kW)	83.9 Hp (62.6 kW)

### Single outlet set

ii) Pump delivery rate at minimum pressure and rated engine speed:	42.8 GPM (162.2 l/min)	49.8 GPM (188.6 l/min)
iii) Pump delivery rate at maximum hydraulic power:	42.7 GPM (161.6 l/min)	46.7 GPM (176.6 l/min)
Delivery pressure:	2024 psi (139 bar)	2005 psi (138 bar)
Power:	50.4 HP (37.6 kW)	54.6 Hp (40.7 kW)

## TwinFlow system

### Two outlet sets combined

	Standard pump	TwinFlow pump
i) Sustained pressure at compensator cutoff:	2877 psi (198 bar)	2855 psi (197 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM (165.8 l/min)	57.3 GPM (217.0 l/min)
Combined flow:	101.1 GPM (382.8 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	43.3 GPM (163.7 l/min)	56.4 GPM (213.6 l/min)
Delivery pressure:	2526 psi (174 bar)	2479 psi (171 bar)
Power:	63.7 HP (47.5 kW)	81.6 Hp (60.9 kW)

### Two outlet sets combined

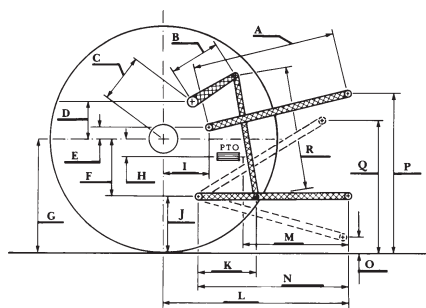
	High flow pump	TwinFlow pump
i) Sustained pressure at compensator cutoff:	2993 psi (206 bar)	2855 psi (197 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	61.0 GPM (230.9 l/min)	57.3 GPM (217.0 l/min)
Combined flow:	118.3 GPM (447.9 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	56.7 GPM (214.7 l/min)	56.4 GPM (213.6 l/min)
Delivery pressure:	2517 psi (174 bar)	2479 psi (171 bar)
Power:	83.3 HP (62.1 kW)	81.6 Hp (60.9 kW)

## HITCH DIMENSIONS AS TESTED - NO LOAD

inch mm

A	39.0	990
B	30.7	780
C	27.9	709
D	26.5	673
E	13.5	342
F	16.3	415
G	38.2	970
H	2.6	66
I	21.2	538
J	21.9	555
K	30.5	775
L	58.5	1487
*L'	65.8	1671
M	53.6	1361
N	43.0	1093
O	9.1	230
P	52.6	1335
Q	46.5	1181
R	39.4	1000

\*L' to Quick Attach ends



Case IH STEIGER 400 Diesel

Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln