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2011

## Test 2011: Case IH Steiger 600

Nebraska Tractor Test Lab

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

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# NEBRASKA OECD TRACTOR TEST 2011 - SUMMARY 794

## CASE IH STEIGER 600 DIESEL

### 16 SPEED

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

**Dates of tests:** November 8-30, 2011

**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)** 0.8463 **Fuel weight** 7.047 lbs/gal (0.845 kg/l) **Diesel Exhaust Fluid (DEF)** 30% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil SAE 15W40 API service classification** CI-4 **Transmission lubricant** Case IH Hytran Ultra transmission fluid **Hydraulic and axle lubricant** AkcelaNexlore hydraulic fluid **Total time engine was operated:** 31.5 hours

**ENGINE: Make** F.P.T. Diesel **Type** six cylinder vertical with two turbochargers, air to air intercooler, water to air intercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** \*A-002-001217\* **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 **Fuel cooler** radiator for pump return fuel **Muffler** vertical **Cooling medium temperature control** thermostat and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** 535 engine hp: 176.6 - 188.9 lb/h (80.1 - 85.7 kg/h) 600 engine hp: 197.9 - 211.9 lb/h (89.8 - 96.1 kg/h) **High idle:** 2150 - 2200 rpm **Turbo boost:** nominal 33.4 - 37.7 psi (230 - 260 kPa) as measured 35.3 psi (243 kPa)

**CHASSIS: Type** four wheel drive with duals **Serial No.** \*ZBF126081\* **Tread width** rear 83.4" (2118 mm) to 160.2" (4070 mm) front 83.4" (2118 mm) to 160.2" (4070 mm) **Wheelbase** 154.0" (3911 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 2.71 (4.36) second 3.27 (5.26) third 3.95 (6.36) fourth 4.75 (7.64) fifth 5.46 (8.79) sixth 6.00 (9.65) seventh 6.57 (10.57) eighth 7.22 (11.62) ninth 7.94 (12.78) tenth 8.72 (14.03) eleventh 9.56 (15.38) twelfth 10.52 (16.93) thirteenth 12.06 (19.41) fourteenth 14.53 (23.38) fifteenth 17.54 (28.23) sixteenth 21.14 (34.02) reverse 4.18 (6.73), 8.32 (13.39) **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** 50760 lb (23024 kg)

#### 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
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>						
<b>Rated Engine Speed—(PTO speed—1051 rpm)</b>						
477.95 (356.41)	2100	26.34 (99.71)	0.388 (0.236)	18.14 (3.57)	1.89 (7.15)	
<b>Standard Power Take-off Speed (1000 rpm)</b>						
512.41 (382.10)	1999	27.23 (103.09)	0.375 (0.228)	18.82 (3.71)	2.08 (7.87)	
<b>Maximum Power (1 hour)</b>						
530.73 (395.76)	1900	27.58 (104.40)	0.366 (0.223)	19.24 (3.79)	2.11 (7.99)	

#### VARYING POWER AND FUEL CONSUMPTION

477.95 (356.41)	2100	26.34 (99.71)	0.388 (0.236)	18.14 (3.57)	1.89 (7.15)	Air temperature
414.71 (309.25)	2146	23.58 (89.27)	0.401 (0.244)	17.59 (3.46)	1.67 (6.32)	75°F (23°C)
312.19 (232.80)	2154	18.86 (71.38)	0.426 (0.259)	16.56 (3.26)	1.25 (4.73)	Relative humidity
209.09 (155.92)	2165	14.23 (53.88)	0.480 (0.292)	14.69 (2.89)	0.88 (3.33)	29%
104.82 (78.17)	2175	9.93 (37.57)	0.667 (0.406)	10.56 (2.08)	0.48 (1.82)	Barometer
--	2188	5.20 (19.69)	--	--	0.14 (0.53)	28.89" Hg (97.83 kPa)

Maximum torque - 1674 lb.-ft. (2270 Nm) at 1401 rpm  
Maximum torque rise - 40.1%  
Torque rise at 1700 engine rpm - 31%  
Power increase at 1900 engine rpm - 11.0%

#### DRAWBAR PERFORMANCE

##### UNBALLASTED

##### 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>									
490.42 (365.71)	33712 (149.96)	5.46 (8.78)	2100	3.1	0.422 (0.257)	16.69 (3.29)	204 (96)	52 (11)	28.57 (96.75)
<b>75% of Pull at Maximum Power—5th Gear</b>									
379.95 (283.32)	25356 (112.79)	5.62 (9.04)	2145	2.2	0.447 (0.272)	15.77 (3.11)	201 (94)	56 (13)	28.60 (96.85)
<b>50% of Pull at Maximum Power—5th Gear</b>									
256.93 (191.59)	16917 (75.25)	5.70 (9.17)	2157	1.4	0.496 (0.302)	14.22 (2.80)	189 (87)	57 (14)	28.59 (96.82)
<b>75% of Pull at Reduced Engine Speed—9th Gear</b>									
379.62 (283.08)	25363 (112.82)	5.61 (9.03)	1471	2.2	0.393 (0.239)	17.91 (3.53)	203 (95)	57 (14)	28.58 (96.78)
<b>50% of Pull at Reduced Engine Speed—9th Gear</b>									
257.15 (191.76)	16916 (75.25)	5.70 (9.17)	1484	1.4	0.419 (0.255)	16.83 (3.32)	197 (92)	57 (14)	28.59 (96.82)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - 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 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)
2nd Gear									
404.48 (301.62)	48323 (214.95)	3.14 (5.05)	2140	8.6	0.460 (0.280)	15.33 (3.02)	205 (96)	43 (6)	28.57 (96.75)
3rd Gear									
475.46 (354.55)	47196 (209.94)	3.78 (6.08)	2103	7.3	0.435 (0.265)	16.20 (3.19)	205 (96)	48 (9)	28.60 (96.85)
4th Gear									
488.37 (364.18)	38943 (173.22)	4.71 (7.57)	2100	4.0	0.425 (0.258)	16.58 (3.27)	205 (96)	56 (13)	28.60 (96.85)
5th Gear									
490.42 (365.71)	33712 (149.96)	5.46 (8.78)	2100	3.1	0.422 (0.257)	16.69 (3.29)	204 (96)	52 (11)	28.57 (96.75)
6th Gear									
493.72 (368.17)	30731 (136.70)	6.03 (9.70)	2101	2.6	0.420 (0.255)	16.78 (3.31)	204 (95)	51 (10)	28.52 (96.58)
7th Gear									
488.63 (364.37)	27738 (123.38)	6.61 (10.63)	2100	2.5	0.420 (0.255)	16.78 (3.31)	204 (96)	50 (10)	28.62 (96.92)
8th Gear									
491.60 (366.59)	25240 (112.27)	7.31 (11.76)	2100	2.2	0.422 (0.257)	16.69 (3.29)	202 (94)	54 (12)	28.60 (96.85)
9th Gear									
485.52 (362.05)	22659 (100.79)	8.04 (12.93)	2099	1.9	0.429 (0.261)	16.42 (3.24)	203 (95)	55 (13)	28.60 (96.85)

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

**Note 1:** This tractor has a driveline protection system that limits the maximum engine torque in gears 1 through 4.

**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 pull in 2<sup>nd</sup> gear (unballasted tractor) was limited to avoid excessive power hop. 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. **2011**, Nebraska Summary 794, January 25, 2012.

Roger M. Hoy  
Director

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

TRACTOR SOUND LEVEL WITH CAB	dB(A)
At no load in 4th gear	74.8
Bystander in 16th gear	85.8

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi(kPa)	Four 800/70R38;***;12(85)	Four 800/70R38;***;9(60)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	6700 lb(3039 kg)	None
<b>Front Tires</b> - No., size, ply & psi(kPa)	Four 800/70R38;***;16(110)	Four 800/70R38;***;11(75)
<b>Ballast</b> - Front end (total)	3300 lb (1497 kg)	None
- Cast Iron (total)	5065 lb (2297 kg)	None
<b>Height of Drawbar</b>	22.0 in (560 mm)	22.0 in (560 mm)
<b>Static Weight with operator</b> - Rear	27690 lb(12560 kg)	22390 lb(10156 kg)
- Front	38310 lb(17377 kg)	28545 lb(12948 kg)
- Total	66000 lb(29937 kg)	50935 lb(23104 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)
2nd Gear									
403.93 (301.21)	48295 (214.82)	3.14 (5.05)	2140	8.6	0.459 (0.279)	15.34 (3.02)	206 (96)	43 (6)	28.59 (96.82)
3rd Gear									
475.52 (354.60)	47253 (210.19)	3.78 (6.08)	2102	7.4	0.433 (0.263)	16.28 (3.21)	203 (95)	48 (9)	28.61 (96.88)
4th Gear									
518.45 (386.61)	45025 (200.28)	4.32 (6.94)	1966	6.0	0.420 (0.256)	16.76 (3.30)	203 (95)	56 (13)	28.60 (96.85)
5th Gear									
535.17 (399.07)	41245 (183.46)	4.87 (7.83)	1900	4.5	0.409 (0.249)	17.23 (3.39)	204 (96)	53 (12)	28.57 (96.75)
6th Gear									
539.43 (402.25)	37498 (166.80)	5.40 (8.68)	1900	3.5	0.402 (0.245)	17.52 (3.45)	203 (95)	51 (11)	28.52 (96.58)
7th Gear									
538.21 (401.34)	34013 (151.30)	5.93 (9.54)	1900	3.2	0.403 (0.245)	17.49 (3.45)	203 (95)	51 (11)	28.62 (96.92)
8th Gear									
540.92 (403.36)	31004 (137.91)	6.55 (10.53)	1900	2.8	0.405 (0.246)	17.40 (3.43)	201 (94)	55 (13)	28.60 (96.85)
9th Gear									
537.84 (401.06)	27906 (124.13)	7.23 (11.64)	1900	2.4	0.408 (0.248)	17.26 (3.40)	201 (94)	55 (13)	28.60 (96.85)
10th Gear									
536.21 (399.85)	25070 (111.52)	8.02 (12.91)	1916	2.1	0.411 (0.250)	17.15 (3.38)	204 (95)	56 (13)	28.60 (96.85)

**DRAWBAR PERFORMANCE**  
**BALLASTED - 1900 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)
1st Gear									
419.61 (312.90)	62135 (276.39)	2.54 (4.08)	2100	9.3	0.455 (0.277)	15.48 (3.05)	206 (97)	47 (8)	28.91 (97.90)
2nd Gear									
488.14 (364.01)	60690 (269.96)	3.02 (4.86)	2050	8.1	0.432 (0.263)	16.30 (3.21)	207 (97)	48 (9)	28.91 (97.90)
3rd Gear									
525.53 (391.89)	57428 (255.45)	3.43 (5.52)	1900	6.7	0.411 (0.250)	17.13 (3.37)	207 (97)	49 (10)	28.90 (97.87)
4th Gear									
535.57 (399.37)	47463 (211.13)	4.23 (6.81)	1900	4.4	0.403 (0.245)	17.47 (3.44)	206 (96)	49 (9)	28.89 (97.83)
5th Gear									
539.32 (402.17)	41197 (183.25)	4.91 (7.89)	1900	3.5	0.399 (0.243)	17.64 (3.48)	206 (96)	50 (10)	28.90 (97.87)
6th Gear									
542.43 (404.49)	37526 (166.92)	5.43 (8.73)	1900	3.1	0.400 (0.243)	17.62 (3.47)	203 (95)	51 (11)	28.90 (97.87)
7th Gear									
538.46 (401.53)	33848 (150.56)	5.97 (9.60)	1900	2.7	0.401 (0.244)	17.57 (3.46)	203 (95)	52 (11)	28.90 (97.87)
8th Gear									
540.41 (402.98)	30840 (137.18)	6.57 (10.57)	1900	2.4	0.403 (0.245)	17.49 (3.44)	202 (94)	51 (11)	28.90 (97.87)
9th Gear									
538.40 (401.48)	27825 (123.77)	7.26 (11.68)	1899	2.1	0.406 (0.247)	17.36 (3.42)	203 (95)	50 (10)	28.90 (97.87)
10th Gear									
535.51 (399.33)	25032 (111.35)	8.03 (12.91)	1908	1.8	0.410 (0.249)	17.20 (3.39)	205 (96)	50 (10)	28.89 (97.83)

## HYDRAULIC PERFORMANCE

CATEGORY: IVN

Quick Attach: yes

OECD Static test

Maximum force exerted through whole range: 19620 lbs (87.3 kN)

### Three outlet sets combined

	Standard pump	High flow pump
i) Sustained pressure of the open relief valve:	2877 psi (198 bar)	3050 psi (210 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM (165.8 l/min)	61.4 GPM (232.4 l/min)
iii) Pump delivery rate at maximum hydraulic power:	43.3 GPM (163.7 l/min)	58.7 GPM (222.0 l/min)
Delivery pressure:	2526 psi (174 bar)	2680 psi (185 bar)
Power:	63.7 HP (47.5 kW)	91.7 Hp (68.4 kW)

### Single outlet set

ii) Pump delivery rate at minimum pressure and rated engine speed:	42.8 GPM (162.2 l/min)	43.8 GPM (165.8 l/min)
iii) Pump delivery rate at maximum hydraulic power:	42.7 GPM (161.6 l/min)	41.4 GPM (156.8 l/min)
Delivery pressure:	2024 psi (139 bar)	2315 psi (160 bar)
Power:	50.4 HP (37.6 kW)	56.0 Hp (41.7 kW)

## TwinFlow system

### Two outlet sets combined

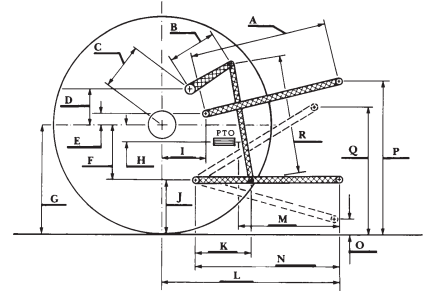
	Standard pump	TwinFlow pump
i) Sustained pressure at compensator cutoff:	2877 psi (198 bar)	2855 psi (197 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM (165.8 l/min)	57.3 GPM (217.0 l/min)
Combined flow:	101.1 GPM (382.8 l/min)	
iii) Pump delivery rate at maximum hydraulic 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	32.6	827
B	29.9	760
C	23.2	590
D	22.0	558
E	13.5	342
F	13.4	340
G	38.2	970
H	6.4	162
I	22.8	578
J	24.8	630
K	29.0	736
L	56.3	1431
*L'	63.6	1615
M	34.3	871
N	46.5	1181
O	7.9	200
P	48.6	1234
Q	42.2	1072
R	39.8	1010



## CASE IH STEIGER 600 Diesel

Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln