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2013

## Test 2071: Case IH Steiger 450 Rowtrac

Nebraska Tractor Test Lab

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# NEBRASKA OECD TRACTOR TEST 2071 - SUMMARY 889

## CASE IH STEIGER ROWTRAC 450 DIESEL

### 16 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
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>						
<b>Rated Engine Speed—(PTO speed—1051 rpm)</b>						
402.18 (299.90)	2100	22.59 (85.52)	0.395 (0.240)	17.80 (3.51)	1.61 (6.10)	
<b>Standard Power Take-off Speed (1000 rpm)</b>						
429.70 (320.43)	1998	23.27 (88.07)	0.381 (0.231)	18.47 (3.64)	1.67 (6.34)	
<b>Maximum Power (1 hour)</b>						
453.89 (338.46)	1900	24.06 (91.09)	0.373 (0.227)	18.86 (3.72)	1.72 (6.52)	

#### VARYING POWER AND FUEL CONSUMPTION

402.18 (299.90)	2100	22.59 (85.52)	0.395 (0.240)	17.80 (3.51)	1.61 (6.10)	Air temperature
346.26 (258.21)	2126	19.97 (75.59)	0.405 (0.247)	17.34 (3.42)	1.24 (4.70)	76°F (24°C)
261.38 (194.91)	2139	16.03 (60.68)	0.431 (0.262)	16.31 (3.21)	0.85 (3.23)	Relative humidity
175.37 (130.77)	2153	12.10 (45.80)	0.485 (0.295)	14.49 (2.86)	0.58 (2.21)	41%
88.18 (65.75)	2166	8.22 (31.10)	0.655 (0.398)	10.73 (2.11)	0.35 (1.34)	Barometer
2.54 (1.90)	2179	4.81 (18.19)	13.281 (8.078)	0.53 (0.10)	0.12 (0.44)	28.69" Hg (97.16 kPa)

Maximum torque - 1464 lb.-ft. (1985 Nm) at 1401 rpm

Maximum torque rise - 45.7%

Torque rise at 1681 engine rpm - 37%

Power increase at 1900 engine rpm - 12.9%

#### 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—4th Gear</b>									
352.92 (263.17)	26882 (119.57)	4.92 (7.92)	2100	2.6	0.454 (0.276)	15.47 (3.05)	203 (95)	76 (24)	28.66 (97.05)
<b>75% of Pull at Maximum Power—4th Gear</b>									
271.73 (202.63)	20175 (89.74)	5.05 (8.13)	2130	1.5	0.486 (0.296)	14.45 (2.85)	202 (94)	84 (29)	28.64 (96.99)
<b>50% of Pull at Maximum Power—4th Gear</b>									
183.81 (137.07)	13457 (59.86)	5.12 (8.24)	2146	0.8	0.551 (0.335)	12.76 (2.51)	202 (94)	86 (30)	28.62 (96.92)
<b>75% of Pull at Reduced Engine Speed—8th Gear</b>									
271.89 (202.75)	20198 (89.84)	5.05 (8.13)	1401	1.6	0.417 (0.254)	16.86 (3.32)	197 (92)	84 (29)	28.64 (96.99)
<b>50% of Pull at Reduced Engine Speed—8th Gear</b>									
183.13 (136.56)	13499 (60.05)	5.09 (8.19)	1402	0.9	0.447 (0.272)	15.74 (3.10)	201 (94)	86 (30)	28.61 (96.88)

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

**Dates of tests:** October 1-3, 2013

**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)** 0.8442 **Fuel weight** 7.029 lbs/gal (0.842 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** CJ-4 **Transmission lubricant** Hytran Ultra Action fluid **Hydraulic and axle lubricant** Hytran Ultra Action fluid **Total time engine was operated:** 13.0 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.** \*A002-190378\* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.315" x 5.906" (135.0 mm x 150.0 mm) **Compression ratio** 15.5 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, radiator for hydraulic and front and rear axle, radiator for transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** thermostat and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** 148.6 - 159.4 lb/h (67.4 - 72.3 kg/h) **High idle:** 2165 - 2215 rpm **Turbo boost:** nominal 21.8 - 24.7 psi (150 - 170 kPa) as measured 23.3 psi (161 kPa)

**CHASSIS: Type** Tracklayer - rubber tracked **Serial No.** \*ZCF130602\* **Track width** rear 88.0" (2235 mm) front 88.0" (2235 mm) **Trackbase** 160.0" (4064 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 2.85 (4.59) second 3.44 (5.53) third 4.14 (6.67) fourth 5.00 (8.04) fifth 5.74 (9.23) sixth 6.30 (10.14) seventh 6.91 (11.12) eighth 7.59 (12.21) ninth 8.35 (13.43) tenth 9.17 (14.75) eleventh 10.05 (16.17) twelfth 11.04 (17.77) thirteenth 12.68 (20.40) fourteenth 15.27 (24.57) fifteenth 18.44 (29.68) sixteenth 22.21 (35.75) reverse 4.32 (6.95), 9.55 (15.37) **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** 55785 lb (25304 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 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									
309.86 (231.06)	44684 (198.76)	2.60 (4.18)	2102	10.0	0.493 (0.300)	14.24 (2.81)	201 (94)	61 (16)	28.68 (97.12)
2nd Gear									
338.30 (252.27)	39349 (175.03)	3.23 (5.19)	2100	7.3	0.474 (0.288)	14.84 (2.92)	202 (94)	70 (21)	28.68 (97.12)
3rd Gear									
349.70 (260.77)	32662 (145.29)	4.02 (6.46)	2100	4.4	0.458 (0.279)	15.34 (3.02)	202 (94)	73 (23)	28.67 (97.08)
4th Gear									
352.92 (263.17)	26882 (119.57)	4.92 (7.92)	2100	2.6	0.454 (0.276)	15.47 (3.05)	203 (95)	76 (24)	28.66 (97.05)
5th Gear									
352.82 (263.09)	23245 (103.40)	5.69 (9.16)	2100	1.9	0.454 (0.276)	15.48 (3.05)	202 (94)	79 (26)	28.67 (97.08)
6th Gear									
352.89 (263.15)	21090 (93.81)	6.28 (10.10)	2100	1.6	0.452 (0.275)	15.56 (3.07)	203 (95)	79 (26)	28.66 (97.05)
7th Gear									
348.09 (259.57)	18924 (84.18)	6.90 (11.10)	2100	1.3	0.457 (0.278)	15.37 (3.03)	202 (94)	81 (27)	28.66 (97.05)
8th Gear									
347.91 (259.44)	17187 (76.45)	7.60 (12.22)	2099	1.2	0.457 (0.278)	15.38 (3.03)	203 (95)	82 (28)	28.66 (97.05)
9th Gear									
343.25 (255.96)	15408 (68.54)	8.35 (13.44)	2099	1.0	0.463 (0.282)	15.18 (2.99)	202 (94)	83 (29)	28.65 (97.02)

**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 3.

**Note 2:** The performance figures on this report are the result of replacing the electronic engine control module of the Case IH Steiger Rowtrac 400 with the Case IH Steiger Rowtrac 450 module.

**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 109°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. **2071**, Nebraska Summary 889, December 2, 2013.

Roger M. Hoy  
Director

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

## TRACTOR SOUND LEVEL WITH CAB dB(A)

At no load in 4th gear	74.8
Bystander in 15th gear	90.3

## TIRES, BALLAST AND WEIGHT

Rear tracks - no & size	2 x 18.0 in (455 mm)
Front tracks - no & size	2 x 18.0 in (455 mm)
Height of drawbar	21.0 in (535 mm)
Static weight with operator- Rear	26330 lb (11943 kg)
- Front	29630 lb (13440 kg)
- Total	55960 lb (25383 kg)

## Tested without ballast

# DRAWBAR PERFORMANCE AT 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									
299.99 (223.70)	46280 (205.86)	2.44 (3.92)	2038	13.2	0.503 (0.306)	13.97 (2.75)	205 (96)	63 (17)	28.68 (97.12)
2nd Gear									
346.72 (258.55)	44054 (195.96)	2.95 (4.75)	2001	10.9	0.479 (0.291)	14.68 (2.89)	204 (95)	68 (20)	28.68 (97.12)
3rd Gear									
376.55 (280.79)	40453 (179.94)	3.49 (5.62)	1900	8.1	0.454 (0.276)	15.50 (3.05)	202 (94)	71 (22)	28.68 (97.12)
4th Gear									
390.19 (290.96)	33536 (149.17)	4.36 (7.02)	1900	4.6	0.439 (0.267)	16.02 (3.16)	202 (94)	76 (24)	28.66 (97.05)
5th Gear									
394.01 (293.81)	29081 (129.36)	5.08 (8.18)	1900	3.3	0.434 (0.264)	16.20 (3.19)	202 (94)	77 (25)	28.66 (97.05)
6th Gear									
396.01 (295.30)	26423 (117.53)	5.62 (9.04)	1900	2.6	0.431 (0.262)	16.29 (3.21)	202 (94)	79 (26)	28.66 (97.05)
7th Gear									
394.31 (294.03)	23871 (106.18)	6.20 (9.97)	1900	2.1	0.432 (0.263)	16.25 (3.20)	202 (94)	80 (27)	28.66 (97.05)
8th Gear									
395.56 (294.97)	21715 (96.59)	6.83 (10.99)	1900	1.7	0.432 (0.262)	16.29 (3.21)	202 (94)	83 (28)	28.65 (97.02)
9th Gear									
394.81 (294.41)	19653 (87.42)	7.53 (12.12)	1901	1.4	0.431 (0.262)	16.30 (3.21)	202 (94)	83 (28)	28.65 (97.02)
10th Gear									
394.42 (294.12)	17829 (79.31)	8.30 (13.35)	1901	1.2	0.432 (0.263)	16.28 (3.21)	203 (95)	83 (28)	28.66 (97.05)

## HYDRAULIC PERFORMANCE

CATEGORY: IVN

Quick Attach: yes

OECD Static test

Maximum force exerted through whole range:	21903 lbs (97.4 kN)	
	<b>Three outlet sets combined</b>	
	<u>Standard pump</u>	<u>High flow pump</u>
i) Sustained pressure of the open relief valve:	2877 psi (198 bar)	3049 psi (210 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM (165.8 l/min)	59.1 GPM (223.8 l/min)
iii) Pump delivery rate at maximum hydraulic power:	43.3 GPM (163.7 l/min)	55.4 GPM (209.7 l/min)
Delivery pressure:	2526 psi (174 bar)	2719 psi (187 bar)
Power:	63.7 HP (47.5 kW)	87.9 Hp (65.5 kW)
	<b>Single outlet set</b>	
ii) Pump delivery rate at minimum pressure and rated engine speed:	42.8 GPM (162.2 l/min)	45.4 GPM (171.7 l/min)
iii) Pump delivery rate at maximum hydraulic power:	42.7 GPM (161.6 l/min)	43.3 GPM (164.0 l/min)
Delivery pressure:	2024 psi (139 bar)	2284 psi (158 bar)
Power:	50.4 HP (37.6 kW)	57.7 Hp (43.1 kW)

### TwinFlow system

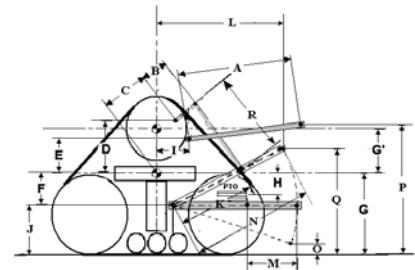
	<b>Two outlet sets combined</b>	
	<u>Standard pump</u>	<u>TwinFlow pump</u>
i) Sustained pressure at compensator cutoff:	2877 psi (198 bar)	2855 psi (197 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM (165.8 l/min)	57.3 GPM (217.0 l/min)
Combined flow:	101.1 GPM (382.8 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)
	<b>Two outlet sets combined</b>	
	<u>High flow pump</u>	<u>TwinFlow pump</u>
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	28.8	731
D	27.9	709
E	14.9	378
F	14.9	379
G	34.0	864
*G'	14.9	378
H	1.2	30
I	22.8	578
J	19.1	485
K	30.5	775
L	60.1	1527
*L'	67.4	1711
M	30.4	771
N	43.0	1093
O	6.3	160
P	49.8	1265
Q	43.7	1111
R	39.4	1000

\*G' to undercarriage pivot point

\*L' to Quick coupler ends



**CASE IH Steiger Rowtrac 450 Diesel**

Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln