2013

Test 2070: Case IH Steiger 400 Rowtrac

Nebraska Tractor Test Lab
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NEBRASKA OECD TRACTOR TEST 2070 - SUMMARY 888
CASE IH STEIGER ROWTRAC 400 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)*	D.E.F. Consumption 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—1051 rpm)						
350.21 *(261.16)*	2100	20.04 *(75.87)*	0.402 *(0.245)*	17.47 *(3.44)*	1.39 *(5.27)*	
Standard Power Take-off Speed (1000 rpm)						
386.12 *(287.93)*	1998	21.10 *(79.86)*	0.384 *(0.234)*	18.30 *(3.61)*	1.50 *(5.67)*	
Maximum Power (1 hour)						
400.72 *(298.82)*	1900	21.33 *(80.74)*	0.374 *(0.228)*	18.79 *(3.70)*	1.47 *(5.57)*	
VARYING POWER AND FUEL CONSUMPTION						
350.21 *(261.16)*	2100	20.04 *(75.87)*	0.402 *(0.245)*	17.47 *(3.44)*	1.39 *(5.27)*	Air temperature
302.05 *(225.24)*	2130	18.03 *(68.26)*	0.420 *(0.255)*	16.75 *(3.30)*	1.21 *(4.56)*	73°F *(23°C)*
227.89 *(169.93)*	2142	14.53 *(55.02)*	0.448 *(0.273)*	15.68 *(3.09)*	0.90 *(3.69)*	Relative humidity
152.79 *(113.93)*	2154	11.11 *(42.07)*	0.511 *(0.311)*	13.75 *(2.71)*	0.60 *(2.28)*	54%
76.85 *(57.31)*	2166	7.81 *(24.93)*	0.715 *(0.435)*	9.84 *(1.94)*	0.34 *(1.94)*	Barometer
1.55 *(1.15)*	2178	4.85 *(18.38)*	22.084 *(13.433)*	0.32 *(0.06)*	0.14 *(0.53)*	28.61" Hg *(96.88 kPa)*

Maximum torque - 1298 lb.-ft. *(1760 Nm)* at 1401 rpm
Maximum torque rise - 48.3%
Torque rise at 1681 engine rpm - 39%
Power increase at 1900 engine rpm - 14.4%

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)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp.°F cool-ing med	*(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—4th Gear									
306.20 *(228.33)*	23091 *(102.71)*	4.97 *(8.00)*	2100	1.6	0.461 *(0.281)*	15.24 *(3.00)*	207 *(97)*	72 *(22)*	28.55 *(96.68)*
75% of Pull at Maximum Power—4th Gear									
234.22 *(174.65)*	17256 *(76.76)*	5.09 *(8.19)*	2136	1.0	0.505 *(0.307)*	13.93 *(2.74)*	192 *(89)*	64 *(18)*	28.55 *(96.68)*
50% of Pull at Maximum Power—4th Gear									
157.79 *(117.66)*	11512 *(51.21)*	5.14 *(8.27)*	2148	0.6	0.587 *(0.357)*	11.98 *(2.36)*	184 *(84)*	67 *(19)*	28.56 *(96.72)*
75% of Pull at Reduced Engine Speed—8th Gear									
234.36 *(174.76)*	17187 *(76.45)*	5.12 *(8.23)*	1412	1.0	0.425 *(0.259)*	16.53 *(3.26)*	184 *(84)*	65 *(18)*	28.55 *(96.68)*
50% of Pull at Reduced Engine Speed—8th Gear									
158.25 *(118.00)*	11490 *(51.11)*	5.17 *(8.31)*	1420	0.6	0.470 *(0.286)*	14.95 *(2.95)*	181 *(83)*	69 *(20)*	28.55 *(96.68)*

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

Dates of tests: September 24 - 30, 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:** 13.5 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.** *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: 134.6 - 144.4 lb/h *(61.1 - 65.5 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 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)*
					1st Gear				
276.15 *(205.93)*	38019 *(169.11)*	2.73 *(4.39)*	2100	5.6	0.483 *(0.294)*	14.55 *(2.87)*	193 *(89)*	57 *(14)*	28.57 *(96.75)*
					2nd Gear				
304.16 *(226.81)*	34303 *(152.59)*	3.33 *(5.35)*	2100	4.3	0.467 *(0.284)*	15.06 *(2.97)*	194 *(90)*	59 *(15)*	28.56 *(96.72)*
					3rd Gear				
309.40 *(230.72)*	28438 *(126.50)*	4.08 *(6.57)*	2099	2.8	0.459 *(0.279)*	15.33 *(3.02)*	207 *(97)*	62 *(16)*	28.56 *(96.72)*
					4th Gear				
306.20 *(228.33)*	23091 *(102.71)*	4.97 *(8.00)*	2100	1.6	0.461 *(0.281)*	15.24 *(3.00)*	207 *(97)*	72 *(22)*	28.55 *(96.68)*
					5th Gear				
305.95 *(228.15)*	20014 *(89.03)*	5.73 *(9.22)*	2099	1.2	0.462 *(0.281)*	15.22 *(3.00)*	207 *(97)*	73 *(23)*	28.55 *(96.68)*
					6th Gear				
306.06 *(228.23)*	18194 *(80.93)*	6.31 *(10.15)*	2099	1.0	0.461 *(0.280)*	15.25 *(3.00)*	206 *(97)*	76 *(24)*	28.55 *(96.68)*
					7th Gear				
299.98 *(223.70)*	16243 *(72.25)*	6.93 *(11.15)*	2099	0.9	0.470 *(0.286)*	14.96 *(2.95)*	207 *(97)*	74 *(24)*	28.55 *(96.68)*
					8th Gear				
299.60 *(223.41)*	14742 *(65.58)*	7.62 *(12.26)*	2100	0.8	0.470 *(0.286)*	14.96 *(2.95)*	207 *(97)*	77 *(25)*	28.55 *(96.68)*
					9th Gear				
293.05 *(218.52)*	13106 *(58.30)*	8.39 *(13.49)*	2100	0.7	0.482 *(0.293)*	14.59 *(2.87)*	207 *(97)*	76 *(25)*	28.55 *(96.68)*

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 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. **2070**, Nebraska Summary 888, 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	Tested without ballast
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)*

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)*	Hp.hr/gal *(kW.h/l)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
					1st Gear				
253.06 *(188.71)*	38462 *(171.09)*	2.47 *(3.98)*	1907	5.9	0.471 *(0.286)*	14.92 *(2.94)*	191 *(88)*	58 *(14)*	28.57 *(96.75)*
					2nd Gear				
298.75 *(222.77)*	37784 *(168.07)*	2.97 *(4.77)*	1900	5.7	0.455 *(0.277)*	15.45 *(3.04)*	206 *(97)*	60 *(16)*	28.57 *(96.75)*
					3rd Gear				
346.42 *(258.32)*	36033 *(160.28)*	3.61 *(5.80)*	1900	5.1	0.438 *(0.267)*	16.03 *(3.16)*	207 *(97)*	61 *(16)*	28.56 *(96.72)*
					4th Gear				
350.36 *(261.26)*	29586 *(131.61)*	4.44 *(7.15)*	1900	2.9	0.433 *(0.264)*	16.22 *(3.20)*	207 *(97)*	73 *(23)*	28.55 *(96.68)*
					5th Gear				
351.62 *(262.20)*	25629 *(114.00)*	5.15 *(8.28)*	1900	2.0	0.430 *(0.262)*	16.34 *(3.22)*	208 *(98)*	73 *(23)*	28.54 *(96.65)*
					6th Gear				
353.09 *(263.30)*	23338 *(103.81)*	5.67 *(9.12)*	1900	1.7	0.428 *(0.260)*	16.42 *(3.23)*	208 *(98)*	76 *(25)*	28.55 *(96.68)*
					7th Gear				
349.31 *(260.48)*	20986 *(93.35)*	6.25 *(10.05)*	1900	1.3	0.432 *(0.263)*	16.26 *(3.20)*	207 *(97)*	75 *(24)*	28.55 *(96.68)*
					8th Gear				
351.09 *(261.81)*	19169 *(85.27)*	6.87 *(11.06)*	1900	1.2	0.430 *(0.262)*	16.35 *(3.22)*	208 *(98)*	76 *(24)*	28.55 *(96.68)*
					9th Gear				
348.12 *(259.59)*	17255 *(76.75)*	7.57 *(12.17)*	1900	1.0	0.434 *(0.264)*	16.18 *(3.19)*	208 *(98)*	75 *(24)*	28.55 *(96.68)*
					10th Gear				
345.49 *(257.63)*	15565 *(69.23)*	8.32 *(13.39)*	1900	0.8	0.437 *(0.266)*	16.09 *(3.17)*	208 *(98)*	75 *(24)*	28.55 *(96.68)*

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)*	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)*

Single outlet set

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

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)*

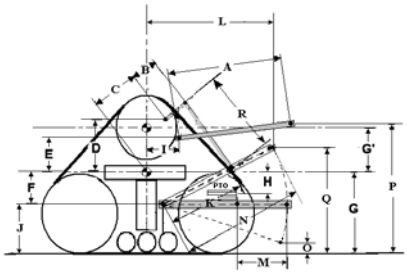
Two outlet sets combined

	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	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



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