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2016

Test 2161: Case IH Steiger 500 RowTrac

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2161 - SUMMARY 1042

CASE IH STEIGER 500 ROWTRAC 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
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1160 rpm)						
449.16 (334.94)	2101	25.44 (96.29)	0.397 (0.241)	17.66 (3.48)	2.16 (8.17)	
Maximum Power (1 hour)						
504.52 (376.22)	1900	27.09 (102.56)	0.376 (0.229)	18.62 (3.67)	2.37 (8.96)	
Standard Power Take-off Speed (1000 rpm)						
501.43 (373.92)	1811	26.54 (100.46)	0.371 (0.226)	18.89 (3.72)	2.30 (8.71)	

VARYING POWER AND FUEL CONSUMPTION

449.16 (334.94)	2101	25.44 (96.29)	0.397 (0.241)	17.66 (3.48)	2.16 (8.17)	Air temperature
389.76 (290.64)	2144	23.01 (87.11)	0.414 (0.252)	16.94 (3.34)	1.86 (7.02)	78°F (25°C)
293.36 (218.76)	2153	18.24 (69.03)	0.436 (0.265)	16.09 (3.17)	1.45 (5.49)	Relative humidity
196.62 (146.62)	2166	13.65 (51.67)	0.487 (0.296)	14.41 (2.84)	1.09 (4.12)	68%
98.85 (73.71)	2177	9.34 (35.35)	0.662 (0.403)	10.58 (2.09)	0.69 (2.60)	Barometer
0.87 (0.65)	2187	5.15 (19.51)	41.307 (25.126)	0.17 (0.03)	0.46 (1.76)	28.75" Hg (97.37 kPa)

Maximum torque - 1637 lb-ft (2219 Nm) at 1400 rpm

Maximum torque rise - 45.8%

Torque rise at 1680 engine rpm - 36%

Power increase at 1900 engine rpm - 12.3%

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)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Power at Rated Engine Speed—4th Gear										
392.22 (292.48)	30286 (134.72)	4.86 (7.81)	2100	3.7	0.453 (0.276)	15.46 (3.05)	0.051 (0.031)	211 (99)	64 (18)	28.72 (97.26)
75% of Pull at Rated Engine Speed—4th Gear										
305.61 (227.89)	22732 (101.12)	5.05 (8.12)	2141	1.8	0.476 (0.289)	14.73 (2.90)	0.045 (0.028)	198 (92)	69 (20)	28.70 (97.19)
50% of Pull at Rated Engine Speed—4th Gear										
206.83 (154.23)	15172 (67.49)	5.11 (8.22)	2150	1.0	0.529 (0.322)	13.25 (2.61)	0.056 (0.034)	208 (98)	70 (21)	28.70 (97.19)
75% of Pull at Reduced Engine Speed—8th Gear										
305.41 (227.74)	22678 (100.88)	5.05 (8.13)	1412	1.9	0.409 (0.249)	17.15 (3.38)	0.053 (0.032)	211 (99)	69 (21)	28.71 (97.22)
50% of Pull at Reduced Engine Speed—8th Gear										
206.40 (153.91)	15099 (67.16)	5.13 (8.26)	1419	0.8	0.439 (0.267)	15.98 (3.15)	0.050 (0.030)	201 (94)	71 (22)	28.71 (97.22)

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

Dates of tests: September 15 - 27, 2016

Manufacturer: CNH Industrial 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)** 0.8418 **Fuel weight** 7.009 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 10W40 **API service classification** CJ-4 **Transmission lubricant** Akcelia Hy-Tran Ultraction fluid **Hydraulic and axle lubricant** Akcelia Hy-Tran Ultraction fluid **Total time engine was operated:** 22.0 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.** 000018333 **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, separate radiators 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) within a vertical muffler **Cooling medium temperature control** thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 170.2 - 180.6 lb/h (77.2 - 81.9 kg/h) **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 24.7 - 27.6 psi (170 - 190 kPa) as measured 26.2 psi (181 kPa)

CHASSIS: Type 4WD with rubber tracks **Serial No.** *ZGF308566* **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 2.86 (4.59) second 3.43 (5.53) third 4.15 (6.67) fourth 5.00 (8.04) fifth 5.73 (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 12.67 (20.40) fourteenth 15.27 (24.57) fifteenth 18.45 (29.68) sixteenth 19.00 (30.58) electronically limited reverse 4.31 (6.95), 9.54 (15.36)

DRAWBAR PERFORMANCE AT 2100 ENGINE RPM

DRAWBAR 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 cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
299.46 (223.31)	44473 (197.83)	2.53 (4.06)	2104	12.4	1st Gear 0.505 (0.307)	13.88 (2.73)	0.051 (0.031)	206 (96)	77 (25)	28.64 (96.99)
360.65 (268.93)	42708 (189.97)	3.17 (5.09)	2102	8.8	2nd Gear 0.479 (0.292)	14.62 (2.88)	0.047 (0.029)	205 (96)	74 (23)	28.64 (96.99)
386.97 (288.56)	36699 (163.25)	3.95 (6.36)	2100	5.5	3rd Gear 0.459 (0.279)	15.27 (3.01)	0.046 (0.028)	205 (96)	72 (22)	28.64 (96.99)
392.22 (292.48)	30286 (134.72)	4.86 (7.81)	2100	3.7	4th Gear 0.453 (0.276)	15.46 (3.05)	0.051 (0.031)	211 (99)	64 (18)	28.72 (97.26)
393.66 (293.55)	26192 (116.51)	5.64 (9.07)	2099	2.6	5th Gear 0.453 (0.275)	15.49 (3.05)	0.050 (0.031)	211 (99)	64 (18)	28.74 (97.33)
391.54 (291.97)	23604 (105.00)	6.22 (10.01)	2100	2.2	6th Gear 0.453 (0.275)	15.49 (3.05)	0.051 (0.031)	210 (99)	65 (18)	28.71 (97.22)
390.62 (291.28)	21396 (95.17)	6.85 (11.02)	2100	1.8	7th Gear 0.456 (0.277)	15.39 (3.03)	0.051 (0.031)	210 (99)	66 (19)	28.70 (97.19)
389.05 (290.11)	19331 (85.99)	7.55 (12.15)	2099	1.4	8th Gear 0.458 (0.279)	15.30 (3.01)	0.053 (0.032)	204 (96)	67 (19)	28.71 (97.22)
385.52 (287.48)	17369 (77.26)	8.32 (13.39)	2100	1.1	9th Gear 0.463 (0.282)	15.14 (2.98)	0.052 (0.032)	206 (96)	67 (19)	28.73 (97.29)

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 1811 engine rpm **Unladen tractor mass** 58150 lb (26376 kg)

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 5.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. 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. **2161**, Nebraska Summary 1042, December 12, 2016.

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	75.0
Bystander in 15th gear	89.4

TRACKS AND WEIGHT

Rear tracks - no & size
Front tracks - no & size
Height of drawbar
Static weight with operator- Rear
- Front
- Total

Tested Without Ballast

2 x 16.0 in (406 mm)
2 x 16.0 in (406 mm)
21.5 in (545 mm)
27005 lb (12249 kg)
31320 lb (14206 kg)
58325 lb (26455 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)	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)
1st Gear										
268.73 (200.39)	43271 (192.48)	2.33 (3.75)	1927	11.9	0.487 (0.296)	14.38 (2.83)	0.049 (0.030)	211 (99)	78 (25)	28.65 (97.02)
2nd Gear										
326.46 (243.44)	43006 (191.30)	2.85 (4.58)	1906	9.5	0.461 (0.280)	15.20 (3.00)	0.053 (0.032)	211 (99)	75 (24)	28.63 (96.95)
3rd Gear										
384.29 (286.57)	41837 (186.10)	3.45 (5.54)	1903	9.2	0.456 (0.277)	15.38 (3.03)	0.050 (0.031)	210 (99)	76 (25)	28.62 (96.92)
4th Gear										
423.06 (315.47)	37500 (166.81)	4.23 (6.81)	1899	7.3	0.446 (0.271)	15.71 (3.10)	0.045 (0.027)	214 (101)	79 (26)	28.65 (97.02)
5th Gear										
436.70 (325.65)	32660 (145.28)	5.02 (8.07)	1900	4.1	0.435 (0.264)	16.13 (3.18)	0.049 (0.030)	213 (101)	64 (18)	28.71 (97.22)
6th Gear										
437.25 (326.05)	29496 (131.20)	5.56 (8.94)	1900	3.4	0.434 (0.264)	16.17 (3.18)	0.049 (0.030)	214 (101)	65 (18)	28.69 (97.16)
7th Gear										
438.81 (327.22)	26840 (119.39)	6.13 (9.87)	1900	2.7	0.430 (0.261)	16.31 (3.21)	0.048 (0.029)	213 (101)	66 (19)	28.70 (97.19)
8th Gear										
439.07 (327.41)	24317 (108.17)	6.77 (10.90)	1899	2.3	0.433 (0.263)	16.20 (3.19)	0.049 (0.030)	213 (101)	67 (19)	28.73 (97.29)
9th Gear										
437.97 (326.59)	21952 (97.65)	7.48 (12.04)	1901	1.8	0.433 (0.263)	16.18 (3.19)	0.049 (0.030)	213 (100)	67 (20)	28.73 (97.29)
10th Gear										
436.70 (325.64)	19850 (88.30)	8.25 (13.28)	1900	1.4	0.435 (0.264)	16.13 (3.18)	0.049 (0.030)	215 (102)	67 (20)	28.71 (97.22)

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)	3094 psi (213 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM (165.8 l/min)	58.5 GPM (221.5 l/min)
iii) Pump delivery rate at maximum hydraulic power:	43.3 GPM (163.7 l/min)	55.6 GPM (210.5 l/min)
Delivery pressure:	2526 psi (174 bar)	2696 psi (186 bar)
Power:	63.7 HP (47.5 kW)	87.5 Hp (65.2 kW)

Single outlet set

ii) Pump delivery rate at minimum pressure and rated engine speed:	42.8 GPM (162.2 l/min)	49.1 GPM (186.0 l/min)
iii) Pump delivery rate at maximum hydraulic power:	42.7 GPM (161.6 l/min)	47.3 GPM (178.9 l/min)
Delivery pressure:	2024 psi (139 bar)	2107 psi (145 bar)
Power:	50.4 HP (37.6 kW)	58.1 Hp (43.3 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

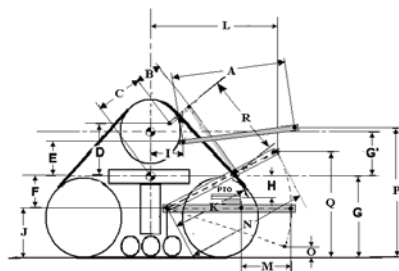
	High flow pump	TwinFlow pump
i) Sustained pressure at compensator cutoff:	2993 psi (206 bar)	2855 psi (197 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	61.0 GPM (230.9 l/min)	57.3 GPM (217.0 l/min)
Combined flow:	118.3 GPM (447.9 l/min)	
iii) Pump delivery rate at maximum hydraulic 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



CASE IH 500 ROWTRAC Diesel

Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln