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2016

Test 2162A: New Holland T9.645

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 2162A - SUMMARY 1043A

NEW HOLLAND T9.645 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)						
477.38 (355.98)	2101	25.99 (98.37)	0.382 (0.232)	18.37 (3.62)	2.28 (8.65)	
Maximum Power (1 hour)						
540.36 (402.95)	1900	27.86 (105.47)	0.361 (0.220)	19.39 (3.82)	2.35 (8.89)	
Standard Power Take-off Speed (1000 rpm)						
535.92 (399.63)	1811	27.29 (103.31)	0.357 (0.217)	19.64 (3.87)	2.22 (8.40)	

VARYING POWER AND FUEL CONSUMPTION

477.38 (355.98)	2101	25.99 (98.37)	0.382 (0.232)	18.37 (3.62)	2.28 (8.65)	Air temperature
415.38 (309.75)	2148	23.44 (88.73)	0.396 (0.241)	17.72 (3.49)	1.87 (7.08)	73°F (23°C)
313.16 (233.52)	2160	18.67 (70.68)	0.418 (0.254)	16.77 (3.30)	1.45 (5.47)	Relative humidity
209.62 (156.31)	2169	14.02 (53.07)	0.469 (0.285)	14.95 (2.95)	1.01 (3.82)	53%
105.18 (78.43)	2179	9.51 (36.01)	0.634 (0.386)	11.06 (2.18)	0.60 (2.25)	Barometer
2.94 (2.19)	2188	5.29 (20.02)	12.605 (7.667)	0.56 (0.11)	0.21 (0.79)	28.63" Hg (96.95 kPa)

Maximum torque - 1758 lb-ft (2384 Nm) at 1400 rpm

Maximum torque rise - 47.3%

Torque rise at 1681 engine rpm - 38%

Power increase at 1900 engine rpm - 13.2%

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)	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—5th Gear										
495.25 (369.31)	34239 (152.30)	5.43 (8.73)	2099	2.6	0.400 (0.243)	17.53 (3.45)	0.049 (0.030)	207 (97)	63 (17)	28.79 (97.49)
75% of Pull at Rated Engine Speed—5th Gear										
381.03 (284.13)	25721 (114.41)	5.56 (8.94)	2139	2.0	0.426 (0.259)	16.44 (3.24)	0.045 (0.028)	200 (93)	71 (22)	28.68 (97.12)
50% of Pull at Rated Engine Speed—5th Gear										
256.64 (191.37)	17123 (76.17)	5.62 (9.04)	2149	1.4	0.463 (0.282)	15.14 (2.98)	0.046 (0.028)	194 (90)	75 (24)	28.66 (97.05)
75% of Pull at Reduced Engine Speed—9th Gear										
381.25 (284.29)	25666 (114.17)	5.57 (8.96)	1474	2.0	0.376 (0.229)	18.64 (3.67)	0.040 (0.024)	201 (94)	73 (23)	28.67 (97.09)
50% of Pull at Reduced Engine Speed—9th Gear										
257.05 (191.68)	17094 (76.04)	5.64 (9.08)	1482	1.4	0.393 (0.239)	17.84 (3.51)	0.042 (0.026)	186 (85)	75 (24)	28.65 (97.02)

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

Dates of tests: October 6 - 11, 2016

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)** 0.8418 **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** New Holland Mastertran Ultrtraction fluid **Hydraulic and axle lubricant** New Holland Mastertran Ultrtraction fluid **Total time engine was operated:** 25.5 hours

ENGINE: Make F.P.T. Diesel **Type** six cylinder vertical with two turbochargers, two stage air to water intercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** 000007977 **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: 535 engine hp: 180.1 - 191.1 lb/h (81.7 - 86.7 kg/h) 580 engine hp: 193.3 - 205.0 lb/h (87.7 - 93.0 kg/h) **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 36.3 - 38.4 psi (250 - 265 kPa) as measured 37.5 psi (258 kPa)

CHASSIS: Type four wheel drive with duals **Serial No.** *ZGF308521* **Tread width** rear 83.4" (2118 mm) and 160.2" (4070 mm) front 83.4" (2118 mm) and 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 2.82 (4.54) second 3.40 (5.47) third 4.11 (6.61) fourth 4.95 (7.96) fifth 5.68 (9.14) sixth 6.24 (10.04) seventh 6.84 (11.01) eighth 7.52 (12.10) ninth 8.26 (13.30) tenth 9.08 (14.61) eleventh 9.95 (16.02) twelfth 10.94 (17.60) thirteenth 12.55 (20.21) fourteenth 15.12 (24.34) fifteenth 18.27 (29.40) sixteenth 22.00 (35.41) reverse 4.28 (6.88), 8.61 (13.85)

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 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)
451.30 (336.53)	54573 (242.75)	3.11 (5.00)	2128	8.7	2nd Gear 0.429 (0.261)	16.34 (3.22)	0.047 (0.029)	205 (96)	65 (18)	28.69 (97.16)
486.63 (362.88)	47544 (211.49)	3.84 (6.18)	2100	4.8	3rd Gear 0.406 (0.247)	17.27 (3.40)	0.049 (0.030)	206 (97)	67 (19)	28.70 (97.19)
493.50 (368.00)	39416 (175.33)	4.70 (7.56)	2100	3.3	4th Gear 0.403 (0.245)	17.38 (3.42)	0.050 (0.030)	208 (98)	63 (17)	28.79 (97.49)
495.25 (369.31)	34239 (152.30)	5.43 (8.73)	2099	2.6	5th Gear 0.400 (0.243)	17.53 (3.45)	0.049 (0.030)	207 (97)	63 (17)	28.79 (97.49)
494.90 (369.04)	31064 (138.18)	5.98 (9.62)	2099	2.3	6th Gear 0.400 (0.244)	17.50 (3.45)	0.049 (0.030)	210 (99)	60 (16)	28.82 (97.60)
492.44 (367.21)	28135 (125.15)	6.56 (10.56)	2099	2.1	7th Gear 0.400 (0.243)	17.54 (3.46)	0.049 (0.030)	210 (99)	60 (16)	28.83 (97.63)
491.77 (366.71)	25529 (113.56)	7.22 (11.62)	2099	2.0	8th Gear 0.402 (0.244)	17.45 (3.44)	0.049 (0.030)	210 (99)	60 (16)	28.81 (97.56)
489.90 (365.31)	23096 (102.74)	7.96 (12.80)	2099	1.9	9th Gear 0.404 (0.246)	17.33 (3.41)	0.050 (0.030)	207 (97)	61 (16)	28.80 (97.53)
488.81 (364.51)	20934 (93.12)	8.76 (14.09)	2098	1.7	10th Gear 0.406 (0.247)	17.25 (3.40)	0.050 (0.030)	209 (98)	61 (16)	28.79 (97.49)

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** 53870 lb (24435 kg)

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.

NOTE 2: The performance results on this report were obtained from tests carried out on the Case IH Steiger 580 Diesel.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. The pull in 2nd gear 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. **2162A**, Nebraska Summary 1043A, December 12, 2016.

Roger M. Hoy
Director

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

TRACTOR SOUND LEVEL WITH CAB

	dB(A)
At no load in 4th gear	74.6
Bystander in 16th gear	87.0

TIRES AND WEIGHT

Rear Tires -No., size, ply & psi (kPa)	Tested Without Ballast
Front Tires -No., size, ply & psi (kPa)	Four 800/70R38;***;10(70)
Height of Drawbar	Four 800/70R38;***;12(85)
Static Weight with operator -Rear	22.5 in (570 mm)
- Front	23275 lb(10557 kg)
- Total	30770 lb(13957 kg)
	54045 lb(24514 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)	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)
2nd Gear										
451.31 (336.54)	54559 (242.69)	3.11 (5.00)	2128	8.6	0.428 (0.260)	16.39 (3.23)	0.047 (0.029)	205 (96)	65 (18)	28.70 (97.19)
3rd Gear										
505.47 (376.93)	51610 (229.57)	3.68 (5.91)	2042	6.5	0.407 (0.248)	17.21 (3.39)	0.047 (0.028)	207 (97)	67 (20)	28.72 (97.26)
4th Gear										
538.76 (401.75)	47724 (212.29)	4.24 (6.82)	1928	5.2	0.396 (0.241)	17.68 (3.48)	0.043 (0.026)	207 (97)	69 (21)	28.69 (97.16)
5th Gear										
545.95 (407.11)	42242 (187.90)	4.85 (7.81)	1900	3.9	0.394 (0.240)	17.79 (3.50)	0.042 (0.025)	210 (99)	71 (21)	28.70 (97.19)
6th Gear										
550.24 (410.31)	38374 (170.69)	5.38 (8.66)	1901	3.0	0.392 (0.238)	17.90 (3.53)	0.042 (0.026)	211 (99)	58 (15)	28.69 (97.16)
7th Gear										
549.70 (409.91)	34897 (155.23)	5.91 (9.51)	1899	2.7	0.391 (0.238)	17.91 (3.53)	0.042 (0.026)	211 (99)	59 (15)	28.70 (97.19)
8th Gear										
549.18 (409.52)	31628 (140.69)	6.51 (10.48)	1900	2.3	0.389 (0.237)	18.02 (3.55)	0.042 (0.025)	208 (98)	60 (16)	28.70 (97.19)
9th Gear										
548.18 (408.77)	28667 (127.51)	7.17 (11.54)	1900	2.2	0.393 (0.239)	17.85 (3.52)	0.042 (0.026)	211 (99)	62 (17)	28.69 (97.16)
10th Gear										
547.90 (408.57)	26034 (115.80)	7.89 (12.70)	1899	2.0	0.393 (0.239)	17.84 (3.51)	0.042 (0.026)	208 (98)	63 (17)	28.71 (97.22)
11th Gear										
543.80 (405.51)	23513 (104.59)	8.67 (13.95)	1900	1.9	0.395 (0.240)	17.73 (3.49)	0.042 (0.026)	210 (99)	64 (18)	28.69 (97.16)

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)	3062 psi (211 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM (165.8 l/min)	59.1 GPM (223.6 l/min)
iii) Pump delivery rate at maximum hydraulic power:	43.3 GPM (163.7 l/min)	56.7 GPM (214.6 l/min)
Delivery pressure:	2526 psi (174 bar)	2685 psi (185 bar)
Power:	63.7 HP (47.5 kW)	88.8 Hp (66.2 kW)

Single outlet set

ii) Pump delivery rate at minimum pressure and rated engine speed:	42.8 GPM (162.2 l/min)	48.3 GPM (182.7 l/min)
iii) Pump delivery rate at maximum hydraulic power:	42.7 GPM (161.6 l/min)	46.5 GPM (175.9 l/min)
Delivery pressure:	2024 psi (139 bar)	2191 psi (151 bar)
Power:	50.4 HP (37.6 kW)	59.4 Hp (44.3 kW)

MegaFlow system

Two outlet sets combined

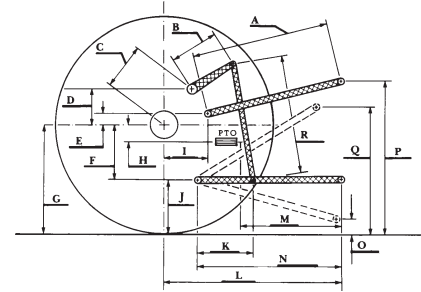
	Standard pump	MegaFlow pump
i) Sustained pressure at compensator cutoff:	2877 psi (198 bar)	2855 psi (197 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM (165.8 l/min)	57.3 GPM (217.0 l/min)
Combined flow:	101.1 GPM (382.8 l/min)	
iii) Pump delivery rate at maximum hydraulic 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	MegaFlow 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



New Holland T9.645 Diesel

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