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1999

## Nebraska Summary: S296 New Holland TS 110

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# SUMMARY OF OECD TEST 1834 - NEBRASKA SUMMARY 296

## NEW HOLLAND TS110 DIESEL

### 24 SPEED

#### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
<b>Rated Engine Speed—(PTO speed—1010 rpm)</b>					
98.4 (73.4)	2070	5.73 (21.68)	0.406 (0.247)	17.19 (3.39)	
<b>Standard Power Take-off Speed (1000 rpm)</b>					
97.8 (72.9)	2049	5.65 (21.39)	0.403 (0.245)	17.31 (3.41)	
<b>VARYING POWER AND FUEL CONSUMPTION</b>					
98.4 (73.4)	2070	5.73 (21.68)	0.406 (0.247)	17.19 (3.39)	Air temperature
86.8 (64.7)	2148	5.21 (19.72)	0.419 (0.255)	16.65 (3.28)	74°F (23°C)
66.0 (49.2)	2177	4.27 (16.15)	0.452 (0.275)	15.46 (3.05)	Relative humidity
44.5 (33.2)	2197	3.35 (12.69)	0.526 (0.320)	13.27 (2.61)	36%
22.4 (16.7)	2215	2.39 (9.03)	0.744 (0.452)	9.39 (1.85)	Barometer
--	2233	1.51 (5.71)	--	--	30.1" Hg (102.0 kPa)

Maximum Torque - 323.4 lb.-ft. (438.5 Nm) at 1348 rpm  
 Maximum Torque Rise - 29.5%  
 Torque rise at 1600 engine rpm - 23%

#### DRAWBAR PERFORMANCE (Unballasted - Front Drive Engaged)

##### 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)	Temp. °F (°C) cool- ing med	Barom. inch Hg (kPa)
<b>Maximum Power—12th(2MH) Gear</b>							
82.7 (61.7)	7075 (31.5)	4.39 (7.06)	2072	4.5	0.478 (0.290)	14.64 (2.88)	185 (85)
<b>75% of Pull at Maximum Power—12th(2MH) Gear</b>							
65.7 (49.0)	5300 (23.6)	4.65 (7.48)	2173	3.4	0.521 (0.317)	13.40 (2.64)	185 (85)
<b>50% of Pull at Maximum Power—12th(2MH) Gear</b>							
44.6 (33.2)	3520 (15.7)	4.75 (7.65)	2197	2.4	0.609 (0.370)	11.47 (2.26)	185 (85)
<b>75% of Pull at Reduced Engine Speed—13th(3ML) Gear</b>							
65.9 (49.1)	5315 (23.6)	4.65 (7.48)	1864	3.7	0.485 (0.295)	14.40 (2.84)	185 (85)
<b>50% of Pull at Reduced Engine Speed—13th(3ML) Gear</b>							
44.6 (33.2)	3520 (15.7)	4.75 (7.64)	1885	2.6	0.552 (0.336)	12.64 (2.49)	185 (84)

**Location of Test:** Silsoe Research Institute, Wrest Park, Silsoe, United Kingdom

**Dates of Test:** August, 1998 - June, 1999

**Manufacturer:** New Holland UK Ltd., Basildon, Essex, United Kingdom

**FUEL and OIL:** Fuel No. 2 Diesel **Specific gravity converted to 60°/60° F (15°/15°C)** 0.839 **Fuel weight** 6.98 lbs/gal (0.837 kg/l) **Oil SAE 10W30 API service classification** CE/SF **Transmission and hydraulic lubricant** SAE 10W30 API GL4 **Front axle lubricant** SAE 10W30 API GL4

**ENGINE: Make** New Holland Diesel **Type** four cylinder vertical with turbocharger **Serial No.** PD736866 **Crankshaft** lengthwise **Rated engine speed** 2070 **Bore and stroke** 4.40" x 5.00" (111.8 mm x 127.0 mm) **Compression ratio** 17.5 to 1 **Displacement** 304 cu in (4987 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and centrifugal precleaner **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** thermostat and variable speed fan

**CHASSIS: Type** front wheel assist **Serial No.** 086473B **Tread width** rear 60.2" (1528 mm) to 79.8" (2028 mm) front 55.3" (1404 mm) to 83.3" (2115 mm) **Wheelbase** 93.0" (2362 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph (km/h)** first 1.00 (1.61) second 1.22 (1.97) third 1.47 (2.36) fourth 1.80 (2.89) fifth 2.09 (3.37) sixth 2.52 (4.05) seventh 2.57 (4.13) eighth 3.05 (4.91) ninth 3.08 (4.95) tenth 3.68 (5.93) eleventh 3.73 (6.00) twelfth 4.51 (7.26) thirteenth 5.26 (8.47) fourteenth 6.10 (9.81) fifteenth 6.44 (10.37) sixteenth 7.46 (12.00) seventeenth 7.66 (12.33) eighteenth 8.93 (14.37) nineteenth 9.37 (15.08) twentieth 10.92 (17.58) twenty-first 12.75 (20.52) twenty-second 15.60 (25.10) twenty-third 18.55 (29.86) twenty-fourth 22.69 (36.52) reverse 1.04 (1.67), 1.27 (2.04), 1.52 (2.44), 1.86 (2.99), 2.17 (3.49), 2.60 (4.19), 2.65 (4.27), 3.16 (5.08), 3.18 (5.12), 3.82 (6.14), 3.86 (6.21), 4.67 (7.51), 5.44 (8.76), 6.30 (10.14), 6.66 (10.72), 7.71 (12.41), 7.92 (12.75), 9.23 (14.86), 9.69 (15.60), 11.29 (18.17), 13.19 (21.22), 16.13 (25.95), 19.19 (30.88), 23.47 (37.77) **Clutch** multiple wet disc electro-hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1890 engine rpm and 1000 rpm at 2049 engine rpm **Unladen tractor mass** 9795 lb (4442 kg)

## DRAWBAR PERFORMANCE

### (Unballasted - Front Drive Engaged) 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)	Temp. °F(°C) cool- ing med	Barom. inch Hg (kPa)
2nd(1LH) Gear							
31.2 (23.3)	10375 (46.1)	1.13 (1.81)	2204	15.1	0.748 (0.455)	9.34 (1.84)	185 (85) 55 (13) 29.6 (100.2)
3rd(2LL) Gear							
37.7 (28.1)	10205 (45.4)	1.39 (2.23)	2199	12.6	0.669 (0.407)	10.44 (2.06)	184 (84) 55 (13) 29.6 (100.2)
4th(2LH) Gear							
45.7 (34.1)	10160 (45.2)	1.69 (2.72)	2186	12.5	0.626 (0.381)	11.17 (2.20)	184 (84) 55 (13) 29.6 (100.2)
5th(3LL) Gear							
53.5 (39.9)	10105 (45.0)	1.99 (3.20)	2179	11.6	0.580 (0.353)	12.03 (2.37)	185 (85) 54 (12) 29.6 (100.2)
6th(1ML) Gear							
63.4 (47.3)	9890 (44.0)	2.40 (3.87)	2164	10.1	0.551 (0.335)	12.69 (2.50)	186 (86) 54 (12) 29.6 (100.2)
7th(3LH) Gear							
64.8 (48.3)	9845 (43.8)	2.47 (3.97)	2165	9.7	0.557 (0.338)	12.57 (2.48)	185 (85) 54 (12) 29.6 (100.2)
8th(4LL) Gear							
75.4 (56.2)	9685 (43.1)	2.92 (4.70)	2131	8.7	0.519 (0.316)	13.45 (2.65)	185 (85) 54 (12) 29.6 (100.2)
9th(1MH) Gear							
76.7 (57.2)	9675 (43.0)	2.97 (4.78)	2134	7.9	0.508 (0.309)	13.76 (2.71)	185 (85) 54 (12) 29.6 (100.2)
10th(2ML) Gear							
81.3 (60.6)	8615 (38.3)	3.54 (5.69)	2074	5.9	0.489 (0.297)	14.29 (2.81)	186 (86) 54 (12) 29.6 (100.2)
11th(4LH) Gear							
81.7 (60.9)	8560 (38.1)	3.58 (5.76)	2073	5.8	0.496 (0.302)	14.06 (2.77)	185 (85) 52 (11) 29.6 (100.2)
12th(2MH) Gear							
82.7 (61.7)	7075 (31.5)	4.38 (7.06)	2072	4.5	0.477 (0.290)	14.64 (2.88)	185 (85) 52 (11) 29.6 (100.2)
13th(3ML) Gear							
81.0 (60.4)	5885 (26.2)	5.16 (8.31)	2074	3.8	0.493 (0.300)	14.16 (2.79)	187 (86) 52 (11) 29.6 (100.2)
14th(1HL) Gear							
80.9 (60.3)	5080 (22.6)	5.97 (9.61)	2064	3.3	0.489 (0.298)	14.28 (2.81)	187 (86) 50 (10) 29.6 (100.3)
15th(3HM) Gear							
81.0 (60.4)	4795 (21.3)	6.33 (10.19)	2069	3.3	0.491 (0.298)	14.24 (2.80)	187 (86) 50 (10) 29.6 (100.3)
16th(1HH) Gear							
80.7 (60.2)	4115 (18.3)	7.36 (11.84)	2067	2.8	0.489 (0.298)	14.28 (2.81)	187 (86) 50 (10) 29.6 (100.3)
17th(4ML) Gear							
79.7 (59.4)	3935 (17.5)	7.59 (12.22)	2073	2.7	0.496 (0.302)	14.06 (2.77)	185 (85) 52 (11) 29.6 (100.3)
18th(2HL) Gear							
77.4 (57.7)	3270 (14.5)	8.88 (14.29)	2073	2.3	0.517 (0.314)	13.52 (2.66)	185 (85) 52 (11) 29.6 (100.3)
19th(4MH) Gear							
78.6 (58.6)	3155 (14.0)	9.34 (15.03)	2076	2.2	0.513 (0.312)	13.60 (2.68)	185 (85) 52 (11) 29.6 (100.3)

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

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD test procedures. This tractor did not meet manufactures claim of 6210 lb (2817 kg), optionally 8700 lb (3950 kg), 3 point hitch lift capacity at 24" (610 mm). The performance figures on this summary were taken from a test conducted under the OECD Code II test code procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **1834**, Nebraska Summary 296, January 13, 2000.

David L. Morgan  
Assistant Director

L.L. Bashford  
M.F. Kocher  
R.D. Grisso Jr.  
Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
Maximum Sound level	78.0	78.0
Bystander in 24th(4HH) Gear	83.0	--

**DRAWBAR PERFORMANCE**  
**(Unballasted - Front Drive Disengaged)**  
**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 (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—16th(1HH) Gear</b>									
83.1 (62.0)	4295 (19.1)	7.26 (11.68)	2067	3.2	0.476 (0.290)	14.67 (2.89)	187 (86)	50 (10)	29.3 (99.1)
<b>75% of Pull at Maximum Power—16th(1HH) Gear</b>									
65.8 (49.1)	3215 (14.3)	7.67 (12.35)	2169	2.5	0.519 (0.316)	13.45 (2.65)	185 (85)	55 (13)	29.3 (99.1)
<b>50% of Pull at Maximum Power—16th(1HH) Gear</b>									
45.2 (33.7)	2170 (9.6)	7.82 (12.58)	2194	1.9	0.598 (0.364)	11.67 (2.30)	185 (84)	55 (13)	29.2 (99.0)
<b>75% of Pull at Reduced Engine Speed—18th(2HL) Gear</b>									
65.8 (49.1)	3210 (14.3)	7.69 (12.37)	1814	2.5	0.476 (0.290)	14.67 (2.89)	185 (85)	55 (13)	29.2 (99.0)
<b>50% of Pull at Reduced Engine Speed—18th(2HL) Gear</b>									
45.3 (33.8)	2165 (9.6)	7.84 (12.62)	1837	1.8	0.526 (0.320)	13.28 (2.62)	185 (84)	55 (13)	29.2 (99.0)

**MAXIMUM POWER IN SELECTED GEARS**

<b>9th(1MH) Gear</b>									
63.2 (47.1)	8140 (36.2)	2.91 (4.68)	2163	10.3	0.541 (0.329)	12.91 (2.54)	184 (84)	55 (13)	29.2 (98.8)
<b>10th(2ML) Gear</b>									
75.4 (56.2)	8070 (35.9)	3.50 (5.64)	2137	8.7	0.513 (0.312)	13.60 (2.68)	184 (84)	55 (13)	29.2 (98.8)
<b>11th(4LH) Gear</b>									
75.8 (56.5)	8095 (36.0)	3.51 (5.65)	2121	8.9	0.510 (0.310)	13.71 (2.70)	187 (86)	57 (14)	29.2 (98.9)
<b>12th(2MH) Gear</b>									
81.9 (61.1)	7170 (31.9)	4.28 (6.90)	2073	5.8	0.483 (0.294)	14.47 (2.85)	185 (85)	52 (11)	29.3 (99.1)
<b>13th(3ML) Gear</b>									
82.1 (61.2)	6075 (27.0)	5.07 (8.15)	2069	4.6	0.485 (0.295)	14.39 (2.83)	186 (86)	50 (10)	29.3 (99.1)
<b>14th(1HL) Gear</b>									
82.7 (61.7)	5240 (23.3)	5.92 (9.53)	2077	3.9	0.483 (0.294)	14.47 (2.85)	185 (85)	50 (10)	29.3 (99.1)
<b>15th(3MH) Gear</b>									
82.6 (61.6)	4940 (22.0)	6.27 (10.09)	2074	3.7	0.478 (0.291)	14.62 (2.88)	185 (85)	52 (11)	29.3 (99.1)
<b>16th(1HH) Gear</b>									
83.1 (62.0)	4295 (19.1)	7.26 (11.68)	2067	3.2	0.476 (0.290)	14.67 (2.89)	187 (86)	50 (10)	29.3 (99.1)
<b>17th(4ML) Gear</b>									
82.9 (61.8)	4145 (18.4)	7.50 (12.06)	2073	3.1	0.476 (0.290)	14.67 (2.89)	185 (85)	52 (11)	29.3 (99.1)
<b>18th(2HL) Gear</b>									
81.7 (60.9)	3490 (15.5)	8.78 (14.12)	2074	2.6	0.482 (0.293)	14.49 (2.85)	186 (86)	52 (11)	29.3 (99.1)
<b>19th(4MH) Gear</b>									
81.9 (61.1)	3335 (14.8)	9.21 (14.81)	2072	2.7	0.493 (0.300)	14.16 (2.79)	185 (85)	52 (11)	29.3 (99.1)

**TIRES AND WEIGHT**

**Rear tires** - No., size, ply & psi (kPa)  
**Front tires** - No., size, ply & psi (kPa)  
**Height of Drawbar**  
**Static Weight with operator** - Rear  
- Front  
- Total

**Tested Without Ballast**

Two 18.4R38; \*\*,12(83)  
Two 14.9R28; \*\*,15(103)  
21.3 in (540 mm)  
6170 lb (2799 kg)  
3790 lb (1718 kg)  
9960 lb (4517 kg)

### THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II			with additional
Quick Attach: None			assistor ram
Maximum Force Exerted Through Whole Range:	5015 lbs	(22.3 kN)	6520 lbs (29.0 kN)
i) Opening pressure of relief valve:	NA		
Sustained pressure of the open relief valve:	2670 psi	(184 bar)	
ii) Pump delivery rate at minimum pressure:	18.3 GPM	(69.3 l/min)	
iii) Pump delivery rate at maximum			
hydraulic power:	16.2 GPM	(61.3 l/min)	
Delivery pressure:	2465 psi	(170 bar)	
Power:	23.3 HP	(17.37 kW)	

**SAE Static Test**—System pressure 2290 psi (158 Bar)  
(with(1) 45 mm lift assist cylinder)

Hitch point distance to ground level in. (mm)	7.8(197)	14.2(361)	20.1(511)	28.0(711)	36.3(921)
Lift force on frame lb	7485	7395	6970	6225	5485
" " " " " " (kN)	(33.3)	(32.9)	(31.0)	(27.7)	(24.4)

**SAE Static Test**—System pressure 2290 psi (158 Bar)  
(with(2) 45 mm lift assist cylinders)

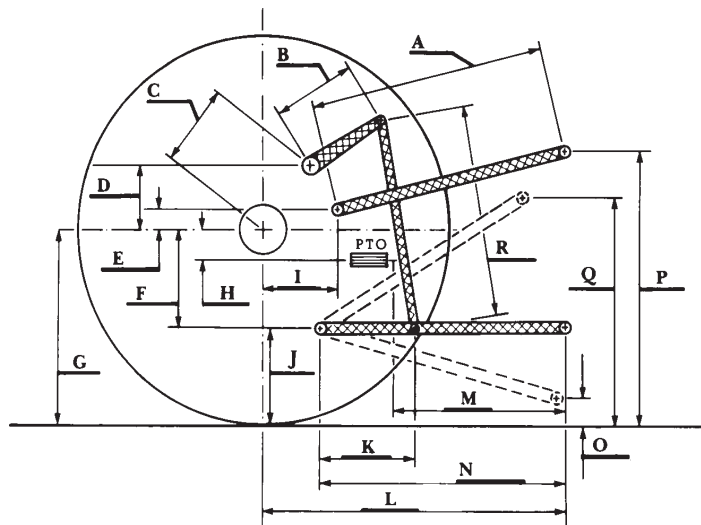
Hitch point distance to ground level in. (mm)	7.8(197)	14.2(361)	20.1(511)	28.0(711)	36.3(921)
Lift force on frame lb	10005	9690	9260	8140	7015
" " " " " " (kN)	(44.5)	(43.1)	(41.2)	(36.2)	(31.2)

**ASAE Static Test**—System pressure 2555 psi (176 Bar)  
(with(1) 45 mm lift assist cylinder)

Hitch point distance to ground level in. (mm)	7.8(197)	14.2(361)	20.1(511)	28.0(711)	36.3(921)
Lift force on frame lb	8340	8250	7755	6925	6115
" " " " " " (kN)	(37.1)	(36.7)	(34.5)	(30.8)	(27.2)

**ASAE Static Test**—System pressure 2555 psi (176 Bar)  
(with(2) 45 mm lift assist cylinders)

Hitch point distance to ground level in. (mm)	7.8(197)	14.2(361)	20.1(511)	28.0(711)	36.3(921)
Lift force on frame lb	11150	10790	10320	9060	7800
" " " " " " (kN)	(49.6)	(48.0)	(45.9)	(40.3)	(34.7)



**HITCH DIMENSIONS AS TESTED—NO LOAD**

	OECD Test		SAE/ASAE Test	
	inch	mm	inch	mm
A	28.3	720	28.3	670
B	10.0	254	10.0	254
C	14.0	356	14.0	356
D	13.4	341	13.4	341
E	5.9	149	5.9	149
F	9.0	229	9.0	229
G	32.3	820	29.1	740
H	1.9	47	1.9	47
I	12.8	325	12.8	325
J	23.3	591	20.1	511
K	18.3	466	20.5	520
L	40.0	1017	40.0	1017
M	22.0	560	22.0	560
N	36.0	915	36.0	915
O	7.7	196	7.8	197
P	47.3	1201	39.1	994
Q	33.8	859	31.9	811
R	33.3	820	32.6	830