

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F.
Larsen

January 2004

Test 2203: New Holland TS135A Diesel

Follow this and additional works at: <http://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Applied Mechanics Commons](#)

"Test 2203: New Holland TS135A Diesel" (2004). *Nebraska Tractor Tests*. 307.
<http://digitalcommons.unl.edu/tractormuseumlit/307>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

SUMMARY OF OECD TEST 2203–NEBRASKA SUMMARY 500

NEW HOLLAND TS135A DIESEL

16 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
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1037 rpm)					
114.5 (85.4)	2199	7.19 (27.22)	0.443 (0.269)	15.93 (3.14)	
Standard Power Take-off Speed (1000 rpm)					
120.1 (89.6)	2120	7.21 (27.29)	0.424 (0.258)	16.65 (3.28)	
Maximum Power (2 hours)					
127.4 (95.0)	1900	7.17 (27.13)	0.397 (0.241)	17.77 (3.50)	

VARYING POWER AND FUEL CONSUMPTION

114.5 (85.4)	2199	7.19 (27.22)	0.443 (0.269)	15.93 (3.14)	Air temperature
100.0 (74.6)	2257	6.58 (24.92)	0.464 (0.282)	15.19 (2.99)	73°F (23°C)
76.4 (57.0)	2298	5.49 (20.78)	0.507 (0.308)	13.92 (2.74)	Relative humidity
51.6 (38.5)	2326	4.41 (16.68)	0.602 (0.366)	11.72 (2.31)	56%
26.0 (19.4)	2358	3.28 (12.42)	0.888 (0.540)	7.94 (1.57)	Barometer
--	2372	2.31 (8.74)	--	--	29.8" Hg (101.0 kPa)

Maximum Torque - 408.2 lb.-ft. (553.4 Nm) at 1398 rpm
 Maximum Torque Rise - 49.1%
 Torque rise at 1800 engine rpm - 34%

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)
Maximum Power—7th (1C) Gear							
94.4 (70.4)	8275 (36.8)	4.28 (6.88)	2199	4.5	0.523 (0.318)	13.50 (2.66)	180 (82)
75% of Pull at Maximum Power—7th (1C) Gear							
74.0 (55.2)	6205 (27.6)	4.47 (7.20)	2279	3.5	0.581 (0.353)	12.14 (2.39)	180 (82)
50% of Pull at Maximum Power—7th (1C) Gear							
50.7 (37.8)	4145 (18.4)	4.58 (7.37)	2310	2.8	0.702 (0.427)	10.05 (1.98)	180 (82)
75% of Pull at Reduced Engine Speed—8th (3B) Gear							
74.3 (55.4)	6215 (27.6)	4.48 (7.21)	2020	3.6	0.551 (0.335)	12.79 (2.52)	178 (81)
50% of Pull at Reduced Engine Speed—8th (3B) Gear							
50.7 (37.8)	4135 (18.4)	4.60 (7.40)	2052	2.5	0.604 (0.368)	11.67 (2.30)	178 (81)

Location of Test: Silsoe Research Institute, Wrest Park, Silsoe, MK45 4HS, United Kingdom

Dates of Test: June to August, 2004.

Manufacturer: CNH U.K. Ltd., Basildon, Essex, SS14 3AD, England

FUEL and OIL: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.847 **Fuel weight** 7.04 lbs/gal (0.8453 kg/l) **Oil SAE** 10W30 **API service classification** CH-4 **Transmission and hydraulic lubricant** New Holland 410B fluid **Front axle lubricant** New Holland 410B fluid

ENGINE: Make CNH Diesel **Type** six cylinder vertical with turbocharger and air to air intercooler **Serial No.** 00066631 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.094" x 5.196" (104.0 mm x 132.0 mm) **Compression ratio** 17.0 to 1 **Displacement** 410 cu in (6728 ml) **Starting system** 12 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 transmission oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** thermostat and variable speed fan

CHASSIS: Type front wheel assist **Serial No.** 209584 **Tread width** rear 68.1" (1730 mm) to 83.9" (2130 mm) front 64.2" (1630 mm) to 81.9" (2080 mm) **Wheelbase** 104.4" (2652 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (4) range operator controlled powershift **Nominal travel speeds mph (km/h)** first 1.42 (2.28) second 1.73 (2.78) third 2.11 (3.40) fourth 2.58 (4.15) fifth 3.32 (5.35) sixth 4.06 (6.53) seventh 4.39 (7.07) eighth 4.96 (7.98) ninth 5.36 (8.63) tenth 6.06 (9.75) eleventh 6.56 (10.56) twelfth 8.02 (12.90) thirteenth 10.32 (16.60) fourteenth 12.60 (20.28) fifteenth 15.41 (24.80) sixteenth 18.83 (30.30) reverse 1.40 (2.25), 1.71 (2.75), 2.09 (3.37), 2.55 (4.10), 3.28 (5.28), 4.01 (6.45), 4.34 (6.98), 4.90 (7.89), 5.30 (8.53), 5.99 (9.64) 6.48 (10.43), 7.92 (12.75), 10.20 (16.41), 12.46 (20.05), 15.23 (24.51), 18.60 (29.94) **Clutch** multiple wet disc electro-hydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1969 engine rpm or 1000 rpm at 2120 engine rpm **Unladen tractor mass** 12020 lb (5452 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)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd(3A) Gear									
62.6 (46.7)	11755 (52.3)	2.00 (3.21)	2292	10.9	0.637 (0.388)	11.07 (2.18)	181 (83)	70 (21)	30.1 (101.9)
4th(4A) Gear									
73.9 (55.1)	11400 (50.7)	2.43 (3.91)	2277	10.8	0.577 (0.351)	12.23 (2.41)	181 (83)	70 (21)	30.1 (101.9)
5th(1B) Gear									
92.7 (69.1)	11285 (50.2)	3.08 (4.95)	2203	9.2	0.538 (0.327)	13.11 (2.58)	180 (82)	70 (21)	30.1 (101.9)
6th(2B) Gear									
103.7 (77.3)	11175 (49.7)	3.48 (5.60)	2034	8.9	0.483 (0.294)	14.62 (2.88)	178 (81)	70 (21)	30.1 (101.9)
7th(1C) Gear									
104.3 (77.8)	10880 (48.4)	3.60 (5.79)	1902	7.0	0.486 (0.295)	14.53 (2.86)	178 (81)	66 (19)	30.1 (101.9)
8th(3B) Gear									
104.6 (78.0)	9420 (41.9)	4.16 (6.70)	1911	5.2	0.471 (0.286)	14.99 (2.95)	176 (80)	68 (20)	30.1 (101.9)
9th(2C) Gear									
106.6 (79.5)	8900 (39.6)	4.49 (7.23)	1900	4.7	0.459 (0.279)	15.38 (3.03)	178 (81)	68 (20)	30.1 (101.9)
10th(4B) Gear									
106.2 (79.2)	7710 (34.3)	5.17 (8.31)	1920	4.3	0.479 (0.291)	14.72 (2.90)	176 (80)	72 (22)	30.1 (101.9)
11th(3C) Gear									
104.2 (77.7)	6955 (30.9)	5.62 (9.04)	1921	3.8	0.493 (0.300)	14.31 (2.82)	178 (81)	68 (20)	30.1 (101.9)
12th(4C) Gear									
102.7 (76.6)	5590 (24.9)	6.89 (11.09)	1915	3.2	0.506 (0.308)	13.95 (2.75)	176 (80)	68 (20)	30.1 (101.9)
13th(1D) Gear									
102.9 (76.7)	4310 (19.2)	8.95 (14.41)	1923	2.7	0.498 (0.303)	14.16 (2.79)	176 (80)	68 (20)	30.1 (101.9)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE: The manufacturer's claim of 115 PTO hp (85.8 kW) was met during the standard PTO speed test.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD test procedures. This tractor did not meet the manufacturer's claims of: 62% PTO torque rise, 26.5 gpm (100 lpm) remote hydraulic flow nor 3 point lift capacity of 12185 lbs (5527 kg). The performance figures on this summary were taken from a test conducted under the OECD Code II test procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **2203** Nebraska Summary 500, December 15, 2005.

Leonard L. Bashford
 Director

M.F. Kocher
 V.I. Adamchuk
 J.A. Smith
 Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
At no load in 7th (1C) gear	72.0	73.0
Bystander	--	--

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 600/65R38; **,10 (70)
 Two 480/65R28; **,10 (70)
 20.3 in (515 mm)
 7445 lb (3378 kg)
 4740 lb (2149 kg)
 12185 lb (5527 kg)

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)	Temp. ^o F (°C) cool- ing med	Temp. ^o F (°C) Air dry bulb	Barom. inch Hg (kPa)	
Maximum Power—7th(1C) Gear									
91.3 (68.1)	8345 (37.1)	4.10 (6.60)	2200	7.0	0.547 (0.333)	12.89 (2.54)	178 (81)	70 (21)	30.1 (101.8)
75% of Pull at Maximum Power—7th(1C) Gear									
73.4 (54.7)	6250 (27.8)	4.40 (7.08)	2282	3.6	0.591 (0.360)	11.93 (2.35)	180 (82)	70 (21)	30.1 (101.9)
50% of Pull at Maximum Power—7th(1C) Gear									
50.5 (37.7)	4190 (18.6)	4.52 (7.27)	2312	2.4	0.713 (0.433)	9.90 (1.95)	180 (82)	68 (20)	30.1 (101.9)
75% of Pull at Reduced Engine Speed—8th(3B) Gear									
73.5 (54.8)	6250 (27.8)	4.41 (7.09)	2028	4.0	0.511 (0.311)	13.81 (2.72)	176 (80)	73 (23)	30.1 (101.8)
50% of Pull at Reduced Engine Speed—8th(3B) Gear									
50.6 (37.7)	4190 (18.6)	4.53 (7.29)	2055	2.7	0.586 (0.357)	12.03 (2.37)	178 (81)	73 (23)	30.1 (101.8)
MAXIMUM POWER IN SELECTED GEARS									
1st(1A) Gear									
30.0 (22.4)	8565 (38.1)	1.32 (2.12)	2342	12.8	0.915 (0.557)	7.71 (1.52)	181 (83)	75 (24)	30.1 (101.8)
2nd(2A) Gear									
36.2 (27.0)	8510 (37.9)	1.60 (2.57)	2331	13.0	0.817 (0.497)	8.63 (1.70)	183 (84)	73 (23)	30.1 (101.8)
3rd(3A) Gear									
44.5 (33.2)	8475 (37.7)	1.97 (3.17)	2316	11.6	0.755 (0.459)	9.34 (1.84)	183 (84)	75 (24)	30.1 (101.8)
4th(4A) Gear									
54.2 (40.4)	8475 (37.7)	2.40 (3.86)	2304	11.5	0.685 (0.416)	10.30 (2.03)	179 (82)	73 (23)	30.1 (101.8)
5th(1B) Gear									
69.1 (51.5)	8420 (37.5)	3.08 (4.95)	2282	11.0	0.639 (0.389)	11.03 (2.17)	181 (83)	73 (23)	30.1 (101.8)
6th(2B) Gear									
83.0 (61.9)	8375 (37.3)	3.72 (5.98)	2237	10.1	0.594 (0.361)	11.88 (2.34)	181 (83)	73 (23)	30.0 (101.7)
7th(1C) Gear									
91.3 (68.1)	8345 (37.1)	4.10 (6.60)	2200	7.0	0.547 (0.333)	12.89 (2.54)	178 (81)	70 (21)	30.1 (101.8)
8th(3B) Gear									
97.1 (72.4)	8275 (36.8)	4.40 (7.08)	2079	6.5	0.517 (0.314)	13.65 (2.69)	178 (81)	68 (20)	30.1 (101.9)
9th(2C) Gear									
101.8 (75.9)	8210 (36.5)	4.65 (7.48)	2034	6.6	0.487 (0.296)	14.48 (2.85)	178 (81)	68 (20)	30.1 (101.8)
10th(4B) Gear									
104.9 (78.2)	7870 (35.0)	5.00 (8.05)	1916	5.6	0.492 (0.299)	14.33 (2.82)	178 (81)	72 (22)	30.1 (101.9)
11th(3C) Gear									
103.9 (77.5)	7170 (31.9)	5.44 (8.75)	1911	4.8	0.476 (0.289)	14.82 (2.92)	176 (80)	73 (23)	30.1 (101.8)
12th(4C) Gear									
105.8 (78.9)	5875 (26.1)	6.75 (10.87)	1913	3.4	0.484 (0.295)	14.57 (2.87)	178 (81)	70 (21)	30.1 (101.9)
13th(1D) Gear									
106.5 (79.4)	4570 (20.3)	8.74 (14.06)	1907	2.6	0.465 (0.283)	15.18 (2.99)	176 (80)	68 (20)	30.1 (101.9)

This vehicle is equipped with an electronically controlled engine Power management system that monitors and boosts engine power output in certain circumstances. This is achieved by electronically changing the characteristics of the engine power-speed curve. The engine Power management function ("boosted" power level) becomes active in the higher transmission gears (13th and above) and for road transport applications. The system is also activated when power transfer through the PTO exceeds a preset level (and forward speed exceeds 0.5 km/h), for mobile PTO driven implement applications. An override system is provided to enable PTO operations at the "boosted" power level while the vehicle is stationary for test purposes. The results of of this PTO output test are presented below.

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
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1037 rpm)					
141.5 (105.5)	2199	8.53 (32.29)	0.425 (0.259)	16.59 (3.27)	
Standard Power Take-off Speed - (1001 rpm)					
145.2 (108.3)	2122	8.53 (32.28)	0.414 (0.252)	17.02 (3.35)	
Maximum Power (2 hours)					
151.5 (113.0)	1900	8.32 (31.48)	0.387 (0.235)	18.22 (3.59)	

VARYING POWER AND FUEL CONSUMPTION

141.5 (105.5)	2199	8.53 (32.29)	0.425 (0.259)	16.59 (3.27)	Air temperature
122.7 (91.5)	2241	7.42 (28.09)	0.427 (0.259)	16.54 (3.26)	73°F (23°C)
93.6 (69.8)	2278	6.46 (24.45)	0.487 (0.296)	14.48 (2.85)	Relative humidity
63.3 (47.2)	2312	5.05 (19.12)	0.563 (0.342)	12.54 (2.47)	55%
32.2 (24.0)	2352	3.68 (13.92)	0.806 (0.490)	8.75 (1.72)	Barometer
--	2372	2.40 (9.08)	--	--	30.3"Hg (101.7kPa)

Maximum Torque 436.5 lb.-ft. (591.8 Nm) at 1703 rpm
 Maximum Torque Rise - 29.1%
 Torque rise at 1750 rpm - 28%

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick Attach: No

Maximum Force Exerted Through Whole Range: 9530 lbs (42.4 kN)

i) Opening pressure of relief valve: NA

variable disp. pump

Sustained pressure at compensator cutoff: 3105 psi (214 bar)

ii) Pump delivery rate at minimum pressure: 26.2 GPM (99.0 l/min)

iii) Pump delivery rate at maximum

hydraulic power: 25.0 GPM (94.5 l/min)

Delivery pressure: 2610 psi (180 bar)

Power: 38.0 HP (28.3 kW)

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi.(bar)	3105 (214)				
Location:	lift cylinder				
Hydraulic oil temperature: °F (°C)	150 (65)				
Location:	hydraulic sump				
Category:	II				
Quick attach:	none				
SAE Static Test—System pressure 2685 psi (185 Bar) (two 90 mm cylinders)					
Hitch point distance to ground level in.(mm)	7.7 (195)	15.6 (395)	23.0 (585)	30.3 (770)	36.2 (920)
Lift force on frame lb	14500	13510	12970	12455	11240
" " " " " " (kN)	(64.5)	(60.1)	(57.7)	(55.4)	(50.0)

HITCH DIMENSIONS AS TESTED—NO LOAD

	OECD test		SAE test	
	inch	mm	inch	mm
A	29.9	760	30.3	770
B	12.2	310	12.2	310
C	15.6	395	15.6	395
D	14.6	370	14.6	370
E	8.2	208	10.8	275
F	9.3	235	9.3	235
G	32.3	820	32.3	820
H	1.1	28	1.1	28
I	17.9	455	16.9	430
J	23.0	585	23.0	585
K	19.8	502	22.8	580
L	46.5	1180	46.5	1180
M	24.6	625	24.6	625
N	39.8	1012	39.8	1012
O	7.7	195	7.7	195
P	47.0	1195	42.0	1068
Q	35.4	900	33.1	840
R	32.3	820	35.0	888

