

January 2004

Tests 2164 & 2165: New Holland TN70A Diesel

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



Part of the [Applied Mechanics Commons](#)

"Tests 2164 & 2165: New Holland TN70A Diesel" (2004). *Nebraska Tractor Tests*. 297.
<http://digitalcommons.unl.edu/tractormuseumlit/297>

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 TESTS 2164 and 2165—NEBRASKA SUMMARY 455 NEW HOLLAND TN70A 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—566 rpm)					
59.5 (44.4)	2302	3.88 (14.68)	0.455 (0.277)	15.33 (3.02)	
Maximum Power (2 hours)					
60.7 (45.3)	2245	3.83 (14.51)	0.441 (0.268)	15.84 (3.12)	
Standard Power Take-off speed (539 rpm)					
60.3 (45.0)	2193	3.75 (14.20)	0.434 (0.264)	16.09 (3.17)	
VARYING POWER AND FUEL CONSUMPTION					
59.5 (44.4)	2302	3.88 (14.68)	0.455 (0.277)	15.33 (3.02)	Air temperature
52.0 (38.8)	2367	3.37 (12.74)	0.453 (0.275)	15.43 (3.04)	66°F (19°C)
40.0 (29.8)	2427	2.80 (10.60)	0.490 (0.298)	14.26 (2.81)	Relative humidity
27.1 (20.2)	2455	2.17 (8.23)	0.562 (0.342)	12.44 (2.45)	63%
13.5 (10.1)	2478	1.51 (5.73)	0.777 (0.473)	8.98 (1.77)	Barometer
--	2489	1.00 (3.79)	--	--	30.0" Hg (101.6 kPa)
Maximum Torque -191.7 lb.-ft. (259.9 Nm) at 1403 rpm Maximum Torque Rise -41.2% Torque rise at 1850 engine rpm -21%					

Location of tests: Alma Mater Studiorum, University Di Bologna, Via Gandolfi, 19-40057, Cadriano, Bologna, Italy

Dates of tests: March - May, 2004

Manufacturer: CNH America LLC, 700 State St. Racine, WI. 53404 USA

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** 15W40 **API service classification** CF-4/SG **Oil consumption for 10 hours** 0.04 lb (16 gm) **Transmission and hydraulic lubricant** Ambra Multi G 15W40 **Front axle lubricant** Ambra Multi G

ENGINE: Make Iveco **Diesel Type** three cylinder vertical with turbocharger **Serial No.** 871343 **Crankshaft** lengthwise **Rated engine speed** 2300 **Bore and stroke** 4.094" x 4.528" (104.0 mm x 115.0 mm) **Compression ratio** 18.0 to 1 **Displacement** 179 cu in (2930 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil **Fuel filter** one paper element **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** thermostat and variable speed fan

CHASSIS: Type 2WD and front wheel assist **Serial No.** HJE161051 **Tread width** rear 48.5" (1232 mm) to 76.7" (1949 mm) front: 2WD - 48.7" (1236 mm) to 76.6" (1945 mm), FWA - 48.7" (1236 mm) to 76.6" (1945 mm) **Wheel base** 2WD - 81.5" (2070 mm) FWA - 81.3" (2065 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds (30 km/h transmission) mph (km/h)** first 0.39 (0.63) second 0.58 (0.93) third 0.85 (1.37) fourth 1.26 (2.03) fifth 1.63 (2.63) sixth 2.00 (3.22) seventh 2.43 (3.91) eighth 2.98 (4.79) ninth 3.57 (5.75) tenth 4.37 (7.04) eleventh 5.30 (8.53) twelfth 5.77 (9.28) thirteenth 6.49 (10.44) fourteenth 8.60 (13.84) fifteenth 12.64 (20.34) sixteenth 18.72 (30.13) reverse 0.38 (0.61), 0.56 (0.90), 0.83 (1.33), 1.22 (1.97), 1.58 (2.54), 1.93 (3.11), 2.36 (3.79), 2.88 (4.64), 3.46 (5.57), 4.24 (6.82), 5.13 (8.26), 5.59 (8.99), 6.28 (10.11), 8.33 (13.40), 12.24 (19.70), 18.14 (29.19) **Clutch** dual dry disc operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2196 engine rpm or 1000 rpm at 2260 engine rpm **Unladen tractor mass** 2WD - 5215 lb (2365 kg), FWA - 5810 lb (2635 kg)

DRAWBAR PERFORMANCE(40 km/h trans.)

BALLASTED - 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. ^o F (°C) cool- ing med	Barom. inch Hg (kPa)		
75% of Pull at Maximum Power—Five Hours 10th (3MHi) Gear									
41.2 (30.7)	2790 (12.40)	5.54 (8.91)	2371	4.0	0.555 (0.337)	12.59 (2.48)	196 (91)	77 (25)	30.0 (101.5)
MAXIMUM POWER IN SELECTED GEARS									
7th (2M Lo) Gear									
44.0 (32.8)	6055 (26.94)	2.73 (4.39)	2367	15.0	0.510 (0.310)	13.71 (2.70)	194 (90)	64 (18)	30.1 (102.0)
8th (2MHi) Gear									
51.4 (38.3)	5890 (26.21)	3.27 (5.26)	2282	13.0	0.495 (0.301)	14.11 (2.78)	194 (90)	64 (18)	30.1 (102.0)
9th (3M Lo) Gear									
50.8 (37.9)	4635 (20.62)	4.11 (6.61)	2246	7.9	0.500 (0.304)	13.96 (2.75)	192 (89)	66 (19)	30.1 (102.0)
10th (3MHi) Gear									
50.9 (38.0)	3710 (16.50)	5.15 (8.29)	2241	5.7	0.504 (0.306)	13.87 (2.73)	196 (91)	63 (17)	30.1 (102.0)
11th (4M Lo) Gear									
51.6 (38.4)	3045 (13.55)	6.35 (10.22)	2247	4.3	0.514 (0.313)	13.59 (2.68)	192 (89)	63 (17)	30.1 (102.0)
12th (1 Hi) Gear									
51.6 (38.5)	2765 (12.31)	7.00 (11.27)	2265	4.0	0.506 (0.308)	13.81 (2.72)	192 (89)	61 (16)	30.1 (102.0)
13th (4 MHi) Gear									
50.5 (37.7)	2395 (10.66)	7.90 (12.72)	2266	3.6	0.517 (0.315)	13.50 (2.66)	190 (88)	63 (17)	30.1 (102.0)
14th (2 Hi) Gear									
49.4 (36.9)	1760 (7.82)	10.54 (16.97)	2255	2.8	0.514 (0.313)	13.59 (2.68)	194 (90)	63 (17)	30.1 (102.0)

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 the manufacturer's claim of 5258 lbs (2385 kg) 3 point lift capacity. The performance results on this summary were taken from OECD tests conducted under the Code I Test procedure.

We, the undersigned, certify that this is a true summary of data from OECD Reports No. **2164** and **2165**, Nebraska Summary 455, August 29, 2005.

Leonard L. Bashford
Director

M.F. Kocher
V.I. Adamchuk
W.P. Campbell
Board of Tractor Test Engineers

TN70A-FWA(40km/h transmission)

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	-No., size, ply & psi (kPa)	Two 16.9R30; **,18 (125)	Two 16.9R30; **,18 (125)
Ballast	-Liquid (total)	None	None
	-Cast Iron (total)	440 lb (200 kg)	None
Front Tires	-No., size, ply & psi (kPa)	Two 11.2R24; **,17 (115)	Two 11.2R24; **,17 (115)
Ballast	-Liquid (total)	None	None
	-Cast Iron (total)	640 lb (290 kg)	None
Height of Drawbar		19.3 in (490 mm)	19.3 in (490 mm)
Static Weight with Operator	- Rear	3905 lb (1770 kg)	3650 lb (1655 kg)
	- Front	3150 lb (1430 kg)	2325 lb (1055 kg)
	- Total	7055 lb (3200 kg)	5975 lb (2710 kg)

DRAWBAR PERFORMANCE(30 km/h trans.)

BALLASTED - 2WD

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)
75% of Pull at Maximum Power—Five Hours 10th (3 MHi) Gear									
37.5 (27.9)	3285 (14.62)	4.28 (6.88)	2389	7.1	0.560 (0.341)	12.48 (2.46)	181 (83)	50 (10)	30.0 (101.5)

MAXIMUM POWER IN SELECTED GEARS

9th (3M Lo)Gear									
41.1 (30.6)	4885 (21.72)	3.16 (5.08)	2365	15.1	0.544 (0.331)	12.84 (2.53)	180 (82)	41 (5)	29.8 (101.0)
10th (3M Hi) Gear									
44.5 (33.1)	4370 (19.44)	3.82 (6.14)	2240	12.1	0.564 (0.343)	12.39 (2.44)	178 (81)	41 (5)	29.8 (101.0)
11th (4 MLo) Gear									
47.3 (35.3)	3700 (16.46)	4.80 (7.72)	2251	8.4	0.534 (0.325)	13.09 (2.58)	176 (80)	43 (6)	29.8 (101.0)
12th (1 Hi) Gear									
48.9 (36.4)	3455 (15.36)	5.31 (8.54)	2256	7.4	0.515 (0.313)	13.55 (2.67)	176 (80)	41 (5)	29.8 (101.0)
13th(4M Hi) Gear									
49.1 (36.6)	3035 (13.49)	6.08 (9.78)	2266	6.1	0.514 (0.313)	13.59 (2.68)	178 (81)	43 (6)	29.8 (101.0)
14th(2 Hi) Gear									
47.0 (35.0)	2185 (9.73)	8.06 (12.97)	2233	4.3	0.526 (0.320)	13.29 (2.62)	178 (81)	43 (6)	29.8 (101.0)

TN70A-2WD(30km/h transmission)

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	-No., size, ply & psi (kPa)	Two 16.9R30;**,18 (125)	Two 16.9R30;**,18 (125)
Ballast	-Liquid (total)	None	None
	-Cast Iron (total)	440 lb (200 kg)	None
Front Tires	-No., size, ply & psi (kPa)	Two 7.50-16; 8; 36 (250)	Two 7.50-16; 8; 36 (250)
Ballast	-Liquid (total)	None	None
	-Cast Iron (total)	640 lb (290 kg)	None
Height of Drawbar		28.3 in (720 mm)	22.4 in (570 mm)
Static Weight with Operator	-Rear	4015 lb (1820 kg)	3750 lb (1700 kg)
	-Front	2445 lb (1110 kg)	1630 lb (740 kg)
	-Total	6460 lb (2930 kg)	5380 lb (2440 kg)

TRACTOR SOUND LEVEL WITHOUT CAB	FWA dB(A)	2WD dB(A)
At no load in 9th (3M Lo) gear	85.1	84.8
Bystander in 16th (4 Hi) gear	82.8	81.8

CENTER OF GRAVITY - 2WD

Horizontal distance forward from centerline of rear wheels	24.7" (628 mm)
Vertical distance above roadway	31.4" (798 mm)
Horizontal distance from center of rear wheel tread	0.5" (13 mm) to the left

CENTER OF GRAVITY - FWA

Horizontal distance forward from centerline of rear wheels	31.7" (804 mm)
Vertical distance above roadway	31.3" (794 mm)
Horizontal distance from center of rear wheel tread	0.3" (7 mm) to the left

TURNING ON A CONCRETE SURFACE (2WD)

Turning radius—without brake right 141" (3.58 m) left 139" (3.53 m)
Turning space radius—without brake right 145" (3.68 m) left 143" (3.63 m)

TURNING ON A CONCRETE SURFACE (FWA)

Turning radius—without brake right 142" (3.61 m) left 142" (3.61 m)
Turning space radius—without brake right 148" (3.75 m) left 148" (3.75 m)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick Attach: None

Maximum force exerted through whole range:	3915 lbs (17.4 kN)	
i) Opening pressure of relief valve:	NA	
		<u>High flow option</u>
Sustained pressure with relief valve open:	3010 psi (208 bar)	2975 psi (205 bar)
ii) Pump delivery rate at minimum pressure:	13.9 GPM (52.6 l/min)	17.1 GPM (64.9 l/min)
iii) Pump delivery rate at maximum		
hydraulic power:	9.8 GPM (37.1 l/min)	15.5 GPM (58.9 l/min)
Delivery pressure:	2860 psi (197 bar)	2380 psi (164 bar)
Power:	16.4 HP (12.2 kW)	21.6 HP (16.1 kW)

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed maximum pressure psi.(bar)	3015 (208)
Location:	hydraulic pump
Hydraulic oil temperature: °F(°C)	114(45)
Location:	hydraulic sump
Category:	II
Quick attach:	none

System pressure 2715 psi (187 Bar)

Hitch point distance to ground level in.(mm)	14.6(370)	19.4(492)	24.2(614)	29.0(736)	33.8(858)	38.6(980)
Lift force on frame lb	4815	5290	5275	4995	4675	4325
" " " " " " (kN)	(21.4)	(23.5)	(23.5)	(22.2)	(20.8)	(19.2)

HITCH DIMENSIONS AS TESTED—NO LOAD

	SAE TEST		OECD TEST	
	inch	mm	inch	mm
A	27.2	690	27.4	695
B	10.0	255	10.0	255
C	12.3	312	12.3	312
D	10.9	276	10.9	276
E	14.2	361	12.1	308
F	7.5	189	7.5	189
G	27.2	690	27.4	695
H	1.2	30	1.2	30
I	13.4	340	13.6	345
J	19.7	501	19.9	506
K	20.6	523	20.6	523
L	40.7	1035	40.7	1035
M	21.7	550	21.7	550
N	34.6	880	34.6	880
O	14.6	370	14.7	374
P	38.7	984	43.9	1116
Q	39.8	1010	39.9	1014
R	22.4	570	22.5	572

