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## Test 1658: Ford 7740 (16x4) Diesel 16-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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# SUMMARY OF OECD TEST 1658—NEBRASKA SUMMARY 107

## FORD 7740 16 x 4 DIESEL

### 16 SPEED

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

**Dates of Test:** May 6-13, 1992

**Manufacturer:** FORD NEW HOLLAND, 500  
Diller Avenue, New Holland, PA 17557

#### POWER TAKE-OFF PERFORMANCE

Power HP <sup>a</sup> (kW)	Crank shaft speed rpm	Fuel Consumption			Mean Atmospheric Conditions
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1024 rpm)					
86.86 (64.77)	2100	5.21 (19.73)	0.419 (0.255)	16.66 (3.28)	
Standard PTO Speed (PTO—1000 rpm)					
87.24 (65.06)	2050	5.13 (19.41)	0.410 (0.249)	17.01 (3.35)	

#### VARYING POWER AND FUEL CONSUMPTION

86.86 (64.77)	2100	5.21 (19.73)	0.419 (0.255)	16.66 (3.28)	Air temperature
77.69 (57.94)	2209	4.90 (18.55)	0.440 (0.268)	15.85 (3.12)	74°F (24°C)
58.64 (43.73)	2223	4.13 (15.62)	0.491 (0.299)	14.21 (2.80)	Relative humidity
39.30 (29.31)	2235	3.31 (12.53)	0.588 (0.357)	11.87 (2.34)	26%
19.77 (14.74)	2247	2.49 (9.44)	0.880 (0.535)	7.93 (1.56)	Barometer
0.67 (0.50)	2262	1.68 (6.35)	17.411 (10.591)	0.40 (0.08)	29.23" Hg (98.97 kPa)

Maximum Torque 277 lb. ft (376 Nm) at 1250 rpm  
Maximum Torque Rise 27.6%

#### DRAWBAR PERFORMANCE FUEL CONSUMPTION CHARACTERISTICS (Front Drive Engaged)

Power HP (kW)	Drawbar pull (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—8th (5L) Gear</b>									
76.93 (57.37)	5673 (25.23)	5.09 (8.19)	2104	4.28	0.475 (0.289)	14.69 (2.89)	188 (87)	77 (25)	28.82 (97.60)
<b>75% of Pull at Maximum Power—8th (5L) Gear</b>									
61.67 (45.99)	4258 (18.94)	5.43 (8.74)	2219	3.07	0.519 (0.316)	13.43 (2.65)	187 (86)	77 (25)	28.81 (97.56)
<b>50% of Pull at Maximum Power—8th (5L) Gear</b>									
41.71 (31.10)	2834 (12.61)	5.52 (8.88)	2238	2.33	0.618 (0.376)	11.29 (2.22)	185 (85)	77 (25)	28.81 (97.56)
<b>75% of Pull at Reduced Engine Speed—10th (6L) Gear</b>									
61.66 (45.98)	4255 (18.92)	5.43 (8.75)	1780	3.16	0.445 (0.271)	15.68 (3.09)	184 (84)	77 (25)	28.81 (97.56)
<b>50% of Pull at Reduced Engine Speed—10th (6L) Gear</b>									
41.73 (31.12)	2837 (12.62)	5.52 (8.88)	1789	2.17	0.500 (0.304)	13.94 (2.75)	183 (84)	77 (25)	28.81 (97.56)

**FUEL, OIL and TIME:** Fuel No. 2 Diesel Cetane No. 53.9 Specific gravity converted to 60°/60°F (15°/15°C) 0.8381 Fuel weight 6.978 lbs/gal (0.836 kg/l) Oil SAE 15W-40 API service classification SG/CE To motor 2.146 gal (8.123 l) Drained from motor 1.962 gal (7.428 l) Transmission and final drive lubricant Ford M2C 134D fluid Front axle lubricant Ford M2C 134D fluid Total time engine was operated 20.5 hours.

**ENGINE:** Make Ford Diesel Type four cylinder vertical with turbocharger Serial No. \*PA334787\* Crankshaft lengthwise Rated rpm 2100 Bore and stroke (as specified) 4.4" × 5.0" (111.8 mm × 127.0 mm) Compression ratio 17.5 to 1 Displacement 304 cu in (5000 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements and aspirator Oil filter one full flow cartridge Oil cooler heat exchanger in lower radiator for crankcase oil, radiator for transmission and hydraulic fluid Fuel filter one paper element and sediment bowl Muffler underhood Exhaust vertical Cooling medium temperature control one thermostat and variable speed fan.

**ENGINE OPERATING PARAMETERS:** Fuel rate 35.3-38.1 lb/hr (16.0-17.3 kg/hr) High idle 2195-2275 rpm Turbo boost nominal 12.2-14.2 psi (84-98 kPa) as measured 12.5 psi (86 kPa)

**CHASSIS:** Type front wheel assist Serial No. \*BD03042\* Tread width rear 60.0" (1524 mm) to 90.0" (2286 mm) front 54.7" (1389 mm) to 83.9" (2132 mm) Wheel base 93.0" (2362 mm) Hydraulic control system direct engine drive Transmission selective gear fixed ratio with partial (2) range operator controlled powershift Nominal travel speeds mph (km/h) first 1.44 (2.32) second 1.81 (2.91) third 1.86 (2.99) fourth 2.33 (3.73) fifth 3.17 (5.10) sixth 4.07 (6.55) seventh 4.30 (6.93) eighth 5.16 (8.31) ninth 5.54 (8.92) tenth 6.44 (10.37) eleventh 6.64 (10.68) twelfth 8.29 (13.33) thirteenth 11.30 (18.19) fourteenth 14.53 (23.39) fifteenth 15.39 (24.77) sixteenth 19.79 (31.84) reverse 2.08 (3.35), 2.66 (4.29), 7.42 (11.94), 9.54 (15.35) Clutch single dry disc operated by foot pedal Brakes wet multiple disc operated by two foot pedals which 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 8680 lb (3938 kg).

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

**DRAWBAR PERFORMANCE)  
MAXIMUM POWER IN SELECTED GEARS**

4th (2H) Gear									
50.24 (37.46)	8796 (39.13)	2.14 (3.45)	2217	14.83 (0.372)	0.612 (2.25)	11.40 (84)	70 (21)	28.76 (97.39)	
5th (3L) Gear									
68.07 (50.76)	8281 (36.84)	3.08 (4.96)	2197	9.40 (0.321)	0.527 (2.61)	13.24 (85)	72 (22)	28.75 (97.36)	
6th (3H) Gear									
73.54 (54.84)	6965 (30.98)	3.96 (6.37)	2115	5.93 (0.301)	0.495 (2.78)	14.10 (87)	77 (25)	28.82 (97.60)	
7th (4L) Gear									
75.76 (56.50)	6787 (30.19)	4.19 (6.74)	2098	5.31 (0.292)	0.479 (2.87)	14.56 (87)	77 (25)	28.82 (97.60)	
8th (5L) Gear									
76.93 (57.37)	5673 (25.23)	5.09 (8.18)	2104	4.28 (0.289)	0.475 (2.89)	14.69 (87)	77 (25)	28.82 (97.60)	
9th (4H) Gear									
75.24 (56.10)	5144 (22.88)	5.49 (8.83)	2103	3.72 (0.290)	0.477 (2.88)	14.63 (86)	77 (25)	28.82 (97.60)	
10th (6L) Gear									
76.84 (57.30)	4495 (19.99)	6.41 (10.32)	2104	3.32 (0.289)	0.475 (2.89)	14.70 (87)	78 (26)	28.82 (97.60)	
11th (5H) Gear									
76.20 (56.82)	4322 (19.23)	6.61 (10.64)	2103	3.16 (0.286)	0.471 (2.92)	14.82 (86)	78 (26)	28.82 (97.60)	
12th (6H) Gear									
75.75 (56.30)	3415 (15.19)	8.29 (13.34)	2099	2.50 (0.293)	0.482 (2.85)	14.46 (86)	77 (25)	28.82 (97.60)	

**DRAWBAR PERFORMANCE  
MAXIMUM POWER IN SELECTED GEARS  
(Ballasted Tractor)**

4th (2H) Gear									
66.36 (49.48)	11352 (50.49)	2.19 (3.53)	2197	11.17 (0.327)	0.537 (2.56)	12.98 (84)	52 (11)	29.11 (98.58)	
5th (3L) Gear									
75.77 (56.50)	9249 (41.14)	3.07 (4.94)	2109	5.01 (0.289)	0.475 (2.89)	14.69 (86)	55 (13)	29.11 (98.58)	
6th (3H) Gear									
75.05 (55.96)	7068 (31.44)	3.98 (6.41)	2095	3.59 (0.290)	0.476 (2.89)	14.66 (86)	57 (14)	29.10 (98.54)	
7th (4L) Gear									
77.10 (57.50)	6836 (30.41)	4.23 (6.81)	2099	3.43 (0.282)	0.463 (2.97)	15.06 (86)	59 (15)	29.09 (98.51)	
8th (5L) Gear									
77.76 (57.98)	5716 (25.42)	5.10 (8.21)	2098	2.78 (0.280)	0.460 (2.99)	15.16 (86)	60 (16)	29.09 (98.51)	
9th (4H) Gear									
75.25 (56.11)	5141 (22.87)	5.49 (8.83)	2099	2.54 (0.290)	0.477 (2.88)	14.63 (86)	61 (16)	29.08 (98.48)	
10th (6L) Gear									
77.05 (57.46)	4520 (20.10)	6.39 (10.29)	2093	2.13 (0.282)	0.464 (2.97)	15.05 (86)	61 (16)	29.08 (98.48)	
11th (5H) Gear									
75.56 (56.35)	4317 (19.20)	6.56 (10.56)	2086	2.13 (0.287)	0.472 (2.91)	14.78 (86)	62 (17)	29.07 (98.44)	
12th (6H) Gear									
74.55 (55.59)	3383 (15.05)	8.26 (13.30)	2095	1.71 (0.292)	0.481 (2.86)	14.52 (86)	63 (17)	29.07 (98.44)	

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. The pull in 4th (3L) gear, 4WD ballasted, was limited to avoid tractor bouncing. For the maximum power tests, the fuel temperature at the injection pump was maintained at 153° F (67° C). This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperatures. The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1658**, Summary 107, June 8, 1992.

LOUIS I. LEVITICUS  
Engineer-in-Charge

L. L. BASHFORD  
R. D. GRISSE  
K. VON BARGEN

Board of Tractor Test Engineers

# **DRAWBAR PERFORMANCE** **FUEL CONSUMPTION CHARACTERISTICS** **(Front Drive Disengaged)**

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)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power 8th (5L) Gear</b>									
78.04 (58.19)	5782 (25.72)	5.06 (8.14)	2097	2.97	0.460 (0.280)	15.17 (2.99)	186 (86)	60 (16)	29.09 (98.51)
<b>75% of Pull at Maximum Power 8th (5L) Gear</b>									
61.57 (45.91)	4335 (19.28)	5.33 (8.57)	2191	2.24	0.509 (0.310)	13.70 (2.70)	185 (85)	68 (20)	29.06 (98.41)
<b>50% of Pull Maximum Power 8th (5L) Gear</b>									
42.13 (31.42)	* 2892 (12.86)	5.46 (8.79)	2233	1.58	0.616 (0.374)	11.34 (2.23)	185 (85)	68 (20)	29.06 (98.41)
<b>75% of Pull at Reduced Engine Speed 10th (6L) Gear</b>									
61.56 (45.91)	4337 (19.29)	5.32 (8.57)	1754	2.24	0.441 (0.269)	15.81 (3.11)	184 (84)	68 (20)	29.06 (98.41)
<b>50% of Pull at Reduced Engine Speed 10th (6L) Gear</b>									
42.13 (31.42)	2891 (12.86)	5.47 (8.80)	1789	1.58	0.501 (0.305)	13.94 (2.75)	183 (84)	68 (20)	29.06 (98.41)

## **MAXIMUM POWER IN SELECTED GEARS**

<b>4th (2H) Gear</b>									
58.90 (43.92)	10474 (46.59)	2.11 (3.39)	2206	14.40	0.571 (0.348)	12.21 (2.41)	184 (84)	53 (12)	29.11 (98.58)
<b>5th (3L) Gear</b>									
74.59 (55.62)	9343 (41.56)	2.99 (4.82)	2099	6.46	0.480 (0.292)	14.52 (2.86)	186 (86)	56 (13)	29.10 (98.54)
<b>6th (3H) Gear</b>									
74.95 (55.89)	7116 (31.65)	3.95 (6.36)	2095	3.84	0.479 (0.291)	14.57 (2.87)	186 (86)	58 (14)	29.10 (98.54)
<b>7th (4L) Gear</b>									
77.09 (57.48)	6896 (30.67)	4.19 (6.75)	2097	3.69	0.464 (0.282)	15.04 (2.96)	186 (86)	60 (16)	29.09 (98.51)
<b>8th (5L) Gear</b>									
78.04 (58.19)	5782 (25.72)	5.06 (8.15)	2097	2.97	0.460 (0.280)	15.17 (2.99)	186 (86)	60 (16)	29.09 (98.51)
<b>9th (4H) Gear</b>									
75.86 (56.57)	5212 (23.18)	5.46 (8.78)	2101	2.64	0.474 (0.288)	14.73 (2.90)	187 (86)	61 (16)	29.08 (98.48)
<b>10th (6L) Gear</b>									
77.07 (57.47)	4552 (20.25)	6.35 (10.22)	2096	2.40	0.465 (0.283)	15.02 (2.96)	187 (86)	62 (17)	29.08 (98.48)
<b>11th (5H) Gear</b>									
76.22 (56.83)	4351 (19.35)	6.57 (10.57)	2101	2.24	0.471 (0.286)	14.82 (2.92)	187 (86)	63 (17)	29.07 (98.44)
<b>12th (6H) Gear</b>									
75.29 (56.15)	3439 (15.30)	8.21 (13.22)	2094	1.74	0.476 (0.289)	14.67 (2.89)	187 (86)	63 (17)	29.07 (98.44)

## **TRACTOR SOUND LEVEL WITHOUT CAB**

**dB(A)**

At 75% of load in 8th (5L) gear — front drive engaged	97.0
Bystander	NA

## **TIRES, BALLAST AND WEIGHT**

**Rear Tires**—No., size, ply & psi (kPa)  
**Ballast**—Liquid (total)  
—Cast Iron (total)  
**Front Tires**—No., size, ply & psi (kPa)  
**Ballast**—Liquid (total)  
—Cast Iron (total)  
**Height of Drawbar**  
**Static Weight with operator**—Rear  
—Front  
—Total

### **With Ballast**

Two 18.4R38; \*, 13 (90)  
2014 lb (914 kg)  
600 lb (272 kg)  
Two 14.9-28; 8; 14 (95)  
None  
None  
19.0 in (485 mm)  
8118 lb (3682 kg)  
3342 lb (1516 kg)  
11460 lb (5198 kg)

### **Without Ballast**

Two 18.4R38; \*, 12 (85)  
None  
None  
Two 14.9-28; 8; 14 (95)  
None  
None  
20.0 in (510 mm)  
5500 lb (2495 kg)  
3346 lb (1518 kg)  
8846 lb (4013 kg)

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

Observed Maximum Pressure psi. (bar)	2675 (184)				
Location	remote outlet				
Hydraulic oil temperature °F(°C)	164 (73)				
Location	rear axle sump				
Category	II				
Quick attach	none				
Hitch point distance to ground level in. (mm)	8.0 (203)	15.0 (381)	22.1 (561)	29.0 (737)	36.0 (914)
Lift force on frame lb.	5788	5582	6454	6091	5129
" " " " " (kN)	(25.7)	(24.8)	(28.7)	(27.1)	(22.8)

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

CATEGORY: II

Quick Attach: none

Maximum Force Exerted

Through Whole Range: 3879 lbs (17.3 kN)

i) Opening pressure of relief valve:

NA

Sustained pressure with relief valve open:

2610 psi (180 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed:

18.1 GPM (68.5 l/min)

iii) Pump delivery rate at maximum hydraulic power:

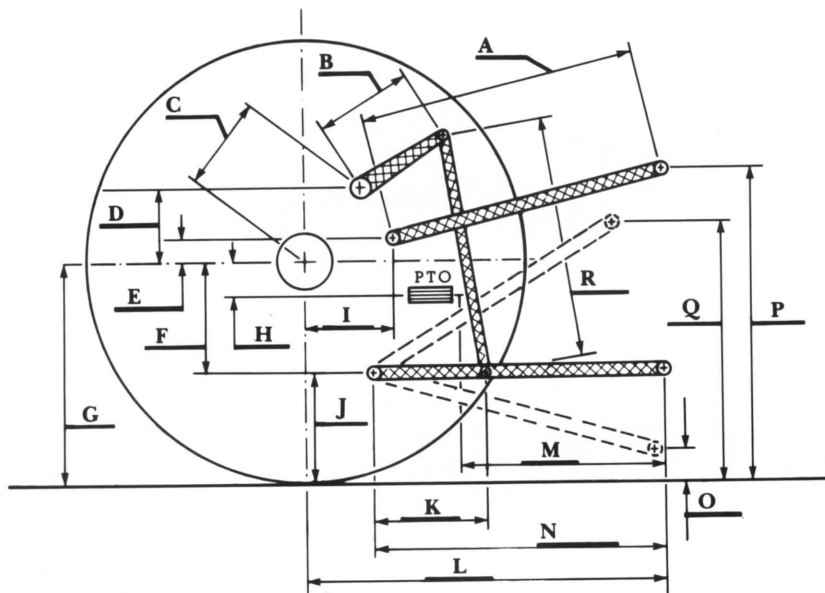
15.6 GPM (59.1 l/min)

Delivery pressure:

2300 psi (159 bar)

Power:

20.9 HP (15.6 kW)



	inch	mm
A	28.1	714
B	10.0	254
C	14.0	356
D	13.4	341
E	8.1	205
F	9.0	229
G	32.3	820
H	1.3	33
I	12.8	325
J	23.3	591
K	20.5	520
L	40.0	1017
M	22.0	559
N	36.0	915
O	10.0	253
P	47.3	1201
Q	34.3	869
R	33.8	857

HITCH DIMENSIONS AS TESTED—NO LOAD



Ford 7740 16 x 4 Diesel

Agricultural Research Division  
Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln  
Darrell Nelson, Dean and Director