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Test 1648: Ford 8830 Powershift Diesel 18-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1648—SUMMARY 086

FORD 8830 POWERSHIFT DIESEL

18 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—1147 rpm)					
* 171.04 (127.54)	2198	10.56 (39.99)	0.432 (0.263)	16.19 (3.19)	
Standard PTO Speed (PTO—1000 RPM)					
166.48 (124.14)	1918	9.76 (36.95)	0.410 (0.249)	17.06 (3.36)	

VARYING POWER AND FUEL CONSUMPTION

171.04 (127.54)	2198	10.56 (39.99)	0.432 (0.263)	16.19 (3.19)	Air temperature 72°F (22°C)
158.89 (118.48)	2399	10.42 (39.46)	0.459 (0.279)	15.24 (3.00)	Relative humidity 68%
118.53 (88.39)	2425	8.54 (32.32)	0.504 (0.306)	13.88 (2.74)	Barometer 29.09" Hg (98.50 kPa)
79.42 (59.22)	2435	6.95 (26.31)	0.612 (0.372)	11.43 (2.25)	
40.36 (30.10)	2443	5.53 (20.95)	0.959 (0.583)	7.29 (1.44)	
0.49 (0.37)	2469	3.56 (13.48)	50.767 (30.880)	0.14 (0.03)	

Maximum Torque 483 lb.-ft (655 Nm) at 1600 rpm
Maximum Torque Rise 18.2%

DRAWBAR PERFORMANCE FUEL CONSUMPTION CHARACTERISTICS (Front Drive Engaged)

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)
Maximum Power—11th Gear									
144.56 (107.80)	8880 (39.50)	6.10 (9.82)	2200	2.91	0.511 (0.311)	13.70 (2.70)	190 (88)	66 (19)	29.08 (98.48)
75% of Pull at Maximum Power—11th Gear									
119.73 (89.29)	6664 (29.64)	6.74 (10.84)	2406	2.23	0.559 (0.340)	12.52 (2.47)	189 (87)	71 (22)	29.04 (98.34)
50% of Pull at Maximum Power—11th Gear									
81.53 (60.80)	4445 (19.77)	6.88 (11.07)	2439	1.54	0.659 (0.401)	10.61 (2.09)	185 (85)	71 (22)	29.04 (98.34)
75% of Pull at Reduced Engine Speed—12th Gear									
119.54 (89.14)	6658 (29.62)	6.73 (10.84)	2055	2.23	0.506 (0.308)	13.83 (2.72)	187 (86)	71 (22)	29.04 (98.34)
50% of Pull at Reduced Engine Speed—12th Gear									
81.60 (60.85)	4443 (19.76)	6.89 (11.08)	2086	1.45	0.570 (0.347)	12.26 (2.41)	184 (84)	71 (22)	29.04 (98.34)

Location of Test: Tractor Testing Laboratory,
University of Nebraska, Lincoln, Nebraska 68583-
0832, U.S.A.

Dates of Test: May 17-22, 1991

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

FUEL OIL and TIME: Fuel No. 2 Diesel Cetane
No. 53.9 Specific gravity converted to 60°/60°F
(15°/15°C) 0.8399 Fuel weight 6.993 lbs/gal (0.838
kg/l) Oil SAE 15W-40 API service classification
SG/CE To motor 4.253 gal (16.099 l) Drained from
motor 4.028 gal (15.246 l) Transmission and final
drive lubricant Ford M2C 134D fluid Hydraulic
lubricant Ford M2C 134D fluid Front axle lubri-
cant Ford M2C 134D fluid Total time engine was
operated 20.5 hours.

ENGINE: Make Ford Diesel Type six cylinder
vertical with turbocharger and air to air inter-
cooler Serial No. *M294149* Crankshaft length-
wise Rated rpm 2200 Bore and stroke (as specified)
4.4" × 4.4" (111.8 mm × 111.8 mm) Compression
ratio 15.6 to 1 Displacement 401 cu in (6572 ml)
Starting system 12 volt Lubrication pressure Air
cleaner two paper elements and aspirator Oil fil-
ter two full flow cartridges Oil cooler engine cool-
ant heat exchanger for crankcase oil, radiator for
hydraulic and transmission oil Fuel filter one pa-
per element and sediment bowl Muffler vertical
Cooling medium temperature control two ther-
mostats and variable speed fan.

ENGINE OPERATING PARAMETERS: Fuel
rate 71.6-79.2 lb/hr (32.5-35.9 kg/hr) High idle
2425-2475 rpm Turbo boost nominal 15-19 psi
(103-131 kPa) as measured 18.0 psi (124 kPa)

CHASSIS: Type front wheel assist Serial No.
A928997 Tread width rear 64.0" (1626 mm) to
120.0" (3048 mm) front 59.8" (1520 mm) to 84.0"
(2134 mm) Wheel base 110.8" (2814 mm) Hy-
draulic control system direct engine drive Trans-
mission selective gear fixed ratio with full range
operator controlled powershift Nominal travel
speeds mph (km/h) first 1.26 (2.03) second 1.49
(2.39) third 1.74 (2.80) fourth 1.99 (3.21) fifth 2.36
(3.79) sixth 2.76 (4.44) seventh 3.25 (5.22) eighth
3.84 (6.17) ninth 4.49 (7.22) tenth 5.23 (8.41) elev-
enth 6.18 (9.94) twelfth 7.23 (11.63) thirteenth 8.28
(13.32) fourteenth 9.79 (15.75) fifteenth 11.45
(18.43) sixteenth 13.48 (21.69) seventeenth 15.93
(25.64) eighteenth 18.64 (30.00) reverse 2.01 (3.24),
2.38 (3.83), 2.79 (4.48), 3.19 (5.13), 3.77 (6.07),
4.41 (7.10), 5.19 (8.36), 6.14 (9.88), 7.18 (11.56)
Clutch multiple wet disc electro-hydraulically op-
erated by foot pedal Brakes wet disc hydraulically
operated by two foot pedals which can be locked
together Steering hydrostatic Power take-off 1000
rpm at 1919 engine rpm Unladen tractor mass
15560 lb (7058 kg).

DRAWBAR PERFORMANCE
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)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
7th Gear									
127.31 (94.94)	15431 (68.64)	3.09 (4.98)	2391	13.93	0.603 (0.367)	11.60 (2.28)	186 (85)	64 (18)	29.08 (98.48)
8th Gear									
138.80 (103.50)	13700 (60.94)	3.80 (6.11)	2291	6.73	0.545 (0.331)	12.83 (2.53)	188 (87)	65 (18)	29.08 (98.48)
9th Gear									
140.14 (104.50)	12046 (53.58)	4.36 (7.02)	2202	4.82	0.526 (0.320)	13.29 (2.62)	187 (86)	67 (19)	29.07 (98.44)
10th Gear									
143.33 (106.88)	10483 (46.63)	5.13 (8.25)	2201	3.92	0.514 (0.313)	13.61 (2.68)	188 (87)	67 (19)	29.07 (98.44)
11th Gear									
144.56 (107.80)	8880 (39.50)	6.10 (9.82)	2200	2.91	0.511 (0.311)	13.70 (2.70)	190 (88)	66 (19)	29.08 (98.48)
12th Gear									
142.16 (106.01)	7408 (32.95)	7.20 (11.58)	2202	2.57	0.519 (0.315)	13.49 (2.66)	189 (87)	66 (19)	29.08 (98.48)
13th Gear									
140.27 (104.60)	6352 (28.26)	8.28 (13.33)	2203	2.14	0.524 (0.319)	13.35 (2.63)	189 (87)	66 (19)	29.08 (98.48)

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS
(Ballasted Tractor)

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)
5th Gear									
127.29 (94.92)	21043 (93.60)	2.27 (3.65)	2368	12.40	0.602 (0.366)	11.61 (2.29)	186 (86)	72 (22)	28.86 (97.73)
6th Gear									
136.71 (101.94)	18472 (82.17)	2.78 (4.47)	2317	6.36	0.555 (0.338)	12.59 (2.48)	188 (87)	73 (23)	28.87 (97.77)
7th Gear									
139.88 (104.31)	16654 (74.08)	3.15 (5.07)	2208	5.33	0.527 (0.320)	13.28 (2.62)	191 (88)	75 (24)	28.88 (97.80)
8th Gear									
140.15 (104.51)	13980 (62.19)	3.76 (6.05)	2198	3.94	0.524 (0.319)	13.34 (2.63)	191 (88)	75 (24)	28.88 (97.80)
9th Gear									
140.17 (104.52)	11831 (52.63)	4.44 (7.15)	2204	3.27	0.524 (0.319)	13.35 (2.63)	192 (89)	75 (24)	28.88 (97.80)
10th Gear									
144.01 (107.39)	10388 (46.21)	5.20 (8.37)	2204	2.68	0.513 (0.312)	13.64 (2.69)	196 (91)	76 (24)	28.87 (97.77)
11th Gear									
142.37 (106.16)	8641 (38.44)	6.18 (9.94)	2204	2.34	0.520 (0.316)	13.44 (2.65)	192 (89)	79 (26)	28.90 (97.87)
12th Gear									
139.22 (103.82)	7187 (31.97)	7.26 (11.69)	2204	1.56	0.529 (0.322)	13.22 (2.60)	192 (89)	81 (27)	28.90 (97.87)
13th Gear									
136.97 (102.14)	6163 (27.41)	8.33 (13.41)	2202	1.39	0.540 (0.328)	12.96 (2.55)	193 (89)	83 (28)	28.89 (97.83)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 179° F (82° 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. **1648**, Summary 086, August 20, 1991.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

R. D. GRISIO

G. J. HOFFMAN

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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—10th Gear									
143.41 (106.94)	10482 (46.62)	5.13 (8.26)	2202	3.55	0.514 (0.313)	13.61 (2.68)	196 (91)	78 (26)	28.89 (97.83)
75% of Pull at Maximum Power—10th Gear									
119.25 (88.93)	7868 (35.00)	5.68 (9.15)	2410	2.54	0.566 (0.344)	12.35 (2.43)	190 (88)	82 (28)	28.89 (97.83)
50% of Pull at Maximum Power—10th Gear									
81.14 (60.51)	5243 (23.32)	5.80 (9.34)	2440	1.60	0.657 (0.400)	10.64 (2.10)	185 (85)	82 (28)	28.89 (97.83)
75% of Pull at Reduced Engine Speed—11th Gear									
119.10 (88.81)	7868 (35.00)	5.68 (9.14)	2038	2.45	0.508 (0.309)	13.76 (2.71)	187 (86)	82 (28)	28.89 (97.83)
50% of Pull at Reduced Engine Speed—11th Gear									
81.10 (60.47)	5245 (23.33)	5.80 (9.33)	2063	1.60	0.566 (0.344)	12.35 (2.43)	185 (85)	82 (28)	28.89 (97.83)

**DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS**

7th Gear									
128.14 (95.56)	16306 (72.53)	2.95 (4.74)	2256	13.01	0.580 (0.353)	12.05 (2.37)	190 (88)	74 (23)	28.87 (97.77)
8th Gear									
137.85 (102.79)	13989 (62.23)	3.70 (5.95)	2201	5.34	0.532 (0.324)	13.14 (2.59)	191 (88)	75 (24)	28.88 (97.80)
9th Gear									
139.52 (104.04)	11937 (53.10)	4.38 (7.05)	2202	4.13	0.526 (0.320)	13.30 (2.62)	195 (91)	74 (23)	28.86 (97.73)
10th Gear									
143.41 (106.94)	10482 (46.62)	5.13 (8.26)	2202	3.55	0.514 (0.313)	13.61 (2.68)	196 (91)	78 (26)	28.89 (97.83)
11th Gear									
141.51 (105.52)	8677 (38.59)	6.12 (9.84)	2204	2.71	0.520 (0.316)	13.44 (2.65)	193 (89)	80 (27)	28.90 (97.87)
12th Gear									
139.02 (103.67)	7261 (32.30)	7.18 (11.55)	2198	2.11	0.529 (0.322)	13.22 (2.60)	193 (89)	82 (28)	28.89 (97.83)
13th Gear									
137.72 (102.70)	6251 (27.80)	8.26 (13.30)	2200	1.77	0.532 (0.324)	13.14 (2.59)	193 (89)	84 (29)	28.89 (97.83)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
Maximum Sound Level	79.0	80.0
Bystander	—	—

TIRES AND WEIGHT

Rear Tires—No., size, ply & psi (kPa)

Ballast—Duals (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

Four 20.8R38; **, 14 (95)

1900 lb (862 kg)

1225 lb (556 kg)

Two 16.9-28; 8; 16 (110)

None

1450 lb (658 kg)

20.5 in (520 mm)

13020 lb (5906 kg)

7280 lb (3302 kg)

20300 lb (9208 kg)

Without Ballast

Two 20.8R38; **, 14 (95)

None

None

Two 16.9-28; 8; 16 (110)

None

None

19.0 in (485 mm)

9895 lb (4488 kg)

5830 lb (2645 kg)

15725 lb (7133 kg)

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi. (bar)	2620 (181)				
Location	remote lift circuit				
Hydraulic oil temperature °F(°C)	145 (63)				
Location	hydraulic sump				
Category	III				
Quick attach	none				
Hitch point distance to ground level in. (mm)	8.0 (203)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb.	8385	8481	8668	8279	7788
" " " " " " (kN)	(37.3)	(37.7)	(38.6)	(36.8)	(34.6)
with lift assist cylinders					
Hitch point distance to ground level in. (mm)	8.2 (208)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb.	12987	12424	11999	11458	10348
" " " " " " (kN)	(57.8)	(55.3)	(53.4)	(51.0)	(46.0)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III

Quick Attach: none

Maximum Force Exerted

Through Whole Range: 6791 lbs (30.2 kN) *9306 lb (41.4 kN)

i) Opening pressure of relief valve:

NA

Sustained pressure with pump stalled:

2640 psi (182 bar)

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

29.0 GPM (109.8 l/min)

iii) Pump delivery rate at maximum hydraulic power:

25.1 GPM (95.0 l/min)

Delivery pressure:

2150 psi (148 bar)

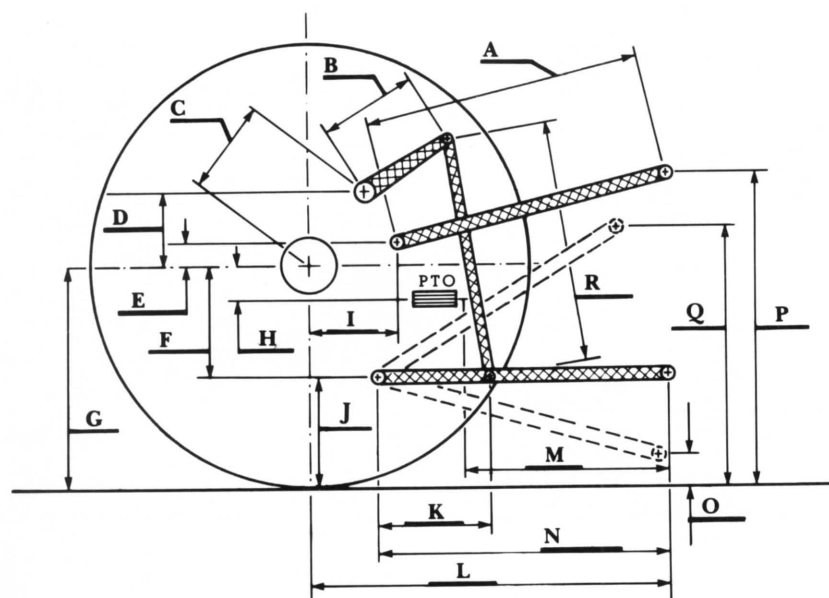
Power:

31.5 HP (23.5 kW)

*with lift assist cylinders



Ford 8830 Powershift Diesel



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	29.0	737
B	15.0	381
C	16.2	412
D	15.5	394
E	8.0	203
F	10.5	267
G	33.7	855
H	2.4	62
I	17.4	442
J	23.2	588
K	22.2	564
L	44.7	1135
M	23.0	584
N	35.7	906
O	9.1	231
P	50.2	1275
Q	33.6	853
R	34.9	886