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Test 1647: Ford 8730 Powershift Diesel 18-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1647—SUMMARY 085

FORD 8730 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
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MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—(PTO speed—1147 rpm)					
140.76 (104.97)	2199	9.05 (34.25)	0.449 (0.273)	15.56 (3.07)	

Standard PTO Speed (PTO—1000 RPM)					
133.06 (99.22)	1917	8.05 (30.49)	0.423 (0.257)	16.52 (3.25)	

VARYING POWER AND FUEL CONSUMPTION

140.76 (104.97)	2199	9.05 (34.25)	0.449 (0.273)	15.56 (3.07)	Air temperature 74°F (23°C)
127.31 (94.94)	2338	8.71 (32.97)	0.478 (0.291)	14.62 (2.88)	
96.88 (72.24)	2374	7.25 (27.44)	0.523 (0.318)	13.36 (2.63)	Relative humidity 69%
65.06 (48.51)	2399	5.79 (21.92)	0.623 (0.379)	11.23 (2.21)	
33.12 (24.69)	2424	4.12 (15.59)	0.870 (0.529)	8.04 (1.58)	Barometer 28.61" Hg (96.87 kPa)
0.49 (0.36)	2452	2.83 (10.72)	40.653 (24.728)	0.17 (0.03)	

Maximum Torque 387 lb.-ft (525 Nm) at 1649 rpm

Maximum Torque Rise 15.2%

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									
123.57 (92.15)	7441 (33.10)	6.23 (10.02)	2199	2.62	0.503 (0.306)	13.90 (2.74)	186 (85)	53 (12)	28.99 (98.17)
75% of Pull at Maximum Power—11th Gear									
99.62 (74.29)	5583 (24.83)	6.69 (10.77)	2344	2.01	0.567 (0.345)	12.32 (2.43)	185 (85)	63 (17)	28.94 (98.00)
50% of Pull at Maximum Power—11th Gear									
67.78 (50.54)	3721 (16.55)	6.83 (10.99)	2380	1.30	0.670 (0.408)	10.43 (2.05)	184 (84)	63 (17)	28.94 (98.00)
75% of Pull at Reduced Engine Speed—12th Gear									
99.75 (74.38)	5581 (24.82)	6.70 (10.79)	2005	1.74	0.500 (0.304)	13.98 (2.75)	186 (86)	63 (17)	28.94 (98.00)
50% of Pull at Reduced Engine Speed—12th Gear									
67.83 (50.58)	3722 (16.55)	6.84 (11.00)	2034	1.30	0.575 (0.350)	12.17 (2.40)	184 (84)	63 (17)	28.94 (98.00)

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

Dates of Test: May 2-15, 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** 4.384 gal (16.594 l) **Drained from**
motor 4.145 gal (15.691 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 27.0 hours.

ENGINE: Make Ford Diesel **Type** six cylinder
vertical with turbocharger **Serial No.** *H294060*
Crankshaft lengthwise **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 **Lu-**
brication pressure **Air cleaner** two paper elements
and aspirator **Oil filter** one full flow cartridge **Oil**
cooler engine coolant heat exchanger for crank-
case oil, radiator for hydraulic and transmission
oil **Fuel filter** one paper element and sediment
bowl **Muffler** vertical **Cooling medium tempera-**
ture control two thermostats and variable speed
fan.

ENGINE OPERATING PARAMETERS: **Fuel**
rate 61.7-68.3 lb/hr (28.0-31.0 kg/hr) **High idle**
2425-2475 rpm **Turbo boost** nominal 16-20 psi
(110-138 kPa) as measured 19.5 psi (135 kPa)

CHASSIS: **Type** front wheel assist **Serial No.**
A928989 **Tread width** rear 64.0" (1625 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 1.28 (2.06) second 1.51
(2.44) third 1.77 (2.85) fourth 2.03 (3.27) fifth 2.40
(3.86) sixth 2.81 (4.52) seventh 3.30 (5.32) eighth
3.90 (6.28) ninth 4.57 (7.35) tenth 5.32 (8.56) elev-
enth 6.28 (10.11) twelfth 7.35 (11.84) thirteenth
8.42 (13.56) fourteenth 9.96 (16.02) fifteenth 11.65
(18.75) sixteenth 13.71 (22.07) seventeenth 16.21
(26.09) eighteenth 18.97 (30.53) reverse 2.05 (3.30),
2.42 (3.90), 2.83 (4.56), 3.25 (5.22), 3.84 (6.17),
4.49 (7.23), 5.28 (8.50), 6.25 (10.05), 7.31 (11.76)
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** 540
rpm at 1873 engine rpm and 1000 rpm at 1919

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)
6th Gear									
104.28 (77.76)	15441 (68.68)	2.53 (4.08)	2301	15.00	0.608 (0.370)	11.50 (2.27)	185 (85)	50 (10)	29.00 (98.21)
7th Gear									
116.54 (86.90)	14179 (63.07)	3.08 (4.96)	2214	8.77	0.540 (0.329)	12.94 (2.55)	186 (85)	52 (11)	29.00 (98.21)
8th Gear									
119.95 (89.45)	11899 (52.93)	3.78 (6.08)	2202	4.98	0.523 (0.318)	13.38 (2.64)	185 (85)	57 (14)	28.98 (98.14)
9th Gear									
119.59 (89.18)	10017 (44.56)	4.48 (7.21)	2201	3.73	0.520 (0.316)	13.45 (2.65)	187 (86)	54 (12)	28.98 (98.14)
10th Gear									
122.65 (91.46)	8764 (38.98)	5.25 (8.45)	2200	2.96	0.508 (0.309)	13.76 (2.71)	187 (86)	55 (13)	28.98 (98.14)
11th Gear									
123.57 (92.15)	7441 (33.10)	6.23 (10.02)	2199	2.62	0.503 (0.306)	13.90 (2.74)	186 (85)	53 (12)	28.99 (98.17)
12th Gear									
120.70 (90.00)	6170 (27.45)	7.34 (11.81)	2205	2.18	0.517 (0.314)	13.53 (2.67)	186 (86)	52 (11)	29.00 (98.21)
13th Gear									
119.24 (88.92)	5310 (23.62)	8.42 (13.55)	2201	1.74	0.522 (0.318)	13.40 (2.64)	187 (86)	54 (12)	28.98 (98.14)

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)
4th Gear									
93.09 (69.42)	18486 (82.23)	1.89 (3.04)	2345	14.25	0.624 (0.380)	11.20 (2.21)	186 (85)	71 (22)	28.99 (98.17)
5th Gear									
114.05 (85.05)	18433 (81.99)	2.32 (3.73)	2272	7.91	0.556 (0.338)	12.57 (2.48)	186 (86)	70 (21)	29.00 (98.21)
6th Gear									
118.89 (88.66)	16518 (73.48)	2.70 (4.34)	2201	5.53	0.526 (0.320)	13.29 (2.62)	186 (86)	69 (21)	29.00 (98.21)
7th Gear									
121.74 (90.78)	14223 (63.27)	3.21 (5.17)	2199	4.54	0.514 (0.312)	13.61 (2.68)	187 (86)	71 (22)	28.99 (98.17)
8th Gear									
120.86 (90.13)	11821 (52.58)	3.83 (6.17)	2198	3.45	0.513 (0.312)	13.64 (2.69)	192 (89)	72 (22)	28.98 (98.14)
9th Gear									
120.01 (89.49)	9919 (44.12)	4.54 (7.30)	2202	2.68	0.521 (0.317)	13.42 (2.64)	190 (88)	65 (18)	28.95 (98.04)
10th Gear									
121.54 (90.63)	8597 (38.24)	5.30 (8.53)	2202	2.07	0.516 (0.314)	13.55 (2.67)	191 (88)	68 (20)	28.96 (98.08)
11th Gear									
121.98 (90.96)	7292 (32.44)	6.27 (10.10)	2196	1.81	0.513 (0.312)	13.63 (2.68)	188 (87)	69 (21)	28.95 (98.04)
12th Gear									
119.85 (89.37)	6091 (27.09)	7.38 (11.88)	2200	1.54	0.523 (0.318)	13.36 (2.63)	190 (88)	69 (21)	28.95 (98.04)
13th Gear									
118.61 (88.45)	5257 (23.38)	8.46 (13.62)	2197	1.37	0.527 (0.321)	13.26 (2.61)	191 (88)	70 (21)	28.95 (98.04)

engine rpm **Unladen tractor mass** 15248 lb
(6916 kg).

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 tempera-
ture at the injection pump return was maintained
at 176° F (80° C). This tractor is equipped with a
variable speed cooling fan. Since engine power is
influenced by fan speed, all power tests were con-
ducted at approximately the same ambient air tem-
peratures. 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. **1647**,
Summary 085, August 20, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSE
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)	Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—11th Gear									
121.80 (90.83)	7310 (32.51)	6.25 (10.06)	2202	2.30	0.515 (0.313)	13.59 (2.68)	188 (86)	69 (21)	28.95 (98.04)
75% of Pull at Maximum Power—11th Gear									
97.80 (72.93)	5485 (24.40)	6.69 (10.76)	2343	1.78	0.578 (0.351)	12.11 (2.39)	188 (87)	75 (24)	28.94 (98.00)
50% of Pull at Maximum Power—11th Gear									
66.74 * (49.77)	3660 (16.28)	6.84 (11.01)	2383	1.25	0.693 (0.421)	10.10 (1.99)	185 (85)	75 (24)	28.94 (98.00)
75% of Pull at Reduced Engine Speed—12th Gear									
97.72 (72.87)	5482 (24.39)	6.68 (10.76)	2002	1.60	0.509 (0.310)	13.73 (2.71)	188 (86)	75 (24)	28.94 (98.00)
50% of Pull at Reduced Engine Speed—12th Gear									
66.89 (49.88)	3652 (16.24)	6.87 (11.06)	2045	1.16	0.586 (0.356)	11.94 (2.35)	184 (84)	75 (24)	28.94 (98.00)

**DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS**

6th Gear									
105.13 (78.39)	15427 (68.62)	2.56 (4.11)	2294	14.07	0.599 (0.365)	11.67 (2.30)	186 (86)	70 (21)	29.00 (98.21)
7th Gear									
117.48 (87.60)	14217 (63.24)	3.10 (4.99)	2199	7.64	0.529 (0.322)	13.21 (2.60)	188 (86)	71 (22)	28.98 (98.14)
8th Gear									
119.95 (89.45)	11897 (52.92)	3.78 (6.09)	2201	4.76	0.519 (0.316)	13.47 (2.65)	191 (88)	72 (22)	28.98 (98.14)
9th Gear									
120.02 (89.50)	10015 (44.55)	4.49 (7.23)	2201	3.16	0.520 (0.316)	13.45 (2.65)	189 (87)	67 (19)	28.96 (98.07)
10th Gear									
121.64 (90.71)	8688 (38.65)	5.25 (8.45)	2198	2.74	0.517 (0.315)	13.52 (2.66)	190 (88)	68 (20)	28.96 (98.07)
11th Gear									
121.80 (90.83)	7310 (32.51)	6.25 (10.06)	2202	2.30	0.515 (0.313)	13.59 (2.68)	188 (86)	69 (21)	28.95 (98.04)
12th Gear									
119.71 (89.27)	6114 (27.20)	7.34 (11.82)	2201	1.87	0.525 (0.319)	13.33 (2.63)	191 (88)	69 (21)	28.95 (98.04)
13th Gear									
118.59 (88.43)	5282 (23.50)	8.42 (13.55)	2197	1.52	0.532 (0.324)	13.14 (2.59)	192 (89)	71 (22)	28.95 (98.04)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged	Engaged
	dB(A)	dB(A)
Maximum Sound Level	82.0	82.0
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 18.4R42; **, 14 (95)

1880 lb (853 kg)

124 lb (56 kg)

Two 16.9-28; 8; 16 (110)

None

516 lb (234 kg)

21 in (535 mm)

11624 lb (5273 kg)

6308 lb (2861 kg)

17932 lb (8134 kg)

Without Ballast

Two 18.4R42; **, 14 (95)

None

None

Two 16.9-28; 8; 16 (110)

None

None

20 in (510 mm)

9620 lb (4364 kg)

5792 lb (2627 kg)

15412 lb (6991 kg)

THREE POINT HITCH PERFORMANCE (SAE Static Test)

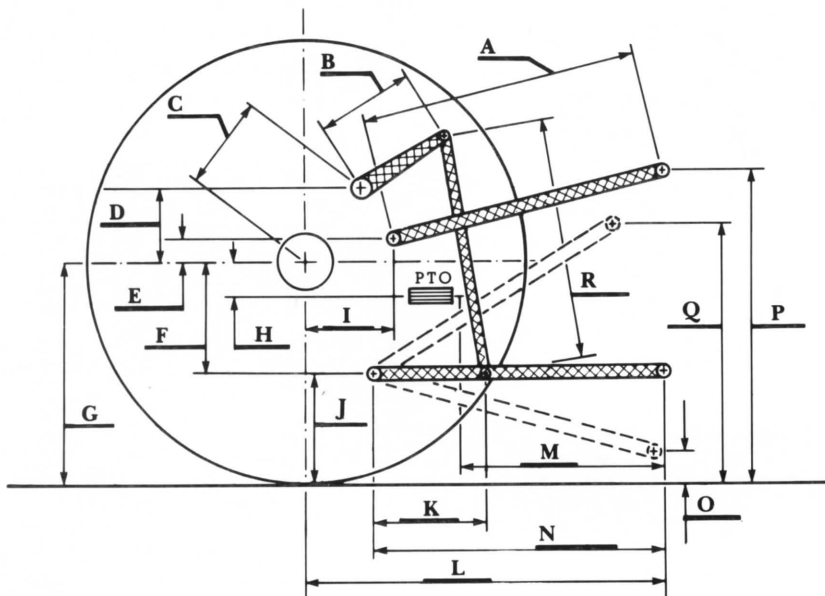
Observed Maximum Pressure psi. (bar)	2620 (181)				
Location	remote lift circuit				
Hydraulic oil temperature °F(°C)	145 (63)				
Location	hydraulic sump				
Category	III				
Quick attach	none				
Hitch point distance to ground level in. (mm)	8.0 (203)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift 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)	(61.0)	(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:	28.5 GPM	(107.9 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	25.5 GPM	(96.5 l/min)	
Delivery pressure:	2250 psi	(155 bar)	
Power:	33.5 HP	(25.0 kW)	*with lift assist cylinders



Ford 8730 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	34.2	870
H	2.4	62
I	17.4	442
J	23.7	603
K	22.2	564
L	44.7	1135
M	23.0	584
N	35.7	906
O	9.6	244
P	50.7	1288
Q	34.1	866
R	34.9	886