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January 1984

## Test 1536: Ford TW-15 FWD Diesel Also Ford 8630 Diesel 16-Speeds

Nebraska Tractor Test Lab

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

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# NEBRASKA TRACTOR TEST 1536—FORD TW-15 FWD DIESEL ALSO FORD 8630 DIESEL 16 SPEED

## POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption			Temperature °F (°C)			Barometer inch Hg (kPa)	
		gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cooling medium	Air wet bulb	Air dry bulb		
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—1147 rpm)									
121.25 (90.42)	2200	7.633 (28.891)	0.439 (0.267)	15.89 (3.130)	205 (96.2)	62 (16.9)	75 (23.9)	28.81 (97.29)	
Standard Power Take-off Speed (1000 rpm)—One Hour									
115.58 (86.19)	1919	6.817 (25.803)	0.411 (0.250)	16.95 (3.340)	204 (95.6)	63 (17.1)	75 (24.1)	28.83 (97.35)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
108.97 (81.26)	2327	7.346 (27.808)	0.470 (0.286)	14.83 (2.922)	200 (93.3)	64 (17.8)	77 (25.0)	..... .....	
0.00 (0.00)	2462	2.473 (9.362)	..... .....	..... .....	184 (84.4)	65 (18.1)	76 (24.2)	..... .....	
56.13 (41.86)	2394	4.925 (18.642)	0.612 (0.372)	11.40 (2.245)	190 (87.8)	63 (17.2)	76 (24.2)	..... .....	
122.10 (91.05)	2200	7.673 (29.045)	0.438 (0.267)	15.91 (3.135)	205 (96.1)	64 (17.8)	76 (24.2)	..... .....	
28.40 (21.17)	2421	3.647 (13.806)	0.896 (0.545)	7.79 (1.534)	186 (85.3)	63 (17.2)	74 (23.1)	..... .....	
83.08 (61.95)	2366	6.120 (23.168)	0.514 (0.313)	13.57 (2.674)	195 (90.6)	63 (17.2)	76 (24.2)	..... .....	
Av Av	66.45 (49.55)	2361 (20.305)	5.364 (0.343)	0.563 (0.343)	12.39 (2.440)	193 (89.6)	64 (17.5)	75 (24.1)	28.84 (97.38)

## DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			Barom. inch Hg (kPa)
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cool- ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 8th (5L) Gear											
105.76 (78.87)	7614 (33.87)	5.21 (8.38)	2200 (8.38)	4.40	7.577 (28.682)	0.500 (0.304)	13.96 (2.750)	203 (94.7)	55 (12.8)	62 (16.7)	29.17 (98.49)
75% of Pull at Maximum Power—Ten Hours 8th (5L) Gear											
85.75 (63.95)	5690 (25.31)	5.65 (9.09)	2354 (9.09)	3.06	6.780 (23.665)	0.551 (0.335)	12.65 (2.492)	197 (91.5)	66 (18.6)	72 (21.9)	29.00 (97.93)
50% of Pull at Maximum Power—Two Hours 8th (5L) Gear											
58.59 (43.69)	3794 (16.88)	5.79 (9.32)	2383 (9.32)	1.87	5.484 (20.759)	0.653 (0.397)	10.68 (2.105)	194 (89.7)	72 (22.2)	90 (32.2)	28.71 (96.95)
50% of Pull at Reduced Engine Speed—Two Hours 11th (6L) Gear											
58.59 (43.69)	3793 (16.87)	5.79 (9.32)	1543 (9.32)	1.91	4.079 (15.440)	0.486 (0.295)	14.36 (2.830)	191 (88.3)	73 (22.5)	92 (33.3)	28.71 (96.95)
MAXIMUM POWER IN SELECTED GEARS											
88.72 (66.16)	15939 (70.90)	2.09 (3.36)	2314 (3.36)	14.80	2nd (1H) Gear			198 (92.2)	56 (13.3)	60 (15.6)	29.09 (98.23)
98.27 (73.28)	15041 (66.90)	2.45 (3.94)	2200 (3.94)	12.53	3rd (2L) Gear			200 (93.1)	56 (13.3)	60 (15.6)	29.15 (98.44)
103.14 (76.91)	11908 (52.97)	3.25 (5.23)	2200 (5.23)	7.77	4th (3L) Gear			202 (94.2)	54 (12.2)	63 (17.2)	29.20 (98.60)
101.53 (75.71)	11417 (50.78)	3.33 (5.37)	2200 (5.37)	7.25	5th (2H) Gear			203 (95.0)	54 (12.2)	63 (17.2)	29.20 (98.60)
102.36 (76.33)	8951 (39.81)	4.29 (6.90)	2200 (6.90)	5.26	6th (3H) Gear			203 (95.0)	54 (12.2)	62 (16.7)	29.20 (98.60)
105.86 (78.94)	8918 (39.67)	4.45 (7.16)	2198 (7.16)	5.26	7th (4L) Gear			202 (94.2)	54 (12.2)	62 (16.7)	29.21 (98.64)
107.35 (80.05)	7733 (34.40)	5.21 (8.38)	2200 (8.38)	4.55	8th (5L) Gear			202 (94.2)	53 (11.7)	62 (16.7)	29.23 (98.71)
101.30 (75.54)	6527 (29.03)	5.82 (9.37)	2199 (9.37)	3.59	9th (4H) Gear			203 (94.7)	56 (13.3)	66 (18.9)	29.20 (98.60)
103.88 (77.46)	5743 (25.54)	6.78 (10.92)	2200 (10.92)	3.11	10th (5H) Gear			202 (94.4)	55 (12.8)	64 (17.8)	29.20 (98.60)
103.95 (77.51)	4762 (21.18)	8.19 (13.17)	2199 (13.17)	2.70	11th (6L) Gear			202 (94.2)	55 (12.8)	64 (17.8)	29.20 (98.60)

Department of Agricultural Engineering

Dates of Test: September 10 - 18, 1984

Manufacturer: FORD MOTOR COMPANY,  
2500 Maple Road, Troy, Michigan 48084

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel  
Cetane No. 46.8 (rating taken from oil company's  
inspection data) **Specific gravity converted to 60/  
60°F (15/15°C)** 0.8377 **Fuel weight** 6.975 lbs/gal  
(0.836 kg/l) **Oil SAE 30 API service classifica-  
tion** SE, SF, CC, CD **To motor** 3.980 gal  
(15.066 l) **Drained from motor** 3.600 gal  
(13.626 l) **Transmission and final drive lubri-  
cant** Ford 134 fluid **Total time engine was oper-  
ated** 45.5 hours.

**ENGINE:** Make Ford Diesel Type six cylinder  
vertical with turbocharger **Serial No.** \*U754974\*  
**Crankshaft** lengthwise **Rated rpm** 2200 **Bore  
and stroke** 4.4" × 4.4" (112 mm × 112 mm) **Com-  
pression ratio** 15.6 to 1 **Displacement** 401 cu in  
(6572 ml) **Starting system** 12 volt **Lubrication  
pressure** **Air cleaner** two paper elements and  
centrifugal precleaner **Oil filter** one full flow car-  
tridge **Oil cooler** heat exchanger in lower part of  
radiator for crankcase oil, radiator for hydraulic  
and transmission oil, **Fuel filter** one paper ele-  
ment and sediment bowl **Muffler** vertical **Cool-  
ing medium temperature control** two thermostats  
and variable speed fan.

**CHASSIS:** Type front wheel assist with duals  
**Serial No.** \*C713306\* **Tread width** rear 60"  
(1524 mm) to 120" (3048 mm) front 65.2" (1656 mm)  
to 84.4" (2144 mm) **Wheel base** 105" (2667 mm)  
**Center of gravity** (without operator or ballast,  
with minimum tread, with fuel tank filled and  
tractor serviced for operation) Horizontal distance  
forward from center-line of rear wheels 31.8" (808  
mm) Vertical distance above roadway 42.8" (1087  
mm) Horizontal distance from center of rear wheel  
tread 0.2" (5 mm) to the left **Hydraulic control  
system** direct engine drive **Transmission** selec-  
tive gear fixed ratio with partial (2) range operator  
controlled powershift **Advertised speeds mph  
(km/h)** first 1.9 (3.0) second 2.4 (3.9) third 2.9 (4.6)  
fourth 3.6 (5.8) fifth 3.7 (5.9) sixth 4.7 (7.5)  
seventh 4.8 (7.8) eighth 5.6 (9.0) ninth 6.2 (10.0)  
tenth 7.2 (11.6) eleventh 8.7 (13.9) twelfth 10.9  
(17.6) thirteenth 11.1 (17.9) fourteenth 14.0 (22.6)  
fifteenth 14.6 (23.4) sixteenth 18.7 (30.1) reverse  
2.0 (3.2), 2.6 (4.2), 6.1 (9.7), 7.8 (12.5) **Clutch**  
single dry disc operated by foot pedal **Brakes**  
single wet disc hydraulically operated by two foot  
pedals which can be locked together **Steering**  
hydrostatic **Turning radius** (on concrete surface  
with brake applied) right 164" (4.17 m) left 164"  
(4.17 m) (on concrete surface without brake) right  
182" (4.62 m) left 182" (4.62 m) **Turning space  
diameter** (on concrete surface with brake applied)  
right 346" (8.79 m) left 346" (8.79 m) (on concrete  
surface without brake) right 382" (9.69 m) left 382"  
(9.69 m) **Power take-off** 540 rpm at 1873 engine  
rpm and 1000 rpm at 1919 engine rpm **Unladen  
tractor mass** 12515 lb (5677 kg).

### LUGGING ABILITY IN 8th (5L) GEAR

Crankshaft Speed rpm	2200	1977	1759	1545	1318	1093
Pull—lbs (kN)	7733 (34.40)	8404 (37.38)	9006 (40.06)	9488 (42.20)	9151 (40.71)	8338 (37.09)
Increase in Pull %	0	9	16	23	18	8
Power—Hp (kW)	107.35 (80.05)	104.37 (77.83)	99.07 (73.88)	91.36 (68.13)	75.38 (56.21)	57.27 (42.70)
Speed—Mph (km/h)	5.21 (8.38)	4.66 (7.50)	4.13 (6.64)	3.61 (5.81)	3.09 (4.97)	2.58 (4.14)
Slip %	4.55	5.03	5.34	5.65	5.49	4.87

### Front Wheel Drive

TRACTOR SOUND LEVEL WITH CAB	Engaged dB(A)	Disengaged dB(A)
Maximum Available Power—Two Hours	79.5	79.0
75% of Pull at Maximum Power—Ten Hours	80.5	
50% of Pull at Maximum Power—Two Hours	80.5	
50% of Pull at Reduced Engine Speed—Two Hours	77.5	
Bystander in 16th (8H) gear		85.5

### DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool- ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Available Power—Two Hours 8th (5L) Gear</b>											
103.15 (76.92)	7597 (33.79)	5.09 (8.19)	2200	6.65	7.513 (28.438)	0.508 (0.309)	13.73 (2.705)	203 (95.0)	55 (12.8)	64 (17.5)	29.21 (98.62)

### MAXIMUM POWER IN SELECTED GEARS

81.33 (60.64)	12048 (53.59)	2.53 (4.07)	2336	14.73	3rd (2L) Gear	196 (90.8)	56 (13.3)	60 (15.6)	29.12 (98.33)
104.19 (77.70)	7672 (34.13)	5.09 (8.20)	2199	6.61	8th (5L) Gear	203 (94.7)	55 (12.8)	63 (17.2)	29.20 (98.60)

### TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
<b>Rear Tires</b>		
—No., size, ply & psi (kPa)	Four 18.4-38; 8; 18 (125)	Four 18.4-38; 8; 18 (125)
Ballast	None	None
—Liquid (each)	52 lb (24 kg)	None
—Test Equip (each)		
<b>Front Tires</b>		
—No., size, ply & psi (kPa)	Two 14.9-28; 6; 18 (125)	Two 14.9-28; 6; 18 (125)
Ballast	None	None
—Liquid (each)	430 lb (195 kg)	None
—Cast Iron (each)	620 lb (281 kg)	None
<b>Height of Drawbar</b>	22 in (560 mm)	22 in (560 mm)
<b>Static Weight with Operator—Rear</b>	10310 lb (4677 kg)	10100 lb (4581 kg)
—Front	6370 lb (2889 kg)	4270 lb (1937 kg)
—Total	16680 lb (7566 kg)	14370 lb (6518 kg)

### THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi (kPa)	2575	17750
Location	remote	
Hydraulic oil temperature °F (°C)	152	67
Location	sump	
	<b>Maximum Lift Capacity</b>	<b>Lift Capacity for Transport</b>
QUICK ATTACH CATEGORY	no II	*not measured
LOAD lbs (kg)	7150	3243
TIME sec	2.23	
<b>HITCH POINT MOVEMENT in (mm)</b>		
Lowest position	8.0	203
Top of timed range	32.1	816
Highest position	36.0	914
<b>LOAD CG MOVEMENT in (mm)</b>		
Lowest position	8.3	211
Top of timed range	31.9	810
Highest position	36.4	926

\*Implement load capacity for transport purposes not specified by manufacturer.

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

**REMARKS:** All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 201°F (93.9°C). Ten gears were chosen between 15% slip and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1536, November 16, 1984.

**NOTE:** Report reissued, supplemental sales permit for Ford 8630 Diesel 16 speed, July, 1990.

LOUIS I. LEVITICUS

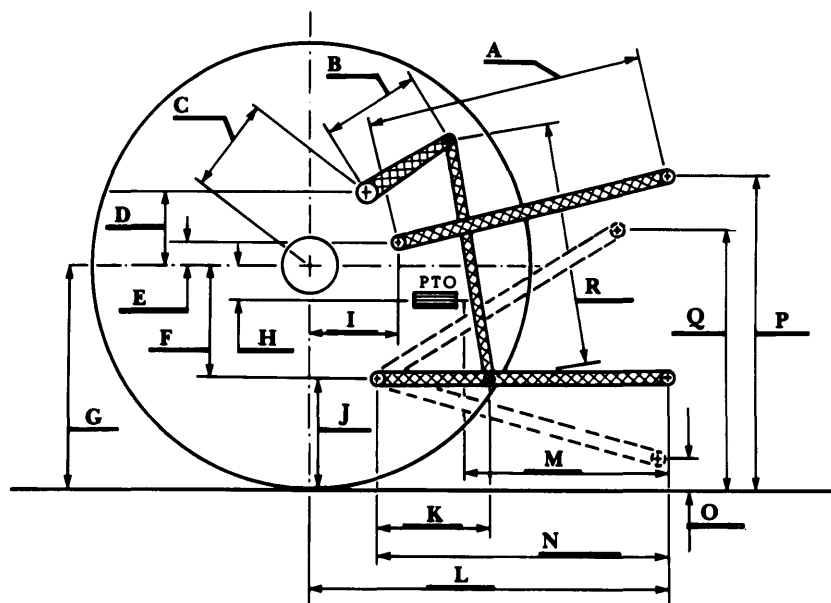
Engineer-in-Charge

K. VON BARGEN

R.D. GRISSO

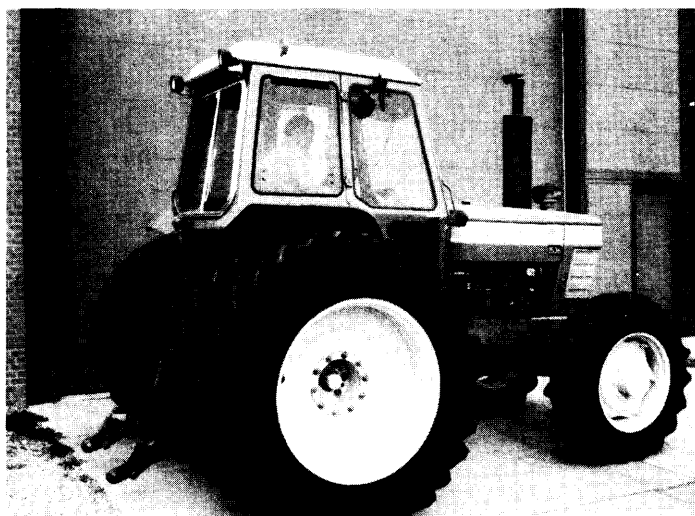
G.J. HOFFMAN

Board of Tractor Test Engineers



	inch	mm
A	29.3	743
B	15.0	381
C	16.2	412
D	15.5	394
E	8.0	203
F	10.5	267
G	33.0	839
H	2.4	62
I	17.0	432
J	22.5	572
K	18.9	481
L	45.3	1150
M	23.6	600
N	36.3	921
O	8.0	203
P	41.5	1054
Q	37.1	943
R	32.5	826

Hitch Dimensions as Tested — No Load



Ford TW-15 Diesel

The Agricultural Experiment Station  
 Institute of Agriculture and Natural Resources  
 University of Nebraska—Lincoln  
 Irvin T. Omtvedt, Dean and Director