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Test 1516: Ford TW-25 and 8730 Diesel 16-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1516—FORD TW-25 DIESEL
ALSO FORD 8730 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)									
140.68 (104.91)	2200	8.973 (33.962)	0.446 (0.271)	15.68 (3.089)	202 (94.4)	64 (17.6)	75 (24.1)	28.62 (96.63)	
Standard Power Take-off Speed (1000 rpm)—One Hour									
135.70 (101.19)	1918	8.147 (30.837)	0.420 (0.255)	16.66 (3.281)	198 (92.4)	64 (18.0)	74 (23.4)	28.60 (96.58)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
126.84 (94.58)	2333	8.578 (32.469)	0.473 (0.288)	14.79 (2.913)	200 (93.3)	66 (18.6)	77 (24.7)	..... .....
0.00 (0.00)	2455	2.620 (9.919)	..... .....	..... .....	183 (83.6)	65 (18.3)	75 (23.6)	..... .....
65.34 (48.72)	2404	5.507 (20.845)	0.590 (0.359)	11.86 (2.337)	186 (85.6)	65 (18.1)	75 (23.6)	..... .....
141.27 (105.35)	2200	8.998 (34.060)	0.446 (0.271)	15.70 (3.093)	201 (93.6)	65 (18.3)	75 (23.9)	..... .....
32.86 (24.50)	2428	4.040 (15.293)	0.860 (0.523)	8.13 (1.602)	183 (83.9)	65 (18.3)	74 (23.3)	..... .....
96.53 (71.98)	2368	7.051 (26.689)	0.511 (0.311)	13.69 (2.697)	191 (88.1)	66 (18.6)	75 (23.9)	..... .....
Av Av	77.14 (57.52)	2364 (23.212)	6.132 (0.338)	0.556 (0.338)	12.58 (2.478)	190 (88.0)	65 (18.4)	75 (23.8)	28.59 (96.54)

DRAWBAR PERFORMANCE WITH BIAS PLY TIRES

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption		Hp.hr/gal (kW.h/l)	Temp. °F (°C)			Barom. inch Hg (kPa)
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)		Cool- ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 8th (5L) Gear											
124.84 (93.09)	8907 (39.62)	5.26 (8.46)	2199	6.09	8.985 (34.012)	0.503 (0.306)	13.89 (2.737)	203 (94.7)	48 (8.9)	59 (15.0)	29.08 (98.18)
75% of Pull at Maximum Power—Ten Hours 8th (5L) Gear											
103.33 (77.05)	6784 (30.18)	5.71 (9.19)	2344	4.29	7.934 (30.034)	0.537 (0.327)	13.02 (2.565)	198 (92.3)	47 (8.4)	58 (14.5)	28.98 (97.85)
50% of Pull at Maximum Power—Two Hours 8th (5L) Gear											
71.22 (53.11)	4523 (20.12)	5.90 (9.50)	2388	2.79	6.362 (24.082)	0.625 (0.380)	11.20 (2.205)	192 (88.6)	48 (8.9)	60 (15.6)	29.04 (98.06)
50% of Pull at Reduced Engine Speed—Two Hours 11th (6L) Gear											
71.28 (53.15)	4523 (20.12)	5.91 (9.51)	1546	2.99	4.732 (17.912)	0.464 (0.282)	15.06 (2.967)	191 (88.3)	48 (8.6)	58 (14.4)	29.04 (98.06)
MAXIMUM POWER IN SELECTED GEARS											
102.93 (76.75)	14871 (66.15)	2.60 (4.18)	2336	14.97	3rd (2L) Gear		198 (91.9)	48 (8.9)	55 (12.8)	29.10 (98.27)	
118.27 (88.20)	13895 (61.81)	3.19 (5.14)	2200	11.96	4th (3L) Gear		201 (93.9)	48 (8.9)	55 (12.8)	29.10 (98.27)	
118.29 (88.21)	13516 (60.12)	3.28 (5.28)	2201	11.34	5th (2H) Gear		202 (94.2)	48 (8.9)	55 (12.8)	29.10 (98.27)	
122.33 (91.22)	10688 (47.54)	4.29 (6.91)	2200	7.83	6th (3H) Gear		203 (95.0)	48 (8.9)	56 (13.3)	29.10 (98.27)	
124.62 (92.93)	10455 (46.50)	4.47 (7.19)	2201	7.53	7th (4L) Gear		204 (95.3)	48 (8.9)	56 (13.3)	29.11 (98.30)	
126.73 (94.50)	9045 (40.23)	5.25 (8.46)	2199	6.06	8th (5L) Gear		204 (95.3)	48 (8.9)	59 (15.0)	29.09 (98.23)	
124.93 (93.16)	7970 (35.45)	5.88 (9.46)	2199	5.42	9th (4H) Gear		203 (95.0)	48 (8.9)	56 (13.3)	29.11 (98.30)	
125.75 (93.77)	6859 (30.51)	6.88 (11.06)	2199	4.53	10th (5H) Gear		203 (94.7)	48 (8.9)	57 (13.9)	29.11 (98.30)	
125.73 (93.75)	5660 (25.17)	8.33 (13.41)	2199	3.55	11th (6L) Gear		203 (94.7)	48 (8.9)	57 (13.9)	29.11 (98.30)	
LUGGING ABILITY IN 8th (5L) GEAR											
Crankshaft Speed rpm				2199	1981	1754	1544	1308	1096		
Pull—lbs (kN)				9045 (40.23)	9699 (43.14)	10343 (46.01)	10239 (45.55)	9819 (43.68)	8489 (37.76)		
Increase in Pull %				0	7	14	13	9	-6		
Power—Hp (kW)				126.73 (94.50)	121.64 (90.71)	114.12 (85.10)	99.52 (74.21)	81.15 (60.51)	59.46 (44.34)		
Speed—Mph (km/h)				5.25 (8.46)	4.70 (7.57)	4.14 (6.66)	3.64 (5.87)	3.10 (4.99)	2.63 (4.23)		
Slip %				6.06	6.84	7.45	7.30	6.99	6.06		

TRACTOR SOUND LEVEL WITH CAB	Radial Ply dB(A)	Bias Ply dB(A)
Maximum Available Power—Two Hours	80.0	81.0
75% of Pull at Maximum Power—Ten Hours		82.5
50% of Pull at Maximum Power—Two Hours		82.5
50% of Pull at Reduced Engine Speed—Two Hours		78.5
Bystander in 16th (8H) gear		89.5

Department of Agricultural Engineering

Dates of Test: April 25 to May 15, 1984

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

FUEL, OIL AND TIME: Fuel No. 2 Diesel
Cetane No. 46.0 (rating taken from oil company's
inspection data) Specific gravity converted to 60°/
60° (15°/15°) 0.8401 Fuel weight 6.995 lbs/gal
(0.838 kg/l) Oil SAE 30 API service classifi-
cation SE, SF, CC, CD To motor 4.579 gal
(17.333 l) Drained from motor 3.999 gal (15.139 l)
Transmission and final drive lubricant Ford 134
fluid Total time engine was operated 41.0 hours.

ENGINE: Make Ford Diesel Type six cylin-
der vertical with turbocharger Serial No.
H729443 Crankshaft lengthwise Rated rpm
2200 Bore and stroke 4.4" × 4.4" (112 mm ×
112 mm) Compression ratio 15.6 to 1 Displace-
ment 401 cu in (6572 ml) Starting system 12 volt
Lubrication pressure Air cleaner two paper ele-
ments and aspirator 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 standard with duals Serial
No. *C713307* Tread width rear 64" (1626 mm)
to 120" (3048 mm) front 63" (1600 mm) to 87" (2210
mm) Wheel base 109.7" (2786 mm) Center of
gravity (without operator or ballast, with mini-
mum tread, with fuel tank filled and tractor serv-
iced for operation) Horizontal distance forward
from center-line of rear wheels 32.5" (825 mm)
Vertical distance above roadway 44.6" (1133 mm)
Horizontal distance from center of rear wheel tread
0.4" (10 mm) to the left Hydraulic control system
direct engine drive Transmission selective gear
fixed ratio with partial (2) range operator con-
trolled powershift Advertised speeds mph (km/
h) first 1.8 (2.9) second 2.3 (3.7) third 2.8 (4.5)
fourth 3.5 (5.6) fifth 3.6 (5.7) sixth 4.5 (7.2) sev-
enth 4.7 (7.5) eighth 5.4 (8.7) ninth 6.0 (9.6) tenth
7.0 (11.2) eleventh 8.4 (13.4) twelfth 10.5 (16.9)
thirteenth 10.7 (17.3) fourteenth 13.5 (21.8) fif-
teenth 14.0 (22.6) sixteenth 18.0 (29.0) reverse 1.9
(3.1), 2.5 (4.0), 5.8 (9.4), 7.5 (12.1) 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 159.6" (4.05 m) left 159.6" (4.05 m)
(on concrete surface without brake) right 174" (4.42
m) left 174" (4.42 m) Turning space diameter (on
concrete surface with brake applied) right 324"
(8.23 m) left 324" (8.23 m) (on concrete surface
without brake) right 360" (9.14 m) left 360" (9.14
m) Power take-off 540 rpm at 1873 engine rpm
and 1000 rpm at 1918 engine rpm.

REPAIRS and ADJUSTMENTS: During pre-
liminary PTO tests, the missing foam rubber seal
strip on the right side of the radiator was installed.

DRAWBAR PERFORMANCE WITH RADIAL PLY TIRES

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											
126.81 (94.56)	8735 (38.85)	5.44 (8.76)	2200	3.17	8.956 (33.904)	0.494 (0.301)	14.16 (2.789)	207 (96.9)	60 (15.3)	72 (21.9)	28.17 (95.11)
MAXIMUM POWER IN SELECTED GEARS											
107.77 (80.37)	15614 (69.45)	2.59 (4.17)	2316	14.68	3rd (2L) Gear			198 (92.2)	56 (13.3)	64 (17.8)	29.24 (98.74)
124.93 (93.16)	13757 (61.19)	3.41 (5.48)	2197	6.14	4th (3L) Gear			203 (94.7)	56 (13.3)	65 (18.3)	29.23 (98.71)
124.16 (92.59)	13318 (59.24)	3.50 (5.63)	2200	5.91	5th (2H) Gear			204 (95.3)	56 (13.3)	66 (18.9)	29.23 (98.71)
125.02 (93.23)	10447 (46.47)	4.49 (7.22)	2199	3.96	6th (3H) Gear			205 (95.8)	56 (13.3)	66 (18.9)	29.22 (98.67)
127.51 (95.09)	10245 (45.57)	4.67 (7.51)	2200	3.80	7th (4L) Gear			207 (96.9)	56 (13.3)	67 (19.4)	29.21 (98.64)
128.81 (96.06)	8883 (39.51)	5.44 (8.75)	2198	3.13	8th (5L) Gear			206 (96.4)	58 (14.4)	70 (21.1)	29.20 (98.60)
126.25 (94.15)	7810 (34.74)	6.06 (9.76)	2200	2.71	9th (4H) Gear			206 (96.4)	56 (13.3)	68 (20.0)	29.21 (98.64)
127.49 (95.07)	6774 (30.13)	7.06 (11.36)	2200	2.28	10th (5H) Gear			205 (96.1)	56 (13.3)	68 (20.0)	29.20 (98.60)
126.53 (94.35)	5574 (24.79)	8.51 (13.70)	2201	1.94	11th (6L) Gear			206 (96.4)	57 (13.9)	68 (20.0)	29.20 (98.60)

TIRES, BALLAST AND WEIGHT

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

Bias Ply Tires

With Ballast		Without Ballast	
Four 20.8-38; 10; 16 (110)		Four 20.8-38; 10; 16 (110)	
888 lb (403 kg)		None	
305 lb (138 kg)		None	
Two 14L-16.1SL; 8; 36 (250)		Two 14L-16.1SL; 8; 36 (250)	
None		None	
72 lb (33 kg)		None	
21 in (535 mm)		21 in (535 mm)	
13300 lb (6033 kg)		10915 lb (4951 kg)	
4665 lb (2116 kg)		4520 lb (2050 kg)	
17965 lb (8149 kg)		15435 lb (7001 kg)	

Radial Ply Tires

With Ballast		Without Ballast	
Four 20.8R38; 10; 16 (110)		Four 20.8R38; 10; 16 (110)	
672 lb (305 kg)		None	
None		None	
Two 14L-16.1SL; 8; 36 (250)		Two 14L-16.1SL; 8; 36 (250)	
None		None	
65 lb (29 kg)		None	
21 in (535 mm)		21 in (535 mm)	
12420 lb (5634 kg)		11075 lb (5024 kg)	
4650 lb (2109 kg)		4520 lb (2050 kg)	
17070 lb (7743 kg)		15595 lb (7074 kg)	



Ford TW-25 Diesel

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

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 183°F (83.9°C). Nine 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. 1516, June 21, 1984.

NOTE: Report reissued, supplemental sales permit for Ford 8730 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