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## Test 1515: Ford TW-15 Diesel 16-Speed

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# NEBRASKA TRACTOR TEST 1515—FORD TW-15 DIESEL

## 16 SPEED

### POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption		Temperature °F (°C)		Cooling medium	Air	Air	Barometer inch Hg (kPa)
		gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW/hl)	wet bulb		dry bulb		
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>									
<b>Rated Engine Speed—Two Hours (PTO Speed—1147 rpm)</b>									
121.40 (90.53)	2200	7.694 (29.121)	0.443 (0.270)	15.78 (3.109)	195 (90.4)	64 (17.5)	75 (23.9)	28.99 (97.89)	
<b>Standard Power Take-off Speed (1000 rpm)—One Hour</b>									
117.83 (87.87)	1918	6.973 (26.391)	0.414 (0.252)	16.90 (3.329)	193 (89.4)	65 (18.1)	75 (23.9)	28.94 (97.73)	
<b>VARYING POWER AND FUEL CONSUMPTION—Two Hours</b>									
108.57 (80.96)	2316	7.311 (27.676)	0.471 (0.287)	14.85 (2.925)	194 (89.7)	65 (18.1)	75 (23.9)	.....	.....
0.00 (0.00)	2430	2.414 (9.139)	.....	.....	182 (83.3)	64 (17.8)	75 (23.6)	.....	.....
55.68 (41.52)	2375	4.837 (18.310)	0.608 (0.370)	11.51 (2.268)	186 (85.3)	64 (17.8)	74 (23.3)	.....	.....
121.75 (90.79)	2200	7.693 (29.120)	0.442 (0.269)	15.83 (3.118)	198 (91.9)	64 (17.8)	74 (23.1)	.....	.....
28.12 (20.97)	2403	3.623 (13.716)	0.901 (0.548)	7.76 (1.529)	185 (84.7)	64 (17.8)	74 (23.1)	.....	.....
82.52 (61.54)	2346	6.141 (23.244)	0.521 (0.317)	13.44 (2.647)	188 (86.4)	65 (18.1)	75 (23.9)	.....	.....
<b>Av</b> <b>Av</b>	<b>66.11</b> <b>(49.30)</b>	<b>5.337</b> <b>(20.201)</b>	<b>0.565</b> <b>(0.344)</b>	<b>12.39</b> <b>(2.440)</b>	<b>188</b> <b>(86.9)</b>	<b>64</b> <b>(17.9)</b>	<b>74</b> <b>(23.5)</b>	<b>28.89</b> <b>(97.56)</b>	

### DRAWBAR PERFORMANCE WITH BIAS PLY TIRES

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption		Temp. °F (°C)		Cool- ing med	Air	Air	Barom. inch Hg (kPa)
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW/hl)	wet bulb		dry bulb		
<b>Maximum Available Power—Two Hours 8th (5L) Gear</b>												
105.89 (78.96)	7778 (34.60)	5.11 (8.22)	2199	6.12	7.654 (28.975)	0.506 (0.308)	13.83 (2.725)	200 (93.1)	52 (10.8)	59 (15.0)	28.73 (97.00)	
<b>75% of Pull at Maximum Power—Ten Hours 8th (5L) Gear</b>												
86.84 (64.76)	5903 (26.26)	5.52 (8.88)	2338	4.58	6.787 (25.691)	0.547 (0.333)	12.80 (2.521)	197 (91.4)	51 (10.3)	54 (12.1)	28.61 (96.62)	
<b>50% of Pull at Maximum Power—Two Hours 8th (5L) Gear</b>												
59.64 (44.47)	3936 (17.51)	5.68 (9.14)	2366	3.00	5.482 (20.751)	0.643 (0.391)	10.88 (2.143)	193 (89.2)	55 (12.5)	64 (17.5)	28.73 (97.00)	
<b>50% of Pull at Reduced Engine Speed—Two Hours 11th (6L) Gear</b>												
59.60 (44.45)	3937 (17.51)	5.68 (9.14)	1532	3.04	4.074 (15.421)	0.478 (0.291)	14.63 (2.882)	190 (87.5)	55 (12.8)	61 (15.8)	28.72 (96.97)	

### MAXIMUM POWER IN SELECTED GEARS

88.44 (65.95)	13247 (58.93)	2.50 (4.03)	2317	14.89	3rd (2L) Gear		198 (92.2)	53 (11.7)	59 (15.0)	28.60 (96.58)
99.43 (74.14)	12072 (53.70)	3.09 (4.97)	2200	12.10	4th (3L) Gear		199 (92.8)	54 (12.2)	60 (15.6)	28.60 (96.58)
99.53 (74.22)	11766 (52.34)	3.17 (5.10)	2199	11.56	5th (2H) Gear		201 (93.6)	54 (12.2)	61 (16.1)	28.60 (96.58)
102.24 (76.24)	9214 (40.98)	4.16 (6.70)	2200	7.96	6th (3H) Gear		202 (94.2)	54 (12.2)	61 (16.1)	28.60 (96.58)
104.66 (78.04)	9058 (40.29)	4.33 (6.97)	2201	7.74	7th (4L) Gear		201 (93.6)	54 (12.2)	60 (15.6)	28.60 (96.58)
107.00 (79.79)	7871 (35.01)	5.10 (8.20)	2200	6.39	8th (5L) Gear		200 (93.3)	53 (11.7)	59 (15.0)	28.59 (96.54)
105.17 (78.43)	6915 (30.76)	5.70 (9.18)	2200	5.55	9th (4H) Gear		200 (93.1)	53 (11.7)	59 (15.0)	28.60 (96.58)
106.98 (79.78)	6008 (26.72)	6.68 (10.75)	2202	4.61	10th (5H) Gear		201 (93.6)	53 (11.7)	59 (15.0)	28.59 (96.54)
107.24 (79.97)	4968 (22.10)	8.09 (13.03)	2201	3.73	11th (6L) Gear		200 (93.3)	53 (11.7)	59 (15.0)	28.59 (96.54)

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

Crankshaft Speed rpm	2200	1977	1757	1542	1316	1098
Pull—lbs (kN)	7871 (35.01)	8654 (38.79)	9210 (41.28)	9482 (42.50)	9237 (41.40)	8254 (37.00)
Increase in Pull %	0	10	17	20	17	5
Power—Hp (kW)	107.00 (79.79)	104.79 (78.14)	98.49 (73.45)	88.73 (66.17)	73.92 (55.12)	55.71 (41.54)
Speed—Mph (km/h)	5.10 (8.20)	4.54 (7.31)	4.01 (6.45)	3.51 (5.65)	3.00 (4.83)	2.53 (4.07)
Slip %	6.39	7.07	7.67	7.96	7.67	6.77

TRACTOR SOUND LEVEL WITH CAB	Radial Ply dB(A)	Bias Ply dB(A)
Maximum Available Power—Two Hours	78.5	79.0
75% of Pull at Maximum Power—Ten Hours		79.0
50% of Pull at Maximum Power—Two Hours		79.0
50% of Pull at Reduced Engine Speed—Two Hours		77.0
Bystander in 16th (8H) gear		87.5

Department of Agricultural Engineering

Dates of Test: April 25 to May 12, 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°) 0.8402 Fuel weight 6.996 lbs/gal  
(0.838 kg/l) Oil SAE 30 API service classifica-  
tion SE, SF, CC, CD To motor 4.257 gal  
(16.115 l) Drained from motor 3.956 gal (14.975 l)  
Transmission and final drive lubricant Ford 134  
fluid Total time engine was operated 44.0 hours.

**ENGINE:** Make Ford Diesel Type six cylin-  
der vertical with turbocharger Serial No.  
\*U732866\* 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 centrifugal precleaner Oil filter one  
full flow cartridge Oil cooler heat exchanger in  
lower part of radiator for crankcase oil, radiator  
for hydraulic and transmission oil Fuel filter one  
paper element and sediment bowl Muffler ver-  
tical Cooling medium temperature control two  
thermostats and variable speed fan.

**CHASSIS:** Type standard with duals Serial  
No. \*C713305\* Tread width rear 60" (1524 mm)  
to 120" (3048 mm) front 60" (1524 mm) to 84" (2134  
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 29.3" (745 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 selective gear  
fixed ratio with partial (2) range operator con-  
trolled 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) sev-  
enth 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) fif-  
teenth 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 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:** No repairs or  
adjustments.

## 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	
<b>Maximum Available Power—Two Hours 8th (5L) Gear</b>											
107.52 (80.17)	7772 (34.57)	5.19 (8.35)	2199	3.75	7.719 (29.218)	0.502 (0.306)	13.93 (2.744)	200 (93.3)	60 (15.3)	68 (20.0)	28.82 (97.30)
<b>MAXIMUM POWER IN SELECTED GEARS</b>											
93.32 (69.59)	14236 (63.32)	2.46 (3.96)	2288	14.64	3rd (2L) Gear			200 (93.1)	54 (12.2)	59 (15.0)	28.75 (97.08)
104.94 (78.25)	12094 (53.79)	3.25 (5.24)	2201	6.76	4th (3L) Gear			198 (92.2)	54 (12.2)	60 (15.6)	28.77 (97.15)
104.57 (77.98)	11770 (52.36)	3.33 (5.36)	2197	6.31	5th (2H) Gear			200 (93.1)	54 (12.2)	60 (15.6)	28.78 (97.19)
106.27 (79.24)	9316 (41.44)	4.28 (6.88)	2199	4.62	6th (3H) Gear			201 (93.6)	55 (12.8)	61 (16.1)	28.79 (97.22)
108.20 (80.68)	9114 (40.54)	4.45 (7.16)	2201	4.47	7th (4L) Gear			201 (93.6)	55 (12.8)	61 (16.1)	28.80 (97.25)
110.02 (82.04)	7949 (35.36)	5.19 (8.35)	2199	3.75	8th (5L) Gear			200 (93.1)	58 (14.4)	65 (18.3)	28.81 (97.29)
107.11 (79.87)	6941 (30.87)	5.79 (9.31)	2200	3.27	9th (4H) Gear			200 (93.1)	56 (13.3)	62 (16.7)	28.80 (97.25)
108.63 (81.00)	6049 (26.91)	6.73 (10.84)	2199	2.87	10th (5H) Gear			199 (92.8)	57 (13.9)	64 (17.8)	28.80 (97.25)
108.44 (80.86)	5002 (22.25)	8.13 (13.08)	2199	2.38	11th (6L) Gear			200 (93.1)	58 (14.4)	65 (18.3)	28.80 (97.25)

### TIRES, BALLAST AND WEIGHT

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

### Bias Ply Tires

<b>With Ballast</b>	<b>Without Ballast</b>
Four 18.4-38; 8; 18 (125)	Four 18.4-38; 8; 18 (125)
572 lb (260 kg)	None
710 lb (322 kg)	None
Two 11.00-16; 6; 32 (220)	Two 11.00-16; 6; 32 (220)
None	None
95 lb (43 kg)	None
22 in (560 mm)	22 in (560 mm)
12325 lb (5591 kg)	9760 lb (4427 kg)
3685 lb (1671 kg)	3495 lb (1585 kg)
16010 lb (7262 kg)	13255 lb (6012 kg)

### Radial Ply Tires

<b>With Ballast</b>	<b>Without Ballast</b>
Four 18.4R38; 8; 18 (125)	Four 18.4R38; 8; 18 (125)
468 lb (212 kg)	None
730 lb (331 kg)	None
Two 11.00-16; 6; 32 (220)	Two 11.00-16; 6; 32 (220)
None	None
82 lb (37 kg)	None
22 in (560 mm)	22 in (560 mm)
12315 lb (5586 kg)	9920 lb (4500 kg)
3660 lb (1660 kg)	3495 lb (1585 kg)
15975 lb (7246 kg)	13415 lb (6085 kg)

**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 191°F (88.1°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. 1515, June 21, 1984.

LOUIS I. LEVITICUS  
Engineer-in-Charge

K. VON BARGEN  
W. E. SPLINTER  
L. L. BASHFORD  
Board of Tractor Test Engineers



**Ford TW-15 Diesel**

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