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Test 1514: Ford TW-5 and 8530 Diesel 16-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

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NEBRASKA TRACTOR TEST 1514—FORD TW-5 DIESEL
ALSO FORD 8530 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—1199 rpm)									
105.74 (78.85)	2300	7.103 (26.886)	0.470 (0.286)	14.89 (2.933)	211 (99.3)	56 (13.6)	75 (23.7)	29.07 (98.18)	
Standard Power Take-off Speed (1000 rpm)—One Hour									
96.83 (72.20)	1919	6.241 (23.621)	0.451 (0.274)	15.52 (3.057)	206 (96.7)	57 (13.9)	75 (23.9)	29.06 (98.11)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
92.13 (68.70)	2358	6.239 (23.618)	0.474 (0.288)	14.77 (2.909)	202 (94.4)	57 (13.6)	75 (23.6)	..... .....
0.00 (0.00)	2436	2.075 (7.856)	..... .....	..... .....	183 (83.6)	57 (13.9)	76 (24.4)	..... .....
46.98 (35.04)	2406	3.949 (14.950)	0.588 (0.358)	11.90 (2.344)	189 (86.9)	58 (14.2)	75 (23.6)	..... .....
107.19 (79.93)	2300	7.161 (27.107)	0.467 (0.284)	14.97 (2.949)	213 (100.3)	57 (13.9)	74 (23.3)	..... .....
23.66 (17.64)	2423	2.942 (11.135)	0.870 (0.529)	8.04 (1.584)	184 (84.4)	58 (14.2)	75 (23.6)	..... .....
69.91 (52.13)	2387	4.996 (18.910)	0.500 (0.304)	13.99 (2.757)	194 (90.0)	58 (14.4)	75 (23.9)	..... .....
Av Av	56.65 (42.24)	2385 (17.263)	4.560 (0.343)	0.563 (0.343)	12.42 (2.447)	194 (90.0)	57 (14.0)	75 (23.8)	29.04 (98.06)

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)			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											
92.62 (69.07)	6453 (28.70)	5.38 (8.66)	2299	5.60	7.047 (26.675)	0.532 (0.324)	13.14 (2.589)	217 (102.8)	60 (15.6)	70 (20.8)	28.59 (96.53)
75% of Pull at Maximum Power—Ten Hours 8th (5L) Gear											
74.90 (55.85)	4960 (22.06)	5.66 (9.11)	2378	3.90	5.802 (21.963)	0.542 (0.330)	12.91 (2.543)	206 (96.4)	62 (16.7)	70 (21.1)	28.96 (97.80)
50% of Pull at Maximum Power—Two Hours 8th (5L) Gear											
51.33 (38.28)	3308 (14.71)	5.82 (9.37)	2411	2.60	4.510 (17.071)	0.615 (0.374)	11.38 (2.242)	198 (91.9)	63 (17.2)	75 (23.9)	28.60 (96.58)
50% of Pull at Reduced Engine Speed—Two Hours 11th (6L) Gear											
51.27 (38.23)	3307 (14.71)	5.81 (9.36)	1558	2.60	3.631 (13.743)	0.495 (0.301)	14.12 (2.782)	195 (90.3)	65 (18.3)	80 (26.4)	28.61 (96.61)
MAXIMUM POWER IN SELECTED GEARS											
82.80 (61.74)	12249 (54.48)	2.53 (4.08)	2333	14.67	3rd (2L) Gear			208 (97.8)	51 (10.6)	56 (13.3)	28.56 (96.44)
89.79 (66.95)	10146 (45.13)	3.32 (5.34)	2302	9.92	4th (3L) Gear			217 (102.5)	52 (11.1)	58 (14.4)	28.56 (96.44)
89.35 (66.63)	9842 (43.78)	3.40 (5.48)	2300	9.50	5th (2H) Gear			214 (101.1)	52 (11.1)	59 (15.0)	28.56 (96.44)
90.69 (67.63)	7711 (34.30)	4.41 (7.10)	2300	7.01	6th (3H) Gear			217 (102.5)	53 (11.7)	60 (15.6)	28.57 (96.48)
93.13 (69.45)	7618 (33.88)	4.58 (7.38)	2299	6.86	7th (4L) Gear			217 (102.8)	54 (12.2)	61 (16.1)	28.57 (96.48)
94.89 (70.76)	6613 (29.41)	5.38 (8.66)	2300	5.64	8th (5L) Gear			219 (103.6)	57 (13.9)	65 (18.3)	28.56 (96.44)
91.85 (68.49)	5717 (25.43)	6.02 (9.70)	2300	4.70	9th (4H) Gear			217 (102.8)	54 (12.2)	61 (16.1)	28.58 (96.51)
94.14 (70.20)	5024 (22.35)	7.03 (11.31)	2298	3.98	10th (5H) Gear			218 (103.1)	54 (12.2)	61 (16.1)	28.57 (96.48)
95.27 (71.04)	4196 (18.66)	8.52 (13.70)	2299	3.34	11th (6L) Gear			217 (102.8)	55 (12.8)	61 (16.1)	28.56 (96.44)
LUGGING ABILITY IN 8th (5L) GEAR											
Crankshaft Speed rpm				2300	2071	1837	1607	1372	1148		
Pull—lbs (kN)				6613 (29.41)	7052 (31.37)	7297 (32.46)	7541 (33.54)	7617 (34.88)	7594 (33.78)		
Increase in Pull %				0	7	10	14	15	15		
Power—Hp (kW)				94.89 (70.76)	90.65 (67.60)	82.99 (61.89)	74.74 (55.73)	64.43 (48.04)	53.71 (40.05)		
Speed—Mph (km/h)				5.38 (8.66)	4.82 (7.76)	4.26 (6.86)	3.72 (5.98)	3.17 (5.10)	2.65 (4.27)		
Slip %				5.64	6.02	6.48	6.63	6.63	6.78		

TRACTOR SOUND LEVEL WITH CAB	Radial Ply dB(A)	Bias Ply dB(A)
Maximum Available Power—Two Hours	81.5	81.0
75% of Pull at Maximum Power—Ten Hours		81.0
50% of Pull at Maximum Power—Two Hours		81.0
50% of Pull at Reduced Engine Speed—Two Hours		80.0
Bystander in 15th (8L) gear		90.5

Department of Agricultural Engineering

Dates of Test: April 26 to May 16, 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 classifi-
cation SE, CC, CD To motor 4.224 gal (15.989 l)
Drained from motor 3.772 gal (14.278 l) Trans-
mission and final drive lubricant Ford 134 fluid
Total time engine was operated 53.0 hours.

ENGINE: Make Ford Diesel Type six cylin-
der vertical Serial No. *G733576* Crankshaft
lengthwise Rated rpm 2300 Bore and stroke
4.4" × 4.4" (112 mm × 112 mm) Compression
ratio 16.3 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 cartridge Oil
cooler heat exchanger in lower part of radiator
for crankcase oil, radiator for hydraulic and trans-
mission oil Fuel filter one paper element and
sediment bowl Muffler vertical Cooling me-
dium temperature control two thermostats and
variable speed fan.

CHASSIS: Type standard with duals Serial
No. *C713304* 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 2.0 (3.1) second 2.5 (4.0) third 3.0 (4.8)
fourth 3.8 (6.1) fifth 3.9 (6.2) sixth 4.9 (7.8) sev-
enth 5.1 (8.1) eighth 5.9 (9.4) ninth 6.5 (10.5) tenth
7.5 (12.1) eleventh 9.1 (14.6) twelfth 11.4 (18.4)
thirteenth 11.7 (18.8) fourteenth 14.7 (23.6) fif-
teenth 15.2 (24.5) sixteenth 19.6 (31.5) reverse 2.1
(3.4), 2.7 (4.4), 6.3 (10.2), 8.1 (13.1) 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 1919 engine rpm.

REPAIRS and ADJUSTMENTS: During pre-
liminary PTO tests, two fuel injectors were re-
moved, adjusted and reinstalled.

DRAWBAR PERFORMANCE WITH RADIAL PLY TIRES

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)
Maximum Available Power—Two Hours 8th (5L) Gear											
93.75 (69.91)	6445 (28.67)	5.46 (8.78)	2300	3.41	6.983 (26.432)	0.521 (0.317)	13.43 (2.645)	214 (101.1)	61 (16.1)	68 (19.7)	29.07 (98.17)
MAXIMUM POWER IN SELECTED GEARS											
76.98 (57.40)	13718 (61.02)	2.10 (3.39)	2342	14.34			2nd (1H) Gear	202 (94.2)	54 (12.2)	60 (15.6)	29.10 (98.27)
90.28 (67.32)	12866 (57.23)	2.63 (4.23)	2301	9.26			3rd (2L) Gear	209 (98.1)	55 (12.8)	62 (16.7)	29.11 (98.30)
93.49 (69.72)	10187 (45.31)	3.44 (5.54)	2299	5.72			4th (3L) Gear	208 (97.8)	56 (13.3)	63 (17.2)	29.12 (98.33)
92.86 (69.25)	9877 (43.93)	3.53 (5.67)	2300	5.41			5th (2H) Gear	210 (98.9)	56 (13.3)	63 (17.2)	29.12 (98.33)
93.15 (69.46)	7764 (34.53)	4.50 (7.24)	2299	4.17			6th (3H) Gear	212 (99.7)	56 (13.3)	63 (17.2)	29.12 (98.33)
94.23 (70.27)	7555 (33.60)	4.68 (7.53)	2300	3.93			7th (4L) Gear	215 (101.4)	56 (13.3)	64 (17.8)	29.13 (98.37)
95.89 (71.51)	6592 (29.32)	5.45 (8.78)	2300	3.45			8th (5L) Gear	215 (101.4)	57 (13.9)	65 (18.3)	29.14 (98.40)
92.65 (69.09)	5721 (25.45)	6.07 (9.77)	2299	2.88			9th (4H) Gear	213 (100.6)	56 (13.3)	64 (17.8)	29.13 (98.37)
94.41 (70.40)	5012 (22.29)	7.06 (11.37)	2300	2.72			10th (5H) Gear	214 (100.8)	56 (13.3)	64 (17.8)	29.13 (98.37)
93.67 (69.85)	4117 (18.31)	8.53 (13.73)	2301	2.23			11th (6L) Gear	214 (101.1)	57 (13.9)	65 (18.3)	29.14 (98.40)

TIRES, BALLAST AND WEIGHT

Rear Tires	—No., size, ply & psi (kPa)
Ballast	—Liquid (each inner)
	—Cast Iron (each)
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 18.4-38; 8; 18 (125)	Four 18.4-38; 8; 18 (125)
585 lb (265 kg)	None
None	None
Two 11.00-16; 6; 32 (220)	Two 11.00-16; 6; 32 (220)
None	None
85 lb (39 kg)	None
19.5 in (495 mm)	19.5 in (495 mm)
10810 lb (4903 kg)	9640 lb (4373 kg)
3620 lb (1642 kg)	3450 lb (1565 kg)
14430 lb (6545 kg)	13090 lb (5938 kg)

Radial Ply Tires	
With Ballast	Without Ballast
Four 18.4R38; 8; 18 (125)	Four 18.4R38; 8; 18 (125)
528 lb (239 kg)	None
None	None
Two 11.00-16; 6; 32 (220)	Two 11.00-16; 6; 32 (220)
None	None
70 lb (32 kg)	None
19 in (485 mm)	19 in (485 mm)
10855 lb (4924 kg)	9800 lb (4445 kg)
3590 lb (1628 kg)	3450 lb (1565 kg)
14445 lb (6552 kg)	13250 lb (6010 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 192°F (89.0°C). Nine gears were chosen between 15% slip and 10 mph (16.1 km/h). This tractor did not attain the estimated 15.00 HP-HR per gallon fuel economy at rated engine speed as claimed by the manufacturer.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1514. June 21, 1984.

NOTE: Report reissued, supplemental sales permit for Ford 8530 Diesel 16 speed, July, 1990.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R.D. GRISSE
G.J. HOFFMAN
Board of Tractor Test Engineers



Ford TW-5 Diesel

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