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Test 1223: Ford 4600 Diesel 8-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1223 — FORD 4600 DIESEL, 8-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—660 rpm)								
52.44 (39.11)	2199	3.707 (14.032)	0.495 (0.301)	14.15 (2.787)	205 (95.9)	58 (14.7)	75 (23.8)	29.050 (98.097)
Standard Power Take-off Speed (540 rpm)—One Hour								
46.31 (34.53)	1799	3.173 (12.012)	0.480 (0.292)	14.59 (2.875)	205 (96.2)	60 (15.3)	75 (24.0)	29.035 (98.047)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
47.00 (35.05)	2320	3.373 (12.769)	0.502 (0.306)	13.93 (2.745)	192 (88.9)	62 (16.4)	74 (23.3)	..... .....
0.00 (0.00)	2443	1.234 (4.673)	..... .....	..... .....	168 (75.6)	62 (16.7)	74 (23.6)	..... .....
24.23 (18.07)	2390	2.186 (8.275)	0.632 (0.384)	11.08 (2.183)	172 (77.8)	64 (17.5)	76 (24.2)	..... .....
52.09 (38.84)	2200	3.751 (14.197)	0.504 (0.307)	13.89 (2.736)	206 (96.7)	65 (18.3)	76 (24.4)	..... .....
12.27 (9.15)	2420	1.646 (6.231)	0.939 (0.571)	7.45 (1.468)	166 (74.4)	65 (18.3)	75 (23.9)	..... .....
35.82 (26.71)	2356	2.726 (10.319)	0.533 (0.324)	13.14 (2.589)	178 (81.1)	66 (18.9)	76 (24.2)	..... .....
Av Av	28.57 (21.30)	2.486 (9.411)	0.609 (0.370)	11.49 (2.264)	180 (82.4)	64 (17.7)	75 (23.9)	28.987 (97.884)

DRAWBAR PERFORMANCE

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 4th Gear											
43.07 (32.12)	3763 (16.74)	4.29 (6.91)	2199	7.90	3.643 (13.792)	0.592 (0.360)	11.82 (2.329)	189 (86.9)	64 (17.8)	79 (25.8)	28.850 (97.422)
75% of Pull at Maximum Power—Ten Hours 4th Gear											
36.22 (27.01)	2912 (12.95)	4.66 (7.51)	2334	5.64	3.058 (11.574)	0.591 (0.359)	11.85 (2.334)	173 (78.5)	64 (17.8)	77 (24.7)	28.823 (97.331)
50% of Pull at Maximum Power—Two Hours 4th Gear											
25.39 (18.93)	1957 (8.71)	4.86 (7.83)	2383	3.57	2.357 (8.924)	0.650 (0.395)	10.77 (2.121)	171 (77.2)	67 (19.4)	87 (30.6)	28.820 (97.321)
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
25.52 (19.03)	1963 (8.73)	4.87 (7.84)	1594	3.47	1.929 (7.301)	0.529 (0.322)	13.23 (2.606)	179 (81.4)	67 (19.4)	90 (32.2)	28.790 (97.220)

MAXIMUM POWER IN SELECTED GEARS

30.28 (22.58)	6342 (28.21)	1.79 (2.88)	2370 (2.88)	14.80	2nd Gear			163 (72.8)	51 (10.6)	55 (12.8)	28.760 (97.118)
42.42 (31.63)	5266 (23.42)	3.02 (4.86)	2199 (4.86)	11.75	3rd Gear			176 (79.7)	58 (14.4)	66 (18.9)	28.840 (97.388)
44.38 (33.10)	3875 (17.24)	4.30 (6.91)	2198 (6.91)	7.75	4th Gear			172 (77.8)	54 (12.2)	59 (15.0)	28.820 (97.321)
45.57 (33.98)	3264 (14.52)	5.24 (8.43)	2200 (8.43)	6.27	5th Gear			174 (78.9)	55 (12.8)	60 (15.6)	28.820 (97.321)
45.44 (33.89)	2570 (11.43)	6.63 (10.67)	2199 (10.67)	4.75	6th Gear			174 (78.9)	56 (13.3)	62 (16.7)	28.830 (97.355)
42.53 (31.72)	1339 (5.96)	11.91 (19.17)	2201 (19.17)	2.57	7th Gear			170 (76.7)	57 (13.9)	64 (17.8)	28.840 (97.388)

LUGGING ABILITY IN RATED GEAR (4th)

Crankshaft Speed rpm	2198	1978	1756	1538	1319	1102	884
Pull—lbs (kN)	3875 (17.24)	4153 (18.48)	4298 (19.12)	4405 (19.60)	4481 (19.93)	4608 (20.50)	4347 (19.34)
Increase in Pull %	0	7	11	14	16	19	12
Power—Hp (kW)	44.38 (33.10)	42.52 (31.70)	38.90 (29.01)	34.78 (25.93)	30.30 (22.59)	25.93 (19.34)	19.75 (14.73)
Speed—Mph (km/h)	4.30 (6.91)	3.84 (6.18)	3.39 (5.46)	2.96 (4.76)	2.54 (4.08)	2.11 (3.40)	1.70 (2.74)
Slip %	7.75	8.41	8.77	9.00	9.24	9.47	9.00

Department of Agricultural Engineering

Dates of Test: September 20 to October 4, 1976

Manufacturer: FORD MOTOR COMPANY,
Tractor Operations, 2500 East Maple Rd., Troy,
Michigan 48084

FUEL, OIL AND TIME: Fuel No. 2 Diesel
Cetane No. 51.8 (rating taken from oil company's
typical inspection data) **Specific gravity converted**
to 60°/60° (15.6°/15.6°) 0.8406 **Fuel weight** 6.999
lbs/gal (0.841 kg/l) **Oil SAE 30 API service**
classification SB/SE-CA/CD **To motor** 1.902 gal
(7.200 l) **Drained from motor** 1.100 gal (4.164 l)
Transmission and final drive lubricant Ford
M-2C53A **Total time engine was operated** 55
hours

ENGINE Make Ford Diesel **Type** 3 cylinder
vertical **Serial No.** *D091251* **Crankshaft**
lengthwise **Rated rpm** 2200 **Bore and stroke** 4.4"
× 4.4" (111.76 mm × 111.76 mm) **Compression**
ratio 16.3 to 1 **Displacement** 201 cu in (3289 ml)
Cranking system 12 volt **Lubrication** pressure
Air cleaner outer paper and safety felt elements
with centrifugal precleaner and dust evacuator
Oil filter full flow cotton blend spin-on cartridge
Fuel filter nylon gauze at bottom of tank and
paper element **Muffler** vertical **Cooling medium**
temperature control thermostat

CHASSIS: Type standard **Serial No.** C510280
Tread width rear 56" (1420 mm) to 80" (2030 mm)
front 52" (1320 mm) to 80" (2030 mm) **Wheel base**
84.5" (2146 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 26.7" (678 mm) Vertical distance above
roadway 40.4" (1026 mm) Horizontal distance
from center of rear wheel tread 0.3" (8 mm) to the
right **Hydraulic control system** direct engine
drive **Transmission** selective gear fixed ratio
Advised speeds mph (km/h) first 1.4 (2.2) sec-
ond 1.8 (2.9) third 3.1 (5.0) fourth 4.2 (6.7) fifth
5.0 (8.0) sixth 6.3 (10.1) seventh 11.0 (17.6) eighth
15.0 (24.0) reverse 2.0 (3.2), 7.2 (11.5) **Clutch**
single dry disc operated by foot pedal **Brakes**
multiple wet disc operated by two foot pedals
which can be locked together **Steering** power as-
sist **Turning radius** (on concrete surface with
brake applied) right 120" (3.05 m) left 120" (3.05
m) (on concrete surface without brake) right 138"
(3.51 m) left 138" (3.51 m) **Turning space diame-**
ter (on concrete surface with brake applied) right
252" (6.40 m) left 252" (6.40 m) (on concrete sur-
face without brake) right 291" (7.39 m) left 291"
(7.39 m) **Belt pulley** 1208 rpm at 2200 engine
rpm diameter 10.25" (260 mm) face 6.5" (165 mm)
Belt speed 3241 fpm (16.5 m/s) **Power take-off**
540 rpm at 1799 engine rpm.

REPAIRS and ADJUSTMENTS: Fuel filter was
replaced following PTO test. All injectors were
removed, checked and reinstalled during prelimi-
nary drawbar tests.

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—Two Hours	84.0
75% of Pull at Maximum Power—Ten Hours	83.0
50% of Pull at Maximum Power—Two Hours	84.0
50% of Pull at Reduced Engine Speed—Two Hours	83.5
Bystander in 8th gear	90.5

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires		
—No., size, ply & psi (kPa)	Two 16.9-30; 6; 16 (110)	Two 16.9-30; 6; 16 (110)
Ballast	790 lb (358 kg)	None
—Liquid (each)	300 lb (136 kg)	None
—Cast Iron (each)		
Front Tires		
—No., size, ply & psi (kPa)	Two 7.50-16; 6; 32 (220)	Two 7.50-16; 6; 32 (220)
Ballast	None	None
—Liquid (each)	80 lb (36 kg)	None
—Cast Iron (each)		
Height of drawbar	21.5 in (550 mm)	21.5 in (550 mm)
Static weight with operator —rear	6200 lb (2812 kg)	4020 lb (1823 kg)
front	2020 lb (916 kg)	1860 lb (844 kg)
total	8220 lb (3728 kg)	5880 lb (2667 kg)

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 165°F (73.9°C). Six gears were chosen between stability limit and 15 mph (24.1 km/h). Coolant overflowed from radiator at conclusion of 10 hour test.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1223**.

LOUIS I. LEVITICUS

Engineer-in Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

K. VON BARGEN

Board of Tractor Test Engineers



Ford 4600 Diesel