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## Test 1243: Ford 9700 Diesel 16-Speed

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1243 — FORD 9700 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—1137 rpm)								
135.64 (101.14)	2200	9.065 (34.313)	0.463 (0.281)	14.96 (2.948)	178 (81.2)	59 (15.0)	75 (23.8)	29.013 (97.974)
Standard Power Take-off Speed (1000 rpm)—One Hour								
129.25 (96.38)	1935	8.102 (30.668)	0.434 (0.264)	15.95 (3.143)	178 (80.9)	59 (15.0)	75 (23.8)	29.010 (97.962)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
120.80 (90.08)	2304	8.482 (32.107)	0.486 (0.296)	14.24 (2.806)	178 (81.1)	59 (15.0)	75 (23.9)	..... .....
0.00 (0.00)	2452	2.904 (10.992)	..... .....	..... .....	171 (77.2)	58 (14.7)	74 (23.1)	..... .....
62.48 (46.59)	2384	5.634 (21.328)	0.624 (0.380)	11.09 (2.185)	173 (78.3)	59 (15.0)	75 (23.9)	..... .....
135.22 (100.83)	2200	9.088 (34.403)	0.465 (0.283)	14.88 (2.931)	179 (81.7)	60 (15.8)	77 (25.0)	..... .....
31.48 (23.48)	2414	4.278 (16.193)	0.940 (0.572)	7.36 (1.450)	171 (77.2)	60 (15.6)	76 (24.2)	..... .....
92.51 (68.98)	2356	7.203 (27.267)	0.539 (0.328)	12.84 (2.530)	176 (79.7)	62 (16.4)	76 (24.7)	..... .....
Av 73.75 Av (55.00)	2352	6.265 (23.715)	0.588 (0.358)	11.77 (2.319)	175 (79.2)	60 (15.4)	75 (24.1)	29.003 (97.940)

## 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 8th (5PD) Gear											
113.32 (84.50)	9415 (41.88)	4.51 (7.26)	2198	7.23	8.975 (33.974)	0.548 (0.334)	12.63 (2.487)	180 (82.2)	71 (21.7)	81 (26.9)	28.760 (97.118)
75% of Pull at Maximum Power—Ten Hours 8th (5PD) Gear											
94.14 (70.20)	7236 (32.19)	4.88 (7.85)	2326	5.19	7.866 (29.777)	0.578 (0.352)	11.97 (2.358)	176 (79.9)	70 (21.0)	80 (26.6)	28.837 (97.378)
50% of Pull at Maximum Power—Two Hours 8th (5PD) Gear											
64.58 (48.16)	4805 (21.37)	5.04 (8.11)	2364	3.61	6.248 (23.652)	0.670 (0.407)	10.34 (2.036)	173 (78.1)	63 (16.9)	69 (20.3)	28.855 (97.439)
50% of Pull at Reduced Engine Speed—Two Hours 11th (6PD) Gear											
64.89 (48.39)	4835 (21.51)	5.03 (8.10)	1671	3.61	4.731 (17.910)	0.505 (0.307)	13.72 (2.702)	169 (76.1)	67 (19.2)	73 (22.8)	28.860 (97.456)

## MAXIMUM POWER IN SELECTED GEARS

110.18 (82.16)	15010 (66.77)	2.75 (4.43)	2259	14.58	5th (3PD) Gear			176 (80.0)	60 (15.6)	65 (18.3)	28.850 (97.422)
112.75 (84.08)	11036 (49.09)	3.83 (6.17)	2199	8.72	7th (4PD) Gear			179 (81.7)	68 (20.0)	76 (24.4)	28.780 (97.186)
116.17 (86.63)	9646 (42.91)	4.52 (7.27)	2201	7.23	8th (5PD) Gear			179 (81.4)	67 (19.4)	73 (22.8)	28.780 (97.186)
115.20 (85.91)	7283 (32.40)	5.93 (9.55)	2200	5.18	10th (5DD) Gear			179 (81.7)	68 (20.0)	77 (25.0)	28.780 (97.186)
118.08 (88.05)	6765 (30.09)	6.55 (10.53)	2201	4.65	11th (6PD) Gear			180 (81.9)	69 (20.6)	78 (25.6)	28.780 (97.186)
114.06 (85.05)	4267 (18.98)	10.02 (16.13)	2200	2.95	13th (7PD) Gear			179 (81.7)	69 (20.6)	78 (25.6)	28.780 (97.186)

## LUGGING ABILITY IN RATED GEAR 8th (5PD)

Crankshaft Speed rpm		2201	1978	1763	1543	1313	1101
Pull—lbs (kN)		9646 (42.91)	10422 (46.36)	10819 (48.12)	10937 (48.65)	10471 (46.58)	9227 (41.04)
Increase in Pull %		0	8	12	13	9	-4
Power—Hp (kW)		116.17 (86.63)	111.89 (83.43)	103.11 (76.89)	91.00 (67.86)	74.55 (55.59)	55.59 (41.46)
Speed—Mph (km/h)		4.52 (7.27)	4.03 (6.48)	3.57 (5.75)	3.12 (5.02)	2.67 (4.30)	2.26 (3.64)
Slip %		7.23	7.88	8.44	8.72	8.16	7.02

Department of Agricultural Engineering

Dates of Test: May 9 to 20, 1977

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°/15°)** 0.8313 **Fuel weight** 6.922 lbs/  
gal (0.831 kg/l) **Oil** SAE 30 **API service classifica-**  
**tion** SB/SE-CA/CD **To motor** 3.340 gal  
(12.643 l) **Drained from motor** 2.717 gal  
(10.281 l) **Transmission and final drive lubric-**  
**ant** Ford M2C53A **Total time engine was oper-**  
**ated** 45.5 hours

**ENGINE:** Make Ford Diesel **Type** 6 cylinder  
vertical with turbocharger **Serial No.** \*H140627\*  
**Crankshaft** lengthwise **Rated rpm** 2200 **Bore**  
**and stroke** 4.4" × 4.4" (111.8 mm × 111.8 mm)  
**Compression ratio** 15.6 to 1 **Displacement** 401 cu  
in (6578 ml) **Cranking system** 12 volt **Lubrica-**  
**tion pressure** **Air cleaner** primary and safety  
paper elements and centrifugal precleaner **Oil**  
**filter** full flow paper element **Oil cooler** engine  
coolant heat exchanger for crankcase oil, radiator  
for transmission and hydraulic oil **Fuel filter** two  
parallel paper elements **Muffler** vertical **Cooling**  
**medium temperature control** thermostat

**CHASSIS:** **Type** standard with duals **Serial**  
**No.** C525432 **Tread width** rear 60" (1524 mm) to  
88" (2235 mm) front 56" (1422 mm) to 84" (2134  
mm) **Wheel base** 109.7" (2786 mm) **Center of**  
**gravity** (without operator or ballast, with  
minimum tread, with fuel tank filled and tractor  
serviced for operation) Horizontal distance for-  
ward from center-line of rear wheels 33.3" (846  
mm) Vertical distance above roadway 44.6" (1133  
mm) Horizontal distance from center of rear wheel  
tread 0.4" (10 mm) to the right **Hydraulic control**  
**system** direct engine drive **Transmission** selec-  
tive gear fixed ratio with partial (2 range) operator  
controlled power shift **Advertised speeds mph**  
**(km/h)** first 1.5 (2.4) second 1.9 (3.1) third 2.1 (3.4)  
fourth 2.7 (4.4) fifth 3.2 (5.1) sixth 4.1 (6.6)  
seventh 4.2 (6.8) eighth 4.9 (7.9) ninth 5.5 (8.8)  
tenth 6.3 (10.2) eleventh 7.0 (11.2) twelfth 8.9  
(14.4) thirteenth 10.4 (16.8) fourteenth 13.4 (21.6)  
fifteenth 14.0 (22.5) sixteenth 18.0 (28.9) reverse  
1.9 (3.0), 2.4 (3.8), 5.9 (9.5) and 7.6 (12.3) **Clutch**  
single dry plate operated by foot pedal **Brakes**  
multiple wet disc hydraulically operated by two  
foot pedals which can be locked together **Steering**  
hydrostatic **Turning radius** (on concrete surface  
with brake applied) right 158" (4.01 m) left 160"  
(4.06 m) (on concrete surface without brake) right  
178" (4.52 m) left 180" (4.57 m) **Turning space**  
**diameter** (on concrete surface with brake applied)  
right 330" (8.38 m) left 334" (8.48 m) (on concrete  
surface without brake) right 370" (9.40 m) left 374"  
(9.50 m) **Power take-off** 540 rpm at 1900 engine  
rpm and 1000 rpm at 1935 engine rpm.

TRACTOR SOUND LEVEL WITH CAB		dB(A)
Maximum Available Power—Two Hours		81.5
75% of Pull at Maximum Power—Ten Hours		82.5
50% of Pull at Maximum Power—Two Hours		83.0
50% of Pull at Reduced Engine Speed—Two Hours		80.0
Bystander in 16th (8DD) gear		89.0
<b>TIRES, BALLAST AND WEIGHT</b>		
<b>Rear Tires</b>	—No., size, ply & psi (kPa)	<b>With Ballast</b>
		Four 18.4-38; 8; inner 16 (110), outer 14 (100)
<b>Ballast</b>	—Liquid (each inner)	1200 lb (544 kg)
	—Cast Iron (each side)	1020 lb (463 kg)
<b>Front Tires</b>	—No., size, ply & psi (kPa)	<b>Without Ballast</b>
		Two 11.00-16; 6; 32 (220)
<b>Ballast</b>	—Liquid (each)	None
	—Cast Iron (each)	90 lb (41 kg)
<b>Height of drawbar</b>		21.5 in (550 mm)
<b>Static weight with operator—rear</b>		13800 lb (6260 kg)
<b>front</b>		3680 lb (1669 kg)
<b>total</b>		17480 lb (7929 kg)

**REPAIRS and ADJUSTMENTS:** Gear shift lever boot was found to be torn and was replaced.

**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 164°F (73.3°C). Six gears were chosen between stability limit and 15 mph (24.1 km/h). #3 cylinder wall was found scored during final inspection. Left brake did not work properly during drawbar tests.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1243**.

LOUIS I. LEVITICUS  
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman  
W. E. SPLINTER  
K. VON BARGEN  
Board of Tractor Test Engineers



**Ford 9700 Diesel, 16-Speed**