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Test 1242: Ford 7700 Diesel 16-Speed

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NEBRASKA TRACTOR TEST 1242 — FORD 7700 DIESEL, 16-SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1020 rpm)								
84.38 (62.92)	2100	5.657 (21.415)	0.464 (0.282)	14.92 (2.938)	191 (88.1)	58 (14.4)	75 (23.8)	29.080 (98.199)
Standard Power Take-off Speed (1000 rpm)—One Hour								
84.29 (62.85)	2059	5.529 (20.929)	0.454 (0.276)	15.24 (3.003)	190 (87.9)	59 (14.8)	75 (24.0)	29.110 (98.300)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
77.05 (57.46)	2260	5.543 (20.983)	0.498 (0.303)	13.90 (2.738)	182 (83.3)	58 (14.7)	74 (23.1)	....
0.00 (0.00)	2366	1.868 (7.071)	....	....	169 (76.1)	58 (14.7)	74 (23.1)	....
39.54 (29.48)	2312	3.654 (13.830)	0.640 (0.389)	10.82 (2.132)	172 (77.8)	59 (15.0)	75 (23.9)	....
84.76 (63.20)	2100	5.686 (21.525)	0.464 (0.282)	14.91 (2.936)	188 (86.4)	60 (15.6)	77 (25.0)	....
19.88 (14.83)	2323	2.713 (10.270)	0.945 (0.575)	7.33 (1.444)	170 (76.7)	60 (15.6)	77 (25.0)	....
58.54 (43.65)	2280	4.546 (17.210)	0.538 (0.327)	12.88 (2.536)	176 (80.0)	60 (15.8)	80 (26.4)	....
Av 46.63	**2274**	**4.002**	**0.594**	**11.65**	**176**	**59**	**76**	**29.120**
Av (34.77)		***(15.148)***	***(0.361)***	***(2.295)***	***(80.0)***	***(15.2)***	***(24.4)***	***(98.334)***

DRAWBAR PERFORMANCE

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 9th (4DD) Gear											
67.62 (50.42)	5435 (24.18)	4.67 (7.51)	2102	10.53	5.670 (21.465)	0.580 (0.353)	11.92 (2.349)	195 (90.6)	65 (18.3)	80 (26.7)	28.950 (97.760)
75% of Pull at Maximum Power—Ten Hours 9th (4DD) Gear											
57.94 (43.21)	4154 (18.48)	5.23 (8.42)	2280	7.49	5.168 (19.564)	0.617 (0.376)	11.21 (2.208)	184 (84.6)	71 (21.5)	81 (27.1)	28.772 (97.159)
50% of Pull at Maximum Power—Two Hours 9th (4DD) Gear											
40.33 (30.07)	2778 (12.36)	5.44 (8.76)	2307	4.97	4.153 (15.722)	0.713 (0.434)	9.71 (1.913)	175 (79.4)	66 (18.6)	81 (27.2)	28.900 (97.591)
50% of Pull at Reduced Engine Speed—Two Hours 12th (6DD) Gear											
40.22 (30.00)	2767 (12.31)	5.45 (8.77)	1550	5.07	3.088 (11.689)	0.531 (0.323)	13.03 (2.566)	169 (76.1)	63 (17.2)	68 (20.0)	28.745 (97.068)
MAXIMUM POWER IN SELECTED GEARS											
68.40 (51.01)	7688 (34.20)	3.34 (5.37)	2170	14.83	6th (3DD) Gear			175 (79.4)	60 (15.6)	64 (17.8)	28.730 (97.017)
69.67 (51.95)	6101 (27.14)	4.28 (6.89)	2101	11.85	8th (5PD) Gear			188 (86.4)	64 (17.8)	74 (23.3)	28.970 (97.827)
68.75 (51.27)	5528 (24.59)	4.66 (7.50)	2100	10.53	9th (4DD) Gear			187 (85.8)	63 (17.2)	72 (22.2)	28.970 (97.827)
70.62 (52.66)	4800 (21.35)	5.52 (8.88)	2099	8.85	10th (6PD) Gear			187 (86.1)	65 (18.3)	76 (24.4)	28.960 (97.794)
71.57 (53.37)	3688 (16.40)	7.28 (11.71)	2101	6.69	12th (6DD) Gear			191 (88.1)	65 (18.3)	77 (25.0)	28.960 (97.794)
70.04 (52.23)	2607 (11.59)	10.08 (16.22)	2098	4.79	13th (7PD) Gear			189 (87.2)	65 (18.3)	78 (25.6)	28.960 (97.794)

LUGGING ABILITY IN RATED GEAR 9th (4DD)

Crankshaft Speed rpm	2100	1890	1681	1474	1259	1052
Pull—lbs (kN)	5528 (24.59)	5976 (26.58)	6371 (28.34)	6427 (28.59)	6074 (27.02)	5349 (23.79)
Increase in Pull %	0	8	15	16	10	−3
Power—Hp (kW)	68.75 (51.27)	66.06 (49.26)	61.84 (46.12)	54.57 (40.69)	44.53 (33.21)	33.38 (24.89)
Speed—Mph (km/h)	4.66 (7.50)	4.15 (6.67)	3.64 (5.86)	3.18 (5.12)	2.75 (4.42)	2.34 (3.77)
Slip %	10.53	11.54	12.76	12.88	11.91	10.28

Department of Agricultural Engineering

Dates of Test: May 9 to 18, 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 classification** SB/SE-CA/CD **To motor** 1.853 gal *(7.014 l)* **Drained from motor** 1.527 gal *(5.780 l)* **Transmission and final drive lubricant** Ford M2C53A **Total time engine was operated** 41.0 hours

ENGINE: Make Ford Diesel **Type** 4 cylinder vertical with turbocharger **Serial No.** F136277 **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 4.4" × 4.2" *(111.8 mm × 106.7 mm)* **Compression ratio** 15.6 to 1 **Displacement** 255 cu in *(4186 ml)* **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** primary and safety paper elements and centrifugal precleaner **Oil filter** full flow screw-on paper cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Fuel filter** nylon gauze in bottom of tank and paper element **Muffler** vertical **Cooling medium temperature control** thermostat

CHASSIS: Type standard **Serial No.** C525430 **Tread width** rear 56" *(1422 mm)* to 80" *(2032 mm)* front 56" *(1422 mm)* to 88" *(2235 mm)* **Wheel base** 101.6" *(2581 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 31.1" *(790 mm)* Vertical distance above roadway 39.1" *(993 mm)* Horizontal distance from center of rear wheel tread 0.1" *(3 mm)* to the right **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2 range) operator controlled power shift **Advertised speeds mph *(km/h)*** first 1.4 *(2.2)* second 1.7 *(2.7)* third 1.7 *(2.8)* fourth 2.2 *(3.5)* fifth 2.9 *(4.7)* sixth 3.8 *(6.1)* seventh 4.0 *(6.5)* eighth 4.8 *(7.8)* ninth 5.2 *(8.4)* tenth 6.0 *(9.7)* eleventh 6.2 *(10.0)* twelfth 7.8 *(12.5)* thirteenth 10.6 *(17.0)* fourteenth 13.6 *(21.8)* fifteenth 14.5 *(23.4)* sixteenth 18.6 *(30.0)* reverse 1.9 *(3.1)*, 2.5 *(4.0)*, 7.0 *(11.2)* and 9.0 *(14.4)* **Clutch** single dry plate operated by foot pedal **Brakes** multiple wet disc operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 147" *(3.73 m)* left 146" *(3.71 m)* (on concrete surface without brake) right 168.5" *(4.28 m)* left 166.5" *(4.23 m)* **Turning space diameter** (on concrete surface with brake applied) right 305" *(7.75 m)* left 303" *(7.70 m)* (on concrete surface without brake) right 348" *(8.84 m)* left 344" *(8.74 m)* **Belt pulley** 1073 rpm at 2050 engine rpm diameter 11" *(280 mm)* face 6.5" *(165 mm)* **Belt speed** 3089 fpm *(15.7 m/s)* **Power take-off** 540 rpm at 1900 engine rpm & 1000 rpm at 2059 engine rpm.

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—Two Hours	83.5
75% of Pull at Maximum Power—Ten Hours	84.0
50% of Pull at Maximum Power—Two Hours	83.5
50% of Pull at Reduced Engine Speed—Two Hours	83.5
Bystander in 15th (8PD) gear	86.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 18.4-34; 6; 16 *(110)*	Two 18.4-34; 6; 16 *(110)*
Ballast	—Liquid (each)	1045 lb *(474 kg)*	None
	—Cast Iron (each)	50 lb *(23 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 7.50-18; 6; 40 *(280)*	Two 7.50-18; 6; 40 *(280)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	105 lb *(48 kg)*	None
Height of drawbar		26.5 in *(670 mm)*	26.5 in *(670 mm)*
Static weight with operator—rear		8130 lb *(3688 kg)*	5940 lb *(2694 kg)*
front		2670 lb *(1211 kg)*	2460 lb *(1116 kg)*
total		10800 lb *(4899 kg)*	8400 lb *(3810 kg)*

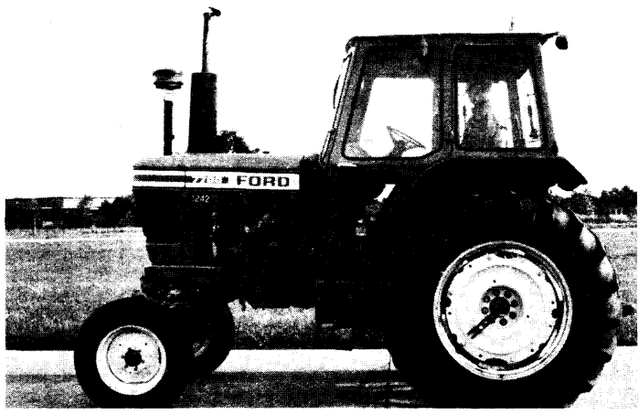
REPAIRS and ADJUSTMENTS: No repairs or adjustments.

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 163°F *(72.8°C)*. Six gears were chosen between 15% slip and 15 mph *(24.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1242.**

LOUIS I. LEVITICUS
Engineer-in Charge

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



Ford 7700 Diesel, 16-Speed

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