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Test 1529: Case 2594 Powershift Diesel 12 and 24-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1529—CASE 2594 POWERSHIFT DIESEL
ALSO CASE INTERNATIONAL 2594 POWERSHIFT DIESEL
24 SPEED ALSO 12 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—1002 rpm)								
182.07 (135.77)	2100	11.962 (45.281)	0.460 (0.280)	15.22 (2.999)	195 (90.7)	63 (17.3)	75 (23.8)	28.67 (96.83)

VARYING POWER AND FUEL CONSUMPTION—Two Hours

160.09 (119.38)	2171	10.704 (40.520)	0.468 (0.285)	14.96 (2.946)	189 (86.9)	63 (17.2)	75 (23.6)	..... .....
0.00 (0.00)	2320	3.055 (11.565)	..... .....	..... .....	173 (78.1)	63 (16.9)	75 (23.6)	..... .....
82.92 (61.83)	2250	6.642 (25.142)	0.561 (0.341)	12.48 (2.459)	179 (81.4)	62 (16.7)	74 (23.3)	..... .....
183.49 (136.82)	2100	11.994 (45.401)	0.458 (0.278)	15.30 (3.014)	193 (89.4)	63 (16.9)	76 (24.2)	..... .....
42.04 (31.35)	2281	4.825 (18.265)	0.804 (0.489)	8.71 (1.716)	174 (78.9)	63 (17.2)	74 (23.3)	..... .....
122.41 (91.28)	2215	8.656 (32.766)	0.495 (0.301)	14.14 (2.786)	183 (83.6)	63 (17.2)	75 (23.6)	..... .....
Av Av	98.49 (73.44)	7.646 (28.943)	0.544 (0.331)	12.88 (2.538)	182 (83.1)	63 (17.0)	75 (23.6)	28.68 (96.84)

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 16th (3-4) Gear											
159.64 (119.04)	9346 (41.57)	6.41 (10.31)	2099	5.83	11.941 (45.202)	0.524 (0.319)	13.37 (2.634)	199 (92.8)	68 (20.0)	75 (23.6)	28.58 (96.51)
75% of Pull at Maximum Power—Ten Hours 16th (3-4) Gear											
128.78 (96.03)	7115 (31.65)	6.79 (10.92)	2186	4.16	9.950 (37.665)	0.541 (0.329)	12.94 (2.550)	193 (89.6)	72 (22.1)	81 (26.9)	28.52 (96.29)
50% of Pull at Maximum Power—Two Hours 16th (3-4) Gear											
89.05 (66.40)	4744 (21.10)	7.04 (11.33)	2235	2.70	7.656 (28.981)	0.602 (0.366)	11.63 (2.291)	187 (85.8)	69 (20.6)	78 (25.6)	28.54 (96.36)
50% of Pull at Reduced Engine Speed—Two Hours 18th (3-6) Gear											
89.03 (66.39)	4743 (21.10)	7.04 (11.33)	1786	2.66	6.585 (24.926)	0.518 (0.315)	13.52 (2.664)	188 (86.4)	69 (20.6)	82 (27.5)	28.55 (96.39)

MAXIMUM POWER IN SELECTED GEARS

145.87 (108.78)	16874 (75.06)	3.24 (5.22)	2131	14.97	8th (2-2) Gear		191 (88.3)	66 (18.9)	72 (22.2)	28.49 (96.21)
152.62 (113.81)	14855 (66.08)	3.85 (6.20)	2100	11.33	9th (2-3) Gear		196 (91.1)	66 (18.9)	71 (21.7)	28.64 (96.71)
153.85 (114.73)	14694 (65.36)	3.93 (6.32)	2099	11.26	10th (3-1) Gear		196 (91.1)	66 (18.9)	71 (21.7)	28.63 (96.68)
159.36 (118.84)	13083 (58.20)	4.57 (7.35)	2099	8.99	11th (2-4) Gear		194 (90.0)	66 (18.9)	71 (21.7)	28.63 (96.68)
159.75 (119.12)	12853 (57.17)	4.66 (7.50)	2100	8.55	12th (3-2) Gear		196 (90.8)	65 (18.3)	71 (21.7)	28.62 (96.65)
158.66 (118.32)	11862 (52.76)	5.02 (8.07)	2101	7.74	13th (2-5) Gear		195 (90.3)	65 (18.3)	71 (21.7)	28.62 (96.65)
158.84 (118.44)	10866 (48.33)	5.48 (8.82)	2099	6.91	14th (3-3) Gear		195 (90.6)	65 (18.3)	71 (21.7)	28.61 (96.61)
160.19 (119.46)	10259 (45.63)	5.86 (9.42)	2098	6.53	15th (2-6) Gear		194 (90.0)	65 (18.3)	71 (21.7)	28.61 (96.61)
161.96 (120.77)	9487 (42.20)	6.40 (10.30)	2100	5.91	16th (3-4) Gear		197 (91.4)	67 (19.4)	73 (22.8)	28.60 (96.58)
159.86 (119.21)	8596 (38.24)	6.97 (11.22)	2099	5.29	17th (3-5) Gear		196 (90.8)	65 (18.3)	70 (21.1)	28.60 (96.58)
159.89 (119.23)	7390 (32.87)	8.11 (13.06)	2100	4.57	18th (3-6) Gear		195 (90.6)	66 (18.9)	71 (21.7)	28.60 (96.58)

LUGGING ABILITY IN 16th (3-4) GEAR

Crankshaft Speed rpm	2100	1892	1679	1476	1263	1051
Pull—lbs (kN)	9487 (42.20)	10389 (46.21)	11049 (49.15)	11127 (49.50)	10720 (47.69)	9392 (41.78)
Increase in Pull %	0	10	16	17	13	−1
Power—Hp (kW)	161.96 (120.77)	158.90 (118.49)	149.02 (111.13)	131.70 (98.21)	108.94 (81.24)	80.07 (59.70)
Speed—Mph (km/h)	6.40 (10.30)	5.74 (9.23)	5.06 (8.14)	4.44 (7.14)	3.81 (6.13)	3.20 (5.14)
Slip %	5.91	6.61	6.91	7.21	6.91	6.14

TRACTOR SOUND LEVEL WITH CAB	Radial Ply dB(A)	Bias Ply dB(A)
Maximum Available Power—Two Hours	76.5	78.0
75% of Pull at Maximum Power—Ten Hours		76.5
50% of Pull at Maximum Power—Two Hours		76.5
50% of Pull at Reduced Engine Speed—Two Hours		74.0
Bystander in 23rd (4-5) gear		87.5

Department of Agricultural Engineering

Dates of Test: May 31 to June 20, 1984

Manufacturer: J. I. CASE COMPANY, 700 State Street, Racine, Wisconsin 53404

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°)** 0.8408 **Fuel weight** 7.001 lbs/gal (0.839 kg/l) **Oil SAE 30 API service classification** SF, CD **To motor** 7.318 gal (27.701 l) **Drained from motor** 6.670 gal (25.249 l) **Transmission and final drive lubricant** Case Powergard PTF transmission fluid **Total time engine was operated** 48.0 hours.

ENGINE: Make Case Diesel **Type** six cylinder vertical with turbocharger **Serial No.** *10356696* **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 4.625" × 5.0" (117.5 mm × 127 mm) **Compression ratio** 15.8 to 1 **Displacement** 504 cu in (8259 ml) **Starting system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements and aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges and prestrainer **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: **Type** standard with duals **Serial No.** *99332894* **Tread width** rear 64" (1626 mm) to 134" (3404 mm) front 61" (1549 mm) to 89" (2261 mm) **Wheel base** 118" (2997 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 27.6" (700 mm) Vertical distance above roadway 39.8" (1011 mm) Horizontal distance from center of rear wheel tread 0" (0 mm) to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (6) range operator controlled powershift **Advertised speeds mph (km/h)** first 1.9 (3.0) second 2.1 (3.4) third 2.5 (4.0) fourth 2.9 (4.6) fifth 3.1 (5.0) sixth 3.2 (5.2) seventh 3.6 (5.8) eighth 3.7 (6.0) ninth 4.3 (6.9) tenth 4.4 (7.0) eleventh 4.9 (7.9) twelfth 5.0 (8.1) thirteenth 5.4 (8.6) fourteenth 5.8 (9.4) fifteenth 6.2 (9.9) sixteenth 6.7 (10.8) seventeenth 7.3 (11.7) eighteenth 8.4 (13.5) nineteenth 10.4 (16.7) twentieth 11.9 (19.1) twenty-first 13.8 (22.2) twenty-second 15.9 (25.5) twenty-third 17.2 (27.7) twenty-fourth 20.8 (33.5) reverse 3.1 (5.0), 5.4 (8.6), 7.3 (11.7) **Clutch** wet multiple disc hydraulically power actuated by foot pedal **Brakes** wet multiple disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 163.8" (4.16 m) left 163.8" (4.16 m) (on concrete surface without brake) right 184.5" (4.69 m) left 184.5" (4.69 m) **Turning space diameter** (on concrete surface with brake applied) right 342" (8.69 m) left 342" (8.69 m) (on concrete surface without brake) right 388.8" (9.88 m) left 388.8" (9.88 m) **Power take-off** 1002 rpm at 2100 engine rpm.

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	
Maximum Available Power—Two Hours 16th (3-4) Gear											
161.92 (120.74)	8845 (39.34)	6.86 (11.05)	2101	2.58	11.771 (44.560)	0.509 (0.310)	13.76 (2.710)	201 (93.6)	69 (20.6)	82 (27.8)	28.99 (97.88)
MAXIMUM POWER IN SELECTED GEARS											
141.35 (105.40)	17730 (78.86)	2.99 (4.81)	2148	13.63	6th (2-1) Gear			188 (86.7)	65 (18.3)	70 (21.1)	28.92 (97.66)
157.04 (117.10)	17197 (76.49)	3.42 (5.51)	2102	9.06	7th (1-6) Gear			192 (88.6)	66 (18.9)	72 (22.2)	28.93 (97.69)
160.99 (120.05)	16918 (75.26)	3.57 (5.74)	2100	8.45	8th (2-2) Gear			192 (88.6)	66 (18.9)	73 (22.8)	28.93 (97.69)
162.69 (121.32)	14266 (63.46)	4.28 (6.88)	2100	4.97	9th (2-3) Gear			195 (90.3)	67 (19.4)	74 (23.3)	28.94 (97.73)
163.17 (121.68)	14051 (62.50)	4.36 (7.01)	2099	4.89	10th (3-1) Gear			194 (90.0)	67 (19.4)	74 (23.3)	28.95 (97.76)
167.36 (124.80)	12590 (56.00)	4.98 (8.02)	2100	4.15	11th (2-4) Gear			195 (90.6)	67 (19.4)	75 (23.9)	28.95 (97.76)
167.28 (124.74)	12352 (54.94)	5.08 (8.17)	2101	3.98	12th (3-2) Gear			197 (91.4)	67 (19.4)	75 (23.9)	28.96 (97.79)
164.75 (122.86)	11378 (50.61)	5.43 (8.74)	2099	3.56	13th (2-5) Gear			197 (91.7)	67 (19.4)	76 (24.4)	28.96 (97.79)
165.21 (123.20)	10473 (46.58)	5.92 (9.52)	2100	3.13	14th (3-3) Gear			197 (91.7)	67 (19.4)	76 (24.4)	28.97 (97.83)
166.41 (124.09)	9894 (44.01)	6.31 (10.15)	2101	2.88	15th (2-6) Gear			198 (91.9)	68 (20.0)	78 (25.6)	28.97 (97.83)
166.82 (124.39)	9119 (40.56)	6.86 (11.04)	2100	2.70	16th (3-4) Gear			198 (92.2)	68 (20.0)	78 (25.6)	28.99 (97.89)
163.52 (121.94)	8228 (36.60)	7.45 (11.99)	2099	2.45	17th (3-5) Gear			198 (92.2)	69 (20.6)	79 (26.1)	28.98 (97.86)
163.64 (122.02)	7113 (31.64)	8.63 (13.88)	2100	2.01	18th (3-6) Gear			198 (92.2)	70 (21.1)	80 (26.7)	28.97 (97.83)

TIRES, BALLAST AND WEIGHT		Bias Ply Tires		Radial Ply Tires	
		With Ballast	Without Ballast	With Ballast	Without Ballast
Rear Tires Ballast	—No., size, ply & psi (kPa)	Four 20.8R38; 8; 14 (95)	Four 20.8R38; 8; 14 (95)	Four 20.8R38; 8; 14 (95)	Four 20.8R38; 8; 14 (95)
	—Liquid (each inner)	1297 lb (589 kg)	None	1380 lb (626 kg)	None
	—Cast Iron (each inner)	200 lb (91 kg)	None	None	None
Front Tires Ballast	—No., size, ply & psi (kPa)	Two 14L-16.1; 10; 40 (275)	Two 14L-16.1; 10; 40 (275)	Two 14L-16.1; 10; 40 (275)	Two 14L-16.1; 10; 40 (275)
	—Liquid (each)	None	None	None	None
	—Cast Iron (each)	288 lb (130 kg)	None	293 lb (133 kg)	None
Height of Drawbar		22.5 in (570 mm)	22.5 in (570 mm)	22.5 in (570 mm)	22.5 in (570 mm)
Static Weight with Operator—Rear		15465 lb (7015 kg)	12470 lb (5656 kg)	15390 lb (6981 kg)	12630 lb (5729 kg)
—Front		4325 lb (1962 kg)	3750 lb (1701 kg)	4335 lb (1966 kg)	3750 lb (1701 kg)
—Total		19790 lb (8977 kg)	16220 lb (7357 kg)	19725 lb (8947 kg)	16380 lb (7430 kg)