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Test 1527: Case 2394 Powershift Diesel 12 and 24-Speeds

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1527—CASE 2394 POWERSHIFT DIESEL
ALSO CASE INTERNATIONAL 2394 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)								
162.15 (120.91)	2100	10.486 (39.695)	0.453 (0.275)	15.46 (3.046)	188 (86.4)	69 (20.3)	76 (24.2)	28.90 (97.59)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
141.26 (105.34)	2152	9.424 (35.675)	0.467 (0.284)	14.99 (2.953)	184 (84.2)	70 (21.1)	77 (24.7)	..... .....
0.00 (0.00)	2327	2.833 (10.724)	..... .....	..... .....	171 (77.2)	70 (21.1)	76 (24.4)	..... .....
73.68 (54.94)	2245	6.141 (23.248)	0.583 (0.355)	12.00 (2.363)	177 (80.6)	71 (21.4)	77 (24.7)	..... .....
159.46 (118.91)	2100	10.401 (39.374)	0.457 (0.278)	15.33 (3.020)	188 (86.4)	71 (21.7)	79 (25.8)	..... .....
37.44 (27.92)	2283	4.363 (16.515)	0.816 (0.496)	8.58 (1.691)	174 (78.9)	71 (21.7)	79 (26.1)	..... .....
108.02 (80.55)	2194	7.757 (29.364)	0.503 (0.306)	13.92 (2.743)	182 (83.1)	72 (22.2)	80 (26.7)	..... .....
Av Av	86.64 (64.61)	2217 (25.817)	0.551 (0.335)	12.70 (2.503)	179 (81.7)	71 (21.5)	78 (25.4)	28.88 (97.52)

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											
137.78 (102.74)	8548 (38.02)	6.04 (9.73)	2100	4.81	10.264 (38.855)	0.521 (0.317)	13.42 (2.644)	194 (90.0)	75 (23.6)	84 (28.9)	28.83 (97.34)
75% of Pull at Maximum Power—Ten Hours 16th (3-4) Gear											
110.93 (82.72)	6573 (29.24)	6.33 (10.18)	2170	3.51	8.724 (33.025)	0.551 (0.335)	12.71 (2.505)	186 (85.8)	71 (21.6)	74 (23.1)	28.98 (97.85)
50% of Pull at Maximum Power—Two Hours 16th (3-4) Gear											
76.63 (57.15)	4382 (19.49)	6.56 (10.55)	2222	2.34	6.943 (26.282)	0.634 (0.386)	11.04 (2.174)	186 (85.6)	77 (24.7)	84 (28.6)	29.00 (97.93)
50% of Pull at Reduced Engine Speed—Two Hours 18th (3-6) Gear											
76.66 (57.16)	4382 (19.49)	6.56 (10.56)	1777	2.34	5.857 (22.172)	0.535 (0.325)	13.09 (2.578)	187 (86.1)	77 (25.0)	89 (31.4)	28.98 (97.84)
MAXIMUM POWER IN SELECTED GEARS											
124.29 (92.68)	15497 (68.93)	3.01 (4.84)	2112	14.77	8th (2-2) Gear			190 (87.8)	72 (22.2)	77 (25.0)	28.82 (97.32)
135.66 (101.16)	13795 (61.36)	3.69 (5.93)	2100	9.16	9th (2-3) Gear			189 (87.2)	71 (21.7)	74 (23.3)	29.03 (98.03)
134.93 (100.62)	13460 (59.87)	3.76 (6.05)	2100	9.01	10th (3-1) Gear			189 (87.2)	71 (21.7)	75 (23.9)	29.03 (98.03)
138.25 (103.09)	11955 (53.18)	4.34 (6.98)	2100	7.39	11th (2-4) Gear			192 (88.6)	76 (24.4)	82 (27.8)	29.00 (97.93)
138.53 (103.30)	11756 (52.29)	4.42 (7.11)	2100	7.17	12th (3-2) Gear			193 (89.4)	76 (24.4)	82 (27.8)	29.00 (97.93)
139.23 (103.82)	10998 (48.92)	4.75 (7.64)	2101	6.41	13th (2-5) Gear			193 (89.2)	75 (23.9)	81 (27.2)	29.01 (97.96)
140.21 (104.56)	10133 (45.07)	5.19 (8.35)	2101	5.71	14th (3-3) Gear			193 (89.4)	75 (23.9)	81 (27.2)	29.01 (97.96)
142.07 (105.95)	9632 (42.84)	5.53 (8.90)	2101	5.40	15th (2-6) Gear			193 (89.4)	73 (22.8)	77 (25.0)	29.02 (98.00)
141.04 (105.18)	8764 (38.98)	6.04 (9.71)	2099	4.77	16th (3-4) Gear			193 (89.2)	73 (22.8)	77 (25.0)	29.01 (97.96)
140.53 (104.79)	8010 (35.63)	6.58 (10.59)	2101	4.30	17th (3-5) Gear			193 (89.2)	74 (23.3)	78 (25.6)	29.01 (97.96)
139.69 (104.17)	6855 (30.49)	7.64 (12.30)	2100	3.73	18th (3-6) Gear			192 (88.9)	74 (23.3)	79 (26.1)	29.01 (97.96)
137.37 (102.44)	5424 (24.13)	9.50 (15.28)	2099	2.83	19th (4-1) Gear			190 (87.8)	75 (23.9)	80 (26.7)	29.01 (97.96)

LUGGING ABILITY IN 16th (3-4) GEAR

Crankshaft Speed rpm	2099	1892	1677	1459	1262	1054
Pull—lbs (kN)	8764 (38.98)	9947 (44.25)	10372 (46.14)	10618 (47.23)	10304 (45.84)	9314 (41.43)
Increase in Pull %	0	13	18	21	18	6
Power—Hp (kW)	141.04 (105.18)	143.08 (106.69)	131.76 (98.25)	117.11 (87.33)	98.46 (73.42)	74.82 (55.79)
Speed—Mph (km/h)	6.04 (9.71)	5.39 (8.68)	4.76 (7.67)	4.14 (6.66)	3.58 (5.77)	3.01 (4.85)
Slip %	4.77	5.71	5.87	6.18	6.02	5.56

TRACTOR SOUND LEVEL WITH CAB

	Radial Ply dB(A)	Bias Ply dB(A)
Maximum Available Power—Two Hours	76.0	76.0
75% of Pull at Maximum Power—Ten Hours		75.5
50% of Pull at Maximum Power—Two Hours		76.0
50% of Pull at Reduced Engine Speed—Two Hours		74.0
Bystander in 23rd (4-5) gear		88.0

Department of Agricultural Engineering

Dates of Test: June 7-23, 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 7.000 lbs/gal (0.839 kg/l) Oil SAE 30 API service classification SF, CD To motor 6.843 gal (25.902 l) Drained from motor 6.348 gal (24.030 l) Transmission and final drive lubricant Case Powergard PTF transmission fluid Total time engine was operated 54.0 hours.

ENGINE: Make Case Diesel Type six cylinder vertical with turbocharger Serial No. *10357180* Crankshaft lengthwise Rated rpm 2100 Bore and stroke 4.625" x 5.0" (117.5 mm x 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 with 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. *9933245* 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 27.5" (700 mm) Vertical distance above roadway 40.7" (1034 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 1.7 (2.8) second 2.0 (3.2) third 2.3 (3.8) fourth 2.7 (4.3) fifth 2.9 (4.7) sixth 3.0 (4.8) seventh 3.4 (5.4) eighth 3.5 (5.6) ninth 4.0 (6.5) tenth 4.1 (6.6) eleventh 4.6 (7.4) twelfth 4.7 (7.6) thirteenth 5.0 (8.1) fourteenth 5.5 (8.8) fifteenth 5.8 (9.3) sixteenth 6.3 (10.1) seventeenth 6.8 (11.0) eighteenth 7.9 (12.0) nineteenth 9.7 (15.6) twentieth 11.2 (18.0) twenty-first 12.9 (20.8) twenty-second 14.9 (23.9) twenty-third 16.1 (25.9) twenty-fourth 20.1 (32.4) reverse 2.9 (4.7), 5.0 (8.1), 6.8 (11.0) 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 342.0" (8.69 m) left 342.0" (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											
139.80 (104.25)	8138 (36.20)	6.44 (10.37)	2100	2.26	10.279 (38.909)	0.515 (0.313)	13.60 (2.679)	196 (90.8)	74 (23.3)	89 (31.4)	28.80 (97.25)
MAXIMUM POWER IN SELECTED GEARS											
121.97 (90.95)	16799 (74.72)	2.72 (4.38)	2119	14.54	6th (2-1) Gear			185 (85.0)	71 (21.7)	75 (23.9)	28.80 (97.25)
137.77 (102.73)	15907 (70.76)	3.25 (5.23)	2100	7.82	7th (1-6) Gear			188 (86.4)	71 (21.7)	76 (24.4)	28.81 (97.29)
139.93 (104.35)	15482 (68.87)	3.39 (5.45)	2100	7.04	8th (2-2) Gear			188 (86.4)	71 (21.7)	77 (25.0)	28.82 (97.33)
142.25 (106.08)	13267 (59.01)	4.02 (6.47)	2101	4.63	9th (2-3) Gear			188 (86.4)	71 (21.7)	78 (25.6)	28.82 (97.32)
142.48 (106.25)	13058 (58.08)	4.09 (6.58)	2099	4.54	10th (3-1) Gear			190 (87.5)	71 (21.7)	79 (26.1)	28.82 (97.32)
143.48 (106.99)	11489 (51.11)	4.68 (7.54)	2101	3.63	11th (2-4) Gear			192 (88.9)	71 (21.7)	80 (26.7)	28.82 (97.32)
142.82 (106.50)	11222 (49.92)	4.77 (7.68)	2100	3.54	12th (3-2) Gear			192 (88.6)	71 (21.7)	80 (26.7)	28.82 (97.32)
145.01 (108.13)	10668 (47.45)	5.10 (8.20)	2099	3.29	13th (2-5) Gear			191 (88.3)	71 (21.7)	81 (27.2)	28.82 (97.32)
143.60 (107.08)	9694 (43.12)	5.55 (8.94)	2100	2.86	14th (3-3) Gear			194 (89.7)	72 (22.2)	82 (27.8)	28.81 (97.29)
143.47 (106.98)	9088 (40.42)	5.92 (9.53)	2099	2.69	15th (2-6) Gear			193 (89.4)	72 (22.2)	83 (28.3)	28.81 (97.29)
143.44 (106.97)	8357 (37.17)	6.44 (10.36)	2099	2.34	16th (3-4) Gear			193 (89.4)	72 (22.2)	83 (28.3)	28.81 (97.29)
142.25 (106.07)	7624 (33.91)	7.00 (11.26)	2100	2.08	17th (3-5) Gear			193 (89.4)	72 (22.2)	84 (28.9)	28.81 (97.29)
139.95 (104.36)	6482 (28.83)	8.10 (13.03)	2099	1.82	18th (3-6) Gear			194 (89.7)	72 (22.2)	84 (28.9)	28.81 (97.29)

TIRES, BALLAST AND WEIGHT		Bias Ply Tires		Radial Ply Tires	
		With Ballast	Without Ballast	With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Four 20.8-38; 8; 14 (95)	Four 20.8-38; 8; 14 (95)	Four 20.8R38; 8; 14 (95)	Four 20.8R38; 8; 14 (95)
	—Liquid (each inner)	1068 lb (484 kg)	None	980 lb (445 kg)	None
	—Cast Iron (each)	None	None	None	None
Front Tires	—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)	110 lb (50 kg)	None	120 lb (54 kg)	None
Height of Drawbar		22.5 in (570 mm)	22.5 in (570 mm)	21.5 in (545 mm)	21.5 in (545 mm)
Static Weight with Operator—Rear		14625 lb (6634 kg)	12490 lb (5665 kg)	14610 lb (6627 kg)	12650 lb (5738 kg)
		3970 lb (1801 kg)	3750 lb (1701 kg)	3990 lb (1810 kg)	3750 lb (1701 kg)
		18595 lb (8435 kg)	16240 lb (7366 kg)	18600 lb (8437 kg)	16400 lb (7439 kg)



Case 2394 Powershift Diesel

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

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

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 return was maintained at 179°F (81.7°C). Twelve gears were chosen between 15% slip and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1527, July 19, 1984.

Report reissued. Supplemental sales permit for Case International 2394 Powershift Diesel June 18, 1985.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
L. L. BASHFORD
T. L. THOMPSON
Board of Tractor Test Engineers