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Test 1302: Case 2390 Powershift Diesel 12-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1302 — CASE 2390 POWERSHIFT DIESEL

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)									
160.72 (119.85)	2100	10.555 (39.953)	0.457 (0.278)	15.23 (3.000)	191 (88.2)	57 (13.9)	75 (24.0)	28.753 (97.096)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
140.48 (104.76)	2161	9.565 (36.206)	0.474 (0.288)	14.69 (2.893)	188 (86.9)	56 (13.6)	74 (23.6)	..... .....
0.00 (0.00)	2306	2.978 (11.275)	..... .....	..... .....	176 (80.0)	56 (13.3)	74 (23.3)	..... .....
72.49 (54.05)	2230	6.159 (23.316)	0.591 (0.360)	11.77 (2.318)	182 (83.6)	57 (13.9)	75 (24.2)	..... .....
160.04 (119.34)	2100	10.543 (39.910)	0.459 (0.279)	15.18 (2.990)	192 (88.9)	57 (13.9)	75 (23.9)	..... .....
36.84 (27.47)	2266	4.569 (17.295)	0.863 (0.525)	8.06 (1.588)	178 (80.8)	56 (13.3)	74 (23.1)	..... .....
107.40 (80.09)	2204	7.858 (29.745)	0.509 (0.310)	13.67 (2.693)	186 (85.6)	57 (13.9)	75 (23.9)	..... .....
Av Av	86.21 (64.29)	2211	6.945 (26.291)	0.561 (0.341)	12.41 (2.445)	184 (84.3)	57 (13.7)	75 (23.7)	28.757 (97.107)

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 6th (2I) Gear											
137.72 (102.70)	9946 (44.24)	5.19 (8.36)	2100	6.04	10.435 (39.499)	0.527 (0.321)	13.20 (2.600)	190 (87.5)	46 (7.8)	58 (14.4)	28.910 (97.625)
75% of Pull at Maximum Power—Ten Hours 6th (2I) Gear											
113.06 (84.31)	7660 (34.07)	5.53 (8.91)	2193	4.25	8.933 (33.816)	0.550 (0.335)	12.66 (2.493)	187 (85.9)	45 (7.2)	57 (14.1)	28.685 (96.865)
50% of Pull at Maximum Power—Two Hours 6th (2I) Gear											
78.19 (58.30)	5137 (22.85)	5.71 (9.19)	2231	2.78	7.112 (26.922)	0.633 (0.385)	10.99 (2.166)	182 (83.1)	40 (4.4)	46 (7.8)	28.535 (96.358)
50% of Pull at Reduced Engine Speed—Two Hours 9th (3H) Gear											
78.41 (58.47)	5139 (22.86)	5.72 (9.21)	1550	2.83	5.639 (21.347)	0.501 (0.304)	13.90 (2.739)	183 (83.6)	40 (4.2)	47 (8.3)	28.595 (96.561)

MAXIMUM POWER IN SELECTED GEARS

126.89 (94.62)	16020 (71.26)	2.97 (4.78)	2154	14.89	3rd (1H) Gear		184 (84.4)	40 (4.4)	46 (7.8)	28.910 (97.625)
139.87 (104.30)	14024 (62.38)	3.74 (6.02)	2099	9.83	4th (2L) Gear		192 (88.9)	50 (10.0)	65 (18.3)	28.880 (97.523)
143.02 (106.65)	12138 (53.99)	4.42 (7.11)	2099	7.49	5th (3L) Gear		192 (88.6)	50 (10.0)	65 (18.3)	28.890 (97.557)
143.37 (106.91)	10360 (46.08)	5.19 (8.35)	2100	6.19	6th (2I) Gear		194 (89.7)	49 (9.4)	63 (17.2)	28.890 (97.557)
144.90 (108.05)	8985 (39.97)	6.05 (9.73)	2101	5.18	7th (3I) Gear		193 (89.4)	49 (9.4)	64 (17.8)	28.870 (97.490)
146.01 (108.88)	8314 (36.98)	6.59 (10.60)	2100	4.78	8th (2H) Gear		193 (89.2)	50 (10.0)	65 (18.3)	28.870 (97.490)
144.87 (108.03)	7094 (31.55)	7.66 (12.32)	2100	3.98	9th (3H) Gear		192 (88.9)	51 (10.6)	66 (18.9)	28.860 (97.456)

LUGGING ABILITY IN 6th (2I) GEAR

Crankshaft Speed rpm		2100	1885	1678	1469	1254	1046
Pull—lbs (kN)		10360 (46.08)	11287 (50.21)	11778 (52.39)	11828 (52.61)	10918 (48.56)	9613 (42.76)
Increase in Pull %		0	9	14	14	5	-7
Power—Hp (kW)		143.37 (106.91)	139.20 (103.80)	128.79 (96.04)	113.01 (84.27)	89.79 (66.96)	66.50 (49.59)
Speed—Mph (km/h)		5.19 (8.35)	4.62 (7.44)	4.10 (6.60)	3.58 (5.77)	3.08 (4.96)	2.59 (4.18)
Slip %		6.19	6.81	7.26	7.56	6.50	5.73

Department of Agricultural Engineering

Dates of Test: April 6-16, 1979

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

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8359 **Fuel weight** 6.960 lbs/gal (0.834 kg/l) **Oil SAE 30 API service classification** SE-CD **To motor** 5.436 gal (20.575 l) **Drained from motor** 5.392 gal (20.409 l) **Transmission and final drive lubricant** Case TFD Fluid **Total time engine was operated** 38.5 hours

ENGINE Make Case Diesel **Type** Six cylinder vertical with turbocharger **Serial No.** 10170112 **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) **Cranking 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 **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard with duals **Serial No.** 8841162 **Tread width** rear 64" (1626 mm) to 134" (3404 mm) front 64" (1626 mm) to 92" (2337 mm) **Wheel base** 104" (2642 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 31.7" (805 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 (3) range operator controlled powershift **Advertised speeds mph (km/h)** first 2.0 (3.2) second 2.7 (4.4) third 3.3 (5.3) fourth 4.1 (6.6) fifth 4.7 (7.6) sixth 5.5 (8.9) seventh 6.2 (10.0) eighth 6.9 (11.1) ninth 7.8 (12.6) tenth 10.9 (17.5) eleventh 14.7 (23.7) twelfth 20.1 (32.4) reverse 3.3 (5.3), 6.9 (11.1), 7.8 (12.6) **Clutch** multiple wet disc hydraulically 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 152" (3.86 m) left 152" (3.86 m) (on concrete surface without brake) right 169" (4.29 m) left 169" (4.29 m) **Turning space diameter** (on concrete surface with brake applied) right 317" (8.05 m) left 317" (8.05 m) (on concrete surface without brake) right 356" (9.04 m) left 356" (9.04 m) **Power take-off** 1002 rpm at 2100 engine rpm.

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 re-

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—Two Hours	76.5
75% of Pull at Maximum Power—Ten Hours	77.0
50% of Pull at Maximum Power—Two Hours	77.0
50% of Pull at Reduced Engine Speed—Two Hours	74.5
Bystander in 12th (4H) gear	87.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (<i>kPa</i>)	Four 20.8-38; 8; 12 (<i>85</i>)	Four 20.8-38; 8; 12 (<i>85</i>)
	Ballast	1470 lb (<i>667 kg</i>)	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi (<i>kPa</i>)	Two 16.5L-16.1; 10; 36 (<i>250</i>)	Two 16.5L-16.1; 10; 36 (<i>250</i>)
	* Ballast	None	None
	—Cast Iron (each)	90 lb (<i>41 kg</i>)	None
Height of drawbar		22 in (<i>560 mm</i>)	22 in (<i>560 mm</i>)
Static weight with operator—rear		14450 lb (<i>6555 kg</i>)	11510 lb (<i>5221 kg</i>)
front		4260 lb (<i>1932 kg</i>)	4080 lb (<i>1851 kg</i>)
Total		18710 lb (<i>8487 kg</i>)	15590 lb (<i>7072 kg</i>)

turn was 187°F (86.2°C). Seven 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. 1302.

LOUIS I. LEVITICUS
Engineer-in Charge

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



Case 2390 Powershift Diesel