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Test 1304: Case 2090 Manual Diesel 8-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1304 — CASE 2090 MANUAL DIESEL 8 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—998 rpm)									
108.74 (81.09)	2100	7.061 (26.729)	0.452 (0.275)	15.40 (3.034)	189 (87.4)	61 (16.3)	75 (24.0)	28.997 (97.917)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
95.40 (71.14)	2168	6.409 (24.263)	0.468 (0.284)	14.88 (2.932)	186 (85.6)	62 (16.7)	76 (24.2)	..... .....
0.00 (0.00)	2316	2.379 (9.007)	..... .....	..... .....	176 (79.7)	62 (16.4)	74 (23.3)	..... .....
49.49 (36.91)	2256	4.263 (16.137)	0.599 (0.365)	11.61 (2.287)	182 (83.1)	62 (16.7)	75 (23.9)	..... .....
109.54 (81.69)	2100	7.125 (26.971)	0.453 (0.275)	15.37 (3.029)	192 (88.6)	62 (16.7)	75 (23.9)	..... .....
25.09 (18.71)	2288	3.259 (12.335)	0.904 (0.550)	7.70 (1.517)	177 (80.6)	62 (16.7)	74 (23.6)	..... .....
73.07 (54.49)	2214	5.405 (20.461)	0.515 (0.313)	13.52 (2.663)	184 (84.4)	63 (17.2)	76 (24.2)	..... .....
Av Av	58.77 (43.82)	2224	4.807 (18.196)	0.569 (8.346)	12.23 (2.408)	183 (83.7)	62 (16.7)	75 (23.8)	29.010 (97.963)

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 5th (3L) Gear											
93.17 (69.48)	6288 (27.97)	5.56 (8.94)	2100	5.64	6.950 (26.310)	0.519 (0.316)	13.41 (2.641)	189 (86.9)	59 (15.0)	71 (21.4)	28.915 (97.642)
75% of Pull at Maximum Power—Ten Hours 5th (3L) Gear											
75.53 (56.32)	4801 (21.36)	5.90 (9.49)	2191	3.94	5.952 (22.530)	0.548 (0.334)	12.69 (2.500)	185 (84.9)	63 (17.3)	69 (20.7)	28.778 (97.179)
50% of Pull at Maximum Power—Two Hours 5th (3L) Gear											
52.59 (39.22)	3217 (14.31)	6.13 (9.87)	2249	2.74	4.903 (18.560)	0.649 (0.395)	10.73 (2.113)	179 (81.7)	46 (7.8)	48 (8.6)	28.925 (97.675)
50% of Pull at Reduced Engine Speed—Two Hours 6th (3H) Gear											
52.26 (38.97)	3191 (14.19)	6.14 (9.88)	1786	2.58	4.059 (15.365)	0.541 (0.329)	12.88 (2.537)	180 (81.9)	47 (8.1)	49 (9.4)	28.980 (97.861)

MAXIMUM POWER IN SELECTED GEARS

80.04 (59.69)	11655 (51.84)	2.58 (4.14)	2182	14.61	2nd (1H) Gear			183 (83.6)	51 (10.6)	55 (12.8)	28.990 (97.895)
92.11 (68.69)	9782 (43.51)	3.53 (5.68)	2099	9.96	3rd (2L) Gear			191 (88.1)	60 (15.6)	74 (23.3)	28.930 (97.692)
94.99 (70.84)	7747 (34.46)	4.60 (7.40)	2099	6.95	4th (2H) Gear			191 (88.3)	60 (15.6)	74 (23.3)	28.930 (97.692)
94.93 (70.79)	6397 (28.45)	5.57 (8.96)	2100	5.48	5th (3L) Gear			191 (88.1)	60 (15.6)	74 (23.3)	28.940 (97.726)
95.31 (71.07)	5036 (22.40)	7.10 (11.42)	2099	4.13	6th (3H) Gear			191 (88.1)	60 (15.6)	74 (23.3)	28.930 (97.692)

LUGGING ABILITY IN 5th (3L) GEAR

Crankshaft Speed rpm	2100	1886	1679	1467	1256	1049
Pull—lbs (kN)	6397 (28.45)	6935 (30.85)	7269 (32.33)	7252 (32.26)	6856 (30.50)	6271 (27.90)
Increase in Pull %	0	8	14	13	7	-2
Power—Hp (kW)	94.93 (70.79)	91.90 (68.53)	85.41 (63.69)	74.48 (55.54)	60.49 (45.11)	46.48 (34.66)
Speed—Mph (km/h)	5.57 (8.96)	4.97 (8.00)	4.41 (7.09)	3.85 (6.20)	3.31 (5.32)	2.78 (4.47)
Slip %	5.48	6.03	6.34	6.49	6.03	5.56

Department of Agricultural Engineering

Dates of Test: April 11-21, 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** 4.233 gal (16.022 l) **Drained from motor** 3.989 gal (15.098 l) **Transmission and final drive lubricant** Case TFD Fluid **Total time engine was operated** 34.5 hours.

ENGINE Make Case Diesel **Type** Six cylinder vertical **Serial No.** 10172513 **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 4.625" × 5.0" (117.5 mm × 127 mm) **Compression ratio** 16 to 1 **Displacement** 504 cu in (8259 ml) **Cranking system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: **Type** standard **Serial No.** 8841892 **Tread width** rear 64" (1626 mm) to 88" (2235 mm) front 60" (1524 mm) to 88" (2235 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 29.0" (737 mm) Vertical distance above roadway 41.3" (1049 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 **Advertised speeds mph (km/h)** first 2.2 (3.5) second 2.8 (4.5) third 3.8 (6.1) fourth 4.8 (7.7) fifth 5.4 (8.7) sixth 6.7 (10.8) seventh 11.7 (18.8) eighth 16.1 (25.9) reverse 2.7 (4.4), 4.6 (7.4), 6.5 (10.5), 14.1 (22.7) **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 142" (3.61 m) left 142" (3.61 m) (on concrete surface without brake) right 167" (4.24 m) left 167" (4.24 m) **Turning space diameter** (on concrete surface with brake applied) right 296" (7.52 m) left 296" (7.52 m) (on concrete surface without brake) right 347" (8.81 m) left 347" (8.81 m) **Power take-off** 998 rpm at 2100 engine rpm and 534 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 return was 183°F (83.8°C). Five gears were chosen between 15% slip and 10 mph (16.1 km/h).

TRACTOR SOUND LEVEL WITH CAB		dB(A)
Maximum Available Power—Two Hours		77.0
75% of Pull at Maximum Power—Ten Hours		76.0
50% of Pull at Maximum Power—Two Hours		77.5
50% of Pull at Reduced Engine Speed—Two Hours		76.0
Bystander in 8th (4H) gear		89.5
TIRES, BALLAST AND WEIGHT		
Rear Tires		
—No., size, ply & psi (kPa)	Two 20.8-38; 8; 18 (125)	Two 20.8-38; 8; 18 (125)
Ballast	None	None
—Liquid (each)	1440 lb (653 kg)	None
—Cast Iron (each)		
Front Tires		
—No., size, ply & psi (kPa)	Two 11.00-16; 8; 40 (275)	Two 11.00-16; 8; 40 (275)
Ballast	None	None
—Liquid (each)	120 lb (54 kg)	None
—Cast Iron (each)		
* Height of drawbar	21 in (535 mm)	21 in (535 mm)
Static weight with operator—rear		
front	11490 lb (5212 kg)	8610 lb (3905 kg)
Total	3540 lb (1606 kg)	3300 lb (1497 kg)
	15030 lb (6818 kg)	11910 lb (5402 kg)

We, the undersigned, certify that this is a true and correct report or official Tractor Test **1304**.

LOUIS I. LEVITICUS
Engineer-in Charge

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



Case 2090 Manual Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottosen, Director