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10-28-1985

## Test 1582: Case International 2394 Powershift Diesel 12 and 24-Speeds

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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# NEBRASKA TRACTOR TEST 1582

## CASE INTERNATIONAL 2394 POWERSHIFT DIESEL

### 24 SPEED ALSO 12 SPEED

### CHASSIS SERIAL NUMBERS 9939480 AND HIGHER

Department of Agricultural Engineering

Dates of Test: October 16 to 28, 1985

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

#### 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)									
162.92 (121.49)	2100	10.304 (39.007)	0.444 (0.270)	15.81 (3.115)	189 (87.3)	64 (17.6)	76 (24.3)	29.03 (98.02)	
VARYING POWER AND FUEL CONSUMPTION — Two Hours									
142.23 (106.06)	2157	9.313 (35.252)	0.459 (0.279)	15.27 (3.009)	186 (85.3)	64 (17.8)	75 (23.9)	..... .....	
0.00 (0.00)	2299	2.922 (11.060)	..... .....	..... .....	178 (81.1)	62 (16.7)	74 (23.1)	..... .....	
73.45 (54.78)	2228	5.831 (22.071)	0.557 (0.339)	12.60 (2.482)	181 (82.8)	62 (16.7)	74 (23.3)	..... .....	
162.40 (121.10)	2100	10.241 (38.766)	0.442 (0.269)	15.86 (3.124)	189 (87.2)	62 (16.7)	76 (24.2)	..... .....	
37.27 (27.79)	2261	4.419 (16.727)	0.832 (0.506)	8.43 (1.661)	180 (81.9)	62 (16.7)	76 (24.2)	..... .....	
108.33 (80.79)	2191	7.486 (28.338)	0.485 (0.295)	14.47 (2.851)	183 (83.9)	63 (17.2)	75 (23.9)	..... .....	
Av Av	87.28 (65.09)	2206 (25.369)	6.702 (2.369)	0.538 (0.328)	13.02 (2.566)	183 (83.7)	63 (16.9)	75 (23.8)	29.00 (97.93)

#### 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 12th (3-2) Gear											
145.56 (108.54)	10649 (47.37)	5.13 (8.25)	2100	3.02	10.138 (38.378)	0.488 (0.297)	14.36 (2.828)	191 (88.3)	65 (18.3)	74 (23.3)	28.63 (96.66)
75% of Pull at Maximum Power — Ten Hours 12th (3-2) Gear											
117.06 (87.29)	8184 (36.40)	5.36 (8.63)	2181	2.23	8.635 (32.688)	0.517 (0.315)	13.56 (2.670)	187 (86.2)	54 (12.2)	68 (19.9)	29.06 (98.11)
50% of Pull at Maximum Power — Two Hours 12th (3-2) Gear											
79.71 (59.44)	5456 (24.27)	5.48 (8.82)	2210	1.45	6.702 (25.369)	0.590 (0.359)	11.89 (2.343)	186 (85.3)	65 (18.1)	74 (23.3)	28.60 (96.56)
50% of Pull at Reduced Engine Speed — Two Hours 16th (3-4) Gear											
79.74 (59.46)	5456 (24.27)	5.48 (8.82)	1661	1.45	5.604 (21.213)	0.493 (0.300)	14.23 (2.803)	185 (85.0)	52 (10.8)	62 (16.7)	29.08 (98.20)

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel  
**Cetane No.** 46.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F (15/15°C)** 0.8423 **Fuel weight** 7.013 lbs/gal (0.840 kg/l) **Oil Case Enginegard SAE 30 API service classification** CD/SF **To motor** 6.769 gal (25.624 l) **Drained from motor** 6.459 gal (24.449 l) **Transmission and final drive lubricant** Case Powergard PTF transmission fluid **Total time engine was operated** 38.0 hours.

**ENGINE:** Make Case Diesel **Type** six cylinder vertical with turbocharger **Serial No.** \*10366623\* **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 4.625" × 5.00" (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.** \*9939481\* **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 centerline 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 1.9 (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

# MAXIMUM POWER IN SELECTED GEARS

131.90 (98.36)	17425 (77.51)	2.84 (4.57)	2123	13.87	5th (1-5) Gear	186 (85.3)	45 (7.2)	48 (8.9)	28.99 (97.89)
138.94 (103.60)	17142 (76.25)	3.04 (4.89)	2102	9.99	6th (2-1) Gear	186 (85.6)	47 (8.3)	53 (11.7)	29.02 (98.00)
146.01 (108.88)	15386 (68.44)	3.56 (5.73)	2100	5.43	7th (1-6) Gear	186 (85.6)	59 (15.0)	62 (16.7)	28.76 (97.12)
147.33 (109.87)	14965 (66.57)	3.69 (5.94)	2098	5.11	8th (2-2) Gear	186 (85.6)	59 (15.0)	63 (17.2)	28.74 (97.05)
147.25 (109.80)	12744 (56.69)	4.33 (6.97)	2100	3.69	9th (2-3) Gear	187 (85.8)	60 (15.6)	64 (17.8)	28.73 (97.02)
147.84 (110.24)	12565 (55.89)	4.41 (7.10)	2101	3.69	10th (3-1) Gear	188 (86.7)	60 (15.6)	65 (18.3)	28.72 (96.98)
148.38 (110.65)	11043 (49.12)	5.04 (8.11)	2101	2.93	11th (2-4) Gear	189 (86.9)	60 (15.6)	66 (18.9)	28.71 (96.95)
148.98 (111.10)	10912 (48.54)	5.12 (8.24)	2098	2.93	12th (3-2) Gear	189 (87.2)	60 (15.6)	67 (19.4)	28.70 (96.92)
147.83 (110.24)	10130 (45.06)	5.47 (8.81)	2098	2.76	13th (2-5) Gear	189 (87.2)	61 (16.1)	68 (20.0)	28.69 (96.88)
147.08 (109.68)	9262 (41.20)	5.95 (9.58)	2099	2.41	14th (3-3) Gear	190 (87.5)	62 (16.7)	69 (20.6)	28.68 (96.85)
146.82 (109.49)	8685 (38.63)	6.34 (10.20)	2098	2.24	15th (2-6) Gear	189 (87.2)	63 (17.2)	70 (21.1)	28.68 (96.85)
146.43 (109.19)	7953 (35.38)	6.90 (11.11)	2101	2.07	16th (3-4) Gear	190 (87.5)	65 (18.3)	73 (22.8)	28.66 (96.78)
144.67 (107.88)	7246 (32.23)	7.49 (12.05)	2098	1.80	17th (3-5) Gear	190 (87.8)	65 (18.3)	72 (22.2)	28.67 (96.81)
144.28 (107.59)	6243 (27.77)	8.67 (13.95)	2100	1.54	18th (3-6) Gear	189 (87.2)	65 (18.3)	71 (21.7)	28.67 (96.81)

# LUGGING ABILITY IN 12th (3-2) GEAR

Crankshaft Speed rpm	2098	1892	1683	1470	1256	1048
Pull—lbs (kN)	10912 (48.54)	11837 (52.65)	12368 (55.02)	12456 (55.41)	12168 (54.13)	11257 (50.07)
Increase in Pull %	0	8	13	14	12	3
Power—Hp (kW)	148.98 (111.10)	145.27 (108.33)	134.62 (100.39)	118.40 (88.29)	98.91 (73.76)	76.61 (57.12)
Speed—Mph (km/h)	5.12 (8.24)	4.60 (7.41)	4.08 (6.57)	3.56 (5.74)	3.05 (4.91)	2.55 (4.11)
Slip %	2.93	3.10	3.44	3.61	3.44	3.10

# TRACTOR SOUND LEVEL WITH CAB

dB(A)

Maximum Available Power—Two Hours	75.5
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	75.0
Bystander in 23rd (4-5) gear	87.0

# TIRES, BALLAST AND WEIGHT

<b>Rear Tires</b>	—No., size, ply & psi (kPa)	<b>With Ballast</b>	<b>Without Ballast</b>
Ballast	—Liquid (each inner) —Cast Iron (each)	Four 20.8R38; 8; inner 16 (110) outer 12 (85) 990 lb (449 kg) None	Four 20.8R38; 8; inner 16 (110) outer 12 (85) None None
<b>Front Tires</b>	—No., size, ply & psi (kPa)	Two 14L-16.1; 10; 44 (305)	Two 14L-16.1; 10; 44 (305)
Ballast	—Liquid (each) —Cast Iron (each)	None 125 lb (57 kg)	None None
<b>Height of Drawbar</b>		20.5 in (520 mm)	20.5 in (520 mm)
<b>Static Weight with Operator</b>	—Rear —Front —Total	14630 lb (6636 kg) 4000 lb (1814 kg) 18630 lb (8450 kg)	12650 lb (5738 kg) 3750 lb (1701 kg) 16400 lb (7439 kg)

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 **Unladen tractor mass** 13970 lb (6337 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 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 was maintained at 156°F (68.9°C). Fourteen gears were chosen between 15% slp and 10 mph (16.1 km/h). The performance figures on this report apply to tractor chassis Serial No. 104-00331 and higher.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1582**, December 3, 1985.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

W. E. SPLINTER

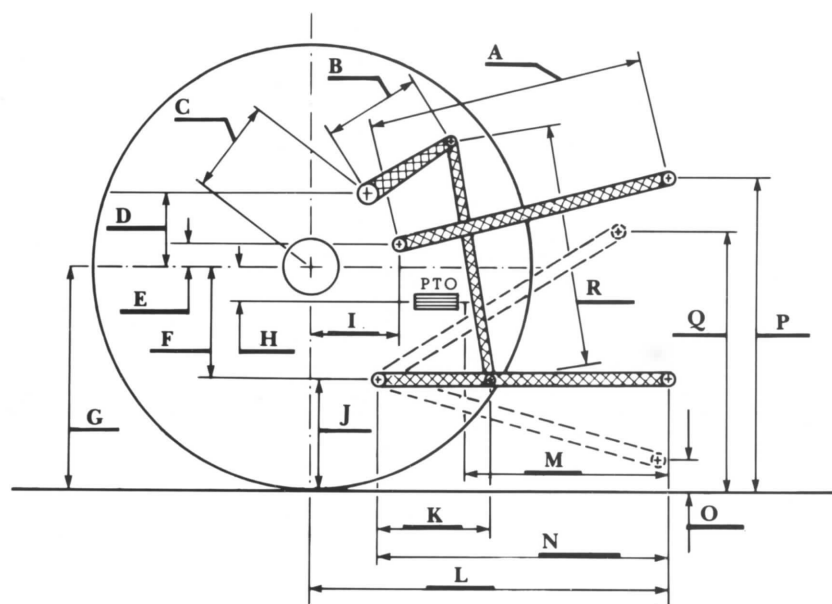
L. L. BASHFORD

Board of Tractor Test Engineers

## THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi (kPa)	2225 (15340)	
Location	remote outlet	
Hydraulic oil temperature °F (°C)	150 (66)	
Location	transmission drain plug	
	<b>Maximum Lift Capacity</b>	<b>Lift Capacity for Transport</b>
QUICK ATTACH	yes	
CATEGORY	III	*not measured
LOAD lbs (kg)	7758 (3519)	
TIME sec	2.34	
HITCH POINT MOVEMENT in (mm)		
Lowest position	9.9 (251)	
Top of timed range	35.9 (912)	
Highest position	40.3 (1024)	
LOAD CG MOVEMENT in (mm)		
Lowest position	9.7 (246)	
Top of timed range	39.2 (996)	
Highest position	46.0 (1168)	

\*Implement load capacity for transport purposes not specified by manufacturer.



Hitch Dimensions as Tested — No Load

	inch	mm
A	23.5	597
B	11.4	289
C	11.5	293
D	1.9	48
E	7.7	196
F	12.7	322
G	33.2	843
H	6.0	152
I	21.9	557
J	20.5	521
K	17.4	441
L	45.8	1163
L'	49.8	1265
M	21.1	536
N	35.4	899
O	8.0	203
P	42.6	1082
Q	42.1	1070
R	20.8	527

L' to end of quick attach



Case International 2394 Diesel