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Test 1382: Case 1490 Powershift Diesel 12-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1382 — CASE 1490 POWERSHIFT DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption			Temperature °F (°C)			Barometer
		gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cooling medium	Air wet bulb	Air dry bulb	inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1075 rpm)								
70.91 (52.88)	2200	4.544 (17.201)	0.449 (0.273)	15.60 (3.074)	190 (87.7)	55 (12.9)	75 (24.1)	29.020 (97.996)
Standard Power take-off Speed (1000 rpm)—One Hour								
70.48 (52.56)	2048	4.292 (16.247)	0.427 (0.260)	16.42 (3.235)	190 (87.6)	55 (12.9)	75 (23.9)	29.000 (97.929)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
62.57 (46.66)	2285	4.253 (16.099)	0.477 (0.290)	14.71 (2.898)	183 (83.9)	55 (12.8)	75 (23.9)	..... (97.996)
0.00 (0.00)	2368	1.472 (5.572)	..... (0.290)	..... (2.898)	172 (77.8)	55 (12.8)	74 (23.3)	..... (97.996)
31.99 (23.85)	2334	2.764 (10.463)	0.606 (0.369)	11.57 (2.279)	175 (79.4)	55 (12.8)	75 (23.6)	..... (97.996)
71.86 (53.59)	2202	4.596 (17.398)	0.448 (0.273)	15.64 (3.080)	190 (87.5)	56 (13.3)	76 (24.4)	..... (97.996)
16.11 (12.01)	2350	2.045 (7.741)	0.890 (0.541)	7.88 (1.551)	174 (78.6)	56 (13.3)	76 (24.2)	..... (97.996)
47.45 (35.38)	2310	3.479 (13.169)	0.514 (0.313)	13.64 (2.687)	179 (81.7)	55 (12.8)	75 (23.9)	..... (97.996)
Av 38.33 Av (28.58)	2308	3.102 (11.742)	0.567 (0.345)	12.36 (2.434)	179 (81.5)	55 (12.9)	75 (23.9)	28.997 (97.917)

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 7th (2-3) Gear											
60.12 (44.83)	4656 (20.71)	4.85 (7.81)	2199	6.61	4.582 (17.345)	0.534 (0.325)	13.12 (2.585)	192 (88.9)	54 (12.5)	66 (18.9)	28.795 (97.240)
75% of Pull at Maximum Power—Ten Hours 7th (2-3) Gear											
48.90 (36.46)	3569 (15.88)	5.14 (8.27)	2290	4.89	4.072 (15.414)	0.584 (0.355)	12.01 (2.366)	187 (86.1)	56 (13.1)	62 (16.7)	28.800 (97.250)
50% of Pull at Maximum Power—Two Hours 7th (2-3) Gear											
33.47 (24.96)	2374 (10.56)	5.29 (8.51)	2316	3.25	3.281 (12.420)	0.687 (0.418)	10.20 (2.009)	185 (85.0)	58 (14.2)	65 (18.3)	28.645 (96.730)
50% of Pull at Reduced Engine Speed—Two Hours 9th (2-4) Gear											
33.55 (25.02)	2368 (10.53)	5.31 (8.55)	1702	3.17	2.496 (9.448)	0.522 (0.318)	13.44 (2.648)	181 (82.8)	59 (15.0)	68 (20.0)	28.630 (96.680)

MAXIMUM POWER IN SELECTED GEARS

52.22 (38.94)	8405 (37.39)	2.33 (3.75)	2275 (8.15)	14.78	4th (1-4) Gear		188 (86.7)	46 (7.8)	50 (10.0)	28.860 (97.460)
55.18 (41.15)	8267 (36.77)	2.50 (4.03)	2202 (7.92)	14.60	5th (2-1) Gear		189 (87.2)	48 (8.9)	54 (12.2)	28.850 (97.420)
59.15 (44.11)	6088 (27.08)	3.64 (5.86)	2201 (7.92)	8.87	6th (2-2) Gear		190 (87.8)	51 (10.6)	58 (14.4)	28.850 (97.420)
61.10 (45.56)	4727 (21.03)	4.85 (7.81)	2200 (7.92)	6.65	7th (2-3) Gear		190 (87.8)	48 (8.9)	54 (12.2)	28.850 (97.420)
59.58 (44.43)	3404 (15.14)	6.56 (10.46)	2201 (7.92)	4.74	8th (3-1) Gear		190 (87.8)	52 (11.1)	59 (15.0)	28.840 (97.390)
61.56 (45.91)	3415 (15.19)	6.76 (10.88)	2199 (7.92)	4.74	9th (2-4) Gear		190 (87.8)	53 (11.7)	60 (15.6)	28.830 (97.350)
58.69 (43.77)	2420 (10.76)	9.10 (14.65)	2200 (7.92)	3.28	10th (3-2) Gear		190 (87.8)	53 (11.7)	61 (16.1)	28.820 (97.320)

Department of Agricultural Engineering

Dates of Test: March 18-April 2, 1981

Manufacturer: J. I. CASE COMPANY, Racine,
Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel
Cetane No. 46.3 (rating taken from oil company's
inspection data) Specific gravity converted to 60°/
60° (15°/15°) 0.8420 Fuel weight 7.011 lbs/gal
(0.840 kg/l) Oil SAE 30 API service classifica-
tion CD-SE To motor 2.520 gal (9.535 l) Drained
from motor 1.813 gal (6.863 l) Transmission lub-
ricant Case TFD fluid Final drive lubricant Case
ETHB fluid Total time engine was operated 37.0
hours

ENGINE Make Case Diesel **Type** four cylinder
vertical with turbocharger **Serial No.** 220101
11410830 **Crankshaft** lengthwise **Rated rpm**
2200 **Bore and stroke** 3.939" × 4.500" (100 mm ×
114.3 mm) **Compression ratio** 16 to 1 **Displace-
ment** 219 cu in (3590 ml) **Starting system** 12 volt
Lubrication pressure Air cleaner two paper ele-
ments with centrifugal precleaner **Oil filter** one
full flow cartridge **Fuel filter** two paper elements
with sediment bowl and screen **Muffler** vertical
Cooling medium temperature control one ther-
mostat.

CHASSIS: Type standard **Serial No.** 1490/53/
11181533 **Tread width** rear 60.75" (1543 mm) to
85" (2159 mm) front 60" (1524 mm) to 88" (2235
mm) **Wheel base** 88" (2235 mm) **Center of gravity**
(without operator or ballast, with minimum tread,
with fuel tank filled and tractor serviced for op-
eration) Horizontal distance forward from center-
line of rear wheels 29.7" (754 mm) Vertical dis-
tance above roadway 37.7" (958 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 (4) range operator controlled
powershift **Advertised speeds mph (km/h)** first
1.0 (1.6) second 1.4 (2.2) third 1.8 (2.9) fourth 2.5
(4.0) fifth 2.8 (4.5) sixth 3.8 (6.1) seventh 5.0 (8.0)
eighth 6.6 (10.6) ninth 6.8 (10.9) tenth 9.0 (14.4)
eleventh 11.7 (18.8) twelfth 16.0 (25.7) reverse 2.9
(4.6), 4.0 (6.4), 5.1 (8.2), 7.0 (11.3) **Clutch** single
dry disc hydraulically operated by foot pedal
Brakes multiple wet disc hydraulically operated by
two foot pedals which can be locked together and
hand lever **Steering** hydrostatic **Turning radius**
(on concrete surface with brake applied) right
143" (3.63 m) left 143" (3.63 m) (on concrete sur-
face without brake) right 158" (4.01 m) left 158"
(4.01 m) **Turning space diameter** (on concrete
surface with brake applied) right 298" (7.57 m) left
298" (7.57 m) (on concrete surface without brake)
right 328" (8.33 m) left 328" (8.33 m) **Power take-
off** 1000 rpm at 2048 engine rpm and 540 rpm at
2077 engine rpm.

LUGGING ABILITY IN 7th (2-3) GEAR

Crankshaft Speed rpm	2200	1983	1758	1536	1309	1094
Pull—lbs (kN)	4727 (21.03)	5170 (23.00)	5462 (24.30)	5614 (24.97)	5561 (24.74)	5347 (23.78)
Increase in Pull %	0	9	16	19	18	13
Power—Hp (kW)	61.10 (45.56)	59.84 (44.62)	55.75 (41.57)	49.97 (37.26)	42.20 (31.47)	34.05 (25.39)
Speed—Mph (km/h)	4.85 (7.81)	4.34 (6.98)	3.83 (6.16)	3.34 (5.38)	2.85 (4.59)	2.39 (3.85)
Slip %	6.65	7.19	7.74	8.01	8.01	7.47

TRACTOR SOUND LEVEL WITH CAB dB(A)

Maximum Available Power—Two Hours	80.5
75% of Pull at Maximum Power—Ten Hours	81.5
50% of Pull at Maximum Power—Two Hours	81.0
50% of Pull at Reduced Engine Speed—Two Hours	79.0
Bystander in 12th (3-4) gear	83.0

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 18.4-34; 6; 16 (110)	Two 18.4-34; 6; 16 (110)
Ballast	—Liquid (each)	1042 lb (473 kg)	None
	—Cast Iron (each)	200 lb (91 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 11L-15; 6; 28 (195)	Two 11L-15; 6; 28 (195)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	75 lb (34 kg)	None
Height of drawbar		22 in (560 mm)	22 in (560 mm)
Static Weight with Operator—Rear		8060 lb (3656 kg)	5575 lb (2529 kg)
	Front	3000 lb (1361 kg)	2850 lb (1293 kg)
	Total	11060 lb (5017 kg)	8425 lb (3822 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 code or official Nebraska test procedure. Temperature at injection pump was 180°F (82.3°C). Seven gears were chosen between 15% slip and 10 mph (16.1 km/h). Upon removal of the upper radiator hose, the cooling system was found to be partially blocked by tape. During final inspection, a number of shallow scratches were found on the cylinder walls.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1382.

LOUIS I. LEVITICUS

Engineer-in Charge

K. VON BARGEN

W. E. SPLINTER

L. L. BASHFORD

Board of Tractor Test Engineers



Case 1490 Powershift DSL