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## Test 1381: Case 1490 Manual Diesel 12-Speed

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1381 — CASE 1490 MANUAL 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—1075 rpm)								
70.51 (52.58)	2200	4.232 (16.020)	0.421 (0.256)	16.66 (3.282)	182 (83.2)	51 (10.6)	75 (23.8)	28.863 (97.467)
Standard Power Take-off Speed (1000 rpm)—One Hour								
68.75 (51.27)	2047	4.002 (15.149)	0.408 (0.248)	17.18 (3.384)	182 (83.1)	51 (10.6)	75 (23.8)	28.845 (97.405)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
62.57 (46.66)	2296	3.932 (14.884)	0.441 (0.268)	15.91 (3.135)	180 (82.2)	51 (10.6)	75 (23.9)	..... .....
0.00 (0.00)	2358	1.155 (4.372)	..... .....	..... .....	172 (77.5)	51 (10.6)	75 (23.6)	..... .....
31.49 (23.48)	2310	2.422 (9.168)	0.539 (0.328)	13.00 (2.561)	177 (80.6)	51 (10.6)	75 (23.6)	..... .....
70.79 (52.79)	2200	4.258 (16.118)	0.422 (0.257)	16.63 (3.275)	182 (83.3)	51 (10.6)	75 (23.9)	..... .....
15.80 (11.78)	2322	1.780 (6.738)	0.790 (0.481)	8.88 (1.748)	173 (78.1)	51 (10.3)	75 (23.6)	..... .....
46.77 (34.88)	2288	3.149 (11.920)	0.472 (0.287)	14.85 (2.926)	177 (80.6)	53 (11.7)	76 (24.2)	..... .....
Av Av	37.90 (28.26)	2.783 (10.535)	0.515 (0.313)	13.62 (2.682)	177 (80.4)	51 (10.7)	75 (23.8)	28.775 (97.169)

## DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

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 (3-2) Gear											
59.12 (44.09)	4864 (21.64)	4.56 (7.34)	2198	6.52	4.279 (16.198)	0.507 (0.308)	13.82 (2.722)	188 (86.7)	47 (8.3)	61 (16.1)	29.035 (98.000)
75% of Pull at Maximum Power—Ten Hours 7th (3-2) Gear											
48.22 (35.96)	3707 (16.49)	4.88 (7.85)	2306	4.67	3.708 (14.036)	0.539 (0.328)	13.00 (2.561)	186 (85.6)	51 (10.4)	60 (15.6)	28.980 (97.860)
50% of Pull at Maximum Power—Two Hours 7th (3-2) Gear											
33.49 (24.97)	2499 (11.12)	5.03 (8.10)	2339	3.16	2.977 (11.269)	0.623 (0.379)	11.25 (2.216)	184 (84.4)	50 (9.7)	60 (15.6)	29.040 (98.050)
50% of Pull at Reduced Engine Speed—Two Hours 9th (2-3) Gear											
33.42 (24.92)	2486 (11.06)	5.04 (8.11)	1720	3.05	2.336 (8.843)	0.490 (0.298)	14.31 (2.819)	182 (83.3)	51 (10.6)	68 (20.0)	28.990 (97.890)
MAXIMUM POWER IN SELECTED GEARS											
56.63 (42.23)	8340 (37.10)	2.55 (4.10)	2195	14.31	4th (3-1) Gear			186 (85.6)	46 (7.8)	51 (10.6)	29.050 (98.100)
56.79 (42.35)	7160 (31.85)	2.97 (4.79)	2199	10.76	5th (1-3) Gear			188 (86.7)	46 (7.8)	58 (14.4)	29.070 (98.170)
58.21 (43.41)	6200 (27.58)	3.52 (5.66)	2200	8.51	6th (2-2) Gear			189 (87.2)	46 (7.8)	58 (14.4)	29.070 (98.170)
60.24 (44.92)	4960 (22.06)	4.56 (7.34)	2200	6.69	7th (3-2) Gear			188 (86.7)	45 (7.2)	56 (13.3)	29.200 (98.600)
60.45 (45.08)	4024 (17.90)	5.63 (9.07)	2202	5.08	8th (4-1) Gear			187 (86.1)	45 (7.2)	56 (13.3)	29.200 (98.600)
58.71 (43.78)	3471 (15.44)	6.34 (10.21)	2199	4.51	9th (2-3) Gear			188 (86.7)	46 (7.8)	58 (14.4)	29.070 (98.170)
59.05 (44.03)	2722 (12.11)	8.14 (13.10)	2201	3.57	10th (3-3) Gear			188 (86.7)	46 (7.8)	58 (14.4)	29.070 (98.170)

Department of Agricultural Engineering

Dates of Test: March 17-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** 2.398 gal (9.077 l) **Drained**  
**from motor** 1.834 gal (6.942 l) **Transmission lub-**  
**ricant** Case TFD fluid **Final drive lubricant** Case  
ETHB fluid **Front axle lubricant** Case FDL SAE  
90 **Total time engine was operated** 45.0 hours

**ENGINE Make** Case Diesel **Type** four cylinder  
vertical with turbocharger **Serial No.** 220102  
11410775 **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** front wheel assist **Serial No.**  
1490/18/11181306 **Tread width** rear 60.75" (1543  
mm) to 85" (2159 mm) front 59" (1499 mm) to 71"  
(1803 mm) **Wheel base** 88" (2235 mm) **Center of**  
**gravity** (without operator or ballast, with mini-  
mum tread, with fuel tank filled and tractor serv-  
iced for operation) Horizontal distance forward  
from center-line of rear wheels 37.0" (940 mm)  
Vertical distance above roadway 33.0" (838 mm)  
Horizontal distance from center of rear wheel  
tread 0" (0 mm) to the right/left **Hydraulic control**  
**system** direct engine drive **Transmission** selec-  
tive gear fixed ratio **Advertised speeds mph (km/**  
**h)** first 1.1 (1.8) second 1.8 (2.9) third 2.2 (3.6)  
fourth 2.8 (4.6) fifth 3.2 (5.2) sixth 3.7 (5.9)  
seventh 4.7 (7.5) eighth 5.7 (9.2) ninth 6.4 (10.3)  
tenth 8.1 (13.0) eleventh 9.3 (15.0) twelfth 16.1  
(25.9) reverse 1.9 (3.0), 3.8 (6.0), 4.8 (7.7), 9.5  
(15.3) **Clutch** single dry disc hydraulically oper-  
ated by foot pedal **Brakes** multiple wet disc hydra-  
ulically operated by two foot pedals which can  
be locked together and hand lever **Steering**  
hydrostatic **Turning radius** (on concrete surface  
with brake applied) right 147" (3.73 m) left 147"  
(3.73 m) (on concrete surface without brake) right  
192" (4.88 m) left 192" (4.88 m) **Turning space**  
**diameter** (on concrete surface with brake applied)  
right 308" (7.82 m) left 308" (7.82 m) (on concrete  
surface without brake) right 398" (10.11 m) left  
398" (10.11 m) **Power take-off** 1000 rpm at 2047  
engine rpm and 540 rpm at 2077 engine rpm.

### LUGGING ABILITY IN 7th (3-2) GEAR

Crankshaft Speed rpm	2200	1979	1759	1537	1320	1098
Pull—lbs (kN)	4960 (22.06)	5363 (23.86)	5591 (24.87)	5768 (25.66)	5721 (25.45)	5419 (24.10)
Increase in Pull %	0	8	13	16	15	9
Power—Hp (kW)	60.24 (44.92)	58.20 (43.40)	53.69 (40.04)	48.20 (35.94)	41.14 (30.68)	32.56 (24.28)
Speed—Mph (km/h)	4.56 (7.34)	4.07 (6.55)	3.60 (5.79)	3.13 (5.04)	2.70 (4.35)	2.25 (3.62)
Slip %	6.69	7.37	7.77	8.04	7.91	7.50

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB(A)
Maximum Available Power—Two Hours	93.5	94.0
75% of Pull at Maximum Power—Ten Hours		93.0
50% of Pull at Maximum Power—Two Hours		92.5
50% of Pull at Reduced Engine Speed—Two Hours		90.0
Bystander in 12th (4-3) gear		84.0

### DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool- ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Available Power—Two Hours 7th (3-2) Gear</b>											
60.31 (44.97)	4831 (21.49)	4.68 (7.53)	2199	4.71	4.297 (16.266)	0.500 (0.304)	14.04 (2.766)	189 (87.2)	48 (8.6)	61 (16.1)	29.000 (97.930)

### MAXIMUM POWER IN SELECTED GEARS

55.20 (41.16)	9919 (44.12)	2.09 (3.36)	2275	14.68	3rd (2-1) Gear			187 (86.1)	44 (6.7)	50 (10.0)	29.050 (98.100)
61.52 (45.88)	4931 (21.93)	4.68 (7.53)	2200	4.82	7th (3-2) Gear			188 (86.7)	45 (7.2)	56 (13.3)	29.200 (98.600)

### TIRES, BALLAST AND WEIGHT

Rear Tires		With Ballast	Without Ballast
Ballast	—No., size, ply & psi (kPa)	Two 18.4-34; 6; 16 (110)	Two 18.4-34; 6; 16 (110)
	—Liquid (each)	1218 lb (552 kg)	None
	—Cast Iron (each)	500 lb (227 kg)	None
Front Tires		Two 12.4R24; 6; 24 (165)	Two 12.4R24; 6; 24 (165)
Ballast	—No., size, ply & psi (kPa)	None	None
	—Liquid (each)	82 lb (37 kg)	None
	—Cast Iron (each)		
Height of drawbar		20 in (510 mm)	20 in (510 mm)
Static Weight with Operator—Rear		7965 lb (3613 kg)	4530 lb (2055 kg)
Front		3340 lb (1515 kg)	3175 lb (1440 kg)
Total		11305 lb (5128 kg)	7705 lb (3495 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 155°F (68.1°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. 1381.

LOUIS I. LEVITICUS  
Engineer-in Charge

K. VON BARGEN  
W. E. SPLINTER  
L. L. BASHFORD  
Board of Tractor Test Engineers



Case 1490 Manual Diesel

The Agricultural Experiment Station  
Institute of Agriculture and Natural Resources  
University of Nebraska—Lincoln  
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