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Test 1682: Case International 7220 Diesel 18-Speed

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1682—SUMMARY 166

CASE INTERNATIONAL 7220 DIESEL

18 SPEED

Location of Test: Tractor Testing Laboratory,
University of Nebraska, Lincoln, Nebraska 68583-0832

Dates of Test: September 14-22, 1994

Manufacturer: J.I. Case Company, 700 State Street,
Racine, Wisconsin 53404

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 50.6 **Specific gravity converted to 60°/60° F (15°/15°C)** 0.8352 **Fuel weight** 6.954 lbs/gal (0.833 kg/l) **Oil SAE** 15W-40 **API service classification** CE/CD **To motor** 4.152 gal (15.717 l) **Drained from motor** 3.878 gal (14.679 l) **Transmission and hydraulic lubricant** Case IH Hytran Plus fluid **Front axle lubricant** Case IH 135 HEP Gear Lube SAE 85W140 **Total time engine was operated** 29.0 hours.

ENGINE: Make Consolidated Diesel Corporation Diesel **Type** six cylinder vertical with turbocharger **Serial No.** *45002275* **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** (as specified) 4.488" × 5.315" (114.0 mm × 135.0 mm) **Compression ratio** 17.3 to 1 **Displacement** 505 cu in (8268 ml) **Starting system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** two thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 62.9-69.5 lb/h (28.5-31.5 kg/h) **High idle:** 2370-2530 rpm **Turbo boost** nominal 8.7-11.3 psi (60-78 kPa) as measured 12.0 psi (83 kPa)

CHASSIS: Type front wheel assist **Serial No.** *JJA0054562* **Tread width** rear 64.0" (1626 mm) to 160.0" (4064 mm) front 60.1" (1527 mm) to 94.8" (2408 mm) **Wheel base** 118.3" (3006 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 1.80 (2.90) second 2.06 (3.32) third 2.38 (3.83) fourth 2.73 (4.40) fifth 3.13 (5.04) sixth 3.60 (5.79) seventh 4.19 (6.75) eighth 4.81 (7.74) ninth 5.55 (8.93) tenth 6.36 (10.23) eleventh 7.30 (11.75) twelfth 8.36 (13.46) thirteenth 9.58 (15.41) fourteenth 10.99 (17.68) fifteenth 12.67 (20.39) sixteenth 14.53 (23.39) seventeenth 16.67 (26.83) eighteenth 19.12 (30.77) reverse 2.59 (4.17), 2.98 (4.79), 6.04 (9.72), 6.93 (11.15) **Clutch** multiple wet disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2229 engine rpm and 1000 rpm at 2193 engine rpm **Unladen tractor mass** 17348 lb (7869 kg)

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1004 rpm)					
156.00 (116.33)	2201	9.08 (34.38)	0.405 (0.246)	17.18 (3.38)	
Maximum Power (2 hours)					
160.01 (119.32)	1901	8.67 (32.83)	0.377 (0.229)	18.45 (3.63)	

VARYING POWER AND FUEL CONSUMPTION

156.00 (116.33)	2201	9.08 (34.38)	0.405 (0.246)	17.18 (3.38)	Air temperature
135.65 (101.15)	2260	8.37 (31.68)	0.429 (0.261)	16.21 (3.19)	75°F (24°C)
103.76 (77.37)	2301	6.90 (26.13)	0.463 (0.281)	15.03 (2.96)	Relative humidity
71.08 (53.00)	2337	5.48 (20.74)	0.536 (0.326)	12.97 (2.56)	69%
36.28 (27.06)	2374	4.10 (15.51)	0.786 (0.478)	8.85 (1.74)	Barometer
0.42 (0.31)	2406	2.67 (10.12)	44.513 (27.076)	0.16 (0.03)	28.90" Hg (97.86 kPa)

Maximum Torque 509 lb.-ft. (690 Nm) at 1403 rpm
Maximum Torque Rise 36.8%
Torque rise at 1800 engine rpm 25%

DRAWBAR PERFORMANCE

(UNBALLASTED—FRONT DRIVE ENGAGED)

FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—9th Gear									
134.46 (100.27)	9229 (41.05)	5.46 (8.79)	2200	4.02	0.474 (0.288)	14.67 (2.89)	191 (88)	46 (8)	28.82 (97.60)
75% of Pull at Maximum Power—9th Gear									
106.08 (79.10)	6921 (30.79)	5.75 (9.25)	2283	2.68	0.509 (0.310)	13.65 (2.69)	191 (88)	46 (8)	28.82 (97.60)
50% of Pull at Maximum Power—9th Gear									
72.47 (54.04)	4609 (20.50)	5.90 (9.50)	2326	1.99	0.597 (0.363)	11.65 (2.29)	188 (87)	46 (8)	28.82 (97.60)
75% of Pull at Reduced Engine Speed—11th Gear									
105.84 (78.92)	6917 (30.77)	5.74 (9.24)	1732	2.59	0.447 (0.272)	15.57 (3.07)	188 (87)	46 (8)	28.82 (97.60)
50% of Pull at Reduced Engine Speed—11th Gear									
72.71 (54.23)	4611 (20.51)	5.91 (9.51)	1772	1.90	0.507 (0.308)	13.72 (2.70)	186 (86)	46 (8)	28.82 (97.60)

DRAWBAR PERFORMANCE
(UNBALLASTED—FRONT DRIVE ENGAGED)
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
4th Gear									
113.40 (84.56)	17138 (76.23)	2.48 (3.99)	2252	13.53	0.533 (0.324)	13.06 (2.57)	190 (88)	62 (17)	28.82 (97.60)
5th Gear									
127.70 (95.22)	16357 (72.76)	2.93 (4.71)	2203	9.06	0.499 (0.303)	13.94 (2.75)	190 (88)	66 (19)	28.82 (97.60)
6th Gear									
131.98 (98.42)	15202 (67.62)	3.26 (5.24)	2079	6.53	0.471 (0.287)	14.75 (2.91)	191 (88)	69 (21)	28.82 (97.60)
7th Gear									
135.17 (100.80)	13980 (62.18)	3.63 (5.84)	1961	5.34	0.452 (0.275)	15.39 (3.03)	194 (90)	76 (24)	28.82 (97.60)
8th Gear									
136.08 (101.48)	12493 (55.57)	4.08 (6.57)	1904	4.19	0.445 (0.271)	15.61 (3.08)	193 (89)	73 (23)	28.82 (97.60)
9th Gear									
136.40 (101.71)	10762 (47.87)	4.75 (7.65)	1905	3.52	0.443 (0.270)	15.68 (3.09)	192 (89)	74 (23)	28.82 (97.60)
10th Gear									
136.17 (101.54)	9336 (41.53)	5.47 (8.80)	1900	3.02	0.443 (0.270)	15.69 (3.09)	192 (89)	78 (26)	28.82 (97.60)
11th Gear									
133.13 (99.28)	7911 (35.19)	6.31 (10.16)	1902	2.42	0.453 (0.276)	15.35 (3.02)	192 (89)	78 (26)	28.82 (97.60)
12th Gear									
132.48 (98.79)	6842 (30.43)	7.26 (11.69)	1901	2.16	0.457 (0.278)	15.21 (3.00)	192 (89)	79 (26)	28.82 (97.60)
13th Gear									
132.02 (98.45)	5950 (26.46)	8.32 (13.39)	1898	1.90	0.453 (0.275)	15.36 (3.03)	193 (89)	79 (26)	28.82 (97.60)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 169° F (76°C). The pull in 3rd gear (ballasted tractor) was limited to avoid excessive tractor bouncing. The performance results on this summary were taken from OECD tests conducted under the Code II Restricted Standard Test Code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1682**, Summary 166, October 3, 1994.

LOUIS I. LEVITICUS
Engineer-in-Charge

R.D. GRISSO
M.F. KOCHER
K. VON BARGEN
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE
(BALLASTED—FRONT DRIVE ENGAGED)
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
123.65 (92.21)	20826 (92.64)	2.23 (3.58)	2221	9.73	0.511 (0.311)	13.60 (2.68)	192 (89)	62 (17)	29.08 (98.48)
4th Gear									
130.35 (97.20)	19533 (86.89)	2.50 (4.03)	2104	6.62	0.478 (0.291)	14.53 (2.86)	192 (89)	68 (20)	29.08 (98.48)
5th Gear									
131.44 (98.01)	18924 (84.18)	2.60 (4.19)	1901	6.14	0.461 (0.281)	15.07 (2.97)	190 (88)	68 (20)	29.08 (98.48)
6th Gear									
135.54 (101.07)	16716 (74.36)	3.04 (4.89)	1902	4.61	0.449 (0.273)	15.49 (3.05)	191 (88)	68 (20)	29.08 (98.48)
7th Gear									
140.84 (105.02)	14699 (65.38)	3.59 (5.78)	1904	3.44	0.431 (0.262)	16.13 (3.18)	193 (89)	65 (18)	28.95 (98.04)
8th Gear									
139.29 (103.87)	12620 (56.13)	4.14 (6.66)	1902	2.94	0.433 (0.263)	16.06 (3.16)	192 (89)	66 (19)	28.95 (98.04)
9th Gear									
138.69 (103.42)	10841 (48.22)	4.80 (7.72)	1903	2.42	0.435 (0.264)	16.00 (3.15)	192 (89)	66 (19)	28.95 (98.04)
10th Gear									
138.21 (103.06)	9404 (41.83)	5.51 (8.87)	1900	2.17	0.436 (0.265)	15.95 (3.14)	193 (89)	66 (19)	28.95 (98.04)
11th Gear									
135.71 (101.20)	8003 (35.60)	6.36 (10.23)	1900	1.64	0.448 (0.272)	15.53 (3.06)	192 (89)	67 (19)	28.96 (98.07)
12th Gear									
134.37 (100.20)	6916 (30.76)	7.29 (11.73)	1899	1.64	0.449 (0.273)	15.47 (3.05)	192 (89)	67 (19)	28.96 (98.07)
13th Gear									
132.14 (98.54)	5927 (26.36)	8.36 (13.46)	1900	1.38	0.458 (0.278)	15.19 (2.99)	192 (89)	67 (19)	28.96 (98.07)

TRACTOR SOUND LEVEL WITH CAB	dB(A)
At 75% load in 7th Gear (Ballasted—Front Drive Engaged)	74.0
Bystander	—

TIRES, BALLAST AND WEIGHT	With Ballast	Without Ballast
Rear Tires —No., size, ply & psi (kPa)	Four 20.8R38; **, 12 (85)	Two 20.8R38; **, 16 (110)
Ballast —Duals (total)	1592 lb (722 kg)	None
—Cast Iron (total)	538 lb (244 kg)	None
Front Tires —No., size, ply & psi (kPa)	Two 14.9R30; ***, 16 (110)	Two 14.9R30; ***, 16 (110)
Ballast —Liquid (total)	None	None
—Cast Iron (total)	554 lb (252 kg)	None
Height of Drawbar	17.0 in (430 mm)	15.5 in (395 mm)
Static Weight with Operator —Rear	14184 lb (6434 kg)	12054 lb (5467 kg)
—Front	6014 lb (2728 kg)	5460 lb (2477 kg)
—Total	20198 lb (9162 kg)	17514 lb (7944 kg)

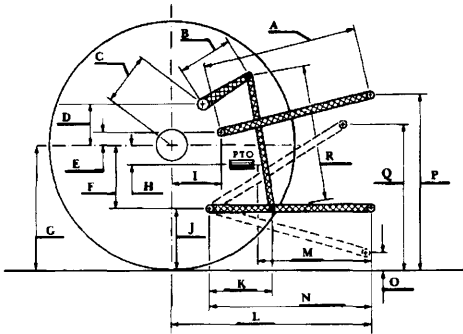
THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III		
Quick Attach: None		
Maximum Force Exerted Through Whole Range:	8636 lbs	(38.4 kN)
i) Opening pressure of relief valve:	NA	
Sustained pressure with pump stalled:	2680 psi	(185 bar)
ii) Pump delivery rate at minimum pressure:	27.5 GPM	(104.1 l/min)
iii) Pump delivery rate at maximum		
hydraulic power:	24.5 GPM	(92.7 l/min)
Delivery pressure:	2100 psi	(145 bar)
Power:	30.0 HP	(22.4 kW)

THREE POINT HITCH PERFORMANCE (SAE Dynamic Test)

Observed Maximum Pressure psi. (bar)	2700	(18620)	
Location	Hydraulic pump		
Hydraulic oil temperature °F (°C)	140	(60)	
Location	Transmission sump		
	Maximum Lift Capacity		Lift Capacity for Transport
QUICK ATTACH	Yes		
CATEGORY:	III		*not measured
LOAD lbs (kg)	10040	(4554)	
TIME sec	3.17		
HITCH MOVEMENT in (mm)			
Lowest position	15.4	(391)	
Top of timed range	**40.4	(1026)	
Highest position	40.6	(1031)	
LOAD CG MOVEMENT in (mm)			
Lowest position	15.6	(396)	
Top of timed range	42.1	(1069)	
Highest position	42.5	(1080)	

*Implement load capacity for transport purposes not specified by manufacturer.
**The observed power range 25.0 in (635 mm) is less then the minimum power range for CAT III, 26 in (660 mm) specified by ASAE Standard S217.10.



HITCH DIMENSIONS AS TESTED—NO LOAD

	OECD test		SAE test	
	inch	mm	inch	mm
A	25.9	657	25.9	657
B	15.0	381	15.0	381
C	21.9	557	21.9	557
D	16.6	422	16.6	422
E	6.7	169	9.8	250
F	13.1	332	13.1	332
G	33.7	855	32.7	831
H	3.5	90	3.5	90
I	24.7	627	24.7	627
J	20.6	523	19.6	523
K	22.8	579	22.8	579
L	51.4	1306	51.4	1306
L'	—	—	55.4	1407
M	22.1	561	22.1	561
N	33.9	861	33.9	861
O	9.9	251	8.0	203
P	42.6	1083	41.6	1058
Q	37.8	959	35.8	908
R	31.3	794	32.1	816



CASE INTERNATIONAL 7220 DIESEL