7-1-1988

Test 1609: Case International 7110 and 7210 Diesel 18-Speed

Nebraska Tractor Test Lab
University of Nebraska-Lincoln, tractortestlab@unl.edu

NEBRASKA OECD TRACTOR TEST 1609—SUMMARY 049
CASE INTERNATIONAL 7110 DIESEL
ALSO CASE INTERNATIONAL 7210 DIESEL—18 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Fuel Consumption 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)					
131.97 (98.41)	2200	7.98 (30.21)	0.418 (0.254)	16.54 (3.26)	
Maximum Power (Two hours)					
132.31 (98.66)	2050	7.67 (29.03)	0.400 (0.243)	17.25 (3.40)	Air temperature
VARYING POWER AND FUEL CONSUMPTION					82°F (28°C)
131.97 (98.41)	2200	7.98 (30.21)	0.418 (0.254)	16.54 (3.26)	
114.77 (85.59)	2249	7.30 (27.63)	0.439 (0.267)	15.72 (3.10)	Relative humidity
87.04 (64.91)	2278	6.13 (23.19)	0.486 (0.296)	14.21 (2.80)	48%
58.84 (43.88)	2305	5.00 (18.91)	0.586 (0.357)	11.78 (2.32)	Barometer
29.68 (22.14)	2335	4.04 (15.30)	0.940 (0.572)	7.35 (1.45)	28.87" Hg (97.75 kPa)
1.02 (0.76)	2354	2.91 (11.02)	19.659 (11.958)	0.35 (0.07)	

Maximum Torque 421.3 lb. ft (571.2 Nm) @ 1500 RPM
Maximum Torque Rise 33.7%

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull (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)
75% of Pull at Maximum Power—Five Hours 8th Gear									
97.12 (72.42)	7712 (34.30)	4.72 (7.60)	2259	2.01	0.517 (0.315)	13.35 (2.63)	183 (84)	64 (18)	28.80 (97.52)
MAXIMUM POWER IN SELECTED GEARS									
3rd Gear									
104.27 (77.76)	18766 (83.48)	2.08 (3.35)	2193	9.92	0.521 (0.317)	13.25 (2.61)	183 (84)	80 (27)	28.84 (97.66)
4th Gear									
108.62 (81.00)	16490 (73.35)	2.47 (3.98)	2190	6.75	0.507 (0.308)	13.63 (2.68)	185 (85)	88 (31)	28.84 (97.66)
5th Gear									
110.67 (82.53)	15265 (67.90)	2.72 (4.38)	2050	4.38	0.477 (0.290)	14.47 (2.85)	183 (84)	75 (24)	28.75 (97.36)
6th Gear									
110.84 (82.65)	13203 (58.73)	3.15 (5.07)	2049	3.51	0.475 (0.289)	14.52 (2.86)	183 (84)	75 (24)	28.76 (97.39)
7th Gear									
115.74 (86.31)	11775 (52.38)	3.69 (5.93)	2046	3.03	0.457 (0.278)	15.10 (2.97)	183 (84)	76 (24)	28.76 (97.39)
8th Gear									
116.50 (86.87)	10282 (45.74)	4.25 (6.84)	2048	2.46	0.456 (0.278)	15.13 (2.98)	184 (84)	77 (25)	28.77 (97.43)
9th Gear									
116.84 (87.13)	8905 (39.61)	4.92 (7.92)	2048	2.30	0.460 (0.280)	15.00 (2.96)	184 (84)	79 (26)	28.78 (97.46)
10th Gear									
115.67 (86.25)	7646 (34.01)	5.67 (9.13)	2051	1.89	0.464 (0.282)	14.90 (2.93)	184 (84)	79 (26)	28.78 (97.46)
11th Gear									
114.00 (85.01)	6559 (29.17)	6.52 (10.49)	2049	1.64	0.471 (0.286)	14.66 (2.89)	184 (84)	81 (27)	28.79 (97.49)
12th Gear									
111.73 (83.32)	5593 (24.88)	7.49 (12.06)	2048	1.39	0.481 (0.293)	14.34 (2.83)	184 (84)	81 (27)	28.80 (97.53)
13th Gear									
109.77 (81.86)	4791 (21.31)	8.59 (13.83)	2050	1.14	0.484 (0.294)	14.28 (2.81)	184 (84)	82 (28)	28.80 (97.53)

Location of Test: Center for Agricultural Equipment, Lincoln Nebraska 68583-0832, U.S.A.

Dates of Test: June - July, 1988

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

FUEL AND OIL: Fuel No. 2 Diesel **Cetane No.** 51.2 **Specific gravity converted to 60°/60°F** ***(15°/15°C)*** 0.8293 **Fuel weight** 6.905 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W-40 **Oil Consumption for 10 hours** 0.59 lb *(269 gm)* **Transmission and hydraulic lubricant** Case IH Hytran Plus Fluid **Front axle lubricant** Case IH 135 HEP Gear Lube

ENGINE: Make Consolidated Diesel Corporation-Case Diesel **Type** six cylinder vertical with turbocharger **Serial No.** *44220549* **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.488" × 5.315" *(114 mm × 135 mm)* **Compression ratio** 17.3 to 1 **Displacement** 504.5 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 cartridges **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** two thermostats.

ENGINE OPERATING PARAMETERS: Fuel rate 52.2-57.6 lb/hr *(23.7-26.1 kg/hr)* **High idle** 2315-2395 rpm **Turbo boost** nominal 6.1-8.1 psi *(42-56 kPa)* as measured 7.5 psi *(52 kPa)*

CHASSIS: Type front wheel assist with duals **Serial No.** *JJA0001876* **Tread width** rear 60" *(1524 mm)* to 128" *(3251 mm)* front 60.1" *(1526 mm)* to 94.8" *(2408)* **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 1.73 *(2.78)* second 1.98 *(3.19)* third 2.28 *(3.68)* fourth 2.62 *(4.22)* fifth 3.01 *(4.84)* sixth 3.45 *(5.55)* seventh 4.02 *(6.47)* eighth 4.61 *(7.43)* ninth 5.32 *(8.56)* tenth 6.10 *(9.82)* eleventh 7.00 *(11.27)* twelfth 8.03 *(12.92)* thirteenth 9.19 *(14.78)* fourteenth 10.54 *(16.96)* fifteenth 12.15 *(19.55)* sixteenth 13.94 *(22.43)* seventeenth 15.99 *(25.73)* eighteenth 18.34 *(29.51)* reverse 2.49 *(4.00)*, 2.85 *(4.59)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** multiple wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2229 engine rpm and 1004 rpm at 2200 engine rpm **Unladen tractor mass** 16590 lb *(7525 kg)*.

TRACTOR SOUND LEVEL WITH CAB (OECD Test)	dB(A)
Maximum sound level—in 7th gear	73.5
Bystander in 18th gear	84.0

CENTER OF GRAVITY

Horizontal distance forward from centerline of rear wheels 38.7″ in *(982 mm)*
Vertical distance above roadway 41.6″ in *(1056 mm)*
Horizontal distance from center of rear wheel tread 0″ *(0 mm)* to the right/left

TURNING ON A CONCRETE SURFACE

Turning radius—with duals right 171″ *(4.33 m)* left 179″ *(4.55 m)*
—without brake right 238″ *(6.05 m)* left 239″ *(6.06 m)*
Turning space radius—with brake applied right 178″ *(4.52 m)* left 186″ *(4.72 m)*
—without brake right 245″ *(6.22 m)* left 246″ *(6.25 m)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 18.4R38; *; inner 18 *(125)* outer 14 *(95)*	Two 18.4R38; *; 18 *(125)*
Ballast	—Duals (total)	1440 lb *(653 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 13.6R28; ***; 18 *(125)*	Two 13.6R28; ***; 18 *(125)*
Ballast	—Cast iron (total)	330 lb *(150 kg)*	None
	—Test equip. (total)	655 lb *(297 kg)*	None
Height of Drawbar		16 in *(405 mm)*	15 in *(380 mm)*
Static Weight	—Rear	13010 lb *(5901 kg)*	11245 lb *(5101 kg)*
	—Front	6005 lb *(2724 kg)*	5345 lb *(2424 kg)*
	—Total	19015 lb *(8625 kg)*	16590 lb *(7525 kg)*

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III
Quick Attach: None

Maximum Force Exerted Through Whole Range:	7036 lbs	*(31.3 kN)*
i) Opening pressure of relief valve:	NA	
Sustained pressure at the compensator cutoff:	2640 psi	*(182 Bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	28.4 GPM	*(107.6 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	26.4 GPM	*(99.9 l/min)*
Delivery pressure:	2200 psi	*(152 Bar)*
Power:	33.9 Hp	*(25.3 kW)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

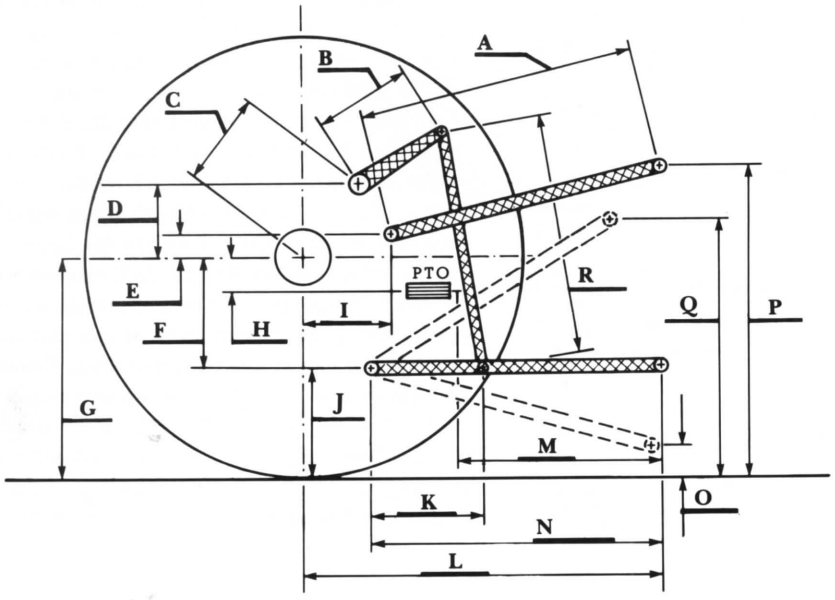
REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump was maintained at 150° F *(65.5° C)*. Manufactuers specifications for engine bore, stroke, displacement and compression ratio were not verified.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1609,** Nebraska Summary 049, January 31, 1989.

Report reissued: Supplemental sales permit for Case International 7210 Diesel, November, 1993.

LOUIS I. LEVITICUS
Engineer-in-Charge

L. L. BASHFORD
R. D. GRISSO
K. VON BARGEN
Board of Tractor Test Engineers



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	*mm*
A	25.8	*654*
B	15.0	*381*
C	21.9	*557*
D	16.6	*422*
E	6.7	*169*
F	13.1	*332*
G	32.3	*820*
*H	3.5	*90*
I	24.7	*627*
J	19.2	*488*
K	22.8	*579*
L	51.4	*1306*
*M	22.1	*561*
N	33.9	*861*
O	9.7	*247*
P	41.2	*1048*
Q	37.1	*942*
R	30.2	*768*

* to 1000 rpm shaft

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS
(Front Wheel Drive Disengaged)

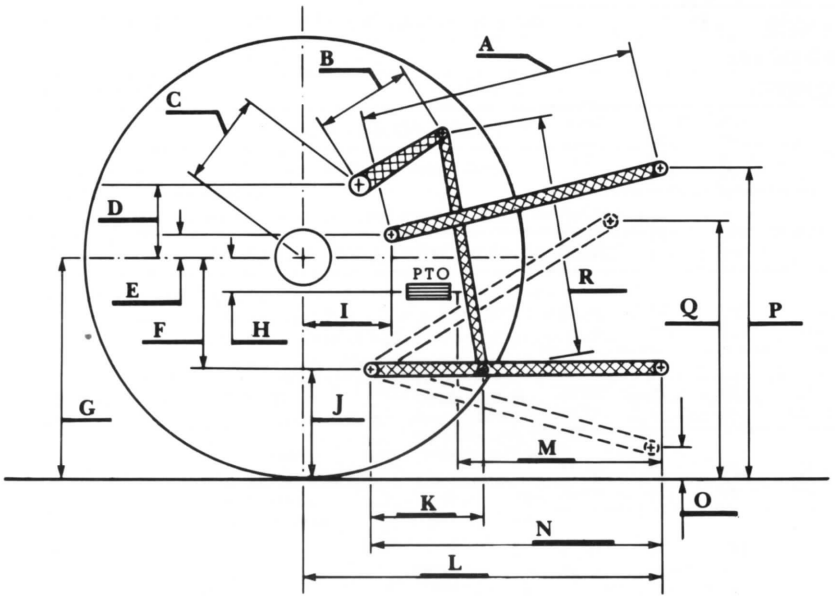
Power Hp *(kW)*	Drawbar pull *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp.°F *(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
				4th Gear					
99.53	15498	2.41	2224	10.92	0.542	12.75	182	74	28.75
(74.22)	*(68.94)*	*(3.88)*			*(0.330)*	*(2.51)*	*(83)*	*(23)*	*(97.36)*
				5th Gear					
106.75	14310	2.80	2148	6.48	0.502	13.75	183	74	28.75
(79.60)	*(63.65)*	*(4.50)*			*(0.306)*	*(2.71)*	*(84)*	*(23)*	*(97.36)*
				6th Gear					
109.28	13223	3.10	2049	5.34	0.482	14.32	183	76	28.76
(81.49)	*(58.82)*	*(4.99)*			*(0.293)*	*(2.82)*	*(84)*	*(24)*	*(97.39)*
				7th Gear					
114.13	11718	3.65	2049	4.40	0.463	14.91	184	77	28.77
(85.11)	*(52.12)*	*(5.88)*			*(0.282)*	*(2.94)*	*(84)*	*(25)*	*(97.43)*
				8th Gear					
115.90	10297	4.22	2048	3.69	0.461	14.96	184	78	28.77
(86.42)	*(45.80)*	*(6.79)*			*(0.281)*	*(2.95)*	*(84)*	*(26)*	*(97.43)*
				9th Gear					
115.94	8879	4.90	2049	3.05	0.462	14.96	184	78	28.78
(86.46)	*(39.49)*	*(7.88)*			*(0.281)*	*(2.95)*	*(84)*	*(26)*	*(97.46)*
				10th Gear					
114.65	7608	5.65	2050	2.64	0.468	14.74	184	80	28.79
(85.49)	*(33.84)*	*(9.09)*			*(0.285)*	*(2.90)*	*(84)*	*(27)*	*(97.49)*
				11th Gear					
113.15	6529	6.50	2048	2.23	0.473	14.59	184	80	28.79
(84.38)	*(29.04)*	*(10.46)*			*(0.288)*	*(2.88)*	*(84)*	*(27)*	*(97.49)*
				12th Gear					
110.71	5550	7.48	2047	1.82	0.485	14.23	184	82	28.80
(82.56)	*(24.69)*	*(12.04)*			*(0.295)*	*(2.80)*	*(84)*	*(28)*	*(97.53)*
				13th Gear					
109.33	4778	8.58	2048	1.49	0.489	14.12	184	83	28.81
(81.53)	*(21.25)*	*(13.81)*			*(0.297)*	*(2.78)*	*(84)*	*(28)*	*(97.56)*

TRACTOR SOUND LEVEL WITH CAB (SAE Test)	Front Wheel Drive Disengaged dB(A)	Front Wheel Drive Engaged dB(A)
Maximum Available Power—8th Gear	73.0	73.0
75% of Pull at Maximum Power—8th Gear		72.5
50% of Pull at Maximum Power—8th Gear		72.5
50% of Pull at Reduced Engine Speed—10th Gear		69.5
Bystander in 17th gear	84.5	

THREE POINT HITCH PERFORMANCE
(SAE Dynamic Test)

Observed Maximum Pressure psi *(kPa)*	2625 *(18100)*	
Location	Hydraulic pump	
Hydraulic oil temperature °F *(°C)*	132 *(56)*	
Location	Transmission sump	
	Maximum Lift Capacity	**Lift Capacity for Transport**
QUICK ATTACH	Yes	
CATEGORY:	III	*not measured
LOAD lbs *(kg)*	8915 *(4044)*	
TIME sec	2.67	
HITCH MOVEMENT in *(mm)*		
Lowest position	15.2 *(386)*	
Top of timed range	** 40.2 *(1021)*	
Highest position	40.2 *(1021)*	
LOAD CG MOVEMENT in *(mm)*		
Lowest position	14.7 *(373)*	
Top of timed range	41.7 *(1059)*	
Highest position	41.1 *(1044)*	

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



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C	21.9	*557*
D	16.6	*422*
E	9.8	*250*
F	13.1	*332*
G	31.6	*802*
*H	3.5	*90*
I	24.7	*627*
J	18.5	*470*
K	22.8	*579*
L	51.4	*1306*
L′	55.4	*1407*
*M	22.1	*561*
N	33.9	*861*
O	8.0	*203*
P	40.5	*1029*
Q	35.5	*902*
R	31.5	*800*

* to 1000 rpm shaft
L′ to end of Quick Attach

HITCH DIMENSIONS AS TESTED—NO LOAD

Case International 7110 Diesel

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