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January 1999

## Test 1764: Case IH MX 180 Diesel

Nebraska Tractor Test Lab

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# NEBRASKA OECD TRACTOR TEST 1764—SUMMARY 291

## CASE IH MX 180 DIESEL

### 18 SPEED

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

**Dates of Test:** October 12 - 26, 1999

**Manufacturer:** Case Corporation, 700 State St. Racine WI, USA

**FUEL, OIL and TIME:** Fuel No. 2 Diesel Specific gravity converted to 60°/60°F (15°/15°C) 0.8512 Fuel weight 7.087 lbs/gal (0.849 kg/l) Oil SAE 15W-40 API service classification SF/CD/CE Transmission and hydraulic lubricant Case IH Hy-Tran Plus fluid Front axle lubricant SAE 85W-140 API GL-5 Total time engine was operated: 38.5 hours

**ENGINE:** Make Consolidated Diesel Corporation Diesel Type six cylinder vertical with turbocharger Serial No. 45837752 Crankshaft lengthwise Rated engine speed 2000 Bore and stroke 4.488" x 5.315" (114.0 mm x 135.0 mm) Compression ratio 16.5 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 Fuel cooler radiator for pump return fuel Muffler vertical Cooling medium temperature control 2 thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS:** Fuel rate: 65.9 - 73.0 lb/h (29.9 - 33.1 kg/h) High idle: 2195 - 2285 rpm Turbo boost: nominal 18.0 - 22.3 psi (124 - 144 kPa) as measured 19.5 psi (134 kPa)

**CHASSIS:** Type front wheel assist Serial No. \*X1804C4JJA0101711\* Treadwidth rear 60.0" (1524 mm) to 128.9" (3275 mm) front 60.0" (1524 mm) to 88.0" (2235 mm) Wheelbase 118.3" (3006 mm) Hydraulic control system direct engine drive Transmission selective gear fixed ratio with full range operator controlled power shift Nominal travel speeds mph (km/h) first 1.84 (2.96) second 2.11 (3.40) third 2.43 (3.92) fourth 2.79 (4.49) fifth 3.20 (5.15) sixth 3.67 (5.91) seventh 4.29 (6.90) eighth 4.92 (7.91) ninth 5.67 (9.12) tenth 6.50 (10.46) eleventh 7.46 (12.00) twelfth 8.56 (13.77) thirteenth 10.66 (17.16) fourteenth 12.23 (19.68) fifteenth 14.10 (22.69) sixteenth 16.17 (26.03) seventeenth 18.55 (29.85) eighteenth 21.28 (34.25) reverse 2.65 (4.26), 3.04 (4.89), 6.17 (9.93), 7.07 (11.39) Clutch multiple wet disc electrohydraulically actuated by foot pedal Brakes wet disc hydraulically operated by two foot pedals that can be locked together Steering hydrostatic Power take-off 540 rpm at 1982 engine rpm and 1000 rpm at 1974 engine rpm Unladen tractor mass 19220 lb (8718 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
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
<b>Rated Engine Speed—(PTO speed—1013 rpm)</b>					
146.54 (109.28)	2000	9.59 (36.31)	0.464 (0.282)	15.28 (3.01)	
<b>Standard Power Take-off Speed (1000 rpm)</b>					
150.99 (112.59)	1973	9.74 (36.88)	0.457 (0.278)	15.50 (3.05)	
<b>Maximum Power (2 hours)</b>					
175.68 (131.00)	1750	10.57 (40.01)	0.426 (0.259)	16.62 (3.27)	

#### VARYING POWER AND FUEL CONSUMPTION

146.54 (109.28)	2000	9.59 (36.31)	0.464 (0.282)	15.28 (3.01)	Air temperature
129.29 (96.41)	2077	8.89 (33.65)	0.413 (0.251)	14.54 (2.87)	83°F (28°C)
98.62 (73.54)	2108	7.45 (28.20)	0.535 (0.325)	13.24 (2.61)	Relative humidity
66.92 (49.90)	2150	6.01 (22.75)	0.637 (0.387)	11.13 (2.19)	43%
34.28 (25.56)	2186	4.61 (17.47)	0.954 (0.580)	7.43 (1.46)	Barometer
1.18 (0.88)	2220	3.26 (12.34)	19.608 (11.927)	0.36 (0.07)	29.15" Hg (98.71 kPa)

Maximum Torque - 558 lb.-ft. (757 Nm) at 1450 rpm

Maximum Torque Rise - 45.2%

Torque rise at 1600 engine rpm - 42%

#### 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) cooling med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—8th Gear</b>									
124.86 (93.11)	9523 (42.36)	4.92 (7.91)	1998	2.67	0.545 (0.331)	13.01 (2.56)	186 (85)	57 (14)	28.88 (97.80)
<b>75% of Pull at Maximum Power—8th Gear</b>									
98.85 (73.71)	7155 (31.82)	5.18 (8.34)	2092	2.06	0.598 (0.364)	11.86 (2.34)	185 (85)	61 (16)	28.88 (97.80)
<b>50% of Pull at Maximum Power—8th Gear</b>									
67.50 (50.33)	4770 (21.22)	5.31 (8.54)	2128	1.26	0.714 (0.434)	9.93 (1.96)	177 (81)	68 (20)	28.87 (97.77)
<b>75% of Pull at Reduced Engine Speed—10th Gear</b>									
98.72 (73.62)	7177 (31.92)	5.16 (8.30)	1574	2.06	0.513 (0.312)	13.81 (2.72)	180 (82)	66 (19)	28.87 (97.77)
<b>50% of Pull at Reduced Engine Speed—10th Gear</b>									
67.48 (50.32)	4778 (21.25)	5.30 (8.52)	1607	1.26	0.572 (0.348)	12.39 (2.44)	175 (79)	73 (23)	28.86 (97.73)

**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)	Temp. °F (°C) cool- ing med	Temp. °F (°C) Air dry bulb	Barom. inch Hg (kPa)	
3rd Gear									
113.70 (84.79)	19501 (86.74)	2.19 (3.52)	2008	12.97	0.598 (0.364)	11.85 (2.33)	177 (81)	54 (12)	29.10 (98.54)
4th Gear									
125.65 (93.69)	18347 (81.61)	2.57 (4.13)	1960	8.53	0.558 (0.339)	12.70 (2.50)	185 (85)	59 (15)	29.08 (98.48)
5th Gear									
136.55 (101.82)	18161 (80.78)	2.82 (4.54)	1871	8.46	0.541 (0.329)	13.11 (2.58)	185 (85)	62 (17)	29.08 (98.48)
6th Gear									
143.91 (107.32)	17695 (78.71)	3.05 (4.91)	1753	7.84	0.523 (0.318)	13.56 (2.67)	186 (86)	64 (18)	29.07 (98.44)
7th Gear									
149.75 (111.67)	15445 (68.70)	3.64 (5.85)	1750	5.69	0.503 (0.306)	14.10 (2.78)	187 (86)	65 (18)	29.06 (98.41)
8th Gear									
150.95 (112.56)	13307 (59.19)	4.25 (6.85)	1751	3.87	0.497 (0.302)	14.26 (2.81)	187 (86)	55 (13)	28.89 (97.83)
9th Gear									
149.08 (111.17)	11353 (50.50)	4.92 (7.93)	1752	3.61	0.504 (0.307)	14.06 (2.77)	188 (86)	66 (19)	29.05 (98.37)
10th Gear									
148.68 (110.87)	9820 (43.68)	5.68 (9.14)	1751	3.02	0.506 (0.308)	14.00 (2.76)	189 (87)	69 (21)	29.04 (98.34)
11th Gear									
148.06 (110.41)	8486 (37.75)	6.54 (10.53)	1749	2.50	0.506 (0.308)	14.00 (2.76)	189 (87)	70 (21)	29.04 (98.34)
12th Gear									
146.72 (109.41)	7283 (32.40)	7.55 (12.16)	1754	1.97	0.511 (0.311)	13.87 (2.73)	189 (87)	71 (22)	29.04 (98.34)
13th Gear									
142.24 (106.07)	5646 (25.11)	9.45 (15.21)	1751	1.71	0.526 (0.320)	13.47 (2.65)	189 (87)	72 (22)	29.04 (98.34)

**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 125°F (51°C). This tractor did not meet the manufacturer's claim of 44.0 GPM (166 lpm) hydraulic flow (high flow option) nor cab sound level of 72.0 dB(A). The pull in 2<sup>nd</sup> gear (ballasted tractor) was limited to avoid excessive tractor bouncing. The performance figures on this summary were taken from a test conducted under the OECD Code II test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1764**, Nebraska Summary 291, December 13, 1999.

Brent T. Sampson  
 Test Engineer

L.L. Bashford  
 M.F. Kocher  
 R.D. Grisso Jr.  
 Board of Tractor Test Engineers

**TRACTOR SOUND LEVEL WITH CAB dB(A)**

At 75% load in 8th gear	73.3
Bystander	--

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi (kPa)	Four 18.4R42;**,10(70)	Two 18.4R42;**,20(135)
<b>Ballast</b> - Duals (total)	1545 lb (701 kg)	None
- Test Equip. (total)	45 lb (20 kg)	None
<b>Front Tires</b> - No., size, ply & psi (kPa)	Two 14.9R30;***,22(150)	Two 14.9R30;***,22(150)
<b>Ballast</b> - Liquid (total)	None	None
- Cast Iron (total)	None	None
<b>Height of Drawbar</b>	16.5 in (420 mm)	16.5 in (420 mm)
<b>Static Weight with operator</b> - Rear	13540 lb (6142 kg)	11950 lb (5421 kg)
- Front	7450 lb (3379 kg)	7450 lb (3379 kg)
- Total	20990 lb (9521 kg)	19400 lb (8800 kg)

**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)
2nd Gear									
111.10 (82.84)	21702 (96.54)	1.92 (3.09)	2032	12.47	0.602 (0.366)	11.77 (2.32)	183 (84)	52 (11)	29.04 (98.34)
3rd Gear									
126.81 (94.56)	21011 (93.46)	2.26 (3.64)	1972	7.85	0.551 (0.335)	12.86 (2.53)	183 (84)	54 (12)	29.04 (98.34)
4th Gear									
138.01 (102.91)	20459 (91.01)	2.53 (4.07)	1896	6.51	0.526 (0.320)	13.46 (2.65)	184 (84)	56 (13)	29.04 (98.34)
5th Gear									
147.29 (109.84)	20159 (89.67)	2.74 (4.41)	1782	6.03	0.511 (0.311)	13.88 (2.73)	187 (86)	59 (15)	29.04 (98.34)
6th Gear									
148.59 (110.80)	17672 (78.61)	3.15 (5.07)	1748	3.98	0.504 (0.307)	14.06 (2.77)	187 (86)	60 (16)	29.04 (98.34)
7th Gear									
153.59 (114.53)	15525 (69.06)	3.71 (5.97)	1750	3.22	0.490 (0.298)	14.47 (2.85)	188 (86)	61 (16)	29.03 (98.31)
8th Gear									
152.76 (113.92)	13365 (59.45)	4.29 (6.90)	1751	2.62	0.492 (0.299)	14.41 (2.84)	188 (87)	61 (16)	29.03 (98.31)
9th Gear									
151.79 (113.19)	11472 (51.03)	4.96 (7.99)	1751	2.10	0.495 (0.301)	14.31 (2.82)	187 (86)	61 (16)	29.03 (98.31)
10th Gear									
150.97 (112.58)	9926 (44.15)	5.70 (9.18)	1751	2.01	0.499 (0.303)	14.21 (2.80)	189 (87)	60 (16)	29.03 (98.31)
11th Gear									
149.18 (111.25)	8516 (37.88)	6.57 (10.57)	1752	1.75	0.502 (0.306)	14.11 (2.78)	189 (87)	59 (15)	29.03 (98.31)
12th Gear									
145.75 (108.68)	7255 (32.27)	7.53 (12.12)	1748	1.48	0.516 (0.314)	13.74 (2.71)	189 (87)	58 (14)	29.02 (98.27)
13th Gear									
142.30 (106.11)	5649 (25.13)	9.45 (15.20)	1753	1.22	0.529 (0.322)	13.39 (2.64)	189 (87)	57 (14)	29.02 (98.27)

### THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III

Quick Attach: No

Maximum Force Exerted Through Whole Range: 10645 lbs (47.4 kN)

i) Opening pressure of relief valve: NA NA  
 Sustained pressure at compensator cutoff: 2970 psi (205 bar) 2970 psi (205 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed: 31.5 GPM (119.2 l/min) 43.3 GPM (163.9 l/min)

iii) Pump delivery rate at maximum hydraulic power: 29.4 GPM (111.3 l/min) 40.3 GPM (152.6 l/min)  
 Delivery pressure: 2770 psi (191 bar) 2700 psi (186 bar)  
 Power: 47.5 HP (34.3 kW) 63.5 HP (47.3 kW)

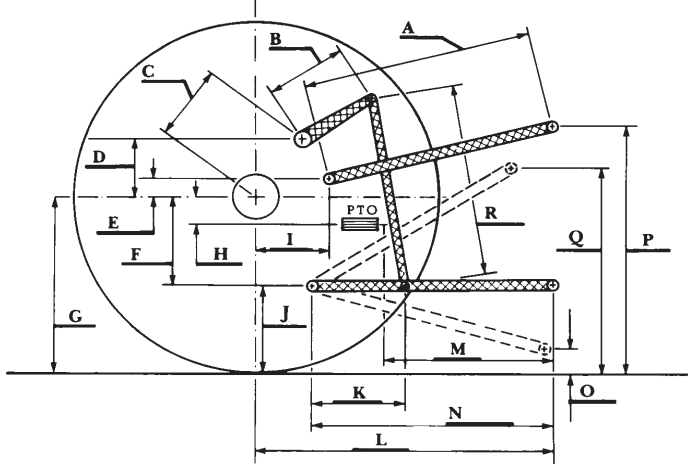
### THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi. (bar) 2990 (206)  
 Location: lift cylinder  
 Hydraulic oil temperature: °F (°C) 149 (65)  
 Location: hydraulic sump  
 Category: III  
 Quick attach: none

#### SAE Static Test—System pressure 2690 psi (186 Bar)

Hitch point distance to ground level in. (mm) 8.2 (207) 16.0 (406) 24.0 (610) 32.0 (813) 40.0 (1016)  
 Lift force on frame lb 18839 16047 14955 14084 12729  
 " " " " " " (kN) (83.8) (71.4) (66.5) (62.7) (56.6)

HITCH DIMENSIONS AS TESTED—NO LOAD



	OECD test		SAE test	
	inch	mm	inch	mm
A	28.3	720	28.3	720
B	20.5	520	20.5	520
C	22.9	581	22.9	581
D	20.7	525	20.7	525
E	8.7	220	8.7	220
F	15.7	400	15.7	400
G	37.6	955	37.6	955
H	3.5	90	3.5	90
I	20.9	531	20.9	531
J	21.9	555	21.9	555
K	30.3	770	30.3	770
L	50.2	1276	50.2	1276
M	24.3	617	24.3	617
N	42.4	1076	42.4	1076
O	8.1	205	8.1	205
P	48.8	1240	43.9	1115
Q	41.0	1042	40.6	1030
R	39.8	1010	39.8	1010



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