

January 2005

## Test 2245: Case IH MXU110 Diesel

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# SUMMARY OF OECD TEST 2245–NEBRASKA SUMMARY 494

## CASE IH MXU110 DIESEL

### 16 SPEED

#### 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—1038 rpm)</b>					
102.9 (76.7)	2201	6.20 (23.45)	0.425 (0.258)	16.60 (3.27)	
<b>Standard Power Take-off Speed (1000 rpm)</b>					
107.3 (80.0)	2119	6.30 (23.85)	0.414 (0.252)	17.04 (3.36)	
<b>Maximum Power (2 hours)</b>					
114.7 (85.5)	1899	6.42 (24.28)	0.395 (0.240)	17.87 (3.52)	

#### VARYING POWER AND FUEL CONSUMPTION

102.9 (76.7)	2201	6.20 (23.45)	0.425 (0.258)	16.60 (3.27)	Air temperature
89.7 (66.9)	2258	5.69 (21.55)	0.447 (0.272)	15.75 (3.10)	72°F(22°C)
68.1 (50.8)	2286	4.72 (17.88)	0.489 (0.297)	14.43 (2.84)	Relative humidity
46.0 (34.3)	2314	3.78 (14.29)	0.579 (0.352)	12.18 (2.40)	44%
23.2 (17.3)	2344	2.80 (10.61)	0.852 (0.518)	8.28 (1.63)	Barometer
--	2364	1.82 (6.88)	--	--	30.5" Hg(103.2 kPa)

Maximum Torque - 373.3 lb.-ft. (496.1 Nm) at 1406 rpm  
 Maximum Torque Rise - 49.0%  
 Torque rise at 1800 engine rpm - 35%

#### 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)
<b>Maximum Power—6th (6B) Gear</b>									
86.4 (64.4)	8205 (36.5)	3.95 (6.36)	2202	4.1	0.498 (0.303)	14.16 (2.79)	181 (83)	45 (7)	29.9 (101.2)
<b>75% of Pull at Maximum Power—6th(6B) Gear</b>									
67.3 (50.2)	6135 (27.3)	4.11 (6.61)	2266	3.1	0.553 (0.336)	12.76 (2.51)	183 (84)	46 (8)	29.9 (101.2)
<b>50% of Pull at Maximum Power—6th(6B) Gear</b>									
46.0 (34.3)	4100 (18.2)	4.21 (6.77)	2299	2.2	0.640 (0.390)	11.01 (2.17)	183 (84)	45 (7)	29.9 (101.2)
<b>75% of Pull at Reduced Engine Speed—7th(7B) Gear</b>									
66.9 (49.9)	6135 (27.3)	4.09 (6.59)	1855	3.1	0.489 (0.297)	14.43 (2.84)	178 (81)	45 (7)	29.9 (101.1)
<b>50% of Pull at Reduced Engine Speed—7th(7B) Gear</b>									
46.1 (34.4)	4100 (18.2)	4.22 (6.78)	1893	2.2	0.551 (0.335)	12.79 (2.52)	180 (82)	46 (8)	29.9 (101.1)

**Location of tests:** Silsoe Research Institute, Wrest Park, Silsoe, MK45 4HS, United Kingdom

**Dates of tests:** February - March, 2005.

**Manufacturer:** CNH U.K. Ltd., Basildon, Essex, SS14 3AD, England

**FUEL and OIL:** Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.847 **Fuel weight** 7.04 lbs/gal (0.8453 kg/l) **Oil SAE** 10W30 **API service classification** CH-4 **Transmission and hydraulic lubricant** MAT 3525 fluid **Front axle lubricant** MAT 3525 fluid

**ENGINE:** Make CNH Diesel **Type** four cylinder vertical with turbocharger and air to air intercooler **Serial No.** 00093019 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.094" x 5.196" (104.0 mm x 132.0 mm) **Compression ratio** 17.0 to 1 **Displacement** 274 cu in (4485 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** one paper element **Muffler** vertical **Cooling medium temperature control** thermostat and variable speed fan

**CHASSIS:** **Type** front wheel assist **Serial No.** 221131 **Tread width** rear 68.1" (1730 mm) to 83.9" (2130 mm) front 64.2" (1630 mm) to 81.9" (2080 mm) **Wheelbase** 95.0" (2412 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (4) range operator controlled powershift **Nominal travel speeds mph (km/h)** first 1.41 (2.27) second 1.73 (2.78) third 2.11 (3.39) fourth 2.58 (4.15) fifth 3.31 (5.32) sixth 4.06 (6.53) seventh 4.94 (7.95) eighth 5.51 (8.86) ninth 6.06 (9.75) tenth 6.75 (10.87) eleventh 8.23 (13.24) twelfth 10.09 (16.24) thirteenth 12.94 (20.82) fourteenth 15.87 (25.54) fifteenth 19.32 (31.09) sixteenth 23.70 (38.14) reverse 1.39 (2.24), 1.71 (2.75), 2.08 (3.35), 2.55 (4.10), 3.27 (5.26), 4.01 (6.45), 4.88 (7.86), 5.44 (8.76), 5.99 (9.64), 6.67 (10.74) 8.13 (13.08), 9.97 (16.05), 12.78 (20.57), 15.68 (25.24), 19.09 (30.73), 23.43 (37.70) **Clutch** multiple wet disc electro-hydraulically operated 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 1969 engine rpm or 1000 rpm at 2120 engine rpm **Unladen tractor mass** 11440 lb (5188 kg)

## 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. <sup>o</sup> F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
1st(1A) Gear									
42.6 (31.8)	12320 (54.8)	1.30 (2.09)	2301	13.8	0.656 (0.399)	10.76 (2.12)	185 (85)	45 (7)	29.9 (101.2)
2nd(2A) Gear									
52.2 (38.9)	12205 (54.3)	1.60 (2.58)	2289	12.1	0.623 (0.379)	11.32 (2.23)	183 (84)	45 (7)	29.9 (101.2)
3rd(3A) Gear									
62.9 (46.9)	12060 (53.7)	1.96 (3.15)	2267	11.1	0.604 (0.368)	11.67 (2.30)	183 (84)	46 (8)	29.9 (101.2)
4th(4A) Gear									
76.2 (56.8)	11925 (53.0)	2.40 (3.85)	2226	9.6	0.533 (0.324)	13.25 (2.61)	183 (84)	45 (7)	29.9 (101.2)
5th(1B) Gear									
89.6 (66.8)	11680 (52.0)	2.88 (4.63)	2058	8.5	0.513 (0.312)	13.76 (2.71)	181 (83)	45 (7)	29.9 (101.2)
6th(2B) Gear									
97.1 (72.4)	10980 (48.9)	3.32 (5.34)	1901	6.8	0.472 (0.287)	14.93 (2.94)	180 (82)	46 (8)	29.9 (101.2)
7th(3B) Gear									
94.9 (70.8)	8590 (38.2)	4.14 (6.67)	1900	4.3	0.473 (0.288)	14.92 (2.94)	178 (81)	46 (8)	29.9 (101.1)
8th(1C) Gear									
96.4 (71.9)	7780 (34.6)	4.65 (7.48)	1903	3.8	0.462 (0.281)	15.28 (3.01)	178 (81)	45 (7)	29.9 (101.3)
9th(4B) Gear									
94.4 (70.4)	6900 (30.7)	5.13 (8.25)	1899	3.4	0.481 (0.292)	14.67 (2.89)	178 (81)	43 (6)	29.9 (101.3)
10th(2C) Gear									
96.0 (71.6)	6295 (28.0)	5.72 (9.20)	1896	3.1	0.463 (0.282)	15.23 (3.00)	178 (81)	45 (7)	29.9 (101.2)
11th(3C) Gear									
92.3 (68.8)	4930 (21.9)	7.02 (11.30)	1901	2.6	0.496 (0.302)	14.21 (2.80)	178 (81)	45 (7)	29.9 (101.2)
12th(4C) Gear									
90.7 (67.6)	3925 (17.5)	8.66 (13.94)	1903	2.1	0.511 (0.311)	13.81 (2.72)	178 (81)	45 (7)	29.9 (101.2)

TRACTOR SOUND LEVEL WITHOUT CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
At no load in 7th (3B) gear	85.0	85.0
Bystander	--	--

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
At no load in 7th (3B) gear	73.0	73.0
Bystander	--	--

#### TIRES AND WEIGHT

**Rear tires** - No., size, ply & psi(kPa)  
**Front tires** - No., size, ply & psi(kPa)  
**Height of Drawbar**  
**Static Weight with operator** - Rear  
 - Front  
 - Total

#### Tested Without Ballast

Two 600/65R38; \*\*,10 (70)  
 Two 480/65R28; \*\*,10 (70)  
 20.5 in (520 mm)  
 7185 lb (3258 kg)  
 4420 lb (2005 kg)  
 11605 lb (5263 kg)

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments.

**NOTE:** All results reported were for a tractor equipped with a cab unless noted otherwise.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD test procedures. This tractor did not meet the manufacturer's claims of: 26.5 gpm (100 lpm) remote hydraulic flow with a variable displacement pump nor 3 point lift claim of 9285 lbs (4212 kg) with mechanical lower links. The performance figures on this summary were taken from a test conducted under the OECD Code II test procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **2245** Nebraska Summary 494, december 15, 2005.

Leonard L. Bashford  
 Director

M.F. Kocher  
 V.I. Adamchuk  
 J.A. Smith  
 Board of Tractor Test Engineers

**DRAWBAR PERFORMANCE**  
**(Unballasted - Front Drive Disengaged)**  
**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)	Temp. °F (°C) cool- ing med	Temp. °F (°C) Air dry bulb	Barom. inch Hg (kPa)	
<b>Maximum Power—10th(2C) Gear</b>									
85.6 (63.8)	4870 (21.7)	6.59 (10.60)	2202	2.9	0.501 (0.305)	14.06 (2.77)	181 (83)	41 (5)	30.2 (102.3)
<b>75% of Pull at Maximum Power—10th(2C) Gear</b>									
66.6 (49.7)	3660 (16.3)	6.82 (10.98)	2268	2.3	0.554 (0.337)	12.74 (2.51)	183 (84)	41 (5)	30.2 (102.3)
<b>50% of Pull at Maximum Power—10th(2C) Gear</b>									
44.9 (33.5)	2425 (10.8)	6.95 (11.18)	2299	1.8	0.672 (0.409)	10.50 (2.07)	183 (84)	41 (5)	30.2 (102.3)
<b>75% of Pull at Reduced Engine Speed—11th(3C) Gear</b>									
66.9 (49.9)	3675 (16.3)	6.83 (10.99)	1868	2.4	0.500 (0.304)	14.11 (2.78)	178 (81)	41 (5)	30.2 (102.2)
<b>50% of Pull at Reduced Engine Speed—11th(3C) Gear</b>									
45.2 (33.7)	2440 (10.8)	6.94 (11.17)	1898	1.8	0.576 (0.350)	12.25 (2.41)	180 (82)	41 (5)	30.2 (102.2)
<b>MAXIMUM POWER IN SELECTED GEARS</b>									
1st(1A) Gear									
32.3 (24.1)	9385 (41.8)	1.29 (2.08)	2323	13.2	0.739 (0.450)	9.54 (1.88)	185 (85)	43 (6)	30.2 (102.3)
2nd(2A) Gear									
39.4 (29.4)	9240 (41.1)	1.60 (2.57)	2312	12.1	0.672 (0.409)	10.50 (2.07)	185 (85)	43 (6)	30.2 (102.3)
3rd(3A) Gear									
47.6 (35.5)	9240 (41.1)	1.93 (3.11)	2293	12.0	0.626 (0.381)	11.27 (2.22)	185 (85)	43 (6)	30.2 (102.3)
4th(4A) Gear									
58.5 (43.6)	9170 (40.8)	2.39 (3.85)	2281	10.8	0.515 (0.313)	13.71 (2.70)	185 (85)	43 (6)	30.2 (102.3)
5th(1B) Gear									
74.5 (55.6)	9115 (40.5)	3.07 (4.93)	2252	9.7	0.545 (0.331)	12.94 (2.55)	183 (84)	41 (5)	30.2 (102.3)
6th(2B) Gear									
87.4 (65.2)	8940 (39.8)	3.67 (5.90)	2162	8.3	0.496 (0.302)	14.21 (2.80)	181 (83)	41 (5)	30.2 (102.3)
7th(3B) Gear									
92.3 (68.8)	8545 (38.0)	4.05 (6.52)	1936	7.0	0.493 (0.300)	14.31 (2.82)	178 (81)	41 (5)	30.2 (102.3)
8th(1C) Gear									
96.3 (71.8)	8005 (35.6)	4.51 (7.26)	1907	5.8	0.470 (0.286)	15.02 (2.96)	178 (81)	41 (5)	30.2 (102.3)
9th(4B) Gear									
95.2 (71.0)	7075 (31.5)	5.05 (8.12)	1911	4.4	0.481 (0.292)	14.67 (2.89)	178 (81)	41 (5)	30.2 (102.3)
10th(2C) Gear									
97.4 (72.6)	6475 (28.8)	5.64 (9.08)	1904	3.8	0.459 (0.279)	15.38 (3.03)	178 (81)	41 (5)	30.2 (102.3)
11th(3C) Gear									
94.9 (70.8)	5125 (22.8)	6.94 (11.17)	1909	2.9	0.482 (0.293)	14.63 (2.88)	178 (81)	39 (4)	30.2 (102.3)
12th(4C) Gear									
93.2 (69.5)	4110 (18.3)	8.50 (13.68)	1896	2.5	0.488 (0.297)	14.47 (2.85)	178 (81)	39 (4)	30.2 (102.3)

This vehicle is equipped with an electronically controlled engine Power management system that monitors and boosts engine power output in certain circumstances. This is achieved by electronically changing the characteristics of the engine power-speed curve. The engine Power management function ("boosted" power level) becomes active in the higher transmission gears (13th and above) and for road transport applications. The system is also activated when power transfer through the PTO exceeds a preset level (and forward speed exceeds 0.5 km/h), for mobile PTO driven implement applications. An override system is provided to enable PTO operations at the "boosted" power level while the vehicle is stationary for test purposes. The results of of this PTO output test are presented below.

### 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—1038 rpm)</b>					
123.2 (91.9)	2201	7.28 (27.54)	0.416 (0.253)	16.94 (3.34)	
<b>Standard Power Take-off Speed - (1000 rpm)</b>					
126.6 (94.4)	2120	7.35 (27.83)	0.410 (0.249)	17.21 (3.39)	
<b>Maximum Power (2 hours)</b>					
133.2 (99.3)	1902	7.47 (28.26)	0.396 (0.241)	17.82 (3.51)	

### VARYING POWER AND FUEL CONSUMPTION

123.2 (91.9)	2201	7.28 (27.54)	0.416 (0.253)	16.94 (3.34)	Air temperature
106.6 (79.5)	2236	6.45 (24.42)	0.427 (0.260)	16.53 (3.26)	72°F (22°C)
81.0 (60.4)	2268	5.28 (20.00)	0.460 (0.280)	15.33 (3.02)	Relative humidity
54.8 (40.9)	2304	4.12 (15.61)	0.530 (0.323)	13.30 (2.62)	36%
27.9 (20.8)	2338	2.98 (11.28)	0.753 (0.458)	9.37 (1.85)	Barometer
--	2366	1.76 (6.66)	--	--	30.3"Hg (102.7kPa)

Maximum Torque 383.4 lb.-ft. (533.0 Nm) at 1601 rpm  
 Maximum Torque Rise - 33.6%  
 Torque rise at 1800 rpm - 29%

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

CATEGORY: II

Quick Attach: No

Maximum Force Exerted Through Whole Range: 7330 lbs (32.6 kN) Mechanical lower link  
7825 lbs (34.8 kN) Electronic draft control

i) Opening pressure of relief valve:	NA	NA
	<b>fixed disp. pump</b>	<b>variable disp. pump</b>
Sustained pressure at compensator cutoff:	2920 psi (201 bar)	3120 psi (215 bar)
ii) Pump delivery rate at minimum pressure:	22.0 GPM(83.3 l/min)	26.3 GPM(99.6 l/min)
iii) Pump delivery rate at maximum hydraulic power:	19.1 GPM(72.2 l/min)	25.9 GPM(97.9 l/min)
Delivery pressure:	2465 psi (170 bar)	2610 psi (180 bar)
Power:	27.5 HP (20.5 kW)	39.4 HP (29.4 kW)

### THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi.(bar)	3060(211)
Location:	lift cylinder
Hydraulic oil temperature: °F(°C)	150(65)
Location:	hydraulic sump
Category:	II
Quick attach:	none

#### Mechanical lower link

SAE Static Test—System pressure 2625 psi (181 Bar) (two 50 mm boost cylinders)

Hitch point distance to ground level in. (mm)	7.9(200)	16.3(415)	23.0(585)	28.5(723)	34.4(875)
Lift force on frame lb	13330	12565	11355	10185	8950
" " " " " " (kN)	(59.3)	(55.9)	(50.5)	(45.3)	(39.8)

#### Electronic draft control

SAE Static Test—System pressure 2815 psi (194 Bar) (two 80 mm external cylinders)

Hitch point distance to ground level in. (mm)	7.9(200)	15.7(400)	23.0(585)	30.3(770)	35.8(910)
Lift force on frame lb	12700	11575	11105	10520	9755
" " " " " " (kN)	(56.5)	(51.5)	(49.4)	(46.8)	(43.4)

### HITCH DIMENSIONS AS TESTED—NO LOAD

	OECD test		SAE test	
	inch	mm	inch	mm
A	27.4	697	28.0	710
B	12.2	310	12.2	310
C	15.6	395	15.6	395
D	14.6	370	14.6	370
E	8.2	208	10.8	275
F	9.3	235	9.3	235
G	32.3	820	32.3	820
H	1.9	48	1.9	48
I	17.9	455	16.9	430
J	23.0	585	23.0	585
K	19.8	505	23.0	585
L	44.0	1118	44.0	1118
M	22.2	563	22.2	563
N	37.4	950	37.4	950
O	7.8	197	7.9	200
P	47.0	1195	42.0	1068
Q	32.3	820	32.3	820
R	30.2	767	32.1	815

