

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F.
Larsen

2002

Nebraska Summary: S423 McCormick MTX 140

Nebraska Tractor Test Laboratory

University of Nebraska-Lincoln, tractortestlab@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

Laboratory, Nebraska Tractor Test, "Nebraska Summary: S423 McCormick MTX 140" (2002). *Nebraska Tractor Tests*. 2838.

<https://digitalcommons.unl.edu/tractormuseumlit/2838>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

SUMMARY OF OECD TEST 2099—NEBRASKA SUMMARY 423

McCORMICK MTX 140 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
---------------------	--------------------------------	-----------------	-----------------------	-----------------------	--------------------------------

MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—(PTO speed—1001 rpm)					
127.1 (94.8)	2202	8.16 (30.89)	0.450 (0.274)	15.58 (3.07)	
Maximum Power (2 hours)					
127.8 (95.3)	2100	7.87 (29.81)	0.432 (0.263)	16.24 (3.20)	

VARYING POWER AND FUEL CONSUMPTION

127.1 (94.8)	2201	8.16 (30.89)	0.450 (0.274)	15.58 (3.07)	Air temperature
111.3 (83.0)	2261	7.62 (28.84)	0.480 (0.292)	14.62 (2.88)	73°F (23°C)
84.5 (63.0)	2288	6.54 (24.77)	0.544 (0.331)	12.89 (2.54)	Relative humidity
56.9 (42.4)	2309	5.28 (20.00)	0.652 (0.397)	10.76 (2.12)	30%
28.8 (21.5)	2331	3.57 (13.53)	0.871 (0.530)	8.06 (1.59)	Barometer
--	2353	2.13 (8.05)	--	--	28.7" Hg (97.2 kPa)

Maximum Torque - 392.6 lb.-ft. (532.3 Nm) at 1449 rpm

Maximum Torque Rise - 29.5%

Torque rise at 1800 engine rpm - 17%

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(III-1) Gear									
110.2 (82.2)	6180 (27.5)	6.69 (10.77)	2200	3.0	0.524 (0.319)	13.40 (2.64)	190 (88)	55 (13)	30.1 (101.9)
75% of Pull at Maximum Power—9th(III-1) Gear									
86.0 (64.2)	4640 (20.6)	6.95 (11.19)	2272	2.4	0.589 (0.358)	11.93 (2.35)	189 (87)	57 (14)	30.1 (101.9)
50% of Pull at Maximum Power—9th(III-1) Gear									
58.2 (43.4)	3075 (13.7)	7.10 (11.43)	2301	1.7	0.718 (0.437)	9.78 (1.93)	189 (87)	57 (14)	30.1 (101.9)
75% of Pull at Reduced Engine Speed—10th(III-2) Gear									
85.6 (63.8)	4630 (20.6)	6.93 (11.15)	1881	2.5	0.507 (0.309)	13.84 (2.73)	187 (86)	59 (15)	30.1 (102.0)
50% of Pull at Reduced Engine Speed—10th(III-2) Gear									
58.1 (43.3)	3085 (13.7)	7.06 (11.36)	1902	1.9	0.591 (0.359)	11.88 (2.34)	185 (85)	59 (15)	30.1 (102.0)

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

Dates of tests: February - April, 2002

Manufacturer: McCormick Tractors Intr. Ltd., Doncaster, South Yorkshire, DN2 4PG, England

FUEL and OIL: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.843 **Fuel weight** 7.02 lbs/gal (0.841 kg/l) **Oil SAE** 15W40 **API service classification** CG-4 **Transmission and hydraulic lubricant** McCormick HTX fluid **Front axle lubricant** API GL5 SAE 85W140

ENGINE: Make Perkins Diesel **Type** six cylinder vertical with turbocharger **Serial No.** U770623H **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 3.937" x 5.00" (100.0 mm x 127.0 mm) **Compression ratio** 17.2 to 1 **Displacement** 365 cu in (5985 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **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.** ZT40SC4JJE3330019 **Tread width** rear 60.2" (1530 mm) to 87.8" (2230 mm) front 60.2" (1530 mm) to 87.8" (2230 mm) **Wheelbase** 106.3" (2700 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 1.78 (2.87) second 2.15 (3.46) third 2.66 (4.28) fourth 3.29 (5.30) fifth 3.34 (5.38) sixth 4.03 (6.48) seventh 4.98 (8.01) eighth 6.16 (9.91) ninth 6.69 (10.77) tenth 8.06 (12.97) eleventh 9.96 (16.03) twelfth 12.33 (19.85) thirteenth 13.01 (20.93) fourteenth 15.67 (25.22) fifteenth 19.37 (31.17) sixteenth 23.99 (38.61) reverse 2.06 (3.32), 2.49 (4.00), 3.08 (4.95), 3.81 (6.13), 3.87 (6.23), 4.66 (7.50), 5.76 (9.27), 7.13 (11.48), 7.74 (12.45), 9.32 (15.00), 11.52 (18.54), 14.27 (22.97) **Clutch** multiple wet disc electro-hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1877 engine rpm or 1000 rpm at 2200 engine rpm **Unladen tractor mass** 14040 lb (6369 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)	Consumption Hp.hr/gal (kW.h/l)	Temp. ^o F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
1st(I-1) Gear									
67.2 (50.1)	15375 (68.4)	1.64 (2.64)	2283	14.3	0.689 (0.419)	10.19 (2.01)	189 (87)	57 (14)	30.1 (102.0)
2nd(I-2) Gear									
79.3 (59.1)	14925 (66.4)	1.99 (3.21)	2269	12.9	0.633 (0.385)	11.08 (2.18)	187 (86)	59 (15)	30.1 (102.0)
3rd(I-3) Gear									
96.3 (71.8)	14500 (64.5)	2.49 (4.01)	2247	11.1	0.576 (0.350)	12.18 (2.40)	189 (87)	59 (15)	30.1 (102.0)
4th(I-4) Gear									
107.5 (80.2)	13230 (58.9)	3.05 (4.91)	2150	8.2	0.528 (0.321)	13.30 (2.62)	186 (86)	59 (15)	30.1 (102.0)
5th(II-1) Gear									
108.8 (81.1)	13130 (58.4)	3.11 (5.00)	2150	7.8	0.520 (0.316)	13.50 (2.66)	189 (87)	59 (15)	30.1 (102.0)
6th(II-2) Gear									
111.2 (82.9)	11160 (49.6)	3.74 (6.01)	2103	5.9	0.499 (0.304)	14.06 (2.77)	189 (87)	59 (15)	30.1 (102.0)
7th(II-3) Gear									
111.0 (82.8)	8825 (39.3)	4.72 (7.59)	2108	4.2	0.505 (0.307)	13.91 (2.74)	185 (85)	54 (12)	30.1 (101.9)
8th(II-4) Gear									
110.9 (82.7)	7075 (31.5)	5.88 (9.46)	2104	3.4	0.505 (0.307)	13.91 (2.74)	187 (86)	55 (13)	30.1 (101.9)
9th(III-1) Gear									
111.3 (83.0)	6530 (29.1)	6.39 (10.29)	2104	3.1	0.501 (0.305)	14.01 (2.76)	187 (86)	57 (14)	30.1 (101.9)
10th(III-2) Gear									
109.6 (81.8)	5315 (23.6)	7.73 (12.44)	2102	2.7	0.512 (0.311)	13.71 (2.70)	190 (88)	57 (14)	30.1 (101.9)
11th(III-3) Gear									
106.3 (79.3)	4155 (18.5)	9.59 (15.44)	2102	2.2	0.527 (0.320)	13.35 (2.63)	190 (88)	57 (14)	30.1 (101.9)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

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 3 point lift claims of 13137 lbs (5959 kg) at the hitch points with either the category II or category IIN hitch. This tractor also did not meet the manufacturer's 3 point lift claim of 10183 lbs (4619 kg) at the frame with the category IIN hitch. 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. **2099** Nebraska Summary 423, October 26, 2005.

Leonard L. Bashford
Director

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

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Disengaged dB(A)	Engaged dB(A)
At no load in 7th (II-2) gear	71.0	71.0
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 650/65R38; **,13 (90)

Two 540/65R28; **,13 (90)

15.0 in (380 mm)

7990 lb (3625 kg)

6215 lb (2819 kg)

14205 lb (6444 kg)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II, IIIN

Quick Attach: None

	Cat II w/assist cylinder
Maximum force exerted through whole range:	9000 lbs (40.0 kN) (at the frame) 10881 lbs (48.4 kN) (at the hitch points)
	Cat IIIN w/assist cylinder
	8586 lbs (38.2 kN) (at the frame) 11079 lbs (49.3 kN) (at the hitch points)
i) Opening pressure of relief valve:	NA
Sustained pressure of the open relief valve:	2845 psi (196 bar)
ii) Pump delivery rate at minimum pressure:	25.5 GPM (96.7 l/min)
iii) Pump delivery rate at maximum	
hydraulic power:	23.2 GPM (87.7 l/min)
Delivery pressure:	2250 psi (155 bar)
Power:	30.4 HP (22.7 kW)

THREE POINT HITCH PERFORMANCE

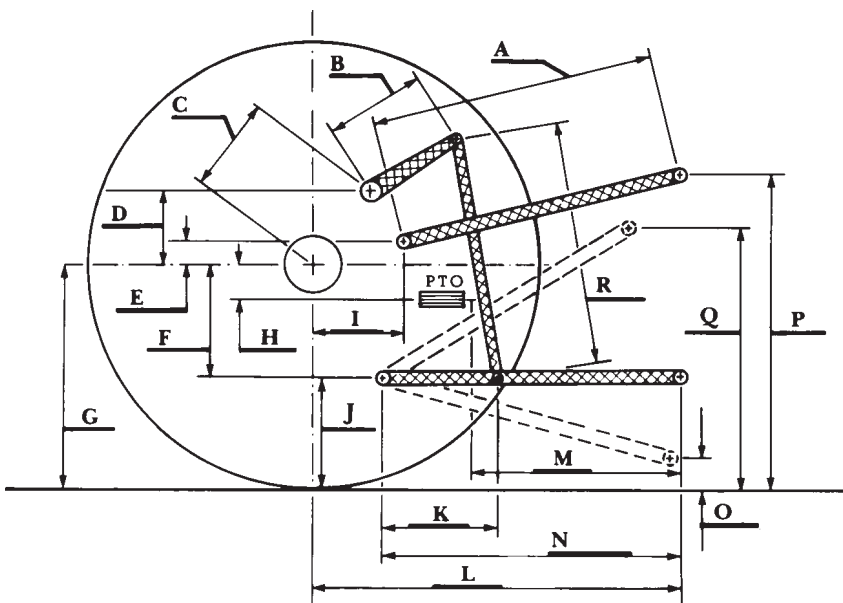
Observed Maximum Pressure psi. (bar)	2980 (205)
Location:	lift cylinder
Hydraulic oil temperature: °F (°C)	158 (70)
Location:	hydraulic sump
Category:	II, IIIN
Quick attach:	none

Cat II w/assist cylinder SAE Static Test—System pressure 2565 psi (177 Bar)

Hitch point distance to ground level in. (mm)	8.0 (203)	15.0 (381)	22.0 (559)	29.0 (737)	36.0 (914)
Lift force on frame lb	13878	13464	12789	11529	10949
" " " " " " (kN)	(61.7)	(59.9)	(56.9)	(51.3)	(48.7)

Cat IIIN w/assist cylinder SAE Static Test—System pressure 2565 psi (177 Bar)

Hitch point distance to ground level in. (mm)	8.0 (203)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb	10197	11556	10967	9630	9072
" " " " " " (kN)	(45.4)	(51.4)	(48.8)	(42.8)	(40.4)



HITCH DIMENSIONS AS TESTED—NO LOAD

	Category II			
	SAE Test		OECD Test	
	inch	mm	inch	mm
A	29.4	746	30.0	762
B	9.1	230	9.1	230
C	11.9	303	11.9	303
D	6.8	173	6.8	173
E	11.2	284	11.2	284
F	10.0	253	10.0	253
G	33.7	855	33.7	855
H	4.1	105	4.1	105
I	13.5	342	13.5	342
J	23.7	602	23.7	602
K	21.8	554	21.8	554
L	43.9	1114	43.9	1114
M	24.2	614	24.2	614
N	35.1	891	35.1	891
O	8.0	203	8.0	203
P	42.7	1085	47.7	1212
Q	36.7	932	36.7	932
R	25.7	654	25.7	654

HITCH DIMENSIONS AS TESTED—NO LOAD

	Category IIIN			
	SAE Test		OECD Test	
	inch	mm	inch	mm
A	28.8	730	29.8	756
B	9.1	230	9.1	230
C	11.9	303	11.9	303
D	6.8	173	6.8	173
E	11.2	284	11.2	284
F	10.0	253	10.0	253
G	33.7	855	33.7	855
H	4.1	105	4.1	105
I	13.5	342	13.5	342
J	23.7	602	23.7	602
K	21.8	554	21.8	554
L	43.9	1114	43.9	1114
M	24.2	614	24.2	614
N	35.1	891	35.1	891
O	8.0	203	9.0	229
P	45.7	1160	50.7	1287
Q	36.7	932	37.5	951
R	25.7	654	25.3	641