

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F.
Larsen

January 2004

Test 2195: Challenger MT545B Techstar Diesel

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



Part of the [Applied Mechanics Commons](#)

"Test 2195: Challenger MT545B Techstar Diesel" (2004). *Nebraska Tractor Tests*. 327.
<https://digitalcommons.unl.edu/tractormuseumlit/327>

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 2195–NEBRASKA SUMMARY 509

CHALLENGER MT545B TECHSTAR DIESEL CONTINUOUSLY VARIABLE TRANSMISSION

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—1082 rpm)					
116.3 (86.7)	2201	7.98 (30.20)	0.473 (0.288)	14.57 (2.87)	
Standard Power Take-off Speed(1000 rpm)					
124.6 (92.9)	2034	7.99 (30.26)	0.442 (0.269)	15.58 (3.07)	
Maximum Power (2 hours)					
125.7 (93.7)	1900	7.76 (29.37)	0.426 (0.259)	16.19 (3.19)	

VARYING POWER AND FUEL CONSUMPTION					
116.3 (86.7)	2201	7.98 (30.20)	0.473 (0.288)	14.57 (2.87)	Air temperature
99.6 (74.3)	2215	7.15 (27.06)	0.495 (0.301)	13.96 (2.75)	66°F (19°C)
75.2 (56.1)	2237	5.91 (22.36)	0.542 (0.330)	12.74 (2.51)	Relative humidity
50.7 (37.8)	2258	4.70 (17.81)	0.641 (0.390)	10.76 (2.12)	45%
25.7 (19.2)	2280	3.47 (13.13)	0.930 (0.566)	7.41 (1.46)	Barometer
--	2298	2.13 (8.07)	--	--	29.8" Hg (100.9 kPa)

Maximum Torque - 397 lb.-ft. (538 Nm) at 1346 rpm
 Maximum Torque Rise - 43.1%
 Torque rise at 1800 engine rpm - 31%

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 dry med	Barom. inch Hg (kPa)
Maximum Power—Turtle								
100.4 (74.9)	8190 (36.43)	4.60 (7.41)	2200	3.4	0.555 (0.337)	12.51 (2.46)	104 (40)	37 (3)
75% of Pull at Maximum Power—Turtle								
76.8 (57.3)	6125 (27.25)	4.70 (7.57)	2223	2.6	0.601 (0.365)	11.55 (2.27)	109 (43)	37 (3)
50% of Pull at Maximum Power—Turtle								
52.0 (38.8)	4065 (18.09)	4.80 (7.72)	2247	1.6	0.712 (0.433)	9.75 (1.92)	107 (42)	37 (3)
75% of Pull at Reduced Engine Speed—Turtle								
77.1 (57.5)	6125 (27.24)	4.72 (7.60)	1806	2.6	0.510 (0.310)	13.60 (2.68)	106 (41)	37 (3)
50% of Pull at Reduced Engine Speed—Turtle								
52.6 (39.2)	4065 (18.08)	4.85 (7.81)	1833	1.5	0.578 (0.351)	12.00 (2.36)	106 (41)	39 (4)

Location of tests: DLG testing Station for Agricultural Machinery, Max-Eyth-Weg 1 D-64823, Gros - Umstadt, Germany

Dates of tests: February - April, 2004
 Sound tests: January 19, 2006

Manufacturer: AGCO S.A., BP 60307, Avenue Blaise Pascal, 60026 Beauvais, France

FUEL and OIL: Fuel No. 2 Diesel **Specific gravity converted to 60°/60° F (15°/15°C)** 0.829 **Fuel weight** 6.90 lbs/gal (0.8269 kg/l) **Oil SAE 10W40 API service classification CH4 Transmission and hydraulic lubricant SAE10W/40 Front axle lubricant Gear oil SAE 85W/90**

ENGINE: Make Perkins Diesel **Type** six cylinder vertical with turbocharger and air to air intercooler **Serial No.** U092650K **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 3.937" x 5.00" (100.0 mm x 127.0 mm) **Compression ratio** 17.5 to 1 **Displacement** 366 cu in (5985 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 final drive oil, radiator for 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.** M309065 **Tread width** rear 61.6" (1566 mm) to 74.6" (1896 mm) front 72.4" (1840 mm) to 78.1" (1984 mm) **Wheelbase** 109.4" (2780 mm) **Hydraulic control system** direct engine drive **Transmission** AGCO CVT. A combination of mechanical and hydrostatic sections are electronically controlled to give the travel speeds shown. The transmission has two mechanical ranges. **Nominal travel speeds mph (km/h)** forward: Low range 0 - 17 (0 - 28), high range 0 - 31 (0 - 50) reverse: Low range 0 - 10 (0 - 16), high range 0 - 24 (0 - 38) **Clutch** a foot pedal controls the hydrostatic oil flow **Brakes** multiple wet disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2062 engine rpm or 1000 rpm at 2033 engine rpm **Unladen tractor mass** 14835 lb (6730 kg)

DRAWBAR PERFORMANCE

(Unballasted - Front Drive Engaged)

MAXIMUM POWER AT SELECTED SPEEDS

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)
98.3 (73.3)	14690 (65.35)	2.51 (4.04)	2020	14.7	Turtle 0.560 (0.341)	12.39 (2.44)	144 (62)	41 (5)	29.5 (100.0)
105.0 (78.3)	12895 (57.35)	3.05 (4.91)	1900	7.3	Turtle 0.510 (0.310)	13.60 (2.68)	142 (61)	43 (6)	29.5 (100.0)
106.1 (79.1)	10140 (45.10)	3.92 (6.31)	1900	4.7	Turtle 0.504 (0.306)	13.77 (2.71)	140 (60)	37 (3)	29.5 (100.0)
106.6 (79.5)	8630 (38.39)	4.63 (7.45)	1900	4.2	Turtle 0.502 (0.305)	13.82 (2.72)	140 (60)	36 (2)	29.5 (100.0)
105.9 (79.0)	6940 (30.88)	5.72 (9.20)	1901	3.3	Turtle 0.506 (0.308)	13.71 (2.70)	144 (62)	36 (2)	29.5 (100.0)
104.5 (77.9)	5730 (25.48)	6.84 (11.01)	1902	2.5	Turtle 0.512 (0.311)	13.55 (2.67)	147 (64)	34 (1)	29.5 (100.0)
105.6 (78.8)	5020 (22.34)	7.89 (12.69)	1902	2.0	Turtle 0.517 (0.314)	13.43 (2.64)	151 (66)	34 (1)	29.5 (100.0)
103.0 (76.8)	4380 (19.48)	8.82 (14.19)	1900	1.9	Turtle 0.529 (0.321)	13.12 (2.58)	147 (64)	39 (4)	29.5 (100.0)
103.4 (77.1)	8325 (37.02)	4.66 (7.50)	1900	3.6	Rabbit 0.519 (0.315)	13.38 (2.63)	142 (61)	39 (4)	29.5 (100.0)
105.4 (78.6)	7000 (31.14)	5.64 (9.08)	1901	3.2	Rabbit 0.510 (0.310)	13.60 (2.68)	142 (61)	39 (4)	29.5 (100.0)
105.4 (78.6)	5680 (25.27)	6.96 (11.20)	1903	2.8	Rabbit 0.510 (0.310)	13.60 (2.68)	144 (62)	39 (4)	29.5 (100.0)
107.5 (80.2)	5060 (22.51)	7.97 (12.83)	1904	2.3	Rabbit 0.508 (0.309)	13.65 (2.69)	140 (60)	39 (4)	29.5 (100.0)
106.6 (79.5)	4455 (19.81)	8.98 (14.45)	1903	1.8	Rabbit 0.512 (0.311)	13.55 (2.67)	142 (61)	37 (3)	29.5 (100.0)

NOTE 1: The data on this summary was obtained from OECD report 2195 conducted on the Massey Ferguson 7480 Diesel.

NOTE 2: The engine of the Challenger MT545B has two different injection pump characteristics. Power boosted - for travel speeds above 9.3 mph (15.0 km/h) or above 5.0 mph (8.0 km/h) with PTO engaged. Standard for all other conditions.

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 capacity claim of 11200 lbs (5080 kg) at 24" behind link ends. 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. **2195**, Nebraska Summary 509, March 15, 2006.

Leonard L. Bashford
Director

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

TRACTOR SOUND LEVEL WITH CAB

dB(A)

At no load in Turtle range - 4.6 mph (7.5 km/h)	70.4
Bystander in Rabbit range	84.4

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires - No., size, ply & psi (kPa)	Four 20.8R38; **; 7(50)	Two 650/65R38; **; 12(80)
Ballast - Duals (total)	1450 lb (658 kg)	None
- Cast Iron (total)	None	None
Front Tires - No., size, ply & psi (kPa)	Two 16.9R28; **; 14(100)	Two 540/65R28; **; 12(80)
Ballast - Liquid (total)	None	None
- Cast Iron (total)	None	None
Height of Drawbar	22.0 in (560 mm)	22.0 in (560 mm)
Static Weight with operator - Rear	10625 lb (4820 kg)	9170 lb (4160 kg)
- Front	6605 lb (2995 kg)	5830 lb (2645 kg)
- Total	17230 lb (7815 kg)	15000 lb (6805 kg)

DRAWBAR PERFORMANCE
(Ballasted - Front Drive Engaged)
MAXIMUM POWER AT SELECTED SPEEDS

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. °F cool- ing med	°C Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—Turtle									
95.1 (70.9)	7315 (32.54)	4.87 (7.84)	2200	2.3	0.589 (0.358)	11.78 (2.32)	151 (66)	73 (23)	29.7 (100.5)
75% of Pull at Maximum Power—Turtle									
72.3 (53.9)	5465 (24.32)	4.96 (7.98)	2223	1.8	0.642 (0.391)	10.80 (2.13)	153 (67)	75 (24)	29.7 (100.5)
50% of Pull at Maximum Power—Turtle									
48.9 (36.5)	3635 (16.16)	5.05 (8.12)	2245	1.2	0.785 (0.478)	8.83 (1.74)	147 (64)	70 (21)	29.7 (100.5)
75% of Pull at Reduced Engine Speed—Turtle									
72.0 (53.7)	5480 (24.38)	4.93 (7.93)	1658	1.9	0.530 (0.322)	13.10 (2.58)	147 (64)	73 (23)	29.7 (100.5)
50% of Pull at Reduced Engine Speed—Turtle									
48.8 (36.4)	3625 (16.12)	5.05 (8.13)	1685	1.2	0.599 (0.365)	11.57 (2.28)	145 (63)	73 (23)	29.7 (100.5)
MAXIMUM POWER IN SELECTED GEARS									
90.9 (67.8)	17075 (75.95)	2.00 (3.22)	1961	14.9	Turtle 0.601 (0.366)	11.55 (2.28)	151 (66)	70 (21)	29.7 (100.5)
96.3 (71.8)	15575 (69.29)	2.32 (3.73)	1897	9.6	Turtle 0.558 (0.339)	12.44 (2.45)	156 (69)	72 (22)	29.7 (100.5)
100.4 (74.9)	13210 (58.76)	2.85 (4.59)	1902	5.9	Turtle 0.536 (0.326)	12.94 (2.55)	153 (67)	73 (23)	29.7 (100.5)
101.9 (76.0)	12520 (55.70)	3.05 (4.91)	1898	5.0	Turtle 0.529 (0.321)	13.12 (2.58)	151 (66)	72 (22)	29.7 (100.5)
103.0 (76.8)	10785 (47.98)	3.58 (5.76)	1906	4.1	Turtle 0.524 (0.319)	13.25 (2.61)	153 (67)	72 (22)	29.7 (100.5)
101.6 (75.8)	9165 (40.77)	4.16 (6.70)	1900	3.5	Turtle 0.529 (0.322)	13.12 (2.59)	145 (63)	64 (18)	29.7 (100.5)
103.4 (77.1)	8010 (35.64)	4.84 (7.79)	1902	2.9	Turtle 0.519 (0.316)	13.35 (2.63)	144 (62)	64 (18)	29.7 (100.5)
101.1 (75.4)	6970 (31.00)	5.44 (8.76)	1903	2.5	Turtle 0.532 (0.323)	13.05 (2.57)	147 (64)	64 (18)	29.7 (100.5)
100.0 (74.6)	5935 (26.41)	6.32 (10.17)	1902	2.1	Turtle 0.538 (0.328)	12.88 (2.54)	145 (63)	64 (18)	29.7 (100.5)
98.3 (73.3)	5220 (23.21)	7.06 (11.37)	1899	2.1	Turtle 0.547 (0.333)	12.69 (2.50)	147 (64)	66 (19)	29.7 (100.5)
99.1 (73.9)	4660 (20.73)	7.98 (12.84)	1892	2.0	Turtle 0.546 (0.332)	12.72 (2.51)	151 (66)	66 (19)	29.7 (100.5)
93.9 (70.0)	3840 (17.09)	9.16 (14.74)	1899	1.9	Turtle 0.582 (0.354)	11.93 (2.35)	151 (66)	72 (22)	29.7 (100.5)
100.6 (75.0)	6500 (28.91)	5.80 (9.34)	1902	2.2	Rabbit 0.535 (0.325)	12.97 (2.55)	155 (67)	72 (22)	29.7 (100.5)
100.0 (74.6)	5915 (26.30)	6.34 (10.21)	1895	2.1	Rabbit 0.536 (0.326)	12.94 (2.55)	165 (74)	68 (20)	29.7 (100.5)
99.1 (73.9)	5255 (23.37)	7.07 (11.38)	1896	1.8	Rabbit 0.542 (0.330)	12.79 (2.52)	158 (70)	68 (20)	29.7 (100.5)
102.1 (76.1)	4900 (21.79)	7.81 (12.57)	1901	1.9	Rabbit 0.538 (0.327)	12.89 (2.54)	156 (69)	70 (21)	29.7 (100.5)
97.6 (72.8)	4085 (18.17)	8.96 (14.42)	1901	1.5	Rabbit 0.560 (0.341)	12.39 (2.44)	160 (71)	70 (21)	29.7 (100.5)
99.6 (74.3)	3945 (17.55)	9.46 (15.23)	1894	1.3	Rabbit 0.549 (0.334)	12.64 (2.49)	151 (66)	70 (21)	29.7 (100.5)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick Attach: None

Maximum force exerted through whole range: 10915 lbs (48.55 kN)

i) Opening pressure of relief valve: NA

Sustained pressure of the open relief valve: 2915 psi (201 bar)

one coupler set two outlet sets combined

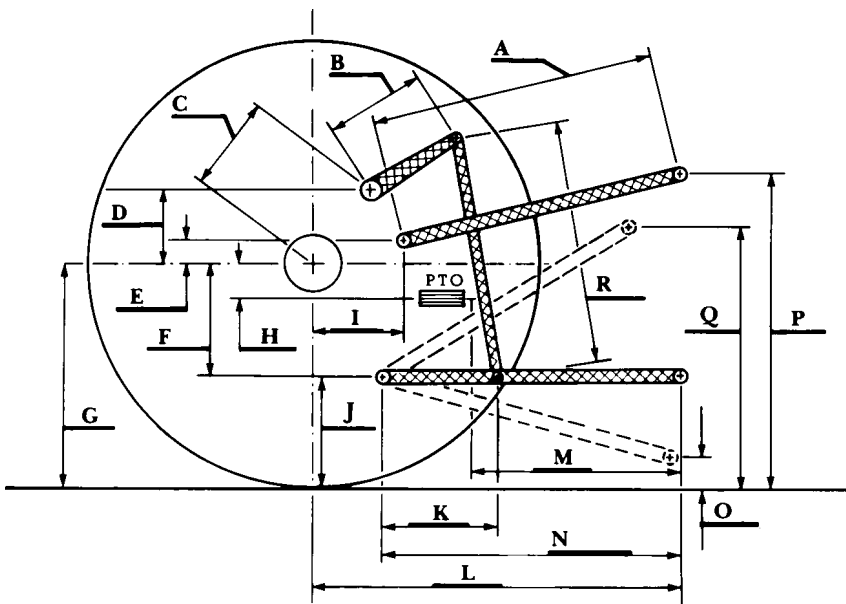
ii) Pump delivery rate at minimum pressure: 27.6 GPM (104.3 l/min) 31.7 GPM (119.9 l/min)

iii) Pump delivery rate at maximum

hydraulic power: 26.9 GPM (101.8 l/min) 28.0 GPM (106.1 l/min)

Delivery pressure: 2310 psi (159 bar) 2685 psi (185 bar)

Power: 36.2 HP (27.0 kW) 43.8 HP (32.6 kW)



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	29.1	740
B	14.0	355
C	13.8	351
D	11.6	295
E	5.5	140
F	9.8	250
G	32.2	820
H	2.8	70
I	17.5	445
J	22.4	570
K	26.2	665
L	45.1	1145
M	26.0	660
N	40.6	1030
O	7.9	200
P	46.5	1180
Q	36.2	920
R	29.3	745