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January 2005

## Test 1846: Challenger MT765B Diesel

Nebraska Tractor Test Lab

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# NEBRASKA OECD TRACTOR TEST 1846—SUMMARY 478

## CHALLENGER MT765B 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—1060 rpm)</b>					
265.78 (198.20)	2100	16.57 (62.73)	0.438 (0.266)	16.04 (3.16)	
<b>Standard Power Take-off Speed - (PTO speed - 1000 rpm)</b>					
294.81 (219.84)	1979	17.08 (64.66)	0.407 (0.248)	17.26 (3.40)	
<b>Maximum Power (1 hour)</b>					
320.72 (239.16)	1750	17.70 (67.00)	0.388 (0.236)	18.12 (3.57)	

#### VARYING POWER AND FUEL CONSUMPTION

265.78 (198.20)	2100	16.57 (62.73)	0.438 (0.266)	16.04 (3.16)	Air temperature
235.96 (175.96)	2191	15.17 (57.44)	0.452 (0.275)	15.55 (3.06)	77°F (25°C)
177.37 (132.26)	2198	12.95 (49.04)	0.513 (0.312)	13.69 (2.70)	Relative humidity
118.30 (88.20)	2198	10.41 (39.39)	0.618 (0.376)	11.37 (2.24)	39%
59.02 (44.01)	2198	6.82 (25.81)	0.812 (0.494)	8.66 (1.71)	Barometer
2.11 (1.58)	2198	3.63 (13.74)	12.066 (7.339)	0.58 (0.11)	28.69" Hg (97.16 kPa)

Maximum Torque - 1027 lb.-ft. (1392 Nm) at 1401 rpm

Maximum Torque Rise - 54.3%

Torque rise at 1699 engine rpm - 45%

#### DRAWBAR PERFORMANCE (Unballasted)

##### 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 Gear</b>									
228.21 (170.17)	19667 (87.48)	4.35 (7.00)	2099	3.57	0.522 (0.317)	13.46 (2.65)	177 (81)	69 (21)	28.72 (97.26)
<b>75% of Pull at Maximum Power—6th Gear</b>									
181.54 (135.37)	14685 (63.52)	4.64 (7.46)	2198	1.91	0.546 (0.332)	12.86 (2.53)	176 (80)	71 (22)	28.73 (97.29)
<b>50% of Pull at Maximum Power—6th Gear</b>									
122.45 (91.31)	9795 (43.57)	4.69 (7.54)	2200	0.83	0.682 (0.415)	10.30 (2.03)	176 (80)	73 (23)	28.74 (97.33)
<b>75% of Pull at Reduced Engine Speed—9th Gear</b>									
181.39 (135.26)	14683 (63.31)	4.63 (7.46)	1537	1.87	0.487 (0.296)	14.42 (2.84)	177 (81)	72 (22)	28.74 (97.33)
<b>50% of Pull at Reduced Engine Speed—9th Gear</b>									
122.64 (91.45)	9791 (43.55)	4.70 (7.56)	1543	0.87	0.563 (0.342)	12.48 (2.46)	175 (79)	75 (24)	28.75 (97.36)

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

**Dates of test:** May 9 - 13, 2005

**Manufacturer:** AGCO Corp, 4205 River Green  
Parkway, Duluth Ga 30096

**FUEL, OIL and TIME:** Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8437  
**Fuel weight** 7.025 lbs/gal (0.842 kg/l) **Oil** SAE 10W-30 **API service classification** CI-4  
**Transmission and hydraulic lubricant** AGCO 821 XL fluid **Total time engine was operated:** 24.5 hours

**ENGINE: Make** Caterpillar **Diesel Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.** \*JSC00106\* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.409" x 5.866" (112.0 mm x 149.0 mm) **Compression ratio** 17.1 to 1 **Displacement** 537 cu in (8810 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 and water separator **Muffler** vertical **Cooling medium temperature control** 1 thermostat and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** 113.0 - 119.9 lb/h (51.3 - 54.4 kg/h) **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 20.2 - 22.2 psi (139 - 153 kPa) as measured 21.2 psi (146 kPa)

**CHASSIS: Type** tracklayer-rubber tracked **Serial No.** \*AGCMT765JAMS61198\* **Track width** 88.0" (2235 mm) to 119.5" (3035 mm) **Length of track on ground** 102.4" (2600 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 1.66 (2.67) second 2.11 (3.40) third 2.66 (4.28) fourth 3.38 (5.44) fifth 4.03 (6.49) sixth 4.54 (7.31) seventh 5.12 (8.24) eighth 5.76 (9.27) ninth 6.48 (10.43) tenth 7.29 (11.73) eleventh 8.22 (13.23) twelfth 9.26 (14.90) thirteenth 11.02 (17.73) fourteenth 14.00 (22.53) fifteenth 17.72 (28.52) sixteenth 24.64 (39.65) at 2300 rpm, reverse 1.33 (2.14), 3.22 (5.18), 3.63 (5.84), 8.82 (14.19) **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated foot pedal **Steering** electro-hydraulic differential steering controlled by steering wheel **Power take-off** 1000 rpm at 1980 engine rpm **Unladen tractor mass** 31085 lb (14100 kg)

DRAWBAR PERFORMANCE

Unballasted at 2100 RPM

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	Air dry bulb	Barom. inch Hg (kPa)	
3th Gear									
183.35 (136.72)	28566 (127.07)	2.41 (3.87)	2175	12.48	0.602 (0.366)	11.66 (2.30)	177 (80)	64 (18)	28.70 (97.19)
4th Gear									
213.91 (159.51)	25799 (114.76)	3.11 (5.00)	2096	7.90	0.560 (0.340)	12.55 (2.47)	177 (81)	65 (18)	28.71 (97.22)
5th Gear									
224.21 (167.20)	22002 (97.87)	3.82 (6.15)	2099	4.73	0.530 (0.322)	13.27 (2.61)	178 (81)	67 (19)	28.72 (97.26)
6th Gear									
228.21 (170.17)	19667 (87.48)	4.35 (7.00)	2099	3.57	0.522 (0.317)	13.46 (2.65)	177 (81)	69 (21)	28.72 (97.26)
7th Gear									
224.22 (167.20)	16906 (75.20)	4.97 (8.00)	2101	2.45	0.531 (0.323)	13.23 (2.61)	179 (81)	70 (21)	28.65 (97.02)
8th Gear									
227.61 (169.73)	15151 (67.40)	5.63 (9.07)	2103	1.93	0.523 (0.318)	13.44 (2.65)	178 (81)	69 (21)	28.66 (97.05)
9th Gear									
223.08 (166.35)	13166 (58.56)	6.35 (10.23)	2100	1.59	0.528 (0.321)	13.29 (2.62)	179 (82)	72 (22)	28.64 (96.99)
10th Gear									
223.37 (166.57)	11667 (51.90)	7.18 (11.55)	2101	1.12	0.532 (0.324)	13.20 (2.60)	179 (82)	73 (23)	28.63 (96.95)
11th Gear									
210.83 (157.21)	9747 (43.36)	8.11 (13.05)	2096	0.75	0.563 (0.343)	12.48 (2.46)	178 (81)	74 (23)	28.62 (96.92)

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 inlet was maintained at 143°F (62°C). 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 and correct report of official Tractor Test No. **1846**, Nebraska Summary 478, June 17,2005.

Leonard L. Bashford  
Director

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

TRACTOR SOUND LEVEL WITH CAB

dB(A)

At no load in 6th gear	74.0
Bystander	--

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Track width	25.0 in (635 mm)	25.0 in (635 mm)
Ballast - Cast iron(front end)	3490 lb (1583 kg)	None
- Cast iron(front idlers)	1250 lb (567 kg)	None
Height of Drawbar	18.5 in (470 mm)	18.5 in (470 mm)
Static Weight with operator	36000 lb(16329 kg)	31260 lb(14179 kg)

**DRAWBAR PERFORMANCE**  
**(Unballasted at 1750 RPM)**  
**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)
3th Gear									
186.07 (138.75)	29028 (129.12)	2.40 (3.87)	2165	12.12	0.600 (0.365)	11.70 (2.31)	177 (81)	64 (18)	28.70 (97.20)
4th Gear									
215.59 (160.77)	26467 (117.73)	3.05 (4.92)	2082	8.93	0.556 (0.338)	12.63 (2.49)	178 (81)	66 (19)	28.71 (97.22)
5th Gear									
240.87 (179.61)	26436 (117.59)	3.42 (5.50)	1960	8.75	0.509 (0.309)	13.81 (2.72)	179 (82)	68 (20)	28.72 (97.26)
6th Gear									
254.01 (189.42)	25924 (115.31)	3.67 (5.91)	1865	8.40	0.488 (0.297)	14.38 (2.83)	180 (82)	69 (21)	28.72 (97.26)
7th Gear									
260.58 (194.31)	24588 (109.37)	3.97 (6.40)	1752	6.46	0.476 (0.290)	14.75 (2.91)	181 (83)	71 (22)	28.65 (97.02)
8th Gear									
268.30 (200.07)	22088 (98.25)	4.55 (7.33)	1748	4.58	0.465 (0.283)	15.12 (2.98)	180 (82)	70 (21)	28.65 (97.02)
9th Gear									
266.30 (198.58)	19258 (85.67)	5.19 (8.35)	1748	3.40	0.467 (0.284)	15.03 (2.96)	181 (83)	73 (23)	28.63 (96.95)
10th Gear									
269.13 (200.69)	17123 (76.17)	5.89 (9.49)	1750	2.58	0.465 (0.283)	15.10 (2.98)	182 (83)	73 (23)	28.63 (96.95)
11th Gear									
264.24 (197.04)	14769 (65.70)	6.71 (10.80)	1753	1.89	0.473 (0.288)	14.84 (2.92)	182 (83)	75 (24)	28.62 (96.92)
12th Gear									
265.35 (197.87)	13140 (58.45)	7.57 (12.19)	1749	1.41	0.467 (0.284)	15.03 (2.96)	183 (84)	76 (24)	28.62 (96.92)
13th Gear									
264.97 (197.59)	10947 (48.69)	9.08 (14.61)	1752	0.88	0.473 (0.288)	14.86 (2.93)	183 (84)	78 (26)	28.61 (96.88)

**DRAWBAR PERFORMANCE**  
**(Ballasted to 36000 lbs at 1750 RPM)**  
**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	Air dry bulb	Barom. inch Hg (kPa)	
2nd Gear									
175.39 (130.79)	34145 (151.89)	1.93 (3.10)	2198	12.17	0.586 (0.356)	11.99 (2.36)	175 (80)	58 (14)	28.75 (97.36)
3rd Gear									
205.98 (153.60)	32328 (143.80)	2.39 (3.85)	2119	10.68	0.565 (0.344)	12.43 (2.45)	177 (80)	58 (14)	28.76 (97.39)
4th Gear									
237.56 (177.15)	30843 (137.19)	2.89 (4.65)	1979	9.34	0.509 (0.310)	13.79 (2.72)	177 (80)	58 (14)	28.76 (97.39)
5th Gear									
259.52 (193.52)	30098 (133.88)	3.23 (5.20)	1847	8.36	0.478 (0.291)	14.68 (2.89)	177 (81)	57 (14)	28.77 (97.43)
6th Gear									
268.00 (199.85)	28735 (127.82)	3.50 (5.63)	1754	7.22	0.464 (0.282)	15.14 (2.98)	178 (81)	57 (14)	28.78 (97.46)
7th Gear									
270.44 (201.67)	25060 (111.47)	4.05 (6.51)	1754	4.84	0.458 (0.278)	15.35 (3.02)	177 (81)	57 (14)	28.78 (97.46)
8th Gear									
274.53 (204.72)	22276 (99.09)	4.62 (7.44)	1757	3.80	0.451 (0.274)	15.59 (3.07)	178 (81)	56 (13)	28.79 (97.49)
9th Gear									
272.48 (203.17)	19507 (86.77)	5.24 (8.43)	1755	2.81	0.455 (0.277)	15.44 (3.04)	178 (81)	56 (13)	28.80 (97.53)
10th Gear									
275.15 (205.18)	17407 (77.43)	5.93 (9.54)	1754	2.19	0.451 (0.274)	15.59 (3.07)	179 (82)	57 (14)	28.81 (97.56)
11th Gear									
269.89 (201.26)	15061 (66.99)	6.72 (10.81)	1753	1.63	0.456 (0.278)	15.39 (3.03)	180 (82)	58 (14)	28.81 (97.56)
12th Gear									
270.08 (201.40)	13321 (59.25)	7.60 (12.24)	1755	1.29	0.461 (0.281)	15.23 (3.00)	180 (82)	58 (14)	28.82 (97.60)
13th Gear									
266.65 (198.84)	11014 (48.99)	9.08 (14.61)	1753	0.93	0.463 (0.281)	15.19 (2.99)	180 (82)	59 (15)	28.82 (97.60)

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

CATEGORY: III

Quick Attach: yes

Maximum force exerted through whole range: 17263 lbs (76.8 kN)

i) Opening pressure of relief valve: NA

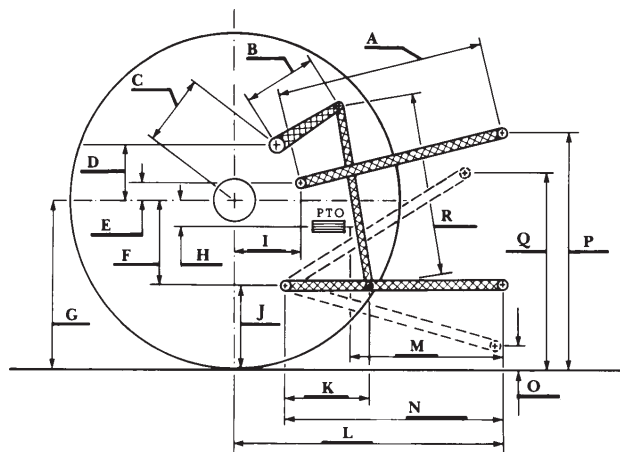
Sustained pressure at compensator cutoff: 2980 psi (205 bar)

ii) Pump delivery rate at minimum pressure and rated engine speed: 44.0 GPM (166.6 l/min)

iii) Pump delivery rate at maximum hydraulic power: 42.3 GPM (160.1 l/min)

Delivery pressure: 2794 psi (193 bar)

Power: 69.0 HP (51.4 kW)



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	27.6	702
B	21.7	550
C	23.5	596
D	23.0	583
E	11.4	290
F	11.8	300
G	33.4	849
H	1.3	34
I	16.7	425
J	21.6	549
K	27.1	688
L	48.4	1230
*L'	52.2	1325
M	27.9	709
N	39.6	1005
O	9.0	230
P	48.6	1234
Q	40.2	1022
R	42.5	1079

\*L' to Quick Attach ends



CHALLENGER MT765B DIESEL

Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln