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January 2005

## Test 1879: Challenger MT875B Diesel

Nebraska Tractor Test Lab

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# NEBRASKA OECD TRACTOR TEST 1879 – SUMMARY 536

## CHALLENGER MT875B DIESEL

### 16 SPEED

#### 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)	Temp. °F (°C) cool- ing med	Barom. inch Hg (kPa)		
Maximum Power—8th Gear									
431.02 (321.41)	28554 (127.01)	5.66 (9.11)	2100	2.49	0.460 (0.280)	15.27 (3.01)	182 (84)	53 (12)	28.60 (96.85)
75% of Pull at Maximum Power—8th Gear									
342.18 (255.16)	21375 (95.08)	6.00 (9.66)	2196	1.13	0.567 (0.345)	12.39 (2.44)	182 (83)	57 (14)	28.74 (97.33)
50% of Pull at Maximum Power—8th Gear									
229.80 (171.36)	14239 (63.34)	6.05 (9.74)	2200	0.60	0.625 (0.380)	11.25 (2.22)	181 (83)	59 (15)	28.74 (97.33)
75% of Pull at Reduced Engine Speed—11th Gear									
340.09 (253.61)	21344 (94.94)	5.98 (9.62)	1532	1.19	0.456 (0.277)	15.41 (3.04)	184 (84)	58 (14)	28.74 (97.33)
50% of Pull at Reduced Engine Speed—11th Gear									
228.81 (170.62)	14235 (63.32)	6.03 (9.70)	1536	0.51	0.508 (0.309)	13.82 (2.72)	182 (84)	58 (14)	28.74 (97.33)

#### Lugging ability in 10th gear

Crankshaft speed rpm	2096	2001	1898	1799	1697	1597	1400	1298
Pull-lbs (kN)	22012 (97.92)	25187 (112.04)	27922 (124.20)	30394 (135.20)	31649 (140.78)	33472 (148.89)	34764 (154.64)	34170 (152.00)
Increase in pull %	0	14	27	38	44	52	58	55
Power-Hp (kW)	425.41 (317.23)	462.19 (344.65)	483.67 (360.68)	494.45 (368.71)	483.49 (360.54)	479.04 (357.22)	433.23 (323.06)	395.59 (294.99)
Speed-mph (km/h)	7.25 (11.66)	6.88 (11.07)	6.50 (10.45)	6.10 (9.82)	5.73 (9.22)	5.37 (8.64)	4.67 (7.52)	4.34 (6.99)
Slip %	1.34	1.79	2.40	3.08	3.58	4.00	4.72	4.47

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

**Dates of tests:** April 25 - May 4, 2005

**Manufacturer:** AGCO Corporation, 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 Trandraulic 821 XL fluid **Total time engine was operated:** 26.0 hours

**ENGINE: Make** Caterpillar **Diesel Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.** \*EJG00101\* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.709" x 7.205" (145.0 mm x 183.0 mm) **Compression ratio** 16.5 to 1 **Displacement** 1105 cu in (18130 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 and water separator **Fuel cooler** radiator for returned fuel **Muffler** vertical **Cooling medium temperature control** 2 thermostats

**ENGINE OPERATING PARAMETERS: Fuel rate:** 194.0 - 205.9 lb/h (88.0 - 93.4 kg/h) **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 21.8 - 24.7 psi (150 - 170 kPa) as measured 23.4 psi (161 kPa)

**CHASSIS: Type** tracklayer-rubber tracked **Serial No.** \*AGCMT875PBFT60101\* **Track width** 100.0" (2540 mm) to 128.0" (3250 mm) **Length of track on ground** 122.4" (3110 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 1.67 (2.69) second 2.13 (3.43) third 2.68 (4.31) fourth 3.41 (5.48) fifth 4.06 (6.54) sixth 4.58 (7.37) seventh 5.16 (8.31) eighth 5.80 (9.34) ninth 6.53 (10.51) tenth 7.34 (11.82) eleventh 8.29 (13.34) twelfth 9.33 (15.02) thirteenth 11.10 (17.87) fourteenth 14.11 (22.71) fifteenth 17.86 (28.75) sixteenth 24.86 (40.00) at 2300 rpm, reverse 1.34 (2.16), 3.24 (5.22), 3.66 (5.89), 8.89 (14.30) **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** NA **Unladen tractor mass** 43525 lb (19743 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)	Consumption Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
271.48 (202.44)	42154 (187.51)	2.42 (3.89)	2101	10.17	0.585 (0.356)	12.02 (2.37)	181 (83)	43 (6)	28.86 (97.73)
4th Gear									
340.74 (254.09)	41696 (185.47)	3.06 (4.93)	2109	10.59	0.581 (0.354)	12.08 (2.38)	182 (83)	43 (6)	28.86 (97.73)
5th Gear									
386.76 (288.41)	38343 (170.56)	3.78 (6.09)	2097	6.75	0.493 (0.300)	14.25 (2.81)	182 (83)	43 (6)	28.86 (97.73)
6th Gear									
411.43 (306.80)	35333 (157.17)	4.37 (7.03)	2099	4.44	0.472 (0.287)	14.89 (2.93)	182 (83)	44 (7)	28.74 (97.33)
7th Gear									
423.91 (316.11)	31969 (142.20)	4.97 (8.00)	2099	3.46	0.469 (0.285)	14.99 (2.95)	182 (83)	45 (7)	28.74 (97.33)
8th Gear									
431.02 (321.41)	28554 (127.01)	5.66 (9.11)	2100	2.49	0.460 (0.280)	15.27 (3.01)	182 (84)	53 (12)	28.60 (96.85)
9th Gear									
427.58 (318.85)	24977 (111.10)	6.42 (10.33)	2098	1.79	0.465 (0.283)	15.09 (2.97)	182 (84)	52 (11)	28.59 (96.82)
10th Gear									
425.41 (317.23)	22012 (97.92)	7.25 (11.66)	2096	1.34	0.465 (0.283)	15.09 (2.97)	183 (84)	48 (9)	28.57 (96.75)
11th Gear									
416.65 (310.70)	19008 (84.55)	8.22 (13.23)	2101	1.00	0.476 (0.290)	14.75 (2.91)	183 (84)	50 (10)	28.57 (96.75)

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

**Note:** This tractor has a driveline protection system that limits the maximum engine torque in gears 1 through 7.

**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 108°F (42°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. **1879**, Nebraska Summary 536, June 2, 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 6th gear	76.1
Bystander	--

#### TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Track width	36.0 in (915 mm)	36.0 in (915 mm)
Ballast - Cast iron(front)	4280 lb (1941 kg)	None
- Cast iron(front idlers)	1375 lb (641 kg)	None
- Cast iron(side)	600 lb (272 kg)	None
Height of Drawbar	19.5 in (495 mm)	19.0 in (485 mm)
Static Weight with operator	50000 lb(22680 kg)	43700 lb(19822 kg)

**DRAWBAR PERFORMANCE**  
**(Unballasted at 1800 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)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
263.25 (196.30)	43244 (192.36)	2.28 (3.67)	2006	11.06	0.579 (0.352)	12.14 (2.39)	181 (83)	43 (6)	28.86 (97.73)
4th Gear									
342.07 (255.09)	41923 (186.48)	3.06 (4.92)	2106	10.57	0.572 (0.348)	12.28 (2.42)	182 (83)	43 (6)	28.86 (97.73)
5th Gear									
377.84 (281.76)	40669 (180.90)	3.48 (5.61)	1995	9.76	0.492 (0.300)	14.27 (2.81)	182 (83)	43 (6)	28.86 (97.73)
6th Gear									
407.78 (304.08)	39919 (177.57)	3.83 (6.16)	1921	8.38	0.469 (0.286)	14.96 (2.95)	182 (84)	44 (7)	28.74 (97.33)
7th Gear									
444.49 (331.45)	38229 (170.05)	4.36 (7.02)	1908	6.82	0.459 (0.279)	15.30 (3.01)	183 (84)	46 (8)	28.74 (97.33)
8th Gear									
474.70 (353.99)	36871 (164.01)	4.83 (7.77)	1862	6.24	0.450 (0.274)	15.61 (3.07)	184 (84)	47 (8)	28.74 (97.33)
9th Gear									
487.13 (363.25)	33658 (149.72)	5.43 (8.73)	1821	4.13	0.440 (0.268)	15.97 (3.15)	184 (85)	53 (12)	28.59 (96.82)
10th Gear									
494.45 (368.71)	30394 (135.20)	6.10 (9.82)	1799	3.08	0.433 (0.263)	16.23 (3.20)	184 (84)	49 (9)	28.57 (96.75)
11th Gear									
491.34 (366.39)	26494 (117.85)	6.95 (11.19)	1796	2.14	0.437 (0.266)	16.09 (3.17)	184 (85)	50 (10)	28.57 (96.75)
12th Gear									
492.57 (367.31)	23427 (104.21)	7.88 (12.69)	1801	1.45	0.436 (0.266)	16.09 (3.17)	184 (84)	51 (11)	28.58 (96.78)
13th Gear									
489.78 (365.23)	19472 (86.62)	9.43 (15.18)	1798	0.93	0.437 (0.266)	16.09 (3.17)	184 (84)	52 (11)	28.58 (96.78)

**DRAWBAR PERFORMANCE**  
**(Ballasted to 50000 lbs at 1800 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)	
3rd Gear									
264.43 (197.19)	45727 (203.41)	2.17 (3.49)	1811	6.53	0.531 (0.323)	13.24 (2.61)	182 (83)	44 (7)	29.08 (98.45)
4th Gear									
332.44 (247.90)	45528 (202.52)	2.74 (4.41)	1795	6.26	0.486 (0.296)	14.46 (2.85)	182 (83)	42 (6)	29.08 (98.45)
5th Gear									
385.43 (287.41)	44001 (195.73)	3.28 (5.29)	1805	6.06	0.459 (0.279)	15.32 (3.02)	182 (83)	47 (8)	29.08 (98.45)
6th Gear									
421.47 (314.29)	42731 (190.08)	3.70 (5.95)	1799	5.81	0.442 (0.269)	15.88 (3.13)	183 (84)	49 (9)	29.08 (98.45)
7th Gear									
486.07 (362.56)	43513 (193.56)	4.19 (6.74)	1802	5.47	0.425 (0.259)	16.53 (3.26)	183 (84)	47 (8)	28.85 (97.70)
8th Gear									
500.26 (373.04)	38989 (173.43)	4.81 (7.74)	1808	3.90	0.423 (0.258)	16.59 (3.27)	183 (84)	48 (9)	28.85 (97.70)
9th Gear									
500.16 (372.97)	34453 (153.26)	5.44 (8.76)	1799	2.85	0.428 (0.261)	16.40 (3.23)	183 (84)	50 (10)	28.85 (97.70)
10th Gear									
505.12 (376.67)	30596 (136.10)	6.19 (9.96)	1800	1.97	0.426 (0.259)	16.48 (3.25)	183 (84)	50 (10)	28.85 (97.70)
11th Gear									
497.40 (370.91)	26552 (118.11)	7.02 (11.31)	1801	1.56	0.432 (0.263)	16.26 (3.20)	183 (84)	50 (10)	28.85 (97.70)
12th Gear									
499.42 (372.41)	23593 (104.95)	7.94 (12.77)	1803	1.15	0.432 (0.263)	16.27 (3.20)	183 (84)	51 (11)	28.84 (97.66)
13th Gear									
492.98 (367.61)	19535 (86.90)	9.46 (15.23)	1798	0.79	0.434 (0.264)	16.18 (3.19)	183 (84)	51 (11)	28.84 (97.66)

**DRAWBAR PERFORMANCE**  
**(Ballasted to 56000 lbs at 1800 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)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
340.02 (253.55)	46352 (206.18)	2.75 (4.43)	1817	7.01	4th Gear 0.489 (0.297)	14.37 (2.83)	182 (83)	58 (14)	29.04 (98.34)
390.50 (291.19)	44351 (197.29)	3.30 (5.31)	1803	5.57	5th Gear 0.455 (0.277)	15.45 (3.04)	182 (84)	57 (14)	29.04 (98.34)
429.55 (320.31)	42961 (191.10)	3.75 (6.03)	1803	4.73	6th Gear 0.437 (0.266)	16.09 (3.17)	183 (84)	56 (13)	29.04 (98.34)
491.59 (366.58)	43571 (193.81)	4.23 (6.81)	1805	4.80	7th Gear 0.437 (0.266)	16.09 (3.17)	183 (84)	55 (13)	29.04 (98.34)
503.88 (373.74)	39012 (173.53)	4.84 (7.79)	1803	3.15	8th Gear 0.428 (0.260)	16.43 (3.24)	183 (84)	54 (12)	29.04 (98.34)
502.64 (374.82)	34253 (152.37)	5.50 (8.86)	1800	1.87	9th Gear 0.426 (0.259)	16.50 (3.25)	183 (84)	45 (7)	29.03 (98.31)
506.53 (377.72)	30516 (135.74)	6.22 (10.02)	1801	1.51	10th Gear 0.424 (0.258)	16.56 (3.26)	183 (84)	47 (8)	29.03 (98.31)
500.19 (372.99)	26588 (118.27)	7.05 (11.33)	1801	1.14	11th Gear 0.430 (0.261)	16.35 (3.22)	183 (84)	49 (9)	29.03 (98.31)
498.69 (371.87)	23546 (104.74)	7.94 (12.78)	1799	0.93	12th Gear 0.430 (0.261)	16.35 (3.22)	183 (84)	51 (11)	29.04 (98.34)
494.79 (368.96)	19576 (87.08)	9.48 (15.23)	1798	0.73	13th Gear 0.437 (0.266)	16.07 (3.17)	183 (84)	53 (12)	29.04 (98.34)

**TIRES, BALLAST AND WEIGHT**

**Track width**

**Ballast** - Cast iron(front end)  
- Cast iron(front idlers)  
- Cast iron(side)

**Height of Drawbar**

**Static Weight with operator**

**With Ballast**

36.0 in (915 mm)  
4280 lb (1941 kg)  
4500 lb (2041 kg)  
3520 lb (1597 kg)  
20.0 in (510 mm)  
56000 lb(25401 kg)

**Without Ballast**

36.0 in (915 mm)  
None  
None  
None  
19.0 in (480 mm)  
43700 lb(19822 kg)

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

CATEGORY: No 3 point hitch available

Quick Attach: NA

Maximum force exerted through whole range: NA

i) Opening pressure of relief valve: NA

Sustained pressure at compensator cutoff: 2998 psi (207 bar)

#### High flow option

ii) Pump delivery rate at minimum pressure and rated engine speed: 44.5 GPM (168.5 l/min) 59.0 GPM (223.3 l/min)

iii) Pump delivery rate at maximum hydraulic power: 43.0 GPM (162.8 l/min) 57.1 GPM (216.1 l/min)

Delivery pressure: 2692 psi (186 bar) 2479 psi (171 bar)

Power: 67.5 HP (50.4 kW) 82.6 HP (61.6 kW)



**CHALLENGER MT875B DIESEL**