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January 2005

## Test 1860: Challenger MT835B Diesel

Nebraska Tractor Test Lab

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# NEBRASKA OECD TRACTOR TEST 1860 – SUMMARY 487

## CHALLENGER MT835B 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—1061 rpm)</b>					
313.06 (233.45)	2100	20.14 (76.23)	0.454 (0.276)	15.55 (3.06)	
<b>Standard Power Take-off Speed - (PTO speed - 1000 rpm)</b>					
340.85 (254.17)	1979	21.05 (79.69)	0.435 (0.265)	16.19 (3.19)	
<b>Maximum Power (1 hour)</b>					
362.83 (270.56)	1851	21.93 (83.03)	0.426 (0.259)	16.55 (3.26)	

#### VARYING POWER AND FUEL CONSUMPTION

313.06 (233.45)	2100	20.14 (76.23)	0.454 (0.276)	15.55 (3.06)	Air temperature
279.22 (208.22)	2199	19.03 (72.05)	0.481 (0.292)	14.67 (2.89)	78°F (25°C)
208.89 (155.77)	2200	15.86 (60.02)	0.535 (0.326)	13.17 (2.60)	Relative humidity
139.61 (104.11)	2200	12.79 (48.42)	0.646 (0.393)	10.91 (2.15)	46%
69.81 (52.05)	2200	9.28 (35.11)	0.937 (0.570)	7.53 (1.48)	Barometer
2.12 (1.58)	2200	6.20 (23.46)	20.659 (12.566)	0.34 (0.07)	28.77" Hg (97.43 kPa)

Maximum Torque - 1261 lb.-ft. (1710 Nm) at 1250 rpm

Maximum Torque Rise - 61.2%

Torque rise at 1699 engine rpm - 39%

#### 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>									
276.33 (206.06)	22811 (101.47)	4.54 (7.31)	2101	1.26	0.519 (0.315)	13.60 (2.68)	167 (75)	60 (16)	28.90 (97.87)
<b>75% of Pull at Maximum Power—6th Gear</b>									
217.51 (162.20)	17038 (75.79)	4.79 (7.70)	2197	0.47	0.577 (0.351)	12.22 (2.41)	163 (73)	62 (17)	28.90 (97.87)
<b>50% of Pull at Maximum Power—6th Gear</b>									
145.75 (108.68)	11364 (50.55)	4.81 (7.74)	2200	0.13	0.699 (0.425)	10.08 (1.99)	165 (74)	63 (17)	28.90 (97.87)
<b>75% of Pull at Reduced Engine Speed—9th Gear</b>									
217.34 (162.07)	16948 (75.39)	4.81 (7.74)	1546	0.49	0.482 (0.293)	14.63 (2.88)	166 (74)	62 (17)	28.90 (97.87)
<b>50% of Pull at Reduced Engine Speed—9th Gear</b>									
145.83 (108.75)	11337 (50.43)	4.82 (7.76)	1545	0.11	0.538 (0.327)	13.12 (2.58)	163 (73)	63 (17)	28.90 (97.87)

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

**Dates of test:** October 17 - November 2, 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)** 0.8468  
**Fuel weight** 7.051 lbs/gal (0.845 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:** 25.0 hours

**ENGINE: Make** Caterpillar **Diesel Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.** \*JAS00103\* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.402" x 6.752" (137.2 mm x 171.5 mm) **Compression ratio** 16.5 to 1 **Displacement** 928 cu in (15213 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:** 137.7 - 146.3 lb/h (62.5 - 66.4 kg/h) **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 16.8 - 21.0 psi (115 - 145 kPa) as measured 19.2 psi (132 kPa)

**CHASSIS: Type** tracklayer-rubber tracked **Serial No.** \*AGCMT835KBAM60607\* **Track width** 100.0" (2540 mm) to 120.0" (3048 mm) **Length of track on ground** 124.3" (3157 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** 1000 rpm at 1980 engine rpm **Unladen tractor mass** 43420 lb (19695 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)
2nd Gear									
227.22 (169.44)	42501 (189.05)	2.00 (3.23)	2185	9.91	0.612 (0.372)	11.52 (2.27)	167 (75)	54 (12)	28.90 (97.87)
3rd Gear									
260.06 (193.93)	39232 (174.51)	2.49 (4.00)	2096	7.78	0.564 (0.343)	12.50 (2.46)	173 (78)	56 (13)	29.00 (98.21)
4th Gear									
264.78 (197.44)	29767 (132.41)	3.34 (5.37)	2099	2.69	0.548 (0.333)	12.87 (2.54)	181 (83)	56 (13)	29.00 (98.21)
5th Gear									
275.87 (205.72)	25777 (114.66)	4.01 (6.46)	2100	1.73	0.530 (0.322)	13.32 (2.62)	177 (81)	57 (14)	28.90 (97.87)
6th Gear									
276.33 (206.06)	22811 (101.47)	4.54 (7.31)	2101	1.26	0.519 (0.315)	13.60 (2.68)	167 (75)	60 (16)	28.90 (97.87)
7th Gear									
271.28 (202.29)	19767 (87.93)	5.15 (8.28)	2102	0.83	0.526 (0.320)	13.42 (2.64)	185 (85)	60 (16)	28.90 (97.87)
8th Gear									
273.80 (204.17)	17654 (78.53)	5.82 (9.36)	2104	0.56	0.524 (0.319)	13.46 (2.65)	174 (79)	61 (16)	28.90 (97.87)
9th Gear									
266.64 (198.83)	15314 (68.12)	6.53 (10.51)	2097	0.46	0.543 (0.330)	12.98 (2.56)	186 (86)	61 (16)	28.90 (97.87)
10th Gear									
265.59 (198.05)	13531 (60.19)	7.36 (11.85)	2095	0.18	0.543 (0.330)	12.99 (2.56)	179 (82)	62 (17)	28.90 (97.87)
11th Gear									
254.71 (189.94)	11507 (51.19)	8.30 (13.36)	2093	0.11	0.558 (0.340)	12.63 (2.49)	187 (86)	62 (17)	28.90 (97.87)

**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 122°F(50°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. **1860**, Nebraska Summary 487, January 27, 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	76.5
Bystander	--

<b>TIRES, BALLAST AND WEIGHT</b>	<b>With Ballast</b>	<b>Without Ballast</b>
<b>Track width</b>	30.0 in (760 mm)	30.0 in (760 mm)
<b>Ballast</b> - Cast iron(front end)	4280 lb (1941 kg)	None
- Cast iron(front idlers)	2125 lb (964 kg)	None
<b>Height of Drawbar</b>	20.0 in (510 mm)	19.5 in (495 mm)
<b>Static Weight with operator</b>	50000 lb(22679 kg)	43595 lb(19774 kg)

**DRAWBAR PERFORMANCE**  
**(Unballasted at 1850 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								
227.38 (169.56)	42531 (189.19)	2.00 (3.23)	2181	9.74	0.610 (0.371)	11.57 (2.28)	54 (12)	28.90 (97.87)
3rd Gear								
260.67 (194.38)	39410 (175.31)	2.48 (3.99)	2094	7.89	0.564 (0.343)	12.50 (2.46)	56 (13)	29.00 (98.21)
4th Gear								
296.02 (220.74)	38495 (171.23)	2.88 (4.64)	1894	6.77	0.534 (0.325)	13.20 (2.60)	57 (14)	29.00 (98.21)
5th Gear								
312.16 (232.78)	33889 (150.74)	3.45 (5.56)	1849	3.91	0.501 (0.305)	14.09 (2.77)	58 (14)	28.90 (97.87)
6th Gear								
317.14 (236.49)	30151 (134.12)	3.94 (6.35)	1854	2.80	0.489 (0.297)	14.43 (2.84)	60 (16)	28.90 (97.87)
7th Gear								
315.35 (235.16)	26410 (117.48)	4.48 (7.21)	1848	1.86	0.491 (0.299)	14.35 (2.83)	60 (16)	28.90 (97.87)
8th Gear								
318.11 (237.21)	23545 (104.73)	5.07 (8.15)	1848	1.41	0.486 (0.296)	14.51 (2.86)	61 (16)	28.90 (97.87)
9th Gear								
314.47 (234.50)	20529 (91.32)	5.74 (9.24)	1855	0.90	0.493 (0.300)	14.30 (2.82)	61 (16)	28.90 (97.87)
10th Gear								
315.52 (235.28)	18231 (81.09)	6.49 (10.44)	1855	0.54	0.489 (0.297)	14.42 (2.84)	62 (17)	28.90 (97.87)
11th Gear								
306.82 (228.80)	15702 (69.85)	7.33 (11.79)	1853	0.32	0.506 (0.308)	13.94 (2.75)	62 (17)	28.90 (97.87)
12th Gear								
307.03 (228.95)	13965 (62.12)	8.24 (13.27)	1849	0.19	0.508 (0.309)	13.87 (2.73)	62 (17)	28.90 (97.87)

**DRAWBAR PERFORMANCE**  
**(Ballasted at 1850 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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
2nd Gear									
249.27 (185.88)	48345 (215.05)	1.93 (3.11)	2113	10.03	0.582 (0.354)	12.12 (2.39)	183 (84)	57 (14)	29.12 (98.61)
3rd Gear									
286.08 (213.33)	45937 (204.34)	2.34 (3.76)	1970	7.44	0.532 (0.324)	13.25 (2.61)	187 (86)	59 (15)	29.12 (98.61)
4th Gear									
305.82 (228.05)	39713 (176.65)	2.89 (4.65)	1846	4.22	0.508 (0.309)	13.89 (2.74)	188 (87)	60 (16)	29.11 (98.59)
5th Gear									
316.53 (236.04)	33951 (151.02)	3.50 (5.63)	1848	2.74	0.490 (0.298)	14.38 (2.83)	188 (87)	60 (16)	29.10 (98.54)
6th Gear									
320.88 (239.28)	30298 (134.77)	3.97 (6.39)	1850	1.98	0.483 (0.293)	14.61 (2.88)	188 (87)	60 (16)	29.09 (98.51)
7th Gear									
317.01 (236.39)	26377 (117.33)	4.51 (7.25)	1850	1.35	0.488 (0.297)	14.46 (2.85)	188 (87)	61 (16)	29.08 (98.48)
8th Gear									
318.79 (237.72)	23451 (104.31)	5.10 (8.20)	1851	0.89	0.483 (0.294)	14.58 (2.87)	188 (87)	61 (16)	29.08 (98.48)
9th Gear									
314.33 (234.39)	20481 (91.11)	5.76 (9.26)	1853	0.61	0.493 (0.300)	14.29 (2.82)	188 (87)	61 (16)	29.07 (98.44)
10th Gear									
314.54 (234.55)	18180 (80.87)	6.49 (10.44)	1854	0.54	0.495 (0.301)	14.25 (2.81)	188 (87)	62 (17)	29.07 (98.44)
11th Gear									
303.33 (226.20)	15545 (69.15)	7.32 (11.78)	1852	0.29	0.510 (0.310)	13.81 (2.72)	188 (87)	62 (17)	29.06 (98.41)
12th Gear									
302.22 (225.37)	13729 (61.07)	8.26 (13.29)	1852	0.18	0.504 (0.307)	13.99 (2.76)	188 (87)	63 (17)	29.06 (98.41)

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

CATEGORY: IVN

Quick Attach: yes

Maximum force exerted through whole range: 20936 lbs (93.1 kN)

i) Opening pressure of relief valve: NA

Sustained pressure at compensator cutoff: 2943 psi (203 bar)

#### High flow option

ii) Pump delivery rate at minimum pressure and rated engine speed:

44.5 GPM (168.5 l/min) 59.6 GPM (225.6 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

43.0 GPM (162.8 l/min) 57.6 GPM (218.0 l/min)

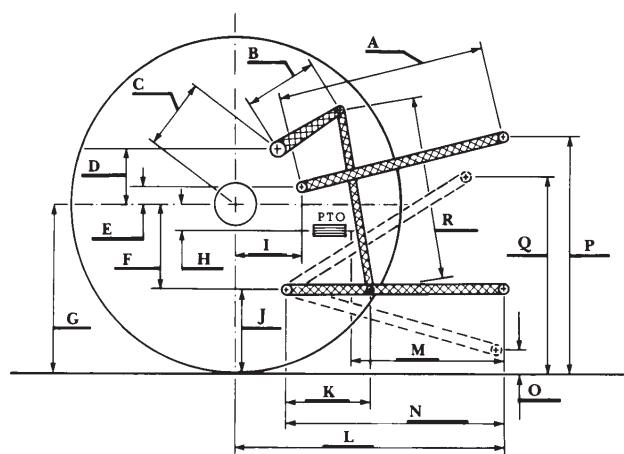
Delivery pressure:

2692 psi (186 bar) 2438 psi (168 bar)

Power:

67.5 HP (50.4 kW) 81.9 HP (61.1 kW)

#### HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	30.2	768
B	21.7	550
C	41.4	1051
D	39.4	1000
E	12.4	315
F	11.8	300
G	35.0	890
H	0.4	10
I	23.0	585
J	23.2	590
K	29.0	737
L	53.9	1369
*L'	60.4	1534
M	26.6	676
N	36.6	929
O	9.0	230
P	50.2	1275
Q	46.5	1181
R	55.9	1421

\*L' to Quick Attach ends



CHALLENGER MT835B DIESEL