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January 2006

Test 1875: Challenger MT 635B Diesel

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NEBRASKA OECD TRACTOR TEST 1875 - SUMMARY 532
CHALLENGER MT 635B 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—1083 rpm)					
184.65 *(137.70)*	2201	11.01 *(41.69)*	0.417 *(0.254)*	16.77 *(3.30)*	
Standard Power Take-off Speed (1000 rpm)					
197.74 *(147.45)*	2031	10.76 *(40.74)*	0.380 *(0.231)*	18.37 *(3.62)*	
Maximum Power (1 Hour)					
199.00 *(148.40)*	2000	10.73 *(40.63)*	0.377 *(0.229)*	18.54 *(3.65)*	
VARYING POWER AND FUEL CONSUMPTION					
184.65 *(137.70)*	2201	11.01 *(41.69)*	0.417 *(0.254)*	16.77 *(3.30)*	Air temperature
157.73 *(117.62)*	2215	9.73 *(36.83)*	0.431 *(0.262)*	16.21 *(3.19)*	81°F *(27°C)*
118.68 *(88.50)*	2226	7.71 *(29.19)*	0.454 *(0.276)*	15.39 *(3.03)*	Relative humidity
79.14 *(59.01)*	2237	5.62 *(21.28)*	0.497 *(0.302)*	14.08 *(2.77)*	19%
39.96 *(28.90)*	2248	3.78 *(14.30)*	0.661 *(0.402)*	10.58 *(2.08)*	Barometer
2.01 *(1.50)*	2258	2.32 *(8.77)*	8.054 *(4.899)*	0.87 *(0.17)*	28.86" Hg *(97.73 kPa)*

Maximum Torque - 631 lb.-ft. *(856 Nm)* at 1499 rpm
Maximum Torque Rise - 43.2%
Torque rise at 1800 engine rpm - 27%

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)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp.°F cool-ing med	Temp.°F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—5.6 mph *(9.0 km/h)*									
157.87 *(117.72)*	10932 *(48.63)*	5.42 *(8.72)*	2194	3.51	0.484 *(0.294)*	14.44 *(2.85)*	185 *(85)*	60 *(16)*	28.83 *(97.63)*
75% of Pull at Maximum Power—5.6 mph *(9.0 km/h)*									
120.88 *(90.14)*	8248 *(36.69)*	5.50 *(8.85)*	2218	2.32	0.516 *(0.314)*	13.54 *(2.67)*	182 *(83)*	68 *(20)*	28.78 *(97.46)*
50% of Pull at Maximum Power—5.6 mph *(9.0 km/h)*									
81.62 *(60.86)*	5476 *(24.36)*	5.59 *(8.99)*	2228	1.49	0.579 *(0.352)*	12.07 *(2.38)*	182 *(83)*	69 *(21)*	28.78 *(97.46)*
75% of Pull at Reduced Engine Speed—7.3 mph *(11.8 km/h)*									
120.29 *(89.70)*	8185 *(36.41)*	5.51 *(8.87)*	1700	2.32	0.429 *(0.261)*	16.31 *(3.21)*	181 *(83)*	71 *(22)*	28.77 *(97.43)*
50% of Pull at Reduced Engine Speed—8.8 mph *(14.2 km/h)*									
81.22 *(60.57)*	5476 *(24.36)*	5.56 *(8.95)*	1409	1.45	0.449 *(0.273)*	15.57 *(3.07)*	176 *(80)*	70 *(21)*	28.78 *(97.46)*

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

Dates of tests: April 20 - May 3, 2006

Manufacturer: AGCO Corporation, 4205 River Green Parkway, Duluth, Georgia, 30096 USA.

FUEL, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60° F *(15°/15°C)*** 0.8395 **Fuel weight** 6.990 lbs/gal *(0.838 kg/l)* **Oil SAE** 15W40 **API service classification** CE/CF-4 /CD-II **Transmission and hydraulic lubricant** AGCO Power Fluid 821 XL fluid **Front axle lubricant** AGCO Gear Lube 715 SAE 80W90 **Total time engine was operated** 22.5 hours

ENGINE: Make Sisu Diesel **Type** six cylinder vertical with turbocharger and air to air intercooler **Serial No.** R083304 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.252" x 5.276" *(108.0 mm x 134.0 mm)* **Compression ratio** 17.5 to 1 **Displacement** 449 cu in *(7365 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** two paper elements and water separator **Muffler** vertical **Cooling medium temperature control** one thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 74.8 - 79.3 lb/h *(33.9 -36.0 kg/h)* **High idle:** 2235 - 2265 rpm **Turbo boost:** nominal 16.2 - 19.9 psi *(112 - 137 kPa)* as measured 18.6 psi *(128 kPa)*

CHASSIS: Type front wheel assist **Serial No.** P201040 **Tread width** rear 60.0" *(1524 mm)* to 126.0" *(3200 mm)* front 68.5" *(1740 mm)* to 93.3" *(2369 mm)* **Wheelbase** 121.1" *(3075 mm)* **Hydraulic control system** direct engine drive **Transmission** Techstar CVT. A combination of mechanical and hydrostatic sections allow an infinite speed adjustment within the ranges noted. The transmission has two mechanical ranges. **Nominal travel speeds mph *(km/h)*** forward: Low range 0-17 *(0-28)*, high range 0-25 *(0-40)* reverse: Low range 0-10 *(0-16)*, high range 0-24 *(0-38)* **Clutch** a foot pedal controls the hydrostatic oil flow **Brakes** wet multiple disc hydraulically actuated by two foot pedals which 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** 19595 lb *(8888 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)*
				3.1 mph*(5.0 km/h)*					
121.20 *(90.38)*	16927 *(75.29)*	2.68 *(4.32)*	2215	13.10	0.558 *(0.339)*	12.53 *(2.47)*	181 *(83)*	65 *(18)*	28.78 *(97.46)*
				3.7 mph*(6.0 km/h)*					
150.28 *(112.07)*	16656 *(74.09)*	3.38 *(5.45)*	2206	8.38	0.510 *(0.310)*	13.70 *(2.70)*	183 *(84)*	54 *(12)*	28.85 *(97.70)*
				4.3 mph*(7.0 km/h)*					
162.33 *(121.05)*	15742 *(70.02)*	3.87 *(6.22)*	2116	6.90	0.471 *(0.286)*	14.85 *(2.93)*	184 *(85)*	56 *(13)*	28.85 *(97.70)*
				4.7 mph*(7.5 km/h)*					
164.56 *(122.72)*	15212 *(67.66)*	4.06 *(6.53)*	2071	6.63	0.462 *(0.281)*	15.12 *(2.98)*	186 *(86)*	57 *(14)*	28.85 *(97.70)*
				5.0 mph*(8.0 km/h)*					
167.28 *(124.74)*	14892 *(66.24)*	4.21 *(6.78)*	2000	6.43	0.450 *(0.273)*	15.55 *(3.06)*	186 *(86)*	57 *(14)*	28.84 *(97.66)*
				5.6 mph*(9.0 km/h)*					
169.95 *(126.73)*	13185 *(58.65)*	4.83 *(7.78)*	1999	4.71	0.442 *(0.269)*	15.83 *(3.12)*	186 *(85)*	58 *(14)*	28.84 *(97.66)*
				6.2 mph*(10.0 km/h)*					
169.43 *(126.34)*	11749 *(52.26)*	5.41 *(8.70)*	2002	3.97	0.445 *(0.271)*	15.70 *(3.09)*	187 *(86)*	59 *(15)*	28.83 *(97.62)*
				6.8 mph*(11.0 km/h)*					
169.42 *(126.33)*	10675 *(47.48)*	5.95 *(9.58)*	1999	3.45	0.444 *(0.270)*	15.75 *(3.10)*	187 *(86)*	61 *(16)*	28.82 *(97.60)*
				7.5 mph*(12.0 km/h)*					
169.10 *(126.10)*	9704 *(43.17)*	6.53 *(10.52)*	1999	2.87	0.447 *(0.272)*	15.64 *(3.08)*	187 *(86)*	62 *(17)*	28.81 *(97.56)*
				8.3 mph*(13.4 km/h)*					
167.81 *(125.14)*	8586 *(38.19)*	7.33 *(11.80)*	1999	2.56	0.450 *(0.274)*	15.54 *(3.06)*	187 *(86)*	63 *(17)*	28.81 *(97.56)*
				8.7 mph*(14.0 km/h)*					
166.99 *(124.52)*	8188 *(36.42)*	7.65 *(12.31)*	2000	2.38	0.448 *(0.273)*	15.60 *(3.07)*	187 *(86)*	65 *(18)*	28.80 *(97.53)*
				9.3 mph*(15.0 km/h)*					
166.00 *(123.79)*	7512 *(33.41)*	8.29 *(13.34)*	2002	2.09	0.451 *(0.274)*	15.49 *(3.05)*	187 *(86)*	66 *(19)*	28.79 *(97.49)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE: The performance figures on this report are the result of replacing the electronic engine control module of the Challenger MT 645B with the MT 635B module.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. The pull at speed setting 2.8 mph *(4.5 km/h)* was limited to avoid excessive tractor bouncing. This tractor did not meet the manufacturer's claim of 39.0 GPM *(147 lpm)* flow at the remote outlets. For the maximum power tests, the fuel temperature at the injection pump inlet was maintained at 150°F *(65°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. **1875**, Nebraska Summary 532, June 16, 2006.

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 Engaged dB(A)	Front Wheel Drive Disengaged dB(A)
At no load - 4.6 mph *(7.5 km/h)*(engine - 2250 rpm)	68.0	67.4
Bystander in Rabbit range	--	86.6

TIRES, BALLAST AND WEIGHT	With Ballast	Without Ballast
Rear tires - No.,size, ply & psi*(kPa)*	Four 480/80R46; ***;12 *(85)*	Two 480/80R46;***;18*(125)*
Ballast - Duals(total)	2190 lb *(993 kg)*	None
- Cast Iron(total)	1100 lb *(499 kg)*	None
Front tires - No.,size, ply & psi*(kPa)*	Two 380/85R34; **;20 *(135)*	Two 380/85R34;**;17*(115)*
Ballast - Liquid(total)	None	None
- Cast Iron(total)	600 lb *(272 kg)*	None
Height of Drawbar	19.5 in *(495 mm)*	20.0 in *(510 mm)*
Static Weight with operator- Rear	15015 lb *(6811 kg)*	11945 lb *(5418 kg)*
- Front	8645 lb *(3921 kg)*	7825 lb *(3549 kg)*
- Total	23660 lb*(10732 kg)*	19770 lb *(8967 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)*	Hp.hr/gal *(kW.h/l)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
				2.8 mph *(4.5 km/h)*					
143.76 *(107.20)*	22442 *(99.83)*	2.40 *(3.87)*	2200	10.50	0.539 *(0.328)*	12.97 *(2.55)*	181 *(83)*	60 *(16)*	28.76 *(97.39)*
				3.1 mph *(5.0 km/h)*					
153.07 *(114.14)*	21333 *(94.89)*	2.69 *(4.33)*	2106	9.10	0.499 *(0.303)*	14.02 *(2.76)*	185 *(85)*	62 *(17)*	28.76 *(97.39)*
				3.7 mph *(6.0 km/h)*					
164.19 *(122.44)*	19519 *(86.82)*	3.15 *(5.08)*	2003	6.11	0.460 *(0.280)*	15.20 *(2.99)*	187 *(86)*	64 *(18)*	28.76 *(97.39)*
				4.3 mph *(7.0 km/h)*					
168.54 *(125.68)*	16720 *(74.38)*	3.78 *(6.08)*	2001	4.02	0.449 *(0.273)*	15.57 *(3.07)*	187 *(86)*	66 *(19)*	28.76 *(97.39)*
				4.7 mph *(7.5 km/h)*					
170.07 *(126.82)*	15803 *(70.30)*	4.04 *(6.49)*	2000	3.55	0.442 *(0.269)*	15.80 *(3.11)*	187 *(86)*	68 *(20)*	28.76 *(97.39)*
				5.0 mph *(8.0 km/h)*					
170.29 *(126.99)*	14721 *(65.48)*	4.34 *(6.98)*	2003	3.15	0.444 *(0.270)*	15.74 *(3.10)*	187 *(86)*	68 *(20)*	28.76 *(97.39)*
				5.6 mph *(9.0 km/h)*					
169.82 *(126.63)*	12921 *(57.48)*	4.93 *(7.93)*	2000	2.60	0.443 *(0.269)*	15.78 *(3.11)*	187 *(86)*	68 *(20)*	28.76 *(97.39)*
				6.2 mph *(10.0 km/h)*					
169.60 *(126.47)*	11592 *(51.56)*	5.49 *(8.83)*	2003	2.17	0.443 *(0.269)*	15.79 *(3.11)*	187 *(86)*	69 *(21)*	28.76 *(97.39)*
				6.8 mph *(11.0 km/h)*					
168.62 *(125.74)*	10468 *(46.56)*	6.04 *(9.72)*	2001	1.95	0.447 *(0.272)*	15.65 *(3.08)*	187 *(86)*	69 *(21)*	28.76 *(97.39)*
				7.5 mph *(12.0 km/h)*					
167.64 *(125.01)*	9510 *(42.30)*	6.61 *(10.64)*	2003	1.72	0.446 *(0.271)*	15.67 *(3.09)*	187 *(86)*	70 *(21)*	28.75 *(97.36)*
				8.1 mph *(13.0 km/h)*					
167.02 *(124.55)*	8669 *(38.56)*	7.22 *(11.63)*	2000	1.52	0.450 *(0.274)*	15.52 *(3.06)*	187 *(86)*	70 *(21)*	28.75 *(97.36)*
				8.7 mph *(14.0 km/h)*					
165.87 *(123.69)*	8081 *(35.95)*	7.70 *(12.39)*	2001	1.40	0.454 *(0.276)*	15.39 *(3.03)*	186 *(86)*	71 *(22)*	28.75 *(97.36)*
				9.3 mph *(15.0 km/h)*					
163.76 *(122.11)*	7311 *(32.52)*	8.40 *(13.52)*	2000	1.19	0.461 *(0.281)*	15.15 *(2.98)*	187 *(86)*	71 *(22)*	28.75 *(97.36)*

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III
Quick Attach: Yes

Maximum force exerted through whole range:	15895 lbs *(70.7 kN)*
i) Opening pressure of relief valve:	NA
Sustained pressure of the open relief valve:	2818 psi *(194 bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	37.9 GPM *(143.5 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	36.5 GPM *(138.2 l/min)*
Delivery pressure:	2441 psi *(168 bar)*
Power:	52.0 HP *(38.8 kW)*

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi. *(bar)*	2800 *(193)*
Location:	lift cylinder
Hydraulic oil temperature: °F *(°C)*	150 *(66)*
Location:	hydraulic sump
Category:	III
Quick attach:	Yes

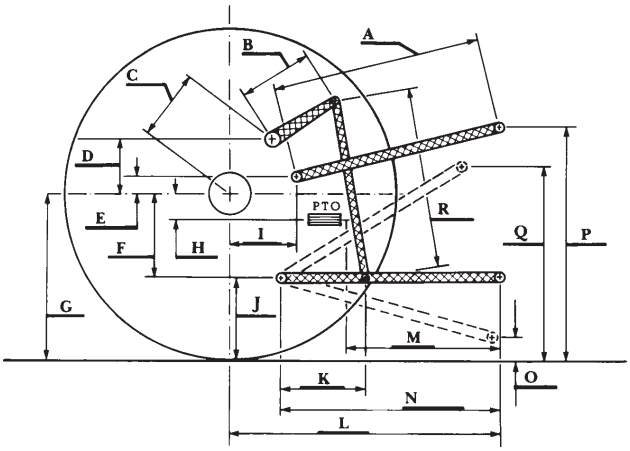
SAE Static Test—System pressure 2520 psi *(174 Bar)*

Hitch point distance to ground level in. *(mm)*	8.6 *(217)*	16.3 *(414)*	24.4 *(620)*	32.3 *(820)*	40.3 *(1024)*
Lift force on frame lb	16726	17682	17713	17118	15672
" " " " " " *(kN)*	*(74.7)*	*(78.7)*	*(78.8)*	*(76.1)*	*(69.7)*

HITCH DIMENSIONS AS TESTED - NO LOAD

	OECD test		SAE test	
	inch	*mm*	inch	*mm*
A	29.2	*743*	29.2	*743*
B	14.2	*360*	14.2	*360*
C	17.7	*449*	17.7	*449*
D	15.4	*390*	15.4	*390*
E	8.9	*225*	8.9	*225*
F	13.0	*330*	13.0	*330*
G	36.2	*920*	36.2	*920*
H	3.4	*85*	3.4	*85*
I	18.7	*475*	18.7	*475*
J	23.2	*590*	23.2	*590*
K	26.8	*680*	26.8	*680*
L	50.4	*1281*	50.4	*1281*
*L'	55.4	*1407*	55.4	*1407*
M	27.9	*709*	27.9	*709*
N	41.1	*1045*	41.1	*1045*
O	9.0	*230*	8.0	*203*
P	46.2	*1173*	46.2	*1173*
Q	39.8	*1011*	38.6	*981*
R	34.5	*876*	35.0	*889*

*L' to Quick Attach ends



CHALLENGER MT 635B Diesel

Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln