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NEBRASKA OECD TRACTOR TEST 1876 - SUMMARY 533
CHALLENGER MT 645B 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)					
204.79 *(152.71)*	2200	12.07 *(45.70)*	0.412 *(0.251)*	16.96 *(3.34)*	
Standard Power Take-off Speed (1000 rpm)					
221.55 *(165.21)*	2032	12.04 *(45.59)*	0.380 *(0.231)*	18.40 *(3.62)*	
Maximum Power (1 Hour)					
222.92 *(166.23)*	1949	11.83 *(44.78)*	0.371 *(0.226)*	18.85 *(3.71)*	
VARYING POWER AND FUEL CONSUMPTION					
204.79 *(152.71)*	2200	12.07 *(45.70)*	0.412 *(0.251)*	16.96 *(3.34)*	Air temperature
175.89 *(131.16)*	2215	10.77 *(40.78)*	0.428 *(0.260)*	16.33 *(3.22)*	79°F *(26°C)*
131.97 *(98.41)*	2225	8.60 *(32.55)*	0.455 *(0.277)*	15.35 *(3.02)*	Relative humidity
88.04 *(65.65)*	2236	6.19 *(23.45)*	0.492 *(0.299)*	14.21 *(2.80)*	37%
43.84 *(32.69)*	2249	3.99 *(15.11)*	0.636 *(0.387)*	10.98 *(2.16)*	Barometer
2.01 *(1.50)*	2259	2.35 *(8.88)*	8.154 *(4.960)*	0.86 *(0.17)*	29.01" Hg *(98.24 kPa)*

Maximum torque - 698 lb.-ft. *(947 Nm)* at 1451 rpm
Maximum torque rise - 42.9%
Torque rise at 1796 engine rpm - 29%

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 med	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—6.2 mph *(10.0 km/h)*									
172.30 *(128.48)*	10824 *(48.15)*	5.97 *(9.61)*	2196	4.15	0.489 *(0.297)*	14.31 *(2.82)*	185 *(85)*	65 *(18)*	28.84 *(97.66)*
75% of Pull at Maximum Power—6.2 mph *(10.0 km/h)*									
131.33 *(97.93)*	8099 *(36.03)*	6.08 *(9.79)*	2217	3.38	0.524 *(0.319)*	13.35 *(2.63)*	185 *(85)*	77 *(25)*	28.77 *(97.43)*
50% of Pull at Maximum Power—6.2 mph *(10.0 km/h)*									
89.00 *(66.37)*	5387 *(23.96)*	6.20 *(9.97)*	2227	1.90	0.574 *(0.349)*	12.19 *(2.40)*	183 *(84)*	79 *(26)*	28.75 *(97.36)*
75% of Pull at Reduced Engine Speed—8.3 mph *(13.4 km/h)*									
131.73 *(98.23)*	8060 *(35.85)*	6.13 *(9.86)*	1699	3.56	0.435 *(0.265)*	16.07 *(3.17)*	188 *(87)*	82 *(28)*	28.73 *(97.29)*
50% of Pull at Reduced Engine Speed—9.8 mph *(15.8 km/h)*									
89.15 *(66.48)*	5416 *(24.09)*	6.17 *(9.93)*	1408	1.92	0.461 *(0.281)*	15.15 *(2.99)*	180 *(82)*	81 *(27)*	28.74 *(97.33)*

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

Dates of tests: April 12-20, 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** 21.5 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: 81.3 - 86.8 lb/h *(36.9 -39.4 kg/h)* **High idle:** 2235 - 2265 rpm **Turbo boost:** nominal 18.1 - 21.8 psi *(125 - 150 kPa)* as measured 20.4 psi *(140 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)*
				3.2 mph*(5.1 km/h)*					
128.69 *(95.96)*	16954 *(75.41)*	2.85 *(4.58)*	2199	10.49	0.549 *(0.334)*	12.73 *(2.51)*	182 *(83)*	65 *(18)*	28.51 *(96.55)*
				3.7 mph*(6.0 km/h)*					
147.68 *(110.13)*	16021 *(71.26)*	3.46 *(5.56)*	2194	8.09	0.524 *(0.319)*	13.34 *(2.63)*	185 *(85)*	66 *(19)*	28.51 *(96.55)*
				4.3 mph*(7.0 km/h)*					
164.82 *(122.91)*	15682 *(69.76)*	3.94 *(6.34)*	2174	7.84	0.512 *(0.311)*	13.66 *(2.69)*	187 *(86)*	71 *(22)*	28.55 *(96.68)*
				4.7 mph*(7.5 km/h)*					
172.11 *(128.34)*	15266 *(67.91)*	4.23 *(6.80)*	2142	7.65	0.493 *(0.300)*	14.18 *(2.79)*	187 *(86)*	71 *(22)*	28.55 *(96.68)*
				5.0 mph*(8.0 km/h)*					
176.17 *(131.37)*	14846 *(66.04)*	4.45 *(7.16)*	2131	6.54	0.481 *(0.292)*	14.55 *(2.87)*	187 *(86)*	70 *(21)*	28.54 *(96.65)*
				5.6 mph*(9.0 km/h)*					
183.05 *(136.50)*	14345 *(63.81)*	4.78 *(7.70)*	2014	5.80	0.463 *(0.281)*	15.11 *(2.98)*	189 *(87)*	74 *(23)*	28.56 *(96.71)*
				6.2 mph*(10.0 km/h)*					
187.55 *(139.85)*	13459 *(59.87)*	5.23 *(8.41)*	1956	4.46	0.446 *(0.271)*	15.67 *(3.09)*	188 *(87)*	66 *(19)*	28.83 *(97.63)*
				6.8 mph*(11.0 km/h)*					
186.40 *(139.00)*	12254 *(54.51)*	5.70 *(9.18)*	1951	4.32	0.447 *(0.272)*	15.65 *(3.08)*	189 *(87)*	71 *(22)*	28.82 *(97.60)*
				7.5 mph*(12.0 km/h)*					
185.82 *(138.57)*	11005 *(48.95)*	6.33 *(10.19)*	1952	3.55	0.448 *(0.272)*	15.61 *(3.08)*	190 *(88)*	72 *(22)*	28.81 *(97.56)*
				8.1 mph*(13.0 km/h)*					
185.58 *(138.39)*	10197 *(45.36)*	6.83 *(10.98)*	1964	3.39	0.449 *(0.273)*	15.57 *(3.07)*	189 *(87)*	74 *(23)*	28.80 *(97.53)*
				8.7 mph*(14.0 km/h)*					
184.60 *(137.66)*	9362 *(41.64)*	7.39 *(11.90)*	1952	3.05	0.451 *(0.274)*	15.50 *(3.05)*	190 *(88)*	75 *(24)*	28.79 *(97.49)*
				9.6 mph*(15.5 km/h)*					
182.82 *(136.33)*	8310 *(36.96)*	8.25 *(13.28)*	1947	2.80	0.451 *(0.274)*	15.51 *(3.06)*	191 *(88)*	75 *(24)*	28.79 *(97.49)*

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Engaged dB(A)	Disengaged dB(A)
At no load - 4.6 mph *(7.5 km/h)*(engine - 2250 rpm)	67.5	67.4
Bystander in Rabbit range	--	87.5

TIRES, BALLAST AND WEIGHT	With Ballast	Without Ballast
Rear tires - No.,size, ply & psi*(kPa)*	Four 480/80R46; ***;12 *(85)*	Two 480/80R46;***;17*(115)*
Ballast - Duals(total)	2190 lb *(993 kg)*	None
- Cast Iron(total)	2575 lb *(1168 kg)*	None
Front tires - No.,size, ply & psi*(kPa)*	Two 380/85R34; **;23 *(160)*	Two 380/85R34;**;17*(115)*
Ballast - Liquid(total)	None	None
- Cast Iron(total)	1800 lb *(816 kg)*	None
Height of Drawbar	19.5 in *(495 mm)*	20.0 in *(510 mm)*
Static Weight with operator- Rear	16175 lb *(7337 kg)*	11945 lb *(5418 kg)*
- Front	10160 lb *(4608 kg)*	7825 lb *(3549 kg)*
- Total	26335 lb*(11945 kg)*	19770 lb *(8967 kg)*

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. The pull at speed setting 2.4 mph *(3.8 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 144°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. **1876**, Nebraska Summary 533, June 16, 2006.

Leonard L. Bashford
Director

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

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)*
				2.4 mph *(3.8 km/h)*					
136.39 *(101.71)*	24706 *(109.90)*	2.07 *(3.33)*	2204	10.99	0.556 *(0.338)*	12.56 *(2.47)*	182 *(84)*	44 *(7)*	28.73 *(97.29)*
				2.8 mph *(4.5 km/h)*					
155.19 *(115.72)*	23716 *(105.49)*	2.45 *(3.95)*	2198	9.44	0.527 *(0.321)*	13.26 *(2.61)*	186 *(85)*	45 *(7)*	28.73 *(97.29)*
				3.1 mph *(5.0 km/h)*					
171.25 *(127.70)*	22787 *(101.36)*	2.82 *(4.54)*	2132	7.68	0.490 *(0.298)*	14.26 *(2.81)*	186 *(86)*	46 *(8)*	28.73 *(97.29)*
				3.7 mph *(6.0 km/h)*					
184.65 *(137.69)*	22266 *(99.05)*	3.11 *(5.00)*	1981	6.65	0.452 *(0.275)*	15.47 *(3.05)*	187 *(86)*	47 *(8)*	28.73 *(97.29)*
				4.3 mph *(7.0 km/h)*					
188.72 *(140.73)*	19194 *(85.38)*	3.69 *(5.93)*	1952	4.76	0.438 *(0.266)*	15.97 *(3.15)*	188 *(87)*	48 *(9)*	28.73 *(97.29)*
				4.7 mph *(7.5 km/h)*					
188.40 *(140.49)*	18163 *(80.79)*	3.89 *(6.26)*	1948	4.45	0.442 *(0.269)*	15.82 *(3.12)*	188 *(87)*	49 *(9)*	28.73 *(97.29)*
				5.0 mph *(8.0 km/h)*					
189.89 *(141.60)*	16958 *(75.43)*	4.20 *(6.76)*	1952	3.52	0.435 *(0.264)*	16.08 *(3.17)*	189 *(87)*	50 *(10)*	28.73 *(97.29)*
				5.6 mph *(9.0 km/h)*					
190.32 *(141.92)*	14770 *(65.70)*	4.83 *(7.78)*	1951	3.08	0.435 *(0.265)*	16.06 *(3.16)*	189 *(87)*	52 *(11)*	28.73 *(97.29)*
				6.2 mph *(10.0 km/h)*					
190.72 *(142.22)*	13521 *(60.14)*	5.29 *(8.51)*	1954	2.67	0.434 *(0.264)*	16.10 *(3.17)*	186 *(86)*	54 *(12)*	28.73 *(97.29)*
				6.8 mph *(11.0 km/h)*					
189.24 *(141.11)*	12256 *(54.52)*	5.79 *(9.32)*	1952	2.32	0.435 *(0.265)*	16.05 *(3.16)*	188 *(87)*	56 *(13)*	28.73 *(97.29)*
				7.5 mph *(12.0 km/h)*					
188.37 *(140.47)*	11099 *(49.37)*	6.36 *(10.24)*	1954	2.00	0.438 *(0.266)*	15.97 *(3.15)*	188 *(87)*	57 *(14)*	28.74 *(97.33)*
				8.1 mph *(13.0 km/h)*					
187.40 *(139.74)*	10234 *(45.52)*	6.87 *(11.05)*	1948	1.73	0.441 *(0.268)*	15.84 *(3.12)*	188 *(87)*	58 *(14)*	28.74 *(97.33)*
				8.7 mph *(14.0 km/h)*					
185.84 *(138.58)*	9366 *(41.66)*	7.44 *(11.97)*	1953	1.67	0.448 *(0.273)*	15.59 *(3.07)*	189 *(87)*	60 *(16)*	28.74 *(97.33)*
				9.6 mph *(15.5 km/h)*					
183.27 *(136.67)*	8181 *(36.39)*	8.40 *(13.52)*	1951	1.39	0.453 *(0.276)*	15.41 *(3.04)*	190 *(88)*	62 *(17)*	28.74 *(97.33)*

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

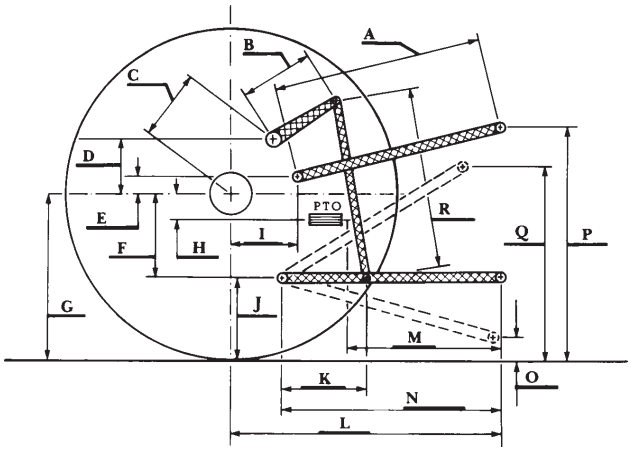
SAE Static Test—System pressure 2520 psi *(174 Bar)*

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 645B Diesel

Institute of Agriculture and Natural Resources
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