

Tractor Test and Power Museum, The Lester F. Larsen

UNL Larsen Tractor Museum Archives

University of Nebraska - Lincoln

Year 2006

Test 1878: Challenger MT 665B Diesel

NEBRASKA OECD TRACTOR TEST 1878 - SUMMARY 535

CHALLENGER MT 665B 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)					
245.73 (183.24)	2200	14.80 (56.02)	0.421 (0.256)	16.60 (3.27)	
Standard Power Take-off Speed (1000 rpm)					
265.89 (198.28)	2032	14.73 (55.75)	0.387 (0.236)	18.05 (3.56)	
Maximum Power (1 Hour)					
267.98 (199.83)	2000	14.73 (55.77)	0.384 (0.234)	18.19 (3.58)	

VARYING POWER AND FUEL CONSUMPTION

245.73 (183.24)	2200	14.80 (56.02)	0.421 (0.256)	16.60 (3.27)	Air temperature
209.97 (156.58)	2215	12.89 (48.79)	0.429 (0.261)	16.29 (3.21)	80°F (26°C)
158.60 (118.26)	2226	10.56 (39.97)	0.465 (0.283)	15.02 (2.96)	Relative humidity
106.39 (79.33)	2237	7.45 (28.21)	0.490 (0.298)	14.27 (2.81)	10%
53.22 (39.69)	2250	4.76 (18.03)	0.626 (0.381)	11.17 (2.20)	Barometer
1.85 (1.38)	2258	2.70 (10.24)	10.211 (6.211)	0.68 (0.13)	28.73" Hg (97.29 kPa)

Maximum Torque - 855 lb.-ft. (1159 Nm) at 1301 rpm

Maximum Torque Rise - 45.5%

Torque rise at 1797 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—6.8 mph (11.0 km/h)									
210.69 (157.11)	12011 (53.43)	6.58 (10.59)	2200	3.50	0.487 (0.296)	14.34 (2.83)	187 (86)	53 (12)	28.80 (97.53)
75% of Pull at Maximum Power—6.8 mph (11.0 km/h)									
161.42 (120.37)	9013 (40.09)	6.72 (10.81)	2217	2.28	0.515 (0.313)	13.58 (2.68)	187 (86)	58 (14)	28.80 (97.53)
50% of Pull at Maximum Power—6.8 mph (11.0 km/h)									
110.10 (82.10)	6016 (26.76)	6.86 (11.04)	2229	1.35	0.570 (0.347)	12.26 (2.41)	186 (85)	58 (14)	28.80 (97.53)
75% of Pull at Reduced Engine Speed—9.0 mph (14.5 km/h)									
161.51 (120.44)	8931 (39.73)	6.78 (10.91)	1701	2.16	0.428 (0.260)	16.33 (3.22)	184 (85)	59 (15)	28.81 (97.56)
50% of Pull at Reduced Engine Speed—10.9 mph (17.5 km/h)									
110.09 (82.09)	6032 (26.83)	6.84 (11.01)	1401	1.36	0.460 (0.280)	15.21 (3.00)	180 (82)	58 (14)	28.81 (97.56)

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

Dates of tests: April 19 - May 2, 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 25.0 hours

ENGINE: Make Sisu Diesel Type six cylinder vertical with turbocharger and air to air intercooler Serial No. R09649 Crankshaft lengthwise Rated engine speed 2200 Bore and stroke 4.370" x 5.709" (111.0 mm x 145.0 mm) Compression ratio 17.5 to 1 Displacement 513 cu in (8420 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: 100.6 - 106.6 lb/h (45.6 - 48.4 kg/h) High idle: 2235 - 2265 rpm Turbo boost: nominal 18.2 - 21.9 psi (125 - 151 kPa) as measured 20.5 psi (141 kPa)

CHASSIS: Type front wheel assist Serial No. P244056 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 20290 lb (9203 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)	Consumption Hp.hr/gal (kW.h/l)	Temp. ^o F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
				4.0 mph(6.5 km/h)					
171.92 (128.20)	18357 (81.66)	3.51 (5.65)	2196	10.68	0.512 (0.311)	13.66 (2.69)	187 (86)	46 (8)	28.80 (97.53)
				4.3 mph(7.0 km/h)					
188.47 (140.54)	17604 (78.31)	4.01 (6.46)	2192	8.80	0.513 (0.312)	13.62 (2.68)	187 (86)	48 (9)	28.80 (97.53)
				4.7 mph(7.5 km/h)					
195.88 (146.07)	17143 (76.25)	4.29 (6.90)	2190	7.65	0.504 (0.307)	13.87 (2.73)	187 (86)	47 (8)	28.80 (97.53)
				5.0 mph(8.0 km/h)					
204.29 (152.34)	16694 (74.26)	4.59 (7.39)	2194	7.17	0.504 (0.306)	13.87 (2.73)	187 (86)	50 (10)	28.80 (97.53)
				5.6 mph(9.0 km/h)					
214.21 (159.74)	16167 (71.92)	4.97 (8.00)	2125	6.75	0.485 (0.295)	14.43 (2.84)	187 (86)	51 (11)	28.80 (97.53)
				6.2 mph(10.0 km/h)					
221.83 (165.42)	15958 (70.99)	5.21 (8.39)	2001	6.45	0.465 (0.283)	15.04 (2.96)	188 (87)	52 (11)	28.80 (97.53)
				6.8 mph(11.0 km/h)					
225.22 (167.95)	14447 (64.26)	5.85 (9.41)	2005	5.18	0.457 (0.278)	15.30 (3.01)	187 (86)	54 (12)	28.80 (97.53)
				7.5 mph(12.0 km/h)					
226.29 (168.74)	13210 (58.76)	6.42 (10.34)	1997	4.20	0.456 (0.277)	15.33 (3.02)	188 (86)	56 (13)	28.80 (97.53)
				8.1 mph(13.0 km/h)					
225.23 (167.96)	12082 (53.74)	6.99 (11.25)	1999	3.58	0.457 (0.278)	15.28 (3.01)	187 (86)	57 (14)	28.80 (97.53)
				8.7 mph(14.0 km/h)					
225.67 (168.28)	11249 (50.04)	7.52 (12.11)	2002	3.16	0.453 (0.275)	15.45 (3.04)	188 (87)	57 (14)	28.80 (97.53)
				9.3 mph(15.0 km/h)					
221.26 (164.99)	10181 (45.29)	8.15 (13.12)	1990	2.74	0.468 (0.284)	14.95 (2.94)	188 (87)	58 (14)	28.80 (97.53)

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 2.7 mph (4.3 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 139°F (60°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. **1878**, Nebraska Summary 535, 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)	Disengaged dB(A)
At no load - 4.6 mph (7.5 km/h)(engine - 2250 rpm)	69.7	69.6
Bystander in Rabbit range	--	86.8

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear tires - No., size, ply & psi(kPa)	Four 480/80R46; ***,14 (95)	Two 480/80R46; ***,18(125)
Ballast - Duals(total)	2190 lb (993 kg)	None
- Cast iron(total)	4995 lb (2266 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)	1400 lb (635 kg)	None
Height of Drawbar	19.5 in (495 mm)	20.0 in (510 mm)
Static Weight with operator - Rear	19115 lb (8670 kg)	12375 lb (5613 kg)
- Front	9935 lb (4507 kg)	8090 lb (3670 kg)
- Total	29050 lb(13177 kg)	20465 lb (9283 kg)

DRAWBAR PERFORMANCE
BALLASTED - SINGLE FRONT TIRES
MAXIMUM POWER AT SELECTED SPEEDS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip % lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	cool- ing med	Temp. °F(°C) Air dry bulb	Barom. inch Hg (kPa)
166.76 (124.35)	27071 (120.42)	2.31 (3.72)	2215	2.7 mph (4.3 km/h) 11.26 0.544 (0.331)	12.86 (2.53)	187 (86)	42 (6)	28.98 (98.14)
196.72 (146.69)	25596 (113.85)	2.88 (4.64)	2182	3.1 mph (5.0 km/h) 9.33 0.523 (0.318)	13.36 (2.63)	187 (86)	43 (6)	28.98 (98.14)
212.27 (158.29)	25268 (112.40)	3.15 (5.07)	2060	3.7 mph (6.0 km/h) 8.59 0.484 (0.294)	14.45 (2.85)	187 (86)	45 (7)	28.98 (98.14)
221.44 (165.13)	22820 (101.51)	3.64 (5.86)	2000	4.3 mph (7.0 km/h) 5.87 0.464 (0.282)	15.08 (2.97)	187 (86)	46 (8)	28.98 (98.14)
224.30 (167.26)	20788 (92.47)	4.05 (6.51)	2001	4.6 mph (7.5 km/h) 4.60 0.461 (0.280)	15.18 (2.99)	187 (86)	48 (9)	28.98 (98.14)
228.54 (170.42)	20111 (89.46)	4.26 (6.86)	2003	5.0 mph (8.0 km/h) 4.11 0.450 (0.274)	15.53 (3.06)	187 (86)	50 (10)	28.98 (98.14)
231.15 (172.37)	17898 (79.61)	4.84 (7.79)	2004	5.6 mph (9.0 km/h) 3.31 0.446 (0.271)	15.67 (3.09)	187 (86)	51 (11)	28.98 (98.14)
231.67 (172.75)	15970 (71.04)	5.44 (8.75)	2001	6.2 mph (10.0 km/h) 2.77 0.442 (0.269)	15.82 (3.12)	188 (86)	52 (11)	28.98 (98.14)
230.23 (171.68)	14507 (64.53)	5.95 (9.58)	1998	6.8 mph (11.0 km/h) 2.43 0.448 (0.273)	15.59 (3.07)	187 (86)	56 (13)	28.98 (98.14)
229.27 (170.97)	13079 (58.18)	6.57 (10.58)	2000	7.5 mph (12.0 km/h) 2.08 0.453 (0.276)	15.42 (3.04)	188 (86)	56 (13)	28.99 (98.17)
227.20 (169.42)	11937 (53.10)	7.14 (11.49)	2003	8.1 mph (13.0 km/h) 1.88 0.455 (0.277)	15.36 (3.03)	188 (87)	56 (13)	28.99 (98.17)
225.89 (168.45)	10977 (48.83)	7.72 (12.42)	2002	8.7 mph (14.0 km/h) 1.70 0.458 (0.279)	15.25 (3.00)	188 (87)	56 (13)	28.99 (98.17)
224.12 (167.12)	10284 (45.75)	8.17 (13.15)	2000	9.3 mph (15.0 km/h) 1.59 0.462 (0.281)	15.12 (2.98)	188 (87)	56 (13)	28.99 (98.17)

DRAWBAR PERFORMANCE
BALLASTED -DUAL FRONT TIRES
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)	Temp. °F(°C) cool- ing med	Barom. inch Hg (kPa)		
2.5 mph (4.0 km/h)									
166.68 (124.30)	29121 (129.54)	2.15 (3.45)	2212	12.18	0.565 (0.344)	12.37 (2.44)	186 (86)	54 (12)	28.73 (97.29)
2.8 mph (4.5 km/h)									
188.09 (140.26)	27828 (123.79)	2.53 (4.08)	2198	10.18	0.552 (0.336)	12.67 (2.50)	187 (86)	55 (13)	28.73 (97.29)
3.1 mph (5.0 km/h)									
200.48 (149.50)	26747 (118.98)	2.81 (4.52)	2124	8.24	0.515 (0.313)	13.58 (2.68)	187 (86)	55 (13)	28.74 (97.33)
3.7 mph (6.0 km/h)									
216.37 (161.35)	25660 (114.14)	3.16 (5.09)	2014	6.41	0.479 (0.291)	14.60 (2.88)	188 (87)	56 (13)	28.74 (97.33)
4.3 mph (7.0 km/h)									
223.33 (166.54)	22349 (99.41)	3.75 (6.03)	1998	4.40	0.463 (0.282)	15.10 (2.98)	188 (86)	56 (13)	28.74 (97.33)
4.6 mph (7.5 km/h)									
225.59 (168.22)	20771 (92.40)	4.07 (6.55)	2001	3.73	0.459 (0.279)	15.24 (3.00)	188 (86)	57 (14)	28.75 (97.36)
5.0 mph (8.0 km/h)									
229.05 (170.80)	19655 (87.43)	4.37 (7.03)	2001	3.33	0.453 (0.276)	15.43 (3.04)	188 (87)	57 (14)	28.76 (97.39)
5.6 mph (9.0 km/h)									
229.25 (170.96)	17405 (77.42)	4.94 (7.95)	2001	2.73	0.450 (0.274)	15.54 (3.06)	187 (86)	58 (14)	28.76 (97.39)
6.2 mph (10.0 km/h)									
228.85 (170.65)	15752 (70.07)	5.45 (8.77)	2000	2.34	0.451 (0.275)	15.48 (3.05)	188 (86)	58 (14)	28.77 (97.43)
6.8 mph (11.0 km/h)									
227.45 (169.61)	14198 (63.15)	6.01 (9.67)	1999	2.07	0.455 (0.277)	15.36 (3.03)	188 (87)	59 (15)	28.77 (97.43)
7.5 mph (12.0 km/h)									
225.31 (168.01)	12699 (56.49)	6.65 (10.71)	1999	1.76	0.460 (0.280)	15.19 (2.99)	188 (87)	59 (15)	28.78 (97.46)
8.1 mph (13.0 km/h)									
223.15 (166.40)	11745 (52.25)	7.12 (11.47)	1995	1.66	0.463 (0.282)	15.10 (2.97)	187 (86)	60 (16)	28.78 (97.46)
8.7 mph (14.0 km/h)									
222.14 (165.65)	10586 (47.09)	7.87 (12.66)	2001	1.48	0.463 (0.281)	15.10 (2.98)	188 (87)	61 (16)	28.79 (97.49)
9.3 mph (15.0 km/h)									
219.95 (164.02)	9898 (44.03)	8.33 (13.41)	2006	1.30	0.470 (0.286)	14.87 (2.93)	188 (87)	62 (17)	28.80 (97.53)

TIRES, BALLAST AND WEIGHT

Rear tires - No., size, ply & psi (kPa)

Ballast - Duals (total)

- Cast iron (total)

Front tires - No., size, ply & psi (kPa)

Ballast - Duals (total)

- Cast Iron (total)

Height of Drawbar

Static Weight with operator - Rear

- Front

- Total

With Ballast

Four 480/80R46;***;14 (95)

2190 lb (993 kg)

5010 lb (2272 kg)

Four 380/85R34;***;15 (105)

1140 lb (517 kg)

2600 lb (1179 kg)

19.5 in (495 mm)

18705 lb (8484 kg)

12700 lb (5760 kg)

31405 lb (14244 kg)

Without Ballast

Two 480/80R46;***;18 (125)

None

None

Two 380/85R34;***;17 (115)

None

None

20.0 in (510 mm)

12375 lb (5613 kg)

8090 lb (3670 kg)

20465 lb (9283 kg)

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:	2801 psi (193 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	38.1 GPM (144.2 l/min)
iii) Pump delivery rate at maximum	
hydraulic power:	36.3 GPM (137.4 l/min)
Delivery pressure:	2462 psi (170 bar)
Power:	52.1 HP (38.9 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

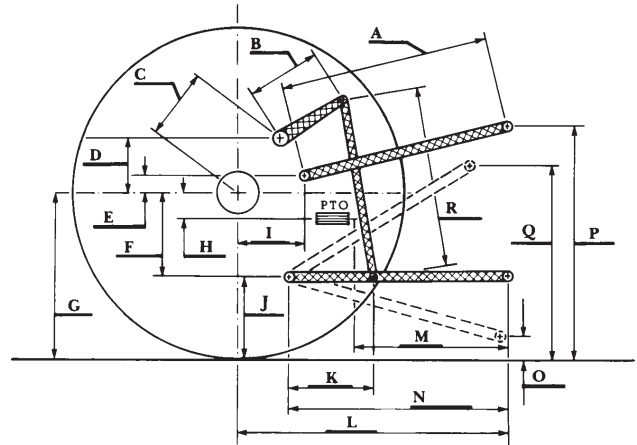
SAE Static Test—System pressure 2520 psi (174 Bar)

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 665B Diesel