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2016

## Test 2168: Challenger MT865E

Nebraska Tractor Test Lab

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# NEBRASKA OECD TRACTOR TEST 2168 - SUMMARY 1049

## CHALLENGER MT865E DIESEL

### 16 SPEED

#### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption		Mean Atmospheric Conditions
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)	
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1061 rpm)						
451.47 (336.66)	2100	27.57 (104.37)	0.428 (0.260)	16.37 (3.23)	1.04 (3.93)	
Standard Power Take-off Speed(1000 rpm)						
517.85 (386.16)	1979	29.41 (111.34)	0.398 (0.242)	17.61 (3.47)	0.94 (3.54)	
Maximum Power (1 hour)						
521.27 (388.71)	1900	28.94 (109.56)	0.389 (0.236)	18.01 (3.55)	0.87 (3.31)	

#### VARYING POWER AND FUEL CONSUMPTION

451.47 (336.66)	2100	27.57 (104.37)	0.428 (0.260)	16.37 (3.23)	1.04 (3.93)	Air temperature
391.32 (291.81)	2141	25.07 (94.92)	0.449 (0.273)	15.61 (3.07)	0.77 (2.90)	74°F (23°C)
296.46 (221.07)	2163	21.15 (80.06)	0.499 (0.304)	14.02 (2.76)	0.43 (1.63)	Relative humidity
198.15 (147.76)	2170	16.80 (63.59)	0.594 (0.361)	11.80 (2.32)	0.34 (1.28)	33%
99.50 (74.20)	2178	12.62 (47.79)	0.888 (0.540)	7.88 (1.55)	0.10 (0.37)	Barometer
1.88 (1.40)	2184	8.39 (31.78)	31.319 (19.051)	0.22 (0.04)	0.07 (0.26)	28.93" Hg (97.97 kPa)

Maximum torque - 1787 lb.-ft. (2422 Nm) at 1451 rpm

Maximum torque rise - 58.2%

Torque rise at 1680 engine rpm - 43%

Power increase at 1900 engine rpm - 15.5%

#### DRAWBAR PERFORMANCE(UNBALLLASTED)

##### 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)	D.E.F. Consumption Hp.hr/gal (kW.h/l)	Temp.°F (°C)	cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Power at Rated Engine Speed—6th Gear</b>										
392.12 (292.40)	33441 (148.75)	4.40 (7.07)	2098	3.9	0.493 (0.300)	14.21 (2.80)	0.022 (0.014)	173 (78)	49 (9)	29.11 (98.58)
<b>75% of Pull at Rated Engine Speed—6th Gear</b>										
308.08 (229.73)	25061 (111.47)	4.61 (7.42)	2156	1.9	0.537 (0.326)	13.04 (2.57)	0.019 (0.011)	180 (77)	56 (13)	29.10 (98.54)
<b>50% of Pull at Rated Engine Speed—6th Gear</b>										
208.76 (155.67)	16709 (74.33)	4.69 (7.54)	2167	0.8	0.634 (0.385)	11.05 (2.18)	0.015 (0.009)	171 (77)	58 (15)	29.09 (98.51)
<b>75% of Pull at Reduced Engine Speed—10th Gear</b>										
307.32 (229.16)	25201 (112.10)	4.57 (7.35)	1331	1.9	0.414 (0.252)	16.93 (3.33)	0.025 (0.015)	174 (79)	57 (14)	29.09 (98.51)
<b>50% of Pull at Reduced Engine Speed—10th Gear</b>										
208.64 (155.58)	16766 (74.58)	4.67 (7.52)	1343	0.8	0.451 (0.274)	15.53 (3.06)	0.024 (0.015)	173 (78)	59 (15)	29.08 (98.48)

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

**Dates of tests:** October 21 - 28, 2016

**Manufacturer:** AGCO Corporation, 4205 River Green Parkway, Duluth Ga 30096

**CONSUMABLE Fluids, OIL and TIME:** Fuel No. 2 Diesel **Specific gravity converted to 60°/ 60°F (15°/15°C)** 0.8408 **Fuel weight** 7.001 lbs/gal (0.839 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil** SAE 10W-40 **API service classification** CJ-4 **Transmission and hydraulic lubricant** AGCO Permatran 821 XL fluid **Total time engine was operated:** 17.5 hours

**ENGINE: Make** AGCO Power Diesel **Type** twelve cylinder vee with 4 turbochargers, two stage air to water aftercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** \*C51648\* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.370" x 5.709" (111.0 mm x 145.0 mm) **Compression ratio** 16.7 to 1 **Displacement** 1026 cu in (16838 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 **Exhaust** DOC (diesel oxidation catalyst) and SCR (selective catalyst reduction) integrated within a vertical muffler **Cooling medium temperature control** 2 thermostats

**ENGINE OPERATING PARAMETERS: Fuel rate:** 182.2- 196.0 lb/h (82.6 - 88.9 kg/h) **High idle:** 2160 - 2200 rpm **Turbo boost:** nominal 26.1 - 29.0 psi (180 - 200 kPa) as measured 27.6 psi (190 kPa)

**CHASSIS: Type** tracklayer-rubber tracked **Serial No.** \*AGCO865EGNKG1028\* **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 2270 rpm, reverse 1.34 (2.16), 3.24 (5.22), 3.66 (5.89), 8.89 (14.30)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED AT 2100 ENGINE 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)	D.E.F Consumption lb/hp.hr (kg/kW.h)	Temp. <sup>o</sup> F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
360.24 (268.63)	43640 (194.12)	3.10 (4.98)	2098	9.3	4th Gear 0.533 (0.324)	13.12 (2.59)	0.022 (0.013)	174 (79)	59 (15)	28.86 (97.73)
384.74 (286.90)	37474 (166.69)	3.85 (6.20)	2100	5.3	5th Gear 0.501 (0.304)	13.99 (2.76)	0.023 (0.014)	173 (78)	54 (12)	29.10 (98.54)
392.12 (292.40)	33441 (148.75)	4.40 (7.07)	2098	3.9	6th Gear 0.493 (0.300)	14.21 (2.80)	0.022 (0.013)	173 (78)	49 (9)	29.11 (98.58)
388.92 (290.02)	29087 (129.39)	5.01 (8.06)	2100	2.9	7th Gear 0.497 (0.302)	14.09 (2.78)	0.021 (0.013)	173 (78)	47 (9)	29.13 (98.65)
392.70 (292.84)	25915 (115.27)	5.69 (9.15)	2099	2.2	8th Gear 0.494 (0.300)	14.18 (2.79)	0.022 (0.013)	173 (78)	46 (8)	29.13 (98.65)
385.11 (287.17)	22464 (99.92)	6.43 (10.35)	2099	1.6	9th Gear 0.501 (0.305)	13.96 (2.75)	0.022 (0.014)	173 (78)	51 (10)	29.12 (98.61)
386.97 (288.56)	19974 (88.85)	7.27 (11.69)	2099	1.2	10th Gear 0.499 (0.303)	14.03 (2.76)	0.023 (0.014)	173 (78)	52 (11)	29.11 (98.58)
375.92 (280.32)	17148 (76.28)	8.22 (13.23)	2099	0.8	11th Gear 0.512 (0.311)	13.69 (2.70)	0.024 (0.015)	173 (78)	53 (12)	29.11 (98.58)

**Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated by foot pedal **Steering** electro-hydraulic differential steering controlled by steering wheel  
**Power take-off** 1000 rpm at 1980 engine rpm  
**Unladen tractor mass** 44375 lb (20128 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 performance figures on this Summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2168**, Nebraska Summary 1049, January 9, 2017.

Roger M. Hoy  
Director

M.F. Kocher  
P.J. Jasa  
S.K. Pitla  
Board of Tractor Test Engineers

**TRACTOR SOUND LEVEL WITH CAB** **dB(A)**

At no load in 6th gear	73.9
Bystander in 15th gear	88.7

**TIRES AND WEIGHT**

**Track width**  
**Height of Drawbar**  
**Static Weight with operator**

**Tested Without Ballast**

36.0 in (915 mm)  
20.5 in (520 mm)  
44550 lb(20207 kg)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED AT 1900 ENGINE 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)	D.E.F Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
4th Gear										
353.40 (263.53)	45720 (203.37)	2.90 (4.66)	2070	13.9	0.551 (0.335)	12.70 (2.50)	0.023 (0.014)	174 (79)	58 (14)	28.86 (97.73)
5th Gear										
404.11 (301.34)	43159 (191.98)	3.52 (5.66)	1998	9.3	0.491 (0.299)	14.26 (2.81)	0.017 (0.010)	175 (79)	60 (15)	28.85 (97.70)
6th Gear										
437.99 (326.61)	42218 (187.79)	3.90 (6.27)	1952	8.6	0.471 (0.287)	14.86 (2.93)	0.018 (0.011)	176 (80)	59 (15)	28.83 (97.63)
7th Gear										
446.52 (332.97)	38133 (169.62)	4.39 (7.07)	1901	6.0	0.458 (0.278)	15.30 (3.01)	0.017 (0.010)	176 (80)	61 (16)	28.82 (97.60)
8th Gear										
457.85 (341.42)	34074 (151.57)	5.04 (8.11)	1900	4.2	0.447 (0.272)	15.67 (3.09)	0.017 (0.010)	177 (80)	62 (17)	28.83 (97.63)
9th Gear										
456.90 (340.71)	29838 (132.72)	5.74 (9.24)	1900	2.9	0.445 (0.271)	15.73 (3.10)	0.018 (0.011)	177 (81)	64 (18)	28.82 (97.60)
10th Gear										
461.12 (343.85)	26555 (118.12)	6.51 (10.48)	1900	2.3	0.441 (0.268)	15.87 (3.13)	0.018 (0.011)	178 (81)	64 (18)	28.83 (97.63)
11th Gear										
451.50 (336.68)	22904 (101.88)	7.40 (11.90)	1900	1.6	0.454 (0.276)	15.42 (3.04)	0.018 (0.011)	178 (81)	65 (19)	28.82 (97.60)
12th Gear										
452.84 (337.68)	20334 (90.45)	8.35 (13.44)	1900	1.2	0.449 (0.273)	15.58 (3.07)	0.018 (0.011)	178 (81)	65 (18)	28.82 (97.60)

## HYDRAULIC PERFORMANCE

CATEGORY: IVN

Quick Attach: yes

OECD Static test

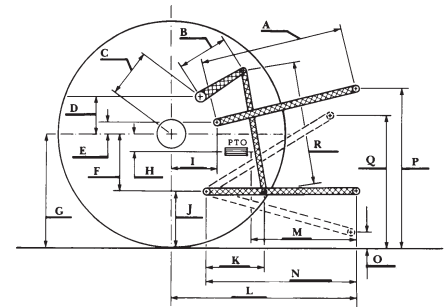
Maximum force exerted through whole range: 20936 lbs (93.1 kN)

	<b>Standard pump</b> <u>3 inlets - 3 outlets</u>	<b>High flow pump</b> <u>3 inlets - 3 outlets</u>
i) Sustained pressure at compensator cutoff:	2867 psi (198 bar)	2888 psi (199 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	58.5 GPM (221.6 l/min)	86.6 GPM (327.7 l/min)
iii) Pump delivery rate at maximum hydraulic power:	55.2 GPM (209.0 l/min)	82.8 GPM (313.6 l/min)
Delivery pressure:	2813 psi (194 bar)	2769 psi (191 bar)
Power:	90.6 HP (67.5 kW)	133.8 HP (99.8 kW)
	<u>1 inlet - 1 outlet</u>	<u>1 inlet - 1 outlet</u>
i) Sustained pressure at compensator cutoff:	2869 psi (198 bar)	2896 psi (200 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	39.0 GPM (147.7 l/min)	40.0 GPM (151.4 l/min)
iii) Pump delivery rate at maximum hydraulic power:	36.8 GPM (139.4 l/min)	37.2 GPM (140.9 l/min)
Delivery pressure:	2343 psi (162 bar)	2404 psi (166 bar)
Power:	50.3 HP (37.5 kW)	52.2 HP (38.9 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 MT865E Diesel**

Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln