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2014

## Test 2087: Challenger MT755E

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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# NEBRASKA OECD TRACTOR TEST 2087-SUMMARY 936

## CHALLENGER MT755E DIESEL

### 16 SPEED

#### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption Gal/hr (l/h)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1060 rpm)						
284.78 (212.36)	2099	18.30 (69.26)	0.451 (0.274)	15.56 (3.07)	1.10 (4.17)	
Standard Power Take-off Speed (1000 rpm)						
316.05 (235.68)	1980	18.71 (70.82)	0.415 (0.253)	16.89 (3.33)	1.27 (4.82)	
Maximum Power (1 hour)						
326.14 (243.20)	1800	18.01 (68.16)	0.387 (0.236)	18.11 (3.57)	1.26 (4.78)	

#### VARYING POWER AND FUEL CONSUMPTION

284.78 (212.36)	2099	18.30 (69.26)	0.451 (0.274)	15.56 (3.07)	1.10 (4.17)	Air temperature
248.38 (185.22)	2155	16.85 (63.79)	0.476 (0.290)	14.74 (2.90)	0.90 (3.40)	78°F (26°C)
187.40 (139.74)	2164	13.78 (52.16)	0.516 (0.314)	13.60 (2.68)	0.53 (1.99)	Relative humidity
125.34 (93.46)	2172	10.13 (38.36)	0.567 (0.345)	12.37 (2.44)	0.28 (1.07)	57%
62.82 (46.85)	2179	7.13 (26.97)	0.796 (0.484)	8.82 (1.74)	0.28 (1.04)	Barometer
2.65 (1.97)	2187	4.45 (16.85)	11.799 (7.177)	0.59 (0.12)	0.23 (0.87)	28.71" Hg (97.22 kPa)

Maximum torque - 1160 lb.-ft. (1573 Nm) at 1101 rpm

Maximum torque rise - 62.7%

Torque rise at 1680 engine rpm - 42%

Power increase at 1800 engine rpm - 14.5%

#### 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)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp. °F (°C) cool- ing med bulb	Barom. inch Hg (kPa)
Maximum Power—8th Gear									
252.35 (188.18)	16795 (74.71)	5.64 (9.07)	2100	2.2	0.511 (0.311)	13.72 (2.70)	0.036 (0.022)	188 (87)	28.71 (97.22)
75% of Pull at Maximum Power—8th Gear									
196.29 (146.37)	12581 (55.96)	5.85 (9.41)	2160	1.2	0.541 (0.329)	12.96 (2.55)	0.039 (0.024)	189 (87)	28.72 (97.26)
50% of Pull at Maximum Power—8th Gear									
132.71 (98.96)	8416 (37.43)	5.91 (9.51)	2170	0.6	0.598 (0.364)	11.74 (2.31)	0.026 (0.016)	188 (87)	28.73 (97.29)
75% of Pull at Reduced Engine Speed—11th Gear									
196.76 (146.72)	12675 (56.38)	5.82 (9.37)	1505	1.2	0.431 (0.262)	16.28 (3.21)	0.039 (0.024)	184 (84)	28.71 (97.22)
50% of Pull at Reduced Engine Speed—11th Gear									
132.48 (98.79)	8377 (37.26)	5.93 (9.54)	1525	0.6	0.465 (0.283)	15.10 (2.98)	0.040 (0.024)	183 (84)	28.73 (97.29)

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

**Dates of tests:** May 27 to June 2, 2014

**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)** 0.8429 **Fuel weight** 7.018 lbs/gal (0.841 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil SAE** 15W-40 **API service classification** CJ-4 **Transmission and hydraulic lubricant** AGCO Permatran 821 XL fluid **Total time engine was operated:** 20.0 hours

**ENGINE: Make** AGCO **Power Diesel Type** seven cylinder vertical with two turbochargers, water to air intercooler, air to air intercooler and D.E.F. (diesel exhaust fluid) technology **Serial No.** \*Z36358\* **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** 599 cu in (9822 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** one paper element and water separator **Fuel cooler** radiator for pump return fuel **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** 119.1 - 128.6 lb/h (54.0 - 58.3 kg/h) **High idle:** 2150 - 2200 rpm **Turbo boost:** nominal 34.8 - 37.7 psi (240 - 260 kPa) as measured 35.8 psi (247 kPa)

**CHASSIS: Type** Tracklayer-rubber tracked **Serial No.** \*AGCC0765AENCD1002\* **Track width** 88.0" (2235 mm) to 119.5" (3035 mm) **Length of track on ground** 102.4" (2600 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 1.66 (2.67) second 2.11 (3.40) third 2.66 (4.28) fourth 3.38 (5.44) fifth 4.03 (6.49) sixth 4.54 (7.31) seventh 5.12 (8.24) eighth 5.76 (9.27) ninth 6.48 (10.43) tenth 7.29 (11.73) eleventh 8.22 (13.23) twelfth 9.26 (14.90) thirteenth 11.02 (17.73) fourteenth 14.00 (22.53) fifteenth 17.72 (28.52) sixteenth 24.64 (39.65) at 2300 rpm, reverse 1.33 (2.14), 3.22 (5.18), 3.63 (5.84), 8.82 (14.19) **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** 33235 lb (15075 kg)

**DRAWBAR PERFORMANCE**

**Unballasted at 2100 RPM**

**DRAWBAR 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)	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. inHg (kPa)
3rd Gear										
196.30 (146.38)	31032 (138.03)	2.38 (3.82)	2108	11.3	0.578 (0.351)	12.15 (2.39)	0.033 (0.020)	189 (87)	67 (20)	28.76 (98.39)
4th Gear										
233.46 (174.09)	28132 (125.14)	3.12 (5.01)	2099	7.9	0.550 (0.335)	12.76 (2.51)	0.040 (0.024)	190 (88)	71 (22)	28.75 (97.36)
5th Gear										
244.38 (182.23)	23972 (106.63)	3.83 (6.16)	2100	5.0	0.525 (0.319)	13.38 (2.64)	0.038 (0.023)	190 (88)	74 (24)	28.73 (97.29)
6th Gear										
251.64 (187.64)	21590 (96.03)	4.37 (7.03)	2100	3.6	0.512 (0.311)	13.72 (2.70)	0.037 (0.022)	189 (87)	76 (24)	28.71 (97.22)
7th Gear										
250.49 (186.79)	18861 (83.90)	4.98 (8.01)	2100	2.6	0.513 (0.312)	13.67 (2.69)	0.037 (0.022)	188 (87)	71 (22)	28.71 (97.22)
8th Gear										
252.35 (188.18)	16795 (74.71)	5.64 (9.07)	2100	2.2	0.511 (0.311)	13.72 (2.70)	0.036 (0.022)	188 (87)	69 (20)	28.71 (97.22)
9th Gear										
250.08 (186.48)	14718 (65.47)	6.37 (10.25)	2100	1.6	0.514 (0.313)	13.65 (2.69)	0.037 (0.022)	189 (87)	78 (25)	28.72 (97.26)
10th Gear										
251.22 (187.33)	13094 (58.24)	7.20 (11.58)	2099	1.2	0.512 (0.312)	13.70 (2.70)	0.037 (0.023)	189 (87)	78 (26)	28.72 (97.26)
11th Gear										
245.71 (183.22)	11321 (50.36)	8.14 (13.10)	2099	0.9	0.523 (0.318)	13.43 (2.65)	0.039 (0.024)	189 (87)	79 (26)	28.71 (97.22)

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments.

**Note 1:**The performance figures on this report are the result of replacing the electronic engine control module of the Challenger MT765E with the Challenger MT755E module.

**Note 2:** This tractor has a driveline protection system that limits the maximum engine torque in gears 1 through 4.

**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 96°F (36°C). 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. **2087**, Nebraska Summary 936, December 19, 2014.

Roger M. Hoy  
Director

M.F. Kocher  
J.D. Luck  
P.J. Jasa  
Board of Tractor Test Engineers

**TRACTOR SOUND LEVEL WITH CAB**

**dB(A)**

At no load in 6th gear	72.0
Bystander in 16th gear	89.7

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
Track width	25.0 in (635 mm)	25.0 in (635 mm)
Ballast - Cast iron(front end)	3245 lb (1472 kg)	None
- Cast iron(front idlers)	2345 lb (1064 kg)	None
Height of Drawbar	21.0 in (535 mm)	20.0 in (510 mm)
Static Weight with operator	39000 lb(17690 kg)	33410 lb(15154 kg)

**DRAWBAR PERFORMANCE**  
**(Unballasted at 1800 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)	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)
3rd Gear										
196.75 (146.71)	31059 (138.16)	2.38 (3.83)	2119	11.6	0.583 (0.355)	12.04 (2.37)	0.031 (0.019)	189 (87)	67 (20)	28.75 (97.36)
4th Gear										
236.11 (176.07)	29956 (133.25)	2.96 (4.76)	2050	10.5	0.550 (0.334)	12.76 (2.51)	0.040 (0.024)	189 (87)	72 (22)	28.76 (97.39)
5th Gear										
262.42 (195.68)	28838 (128.28)	3.41 (5.49)	1958	9.1	0.502 (0.305)	13.98 (2.75)	0.043 (0.026)	190 (88)	74 (24)	28.77 (97.42)
6th Gear										
271.03 (202.11)	27947 (124.31)	3.64 (5.86)	1839	8.4	0.473 (0.288)	14.85 (2.92)	0.042 (0.026)	188 (87)	75 (24)	28.77 (97.43)
7th Gear										
279.21 (208.20)	25243 (112.28)	4.15 (6.67)	1800	5.4	0.454 (0.276)	15.45 (3.04)	0.039 (0.024)	187 (86)	72 (22)	28.71 (97.22)
8th Gear										
284.46 (212.12)	22532 (100.23)	4.74 (7.62)	1800	4.1	0.445 (0.271)	15.75 (3.10)	0.039 (0.024)	187 (86)	69 (21)	28.71 (97.22)
9th Gear										
284.97 (212.50)	19849 (88.29)	5.38 (8.66)	1800	3.0	0.443 (0.269)	15.86 (3.12)	0.039 (0.024)	187 (86)	76 (25)	28.71 (97.22)
10th Gear										
286.98 (214.00)	17634 (78.44)	6.11 (9.83)	1800	2.4	0.440 (0.268)	15.95 (3.14)	0.039 (0.024)	188 (87)	78 (26)	28.72 (97.26)
11th Gear										
284.53 (212.17)	15408 (68.54)	6.93 (11.14)	1800	1.7	0.443 (0.269)	15.85 (3.12)	0.040 (0.024)	188 (87)	79 (26)	28.72 (97.26)
12th Gear										
285.67 (213.02)	13692 (60.90)	7.83 (12.59)	1800	1.3	0.442 (0.269)	15.86 (3.12)	0.040 (0.024)	188 (87)	80 (27)	28.72 (97.26)
13th Gear										
286.15 (213.38)	11474 (51.04)	9.35 (15.05)	1800	0.9	0.442 (0.269)	15.87 (3.13)	0.040 (0.024)	188 (87)	81 (27)	28.72 (97.26)

**DRAWBAR PERFORMANCE**  
**(Ballasted at 1800 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)	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)
186.00 (138.70)	32845 (146.10)	2.13 (3.42)	1806	7.4	3rd Gear 0.481 (0.292)	14.60 (2.88)	0.043 (0.026)	186 (86)	71 (22)	28.76 (97.39)
239.66 (178.71)	31509 (140.16)	2.86 (4.59)	1899	6.9	4th Gear 0.489 (0.298)	14.35 (2.83)	0.042 (0.025)	187 (86)	73 (23)	28.77 (97.43)
275.31 (205.29)	31127 (138.46)	3.32 (5.34)	1853	6.8	5th Gear 0.465 (0.283)	15.09 (2.97)	0.042 (0.026)	188 (86)	74 (23)	28.77 (97.43)
281.52 (209.93)	28691 (127.62)	3.68 (5.92)	1800	5.5	6th Gear 0.449 (0.273)	15.62 (3.08)	0.040 (0.024)	187 (86)	76 (24)	28.77 (97.43)
283.85 (211.66)	25255 (112.34)	4.22 (6.78)	1800	4.1	7th Gear 0.446 (0.271)	15.74 (3.10)	0.040 (0.024)	188 (86)	78 (25)	28.77 (97.43)
288.42 (215.07)	22565 (100.37)	4.80 (7.72)	1801	3.1	8th Gear 0.438 (0.266)	16.02 (3.16)	0.039 (0.024)	188 (87)	79 (26)	28.78 (97.46)
286.42 (213.58)	19778 (87.98)	5.43 (8.74)	1800	2.3	9th Gear 0.439 (0.267)	15.98 (3.15)	0.040 (0.024)	188 (87)	79 (26)	28.77 (97.43)
289.64 (215.98)	17680 (78.64)	6.14 (9.88)	1800	1.9	10th Gear 0.436 (0.265)	16.09 (3.17)	0.040 (0.024)	188 (87)	80 (27)	28.78 (97.46)
284.64 (212.26)	15339 (68.23)	6.96 (11.20)	1799	1.4	11th Gear 0.443 (0.270)	15.83 (3.12)	0.040 (0.025)	188 (87)	81 (27)	28.77 (97.43)
285.79 (213.11)	13634 (60.65)	7.86 (12.65)	1801	1.1	12th Gear 0.442 (0.269)	15.86 (3.13)	0.041 (0.025)	188 (87)	81 (27)	28.78 (97.46)
286.36 (213.53)	11447 (50.92)	9.38 (15.10)	1801	0.8	13th Gear 0.441 (0.268)	15.90 (3.13)	0.040 (0.025)	188 (87)	81 (27)	28.78 (97.46)

## HYDRAULIC PERFORMANCE

CATEGORY: III

Quick Attach: yes

OECD Static test

Maximum force exerted through whole range: 17263 lbs (76.8 kN)

**Standard pump** **High flow pump**

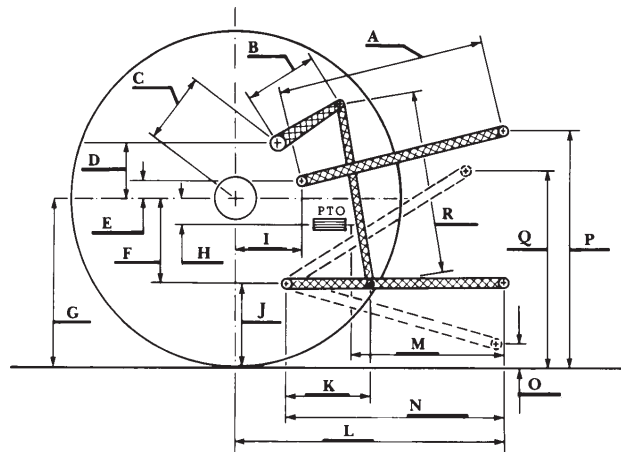
3 outlet sets combined

i) Sustained pressure at compensator cutoff:	2903 psi (202 bar)	2888 psi (199 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	59.4 GPM (224.9 l/min)	85.2 GPM (322.7 l/min)
iii) Pump delivery rate at maximum hydraulic power:	56.0 GPM (212.0 l/min)	80.2 GPM (303.4 l/min)
Delivery pressure:	2836 psi (196 bar)	2739 psi (189 bar)
Power:	92.7 HP (69.1 kW)	128.1 HP (93.5 kW)

single outlet set

i) Sustained pressure at compensator cutoff:	2871 psi (198 bar)	2892 psi (199 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	37.7 GPM (142.5 l/min)	39.8 GPM (150.7 l/min)
iii) Pump delivery rate at maximum hydraulic power:	34.6 GPM (130.8 l/min)	36.8 GPM (139.2 l/min)
Delivery pressure:	2384 psi (164 bar)	2368 psi (163 bar)
Power:	48.1 HP (35.8 kW)	50.8 HP (37.9 kW)

## HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	27.6	702
B	21.7	550
C	23.5	596
D	23.0	583
E	11.4	290
F	11.8	300
G	33.4	849
H	1.3	34
I	16.7	425
J	21.6	549
K	27.1	688
L	48.4	1230
*L'	52.2	1325
M	27.9	709
N	39.6	1005
O	9.0	230
P	48.6	1234
Q	40.2	1022
R	42.5	1079

\*L' to Quick Attach ends



## CHALLENGER MT755E DIESEL

Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln