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2009

## Nebraska Summary: S751 Challenger MT645C IEGR

Nebraska Tractor Test Laboratory

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

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# SUMMARY OF OECD TEST 2557-NEBRASKA SUMMARY 751 CHALLENGER MT645C IEGR DIESEL TECHSTAR 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
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
<b>Rated Engine Speed—(PTO speed—1081 rpm)</b>					
216.2 (161.2)	2200	13.52 (51.16)	0.433 (0.263)	15.99 (3.15)	
<b>Standard Power Take-off Speed(1000 rpm)</b>					
239.0 (178.2)	2035	13.84 (52.37)	0.401 (0.244)	17.27 (3.40)	
<b>Maximum Power (1 hour)</b>					
250.0 (186.4)	1850	13.97 (52.88)	0.387 (0.236)	17.89 (3.52)	

## VARYING POWER AND FUEL CONSUMPTION

216.2 (161.2)	2200	13.52 (51.16)	0.433 (0.263)	15.99 (3.15)	Air temperature
185.6 (138.4)	2221	12.22 (46.26)	0.456 (0.277)	15.19 (2.99)	68°F (20°C)
139.9 (104.3)	2232	9.73 (36.85)	0.481 (0.293)	14.37 (2.83)	Relative humidity
93.6 (69.8)	2242	6.78 (25.67)	0.501 (0.305)	13.81 (2.72)	55%
46.9 (35.0)	2249	4.60 (17.41)	0.678 (0.413)	10.20 (2.01)	Barometer
--	2258	2.57 (9.73)	--	--	29.8" Hg (101.0 kPa)

Maximum Torque - 830 lb.-ft. (1126 Nm) at 1500 rpm  
 Maximum Torque Rise - 60.8%  
 Torque rise at 1800 engine rpm - 38%  
 Power increase at 1850 engine rpm - 15.6%

## 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)
<b>Maximum Power—Turtle 7.5</b>									
175.1 (130.6)	14090 (62.68)	4.66 (7.50)	2201	2.1	0.534 (0.325)	12.97 (2.56)	147 (64)	52 (11)	29.7 (100.6)
<b>75% of Pull at Maximum Power—Turtle 7.5</b>									
133.6 (99.6)	10550 (46.92)	4.75 (7.64)	2219	1.6	0.566 (0.344)	12.23 (2.41)	149 (65)	52 (11)	29.7 (100.6)
<b>50% of Pull at Maximum Power—Turtle 7.5</b>									
90.1 (67.2)	7010 (31.19)	4.82 (7.76)	2233	1.1	0.637 (0.388)	10.86 (2.14)	153 (67)	52 (11)	29.7 (100.6)
<b>75% of Pull at Reduced Engine Speed—Turtle 9</b>									
133.4 (99.5)	10560 (46.97)	4.74 (7.63)	1818	1.5	0.500 (0.304)	13.86 (2.73)	158 (70)	54 (12)	29.7 (100.6)
<b>50% of Pull at Reduced Engine Speed—Turtle 9</b>									
90.4 (67.4)	7030 (31.27)	4.82 (7.76)	1830	1.0	0.534 (0.325)	12.97 (2.56)	156 (69)	54 (12)	29.7 (100.6)

**Location of tests:** DLG - Test Centre, Technology and Farm inputs, Max-Eyth-Weg 1, D-64823 Gross-Umstadt, Germany

**Dates of tests:** October 2009 - March 2010.

**Manufacturer:** AGCO S.A. ZA n2 BP 60307, Avenue Blaise Pascal, 60026 Beauvais, France

**FUEL and OIL:** Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.831 **Fuel weight** 6.93 lbs/gal (0.8295 kg/l) **Oil SAE 10W40 API service classification** CI4 **Transmission and hydraulic lubricant** BP STOU 10W/40 **Front axle lubricant** SAE 85W90 API GL5

**ENGINE:** Make Sisu Diesel **Type** six cylinder vertical with turbocharger, air to air intercooler and IEGR technology **Serial No.** 21340 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.370" x 5.709" (111.0 mm x 145.0 mm) **Compression ratio** 16.7 to 1 **Displacement** 513 cu in (8419 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **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 **Muffler** vertical **Cooling medium temperature control** thermostat and variable speed fan

**CHASSIS:** **Type** front wheel assist with duals **Serial No.** T073991 **Tread width** rear 60.0" (1525 mm) to 101.8" (2585 mm) front 60.8" (1545 mm) to 89.2" (2265 mm) **Wheelbase** 122.2" (3105 mm) **Hydraulic control system** direct engine drive **Transmission** 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 0-18 (0-30), high range 0-25 (0-40) reverse: Low range 0-12 (0-19), high range 0-12 (0-19) **Clutch** a foot pedal controls the hydrostatic oil flow **Brakes** multiple wet disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2038 engine rpm or 1000 rpm at 2033 engine rpm **Unladen tractor mass** 25840 lb (11720 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 lb/hp.hr (kg/kW.h)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Turtle 5									
178.1 (132.8)	26770 (119.08)	2.49 (4.02)	1977	15.2	0.543 (0.331)	12.74 (2.51)	147 (64)	59 (15)	29.6 (100.2)
Turtle 6									
199.3 (148.6)	25460 (113.25)	2.94 (4.73)	1852	7.8	0.487 (0.296)	14.21 (2.80)	162 (72)	61 (16)	29.6 (100.2)
Turtle 7.5									
209.6 (156.3)	20320 (90.38)	3.87 (6.23)	1850	3.6	0.462 (0.281)	14.97 (2.95)	162 (72)	59 (15)	29.6 (100.2)
Turtle 9									
210.8 (157.2)	17060 (75.89)	4.63 (7.46)	1851	2.4	0.461 (0.280)	15.02 (2.96)	158 (70)	61 (16)	29.6 (100.2)
Turtle 11									
201.6 (150.3)	13280 (59.08)	5.69 (9.16)	1850	1.9	0.482 (0.293)	14.37 (2.83)	144 (62)	57 (14)	29.6 (100.4)
Turtle 13									
199.9 (149.1)	11225 (49.92)	6.68 (10.73)	1851	1.5	0.484 (0.295)	14.29 (2.82)	142 (61)	57 (14)	29.6 (100.4)
Turtle 15									
195.4 (145.7)	9445 (42.01)	7.76 (12.49)	1852	1.3	0.496 (0.302)	13.96 (2.75)	163 (73)	57 (14)	29.6 (100.4)
Turtle 17									
193.9 (144.6)	8200 (36.48)	8.87 (14.27)	1853	1.1	0.500 (0.304)	13.86 (2.73)	160 (71)	57 (14)	29.6 (100.4)
Rabbit 11									
204.6 (152.6)	13580 (60.40)	5.65 (9.10)	1851	2.0	0.473 (0.288)	14.62 (2.88)	160 (71)	59 (15)	29.6 (100.1)
Rabbit 13									
206.5 (154.0)	11600 (51.61)	6.68 (10.74)	1852	1.6	0.470 (0.286)	14.72 (2.90)	160 (71)	59 (15)	29.6 (100.1)
Rabbit 15									
205.8 (153.5)	9875 (43.93)	7.82 (12.58)	1852	1.3	0.472 (0.287)	14.67 (2.89)	163 (73)	59 (15)	29.6 (100.1)
Rabbit 17									
204.6 (152.6)	8770 (39.02)	8.75 (14.08)	1858	1.2	0.475 (0.289)	14.57 (2.87)	163 (73)	59 (15)	29.6 (100.2)

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

**NOTE:** The data on this summary was obtained from OECD report 2557 conducted on the Massey Ferguson 8650 Diesel.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD test procedures. This tractor did not meet the manufacturer's remote hydraulic flow claim of 26.4 GPM (100 l/min) from one outlet set. 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 summary of data from OECD Report No. **2557**, Nebraska summary 751, October 26, 2010.

Roger M. Hoy  
Director

M.F. Kocher  
D.R. Keshwani  
J.A. Smith  
Board of Tractor Test Engineers

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

At no load in Turtle - 4.6 mph (7.5 km/h) - no load	71.0
Bystander	---

**TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Rear Tires</b> - No., size, ply & psi(kPa)	Four 480/80R46;***;9(60)	Four 480/80R46;***;9(60)
<b>Ballast</b> - Fluid (total)	None	None
- Cast Iron (total)	None	None
<b>Front Tires</b> - No., size, ply & psi(kPa)	Four 420/90R30;***;9(60)	Two 420/90R30;***;9(60)
<b>Ballast</b> - Duals (total)	1170 lb (530 kg)	None
- Cast Iron (total)	None	None
<b>Height of Drawbar</b>	19.5 in (500 mm)	19.5 in (500 mm)
<b>Static Weight with operator</b> - Rear	15320 lb (6950 kg)	15320 lb (6950 kg)
- Front	11850 lb (5375 kg)	10680 lb (4845 kg)
- Total	27170 lb(12325 kg)	26000 lb(11795 kg)

**DRAWBAR PERFORMANCE**  
**(Ballasted - 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)	Temp. °F cool- ing med	Temp. °C Air dry bulb	Barom. inch Hg (kPa)	
<b>Maximum Power—Turtle 7.5</b>									
174.6 (130.2)	13920 (61.93)	4.70 (7.57)	2201	2.0	0.535 (0.325)	12.94 (2.55)	160 (71)	55 (13)	29.1 (98.7)
<b>75% of Pull at Maximum Power—Turtle 7.5</b>									
133.7 (99.7)	10435 (46.43)	4.80 (7.73)	2219	1.4	0.585 (0.356)	11.83 (2.33)	163 (73)	55 (13)	29.1 (98.7)
<b>50% of Pull at Maximum Power—Turtle 7.5</b>									
89.7 (66.9)	6910 (30.77)	4.87 (7.84)	2232	0.8	0.654 (0.398)	10.59 (2.09)	162 (72)	55 (13)	29.1 (98.7)
<b>75% of Pull at Reduced Engine Speed—Turtle 9</b>									
133.8 (99.8)	10440 (46.43)	4.81 (7.74)	1881	1.5	0.498 (0.303)	13.91 (2.74)	163 (73)	55 (13)	29.1 (98.7)
<b>50% of Pull at Reduced Engine Speed—Turtle 9</b>									
90.3 (67.3)	6945 (30.90)	4.87 (7.84)	1885	0.9	0.550 (0.334)	12.59 (2.48)	162 (72)	55 (13)	29.1 (98.7)

**MAXIMUM POWER AT SELECTED SPEEDS**

174.9 (130.4)	27130 (120.67)	2.42 (3.89)	1969	14.9	Turtle 5 0.555 (0.338)	12.48 (2.46)	162 (72)	52 (11)	29.1 (98.7)
199.9 (149.1)	26465 (117.73)	2.83 (4.56)	1862	12.8	Turtle 6 0.478 (0.291)	14.47 (2.85)	142 (61)	57 (14)	29.4 (99.5)
205.4 (153.2)	19885 (88.45)	3.87 (6.24)	1849	3.1	Turtle 7.5 0.470 (0.286)	14.72 (2.90)	147 (64)	55 (13)	29.4 (99.5)
205.7 (153.4)	16605 (73.87)	4.65 (7.48)	1851	2.2	Turtle 9 0.472 (0.287)	14.67 (2.89)	151 (66)	55 (13)	29.4 (99.5)
201.4 (150.2)	13330 (59.30)	5.67 (9.12)	1851	1.7	Turtle 11 0.482 (0.293)	14.37 (2.83)	142 (61)	52 (11)	29.4 (99.6)
201.4 (150.2)	11175 (49.75)	6.76 (10.87)	1852	1.4	Turtle 13 0.481 (0.293)	14.39 (2.84)	144 (62)	54 (12)	29.4 (99.6)
197.9 (147.6)	9730 (43.28)	7.63 (12.28)	1850	1.2	Turtle 15 0.489 (0.298)	14.15 (2.79)	145 (63)	54 (12)	29.4 (99.6)
195.4 (145.7)	8430 (37.50)	8.69 (13.98)	1853	1.0	Turtle 17 0.496 (0.302)	13.96 (2.75)	149 (65)	54 (12)	29.4 (99.6)
199.1 (148.5)	13065 (58.11)	5.72 (9.20)	1852	1.8	Rabbit 11 0.485 (0.295)	14.26 (2.81)	136 (58)	55 (13)	29.4 (99.4)
200.2 (149.3)	11165 (49.66)	6.72 (10.82)	1852	1.4	Rabbit 13 0.483 (0.294)	14.31 (2.82)	145 (63)	55 (13)	29.4 (99.4)
199.4 (148.7)	9565 (42.56)	7.82 (12.58)	1854	1.1	Rabbit 15 0.485 (0.295)	14.26 (2.81)	149 (65)	57 (14)	29.4 (99.4)
198.9 (148.3)	8630 (38.39)	8.64 (13.91)	1851	0.8	Rabbit 17 0.489 (0.297)	14.16 (2.79)	153 (67)	55 (13)	29.4 (99.4)

## HYDRAULIC PERFORMANCE

CATEGORY: IVN

Quick Attach: No

OECD Static test

Maximum force exerted through whole range: 24590 lbs (109.4 kN)

i) Sustained pressure at compensator cutoff: 3190 psi (220 bar)  
three outlet sets combined

ii) Pump delivery rate at minimum pressure and rated engine speed: 49.5 GPM (187.4 l/min)

iii) Pump delivery rate at maximum hydraulic power: 44.6 GPM (169.0 l/min)  
 Delivery pressure: 2205 psi (152 bar)  
 Power: 57.4 HP (42.8 kW)  
single outlet set

ii) Pump delivery rate at minimum pressure and rated engine speed: 25.3 GPM (95.6 l/min)

iii) Pump delivery rate at maximum hydraulic power: 23.8 GPM (90.1 l/min)  
 Delivery pressure: 2510 psi (173 bar)  
 Power: 34.9 HP (26.0 kW)

### HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	35.8	910
B	14.6	370
C	19.1	484
D	15.9	405
E	15.6	395
F	13.0	330
G	36.4	925
H	2.0	50
I	16.5	420
J	23.4	595
K	28.7	730
L	52.4	1330
M	29.8	757
N	42.9	1090
O	9.1	230
P	50.4	1280
Q	38.7	983
R	37.0	940

