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2008

Test 1931: Challenger MT975B Diesel

Nebraska Tractor Test Lab

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NEBRASKA OECD TRACTOR TEST 1931 – SUMMARY 603

CHALLENGER MT975B DIESEL

16 SPEED

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—1050 rpm)					
518.16 (386.39)	2100	32.80 (124.17)	0.444 (0.270)	15.80 (3.11)	
Standard Power Take-off Speed - (PTO speed - 1000 rpm)					
552.37 (411.90)	2000	33.82 (128.04)	0.429 (0.261)	16.33 (3.22)	
Maximum Power (1 hour)					
584.72 (436.03)	1750	32.91 (124.60)	0.394 (0.240)	17.76 (3.50)	

VARYING POWER AND FUEL CONSUMPTION

518.16 (386.39)	2100	32.80 (124.17)	0.444 (0.270)	15.80 (3.11)	Air temperature
460.03 (343.05)	2199	30.40 (115.07)	0.463 (0.282)	15.13 (2.98)	82°F (28°C)
343.12 (255.86)	2199	24.65 (93.30)	0.503 (0.306)	13.92 (2.74)	Relative humidity
230.28 (171.72)	2199	17.60 (66.61)	0.535 (0.326)	13.09 (2.58)	42%
113.78 (84.85)	2199	11.32 (42.84)	0.697 (0.424)	10.05 (1.98)	Barometer
2.62 (1.79)	2199	6.56 (18.97)	17.587 (10.609)	0.40 (0.08)	28.57" Hg (96.75 kPa)

Maximum Torque - 2010 lb.-ft. (2725 Nm) at 1297 rpm
Maximum Torque Rise - 55.1%
Torque rise at 1700 engine rpm - 39.6%
Power increase at 1750 engine rpm - 12.8%

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)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—8th Gear									
466.08 (347.56)	32089 (142.74)	5.45 (8.77)	2101	2.98	0.500 (0.304)	14.02 (2.76)	192 (89)	76 (24)	28.99 (98.17)
75% of Pull at Maximum Power—8th Gear									
370.04 (275.94)	24105 (107.22)	5.76 (9.26)	2204	2.04	0.547 (0.333)	12.80 (2.52)	191 (88)	81 (27)	28.91 (97.90)
50% of Pull at Maximum Power—8th Gear									
248.21 (185.09)	16051 (71.40)	5.80 (9.33)	2199	1.20	0.610 (0.371)	11.49 (2.26)	190 (88)	81 (27)	28.91 (97.90)
75% of Pull at Reduced Engine Speed—11th Gear									
368.96 (275.13)	24065 (107.05)	5.75 (9.25)	1546	2.13	0.447 (0.272)	15.66 (3.08)	191 (88)	81 (27)	28.91 (97.90)
50% of Pull at Reduced Engine Speed—11th Gear									
249.21 (185.83)	16120 (71.70)	5.80 (9.33)	1543	1.20	0.491 (0.299)	14.27 (2.81)	190 (88)	82 (28)	28.91 (97.90)

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

Dates of tests: June 6 - 20, 2008

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

FUEL, OIL and TIME: Fuel No. 2 Diesel Specific gravity converted to 60°/60°F (15°/15°C) 0.8416 Fuel weight 7.007 lbs/gal (0.840 kg/l) Oil SAE 10W-30 API service classification CI-4 Transmission and hydraulic lubricant AGCO Trandraulic 821 XL fluid Total time engine was operated: 28.5 hours

ENGINE: Make Caterpillar Diesel Type six cylinder vertical with turbocharger and air to air aftercooler Serial No.*EJG01186* Crankshaft lengthwise Rated engine speed 2100 Bore and stroke 5.709" x 7.205" (145.0 mm x 183.0 mm) Compression ratio 16.3 to 1 Displacement 1105 cu in (18130 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 oil, radiator for transmission and front and rear axle oil Fuel filter two paper elements and water separator Muffler vertical Cooling medium temperature control 2 thermostats

ENGINE OPERATING PARAMETERS: Fuel rate: 209.4 - 231.7 lb/h (95.0 - 105.1 kg/h) High idle: 2175 - 2225 rpm Turbo boost: nominal 21.0 - 23.9 psi (145 - 165 kPa) as measured 22.8 psi (157 kPa)

CHASSIS: Type four wheel drive with triples Serial No.*AGCCO975PNTUG1036* Tread width rear 77.0" (1955 mm) to 183.0" (4650 mm) front 77.0" (1955 mm) to 183.0" (4650 mm) Wheelbase 155.5" (3950 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 1.65 (2.65) second 2.09 (3.36) third 2.65 (4.26) fourth 3.36 (5.41) fifth 4.00 (6.44) sixth 4.50 (7.25) seventh 5.08 (8.17) eighth 5.72 (9.20) ninth 6.43 (10.34) tenth 7.24 (11.65) eleventh 8.16 (13.14) twelfth 9.19 (14.79) thirteenth 10.94 (17.61) fourteenth 13.89 (22.36) fifteenth 17.59 (28.30) sixteenth 24.46 (39.36) at 2300 rpm, reverse 1.32 (2.12), 3.20 (5.15), 3.60 (5.80), 8.76 (14.09) Clutch wet multiple disc hydraulically actuated by foot pedal Brakes wet multiple disc hydraulically actuated foot pedal Steering hydrostatic Power take-off 1000 rpm at 2000 engine rpm Unladen tractor mass 50715 lb (23004 kg)

DRAWBAR PERFORMANCE

Unballasted at 2100 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)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
5th Gear									
361.84 (269.82)	35879 (159.60)	3.78 (6.09)	2098	3.55	0.538 (0.327)	13.02 (2.56)	191 (88)	74 (23)	29.00 (98.21)
6th Gear									
414.79 (309.31)	36598 (162.79)	4.25 (6.84)	2097	3.64	0.512 (0.311)	13.69 (2.70)	192 (89)	75 (24)	29.00 (98.21)
7th Gear									
456.38 (340.32)	35632 (158.50)	4.80 (7.73)	2099	3.53	0.500 (0.304)	14.01 (2.76)	192 (89)	75 (24)	28.99 (98.17)
8th Gear									
466.08 (347.56)	32089 (142.74)	5.45 (8.77)	2101	2.98	0.500 (0.304)	14.02 (2.76)	192 (89)	76 (24)	28.99 (98.17)
9th Gear									
464.69 (346.52)	28378 (126.23)	6.14 (9.88)	2096	2.73	0.509 (0.309)	13.77 (2.71)	192 (89)	76 (24)	28.99 (98.17)
10th Gear									
461.12 (343.86)	24826 (110.43)	6.97 (11.21)	2103	2.07	0.510 (0.310)	13.74 (2.71)	192 (89)	73 (23)	29.00 (98.21)
11th Gear									
456.71 (340.57)	21732 (96.67)	7.88 (12.68)	2104	1.80	0.523 (0.318)	13.39 (2.64)	192 (89)	79 (26)	28.92 (97.93)
12th Gear									
449.52 (335.20)	18918 (84.15)	8.91 (14.34)	2104	1.48	0.527 (0.320)	13.30 (2.62)	192 (89)	79 (26)	28.92 (97.93)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

Note: This tractor has a driveline protection system that limits the maximum engine torque in gears 1 through 7.

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 primary fuel filter was maintained at 114°F(46°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. **1931**, Nebraska Summary 603, December 15, 2008.

Roger M. Hoy
Director

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

TRACTOR SOUND LEVEL WITH CAB

dB(A)

At no load in 6th gear	78.0
Bystander	--

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires - No., size, ply & psi(kPa)	Six 520/85R46;***;6(40)	Six 520/85R46;***;8(55)
Ballast - Liquid (total)	None	None
- Cast Iron (total)	None	None
Front Tires - No., size, ply & psi(kPa)	Six 520/85R46;***;20(110)	Six 520/85R46;***;12(85)
Ballast - Cast iron-front wheels(total)	4810 lb (2182 kg)	None
- Cast Iron -front end (total)	4300 lb (1950 kg)	None
Height of Drawbar	21.5 in (545 mm)	21.0 in (535 mm)
Static Weight with operator - Rear	19260 lb (8736 kg)	21995 lb (9977 kg)
- Front	40560 lb(18398 kg)	28715 lb(13025 kg)
- Total	59820 lb(27134 kg)	50710 lb(23002 kg)

DRAWBAR PERFORMANCE
(Unballasted at 1750 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)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
5th Gear									
374.88 (279.55)	46088 (205.01)	3.05 (4.91)	1751	6.78	0.473 (0.287)	14.83 (2.92)	191 (88)	74 (23)	28.80 (97.53)
6th Gear									
439.39 (327.65)	48748 (216.84)	3.38 (5.44)	1755	8.52	0.477 (0.290)	14.69 (2.89)	192 (89)	76 (24)	28.80 (97.53)
7th Gear									
473.07 (352.77)	47208 (209.99)	3.76 (6.05)	1778	10.85	0.495 (0.301)	14.15 (2.79)	193 (89)	79 (26)	28.92 (97.93)
8th Gear									
512.01 (381.80)	43779 (194.74)	4.39 (7.06)	1748	6.07	0.457 (0.278)	15.32 (3.02)	193 (89)	76 (24)	28.99 (98.17)
9th Gear									
517.47 (385.88)	38684 (172.08)	5.02 (8.07)	1747	4.43	0.456 (0.277)	15.37 (3.03)	193 (89)	77 (25)	28.98 (98.14)
10th Gear									
523.03 (390.02)	34218 (152.21)	5.73 (9.22)	1752	3.26	0.450 (0.273)	15.59 (3.07)	193 (89)	74 (23)	29.00 (98.21)
11th Gear									
518.51 (386.65)	29953 (133.24)	6.49 (10.45)	1753	2.81	0.466 (0.284)	15.03 (2.96)	193 (90)	79 (26)	28.92 (97.93)
12th Gear									
519.81 (387.63)	26447 (117.64)	7.37 (11.86)	1756	2.43	0.467 (0.284)	15.01 (2.96)	195 (90)	80 (27)	28.92 (97.93)
13th Gear									
518.25 (386.46)	22166 (98.60)	8.77 (14.11)	1747	1.86	0.466 (0.284)	15.03 (2.96)	195 (91)	80 (27)	28.92 (97.93)

DRAWBAR PERFORMANCE
(Ballasted at 1750 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)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
4th Gear									
328.40 (244.89)	47867 (212.92)	2.57 (4.14)	1752	6.59	0.496 (0.302)	14.13 (2.78)	192 (89)	73 (23)	28.96 (98.07)
5th Gear									
385.51 (287.48)	46983 (208.99)	3.08 (4.95)	1749	6.00	0.481 (0.293)	14.56 (2.87)	192 (89)	72 (22)	28.96 (98.07)
6th Gear									
439.59 (327.81)	47737 (212.35)	3.45 (5.56)	1746	6.16	0.465 (0.283)	15.07 (2.97)	192 (89)	71 (22)	28.96 (98.07)
7th Gear									
495.12 (369.21)	47526 (211.40)	3.91 (6.29)	1747	5.91	0.454 (0.276)	15.43 (3.04)	193 (89)	70 (21)	28.96 (98.07)
8th Gear									
515.48 (384.39)	43335 (192.76)	4.46 (7.18)	1750	4.70	0.452 (0.275)	15.52 (3.06)	193 (89)	69 (21)	28.96 (98.07)
9th Gear									
520.20 (387.91)	38447 (171.02)	5.07 (8.17)	1750	3.62	0.450 (0.274)	15.56 (3.06)	193 (89)	69 (21)	28.96 (98.07)
10th Gear									
523.96 (390.72)	34255 (152.37)	5.74 (9.23)	1749	3.30	0.452 (0.275)	15.49 (3.05)	193 (89)	74 (23)	28.97 (98.10)
11th Gear									
519.48 (387.38)	30030 (133.58)	6.49 (10.44)	1745	2.80	0.450 (0.274)	15.56 (3.07)	193 (89)	75 (24)	28.97 (98.10)
12th Gear									
516.65 (385.26)	26396 (117.42)	7.34 (11.81)	1746	2.21	0.454 (0.276)	15.42 (3.04)	193 (89)	76 (24)	28.97 (98.10)
13th Gear									
518.87 (386.92)	22177 (98.65)	8.77 (14.12)	1745	1.75	0.448 (0.272)	15.64 (3.08)	193 (89)	77 (25)	28.98 (98.14)

HYDRAULIC PERFORMANCE

CATEGORY: NA

Quick Attach: NA

Maximum force exerted through whole range:

i) Sustained pressure at compensator cutoff:

NA

3067 psi (211 bar)

2912 psi (201 bar)

Standard pump

High flow pump

ii) Pump delivery rate at minimum pressure
and rated engine speed:

43.7 GPM (165.6 l/min)

59.2 GPM (224.1 l/min)

iii) Pump delivery rate at maximum

hydraulic power:

41.2 GPM (155.8 l/min)

56.6 GPM (214.2 l/min)

Delivery pressure:

2761 psi (190 bar)

2654 psi (183 bar)

Power:

66.4 HP (49.5 kW)

87.6 HP (65.3 kW)



CHALLENGER MT975B DIESEL

Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln