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## Test 1306: Deutz DX-110 Diesel 15-Speed

Nebraska Tractor Test Lab

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# NEBRASKA TRACTOR TEST 1306 — DEUTZ DX-110 DIESEL 15 SPEED

## POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption			Temperature °F (°C)			Barometer inch Hg (kPa)
		gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cooling medium	Air wet bulb	Air dry bulb	
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1110 rpm)								
100.29 (74.78)	2300	6.677 (25.276)	0.463 (0.282)	15.02 (2.959)	air cooled	64 (17.6)	75 (23.8)	28.727 (97.005)
Standard Power Take-off Speed (1000 rpm)—One Hour								
93.61 (69.80)	2071	6.200 (23.470)	0.461 (0.280)	15.10 (2.974)	air cooled	65 (18.1)	75 (24.0)	28.710 (96.949)

## VARYING POWER AND FUEL CONSUMPTION—Two Hours

87.13 (64.97)	2354	5.359 (20.287)	0.428 (0.260)	16.26 (3.203)	air cooled	65 (18.3)	75 (23.9)	..... .....	
0.00 (0.00)	2428	1.479 (5.598)	..... .....	..... .....	air cooled	64 (17.8)	74 (23.6)	..... .....	
44.22 (32.97)	2389	3.208 (12.143)	0.505 (0.307)	13.78 (2.715)	air cooled	64 (17.8)	75 (23.9)	..... .....	
100.61 (75.02)	2300	6.761 (25.592)	0.468 (0.284)	14.88 (2.932)	air cooled	65 (18.3)	76 (24.7)	..... .....	
22.33 (16.65)	2398	2.311 (8.748)	0.720 (0.438)	9.66 (1.904)	air cooled	64 (18.1)	76 (24.2)	..... .....	
65.66 (48.96)	2360	4.217 (15.962)	0.447 (0.272)	15.57 (3.067)	air cooled	64 (17.8)	75 (23.9)	..... .....	
<b>Av 53.32</b> <b>Av (39.76)</b>	<b>2372</b>	<b>3.889</b> <b>(14.722)</b>	<b>0.507</b> <b>(0.309)</b>	<b>13.71</b> <b>(2.701)</b>	air cooled	<b>64</b> <b>(18.0)</b>	<b>75</b> <b>(24.0)</b>	<b>28.677</b> <b>(96.837)</b>	

## DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			Barom. inch Hg (kPa)
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cool- ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 9th (1S) Gear											
87.19 (65.02)	6142 (27.32)	5.32 (8.57)	2300	5.76	6.449 (24.414)	0.515 (0.313)	13.52 (2.663)	air cooled	49 (9.2)	58 (14.2)	28.830 (97.355)
75% of Pull at Maximum Power—Ten Hours 9th (1S) Gear											
68.97 (51.43)	4660 (20.73)	5.55 (8.93)	2356	4.07	4.915 (18.606)	0.496 (0.302)	14.03 (2.764)	air cooled	41 (4.9)	49 (9.2)	28.959 (97.790)
50% of Pull at Maximum Power—Two Hours 9th (1S) Gear											
47.29 (35.27)	3128 (13.91)	5.67 (9.12)	2371	2.77	3.755 (14.213)	0.552 (0.336)	12.60 (2.481)	air cooled	52 (11.1)	65 (18.1)	28.700 (96.916)
50% of Pull at Reduced Engine Speed—Two Hours 12th (5Z) Gear											
47.07 (35.10)	3119 (13.87)	5.66 (9.11)	1492	2.65	3.126 (11.833)	0.462 (0.281)	15.06 (2.967)	air cooled	44 (6.4)	54 (11.9)	28.945 (97.743)

## MAXIMUM POWER IN SELECTED GEARS

75.44 (56.25)	11773 (52.37)	2.40 (3.87)	2350	12.70	4th (1Z) Gear			air cooled	41 (5.0)	47 (8.3)	28.960 (97.794)	
85.80 (63.98)	10009 (44.52)	3.21 (5.17)	2299	10.95	5th (4L) Gear			air cooled	52 (11.1)	65 (18.3)	28.770 (97.152)	
86.57 (64.55)	8642 (38.44)	3.76 (6.05)	2298	8.64	6th (2Z) Gear			air cooled	51 (10.6)	64 (17.8)	28.770 (97.152)	
86.28 (64.34)	7906 (35.17)	4.09 (6.59)	2299	7.51	7th (5L) Gear			air cooled	51 (10.6)	64 (17.8)	28.780 (97.186)	
87.91 (65.55)	6993 (31.10)	4.71 (7.59)	2300	6.49	8th (3Z) Gear			air cooled	51 (10.6)	64 (17.8)	28.790 (97.220)	
88.24 (65.80)	6217 (27.65)	5.32 (8.57)	2298	5.68	9th (1S) Gear			air cooled	53 (11.7)	66 (18.9)	28.740 (97.051)	
90.82 (67.73)	4868 (21.65)	7.00 (11.26)	2300	4.48	10th (4Z) Gear			air cooled	52 (11.1)	65 (18.3)	28.770 (97.152)	
89.34 (66.62)	4022 (17.89)	8.33 (13.41)	2301	3.47	11th (2S) Gear			air cooled	53 (11.7)	66 (18.9)	28.760 (97.118)	

## Department of Agricultural Engineering

Dates of Test: April 21-30 1979

**MANUFACTURER:** KLOCKNER-HUMBOLDT-DEUTZ, AG 5, Cologne 80, West Germany.

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel Cetane No. 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8357 **Fuel weight** 6.958 lbs/gal (0.834 kg/l) **Oil SAE 30 API service classification** SB/SE-CA/CD **To motor** 6.007 gal (22.736 l) **Drained from motor** 3.235 gal (12.244 l) **Transmission and final drive lubricant** SAE 20W20 **Total time engine was operated** 46.0 hours

**ENGINE Make** Deutz Diesel **Type** 6 cylinder vertical **Serial No.** 5909217 **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 3.94" × 4.72" (100 mm × 120 mm) **Compression ratio** 17 to 1 **Displacement** 345 cu in (5652 ml) **Cranking system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one paper cartridge **Oil cooler** radiator for crankcase oil, radiator for hydraulic oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** air cooled.

**CHASSIS: Type** standard with duals **Serial No.** 7620 0190 **Tread width** 70.9" (1800 mm) to 126" (3200 mm) front 59.1" (1500 mm) to 82.7" (2100 mm) **Wheel base** 105.8" (2688 mm) **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 36.5" (928 mm) Vertical distance above roadway 39.2" (997 mm) Horizontal distance from center of rear wheel tread 0.3" (8 mm) to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph (km/h)** first 1.3 (2.2) second 2.0 (3.3) third 2.5 (4.0) fourth 2.7 (4.4) fifth 3.6 (5.9) sixth 4.1 (6.7) seventh 4.5 (7.2) eighth 5.1 (8.2) ninth 5.7 (9.2) tenth 7.4 (11.9) eleventh 8.7 (14.0) twelfth 9.1 (14.6) thirteenth 10.7 (17.2) fourteenth 15.5 (25.0) fifteenth 18.6 (30.0) reverse 3.3 (5.4), 5.1 (8.2), 6.2 (10.1), 9.1 (14.6), 11.1 (17.9) **Clutch** single dry disc operated by foot pedal **Brakes** double dry disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 163" (4.14 m) left 159" (4.04 m) (on concrete surface without brake) right 183.5" (4.66 m) left 180.7" (4.59 m) **Turning space diameter** (on concrete surface with brake applied) right 344" (8.74 m) left 337" (8.56 m) (on concrete surface without brake) right 385" (9.78 m) left 380.4" (9.66 m) **Power take-off** 1000 rpm at 2071 engine rpm and 540 rpm at 2060 engine rpm.

# LUGGING ABILITY IN 9th (1S) GEAR

Crankshaft Speed rpm	2298	2072	1843	1608	1376	1146
Pull—lbs (kN)	6217 (27.65)	6500 (28.91)	6746 (30.01)	6756 (30.05)	6750 (30.03)	6640 (29.54)
Increase in Pull %	0	5	9	9	9	7
Power—Hp (kW)	88.24 (65.80)	82.95 (61.85)	76.38 (56.95)	66.69 (49.73)	57.03 (42.53)	46.71 (34.83)
Speed—Mph (km/h)	5.32 (8.57)	4.79 (7.70)	4.25 (6.83)	3.70 (5.96)	3.17 (5.10)	2.64 (4.25)
Slip %	5.68	5.98	6.27	6.27	6.27	6.13

TRACTOR SOUND LEVEL WITH CAB dB(A)	WITH EUROPEAN CAB	WITH AMERICAN CAB
Maximum Available Power—Two Hours	82.5	84.5
75% of Pull at Maximum Power—Ten Hours	82.5	83.0
50% of Pull at Maximum Power—Two Hours	82.0	83.0
50% of Pull at Reduced Engine Speed—Two Hours	77.5	78.0
Bystander in 15th (5S) gear	—	89.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Four 18.4-38; 8; inner 14 (95) outer 12 (85)	Four 18.4-38; 8; inner 14 (95) outer 12 (85)
Ballast	—Liquid (each inner) —Cast Iron (each)	1000 lb (454 kg) None	None None
Front Tires	—No., size, ply & psi (kPa)	Two 11.00-16; 8; 40 (275)	Two 11.00-16; 8; 40 (275)
Ballast	—Liquid (each) —Cast Iron (each)	None 180 lb (82 kg)	None None
Height of Drawbar		27 in (685 mm)	27 in (685 mm)
Static Weight with Operator—Rear		11180 lb (5071 kg)	9180 lb (4164 kg)
—Front		3760 lb (1706 kg)	3400 lb (1542 kg)
—Total		14940 lb (6777 kg)	12580 lb (5706 kg)

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

**REMARKS:** All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 167°F (75.3°C). Eight gears were chosen between stability limit and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1306**:

LOUIS I. LEVITICUS  
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

K. VON BARGEN

Board of Tractor Test Engineers



**DEUTZ DX-110 DIESEL**

The Agricultural Experiment Station  
Institute of Agriculture and Natural Resources  
University of Nebraska—Lincoln  
H. W. Ottoson, Director