1-1-1981

Test 1405: Deutz DX-120 Diesel 15-Speed

Nebraska Tractor Test Lab
University of Nebraska-Lincoln, tractortestlab@unl.edu

NEBRASKA TRACTOR TEST 1405 — DEUTZ DX-120 DIESEL
ALSO DEUTZ-FAHR DX-120 DIESEL
15 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cooling medium	Temperature °F (°C) Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1158 rpm)								
111.29 (82.99)	2400	6.901 (26.123)	0.435 (0.264)	16.13 (3.177)	air cooled	59 (15.0)	75 (24.1)	29.160 (98.469)
Standard Power Take-off Speed (1000 rpm)—One Hour								
101.90 (75.99)	2072	6.214 (23.523)	0.427 (0.260)	16.40 (3.230)	air cooled	60 (15.4)	76 (24.3)	29.110 (98.300)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
97.10 (72.41)	2463	5.946 (22.508)	0.429 (0.261)	16.33 (3.217)	air cooled	60 (15.6)	76 (24.4)	....
0.00 (0.00)	2604	1.708 (6.465)	....	....	air cooled	60 (15.6)	76 (24.4)	....
49.85 (37.17)	2538	3.741 (14.161)	0.526 (0.320)	13.33 (2.625)	air cooled	60 (15.6)	76 (24.4)	....
111.94 (83.47)	2399	6.978 (26.415)	0.437 (0.266)	16.04 (3.160)	air cooled	60 (15.6)	76 (24.4)	....
25.45 (18.98)	2576	2.727 (10.323)	0.751 (0.457)	9.33 (1.839)	air cooled	60 (15.3)	75 (23.6)	....
73.98 (55.17)	2504	4.786 (18.117)	0.453 (0.276)	15.46 (3.045)	air cooled	59 (15.0)	74 (23.3)	....
Av 59.72 **Av (44.53)**	**2514**	**4.314** **(16.330)**	**0.506** **(0.308)**	**13.84** **(2.727)**	**air cooled**	**60** **(15.4)**	**75** **(24.1)**	**29.077** **(98.188)**

DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 9th (1H) Gear											
92.86 (69.25)	5787 (25.74)	6.02 (9.68)	2399	4.82	6.831 (25.860)	0.516 (0.314)	13.59 (2.678)	air cooled	62 (16.7)	78 (25.3)	28.820 (97.321)
75% of Pull at Maximum Power—Ten Hours 9th (1H) Gear											
76.40 (56.97)	4504 (20.03)	6.36 (10.24)	2507	3.70	5.669 (21.458)	0.520 (0.316)	13.48 (2.655)	air cooled	51 (10.3)	62 (16.7)	29.009 (97.959)
50% of Pull at Maximum Power—Two Hours 9th (1H) Gear											
52.59 (39.21)	3010 (13.39)	6.55 (10.54)	2548	2.49	4.370 (16.542)	0.582 (0.354)	12.03 (2.371)	air cooled	62 (16.7)	79 (26.1)	28.820 (97.321)
50% of Pull at Reduced Engine Speed—Two Hours 13th (3H) Gear											
52.28 (38.98)	2999 (13.34)	6.54 (10.52)	1459	2.69	3.478 (13.166)	0.466 (0.284)	15.03 (2.961)	air cooled	62 (16.4)	67 (19.4)	28.990 (97.895)
MAXIMUM POWER IN SELECTED GEARS											
87.95 (65.59)	12615 (56.12)	2.61 (4.21)	2448	14.98	4th (1M) Gear			air cooled	55 (12.8)	58 (14.4)	28.970 (97.827)
94.27 (70.30)	10405 (46.28)	3.40 (5.47)	2400	9.78	5th (4L) Gear			air cooled	61 (16.1)	71 (21.7)	28.810 (97.287)
94.94 (70.80)	8985 (39.97)	3.96 (6.38)	2400	7.83	6th (2M) Gear			air cooled	60 (15.6)	70 (21.1)	28.810 (97.287)
94.42 (70.41)	8229 (36.60)	4.30 (6.93)	2399	6.97	7th (5L) Gear			air cooled	59 (15.0)	69 (20.6)	28.810 (97.287)
95.93 (71.54)	7260 (32.29)	4.96 (7.97)	2400	5.94	8th (3M) Gear			air cooled	58 (14.4)	68 (20.0)	28.800 (97.253)
96.29 (71.80)	6003 (26.70)	6.01 (9.68)	2399	4.89	9th (1H) Gear			air cooled	57 (13.9)	66 (18.9)	28.800 (97.253)
97.41 (72.64)	4990 (22.20)	7.32 (11.78)	2398	3.98	10th (4M) Gear			air cooled	62 (16.7)	72 (22.2)	28.820 (97.321)
94.62 (70.56)	4077 (18.14)	8.70 (14.01)	2399	3.36	11th (2H) Gear			air cooled	62 (16.7)	73 (22.8)	28.820 (97.321)

Department of Agricultural Engineering

Dates of Test: September 17-24, 1981

Manufacturer: KLOCKNER-HUMBOLDT -DEUTZ AG, 5000 Cologne 80, West Germany

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° *(15°/15°)*** 0.8417 **Fuel weight** 7.008 lbs/gal *(0.840 kg/l)* **Oil SAE** 30 **API service classification** SE-SF/CC-CD **To motor** 4.271 gal *(16.167 l)* **Drained from motor** 3.208 gal *(12.144 l)* **Transmission lubricant** SAE 20W20 **Total time engine was operated** 39.5 hours.

ENGINE: Make Deutz Diesel **Type** six cylinder vertical **Serial No.** 6472009 **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 4.02″ × 4.92″ *(102 mm × 125 mm)* **Compression ratio** 17 to 1 **Displacement** 374 cu in *(6128 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element, one felt element and 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** thermo hydraulic fan.

CHASSIS: Type standard with duals **Serial No.** 7626 0169 **Tread width** rear 63″ *(1600 mm)* to 126″ *(3200 mm)* front 63″*(1600 mm)* to 86.6″ *(2200 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 28.9″ *(734 mm)* Vertical distance above roadway 39.3″ *(997 mm)* Horizontal distance from center of rear wheel tread 0.4″ *(10 mm)* to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 1.4 *(2.2)* second 2.1 *(3.4)* third 2.6 *(4.2)* fourth 2.8 *(4.5)* fifth 3.8 *(6.1)* sixth 4.3 *(6.9)* seventh 4.6 *(7.4)* eighth 5.3 *(8.5)* ninth 5.9 *(9.5)* tenth 7.7 *(12.3)* eleventh 8.7 *(13.9)* twelfth 9.4 *(15.1)* thirteenth 11.1 *(17.8)* fourteenth 16.0 *(25.8)* fifteenth 19.7 *(31.7)* reverse 3.5 *(5.6)*, 5.3 *(8.5)*, 6.5 *(10.4)*, 9.4 *(15.1)*, 11.5 *(18.6)* **Clutch** dry disc operated by foot pedal **Brakes** caliper disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 161.4″ *(4.1 m)* left 157.5″ *(4.0 m)* (on concrete surface without brake) right 181.1″ *(4.6 m)* left 189.0″ *(4.8 m)* **Turning space diameter** (on concrete surface with brake applied) right 328.7″ *(8.35 m)* left 324.8″ *(8.25 m)* (on concrete surface without brake) right 378.0″ *(9.60 m)* left 393.7″ *(10.00 m)* **Power take-off** 1000 rpm at 2072 engine rpm and 540 rpm at 2057 engine rpm.

LUGGING ABILITY IN 9th (1H) GEAR

Crankshaft Speed rpm	2399	2158	1905	1680	1435	1194
Pull—lbs	6003	6414	6677	6721	6788	6584
(kN)	*(26.70)*	*(28.53)*	*(29.70)*	*(29.90)*	*(30.20)*	*(29.29)*
Increase in Pull %	0	7	11	12	13	10
Power—Hp	96.29	92.21	84.51	74.97	64.60	52.24
(kW)	*(71.80)*	*(68.76)*	*(63.02)*	*(55.91)*	*(48.17)*	*(38.96)*
Speed—Mph	6.01	5.39	4.75	4.18	3.57	2.98
(km/h)	*(9.68)*	*(8.68)*	*(7.64)*	*(6.73)*	*(5.74)*	*(4.79)*
Slip %	4.89	5.20	5.50	5.50	5.50	5.50

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—Two Hours	85.0
75% of Pull at Maximum Power—Ten Hours	84.5
50% mf Pull at Maximum Power—Two Hours	85.0
50% of Pull at Reduced Engine Speed—Two Hours	80.5
Bystander in 15th (5H) gear	88.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 18.4-38; 8; 12 *(85)*	Four 18.4-38; 8; 12 *(85)*
Ballast	—Liquid (each inner)	910 lb *(413 kg)*	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 11.00-16; 6; 32 *(220)*	Two 11.00-16; 6; 32 *(220)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	80 lb *(36 kg)*	None
Height of Drawbar		24.5 in *(620 mm)*	24.5 in *(620 mm)*
Static Weight with Operator	—Rear	11240 lb *(5098 kg)*	9420 lb *(4273 kg)*
	—Front	3710 lb *(1683 kg)*	3550 lb *(1610 kg)*
	—Total	14950 lb *(6781 kg)*	12970 lb *(5883 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 codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 154°F *(67.8°C)*. Eight gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

NOTE: Supplemental permit for Deutz-Fahr DX-120 granted November 1982.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1405.**

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

Deutz DX-120 Diesel

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director

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15 SPEED

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