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January 1979

Test 1307: Deutz DX-160 Diesel 24-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1307 — DEUTZ DX-160 DIESEL
ALSO DEUTZ-FAHR DX-160 DIESEL
24 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—1148 rpm)									
145.41 (108.43)	2200	8.425 (31.891)	0.403 (0.245)	17.26 (3.400)	air cooled	60 (15.5)	75 (24.0)	28.830 (97.355)	
Standard Power Take-off Speed (1000 rpm)—One Hour									
140.99 (105.13)	1917	7.913 (29.955)	0.391 (0.238)	17.82 (3.510)	air cooled	60 (15.6)	75 (24.0)	28.810 (97.287)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
125.59 (93.65)	2236	7.455 (28.219)	0.413 (0.251)	16.85 (3.319)	air cooled	60 (15.6)	75 (23.9)	..... .....
0.00 (0.00)	2337	2.031 (7.687)	..... .....	..... .....	air cooled	60 (15.8)	76 (24.2)	..... .....
64.11 (47.81)	2283	4.704 (17.806)	0.510 (0.311)	13.63 (2.685)	air cooled	60 (15.3)	75 (23.9)	..... .....
145.69 (108.64)	2200	8.481 (32.104)	0.405 (0.246)	17.18 (3.384)	air cooled	60 (15.8)	76 (24.4)	..... .....
32.49 (24.23)	2314	3.272 (12.388)	0.701 (0.426)	9.93 (1.956)	air cooled	60 (15.3)	74 (23.1)	..... .....
95.32 (71.08)	2264	6.071 (22.980)	0.443 (0.270)	15.70 (3.093)	air cooled	60 (15.3)	74 (23.6)	..... .....
Av Av	77.20 (57.57)	2272	5.336 (20.197)	0.481 (0.293)	14.47 (2.850)	air cooled	60 (15.5)	75 (23.8)	28.770 (97.152)

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 15th (3ZH) Gear											
121.64 (90.71)	8074 (35.92)	5.65 (9.09)	2199	5.76	8.354 (31.622)	0.478 (0.291)	14.56 (2.869)	air cooled	57 (13.9)	66 (18.9)	28.780 (97.186)
75% of Pull at Maximum Power—Ten Hours 15th (3ZH) Gear											
97.75 (72.89)	6205 (27.60)	5.91 (9.51)	2263	4.29	7.010 (26.535)	0.499 (0.304)	13.95 (2.747)	air cooled	42 (5.3)	52 (11.1)	29.026 (98.016)
50% of Pull at Maximum Power—Two Hours 15th (3ZH) Gear											
67.33 (50.20)	4146 (18.44)	6.09 (9.80)	2292	2.62	5.641 (21.353)	0.583 (0.355)	11.93 (2.351)	air cooled	47 (8.3)	50 (9.7)	28.850 (97.422)
50% of Pull at Reduced Engine Speed—Two Hours 20th (2SH) Gear											
67.06 (50.01)	4140 (18.41)	6.08 (9.78)	1444	2.66	4.455 (16.865)	0.462 (0.281)	15.05 (2.965)	air cooled	59 (15.0)	72 (21.9)	28.725 (97.000)
MAXIMUM POWER IN SELECTED GEARS											
109.06 (81.33)	15172 (67.49)	2.70 (4.34)	2235	14.41	7th (1ZH) Gear			air cooled	53 (11.7)	60 (15.6)	28.810 (97.287)
115.03 (85.78)	14333 (63.76)	3.01 (4.84)	2200	13.32	8th (2ZL) Gear			air cooled	52 (11.1)	58 (14.4)	28.820 (97.321)
116.36 (86.77)	13979 (62.18)	3.12 (5.02)	2200	13.39	9th (3LH) Gear			air cooled	47 (8.3)	58 (14.4)	28.830 (97.355)
118.18 (88.13)	12329 (54.84)	3.59 (5.78)	2200	10.16	10th (4LL) Gear			air cooled	47 (8.3)	58 (14.4)	28.840 (97.388)
123.34 (91.98)	11695 (52.02)	3.96 (6.36)	2199	9.10	11th (2ZH) Gear			air cooled	47 (8.3)	59 (15.0)	28.840 (97.388)
121.16 (90.35)	10293 (45.79)	4.41 (7.10)	2201	7.64	12th (3ZL) Gear			air cooled	47 (8.3)	59 (15.0)	28.840 (97.388)
124.20 (92.61)	10030 (44.61)	4.64 (7.47)	2199	7.49	13th (4LH) Gear			air cooled	47 (8.3)	60 (15.6)	28.850 (97.422)
121.17 (90.35)	9021 (40.13)	5.04 (8.11)	2199	6.52	14th (1SL) Gear			air cooled	47 (8.3)	60 (15.6)	28.850 (97.422)
124.24 (92.65)	8274 (36.80)	5.63 (9.06)	2199	6.14	15th (3ZH) Gear			air cooled	48 (8.9)	61 (16.1)	28.860 (97.456)
122.14 (91.08)	7254 (32.27)	6.31 (10.16)	2200	5.22	16th (4ZL) Gear			air cooled	47 (8.3)	57 (13.9)	28.830 (97.355)
124.81 (93.07)	7296 (32.46)	6.41 (10.32)	2198	5.14	17th (1SH) Gear			air cooled	47 (8.3)	55 (12.8)	28.830 (97.355)
121.29 (90.45)	6295 (28.00)	7.23 (11.63)	2200	4.67	18th (2SL) Gear			air cooled	47 (8.3)	53 (11.7)	28.830 (97.355)
123.44 (92.05)	5783 (25.72)	8.00 (12.88)	2202	4.27	19th (4ZH) Gear			air cooled	48 (8.9)	52 (11.1)	28.820 (97.321)

Department of Agricultural Engineering

Dates of Test: April 24 to May 2, 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 4.648 gal (17.593 l) Drained from motor 3.082 gal (11.665 l) Transmission and final drive lubricant SAE 20W30 Total time engine was operated 42.5 hours

ENGINE: Make Deutz Diesel Type 6 cylinder vertical with turbocharger Serial No. 6011763 Crankshaft lengthwise Rated rpm 2200 Bore and stroke 4.02" × 4.92" (102.0 mm × 125.0 mm) Compression ratio 15.5 to 1 Displacement 374 cu in (6128 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. 7624 0013 Tread width 70.9" (1800 mm) to 126" (3200 mm) front 62.8" (1596 mm) to 86.6" (2200 mm) Wheel base 111.5" (2831 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 32.3" (820 mm) Vertical distance above roadway 40.6" (1030 mm) Horizontal distance from center of rear wheel tread 0.2" (4 mm) to the left Hydraulic control system direct engine drive Transmission selective gear fixed ratio with partial (2) range operator controlled power shift Advertised speeds mph (km/h) first 1.5 (2.4) second 1.9 (3.0) third 2.1 (3.4) fourth 2.5 (4.0) fifth 2.7 (4.3) sixth 2.9 (4.7) seventh 3.2 (5.1) eighth 3.5 (5.7) ninth 3.7 (5.9) tenth 4.1 (6.5) eleventh 4.4 (7.1) twelfth 4.9 (7.8) thirteenth 5.1 (8.2) fourteenth 5.5 (8.8) fifteenth 6.1 (9.8) sixteenth 6.8 (10.9) seventeenth 6.9 (11.1) eighteenth 7.7 (12.4) nineteenth 8.5 (13.7) twentieth 9.7 (15.6) twenty-first 10.6 (17.1) twenty-second 13.3 (21.4) twenty-third 14.8 (23.8) twenty-fourth 18.6 (30.0) reverse 2.6 (4.2), 3.3 (5.3), 3.7 (5.9), 4.6 (7.4), 5.1 (8.1), 6.3 (10.2), 7.0 (11.3), 8.8 (14.2) Clutch single dry disc operated by foot pedal Brakes multiple wet disc hydraulically operated by two foot pedals which can be locked together Steering hydrostatic Turning radius (on concrete surface with brake applied) right 166.2" (4.22 m) left 179.9" (4.34 m) (on concrete surface without brake) right 185.8" (4.72 m) left 196.5" (4.99 m) Turning space diameter (on concrete surface with brake applied) right 352" (8.94 m) left 362" (9.18 m) (on concrete surface without brake) right 392" (9.94 m) left 413" (10.48 m) Power take-off 1000 rpm at 1917 engine rpm.

REPAIRS and ADJUSTMENTS: The cooling fan belts were replaced at completion of limber up test.

LUGGING ABILITY IN 15th (3ZH) GEAR						
Crankshaft Speed rpm	2199	1980	1758	1545	1317	1095
Pull—lbs (<i>kN</i>)	8274 (36.80)	9098 (40.47)	9881 (43.95)	9627 (42.82)	8327 (37.04)	6807 (30.28)
Increase in Pull %	0	10	19	16	1	-18
Power—Hp (<i>kW</i>)	124.24 (92.65)	122.11 (91.05)	116.96 (87.22)	100.27 (74.77)	74.80 (55.78)	51.49 (38.39)
Speed—Mph (<i>km/h</i>)	5.63 (9.06)	5.03 (8.10)	4.44 (7.14)	3.91 (6.29)	3.37 (5.42)	2.84 (4.56)
Slip %	6.14	6.97	7.57	7.27	6.22	4.98

TRACTOR SOUND LEVEL WITH CAB	EUROPEAN MADE CAB dB(A)	AMERICAN MADE CAB dB(A)
Maximum Available Power—Two Hours	80.5	80.5
75% of Pull at Maximum Power—Ten Hours	80.5	81.5
50% of Pull at Maximum Power—Two Hours	79.5	81.5
50% of Pull at Reduced Engine Speed—Two Hours	76.5	80.0
Bystander in 24th (4SH) gear	—	86.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (<i>kPa</i>)	Four 20.8-38; 8; 12 (85)	Four 20.8-38; 8; 12 (85)
Ballast	—Liquid (each)	875 lb (397 kg)	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi (<i>kPa</i>)	Two 11.00-16; 8; 40 (275)	Two 11.00-16; 8; 40 (275)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	185 lb (84 kg)	None
Height of Drawbar		24.5 in (620 mm)	24.5 in (620 mm)
Static Weight with Operator—Rear		14040 lb (6369 kg)	10540 lb (4781 kg)
—Front		4670 lb (2118 kg)	4300 lb (1950 kg)
—Total		18710 lb (8487 kg)	14840 lb (6731 kg)

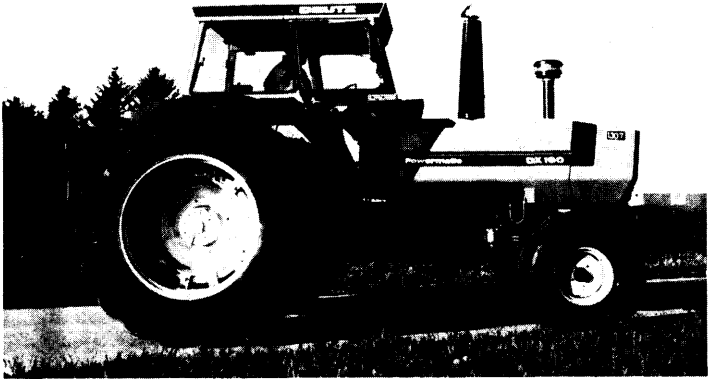
REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 122°F (49.8°C). Thirteen gears were chosen between 15% slip and 10 mph (16.1 km/h).

NOTE: Supplemental permit for Deutz-Fahr DX-160 granted November 1982.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1307**.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
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Board of Tractor Test Engineers



Deutz DX-160 Diesel

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