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Test 1345: Allis-Chalmers 7010 Power Director Diesel 20-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1345

ALLIS CHALMERS 7010 POWER DIRECTOR DIESEL

20 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—1021 rpm)									
106.53 (79.44)	2300	6.989 (26.456)	0.463 (0.282)	15.24 (3.003)	191 (88.1)	58 (14.5)	75 (23.9)	28.893 (97.568)	
Standard Power Take-Off Speed (1000 rpm)—One Hour									
107.52 (80.18)	2253	6.944 (26.287)	0.456 (0.277)	15.48 (3.050)	193 (89.2)	58 (14.4)	75 (23.9)	28.890 (97.557)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
96.41 (71.89)	2452	6.831 (25.858)	0.500 (0.304)	14.11 (2.780)	189 (87.2)	58 (14.4)	75 (23.9)	..... .....
0.00 (0.00)	2572	2.566 (9.713)	..... .....	..... .....	178 (81.4)	58 (14.4)	74 (23.6)	..... .....
49.38 (36.82)	2511	4.647 (17.592)	0.665 (0.404)	10.62 (2.093)	186 (85.8)	58 (14.4)	74 (23.6)	..... .....
107.21 (79.94)	2300	7.001 (26.501)	0.461 (0.281)	15.31 (3.017)	194 (89.7)	59 (15.0)	76 (24.4)	..... .....
24.99 (18.63)	2542	3.602 (13.636)	1.018 (0.619)	6.94 (1.366)	180 (82.2)	59 (15.0)	75 (23.9)	..... .....
73.04 (54.46)	2477	5.692 (21.548)	0.550 (0.335)	12.83 (2.528)	190 (87.8)	60 (15.3)	76 (24.2)	..... .....
Av	58.50	2476	5.057	0.610	11.57	186	59	75	28.890
Av	(43.63)		(19.141)	(0.371)	(2.279)	(85.7)	(14.8)	(23.9)	(97.557)

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 11th (5SL) Gear											
87.83 (65.49)	5448 (24.23)	6.05 (9.73)	2302	7.60	6.974 (26.399)	0.561 (0.341)	12.59 (2.481)	187 (85.8)	43 (6.1)	56 (13.3)	29.020 (97.996)
75% of Pull at Maximum Power—Ten Hours 11th (5SL) Gear											
75.38 (56.21)	4254 (18.92)	6.64 (10.69)	2468	5.38	6.563 (24.845)	0.615 (0.374)	11.48 (2.262)	186 (85.4)	47 (8.1)	60 (15.7)	28.746 (97.071)
50% of Pull at Maximum Power—Two Hours 11th (5SL) Gear											
51.72 (38.57)	2834 (12.61)	6.84 (11.02)	2500	3.81	5.346 (20.235)	0.730 (0.444)	9.68 (1.906)	183 (83.9)	46 (7.5)	61 (16.1)	28.975 (97.844)
50% of Pull at Reduced Engine Speed—Two Hours 14th (2FH) Gear											
52.10 (38.85)	2857 (12.71)	6.84 (11.00)	1882	3.81	4.372 (16.550)	0.593 (0.360)	11.92 (2.347)	184 (84.4)	59 (15.0)	68 (19.7)	28.325 (95.649)
MAXIMUM POWER IN SELECTED GEARS											
79.19 (59.05)	9426 (41.93)	3.15 (5.07)	2427	14.95	4th (1 FL) Gear			184 (84.4)	55 (12.8)	62 (16.7)	28.320 (95.632)
78.33 (58.41)	8852 (39.37)	3.32 (5.34)	2301	14.95	5th (2 SH) Gear			187 (86.1)	62 (16.7)	73 (22.8)	28.340 (95.700)
84.30 (62.86)	8281 (36.83)	3.82 (6.14)	2301	12.10	6th (1 FH) Gear			188 (86.7)	56 (13.3)	63 (17.2)	28.320 (95.632)
85.08 (63.45)	8382 (37.29)	3.81 (6.13)	2301	12.29	7th (3 SL) Gear			188 (86.7)	56 (13.3)	63 (17.2)	28.320 (95.632)
88.14 (65.72)	7703 (34.26)	4.29 (6.91)	2302	11.52	8th (4 SL) Gear			186 (85.6)	39 (3.9)	50 (10.0)	29.050 (98.097)
87.75 (65.44)	6789 (30.20)	4.85 (7.80)	2298	9.54	9th (3 SH) Gear			185 (85.0)	38 (3.3)	48 (8.9)	29.060 (98.131)
89.11 (66.45)	6080 (27.05)	5.50 (8.84)	2300	8.30	10th (4 SH) Gear			186 (85.3)	38 (3.3)	48 (8.9)	29.060 (98.131)
91.44 (68.19)	5671 (25.23)	6.05 (9.73)	2300	7.53	11th (5 SL) Gear			186 (85.6)	36 (2.2)	45 (7.2)	29.060 (98.131)
90.53 (67.51)	5193 (23.10)	6.54 (10.52)	2301	7.03	12th (2 FL) Gear			186 (85.6)	39 (3.9)	50 (10.0)	29.050 (98.097)
86.87 (64.78)	4270 (19.00)	7.63 (12.28)	2302	5.80	13th (5 SH) Gear			187 (86.1)	40 (4.4)	51 (10.6)	29.050 (98.097)
90.42 (67.42)	4128 (18.36)	8.21 (13.22)	2300	5.43	14th (2 FH) Gear			186 (85.6)	40 (4.4)	51 (10.6)	29.050 (98.097)

Department of Agricultural Engineering

Dates of Test: May 1—13, 1980

Manufacturer: ALLIS CHALMERS CORPORATION, P.O. Box 512, Milwaukee, Wisconsin 53201

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8482 **Fuel weight** 7.062 lbs/gal (0.846 kg/l) **Oil SAE 30 API service classification** SE-CD **To motor** 3.279 gal (12.411 l) **Drained from motor** 2.900 gal (10.977 l) **Transmission and final drive lubricant** A.C. Power fluid 821 **Total time engine was operated** 41.0 hours.

ENGINE Make Allis Chalmers Dsl Type six cylinder vertical with turbocharger **Serial No.** 4907684 **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 3.875" × 4.25" (98.4 mm × 107.9 mm) **Compression ratio** 16.25 to 1 **Displacement** 301 cu in (4932 ml) **Starting system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** two full flow elements **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** two thermostats

CHASSIS: Type standard **Serial No.** 7010 1649 **Tread width** rear 64" (1626 mm) to 97" (2464 mm) front 60" (1524 mm) to 91" (2311 mm) **Wheel base** 106" (2692 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 30.8" (782 mm) Vertical distance above roadway 38.7" (983 mm) Horizontal distance from center of rear wheel tread 0" (0 mm) to the right/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 1.6 (2.6) second 2.0 (3.2) third 3.3 (5.3) fourth 3.7 (6.0) fifth 4.1 (6.6) sixth 4.5 (7.2) seventh 4.5 (7.2) eighth 5.1 (8.2) ninth 5.6 (9.0) tenth 6.2 (10.0) eleventh 6.8 (11.0) twelfth 7.3 (11.7) thirteenth 8.4 (13.5) fourteenth 9.1 (14.6) fifteenth 10.1 (16.3) sixteenth 11.3 (18.3) seventeenth 12.5 (20.1) eighteenth 13.9 (22.4) nineteenth 15.2 (24.5) twentieth 18.8 (30.3) reverse 3.1 (5.0), 3.8 (6.1), 6.8 (11.0), 8.4 (13.5) **Clutch** multiple wet disc hydraulically 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 149" (3.79 m) left 148" (3.75 m) (on concrete surface without brake) right 168" (4.26 m) left 167" (4.25 m) **Turning space diameter** (on concrete surface with brake applied) right 310" (7.87 m) left 306" (7.77 m) (on concrete surface without brake) right 346" (8.80 m) left 346" (8.78 m) **Power take-off** 1000 rpm at 2253 engine rpm and 540 rpm at 2230 engine rpm.

LUGGING ABILITY IN 11th (5 SL) GEAR

Crankshaft Speed rpm	2300	2072	1841	1613	1382	1155
Pull—lbs (kN)	5671 (25.23)	6337 (28.19)	6622 (29.46)	7096 (31.56)	7155 (31.83)	6206 (27.61)
Increase in Pull %	0	12	17	25	26	9
Power—Hp (kW)	91.44 (68.19)	91.04 (67.89)	84.02 (62.65)	78.19 (58.30)	67.47 (50.31)	49.78 (37.12)
Speed—Mph (km/h)	6.05 (9.73)	5.39 (8.67)	4.76 (7.66)	4.13 (6.65)	3.54 (5.69)	3.01 (4.84)
Slip %	7.53	8.58	9.13	9.94	10.07	8.44

TRACTOR SOUND LEVEL WITH CAB dB(A)

Maximum Available Power—Two Hours	77.5
75% of Pull at Maximum Power—Ten Hours	77.5
50% of Pull at Maximum Power—Two Hours	76.5
50% of Pull at Reduced Engine Speed—Two Hours	75.0
Bystander in 20th (5 FH) gear	87.5

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 18.4-38; 8; 18 (125)	Two 18.4-38; 8; 18 (125)
Ballast	—Liquid (each)	658 lb (298 kg)	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi (kPa)	Two 10.00-16; 6; 32 (220)	Two 10.00-16; 6; 32 (220)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	108 lb (49 kg)	None
Height of Drawbar		20.0 in (510 mm)	20.0 in (510 mm)
Static Weight with Operator—Rear		9300 lb (4218 kg)	7985 lb (3622 kg)
	—Front	3490 lb (1583 kg)	3275 lb (1486 kg)
	—Total	12790 lb (5801 kg)	11260 lb (5108 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 was 142°F (61.1°C). Eleven gears were chosen between 15% slip and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1345**.

LOUIS I. LEVITICUS

Engineer-in Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

K. VON BARGEN

Board of Tractor Test Engineers



Allis Chalmers 7010 Power Director Dsl