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Test 1260: Allis-Chalmers 7020 Power Director Diesel

Nebraska Tractor Test Lab
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NEBRASKA TRACTOR TEST 1260

ALLIS-CHALMERS 7020 POWER DIRECTOR DIESEL

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)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—1021 rpm)									
	123.85 *(92.35)*	2300	7.823 *(29.615)*	0.438 *(0.266)*	15.83 *(3.118)*	191 *(88.4)*	57 *(13.8)*	75 *(23.8)*	29.187 *(98.559)*
Standard Power Take-off Speed (1000 rpm)—One Hour									
	125.51 *(93.59)*	2253	7.804 *(29.541)*	0.431 *(0.262)*	16.08 *(3.168)*	192 *(88.8)*	55 *(12.9)*	75 *(23.9)*	29.180 *(98.536)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	110.21 *(82.18)*	2408	7.459 *(28.235)*	0.469 *(0.285)*	14.78 *(2.911)*	188 *(86.4)*	54 *(12.2)*	74 *(23.3)*	....
	0.00 *(0.00)*	2550	2.694 *(10.199)*	....	....	176 *(80.3)*	54 *(12.5)*	74 *(23.6)*	....
	57.01 *(42.52)*	2486	5.124 *(19.397)*	0.622 *(0.379)*	11.13 *(2.192)*	183 *(83.9)*	54 *(12.2)*	75 *(23.9)*	....
	124.34 *(92.72)*	2300	7.879 *(29.825)*	0.439 *(0.267)*	15.78 *(3.109)*	193 *(89.4)*	54 *(12.5)*	76 *(24.4)*	....
	28.74 *(21.43)*	2518	3.885 *(14.708)*	0.936 *(0.570)*	7.40 *(1.457)*	178 *(81.1)*	54 *(12.2)*	75 *(23.9)*	....
	84.11 *(62.72)*	2448	6.328 *(23.955)*	0.521 *(0.317)*	13.29 *(2.618)*	187 *(86.1)*	54 *(12.2)*	76 *(24.2)*	....
Av	**67.40**	**2452**	**5.562**	**0.571**	**12.12**	**184**	**54**	**75**	**29.137**
Av	***(50.26)***		***(21.053)***	***(0.348)***	***(2.387)***	***(84.5)***	***(12.3)***	***(23.9)***	***(98.390)***

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 8th (4SL) Gear											
102.09 *(76.13)*	7983 *(35.51)*	4.80 *(7.72)*	2299	7.51	7.797 *(29.514)*	0.529 *(0.332)*	13.09 *(2.579)*	189 *(87.2)*	56 *(13.3)*	74 *(23.1)*	28.990 *(97.895)*
75% of Pull at Maximum Power—Ten Hours 8th (4SL) Gear											
84.67 *(63.14)*	6132 *(27.28)*	5.18 *(8.33)*	2425	5.31	7.006 *(26.521)*	0.573 *(0.349)*	12.08 *(2.381)*	183 *(83.8)*	52 *(11.2)*	63 *(17.1)*	28.984 *(97.875)*
50% of Pull at Maximum Power—Two Hours 8th (4SL) Gear											
58.85 *(43.88)*	4102 *(18.25)*	5.38 *(8.66)*	2477	3.65	5.811 *(21.999)*	0.684 *(0.416)*	10.13 *(1.995)*	180 *(82.2)*	45 *(6.9)*	50 *(9.7)*	28.825 *(97.338)*
50% of Pull at Reduced Engine Speed—Two Hours 12th (2FL) Gear											
58.83 *(43.87)*	4095 *(18.22)*	5.39 *(8.67)*	1709	3.57	4.566 *(17.285)*	0.538 *(0.327)*	12.88 *(2.538)*	180 *(82.2)*	49 *(9.2)*	61 *(15.8)*	28.885 *(97.540)*
MAXIMUM POWER IN SELECTED GEARS											
95.50 *(71.22)*	11964 *(53.22)*	2.99 *(4.82)*	2399	14.93	3rd (2SL) Gear			181 *(82.8)*	43 *(6.1)*	45 *(7.2)*	28.940 *(97.726)*
103.28 *(77.01)*	9192 *(40.89)*	4.21 *(6.78)*	2300	9.19	6th (1FH) Gear			188 *(86.4)*	53 *(11.7)*	67 *(19.4)*	28.960 *(97.794)*
104.41 *(77.86)*	8178 *(36.38)*	4.79 *(7.70)*	2301	7.63	8th (4SL) Gear			187 *(85.8)*	52 *(11.1)*	65 *(18.3)*	28.980 *(97.861)*
105.16 *(78.42)*	7368 *(32.78)*	5.35 *(8.61)*	2300	6.71	9th (3SH) Gear			188 *(86.7)*	54 *(12.2)*	69 *(20.6)*	28.940 *(97.726)*
107.36 *(80.06)*	6075 *(27.02)*	6.63 *(10.67)*	2301	5.46	11th (5SL) Gear			188 *(86.7)*	55 *(12.8)*	71 *(21.7)*	28.920 *(97.659)*
102.81 *(76.66)*	4641 *(20.64)*	8.31 *(13.37)*	2300	3.94	13th (5SH) Gear			188 *(86.7)*	56 *(13.3)*	73 *(22.8)*	28.910 *(97.625)*

Department of Agricultural Engineering

Dates of Test: October 10 to 21, 1977

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

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 50.8 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° *(15°/15°)*** 0.8318 **Fuel weight** 6.926 lbs/gal *(0.832 kg/l)* **Oil SAE** 30 **API service classification** SE-CD **To motor** 3.605 gal *(13.646 l)* **Drained from motor** 2.671 gal *(10.111 l)* **Transmission and final drive lubricant** Allis-Chalmers Power Fluid 821 **Total time engine was operated** 41.5 hours

ENGINE Make Allis-Chalmers Diesel **Type** 6 cylinder vertical with turbocharger and intercooler **Serial No.** 49-00015 **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 3.875″ × 4.25″ *(98.4 mm × 108.0 mm)* **Compression ratio** 16.25 to 1 **Displacement** 301 cu in *(4928 ml)* **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** two full flow screw-on paper cartridges and one by-pass element **Oil cooler** engine coolant heat exchanger for crankcase oil and radiator for transmission and hydraulic fluid **Fuel filter** one snap-on paper cartridge **Muffler** vertical **Cooling medium temperature control** 2 thermostats

CHASSIS: Type standard **Serial No.** 7020-1016 **Tread width** rear 64″ *(1626 mm)* to 97″ *(2464 mm)* front 62″ *(1575 mm)* to 90″ *(2286 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 31″ *(787 mm)* Vertical distance above roadway 41″ *(1041 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 1.7 *(2.7)* second 2.1 *(3.4)* third 3.4 *(5.5)* fourth 3.8 *(6.1)* fifth 4.2 *(6.8)* sixth 4.7 *(7.6)* seventh 4.7 *(7.6)* eighth 5.2 *(8.4)* ninth 5.8 *(9.3)* tenth 6.5 *(10.5)* eleventh 7.0 *(11.3)* twelfth 7.6 *(12.2)* thirteenth 8.7 *(14.0)* fourteenth 9.4 *(15.1)* fifteenth 10.4 *(16.7)* sixteenth 11.6 *(18.7)* seventeenth 12.9 *(20.8)* eighteenth 14.4 *(23.1)* nineteenth 15.7 *(25.3)* twentieth 19.4 *(31.2)* reverse 3.2 *(5.1)*, 3.9 *(6.3)*, 7.1 *(11.4)*, 8.7 *(14.0)* **Clutch** multiple wet disc power actuated and operated by foot pedal **Brakes** multiple wet disc power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface

LUGGING ABILITY IN RATED GEAR 8th (4SL)

Crankshaft Speed rpm	2301	2067	1838	1607	1378	1144
Pull—lbs *(kN)*	8178 *(36.38)*	9010 *(40.08)*	9477 *(42.16)*	9468 *(42.11)*	8916 *(39.66)*	7426 *(33.03)*
Increase in Pull %	0	10	16	16	9	–9
Power—Hp *(kW)*	104.41 *(77.86)*	102.08 *(76.12)*	94.48 *(70.45)*	82.63 *(61.62)*	67.23 *(50.13)*	47.51 *(35.43)*
Speed—Mph *(km/h)*	4.79 *(7.70)*	4.25 *(6.84)*	3.74 *(6.02)*	3.27 *(5.27)*	2.83 *(4.55)*	2.40 *(3.86)*
Slip %	7.63	8.82	9.69	9.69	8.82	7.02

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—Two Hours	77.5
75% of Pull at Maximum Power—Ten Hours	77.0
50% of Pull at Maximum Power—Two Hours	76.5
50% of Pull at Reduced Engine Speed—Two Hours	74.5
Bystander in 19th (5FL) gear	89.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 20.8-38; 8; 18 *(120)*	Two 20.8-38; 8; 18 *(120)*
Ballast	—Liquid (each)	1568 lb *(711 kg)*	None
	—Cast Iron (each)	400 lb *(181 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 11.00-16; 8; 40 *(280)*	Two 11.00-16; 8; 40 *(280)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	75 lb *(34 kg)*	None
Height of drawbar		21.5 in *(550 mm)*	21.5 in *(550 mm)*
Static weight with operator—rear		12140 lb *(5507 kg)*	8205 lb *(3722 kg)*
front		3515 lb *(1594 kg)*	3365 lb *(1526 kg)*
total		15655 lb *(7101 kg)*	11570 lb *(5248 kg)*

with brake applied) right 149″ *(3.78 m)* left 157″ *(3.99 m)* (on concrete surface without brake) right 166.4″ *(4.23 m)* left 176″ *(4.47 m)* **Turning space diameter** (on concrete surface with brake applied) right 312.2″ *(7.93 m)* left 328.2″ *(8.34 m)* (on concrete surface without brake) right 347.3″ *(8.82 m)* left 366.5″ *(9.31 m)* **Power take-off** 1000 rpm at 2253 engine rpm.

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 153°F *(67.3°C)*. Six gears were chosen between 15% slip and 15 mph *(24.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1260.**

LOUIS I. LEVITICUS
Engineer-in Charge

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