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Test 1449: Allis-Chalmers and Deutz-Allis 8070 Powershift Diesel 12-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1449

ALLIS CHALMERS 8070 POWERSHIFT DIESEL

ALSO DEUTZ ALLIS 8070 POWERSHIFT DIESEL

12 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—1065 rpm) | | | | | | | | | |
| 170.72 (127.31) | 2400 | 10.692 (40.474) | 0.437 (0.266) | 15.97 (3.145) | 191 (88.4) | 69 (20.4) | 75 (24.0) | 28.915 (97.642) | |
| Standard Power Take-off Speed (1000 rpm)—One Hour | | | | | | | | | |
| 171.44 (127.84) | 2253 | 10.403 (39.380) | 0.423 (0.257) | 16.48 (3.246) | 192 (88.7) | 69 (20.4) | 74 (23.6) | 28.925 (97.675) | |
| VARYING POWER AND FUEL CONSUMPTION—Two Hours | | | | | | | | | |
| 151.31 (112.83) | 2503 | 9.961 (37.706) | 0.459 (0.279) | 15.19 (2.992) | 188 (86.9) | 70 (21.1) | 75 (23.9) | | |
| 0.00 (0.00) | 2672 | 3.137 (11.875) | | | 175 (79.4) | 70 (21.1) | 76 (24.2) | | |
| 78.31 (58.40) | 2590 | 6.540 (24.757) | 0.582 (0.354) | 11.97 (2.359) | 182 (83.1) | 70 (20.8) | 75 (23.9) | | |
| 170.94 (127.47) | 2400 | 10.727 (40.606) | 0.438 (0.266) | 15.94 (3.139) | 192 (88.6) | 69 (20.6) | 75 (23.9) | | |
| 39.70 (29.60) | 2628 | 4.798 (18.162) | 0.843 (0.513) | 8.27 (1.630) | 177 (80.6) | 69 (20.6) | 76 (24.2) | | |
| 115.57 (86.18) | 2549 | 8.219 (31.112) | 0.496 (0.302) | 14.06 (2.770) | 186 (85.6) | 68 (20.3) | 75 (23.9) | | |
| Av Av | 92.64 (69.08) | 2557 (27.369) | 7.230 (0.544) | 12.81 (0.331) | 183 (2.524) | 69 (84.1) | 75 (20.7) | 28.937 (24.0) | 28.937 (97.715) |

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 7th (2F) Gear | | | | | | | | | | | |
| 145.36 (108.40) | 9260 (41.19) | 5.89 (9.47) | 2400 | 4.54 | 10.632 (40.246) | 0.510 (0.310) | 13.67 (2.693) | 187 (86.1) | 54 (11.9) | 58 (14.2) | 29.225 (98.688) |
| 75% of Pull at Maximum Power—Ten Hours 7th (2F) Gear | | | | | | | | | | | |
| 117.58 (87.68) | 7061 (31.41) | 6.24 (10.05) | 2518 | 3.51 | 9.337 (35.346) | 0.554 (0.337) | 12.59 (2.481) | 184 (84.2) | 58 (14.3) | 60 (15.3) | 28.992 (97.902) |
| 50% of Pull at Maximum Power—Two Hours 7th (2F) Gear | | | | | | | | | | | |
| 80.87 (60.30) | 4707 (20.94) | 6.44 (10.37) | 2566 | 2.27 | 7.602 (28.776) | 0.655 (0.399) | 10.64 (2.096) | 180 (81.9) | 51 (10.6) | 53 (11.7) | 29.245 (98.756) |
| 50% of Pull at Reduced Engine Speed—Two Hours 9th (3F) Gear | | | | | | | | | | | |
| 80.93 (60.35) | 4708 (20.94) | 6.45 (10.38) | 1864 | 2.32 | 6.472 (24.500) | 0.558 (0.339) | 12.50 (2.463) | 181 (82.8) | 53 (11.7) | 57 (13.6) | 29.235 (98.722) |
| MAXIMUM POWER IN SELECTED GEARS | | | | | | | | | | | |
| 120.86 (90.13) | 18777 (83.52) | 2.41 (3.88) | 2496 | 14.60 | 2nd (2S) Gear | | | 183 (83.9) | 57 (13.9) | 59 (15.0) | 28.910 (97.625) |
| 142.59 (106.33) | 15723 (69.94) | 3.40 (5.47) | 2399 | 9.13 | 3rd (3S) Gear | | | 187 (85.8) | 57 (13.9) | 59 (15.0) | 28.900 (97.591) |
| 147.14 (109.72) | 13301 (59.16) | 4.15 (6.68) | 2400 | 7.12 | 4th (1F) Gear | | | 187 (86.1) | 57 (13.9) | 59 (15.0) | 28.910 (97.625) |
| 144.07 (107.44) | 12251 (54.49) | 4.41 (7.10) | 2400 | 6.58 | 5th (4S) Gear | | | 187 (86.1) | 57 (13.9) | 59 (15.0) | 28.910 (97.625) |
| 139.79 (104.24) | 9418 (41.89) | 5.57 (8.96) | 2401 | 4.86 | 6th (5S) Gear | | | 187 (86.1) | 57 (13.9) | 59 (15.0) | 28.910 (97.625) |
| 147.29 (109.83) | 9414 (41.88) | 5.87 (9.44) | 2399 | 4.86 | 7th (2F) Gear | | | 187 (86.1) | 57 (13.9) | 59 (15.0) | 28.910 (97.625) |
| 138.88 (103.56) | 7329 (32.60) | 7.11 (11.44) | 2400 | 3.73 | 8th (6S) Gear | | | 187 (86.1) | 56 (13.3) | 59 (15.0) | 28.900 (97.591) |
| 144.59 (107.82) | 6609 (29.40) | 8.20 (13.20) | 2396 | 3.23 | 9th (3F) Gear | | | 187 (85.8) | 56 (13.3) | 59 (15.0) | 28.900 (97.591) |

Department of Agricultural Engineering

Dates of Test: September 1-16, 1982

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

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 46.6 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8373 **Fuel weight** 6.972 lbs/gal (0.836 kg/l) **Oil SAE 15W-40 API service classification SF-CD To motor** 3.647 gal (13.804 l) **Drained from motor** 3.049 gal (11.543 l) **Transmission and final drive lubricant** Allis Chalmers Power Fluid 821 **Total time engine was operated** 40.5 hours.

ENGINE: Make Allis Chalmers Diesel Type six cylinder vertical with turbocharger and inter-cooler **Serial No.** 70-22839 **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 4.25" × 5.00" (107.9 mm × 127.0 mm) **Compression ratio** 15.5 to 1 **Displacement** 426 cu in (6981 ml) **Starting system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements **Oil filter** two full flow paper cartridges and one bypass cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard with duals **Serial No.** 8070S 1227 **Tread width** rear 64" (1626 mm) to 123" (3124 mm) front 72" (1829 mm) to 100" (2540 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 27.1" (689 mm) Vertical distance above roadway 39.6" (1006 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 (6) range operator controlled powershift **Advertised speeds mph (km/h)** first 2.0 (3.2) second 2.7 (4.3) third 3.8 (6.1) fourth 4.5 (7.2) fifth 4.8 (7.7) sixth 5.9 (9.4) seventh 6.2 (9.9) eighth 7.5 (12.0) ninth 8.6 (13.8) tenth 10.8 (17.3) eleventh 13.4 (21.5) twelfth 16.8 (27.0) reverse 3.2 (5.1), 7.3 (11.7) **Clutch** multiple wet disc hydraulically power actuated and operated by foot pedal **Brakes** multiple wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 159.7" (4.06 m) left 158.6" (4.03 m) (on concrete surface without brake) right 173.0" (4.39 m) left 172.0" (4.37 m) **Turning space diameter** (on concrete surface with brake applied) right 345.0" (8.76 m) left 342.7" (8.70 m) (on concrete surface without brake) right 371.5" (9.44 m) left 370.2" (9.40 m) **Power take-off** 1000 rpm at 2253 engine rpm.

LUGGING ABILITY IN 7th (2F) GEAR

| | | | | | | |
|----------------------|--------------------|--------------------|--------------------|-------------------|------------------|------------------|
| Crankshaft Speed rpm | 2399 | 2163 | 1922 | 1690 | 1451 | 1215 |
| Pull—lbs (kN) | 9414 (41.88) | 10341 (46.00) | 11104 (49.39) | 10843 (48.23) | 10089 (44.88) | 9506 (42.28) |
| Increase in Pull % | 0 | 10 | 18 | 15 | 7 | 1 |
| Power—Hp (kW) | 147.29 (109.83) | 145.05 (108.16) | 137.74 (102.71) | 118.38 (88.28) | 94.98 (70.82) | 75.16 (56.05) |
| Speed—Mph (km/h) | 5.87 (9.44) | 5.26 (8.47) | 4.65 (7.49) | 4.09 (6.59) | 3.53 (5.68) | 2.97 (4.77) |
| Slip % | 4.86 | 5.49 | 5.80 | 5.65 | 5.17 | 5.02 |

TRACTOR SOUND LEVEL WITH CAB dB(A)

| | |
|---|------|
| Maximum Available Power—Two Hours | 79.5 |
| 75% of Pull at Maximum Power—Ten Hours | 79.5 |
| 50% of Pull at Maximum Power—Two Hours | 80.0 |
| 50% of Pull at Reduced Engine Speed—Two Hours | 77.0 |
| Bystander in 12th (6F) gear | 88.5 |

TIRES, BALLAST AND WEIGHT

| | | With Ballast | Without Ballast |
|----------------------------------|-----------------------------|---|---|
| Rear Tires | —No., size, ply & psi (kPa) | Inner Two 20.8-38; 10; 16 (110) Outer Two 20.8-38; 8; 16 (110) | Inner Two 20.8-38; 10; 16 (110) Outer Two 20.8-38; 8; 16 (110) |
| Ballast | —Liquid (each inner) | 1705 lb (773 kg) | None |
| | —Cast Iron (each inner) | 940 lb (427 kg) | None |
| Front Tires | —No., size, ply & psi (kPa) | Two 18.4-16.1; 8; 20 (140) | Two 18.4-16.1; 8; 20 (140) |
| Ballast | —Liquid (each) | None | None |
| | —Cast Iron (each) | 115 lb (52 kg) | None |
| Height of Drawbar | | 20.5 in (520 mm) | 20.5 in (520 mm) |
| Static Weight with Operator—Rear | | 17830 lb (8088 kg) | 12540 lb (5688 kg) |
| | —Front | 4540 lb (2059 kg) | 4310 lb (1955 kg) |
| | —Total | 22370 lb (10147 kg) | 16850 lb (7643 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. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 161°F (71.8°C). Eight gears were chosen between 15% slip and 10 mph (16.1 km/h). During final inspection, an area of scratches approximately 3/8" (10 mm) wide extending for the length of the bore was discovered on the left side of #5 cylinder wall.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1449.

Report reissued. Supplemental sales permit for Deutz Allis 8070 Powershift Diesel, September, 1985.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
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Board of Tractor Test Engineers



Allis Chalmers 8070 Powershift Diesel

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University of Nebraska—Lincoln
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