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Test 1341: Leyland 472 and 272 Diesel 9-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1341 — LEYLAND 472 DIESEL ALSO LEYLAND 272 DIESEL 9 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—655 rpm) | | | | | | | | | |
| 63.52 (47.37) | 2200 | 4.584 (17.351) | 0.510 (0.310) | 13.86 (2.730) | 226 (107.9) | 59 (14.9) | 75 (24.0) | 28.877 (97.512) | |
| Standard Power Take-off Speed (540 rpm)—One Hour | | | | | | | | | |
| 58.50 (43.62) | 1813 | 3.908 (14.794) | 0.472 (0.287) | 14.97 (2.949) | 230 (110.1) | 59 (14.8) | 76 (24.7) | 28.875 (97.507) | |
| VARYING POWER AND FUEL CONSUMPTION—Two Hours | | | | | | | | | |
| 56.63 (42.23) | 2308 | 3.900 (14.762) | 0.486 (0.296) | 14.52 (2.860) | 216 (102.2) | 59 (15.0) | 79 (26.1) | | |
| 0.00 (0.00) | 2407 | 1.143 (4.326) | | | 183 (83.9) | 59 (15.0) | 80 (26.7) | | |
| 29.07 (21.67) | 2368 | 2.396 (9.070) | 0.582 (0.354) | 12.13 (2.390) | 190 (87.5) | 59 (15.0) | 82 (28.1) | | |
| 63.67 (47.48) | 2200 | 4.605 (17.432) | 0.511 (0.311) | 13.83 (2.724) | 226 (107.8) | 59 (15.0) | 84 (28.6) | | |
| 14.66 (10.93) | 2388 | 1.784 (6.754) | 0.860 (0.523) | 8.21 (1.618) | 186 (85.8) | 59 (15.0) | 84 (28.9) | | |
| 43.01 (32.07) | 2336 | 3.037 (11.498) | 0.499 (0.303) | 14.16 (2.790) | 195 (90.6) | 58 (14.7) | 84 (29.2) | | |
| Av Av | 34.51 (25.73) | 2335 | 2.811 (10.640) | 0.575 (0.350) | 12.28 (2.418) | 199 (93.0) | 59 (15.0) | 82 (27.9) | 28.863 (97.467) |

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

| 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 4th (M-1) Gear | | | | | | | | | | | |
| 51.49 (38.40) | 4339 (19.30) | 4.45 (7.16) | 2200 | 8.87 | 4.549 (17.220) | 0.624 (0.379) | 11.32 (2.230) | 217 (102.5) | 46 (7.5) | 60 (15.3) | 28.840 (97.388) |
| 75% of Pull at Maximum Power—Ten Hours 4th (M-1) Gear | | | | | | | | | | | |
| 42.48 (31.68) | 3347 (14.89) | 4.76 (7.66) | 2294 | 6.57 | 3.639 (13.776) | 0.605 (0.368) | 11.67 (2.299) | 192 (89.0) | 47 (8.6) | 61 (16.2) | 28.884 (97.537) |
| 50% of Pull at Maximum Power—Two Hours 4th (M-1) Gear | | | | | | | | | | | |
| 29.88 (22.28) | 2239 (9.96) | 5.00 (8.05) | 2361 | 4.60 | 2.850 (10.788) | 0.674 (0.410) | 10.48 (2.065) | 187 (85.8) | 45 (7.2) | 62 (16.4) | 28.790 (97.220) |
| 50% of Pull at Reduced Engine Speed—Two Hours 6th (M-3) Gear | | | | | | | | | | | |
| 29.52 (22.02) | 2212 (9.84) | 5.01 (8.06) | 1375 | 4.67 | 2.089 (7.906) | 0.500 (0.304) | 14.13 (2.784) | 186 (85.6) | 44 (6.4) | 50 (10.0) | 28.960 (97.794) |
| MAXIMUM POWER IN SELECTED GEARS | | | | | | | | | | | |
| 47.88 (35.71) | 7224 (32.13) | 2.49 (4.00) | 2263 | 14.93 | 2nd (L-2) Gear | | | 192 (88.9) | 43 (6.1) | 48 (8.9) | 28.950 (97.760) |
| 51.74 (38.58) | 5867 (26.10) | 3.31 (5.32) | 2200 | 12.28 | 3rd (L-3) Gear | | | 208 (97.8) | 43 (6.1) | 56 (13.3) | 28.880 (97.523) |
| 52.92 (39.46) | 4454 (19.81) | 4.46 (7.17) | 2200 | 8.84 | 4th (M-1) Gear | | | 209 (98.1) | 41 (5.0) | 52 (11.1) | 28.870 (97.490) |
| 53.27 (39.72) | 3377 (15.02) | 5.91 (9.52) | 2198 | 6.58 | 5th (M-2) Gear | | | 205 (96.1) | 43 (6.1) | 56 (13.3) | 28.880 (97.523) |
| 51.99 (38.77) | 2440 (10.85) | 7.99 (12.86) | 2199 | 4.91 | 6th (M-3) Gear | | | 202 (94.1) | 44 (6.7) | 57 (13.9) | 28.880 (97.523) |

Department of Agricultural Engineering

Dates of Test: April 18-26, 1980

Manufacturer: LEYLAND VEHICLES LIMITED MLVD Blackburn Road, Bathgate, West Lothian, Scotland.

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 47.9 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8482 **Fuel weight** 7.062 lbs/gal (0.846 kg/l) **Oil** SAE 20-20W **API service classification** SB/SE-CA/CC **To motor** 2.368 gal (8.963 l) **Drained from motor** 2.008 gal (7.600 l) **Transmission and final drive lubricant** SAE 20W30 **Total time engine was operated** 40.0 hours

ENGINE: Make Leyland Dsl **Type** Four cylinder vertical **Serial No.** 498NT/1560/75001 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 3.858" × 4.921" (98 mm × 125 mm) **Compression ratio** 16.8 to 1 **Displacement** 230 cu in (3771 ml) **Starting system** 12 volt **Lubrication pressure** **Air cleaner** one paper element **Oil filter** one full flow cartridge **Fuel filter** one paper cartridge and two gauze screens **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** Front wheel assist **Serial No.** 247466 **Tread width** rear 60" (1520 mm) to 80" (2032 mm) front 61" (1549 mm) to 73" (1854 mm) **Wheel base** 83.28 (2115 mm) **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 32.9" (835 mm) Vertical distance above roadway 33.8" (858 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 **Advertised speeds mph (km/h)** first 2.2 (3.6) second 2.9 (4.6) third 3.8 (6.1) fourth 5.0 (8.0) fifth 6.4 (10.3) sixth 8.5 (13.7) seventh 11.8 (19.0) eighth 15.3 (24.6) ninth 20.3 (32.7) reverse 3.3 (5.2), 7.3 (11.7), 17.3 (27.8) **Clutch** double dry disc hydraulically operated by foot pedal **Brakes** multiple dry disc hydraulically operated by two foot pedals which can be locked together and hand lever **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 176" (4.47 m) left 172" (4.37 m) (on concrete surface without brake) right 211" (5.36 m) left 208" (5.29 m) **Turning space diameter** (on concrete surface with brake applied) right 352" (8.94 m) left 344" (8.74 m) (on concrete surface without brake) right 422" (10.71 m) left 417" (10.59 m) **Power take-off** 540 rpm at 1813 engine rpm.

LUGGING ABILITY IN 4th (M-1) GEAR

| | | | | | | |
|----------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Crankshaft Speed rpm | 2200 | 1977 | 1756 | 1545 | 1313 | 1098 |
| Pull—lbs (kN) | 4454 (19.81) | 4828 (21.48) | 5170 (23.00) | 5339 (23.75) | 5404 (24.04) | 5147 (22.89) |
| Increase in Pull % | 0 | 8 | 16 | 20 | 21 | 16 |
| Power—Hp (kW) | 52.92 (39.46) | 51.10 (38.10) | 48.18 (35.93) | 43.54 (32.47) | 37.41 (27.90) | 29.96 (22.34) |
| Speed—Mph (km/h) | 4.46 (7.17) | 3.97 (6.39) | 3.49 (5.62) | 3.06 (4.92) | 2.60 (4.18) | 2.18 (3.51) |
| Slip % | 8.84 | 9.58 | 10.44 | 10.80 | 10.92 | 10.44 |

| TRACTOR SOUND LEVEL WITH CAB | dB(A) | Front Wheel Drive Disengaged dB(A) |
|---|-------|---------------------------------------|
| Maximum Available Power—Two Hours | 85.5 | 84.5 |
| 75% of Pull at Maximum Power—Ten Hours | - | 91.0 |
| 50% of Pull at Maximum Power—Two Hours | - | 85.5 |
| 50% of Pull at Reduced Engine Speed—Two Hours | - | 80.0 |
| Bystander in 8th (H-2) gear | - | 87.5 |

DRAWBAR PERFORMANCE (Front Wheel Engaged)

| 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 4th (M-1) Gear | | | | | | | | | | | |
| 51.22 (38.20) | 4092 (18.20) | 4.69 (7.55) | 2200 | 5.86 | 4.514 (17.086) | 0.622 (0.379) | 11.35 (2.236) | 221 (105.0) | 45 (7.2) | 60 (15.6) | 28.795 (97.236) |

MAXIMUM POWER IN SELECTED GEARS

| | | | | | | | | | | |
|------------------|-----------------|----------------|------|-------|----------------|--|----------------|-------------|--------------|--------------------|
| 49.05 (36.57) | 9458 (42.07) | 1.94 (3.13) | 2247 | 14.73 | 1st (L-1) Gear | | 195 (90.6) | 43 (6.1) | 48 (8.9) | 28.950 (97.760) |
| 52.94 (39.48) | 5610 (24.96) | 3.54 (5.69) | 2199 | 7.90 | 3rd (L-3) Gear | | 213 (100.3) | 43 (6.1) | 56 (13.3) | 28.880 (97.523) |
| 52.65 (39.26) | 4203 (18.69) | 4.70 (7.56) | 2200 | 5.62 | 4th (M-1) Gear | | 213 (100.6) | 42 (5.6) | 54 (12.2) | 28.870 (97.490) |

TIRES, BALLAST AND WEIGHT

| | | With Ballast | Without Ballast |
|---|-----------------------------|-----------------------------|-----------------------------|
| Rear Tires | —No., size, ply & psi (kPa) | Two 16.9-34; 8; 16 (110) | Two 16.9-34; 8; 16 (110) |
| | —Liquid (each) | 900 lb (408 kg) | None |
| | —Cast Iron (each) | 460 lb (209 kg) | None |
| Front Tires | —No., size, ply & psi (kPa) | Two 12.4/11-28; 6; 20 (140) | Two 12.4/11-28; 6; 20 (140) |
| | —Liquid (each) | 400 lb (182 kg) | None |
| | —Cast Iron (each) | 530 lb (240 kg) | None |
| Height of Drawbar | | 18.5 in (470 mm) | 18.5 in (470 mm) |
| Static Weight with Operator—Rear | | 7210 lb (3270 kg) | 4490 lb (2037 kg) |
| —Front | | 4780 lb (2168 kg) | 2920 lb (1324 kg) |
| —Total | | 11990 lb (5438 kg) | 7410 lb (3361 kg) |



Leyland 472 Diesel

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

REPAIRS and ADJUSTMENTS: The PTO clutch linkage required adjustment during the varying load PTO test.

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 158°F (70.0°C). Five 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 1341.

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers