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January 1988

## Test 1613: Caterpillar Challenger 65 Diesel 10-Speed

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# NEBRASKA OECD TRACTOR TEST 1613—SUMMARY 053

## CATERPILLAR CHALLENGER 65 DIESEL

### 10 SPEED

#### POWER TAKE-OFF PERFORMANCE

| Power<br>HP<br>(kW)                             | Crank<br>shaft<br>speed<br>rpm | Fuel Consumption |                       |                       | Mean Atmospheric<br>Conditions |
|---|--------------------------------|------------------|-----------------------|-----------------------|--------------------------------|
|   |                                | Gal/hr<br>(l/h)  | lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) |                                |
| <b>MAXIMUM POWER AND FUEL CONSUMPTION</b>       |                                |                  |                       |                       |                                |
| <b>Rated Engine Speed—(PTO speed—1025 rpm)</b>  |                                |                  |                       |                       |                                |
| 232.29<br>(173.21)                              | 2101                           | 14.44<br>(54.66) | 0.430<br>(0.261)      | 16.09<br>(3.17)       |                                |
| <b>Maximum Power (Two hours)</b>                |                                |                  |                       |                       |                                |
| 237.91<br>(177.41)                              | 1900                           | 13.99<br>(52.96) | 0.406<br>(0.247)      | 17.00<br>(3.35)       |                                |
| <b>Standard Power Take-off Speed (1000 rpm)</b> |                                |                  |                       |                       |                                |
| 236.30<br>(176.21)                              | 2049                           | 14.36<br>(54.35) | 0.420<br>(0.255)      | 16.46<br>(3.24)       |                                |

#### VARYING POWER AND FUEL CONSUMPTION

|                    |      |                  |                    |                 |                                    |
|--------------------|------|------------------|--------------------|-----------------|------------------------------------|
| 232.29<br>(173.21) | 2101 | 14.44<br>(54.66) | 0.430<br>(0.261)   | 16.09<br>(3.17) | Air temperature<br>80°F (26°C)     |
| 200.58<br>(149.57) | 2148 | 13.11<br>(49.63) | 0.452<br>(0.275)   | 15.30<br>(3.01) | Relative humidity<br>58%           |
| 155.05<br>(115.62) | 2192 | 10.90<br>(41.25) | 0.486<br>(0.295)   | 14.23<br>(2.80) | Barometer<br>29.00" Hg (98.21 kPa) |
| 105.04<br>(78.33)  | 2240 | 8.77<br>(33.20)  | 0.577<br>(0.351)   | 11.98<br>(2.36) |                                    |
| 53.27<br>(35.97)   | 2272 | 6.38<br>(24.16)  | 0.828<br>(0.504)   | 8.35<br>(1.64)  |                                    |
| 0.54<br>(0.40)     | 2302 | 4.65<br>(17.58)  | 59.997<br>(36.495) | 0.12<br>(0.02)  |                                    |

Maximum Torque 739.3 lb. ft (1002.3 Nm) @ 1400 RPM  
Maximum Torque Rise 27.3%

#### DRAWBAR PERFORMANCE FUEL CONSUMPTION CHARACTERISTICS

| Power<br>Hp<br>(kW)                                 | Drawbar<br>pull<br>(kN) | Speed<br>mph<br>(km/h) | Crank-<br>shaft<br>speed<br>rpm | Slip<br>% | Fuel Consumption      |                       | Temp.°F (°C)        |                    | Barom.<br>inch<br>Hg<br>(kPa) |
|---|-------------------------|------------------------|---------------------------------|-----------|-----------------------|-----------------------|---------------------|--------------------|-------------------------------|
|   |                         |                        |                                 |           | lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | cool-<br>ing<br>med | Air<br>dry<br>bulb |                               |
| <b>Maximum Power—3rd Gear</b>                       |                         |                        |                                 |           |                       |                       |                     |                    |                               |
| 213.73<br>(159.38)                                  | 19577<br>(87.08)        | 4.09<br>(6.59)         | 1900                            | 2.14      | 0.454<br>(0.276)      | 15.22<br>(3.00)       | 184<br>(84)         | 69<br>(21)         | 28.99<br>(98.17)              |
| <b>75% of Pull at Maximum Power—3rd Gear</b>        |                         |                        |                                 |           |                       |                       |                     |                    |                               |
| 182.06<br>(135.76)                                  | 14678<br>(65.29)        | 4.65<br>(7.49)         | 2142                            | 1.46      | 0.502<br>(0.305)      | 13.77<br>(2.71)       | 182<br>(83)         | 76<br>(24)         | 28.91<br>(97.90)              |
| <b>50% of Pull at Maximum Power—3rd Gear</b>        |                         |                        |                                 |           |                       |                       |                     |                    |                               |
| 125.49<br>(93.58)                                   | 9789<br>(43.54)         | 4.81<br>(7.74)         | 2203                            | 0.93      | 0.574<br>(0.349)      | 12.03<br>(2.37)       | 179<br>(82)         | 78<br>(26)         | 28.89<br>(97.83)              |
| <b>75% of Pull at Reduced Engine Speed—4th Gear</b> |                         |                        |                                 |           |                       |                       |                     |                    |                               |
| 181.56<br>(135.39)                                  | 14676<br>(65.28)        | 4.64<br>(7.47)         | 1866                            | 1.46      | 0.461<br>(0.281)      | 14.98<br>(2.95)       | 183<br>(84)         | 77<br>(25)         | 28.90<br>(97.87)              |
| <b>50% of Pull at Reduced Engine Speed—4th Gear</b> |                         |                        |                                 |           |                       |                       |                     |                    |                               |
| 125.54<br>(93.62)                                   | 9785<br>(43.53)         | 4.81<br>(7.74)         | 1926                            | 0.99      | 0.512<br>(0.311)      | 13.50<br>(2.66)       | 178<br>(81)         | 78<br>(26)         | 28.88<br>(97.80)              |

**Location of Test:** Center for Agricultural Equip-  
ment, Lincoln Nebraska 68583-0832, U.S.A.

**Dates of Test:** September, 1988

**Manufacturer:** Caterpillar Inc., 100 N.E. Adams,  
Peoria, IL 61629 U.S.A.

**FUEL AND OIL:** Fuel No. 2 Diesel Cetane No.  
51.2 Specific gravity converted to 60°/60°F (15°/  
15°C) 0.8299 Fuel weight 6.910 lbs/gal (0.828 kg/l)  
Oil SAE 15W40 Oil consumption for 10 hours  
0.554 gal (2.097 l) Transmission and final drive  
lubricant SAE 30W API CD/TO-2

**ENGINE:** Make Caterpillar Diesel Type six cyl-  
inder vertical with turbocharger and intercooler  
Serial No. 08Z45452 Crankshaft lengthwise Rated  
engine speed 2100 Bore and stroke 4.75" × 6.00"  
(120.6 mm × 152.4 mm) Compression ratio 15 to  
1 Displacement 638 cu in (10450 ml) Starting sys-  
tem 12 volt Lubrication pressure Air cleaner two  
paper elements and aspirator Oil filter one full  
flow cartridge Oil cooler engine coolant heat ex-  
changer for crankcase oil, engine coolant heat ex-  
changer for transmission oil, radiator for steering  
oil Fuel filter one paper cartridge and screen Muf-  
fler underhood Exhaust vertical Cooling medium  
temperature control thermostat.

**ENGINE OPERATING PARAMETERS:** Fuel  
rate 92.9-102.6 lb/hr (42.2-46.6 kg/hr) High idle  
2220-2340 rpm Turbo boost nominal 14.5-19.7 psi  
(100-136 kPa) as measured 16.0 psi (110 kPa)

**CHASSIS:** Type track layer—rubber track Se-  
rial No. \*7YC00742\* Tread width 84.6" (2150 mm)  
Length of track on ground 107.6" (2733 mm) Hy-  
draulic control system direct engine drive Trans-  
mission selective gear fixed ratio with full range  
operator controlled powershift Nominal travel  
speeds mph (km/h) first 2.6 (4.2) second 4.0 (6.4)  
third 4.7 (7.5) fourth 5.3 (8.6) fifth 6.1 (9.9) sixth  
7.0 (11.3) seventh 8.1 (13.0) eighth 9.3 (14.9) ninth  
12.0 (19.2) tenth 18.1 (29.1) reverse 1.9 (3.1), 4.5  
(7.2) Clutch multiple wet disc hydraulically power  
actuated by foot pedal Brakes caliper disc hy-  
draulically power actuated and operated by foot  
pedal Steering differential steering hydrostatically  
actuated by steering wheel Power take-off 1000  
rpm at 2050 engine rpm Unladen tractor mass  
33200 lb (15059 kg).

**REPAIRS AND ADJUSTMENTS:** No repairs or  
adjustments.

**DRAWBAR PERFORMANCE AT 1900 RPM  
MAXIMUM POWER IN SELECTED GEARS**

| Power<br>Hp<br>(kW) | Drawbar<br>pull<br>(kN) | Speed<br>mph<br>(km/h) | Crank-<br>shaft<br>speed<br>rpm | Slip<br>% | Fuel Consumption<br>lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | Temp.°F (°C)<br>cool-<br>ing<br>med | Air<br>dry<br>bulb | Barom.<br>inch<br>Hg<br>(kPa) |
|---------------------|-------------------------|------------------------|---------------------------------|-----------|---|-----------------------|-------------------------------------|--------------------|-------------------------------|
| 1st Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 186.56<br>(139.12)  | 32684<br>(145.38)       | 2.14<br>(3.44)         | 2004                            | 13.66     | 0.534<br>(0.325)                          | 12.95<br>(2.55)       | 181<br>(83)                         | 66<br>(19)         | 28.67<br>(97.09)              |
| 2nd Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 209.68<br>(156.36)  | 22912<br>(101.92)       | 3.43<br>(5.52)         | 1901                            | 3.37      | 0.462<br>(0.281)                          | 14.95<br>(2.94)       | 184<br>(84)                         | 70<br>(21)         | 28.98<br>(98.14)              |
| 3rd Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 213.73<br>(159.38)  | 19577<br>(87.08)        | 4.09<br>(6.59)         | 1900                            | 2.14      | 0.454<br>(0.276)                          | 15.22<br>(3.00)       | 184<br>(84)                         | 69<br>(21)         | 28.99<br>(98.17)              |
| 4th Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 213.52<br>(159.22)  | 16978<br>(75.52)        | 4.72<br>(7.59)         | 1902                            | 1.72      | 0.454<br>(0.276)                          | 15.23<br>(3.00)       | 185<br>(85)                         | 71<br>(22)         | 28.98<br>(98.14)              |
| 5th Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 211.95<br>(158.05)  | 14674<br>(65.27)        | 5.42<br>(8.72)         | 1897                            | 1.41      | 0.457<br>(0.278)                          | 15.11<br>(2.98)       | 185<br>(85)                         | 72<br>(22)         | 28.97<br>(98.10)              |
| 6th Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 209.39<br>(156.14)  | 12583<br>(55.97)        | 6.24<br>(10.04)        | 1899                            | 1.14      | 0.461<br>(0.280)                          | 14.99<br>(2.95)       | 186<br>(85)                         | 74<br>(23)         | 28.96<br>(98.07)              |
| 7th Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 208.30<br>(155.33)  | 10912<br>(48.54)        | 7.16<br>(11.52)        | 1900                            | 1.04      | 0.465<br>(0.283)                          | 14.88<br>(2.93)       | 186<br>(86)                         | 75<br>(24)         | 28.96<br>(98.07)              |
| 8th Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 205.48<br>(153.23)  | 9358<br>(41.62)         | 8.23<br>(13.25)        | 1900                            | 0.88      | 0.474<br>(0.288)                          | 14.58<br>(2.87)       | 186<br>(86)                         | 76<br>(24)         | 28.95<br>(98.04)              |

**DRAWBAR PERFORMANCE AT 2100 RPM  
MAXIMUM POWER IN SELECTED GEARS**

| Power<br>Hp<br>(kW) | Drawbar<br>pull<br>(kN) | Speed<br>mph<br>(km/h) | Crank-<br>shaft<br>speed<br>rpm | Slip<br>% | Fuel Consumption<br>lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | Temp.°F (°C)<br>cool-<br>ing<br>med | Air<br>dry<br>bulb | Barom.<br>inch<br>Hg<br>(kPa) |
|---------------------|-------------------------|------------------------|---------------------------------|-----------|---|-----------------------|-------------------------------------|--------------------|-------------------------------|
| 1st Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 193.73<br>(144.46)  | 29766<br>(132.41)       | 2.44<br>(3.93)         | 2116                            | 6.78      | 0.512<br>(0.311)                          | 13.51<br>(2.66)       | 179<br>(81)                         | 63<br>(17)         | 28.68<br>(97.12)              |
| 2nd Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 204.46<br>(152.47)  | 20005<br>(88.98)        | 3.83<br>(6.17)         | 2101                            | 2.29      | 0.485<br>(0.295)                          | 14.25<br>(2.81)       | 182<br>(83)                         | 70<br>(21)         | 28.99<br>(98.17)              |
| 3rd Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 206.28<br>(153.83)  | 17012<br>(75.67)        | 4.55<br>(7.32)         | 2100                            | 1.62      | 0.480<br>(0.292)                          | 14.41<br>(2.84)       | 182<br>(83)                         | 69<br>(21)         | 28.99<br>(98.17)              |
| 4th Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 206.42<br>(153.92)  | 14834<br>(65.98)        | 5.22<br>(8.40)         | 2099                            | 1.46      | 0.488<br>(0.295)                          | 14.34<br>(2.82)       | 183<br>(84)                         | 71<br>(22)         | 28.98<br>(98.14)              |
| 5th Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 204.80<br>(152.72)  | 12790<br>(56.89)        | 6.00<br>(9.66)         | 2099                            | 1.14      | 0.486<br>(0.296)                          | 14.21<br>(2.80)       | 183<br>(84)                         | 72<br>(22)         | 28.97<br>(98.10)              |
| 6th Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 200.71<br>(149.67)  | 10899<br>(48.48)        | 6.91<br>(11.11)        | 2098                            | 1.04      | 0.494<br>(0.301)                          | 13.98<br>(2.75)       | 184<br>(84)                         | 73<br>(23)         | 28.97<br>(98.10)              |
| 7th Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 199.32<br>(148.63)  | 9422<br>(42.00)         | 7.92<br>(12.74)        | 2098                            | 0.88      | 0.499<br>(0.304)                          | 13.85<br>(2.73)       | 184<br>(84)                         | 75<br>(24)         | 28.96<br>(98.07)              |
| 8th Gear            |                         |                        |                                 |           |   |                       |                                     |                    |                               |
| 194.96<br>(145.38)  | 8031<br>(35.72)         | 9.10<br>(14.65)        | 2099                            | 0.77      | 0.510<br>(0.310)                          | 13.54<br>(2.67)       | 184<br>(84)                         | 76<br>(24)         | 28.95<br>(97.04)              |

**TIRES AND WEIGHT**

**Rear Tires** —No., size, ply & psi (kPa)  
**Front Tires** —No., size, ply & psi (kPa)  
**Height of Drawbar**  
**Static Weight**

**Tested Without Ballast**

NA  
 NA  
 16.5 in (420 mm)  
 Total 33220 lb (15068 kg)

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump was maintained at 133° F (56.1° C). Manufacturers specifications for engine bore, stroke, displacement and compression ratio were not verified.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1613, Summary 053, April 6, 1989.

LOUIS I. LEVITICUS  
 Engineer-in-Charge

K. VON BARGEN  
 R. D. GRISSO  
 T. L. THOMPSON  
 Board of Tractor Test Engineers

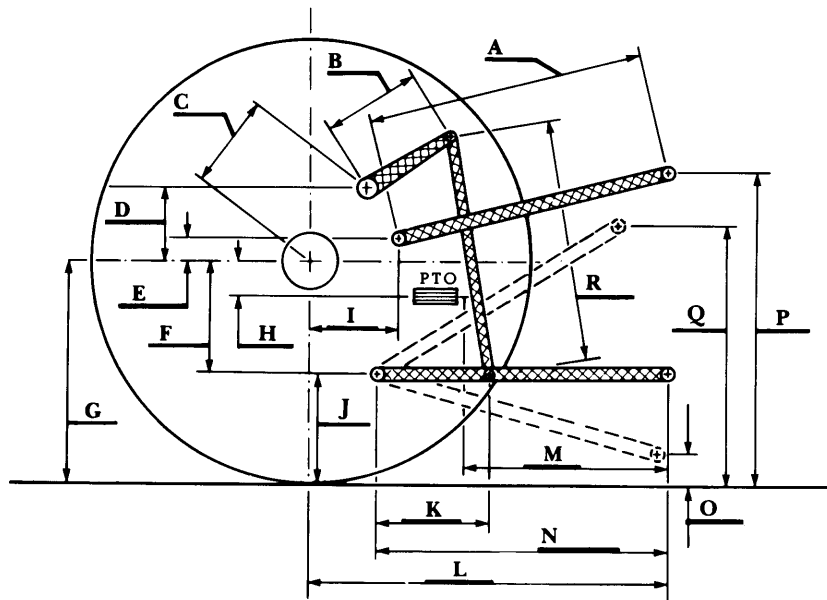
### THREE POINT HITCH PERFORMANCE (SAE Static Test)

|   |               |               |               |              |              |
|---|---------------|---------------|---------------|--------------|--------------|
| Observed Maximum Pressure psi. (bar)          | 2500 (172)    |               |               |              |              |
| Location                                      | remote outlet |               |               |              |              |
| Hydraulic oil temperature °F(°C)              | 153 (67)      |               |               |              |              |
| Location                                      | pump inlet    |               |               |              |              |
| Category                                      | III           |               |               |              |              |
| Quick attach                                  | no            |               |               |              |              |
| Hitch point distance to ground level in. (mm) | 8.2 (208)     | 16.0 (406)    | 24.0 (610)    | 32.0 (812)   | 40.0 (1016)  |
| Lift force on frame lb. (kN)                  | 31630 (140.7) | 26570 (118.2) | 22510 (100.1) | 18390 (81.8) | 12800 (56.9) |

### THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III  
Quick Attach: None

|   |                        |
|---|------------------------|
| Maximum Force Exerted Through Whole Range:          | 12313 lbs (54.8 kN)    |
| i) Opening pressure of relief valve:                | NA                     |
| Sustained pressure at open relief valve:            | 2500 psi (172 Bar)     |
| ii) Pump delivery rate at minimum pressure:         | 28.2 GPM (106.7 l/min) |
| iii) Pump delivery rate at maximum hydraulic power: | 25.6 GPM (96.9 l/min)  |
| Delivery pressure:                                  | 2250 psi (155 Bar)     |
| Power:  | 33.6 Hp (25.1 kW)      |



Hitch Dimensions as Tested — No Load

|    | inch | mm   |
|----|------|------|
| A  | 25.5 | 648  |
| B  | 21.5 | 545  |
| C  | 18.6 | 472  |
| D  | 16.3 | 415  |
| E  | 16.6 | 422  |
| F  | 3.9  | 98   |
| G  | 23.4 | 593  |
| *H | -5.1 | -130 |
| I  | 14.6 | 370  |
| J  | 19.5 | 495  |
| K  | 21.1 | 535  |
| L  | 40.6 | 1030 |
| M  | 25.5 | 648  |
| N  | 30.1 | 765  |
| O  | 9.0  | 229  |
| P  | 41.5 | 1054 |
| Q  | 37.8 | 960  |
| R  | 25.8 | 655  |

\*PTO is above rear axle.

### TRACTOR SOUND LEVEL WITH CAB

|  | dB(A) |
|--|-------|
| Maximum Available Power—3rd Gear             | 75.5  |
| 75% of Pull at Maximum Power—3rd Gear        | 75.5  |
| 50% of Pull at Maximum Power—3rd Gear        | 74.5  |
| 50% of Pull at Reduced Engine Speed—4th Gear | 73.5  |
| Bystander in 10th gear                       | 89.0  |

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**CENTER FOR AGRICULTURAL EQUIPMENT  
DEPARTMENT OF AGRICULTURAL ENGINEERING  
INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES  
UNIVERSITY OF NEBRASKA-LINCOLN**

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**TEST REPORT No. 88 - 11**

**Performance comparison between the Caterpillar Challenger 65  
and a Four-Wheel drive articulated tractor.**

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**INTRODUCTION.**

The test was requested by Caterpillar Inc. of Peoria, Illinois in addition to the Standard Restricted OECD test — Code II. (See also Nebraska report # 1613). The purpose of this test series was to obtain performance data on two different tractor types on two different surfaces.

**TEST PROCEDURE.**

The relevant specifications of the Caterpillar Challenger 65 and the Four-wheel drive tractor are presented in Table I.

TABLE I—Tractor Specifications

|                  |                                     |                         |
|------------------|-------------------------------------|-------------------------|
| Make             | Caterpillar                         | Four-wheel drive (*)    |
| Type             | Rubber-tracked crawler              | Articulated steering    |
| Model            | Challenger 65                       | Powershift              |
| 1) PTO pwr @ RES | 173.21 kW (232.92 hp)               | No PTO                  |
| 2) Eng pwr @ RES | 201 kW (270 hp)                     | 209 kW (280 hp)         |
| 3) RES           | 2100 rpm                            | 2100 rpm                |
| Total weight     | 15150 kg (33400 lbs)                | 15195 kg (33500 lbs)    |
| Tires/Tracks     | Width 2×626 mm (24.6 in)            | Front: 4×20.8-38/8 ply  |
|                  | Contact Length 2×2718 mm (107.0 in) | Rear: 4×20.8-38/8 ply   |
| Tire pressure    | Does not apply                      | Inner: 110 kPa (16 psi) |
|                  |                                     | Outer: 95 kPa (14 psi)  |

- 1) Challenger 65 — See test # 1613  
 2) Data from manufacturers literature. Not tested.  
 3) RES = Rated engine speed  
 (\*) Versatile 876.

Both tractors were operated on a concrete test track and on a Waukesha silty clay loam soil. For each run the soil was chiseled twice to a depth of 30 cm (12 inch), disked, watered and packed. Cone Index readings were taken on the North and South side of the track. The treatments produced readings at the 6 inch level at or above 14.37 kN/m<sup>2</sup> (300 psi). Average readings for the north and south side are shown in table II for 2" and 4" depths.

Table II—Cone Index readings for the soil track.

|            | DEPTH                               |                                     |
|------------|-------------------------------------|-------------------------------------|
|            | 2"                                  | 4"                                  |
| North Side | 4.50 kN/m <sup>2</sup><br>(94 psi)  | 8.14 kN/m <sup>2</sup><br>(170 psi) |
| South Side | 5.03 kN/m <sup>2</sup><br>(105 psi) | 7.47 kN/m <sup>2</sup><br>(156 psi) |

## TEST RESULTS.

Table IIIa—Four-wheel drive performance on concrete.

| Gear | Power<br>kW<br>(hp) | Drawbar<br>Pull<br>kN<br>(lb) | Speed<br>km/h<br>(mph) | Engine<br>Speed<br>rpm | Slip<br>% |
|------|---------------------|-------------------------------|------------------------|------------------------|-----------|
| 3    | 138.79<br>(186.12)  | 116.71<br>(26237)             | 4.28<br>(2.66)         | 2074                   | 14.45     |
| 4    | 154.64<br>(207.37)  | 98.76<br>(22203)              | 5.64<br>(3.50)         | 2098                   | 8.75      |
| 5    | 158.52<br>(212.57)  | 80.65<br>(18131)              | 7.08<br>(4.40)         | 2100                   | 6.28      |
| 6    | 153.56<br>(205.92)  | 62.72<br>(14101)              | 8.81<br>(5.48)         | 2099                   | 4.59      |

TABLE IIIb—Caterpillar Challenger 65 performance on concrete.

| Gear | Power<br>kW<br>(hp) | Drawbar<br>Pull<br>kN<br>(lb) | Speed<br>km/h<br>(mph) | Engine<br>Speed<br>rpm | Slip<br>% |
|------|---------------------|-------------------------------|------------------------|------------------------|-----------|
| 1    | 139.12<br>(186.56)  | 145.38<br>(32684)             | 3.44<br>(2.14)         | 2004                   | 13.66     |
| 1    | 144.46<br>(193.73)  | 132.41<br>(29766)             | 3.93<br>(2.44)         | 2116                   | 6.78      |
| 2    | 152.47<br>(204.46)  | 88.98<br>(20005)              | 6.17<br>(3.83)         | 2101                   | 2.29      |
| 3    | 153.83<br>(206.28)  | 75.67<br>(17012)              | 7.32<br>(4.55)         | 2100                   | 1.62      |
| 4    | 153.92<br>(206.42)  | 65.98<br>(14834)              | 8.40<br>(5.22)         | 2099                   | 1.46      |

TABLE IIIc—Four-wheel drive performance on soil.

| Gear | Power<br>kW<br>(hp) | Drawbar<br>Pull<br>kN<br>(lb) | Speed<br>km/h<br>(mph) | Engine<br>Speed<br>rpm | Slip<br>% |
|------|---------------------|-------------------------------|------------------------|------------------------|-----------|
| 5    | 125.42<br>(168.19)  | 74.71<br>(16797)              | 6.04<br>(3.76)         | 2098                   | 19.88     |
| 5    | 127.28<br>(170.68)  | 69.31<br>(15582)              | 6.61<br>(4.11)         | 2157                   | 14.84     |
| 6    | 141.46<br>(189.70)  | 60.73<br>(13652)              | 8.39<br>(5.21)         | 2098                   | 9.12      |

TABLE IIId—Caterpillar Challenger 65 performance on soil.

| Gear | Power<br>kW<br>(hp) | Drawbar<br>Pull<br>kN<br>(lb) | Speed<br>km/h<br>(mph) | Engine<br>Speed<br>rpm | Slip<br>% |
|------|---------------------|-------------------------------|------------------------|------------------------|-----------|
| 1    | 106.51<br>(142.83)  | 104.62<br>(23520)             | 3.66<br>(2.28)         | 2155                   | 14.50     |
| 2    | 129.12<br>(173.16)  | 106.50<br>(23942)             | 4.36<br>(2.71)         | 1695                   | 14.34     |
| 2    | 146.11<br>(195.94)  | 86.95<br>(19548)              | 6.05<br>(3.76)         | 2096                   | 3.92      |
| 3    | 149.16<br>(200.02)  | 74.11<br>(16662)              | 7.25<br>(4.50)         | 2099                   | 2.55      |
| 4    | 146.21<br>(196.08)  | 63.21<br>(14210)              | 8.33<br>(5.17)         | 2097                   | 2.09      |

## REMARKS.

1. The 4wd test on concrete was run in 3rd gear at a slightly lugged down condition in order to reach the 15% slip level. A lower gear could have been used at part load as well. (Table IIIa)
2. The Challenger 65 test on concrete was run twice in 1st gear; at part load in order to produce 7% slip and at full load lugged down in order to produce a slip as close to 15% as possible. (Table IIIb).
3. Fourth gear was not run on the soil track on the Four-wheel drive tractor because the tractor had reached 20% slip in 5th gear at rated engine speed and 15% at reduced load speed. (Table IIIc)
4. First gear in soil on the Challenger 65 was runs as close to 15% slip as possible. However this caused a condition of irregular pull, which made measurement difficult. Therefore the second gear was tested at two levels. One to correspond to about 15% slip and the other at approximately rated engine speed. (Table IIId)

The tests were performed during the fall of 1988 on the concrete and soil track at the Center for Agricultural Equipment, (formerly the Nebraska Tractor Testing Laboratory) University of Nebraska, Lincoln.

I hereby certify that the above data are the actual and correct results of the test series.

Date: June 10, 1989  
Lincoln, Nebraska.

For the Center  
Dr. Louis I. Leviticus  
Associate Director



**Catterpillar Challenger 65 Diesel**

**Agricultural Research Division  
Institute of Agriculture and Natural Resources  
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