

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

---

January 2000

## Test 1942: Buhler Versatile 2360 Diesel

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

Follow this and additional works at: <https://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

---

Nebraska Tractor Test Lab, "Test 1942: Buhler Versatile 2360 Diesel" (2000). *Nebraska Tractor Tests*. 360. <https://digitalcommons.unl.edu/tractormuseumlit/360>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

# SUMMARY OF OECD TEST 1942—NEBRASKA SUMMARY 351A

## BUHLER VERSATILE 2360 DIESEL

### 12 SPEED

#### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
<b>Rated Engine Speed (PTO speed-997 rpm)</b>					
301.3 (224.7)	2100	17.84 (67.53)	0.419 (0.255)	16.90 (3.33)	
<b>Maximum Power (2 hours)</b>					
349.1 (260.3)	1800	18.49 (69.99)	0.375 (0.228)	18.88 (3.72)	
<b>VARYING POWER AND FUEL CONSUMPTION</b>					
301.3 (224.7)	2100	17.84 (67.53)	0.419 (0.255)	16.90 (3.33)	Air temperature
260.4 (194.2)	2134	16.17 (61.22)	0.439 (0.267)	16.10 (3.17)	72°F (22°C)
197.3 (147.1)	2159	13.48 (51.01)	0.483 (0.294)	14.64 (2.88)	Relative humidity
133.3 (99.4)	2184	10.61 (40.17)	0.564 (0.343)	12.54 (2.47)	63%
67.5 (50.3)	2211	7.82 (29.62)	0.821 (0.500)	8.63 (1.70)	Barometer
11.8 (8.8)	2225	5.70 (21.56)	3.421 (2.081)	2.07 (0.41)	29.5" Hg (99.89 kPa)

Maximum Torque - 1099 lb.-ft. (1490 Nm) at 1400 rpm  
Maximum Torque Rise - 45.7%  
Torque rise at 1700 engine rpm - 39%

#### DRAWBAR PERFORMANCE

##### FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—4th (L4) Gear</b>									
277.2 (206.7)	22420 (99.73)	4.64 (7.46)	2100	2.6	0.453 (0.276)	15.53 (3.06)	175 (79)	59 (15)	29.2 (98.9)
<b>75% of Pull at Maximum Power—4th (L4) Gear</b>									
214.2 (159.7)	16810 (74.78)	4.78 (7.69)	2153	2.1	0.493 (0.300)	14.26 (2.81)	176 (80)	62 (17)	29.2 (99.0)
<b>50% of Pull at Maximum Power—4th (L4) Gear</b>									
146.0 (108.9)	11215 (49.88)	4.88 (7.86)	2183	1.4	0.578 (0.352)	12.14 (2.40)	175 (79)	62 (17)	29.2 (99.0)
<b>75% of Pull at Reduced Engine Speed—5th (M1) Gear</b>									
214.0 (159.6)	16820 (74.82)	4.77 (7.68)	1879	1.9	0.454 (0.276)	15.50 (3.05)	176 (80)	64 (18)	29.2 (99.0)
<b>50% of Pull at Reduced Engine Speed—5th (M1) Gear</b>									
145.8 (108.7)	11200 (49.83)	4.88 (7.85)	1906	1.2	0.522 (0.317)	13.50 (2.66)	175 (79)	64 (18)	29.2 (99.0)

**Location of Test:** Prairie Agricultural Machinery Institute(PAMI), Portage La Prairie, Manitoba, Canada R1N 3C5

**Dates of Test:** June-July, 2000

**Manufacturer:** Buhler-Versatile Inc. 1260 Clarence Ave., Winnipeg, Manitoba, Canada R3C 4E8

**FUEL and OIL:** Fuel No. 2 Diesel **Specific gravity converted to 60°/60° F (15°/15°C)** 0.846 **Fuel weight** 7.080 lbs/gal (0.848 kg/l) **Oil SAE** 15W-40 **API service classification** CF-4 **Transmission and hydraulic lubricant** Esso Hydraul 56 fluid **Final drive lubricant** SAE 80W90 gear oil

**ENGINE: Make** Cummins **Diesel Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 11999631 **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.50" x 6.00" (139.7 mm x 152.4 mm) **Compression ratio** 18.5 to 1 **Displacement** 855 cu in (14039 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** thermostat

**CHASSIS: Type** Four wheel drive with duals **Serial No.** D108303 **Tread width** rear 72.0" (1829 mm) and 129.2" (3282 mm) front 72.0" (1829 mm) and 129.2" (3282 mm) **Wheel base** 133.0" (3380 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph (km/h)** first 2.96 (4.77) second 3.47 (5.58) third 4.04 (6.51) fourth 4.71 (7.58) fifth 5.38 (8.66) sixth 6.30 (10.13) seventh 7.34 (11.81) eighth 8.55 (13.75) ninth 11.15 (17.95) tenth 13.04 (20.98) eleventh 15.21 (24.48) twelfth 17.70 (28.49) reverse 3.84 (6.18), 4.49 (7.23), 5.24 (8.43), 6.10 (9.82) **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** caliper disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Power take-off** 1000 rpm at 2106 engine rpm **Unladen tractor mass** 30630 lb (13893 kg)

## DRAWBAR PERFORMANCE MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)	
2nd (L2) Gear									
270.6 (201.8)	31355 (139.47)	3.24 (5.21)	2079	6.9	0.473 (0.288)	14.87 (2.93)	172 (78)	59 (15)	29.2 (98.8)
3rd (L3) Gear									
296.0 (220.7)	31070 (138.20)	3.57 (5.75)	1960	6.5	0.441 (0.268)	15.96 (3.14)	174 (79)	59 (15)	29.2 (98.8)
4th (L4) Gear									
312.9 (233.3)	30360 (135.05)	3.86 (6.22)	1801	5.4	0.413 (0.251)	17.06 (3.36)	174 (79)	59 (15)	29.2 (98.8)
5th (M1) Gear									
317.2 (236.5)	26400 (117.44)	4.51 (7.25)	1799	3.3	0.410 (0.249)	17.17 (3.38)	174 (79)	59 (15)	29.2 (98.8)
6th (M2) Gear									
319.2 (238.0)	22505 (100.11)	5.32 (8.56)	1800	2.5	0.404 (0.246)	17.41 (3.43)	176 (80)	60 (16)	29.2 (98.9)
7th (M3) Gear									
320.1 (238.7)	19260 (85.68)	6.23 (10.03)	1801	2.0	0.406 (0.247)	17.36 (3.42)	176 (80)	61 (16)	29.2 (99.0)
8th (M4) Gear									
321.4 (239.7)	16580 (73.75)	7.27 (11.70)	1800	1.7	0.404 (0.246)	17.41 (3.43)	178 (81)	61 (16)	29.2 (99.0)
9th (H1) Gear									
316.2 (235.8)	12430 (55.29)	9.54 (15.35)	1801	1.2	0.408 (0.248)	17.26 (3.40)	178 (81)	61 (16)	29.2 (99.0)

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

**NOTE:** This tractor was not equipped with a 3 point hitch when tested. The 3 point hitch performance data shown on this report is from a test series done on the New Holland 9282 Diesel.

**NOTE:** The data on this Summary was obtained from OECD report 1942 conducted on the New Holland 9684 Quadrasync Diesel.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD test procedures. This tractor did not meet the manufacturers claim of 50 gal/min (189.3 l/min) hydraulic flow. The pull in 2<sup>nd</sup> (L2) gear was limited due to tire hop. The performance results on this summary were taken from OECD tests conducted under the Code II Test Code procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **1942**, Nebraska Summary 351A, October 4, 2004.

Leonard L. Bashford  
Director

M.F. Kocher  
D.L. Martin  
W.P. Campbell  
Board of Tractor Test Engineers

## TRACTOR SOUND LEVEL WITH CAB

	dB(A)
At 75% Load in 5th(M1) Gear	77.9
Bystander	--

## TIRES AND WEIGHT

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

## Tested Without Ballast

Four 20.8R42; \*\*, 8 (55)  
 Four 20.8R42; \*\*, 12 (83)  
 21.9 in (555 mm)  
 11670 lb (5293 kg)  
 19125 lb (8675 kg)  
 30795 lb (13968 kg)

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

CATEGORY: IVN

Quick Attach: none

Maximum Force Exerted Through Whole Range: 15285 lb (68.0 kN)

- i) Opening pressure of relief valve: NA
- Sustained pressure of the open relief valve: 2895 psi (199 bar)
- ii) Pump delivery rate at minimum pressure: 49.0 GPM (185.5 l/min)
- iii) Pump delivery rate at maximum
  - hydraulic power: 44.3 GPM (167.5 l/min)
  - Delivery pressure: 2175 psi (150 bar)
  - Power: 56.2 HP (41.9 kW)

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

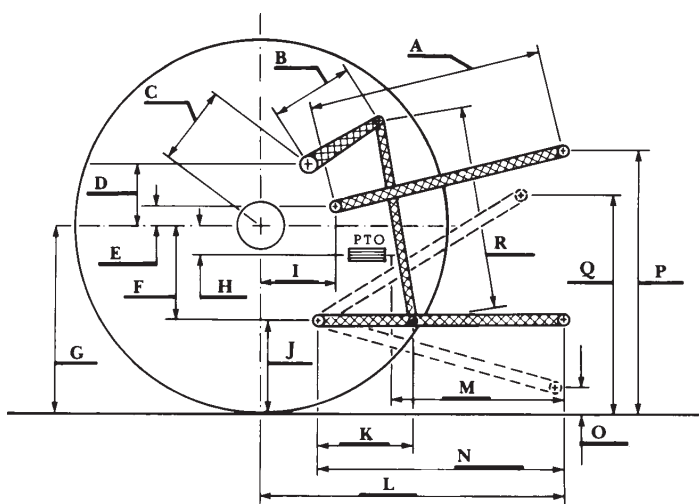
Observed Maximum Pressure psi(bar) 2800(193)  
 Location lift cylinder  
 Hydraulic oil Temperature °F(°C) 150 (65)  
 Location hydraulic sump  
 Category IVN  
 Quick Attach None

#### System Pressure - 2600 psi (179 bar)

Hitch point distance to ground level in. (mm)	8.0 (203)	19.4 (492)	27.2 (692)	35.1 (892)	44.1 (1120)
Lift force on frame lb.	25955	22535	20220	17905	13430
" " " " " (kN)	(115.4)	(100.2)	(89.9)	(79.6)	(59.7)

#### ASAE Test - System Pressure - 2800 psi (193 bar)

Hitch point distance to ground level in. (mm)	8.0 (203)	19.4 (492)	27.2 (692)	35.1 (892)	44.1 (1120)
Lift force on frame lb.	28025	24315	21820	19325	14465
" " " " " (kN)	(124.7)	(108.2)	(97.1)	(86.0)	(64.4)



#### HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	27.8	705
B	18.6	472
C	27.0	685
D	19.0	483
E	13.4	341
F	10.4	263
G	33.7	855
H	1.7	43
I	25.3	642
J	23.3	592
K	18.0	457
L	53.4	1356
M	25.3	718
N	43.0	1092
O	9.1	230
P	50.3	1277
Q	41.3	1050
R	33.1	842