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4-19-1988

## Test 1607: White 160 Diesel and White Workhorse 170 Diesel 18-Speed

Nebraska Tractor Test Lab

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

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# NEBRASKA TRACTOR TEST 1607—WHITE 160 DIESEL ALSO WHITE WORKHORSE 170 DIESEL 18 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 — 1016 rpm)								
162.47 (121.15)	2200	9.239 (34.974)	0.393 (0.239)	17.59 (3.464)	183 (83.9)	62 (16.6)	75 (24.1)	28.69 (96.87)
Standard Power Take-off Speed (1000 rpm) — One Hour								
165.97 (123.76)	2167	9.333 (35.330)	0.389 (0.236)	17.78 (3.503)	183 (84.1)	61 (16.3)	75 (23.9)	28.69 (96.86)
VARYING POWER AND FUEL CONSUMPTION — Two Hours								
142.31 (106.12)	2271	8.363 (31.656)	0.406 (0.247)	17.02 (3.352)	182 (83.1)	61 (16.1)	74 (23.3)	..... .....
0.00 (0.00)	2389	2.816 (10.661)	..... .....	..... .....	177 (80.3)	62 (16.7)	75 (23.9)	..... .....
73.15 (54.55)	2324	5.320 (20.140)	0.503 (0.306)	13.75 (2.709)	180 (82.2)	62 (16.7)	75 (23.6)	..... .....
164.28 (122.50)	2199	9.213 (34.875)	0.388 (0.236)	17.83 (3.513)	184 (84.2)	62 (16.7)	76 (24.2)	..... .....
36.92 (27.53)	2345	4.092 (15.491)	0.766 (0.466)	9.02 (1.777)	177 (80.6)	62 (16.4)	75 (23.9)	..... .....
108.32 (80.77)	2294	6.796 (25.725)	0.434 (0.264)	15.94 (3.140)	180 (82.2)	62 (16.7)	76 (24.2)	..... .....
Av Av	87.58 (65.31)	2303 (23.091)	6.100 (0.293)	0.481 (2.828)	14.36 (82.1)	180 (16.5)	62 (23.8)	75 (96.86)

## DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

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 12th (4D) Gear											
140.37 (104.68)	8441 (37.55)	6.24 (10.04)	2201	2.53	9.084 (34.388)	0.447 (0.272)	15.45 (3.044)	183 (83.9)	49 (9.4)	66 (18.9)	28.92 (97.66)
75% of Pull at Maximum Power — Ten Hours 12th (4D) Gear											
111.86 (83.42)	6437 (28.63)	6.52 (10.49)	2284	1.73	7.800 (29.525)	0.482 (0.293)	14.34 (2.825)	183 (84.1)	53 (11.9)	70 (21.1)	28.81 (97.30)
50% of Pull at Maximum Power — Two Hours 12th (4D) Gear											
76.08 (56.74)	4291 (19.09)	6.65 (10.70)	2320	1.28	6.191 (23.436)	0.563 (0.342)	12.29 (2.421)	181 (82.8)	40 (4.4)	52 (10.8)	29.10 (98.25)
50% of Pull at Reduced Engine Speed—Two Hours 15th (5O) Gear											
76.07 (56.73)	4291 (19.09)	6.65 (10.70)	1647	1.28	5.193 (19.658)	0.472 (0.287)	14.65 (2.886)	181 (82.8)	44 (6.4)	57 (13.9)	29.07 (98.15)

## MAXIMUM POWER IN SELECTED GEARS

128.21 (95.61)	18055 (80.31)	2.66 (4.29)	2246	12.10	5th (2D) Gear			181 (82.5)	36 (2.2)	43 (6.1)	29.06 (98.13)
138.34 (103.16)	15667 (69.69)	3.31 (5.33)	2199	5.92	6th (2O) Gear			NA NA	44 (6.7)	53 (11.7)	28.97 (97.83)
139.18 (103.79)	13605 (60.52)	3.84 (6.17)	2200	4.46	7th (3U) Gear			182 (83.3)	44 (6.7)	53 (11.7)	28.97 (97.83)
142.57 (106.31)	11314 (50.33)	4.73 (7.60)	2199	3.55	8th (3D) Gear			182 (83.3)	44 (6.7)	53 (11.7)	28.97 (97.83)
140.61 (104.85)	10382 (46.18)	5.08 (8.17)	2200	3.13	9th (4U) Gear			182 (83.3)	46 (7.8)	59 (15.0)	28.98 (97.86)
139.22 (103.82)	9247 (41.13)	5.65 (9.09)	2200	2.71	10th (3O) Gear			183 (83.6)	46 (7.8)	59 (15.0)	28.98 (97.86)
140.53 (104.80)	8688 (38.64)	6.07 (9.76)	2199	2.62	11th (5U) Gear			182 (83.3)	46 (7.8)	59 (15.0)	28.98 (97.86)
142.74 (106.44)	8582 (38.17)	6.24 (10.04)	2202	2.54	12th (4D) Gear			182 (83.3)	48 (8.9)	63 (17.2)	28.96 (97.79)
138.81 (103.51)	7013 (31.19)	7.42 (11.95)	2200	2.11	13th (4O) Gear			182 (83.3)	46 (7.8)	59 (15.0)	28.98 (97.86)
142.60 (106.33)	7190 (31.98)	7.44 (11.97)	2201	1.93	14th (5D) Gear			182 (83.3)	46 (7.8)	59 (15.0)	28.98 (97.86)
137.54 (102.57)	5833 (25.94)	8.84 (14.23)	2199	1.67	15th (5O) Gear			182 (83.3)	46 (7.8)	59 (15.0)	28.98 (97.96)

Department of Agricultural Engineering

Dates of Test: April 5 to 19, 1988

**Manufacturer:** WHITE-NEW IDEA FARM EQUIPMENT COMPANY, Division of Allied Products, 123 West Sycamore Street, Coldwater, Ohio 45828

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel Cetane No. 49.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F (15/15°C)** 0.8303 **Fuel weight** 6.913 lbs/gal (0.828 kg/l) **Oil SAE 15W40 API service classification** CC, CD/SD, SE, SF **To motor** 5.263 gal (19.921 l) **Drained from motor** 4.497 gal (17.022 l) **Transmission and powershift lubricant** WFE universal fluid **Front axle lubricant** SAE 90 gear lubricant API GL-5 **Total time engine was operated** 39.5 hours.

**ENGINE:** Make Consolidated Diesel Corporation-Cummins Diesel **Type** six cylinder vertical with turbocharger **Serial No.** 44207046 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.49" × 5.32" (114 mm × 135 mm) **Compression ratio** 17.3 to 1 **Displacement** 504.5 cu in (8270 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, separate radiators for transmission and powershift oils **Fuel filter** two paper elements and water separator **Fuel cooler** radiator for injection pump return fuel **Muffler** vertical **Cooling medium temperature control** two thermostats.

**CHASSIS:** **Type** front wheel assist with duals **Serial No.** \*401099-I60F\* **Tread width** rear 65" (1651 mm) to 126" (3200 mm) front 65" (1651 mm) to 82.5" (2096 mm) **Wheel base** 91" (2311 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 34.2" (867 mm) Vertical distance above roadway 38.9" (988 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 (3) range operator controlled powershift **Advertised speeds mph (km/h)** first 1.8 (2.9) second 2.1 (3.4) third 2.3 (3.7) fourth 2.5 (4.0) fifth 2.8 (4.5) sixth 3.3 (5.3) seventh 3.8 (6.1) eighth 4.6 (7.4) ninth 4.9 (7.9) tenth 5.5 (8.8) eleventh 5.9 (9.5) twelfth 6.0 (9.6) thirteenth 7.1 (11.4) fourteenth 7.1 (11.4) fifteenth 8.5 (13.7) sixteenth 12.6 (20.3) seventeenth 15.3 (24.7) eighteenth 18.2 (29.3) reverse 2.0 (3.2), 2.5 (4.0), 3.0 (4.8), 4.4 (7.1), 5.4 (8.7), 6.3 (10.1) **Clutch** dual dry disc operated by foot pedal **Brakes** multiple wet disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 163.5" (4.15 m) left 163.5"

### LUGGING ABILITY IN 12th (4D) GEAR

Crankshaft Speed rpm	2202	1985	1763	1546	1318	1100
Pull—lbs (kN)	8582 (38.17)	10283 (45.74)	11587 (51.54)	12220 (54.36)	11997 (53.37)	10649 (47.37)
Increase in Pull %	0	20	35	42	40	24
Power—Hp (kW)	142.74 (106.44)	153.26 (114.29)	152.56 (113.77)	140.70 (104.92)	117.77 (87.82)	87.74 (65.43)
Speed—Mph (km/h)	6.24 (10.04)	5.59 (8.99)	4.94 (7.95)	4.32 (6.95)	3.68 (5.92)	3.09 (4.97)
Slip %	2.54	2.96	3.64	3.97	3.97	3.30

### TRACTOR SOUND LEVEL WITH CAB

	Front Wheel Drive Disengaged dB(A)	Engaged dB(A)
Maximum Available Power—Two Hours	77.5	76.5
75% of Pull at Maximum Power—Ten Hours		76.5
50% of Pull at Maximum Power—Two Hours		76.5
50% of Pull at Reduced Engine Speed—Two Hours		76.5
Bystander in 18th (60) gear	86.5	

### DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

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)
<b>Maximum Available Power — Two hours 12th (4D) Gear</b>											
138.42 (103.22)	8442 (37.55)	6.15 (9.90)	2199 (9.90)	3.48	9.077 (34.361)	0.453 (0.276)	15.25 (3.004)	184 (84.2)	51 (10.6)	70 (20.8)	28.88 (97.52)

### MAXIMUM POWER IN SELECTED GEARS

113.41 (84.57)	13768 (61.24)	3.09 (4.97)	2272	14.76	6th (2O) Gear	181 (82.5)	38 (3.3)	47 (8.3)	29.08 (98.20)
142.52 (106.28)	8674 (38.58)	6.16 (9.92)	2201	3.44	12th (4D) Gear	182 (83.3)	46 (7.8)	59 (15.0)	28.98 (97.86)

### TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
<b>Rear Tires</b>	—No., size, ply & psi (kPa) Four 20.8R38; 8; 12 (85)	Four 20.8R38; 8; 12 (85)
<b>Ballast</b>	—Liquid (each) None	None
	—Effect of front wts. (each) -90 lb (-41 kg)	None
<b>Front Tires</b>	—No., size, ply & psi (kPa) Two 18.4-26; 6; 16 (110)	Two 18.4-26; 6; 16 (110)
<b>Ballast</b>	—Liquid (each) None	None
	—Cast Iron (each) 960 lb (436 kg)	None
<b>Height of Drawbar</b>	22.5 in (570 mm)	22.5 in (570 mm)
<b>Static Weight with Operator—Rear</b>	11050 lb (5012 kg)	11410 lb (5176 kg)
—Front	7800 lb (3538 kg)	5880 lb (2667 kg)
—Total	18850 lb (8550 kg)	17290 lb (7843 kg)

### THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi (kPa)	2275 (15690)
Location	remote outlet
Hydraulic oil temperature °F (°C)	161 (72)
Location	pump inlet
<b>Maximum Lift Capacity</b>	
QUICK ATTACH	yes
CATEGORY	III
LOAD lbs (kg)	*7035 (3191)
TIME sec	5.42
<b>HITCH POINT MOVEMENT in (mm)</b>	
Lowest position	14.1 (358)
Top of timed range	40.1 (1019)
Highest position	40.1 (1019)
<b>LOAD CG MOVEMENT in (mm)</b>	
Lowest position	13.0 (330)
Top of timed range	45.0 (1143)
Highest position	45.0 (1143)

\*Manufacturers claim was 8000 lb (3628 kg)

(4.15 m)(on concrete surface without brake) right 212.5" (5.40 m) left 212.5" (5.40 m) **Turning space diameter** (on concrete surface with brake applied) right 345.5" (8.78 m) left 345.5" (8.78 m)(on concrete surface without brake) right 452.5" (11.49 m) left 452.5" (11.49 m) **Power take-off** 1000 rpm at 2167 engine rpm **Unladen tractor mass** 15610 lb (7081 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 codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 130 °F (54°C). Eleven gears were chosen between 15% slip and 10 mph (16.1 km/h). The pull in 5th (2D) gear was limited to avoid tractor bouncing.

We, the undersigned, certify that this is as true and correct report of official Tractor Test No. 1607, May 17, 1988.

Note: Report reissued, supplemental sales permit for White Workhorse 170 Diesel November, 1991.

LOUIS I. LEVITICUS

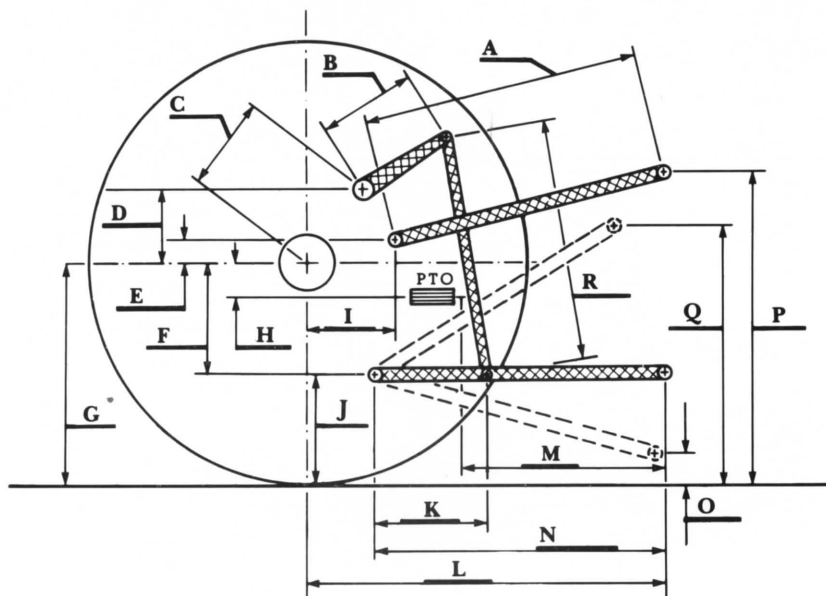
Engineer-in-charge

K. VON BARGEN

R. D. GRISSO

L. L. BASHFORD

Board of Tractor Test Engineers



Hitch Dimensions as Tested — No Load

	inch	mm
A	24.6	625
B	16.0	406
C	20.1	511
D	18.6	472
E	10.4	263
F	10.2	260
G	33.1	841
H	1.9	48
I	19.9	505
J	22.9	581
K	22.3	566
L	45.3	1151
L'	49.9	1267
M	23.4	594
N	34.8	884
O	6.5	165
P	46.3	1175
Q	36.5	927
R	39.9	1013

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### WHITE WORKHORSE 170 DIESEL THREE POINT HITCH PERFORMANCE (From Nebraska Tractor Test 1635) DEUTZ ALLIS 9190 DIESEL

Observed Maximum Pressure psi. (kPa)	2500 (17235)
Location	remote outlet
Hydraulic oil temperature °F (°C)	179 (82)
Location	hydraulic suction line

	Maximum Lift Capacity	
QUICK ATTACH	No	Yes
CATEGORY	III	III
LOAD lbs (kg)	9898 (4490)	7966 (3613)
TIME sec	8.63	5.53
HITCH POINT MOVEMENT in (mm)		
Lowest position	14.0 (356)	13.2 (335)
Top of timed range	*39.2 (996)	40.0 (1016)
Highest position	**39.2 (996)	40.2 (1021)
LOAD CG MOVEMENT in (mm)		
Lowest position	14.1 (357)	13.3 (337)
Top of timed range	40.7 (1033)	41.5 (1053)
Highest position	40.7 (1033)	41.7 (1058)

\*The observed power range 25.2" (645 mm) does not meet the minimum power range 26.0" (660 mm) specified by ASAE Standard S217.10

\*\*The observed highest position 39.2" (996 mm) is less than the minimum height for highest position for Cat III, 40.0" (1016 mm) specified by ASAE Standard S217.10



White 160 Diesel

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