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## Test 1319: International 3388 and 6388 Diesel 16-Speed

Nebraska Tractor Test Lab

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

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# NEBRASKA TRACTOR TEST 1319 — INTERNATIONAL 3388 DIESEL ALSO INTERNATIONAL 6388 DIESEL 16 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—1159 rpm)								
130.61 (97.39)	2400	8.381 (31.724)	0.449 (0.273)	15.58 (3.070)	189 (87.2)	67 (19.2)	75 (23.8)	28.850 (97.422)
Standard Power Take-off Speed (1000 rpm)—One Hour								
128.59 (95.89)	2070	7.631 (28.888)	0.415 (0.253)	16.85 (3.319)	189 (87.3)	66 (18.9)	75 (23.8)	28.860 (97.456)

## VARYING POWER AND FUEL CONSUMPTION—Two Hours

115.24 (85.93)	2494	7.779 (29.445)	0.472 (0.287)	14.82 (2.918)	187 (86.1)	67 (19.4)	76 (24.2)	.....
0.00 (0.00)	2640	3.013 (11.405)	.....	.....	182 (83.3)	66 (19.2)	75 (23.9)	.....
59.44 (44.32)	2574	5.426 (20.539)	0.639 (0.389)	10.95 (2.158)	184 (84.4)	67 (19.4)	75 (23.9)	.....
130.88 (97.60)	2400	8.361 (31.651)	0.447 (0.272)	15.65 (3.084)	188 (86.9)	67 (19.4)	75 (23.9)	.....
30.26 (22.57)	2607	4.166 (15.769)	0.964 (0.586)	7.27 (1.431)	183 (83.9)	67 (19.4)	75 (23.9)	.....
87.98 (65.60)	2534	6.583 (24.919)	0.524 (0.319)	13.36 (2.633)	186 (85.6)	67 (19.4)	75 (23.9)	.....
<b>Av 70.63</b> <b>Av (52.67)</b>	<b>2542</b>	<b>5.888</b> <b>(22.288)</b>	<b>0.584</b> <b>(0.355)</b>	<b>12.00</b> <b>(2.363)</b>	<b>185</b> <b>(85.0)</b>	<b>67</b> <b>(19.4)</b>	<b>75</b> <b>(23.9)</b>	<b>28.873</b> <b>(97.501)</b>

## 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 8th (4LoDD) Gear											
111.75 (83.33)	6864 (30.53)	6.10 (9.83)	2400	2.30	8.268 (31.297)	0.518 (0.315)	13.52 (2.662)	190 (87.8)	69 (20.6)	77 (25.0)	28.855 (97.439)
75% of Pull at Maximum Power—Ten Hours 8th (4LoDD) Gear											
89.92 (67.05)	5232 (23.27)	6.44 (10.37)	2519	1.75	7.389 (27.971)	0.575 (0.350)	12.17 (2.397)	187 (86.1)	70 (21.3)	77 (25.0)	28.793 (97.230)
50% of Pull at Maximum Power—Two Hours 8th (4LoDD) Gear											
61.24 (45.67)	3483 (15.49)	6.59 (10.61)	2568	1.37	6.071 (22.983)	0.694 (0.422)	10.09 (1.987)	185 (84.7)	65 (18.3)	71 (21.7)	28.870 (97.490)
50% of Pull at Reduced Engine Speed—Two Hours 11th (2HiTA) Gear											
61.80 (46.08)	3508 (15.60)	6.61 (10.63)	1501	1.24	4.554 (17.237)	0.516 (0.314)	13.57 (2.673)	186 (85.6)	72 (21.9)	78 (25.3)	28.900 (97.591)

## MAXIMUM POWER IN SELECTED GEARS

93.58 (69.78)	16764 (74.57)	2.09 (3.37)	2490	11.54	2nd (1LoDD) Gear			186 (85.6)	63 (17.2)	66 (18.9)	28.870 (97.490)
110.65 (82.51)	14552 (64.73)	2.85 (4.59)	2402	6.83	3rd (2LoTA) Gear			189 (87.2)	68 (20.0)	76 (24.4)	28.880 (97.523)
112.14 (83.62)	12358 (54.97)	3.40 (5.48)	2401	4.96	4th (2LoDD) Gear			190 (87.5)	68 (20.0)	77 (25.0)	28.880 (97.523)
113.37 (84.54)	9765 (43.44)	4.35 (7.01)	2401	3.34	5th (3LoTA) Gear			189 (87.2)	66 (18.9)	73 (22.8)	28.870 (97.490)
113.40 (84.57)	8306 (36.95)	5.12 (8.24)	2400	2.76	6th (3LoDD) Gear			190 (87.5)	66 (18.9)	73 (22.8)	28.870 (97.490)
113.16 (84.39)	8166 (36.33)	5.20 (8.36)	2399	2.68	7th (4LoTA) Gear			190 (87.8)	67 (19.4)	74 (23.3)	28.860 (97.456)
113.79 (84.86)	6983 (31.06)	6.11 (9.83)	2400	2.35	8th (4LoDD) Gear			190 (87.8)	67 (19.4)	74 (23.3)	28.860 (97.456)
114.42 (85.32)	6430 (28.60)	6.67 (10.74)	2399	2.18	9th (1HiTA) Gear			190 (87.8)	67 (19.4)	74 (23.3)	28.880 (97.523)
113.07 (84.32)	5413 (24.08)	7.83 (12.61)	2398	1.67	10th (1HiDD) Gear			190 (87.5)	67 (19.4)	75 (23.9)	28.880 (97.523)

Department of Agricultural Engineering

Dates of Test: August 21 to 27, 1979

Manufacturer: INTERNATIONAL HARVESTER COMPANY, 401 North Michigan Avenue, Chicago, Illinois 60611.

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel Cetane No. 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8407 **Fuel weight** 7.000 lbs/gal (0.839 kg/l) **Oil** SAE 30 **API service classification** SC/SE-CA/CD **To motor** 3.932 gal (14.883 l) **Drained from motor** 3.723 gal (14.092 l) **Transmission and final drive lubricant** I.H. Hytran Fluid **Total time engine was operated** 37.0 hours

**ENGINE:** Make International Diesel Type 6 cylinder vertical with turbocharger **Serial No.** 437TT2U101187\* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 4.300" × 5.000" (109.2 mm × 127.0 mm) **Compression ratio** 16.0 to 1 **Displacement** 436 cu in (7140 ml) **Cranking system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements **Oil filter** two paper cartridges **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** one thermostat

**CHASSIS:** Type four wheel drive **Serial No.** 2880003U8820\* **Tread width** rear 59.8" (1519 mm) to 104" (2642 mm) front 59.8" (1519 mm) to 104" (2642 mm) **Wheel base** 110" (2794 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 60.9" (1547 mm) Vertical distance above roadway 41.9" (1064 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 (2) range operator controlled powershift **Advised speeds mph (km/h)** first 1.8 (3.0) second 2.2 (3.5) third 2.9 (4.7) fourth 3.4 (5.5) fifth 4.3 (6.9) sixth 5.0 (8.0) seventh 5.1 (8.1) eighth 5.9 (9.5) ninth 6.5 (10.4) tenth 7.6 (12.2) eleventh 10.1 (16.3) twelfth 11.9 (19.7) thirteenth 14.9 (24.0) fourteenth 17.4 (28.1) fifteenth 17.7 (28.4) sixteenth 20.7 (33.3) reverse 3.2 (5.1), 3.7 (6.0), 5.0 (8.0), 5.8 (9.4), 7.3 (11.8), 8.6 (13.8), 8.7 (14.0), 10.2 (16.4) **Clutch** single dry disc operated by foot pedal with hydraulic power assist **Brakes** multiple wet disc hydraulically power actuated and operated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 194.4" (4.94 m) left 194.4" (4.94 m) **Turning space diameter** (on concrete surface without brake) right 432.2" (10.98 m) left 432.2" (10.98 m) **Power take-off** 1000 rpm at 2070 engine rpm and 540 rpm at 2105 engine rpm.

### LUGGING ABILITY IN 8th (4LoDD) GEAR

Crankshaft Speed rpm	2400	2162	1920	1684	1445	1203
Pull—lbs (kN)	6983 (31.06)	7835 (34.85)	8323 (37.02)	8682 (38.62)	8305 (36.94)	7551 (33.59)
Increase in Pull %	0	12	19	24	19	8
Power—Hp (kW)	113.79 (84.86)	114.61 (85.47)	107.91 (80.47)	98.55 (73.49)	81.00 (60.40)	61.48 (45.85)
Speed—Mph (km/h)	6.11 (9.83)	5.49 (8.83)	4.86 (7.82)	4.26 (6.85)	3.66 (5.89)	3.05 (4.91)
Slip %	2.35	2.51	2.68	3.01	2.68	2.51

### TRACTOR SOUND LEVEL WITH CAB dB(A)

Maximum Available Power—Two Hours	78.0
75% of Pull at Maximum Power—Ten Hours	78.5
50% of Pull at Maximum Power—Two Hours	78.0
50% of Pull at Reduced Engine Speed—Two Hours	75.5
Bystander in 15th (4HiTA) gear	87.0

### TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 18.4R38; 8; 16 (110)	Two 18.4R38; 8; 16 (110)
	—Liquid (each)	None	None
	—Test Equipment (each)	130 lb (59 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 18.4R38; 8; 16 (110)	Two 18.4R38; 8; 16 (110)
	—Liquid (each)	None	None
	—Test Equipment (each)	85 lb (39 kg)	None
Height of Drawbar		20.5 in (520 mm)	20.5 in (520 mm)
Static Weight with Operator—	Rear	8080 lb (3665 kg)	7820 lb (3547 kg)
	Front	9770 lb (4432 kg)	9600 lb (4355 kg)
	Total	17850 lb (8097 kg)	17420 lb (7902 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. Temperature at injection pump return was 165°F (73.7°C). Nine gears were chosen between 15% slip and 10 mph (16.1 km/h). The pull in 2nd (1LoDD) gear was limited to avoid tractor bouncing.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1319.

LOUIS I. LEVITICUS

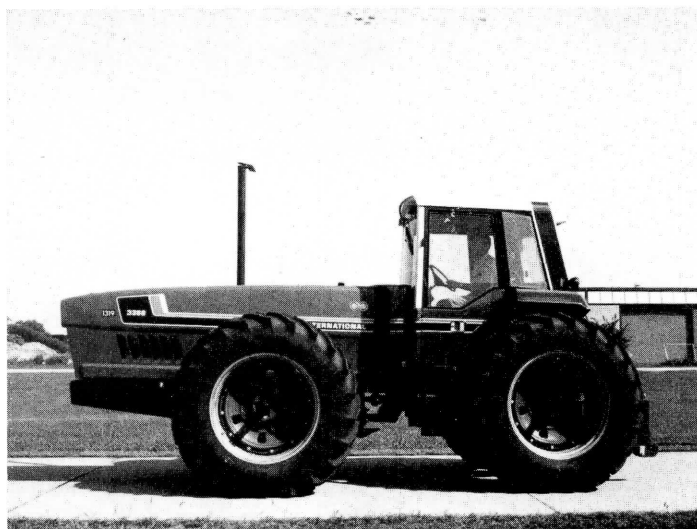
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

K. VON BARGEN

Board of Tractor Test Engineers



International 3388 Diesel