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Test 1247: International 1086 Diesel 16-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1247 — INTERNATIONAL 1086 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)								
131.41 (97.99)	2400	8.583 (32.489)	0.455 (0.277)	15.31 (3.016)	189 (87.1)	62 (16.5)	75 (24.1)	29.053 (98.109)
Standard Power Take-off Speed (1000 rpm)—One Hour								
133.67 (99.68)	2070	8.157 (30.877)	0.425 (0.258)	16.39 (3.228)	192 (88.9)	62 (16.4)	76 (24.2)	29.045 (98.081)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
115.91 (86.43)	2490	7.973 (30.181)	0.479 (0.291)	14.54 (2.864)	187 (86.1)	62 (16.4)	77 (25.0)	..... .....
0.00 (0.00)	2675	2.918 (11.045)	..... .....	..... .....	178 (81.4)	60 (15.6)	75 (23.9)	..... .....
60.12 (44.83)	2588	5.404 (20.458)	0.626 (0.381)	11.12 (2.191)	182 (83.3)	60 (15.6)	76 (24.7)	..... .....
130.52 (97.33)	2401	8.550 (32.367)	0.456 (0.277)	15.26 (3.007)	190 (87.8)	62 (16.7)	80 (26.4)	..... .....
30.64 (22.85)	2638	4.258 (16.118)	0.967 (0.588)	7.20 (1.417)	180 (82.2)	63 (17.2)	78 (25.8)	..... .....
88.74 (66.17)	2538	6.684 (25.303)	0.524 (0.319)	13.28 (2.615)	186 (85.3)	64 (18.1)	81 (27.2)	..... .....
Av Av	70.99 (52.94)	5.965 (22.579)	0.585 (0.356)	11.90 (2.344)	184 (84.4)	62 (16.6)	78 (25.5)	29.043 (98.075)

DRAWBAR PERFORMANCE WITH RADIAL TIRES

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW/hil)	Cool- ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 8th (1-HiTA) Gear											
113.04 (84.29)	7727 (34.37)	5.49 (8.83)	2398	4.40	8.512 (32.220)	0.524 (0.319)	13.28 (2.616)	192 (88.9)	61 (15.8)	83 (28.3)	28.880 (97.523)
75% of Pull at Maximum Power—Ten Hours 8th (1-HiTA) Gear											
92.17 (68.73)	5961 (26.51)	5.80 (9.33)	2504	3.28	7.456 (28.223)	0.563 (0.342)	12.36 (2.435)	189 (86.9)	68 (20.1)	86 (29.8)	28.598 (96.571)
50% of Pull at Maximum Power—Two Hours 8th (1-HiTA) Gear											
63.60 (47.42)	3958 (17.61)	6.02 (9.70)	2576	2.31	6.087 (23.044)	0.666 (0.405)	10.45 (2.058)	182 (83.1)	56 (13.1)	66 (18.9)	28.800 (97.253)
50% of Pull at Reduced Engine Speed—Two Hours 12th (2-HiDD) Gear											
63.72 (47.52)	3974 (17.68)	6.01 (9.68)	1507	2.23	4.525 (17.130)	0.494 (0.301)	14.08 (2.774)	185 (85.0)	59 (14.7)	72 (21.9)	28.810 (97.287)

MAXIMUM POWER IN SELECTED GEARS

93.54 (69.75)	13503 (60.06)	2.60 (4.18)	2511	11.52	4th (2-LoDD) Gear	184 (84.4)	54 (12.2)	62 (16.7)	28.810 (97.287)
112.41 (83.83)	9164 (40.76)	4.60 (7.40)	2398	5.40	6th (3-LoDD) Gear	192 (88.6)	60 (15.6)	82 (27.8)	28.910 (97.625)
116.28 (86.71)	7946 (35.35)	5.49 (8.83)	2402	4.40	8th (1-HiTA) Gear	190 (87.8)	59 (15.0)	80 (26.7)	28.950 (97.760)
113.53 (84.66)	6807 (30.28)	6.25 (10.06)	2399	3.65	9th (4-LoDD) Gear	192 (88.6)	60 (15.6)	81 (27.2)	28.920 (97.659)
115.30 (85.98)	6064 (26.97)	7.13 (11.48)	2400	3.22	10th (1-HiDD) Gear	190 (87.8)	60 (15.6)	81 (27.2)	28.930 (97.692)
115.82 (86.37)	5868 (26.10)	7.40 (11.91)	2400	3.04	11th (2-HiTA) Gear	191 (88.3)	60 (15.6)	82 (27.8)	28.900 (97.591)

LUGGING ABILITY IN 8th (1-HiTA) GEAR

Crankshaft Speed rpm	2402	2153	1925	1683	1443	1196
Pull—lbs (kN)	7946 (35.35)	9174 (40.81)	9857 (43.84)	10305 (45.84)	10411 (46.31)	9327 (41.49)
Increase in Pull %	0	15	24	30	31	17
Power—Hp (kW)	116.28 (86.71)	119.32 (88.98)	113.68 (84.77)	103.41 (77.12)	89.32 (66.61)	67.11 (50.04)
Speed—Mph (km/h)	5.49 (8.83)	4.88 (7.85)	4.33 (6.96)	3.76 (6.06)	3.22 (5.18)	2.70 (4.34)
Slip %	4.40	5.40	6.05	6.53	6.85	5.72

Department of Agricultural Engineering

Dates of Test: June 2 to 14, 1977

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

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 51.8 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8360 **Fuel weight** 6.961 lbs/gal (0.834 kg/l) **Oil SAE 30 API service classification** CA-CD/SC-SE **To motor** 4.214 gal (15.952 l) **Drained from motor** 3.759 gal (14.229 l) **Transmission and final drive lubricant** IH Hy-tran Fluid **Total time engine was operated** 63 hours

ENGINE: Make International Diesel Type 6 cylinder vertical with turbocharger **Serial No.** 414 TT 2U 104913* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 4.30" × 4.75" (109.2 mm × 120.6 mm) **Compression ratio** 16 to 1 **Displacement** 414 cu in (6782 ml) **Cranking system** 12 volt **Lubrication pressure** **Air cleaner** two paper elements **Oil Filter** two full flow paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Fuel filter** two paper cartridges **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** thermostat

CHASSIS: Type standard **Serial No.** 2610176 U0 16741* **Tread width** rear 62" (1575 mm) to 118" (3000 mm) front 60" (1524 mm) to 84" (2134 mm) **Wheel base** 104.8" (2662 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 29.7" (754 mm) Vertical distance above roadway 42.4" (1077 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 power shift **Advertised speeds mph (km/h)** first 1.5 (2.4) second 2.0 (3.2) third 2.0 (3.2) fourth 2.6 (4.2) fifth 3.5 (5.6) sixth 4.5 (7.2) seventh 4.7 (7.5) eighth 5.4 (8.7) ninth 6.0 (9.6) tenth 6.9 (11.1) eleventh 7.1 (11.4) twelfth 9.2 (14.8) thirteenth 12.4 (19.9) fourteenth 15.9 (25.6) fifteenth 16.5 (26.5) sixteenth 21.2 (34.1) reverse 2.6 (4.2), 3.4 (5.4), 3.5 (5.6), 4.5 (7.2), 6.1 (9.8), 7.8 (12.6), 8.1 (13.0), 10.4 (16.7) **Clutch** single dry disc operated by foot pedal with hydraulic power assist **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 139" (3.53 m) left 139" (3.53 m) (on concrete surface without brake) right 162" (4.11 m) left 162" (4.11 m) **Turning space diameter** (on concrete surface with brake applied) right 288.6" (7.33 m) left 288.6" (7.33 m) (on concrete surface without brake) right 335" (8.51 m) left 335" (8.51 m) **Power take-off** 540 rpm at 2106 engine rpm and 1000 rpm at 2070 engine rpm

TRACTOR SOUND LEVEL WITH CAB AND RADIAL TIRES	dB(A)
Maximum Available Power—Two Hours	78.5
75% of Pull at Maximum Power—Ten Hours	78.5
50% of Pull at Maximum Power—Two Hours	80.5
50% of Pull at Reduced Engine Speed—Two Hours	77.0
Bystander in 16th (4-HiDD) gear	86.0

DRAWBAR PERFORMANCE WITH BIAS PLY TIRES

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 (1-HiTA) Gear												
108.99 (81.27)	8049 (35.80)	5.08 (8.17)	2400	7.30	8.494 (32.152)	0.542 (0.330)	12.83 (2.528)	189 (87.2)	66 (18.9)	72 (21.9)	28.960 (97.794)	
75% of Pull at Maximum Power—Two Hours 8th (1-HiTA) Gear												
89.79 (66.96)	6192 (27.54)	5.44 (8.75)	2516	5.23	7.434 (28.142)	0.576 (0.351)	12.08 (2.379)	185 (85.0)	67 (19.4)	74 (23.3)	28.935 (97.709)	
50% of Pull at Maximum Power—Two Hours 8th (1-HiTA) Gear												
62.13 (46.33)	4113 (18.29)	5.66 (9.12)	2576	3.68	5.908 (22.364)	0.662 (0.403)	10.52 (2.072)	181 (82.8)	66 (18.9)	72 (22.2)	29.035 (98.047)	
50% of Pull at Reduced Engine Speed—Two Hours 12th (2-HiDD) Gear												
62.13 (46.33)	4102 (18.24)	5.68 (9.14)	1513	3.56	4.435 (16.790)	0.497 (0.302)	14.01 (2.759)	185 (84.7)	70 (21.1)	79 (25.8)	29.035 (98.047)	

MAXIMUM POWER IN SELECTED GEARS

78.54 (58.57)	12137 (53.99)	2.43 (3.90)	2536	14.10	4th (2-LoDD) Gear			183 (83.9)	64 (17.8)	66 (18.9)	29.020 (97.996)
107.70 (80.31)	9554 (42.50)	4.23 (6.80)	2398	8.77	6th (3-LoDD) Gear			187 (86.1)	65 (18.3)	70 (21.1)	28.950 (97.760)
111.56 (83.19)	8239 (36.65)	5.08 (8.17)	2400	7.22	8th (1-HiTA) Gear			187 (86.1)	64 (17.8)	67 (19.4)	28.930 (97.692)
110.85 (82.66)	7149 (31.80)	5.81 (9.36)	2399	6.08	9th (4-LoDD) Gear			188 (86.4)	65 (18.3)	70 (21.1)	28.950 (97.760)
114.14 (85.12)	6431 (28.61)	6.66 (10.71)	2400	5.31	10th (1-HiDD) Gear			190 (87.5)	68 (20.0)	74 (23.3)	28.930 (97.692)
113.91 (84.94)	6185 (27.51)	6.91 (11.12)	2400	5.15	11th (2-HiTA) Gear			187 (86.1)	64 (17.8)	69 (20.6)	28.940 (97.726)

LUGGING ABILITY IN 8th (1-HiTA) GEAR

Crankshaft Speed rpm	2400	2160	1922	1684	1438	1199
Pull—lbs (kN)	8239 (36.65)	9572 (42.58)	10313 (45.88)	10805 (48.06)	10847 (48.25)	9839 (43.76)
Increase in Pull %	0	16	25	31	32	19
Power—Hp (kW)	111.56 (83.19)	114.65 (85.50)	108.44 (80.86)	98.36 (73.35)	83.96 (62.61)	64.93 (48.42)
Speed—Mph (km/h)	5.08 (8.17)	4.49 (7.23)	3.94 (6.35)	3.41 (5.49)	2.90 (4.67)	2.47 (3.98)
Slip %	7.22	8.85	9.99	11.24	11.52	9.56

RADIAL PLY TIRES

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 20.8R38; 8; 16 (110)	Two 20.8R38; 8; 16 (110)
	Ballast	1440 lb (653 kg)	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi (kPa)	Two 10.00-16; 6; 32 (220)	Two 10.00-16; 6; 32 (220)
	Ballast	None	None
	—Cast Iron (each)	20 lb (9 kg)	None
Height of Drawbar		22.5 in (570 mm)	22.5 in (570 mm)
Static weight with operator—Rear		12015 lb (5450 kg)	9135 lb (4144 kg)
—Front		3625 lb (1644 kg)	3590 lb (1628 kg)
—Total		15640 lb (7094 kg)	12725 lb (5772 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 160°F (71.1°C). Six gears were chosen between stability limit with radial tires, tangential pull limit for bias ply tires and 15 mph (24.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1247.

LOUIS I. LEVITIGUS

Engineer-in Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

K. VON BARGEN

Board of Tractor Test Engineers



International 1086 Diesel

BIAS PLY TIRES

With Ballast	Without Ballast
Two 20.8-38; 8; 18 (120)	Two 20.8-38; 8; 18 (120)
1530 lb (694 kg)	None
None	None
Two 10.00-16; 6; 32 (220)	Two 10.00-16; 6; 32 (220)
None	None
20 lb (9 kg)	None
22.5 in (570 mm)	22.5 in (570 mm)
12010 lb (5448 kg)	8950 lb (4060 kg)
3625 lb (1644 kg)	3590 lb (1628 kg)
15640 lb (7094 kg)	12540 lb (5688 kg)