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Test 1440: International 3688 Diesel 16-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1440 — INTERNATIONAL 3688 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)								
113.72 (84.80)	2400	7.531 (28.508)	0.462 (0.281)	15.10 (2.975)	191 (88.4)	57 (13.9)	75 (24.0)	28.943 (97.737)
Standard Power Take-off Speed (1000 rpm)—One Hour								
112.48 (83.88)	2071	7.143 (27.039)	0.443 (0.269)	15.75 (3.102)	195 (90.3)	57 (13.8)	75 (23.8)	28.930 (97.692)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
99.71 (74.35)	2478	6.811 (25.782)	0.476 (0.290)	14.64 (2.884)	186 (85.3)	57 (13.9)	76 (24.2)	..... .....
0.00 (0.00)	2610	2.715 (10.277)	..... .....	..... .....	169 (76.1)	56 (13.6)	74 (23.1)	..... .....
51.42 (38.34)	2556	4.655 (17.621)	0.631 (0.384)	11.05 (2.176)	176 (79.7)	56 (13.6)	74 (23.6)	..... .....
113.83 (84.88)	2401	7.551 (28.584)	0.463 (0.281)	15.08 (2.969)	190 (88.1)	57 (13.9)	74 (23.6)	..... .....
26.16 (19.51)	2586	3.653 (13.828)	0.974 (0.592)	7.16 (1.411)	172 (77.5)	58 (14.4)	76 (24.7)	..... .....
76.21 (56.83)	2521	5.696 (21.562)	0.521 (0.317)	13.38 (2.636)	180 (81.9)	58 (14.2)	76 (24.2)	..... .....
Av 61.22 Av (45.65)	2526	5.180 (19.608)	0.590 (0.359)	11.82 (2.328)	179 (81.4)	57 (13.9)	75 (23.9)	28.890 (97.557)

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 (H1) Gear											
99.21 (73.98)	6813 (30.31)	5.46 (8.79)	2400	4.81	7.457 (28.229)	0.524 (0.319)	13.30 (2.621)	183 (83.9)	51 (10.3)	59 (14.7)	28.930 (97.692)
75% of Pull at Maximum Power—Ten Hours 8th (H1) Gear											
78.92 (58.85)	5157 (22.94)	5.74 (9.24)	2491	3.55	6.393 (24.198)	0.565 (0.344)	12.35 (2.432)	180 (82.0)	57 (13.8)	62 (16.8)	28.887 (97.547)
50% of Pull at Maximum Power—Two Hours 8th (H1) Gear											
54.16 (40.39)	3438 (15.29)	5.91 (9.51)	2536	2.44	5.217 (19.747)	0.672 (0.409)	10.38 (2.045)	175 (79.4)	54 (11.9)	60 (15.3)	28.985 (97.878)
50% of Pull at Reduced Engine Speed—Two Hours 12th (H4) Gear											
54.20 (40.41)	3438 (15.29)	5.91 (9.51)	1622	2.44	3.818 (14.454)	0.491 (0.299)	14.19 (2.796)	177 (80.6)	56 (13.3)	64 (17.5)	28.985 (97.878)

MAXIMUM POWER IN SELECTED GEARS

73.52 (54.82)	12250 (54.49)	2.25 (3.62)	2476	14.90	4th (L4) Gear			175 (79.4)	53 (11.7)	57 (13.9)	28.970 (97.827)
96.23 (71.76)	10391 (46.22)	3.47 (5.59)	2401	8.38	5th (L5) Gear			181 (82.5)	51 (10.6)	60 (15.6)	28.930 (97.692)
97.47 (72.68)	8766 (38.99)	4.17 (6.71)	2400	6.37	6th (L6) Gear			183 (83.6)	51 (10.6)	60 (15.6)	28.930 (97.692)
97.51 (72.72)	7648 (34.02)	4.78 (7.70)	2400	5.26	7th (L7) Gear			183 (83.9)	51 (10.6)	60 (15.6)	28.930 (97.692)
100.12 (74.66)	6876 (30.58)	5.46 (8.79)	2400	4.81	8th (H1) Gear			183 (83.6)	50 (10.0)	58 (14.4)	28.920 (97.659)
99.06 (73.87)	6552 (29.14)	5.67 (9.13)	2400	4.50	9th (L8) Gear			183 (83.9)	51 (10.6)	60 (15.6)	28.930 (97.692)
99.76 (74.39)	5778 (25.70)	6.47 (10.42)	2401	3.97	10th (H2) Gear			183 (83.6)	51 (10.6)	60 (15.6)	28.930 (97.692)
100.28 (74.78)	5111 (22.73)	7.36 (11.84)	2400	3.42	11th (H3) Gear			184 (84.2)	51 (10.6)	59 (15.0)	28.930 (97.692)
99.37 (74.10)	4281 (19.04)	8.70 (14.01)	2401	2.88	12th (H4) Gear			183 (83.9)	51 (10.6)	59 (15.0)	28.930 (97.692)

Department of Agricultural Engineering

Dates of Test: May 26 to June 7, 1982

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

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 46.6 (rating taken from oil company's inspection data) Specific gravity converted to 60°/60° (15°/15°) 0.8375 Fuel weight 6.973 lbs/gal (0.836 kg/l) Oil SAE 30 API service classification CD/SE To motor 2.722 gal (10.302 l) Drained from motor 2.129 gal (8.058 l) Transmission and final drive lubricant I.H. Hytran fluid Total time engine was operated 46.0 hours.

ENGINE: Make International Diesel Type six cylinder vertical Serial No. 436DT2U092915* Crankshaft lengthwise Rated rpm 2400 Bore and stroke 4.30" × 5.00" (109.2 mm × 127 mm) Compression ratio 16 to 1 Displacement 436 cu in (7145 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements with aspirator Oil filter two full flow 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 standard with duals Serial No. 2530002U001879* Tread width rear 66" (1676 mm) to 128.5" (3264 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 27.5" (699 mm) Vertical distance above roadway 40.5" (1029 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 Advertised speeds mph (km/h) first 1.6 (2.6) second 1.9 (3.1) third 2.2 (3.5) fourth 2.5 (4.1) fifth 3.7 (6.0) sixth 4.4 (7.0) seventh 5.0 (8.0) eighth 5.6 (9.1) ninth 5.8 (9.4) tenth 6.6 (10.7) eleventh 7.5 (12.1) twelfth 8.8 (14.2) thirteenth 13.0 (20.9) fourteenth 15.3 (24.6) fifteenth 17.4 (28.0) sixteenth 20.4 (32.9) reverse 2.8 (4.5), 3.3 (5.3), 3.7 (5.9), 4.3 (7.0), 6.4 (10.3), 7.5 (12.1), 8.5 (13.7), 10.0 (16.2) Clutch single plate dry disc operated by foot pedal with hydraulic power assist Brakes wet multiple disc hydraulically power actuated and operated by two foot pedals which can be locked together Steering hydrostatic Turning radius (on concrete surface with brake applied) right 141" (3.58 m) left 141" (3.58 m) (on concrete surface without brake) right 172" (4.37 m) left 172" (4.37 m) Turning space diameter (on concrete surface with brake applied) right 291" (7.39 m) left 291" (7.39 m) (on concrete surface without brake) right 354" (8.99 m) left 354" (8.99 m) Power take-off 540 rpm at 2106 engine rpm and 1000 rpm at 2071 engine rpm.

LUGGING ABILITY IN 8th (H1) GEAR

Crankshaft Speed rpm	2400	2161	1925	1679	1447	1197
Pull—lbs (kN)	6876 (30.58)	7736 (34.41)	8350 (37.14)	8708 (38.74)	8704 (38.72)	8463 (37.65)
Increase in Pull %	0	13	21	27	27	23
Power—Hp (kW)	100.12 (74.66)	100.73 (75.11)	96.32 (71.83)	87.28 (65.09)	75.14 (56.03)	60.55 (45.15)
Speed—Mph (km/h)	5.46 (8.79)	4.88 (7.86)	4.33 (6.96)	3.76 (6.05)	3.24 (5.21)	2.68 (4.32)
Slip %	4.81	5.41	5.86	6.30	6.45	6.30

TRACTOR SOUND LEVEL WITH CAB

dB(A)

Maximum Available Power—Two Hours	80.5
75% of Pull at Maximum Power—Ten Hours	82.5
50% of Pull at Maximum Power—Two Hours	80.5
50% of Pull at Reduced Engine Speed—Two Hours	77.0
Bystander in 15th (H7) gear	89.0

TIRES, BALLAST AND WEIGHT

Rear Tires

—No., size, ply & psi (kPa)

Ballast

—Liquid (each inner)

—Test Equip. (each)

Front Tires

Ballast

—No., size, ply & psi (kPa)

—Test Equip. (each)

—Cast Iron (each)

Height of Drawbar

Static Weight with Operator—Rear

—Front

—Total

With Ballast

Inner Two 18.4-38; 8; 12 (85) Outer Two 18.4-38; 6; 12 (85)

250 lb (114 kg)

95 lb (43 kg)

Two 11L-15; 6; 32 (220)

82 lb (37 kg)

45 lb (20 kg)

21.5 in (545 mm)

10610 lb (4813 kg)

3725 lb (1689 kg)

14335 lb (6502 kg)

Without Ballast

Inner Two 18.4-38; 8; 12 (85) Outer Two 18.4-38; 6; 12 (85)

None

None

Two 11L-15; 6; 32 (220)

None

None

21.5 in (545 mm)

9730 lb (4414 kg)

3470 lb (1574 kg)

13200 lb (5988 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 or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 123°F (50.6°C). Nine gears were chosen between 15% slip and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1440.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

W. E. SPLINTER

L. L. BASHFORD

Board of Tractor Test Engineers



International 3688 Diesel