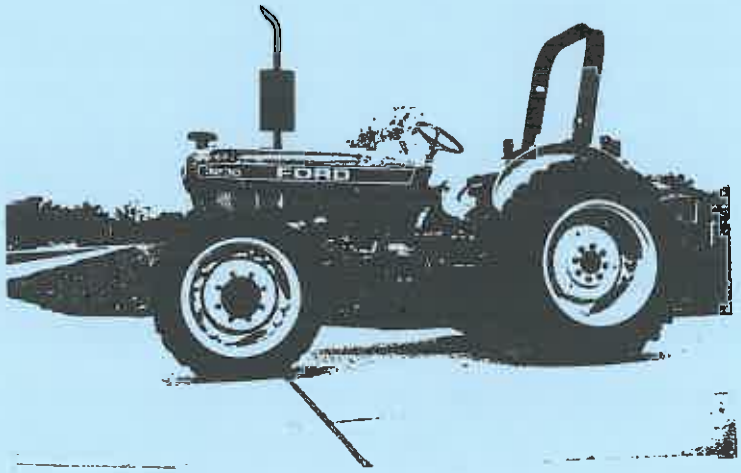
OECD APPROVAL # 1324
(Restricted code)
Date of approval: 6 September 1991

NEBRASKA TRACTOR TESTING LABORATORY
DEPARTMENT OF AGRICULTURAL ENGINEERING
INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF NEBRASKA - EAST CAMPUS
LINCOLN, NEBRASKA 68583-0832, USA

REPORT ON TEST IN ACCORDANCE WITH OECD STANDARD CODE FOR THE OFFICIAL TESTING OF AGRICULTURAL TRACTOR PERFORMANCE

FORD NEW HOLLAND 3230 (4WD) 8 x 2
WITH MECHANICAL FRONT WHEEL DRIVE



Ford 3230 (8 x 2) Diesel

MANUFACTURED BY: FORD NEW HOLLAND LTD
BASILDON, ESSEX
ENGLAND

NEBRASKA TEST NO. 1642

Test date: April 1991

This test report provides the results of the tests conducted in accordance with the OECD Standard Test Code for the Official Testing of Agricultural Tractor Performance - C(87)53 Final - Annex II, Restricted Code.

This report has been approved by the OECD Coordinating Centre in Paris (CEMAGREF) on September 6, 1991

Ford 3230 8 x 2 with MFWD OECD # 1324

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SPECIFICATIONS OF TRACTOR.

Manufacturers name/address	: Ford New Holland Ltd. Basildon, Essex England
Submitted for test by	: The manufacturer
Selected for test by	: The manufacturer in agreement with the test station.
Place of running in	: Ford New Holland New Holland, PA
Duration of running in	: 155 hours
Location of test	: Tractor Testing Laboratory Lincoln, Nebraska, U.S.A.

TRACTOR SPECIFICATIONS.

Make	Ford
Model	3230 (BS 51)
Type	Unit construction, mechanical front wheel drive (4WD)
Number of driving wheels	4
Serial Number	*BC76439*
1st Serial number	*C43103*

ENGINE.

Make	Ford New Holland
Model	B192
Type	Diesel, direct injection
Serial Number	*B293617*
Cylinders	
Number/Disposition	3, in-line, vertical
Bore/stroke	111.8 mm x 106.7 mm (4.4 in x 4.2 in)
Capacity	3142 ml (192 cu in)
Compression Ratio	16.3 - 1
Arrangement of valves	Overhead
Cylinder liners	None, Monobloc construction
Fuel System	
Feed system	Gravity
Make/Type/Model of filters	Plastic strainer in tank and paper element filter with sediment bowl and water trap between tank and injection pump
Fuel Tank capacity	65.7 liters (17.4 US gallons)

Make/Model/Type Injection Pump	Lucas/CAV/DPA 3238F
Pump Serial number	26373 JHG
Production setting of pump Flow Rate	6.6 - 7.5 Kg/h at 2000 rev/min (14.5 - 16.5 lb/h)
Make/Model/Type Injectors	CAV/multi-hole/JB 6801111 nozzle
Injection pressure	23.3-24.3 MPa
Timing	15 degrees before TDC
Governor	
Make/Model/Type	CAV/mechanical
Governed engine speed range	From 600 to 2200 rev/min
Rated engine speed	2000 rev/min
High-idle speed range	2150 - 2200 rev/min
Air Cleaner.	
Pre-cleaner Make/Model/Type	Ford New Holland
Air intake location	Above front hood
Primary Cleaner Make/Model/Type	Locker air maze/dry paper element/pleated paper
Secondary element Make/Model/Type	pleated paper
Maintenance indicator	restriction pressure switch in manifold inlet tube
Lubrication system.	
Type of feed pump	Force feed from eccentric rotor pump
Type of filters	Full flow paper element filter
Number	one
Cooling system.	
Type of coolant	Liquid
Type of pump	Centrifugal
Fan specification	Belt driven
Number of fan blades	4
Fan diameter	406 mm (16 in)
Coolant system capacity	10.4 l (11 qt)
Type of temperature control	1 thermostat
Superpressure system	48 kPa (7 psi)
Starting system.	
Make/Model/Type	Lucas-MME/M127/electro-mechanical engagement
Power Rating	2.8 kW (3.8 hp)
Cold starting aid	CAV Thermostart
Safety device	Transmission neutral switch

Electrical system.	
Voltage & grounding.	12 Volt DC;negative ground
Generator	
Make/Model/Type	Lucas MME A 12755
Power rating	55 Amp at 6000 rev/min.
Batteries	
Number & connection	1-12 V battery
Rating	107 Amp-hour at 20 hour rating 800 cold crank amps
Exhaust system.	
Make/Model/Type	Nelson Burgess two chamber
Location	vertical above hood,left of centerline

TRANSMISSION.

Clutch. (travel)	
Make/Model/Type	AP single dry plate
Number of plates	1
Plate diameter	330 mm (13 in)
Method of operation	mechanical by foot pedal
Gear Box.	
Make/Model/Type	Ford New Holland
Arrangement	4 forward speeds, high/low range selector 1R high/low
Number of gears	8 forward and 2 reverse controlled by two hand levers
Available options	none
Rear axle and final drives.	
Make/Model/Type	Ford New Holland/crown wheel and pinion, differential and epicyclic reduction gear final drive
Differential Lock	
Type	Mechanical
Method of engagement	pedal operated
Method of disengagement	self disengaging

Front Axle and final drives.

Make/Model/Type	Carraro 707/164
Differential lock Type	none

Gear ratios and travel speeds.

(Tire dynamic radius of 610 mm (24.0 in) ISO 4251/1-1984)

Gear Number	Number of engine revolutions for one revolution of the driving wheels	Nominal travel speed at rated engine speed of 2000 rev/min [km/h]	[mph]
1L	164.96	2.79	1.73
2L	132.17	3.48	2.16
3L	75.31	6.10	3.79
4L	55.33	8.30	5.16
1H	46.17	9.94	6.18
2H	36.99	12.41	7.71
3H	21.08	21.76	13.52
4H	15.49	29.75	18.49
1R	114.75	4.00	2.49
2R	32.12	14.30	8.89

Number of front wheel revolutions for one rear wheel revolution. 1.3652

POWER - TAKE - OFF.

Main Power-Take-Off.	
Type	Independent
Method of engagement	Hydraulically actuated multi-plate wet clutch operated by hand lever, independent of main drive clutch.
Number of shafts	One
Method of changing speeds	none
Standard PTO. 540 rev/min.	
Location	Rear of tractor, vertical center plane.
Diameter of shaft	34.9 mm (1.375 in)
Number of splines	6; conforms to ISO 500/1979.
Height above ground	490 mm (19.3 in)
Distance from median plane of tractor	0 mm
Distance behind rear axle	401 mm (15.8 in)
PTO Speed at rated engine spd	600 rev/min
Engine speed at Std. PTO spd	1800 rev/min
Engine speed/PTO speed ratio	3.333
Direction of rotation when viewed from shaft end	Clockwise.

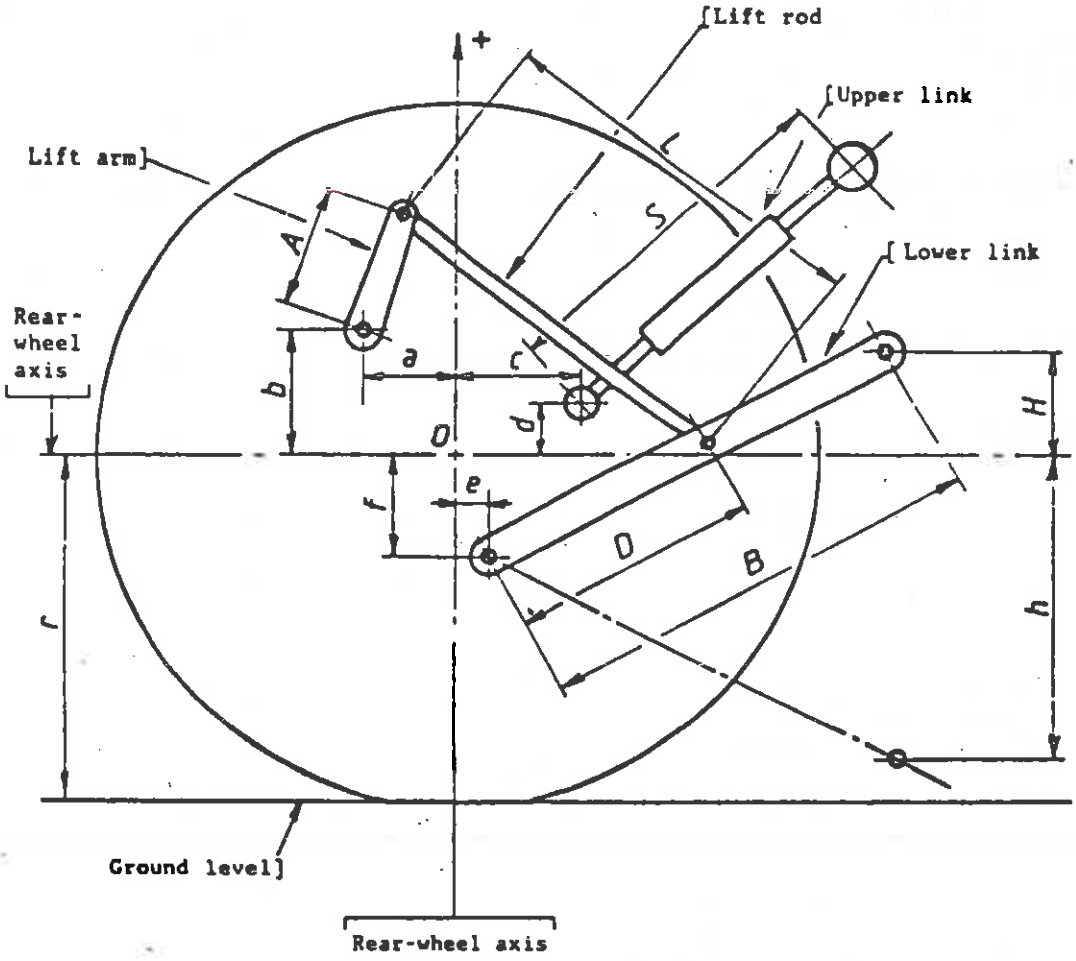
POWER LIFT.

Make	Sunstrand
Type of hydraulic system	Open Center
Number/Type of cylinders	One internal,single acting
Type of linkage lock for transport	None
Relief valve setting	17.2 MPa 2500 psi
Opening pressure of cylinder safety valve	19.6 MPa (2850 psi)
Lift pump type	Gear
Power transmission to pump	From PTO shaft independent of main and PTO clutches
Type/Number of filters	Full flow/one
Location of oil reservoir	Rear axle housing
Number/Type/Location of tapping points.	1 pair of ISO standard couplings at rear of tractor.
Max. oil volume available for external cylinders.	27.7 l (29 qt)

THREE POINT LINKAGE.

- Category 1 or 2 in conformity with ISO 730/1-1977
- Category adaptor - None

THREE POINT LINKAGE



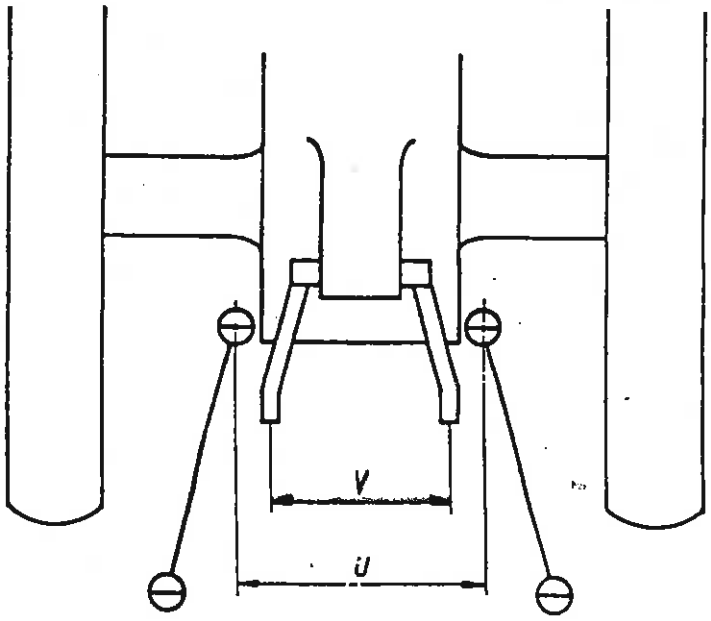


Table 1.1 -*Linkage geometry dimensions.

		Dimension or range [mm]	Dimension or range [in]	Settings used on test [mm]	Settings used on test [in]
Lift category		I			
Rear Tire - Radius Index	(r)	610	24.0		
Front Tire - Radius Index	(r')	470	18.5		
Length of lift arms	(A)	254	10.0	same	
Length of lower links	(B)	864	34.0	same	
Distance of lift arm pivot from: horizontal	(a)	203	8.0	same	
rear wheel axis: vertical	(b)	257	10.1	same	
Horizontal distance between the 2 lower link points	(u)	520	20.5	same	
Horizontal distance between the 2 lift arm end points	(v)	546	21.5	same	
Length of upper link	(S)	622 to 762	24.5 to 30.0	719	28.3
Distance of upper link pivot from: horizontal	(c)	262 or 222	10.3 or 8.7	222	8.7
rear wheel axis: vertical	(d)	153 or 191	6.0 or 7.5	191	7.5
Distance of lower link pivot from: horizontal	(e)	68	2.7	same	
rear wheel axis: vertical	(f)	203	8.0	same	
Distance of lower link pivot points to lift rod pivot pts on lower links.	(D)	481	18.9	same	
Length of lift rods	(L)	696 to 833	27.4 to 32.8	740	29.1
Height of lower hitch points relative to rear wheel axis In low position	(h)	389 to 630	15.3 to 24.8	419	16.5
In high position	(H)	83 to 232	3.2 to 9.1	219	8.6
Height above ground of lower hitch points when locked in transport position.		704 to 853	27.7 to 33.6	841	33.1

*Assuming (r) with a tire dynamic index of 610 mm (24.0 in)
ISO 4251/1-1984

SWINGING DRAWBAR.

Type	Oscillating
Height above ground	Min 240 mm (9.5 in) Max 375 mm (14.8 in)
Adjustments	Inverting drawbar
Distance of hitch point from rear wheel axis,horizontal	632 mm (24.9 in),750 mm (29.5 in)
Distance of hitch point from PTO shaft end Vertical Horizontal	 254 mm (10.0 in),114 mm (4.5 in) 355 mm (14.0 in),241 mm (9.5 in)
Lateral adjustment; Right hand Left hand	163 mm (6.4 in) 163 mm (6.4 in)
Distance of pivot point from rear wheel axis; horizontal	On rear axle centre line
Diameter of drawbar pin hole	27 mm (1.1 in)
Maximum vertical static permissible load	drawbar extended - 7.8 kN (1745 lb) drawbar retracted-10.2 kN (2300 lb)

STEERING

Make/Model/Type	Danfoss Motor/10 SPC-100/ Hydrostatic
Method of operation	Steering wheel
Pump	Gear pump,engine mounted
Ram(s)	One double acting cylinder
Working pressure	13.4 to 14.1 MPa (1950 - 2050 psi)
Oil cooler	heat exchanger with air

BRAKES.

Service brake. Make/Model/Type	Girling/oil immersed multiplate on rear axle planetary shafts operated by two pedals which can be locked together.
Method of operation	
Parking brake. Type	Mechanical linkage coupled to service brake
Method of operation	Hand lever with ratchet
Trailer Brake Type	None

WHEELS.

Number.	
Front	Two; Driving and steering
Rear	Two; Driving
Wheel base	2136 mm (84.1 in)

Track width adjustment

	Minimum [mm]	Minimum [in]	Maximum [mm]	Maximum [in]	Adjustment method
Front	1396	55.0	1855	73.0	Reversing wheels and offset lug rims
Rear	1423	56.0	2026	79.8	Reversing wheels and offset lug rims

STRUCTURE.

Make/Model/Type	Ford New Holland/ 2 Post Safety frame
Manufacturer's name/address	Ford New Holland New Holland, Penn.
Protective device	2 post ROPS
OECD approval number	None

DRIVER'S SEAT.

Make/Model/Type	Bostrom XL2
Type of suspension	mechanical
Type of damping	double acting hydraulic
Range of adjustment	
Longitudinal	50 mm (2.0 in)
Vertical	none

LIGHTING.

	Height above ground of center [mm]	Height above ground of center [in]	Size [mm]	Distance from out - side edge to median plane of tractor. [mm]	Distance from out - side edge to median plane of tractor. [in]
Headlights	900	35.4	127 dia.	152	6.0
Rearlight Left side	1350	53.2	146 x 95	420	16.5
Reflector Right side	1400	55.1	80 x 40	616	24.3

TEST CONDITIONS.

Overall dimensions.

Length		3606 mm (142.0 in)
Width	Minimum	1795 mm (70.8 in)
	Maximum	2402 mm (94.6 in)
Height - Top of ROPS		2248 mm (88.5 in)
- Top of exhaust		2290 mm (90.2 in)
Ground clearance. (unballasted)		259 mm (10.2 in)
Clearance-limiting part		bottom of drawbar support

Tractor Mass (with cab,full fuel tank).

		without driver [kg]	[lb]	with driver [kg]	[lb]
Unballasted	Front	994	2192	1004	2214
	Rear	1443	3182	1508	3324
	Total	2437	5374	2512	5538

Tire Specifications.

	Front Wheels	Rear Wheels
Make	Goodyear	Goodyear
Dimensions	8.3-24	13.6-28
Ply rating	4 ply	6 ply
Type	Bias	Bias
Max.load (tire manufacturer)	625 kg/tire (1380 lb/tire)	1430 kg/tire (3150 lb/tire)
Max.load(tractor manufacturer)	625 kg/tire (1380 lb/tire)	1430 kg/tire (3155 lb/tire)
Inflation pressure (tire mfr)	160 kPa(23 psi)	160 kPa(23 psi)
Dynamic Radius Index	470 mm(18.5 in)	610 mm (24.0 in)
Chosen track width	1553 mm(61.1 in)	1625 mm (64.0 in)

Oils and Lubrication.

Capacity and change interval:

	Capacity liter	Capacity quart	Oil change hours	Filter change hours
Engine (w/o filter)	6.6	7	300	300
Gear Box	12	14	1200	NA
Rear axle	47	50	1200	300
Front axle housing	5.5	6	1200	NA
Hydraulic system	common with rear axle			
Steering	2.2	2.5	1200	1200

Oil and Lubricant specifications:

	Recommended	Used during test
Engine oil		
Type	Ford M2C121-C	same
Viscosity	SAE 15W-40	
Classification	API SG/CE Mil-L-2104C	
Transmission		
Type	Ford M2C134-D	same
Viscosity	9.0 cST at 100'C	
Classification	Mil-L-2105	
Rear axle		
Type	Ford M2C134-D	same
Viscosity	9.0 cST at 100'C	
Classification	Mil-L-2105	
Hydraulic fluid	same as rear axle	same
Steering oil		
Type	Ford M2C134-D	same
Viscosity	9.0 cST at 100'C	
Classification	Mil-L-2105	
Front axle		
Type	Ford M2C134-D	same
Viscosity	9.0 cST at 100'C	
Classification	Mil-L 2105	
Grease	Ford M1C137-B	
Number of lubrication points	13	

Fuel

Type/grade	Grade 2-D, (in conformity with the national standard)
Density (Pto test)	0.838 g/cubic-cm (6.993 lb/gallon) at 15'C (59'F)
Cetane number	53.9
Viscosity	2.31 cSt at 38'C (100'F)

COMPULSORY TESTS.

(1) MAIN POWER TAKE-OFF PERFORMANCE (540 rev/min).

Date of tests : 10 April, 1991
Location of tests : Tractor Testing Laboratory
University of Nebraska, Lincoln, Nebraska.
Type of Dynamometer: Eaton Dynamatic 2025 D.G.

Power kW (hp)	Speeds engine rev/min	Speeds PTO rev/min	Fuel Consumption hourly l/h (gal/h)	Fuel Consumption hourly kg/h (lb/h)	Fuel Consumption specific kg/kW.h (lb/hp.h)	Specific energy kW.h/l (hp.h/gal)
1.1 Maximum Power- 2 hour test.						
24.11 (32.33)	2000	600	7.99 (2.11)	6.70 (14.77)	0.278 (0.457)	3.02 (15.31)
1.2 Power at rated engine speed. (1 hour)						
24.11 (32.33)	2000	600	7.99 (2.11)	6.70 (14.77)	0.278 (0.457)	3.02 (15.31)
1.3 Maximum power at standard PTO speed. (540 rev/min)						
23.11 (30.99)	1800	540	7.40 (1.95)	6.20 (13.67)	0.268 (0.441)	3.12 (15.85)

1.4 Part Loads - governor hand lever set for maximum power at rated engine speed

Power kW (hp)	Speeds engine rev/min	Speeds PTO rev/min	Fuel Consumption hourly l/h (gal/h)	Fuel Consumption hourly kg/h (lb/h)	Fuel Consumption specific kg/kW.h (lb/hp.h)	Specific energy kW.h/l (hp.h/gal)
i. Torque corresponding to maximum power at rated engine speed.						
24.11 (32.33)	2000	600	7.99 (2.11)	6.70 (14.77)	0.278 (0.457)	3.02 (15.31)
ii. 85% of the torque obtained in (i)						
21.47 (28.80)	2100	630	7.47 (1.97)	6.26 (13.80)	0.292 (0.479)	2.87 (14.59)
iii. 75% of the torque defined in (ii)						
16.24 (21.78)	2117	635	6.50 (1.72)	5.44 (12.00)	0.335 (0.551)	2.50 (12.69)
iv. 50% of the torque defined in (ii)						
10.90 (14.62)	2130	639	5.20 (1.37)	4.35 (9.60)	0.399 (0.657)	2.10 (10.65)
v. 25% of the torque defined in (ii)						
5.49 (7.36)	2145	644	4.22 (1.12)	3.54 (7.80)	0.645 (1.060)	1.30 (6.60)
vi. unloaded						
0.09 (0.12)	2167	650	3.09 (0.82)	2.59 (5.70)	28.015 (46.056)	0.03 (0.15)

1.5 Part Loads - governor hand lever set for maximum power at standard pto speed

Power kW (hp)	Speeds engine rev/min	Speeds PTO rev/min	Fuel Consumption hourly l/h (gal/h)	Fuel Consumption hourly kg/h (lb/h)	Fuel Consumption specific kg/kW.h (lb/hp.h)	Specific energy kW.h/l (hp.h/gal)
i. Torque corresponding standard PTO rpm						
23.11 (30.99)	1800	540	7.40 (1.95)	6.20 (13.67)	0.268 (0.441)	3.12 (15.85)
ii. 85% of the torque obtained in (i)						
20.71 (27.77)	1897	569	7.15 (1.89)	5.99 (13.20)	0.289 (0.475)	2.90 (14.71)
iii. 75% of the torque defined in (ii)						
15.70 (21.06)	1919	576	5.85 (1.54)	4.90 (10.80)	0.312 (0.513)	2.69 (13.63)
iv. 50% of the torque defined in (ii)						
10.56 (14.16)	1936	581	4.71 (1.24)	3.95 (8.70)	0.374 (0.614)	2.24 (11.38)
v. 25% of the torque defined in (ii)						
5.33 (7.15)	1958	587	3.57 (0.94)	2.99 (6.60)	0.561 (0.923)	1.49 (7.58)
vi. Unloaded						
0.08 (0.11)	1983	595	2.27 (0.60)	1.91 (4.20)	22.551 (37.073)	0.04 (0.19)

No-load maximum engine speed	2167 rev/min
Equivalent engine torque:	
at rated engine speed	115 Nm (2000 rev/min)
at maximum power	115 Nm (2000 rev/min)
at maximum torque	153 Nm (998 rev/min)
Mean atmospheric conditions:	
Temperature-dry bulb	24'C (75'F)
Relative humidity	30 %
Barometer	98.40 kPa (29.06 in Hg)

Maximum Temperatures :	
Thermostat housing	86'C (187'F)
Engine oil	106'C (222'F)
Fuel at injection pump	56'C (132'F)
Engine air intake	28'C (83'F)
Trans./Hydr. Oil	76'C (168'F)

2. HYDRAULIC POWER AND LIFTING FORCE.

Date of test: 17 April 1991
Location: TTL/UNL, Lincoln, Nebr.

2.1 HYDRAULIC POWER TEST - HYDRAULIC PUMP PERFORMANCE

Sustained pressure with relief valve open	18.00 MPa (2610 psi)
Pump delivery rate at minimum pressure and rated engine speed	30.3 l/m (8.0 gpm)

	Flow Rate l/min (gal/min)	Pressure MPa (psi)	Power kW (hp)
At 90% of relief valve setting	23.5 (6.2)	16.20 (2350)	6.3 (8.5)
At maximum hydraulic power	23.1 (6.1)	16.55 (2400)	6.4 (8.5)

Tapping point	one remote outlet
Hydraulic fluid temperature at flow meter	65'C (148'F)

2.2 POWER LIFT TEST.

		Hitch Points	Frame
Lower hitch points above ground - down position.	[mm/in]	206/8.1	191/7.5
Vertical movement without load	[mm/in]	638/25.1	759/29.9
Vertical movement with load	[mm/in]	617/24.3	726/28.6
Maximum corrected force through full range	[kN/lbf]	14.1/3159	13.6/3056
Corresponding pressure	[kPa/psi]	16258/2358	
Moment about rear axle	[kN.m/ft.lb]	25.2/18612	32.7/24113
Maximum mast tilt angle	[degrees]	--	8.9

Lifting height relative to the horizontal position of lower links

[mm]	-216	-201	-99	0	99
[in]	-8.5	-7.9	-3.9	0	3.9
Corrected lift forces.					
hitch points [kN]	--	14.1	16.0	16.9	18.1
hitch points [lb]	--	3159	3600	3789	4077
at frame [kN]	13.6	--	14.5	15.6	15.7
at frame [lb]	3056	--	3515	3533	3515

Lifting height relative to the horizontal position of lower links

[mm]	201	300	401	417	511
[in]	7.9	11.8	15.8	16.4	20.1
Corrected lift forces.					
hitch points [kN]	18.8	19.3	20.6	20.4	--
hitch points [lb]	4231	4344	4625	4589	--
at frame [kN]	15.6	--	15.3	14.8	14.4
at frame [lb]	3515	--	3443	3317	3234

DRAWBAR POWER AND FUEL CONSUMPTION (UNBALLASTED TRACTOR)

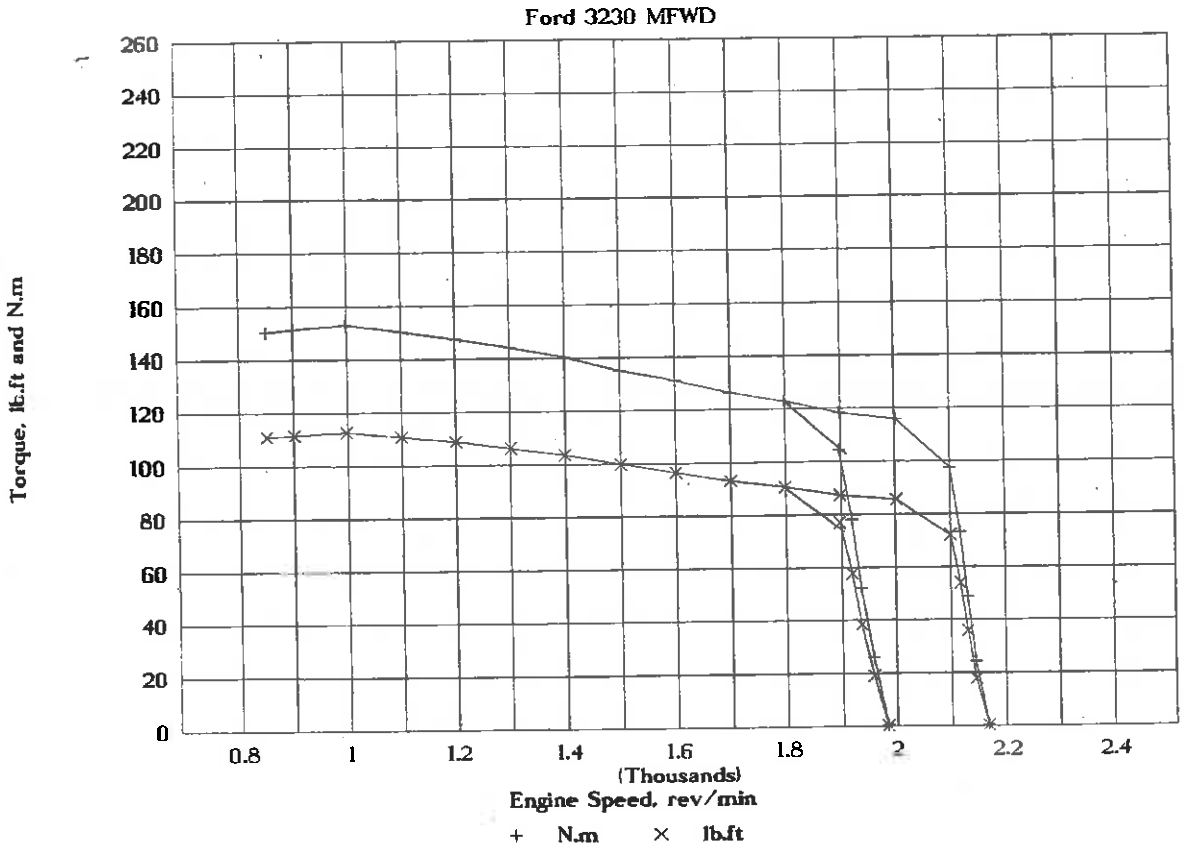
Date of tests: 12–Apr–91 15–Apr–91 Fuel density: 0.838 kg/l
Type of track: Concrete Test # 1642

Gear	Power kW	Pull kN	Speed km/h	Engine Speed rev/min	Slip	SFC kg/kW.h	SFE kW.h/l	Temperature, deg C: Fuel	Coolant	Oil	Dry	Wet	Relative humidity	Barometric pressure kPa
I. Maximum Power (unballasted, fwa 2000 rev/min) Tire pressure: 97 kPa, rear 110 kPa, front Drawbar height: 381 mm														
1 (1L)	13.65	18.94	2.59	2104	14.42%	0.420	1.99	53	81	96	9	7	76%	97.66
2 (2L)	16.99	19.01	3.22	2094	14.66%	0.390	2.15	56	81	94	8	6	75%	97.56
3 (3L)	19.17	11.73	5.88	2000	6.86%	0.356	2.36	57	82	99	17	15	81%	97.22
4 (4L)	19.24	8.46	8.18	1998	4.67%	0.355	2.36	57	80	96	13	11	79%	97.32
5 (1H)	19.41	7.04	9.92	2001	3.78%	0.351	2.38	56	82	99	16	14	81%	97.26
6 (2H)	18.58	5.37	12.45	1996	2.93%	0.365	2.30	56	82	100	19	17	82%	97.16
II. Part Loads (unballasted, fwa 2000 rev/min) Tire pressure: 97 kPa, rear 110 kPa, front Drawbar height: 381 mm														
II.1 in selected gear at maximum power														
5 (1H)	19.41	7.04	9.92	2001	3.78%	0.351	2.38	56	82	99	16	14	81%	97.26
II.1.1 75% of pull at maximum power at rated speed														
5 (1H)	15.42	5.28	10.51	2112	3.36%	0.396	2.12	37	80	94	12	8	58%	97.70
II.1.2 50% of pull at maximum power at rated speed														
5 (1H)	10.46	3.52	10.69	2128	2.44%	0.487	1.72	38	82	97	12	8	58%	97.70
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1														
6 (2H)	15.42	5.29	10.49	1689	3.36%	0.349	2.40	37	81	93	12	8	58%	97.70
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2														
6 (2H)	10.44	3.52	10.67	1702	2.62%	0.421	1.99	37	80	94	12	8	58%	97.70
II.2 in selected gear nearest to 7.5 km/h														
4 (4L)	19.24	8.46	8.18	1998	4.67%	0.355	2.36	57	80	96	13	11	79%	97.32
II.2.1 75% of pull at maximum power at rated speed														
4 (4L)	15.27	6.34	8.67	2107	4.02%	0.398	2.10	53	80	96	10	7	66%	97.70
II.2.2 50% of pull at maximum power at rated speed														
4 (4L)	10.40	4.23	8.86	2123	2.99%	0.499	1.68	49	79	95	10	7	66%	97.70
II.2.3 next higher gear at reduced engine speed, same pull and travel speed as II.2.1														
5 (1H)	15.25	6.34	8.66	1754	4.14%	0.356	2.36	53	82	96	10	7	66%	97.70
II.2.4 next higher gear at reduced engine speed, same pull and travel speed as II.2.2														
5 (1H)	10.38	4.21	8.89	1777	2.87%	0.420	1.99	38	79	93	10	7	66%	97.70

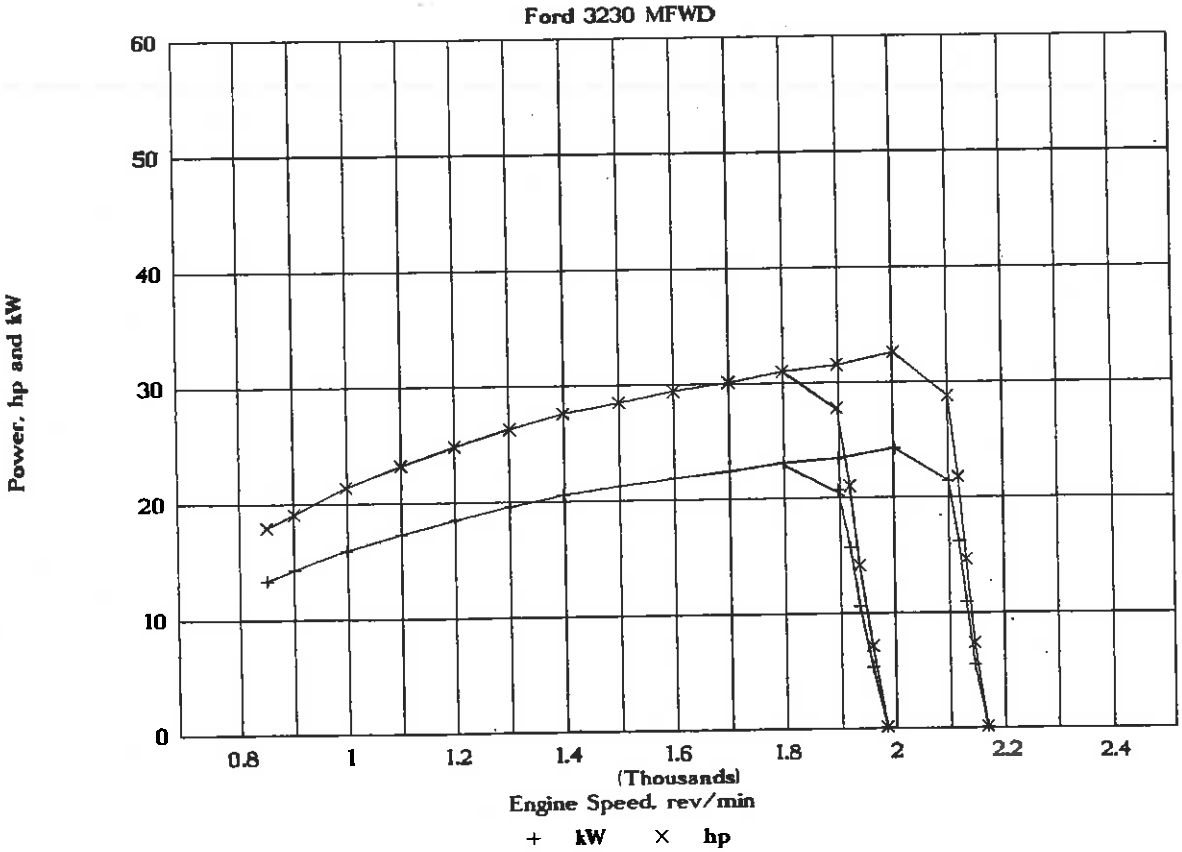
Date of tests: 12–Apr–91 15–Apr–91 Fuel density: 6.993 lb/gal
Type of track: Concrete Test # 1642

Gear	Power hp	Pull lb	Speed mph	Engine Speed rpm	Slip	SFC lb/hp–hr	SFE hp–hr/gal	Temperature, deg F: Fuel	Coolant	Oil	Dry	Wet	Relative humidity	Barometric Pressure in Hg
I. Maximum Power (unballasted, fwa 2000 rev/min) Tire pressure: 14 psi, rear 16 psi, front Drawbar height: 15 in														
1 (1L)	18.31	4259	1.61	2104	14.42%	0.691	10.12	128	178	205	49	44	76%	28.84
2 (2L)	22.78	4275	2.00	2094	14.66%	0.641	10.92	133	178	202	46	43	75%	28.81
3 (3L)	25.71	2637	3.66	2000	6.86%	0.585	11.96	134	180	211	62	59	81%	28.71
4 (4L)	25.80	1903	5.08	1998	4.67%	0.584	11.98	135	177	205	55	52	79%	28.74
5 (1H)	26.03	1584	6.16	2001	3.78%	0.578	12.11	133	179	210	60	57	81%	28.7.
6 (2H)	24.91	1208	7.74	1996	2.93%	0.600	11.65	132	180	212	67	62	82%	28.69
Note:														
II. Part Loads (unballasted, fwa 2000 rev/min) Tire pressure: 14 psi, rear 16 psi, front Drawbar height: 15 in														
II.1 in selected gear at maximum power														
5 (1H)	26.03	1584	6.16	2001	3.78%	0.578	12.11	133	179	210	60	57	81%	28.72
II.1.1 75% of pull at maximum power at rated speed														
5 (1H)	20.67	1187	6.53	2112	3.36%	0.651	10.75	99	176	201	53	46	58%	28.85
II.1.2 50% of pull at maximum power at rated speed														
5 (1H)	14.02	792	6.64	2128	2.44%	0.800	8.74	100	180	206	53	46	58%	28.85
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1														
6 (2H)	20.67	1189	6.52	1689	3.36%	0.575	12.17	99	177	200	53	46	58%	28.85
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2														
6 (2H)	14.00	792	6.63	1702	2.62%	0.693	10.10	99	176	202	53	46	58%	28.85
II.2 in selected gear nearest to 4.6 mph														
4 (4L)	25.80	1903	5.08	1998	4.67%	0.584	11.98	135	177	205	55	52	79%	28.74
II.2.1 75% of pull at maximum power at rated speed														
4 (4L)	20.47	1425	5.39	2107	4.02%	0.654	10.69	128	176	205	50	44	66%	28.85
II.2.2 50% of pull at maximum power at rated speed														
4 (4L)	13.95	951	5.50	2123	2.99%	0.821	8.52	121	175	203	50	44	66%	28.85
II.2.3 next higher gear at reduced engine speed, same pull and travel speed as II.2.1														
5 (1H)	20.46	1426	5.38	1754	4.14%	0.585	11.96	127	179	205	50	44	66%	28.85
II.2.4 next higher gear at reduced engine speed, same pull and travel speed as II.2.2														
5 (1H)	13.93	946	5.52	1777	2.87%	0.691	10.12	101	174	199	50	44	66%	28.85

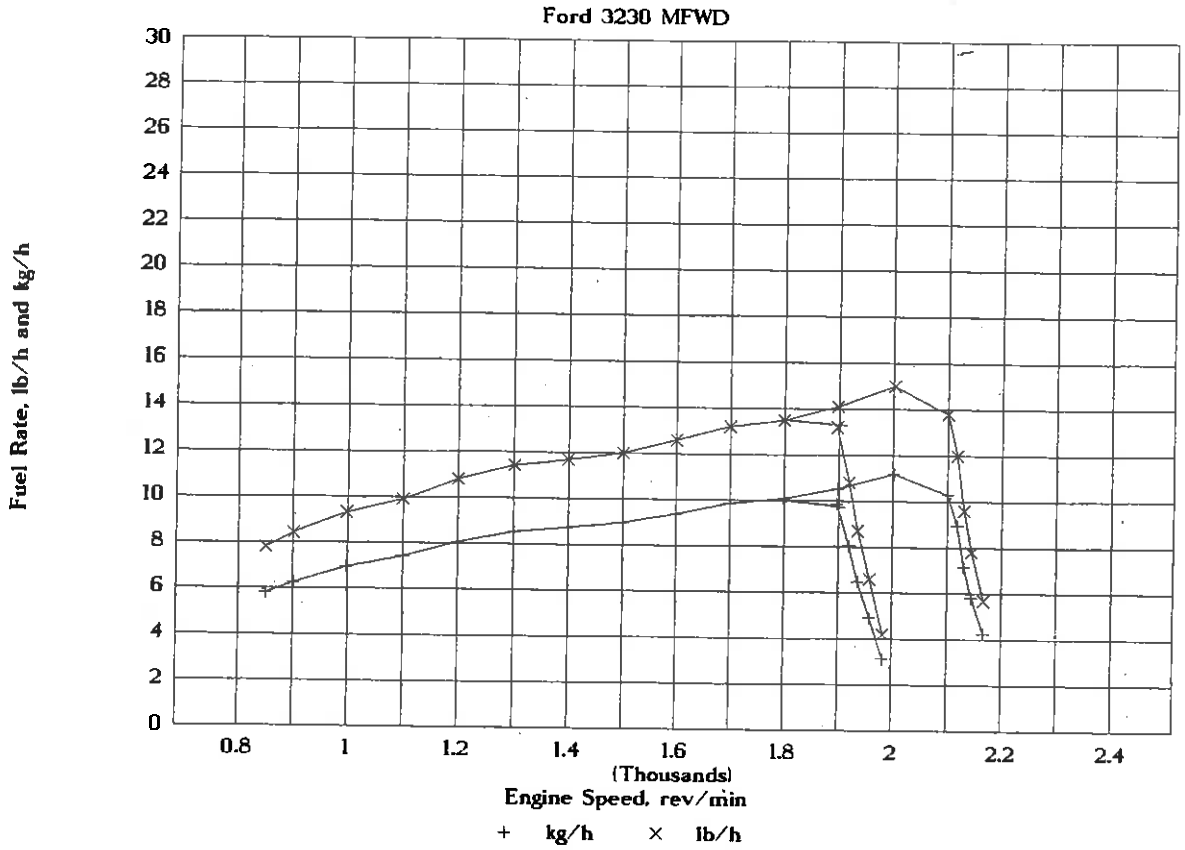
Equivalent Crankshaft Torque



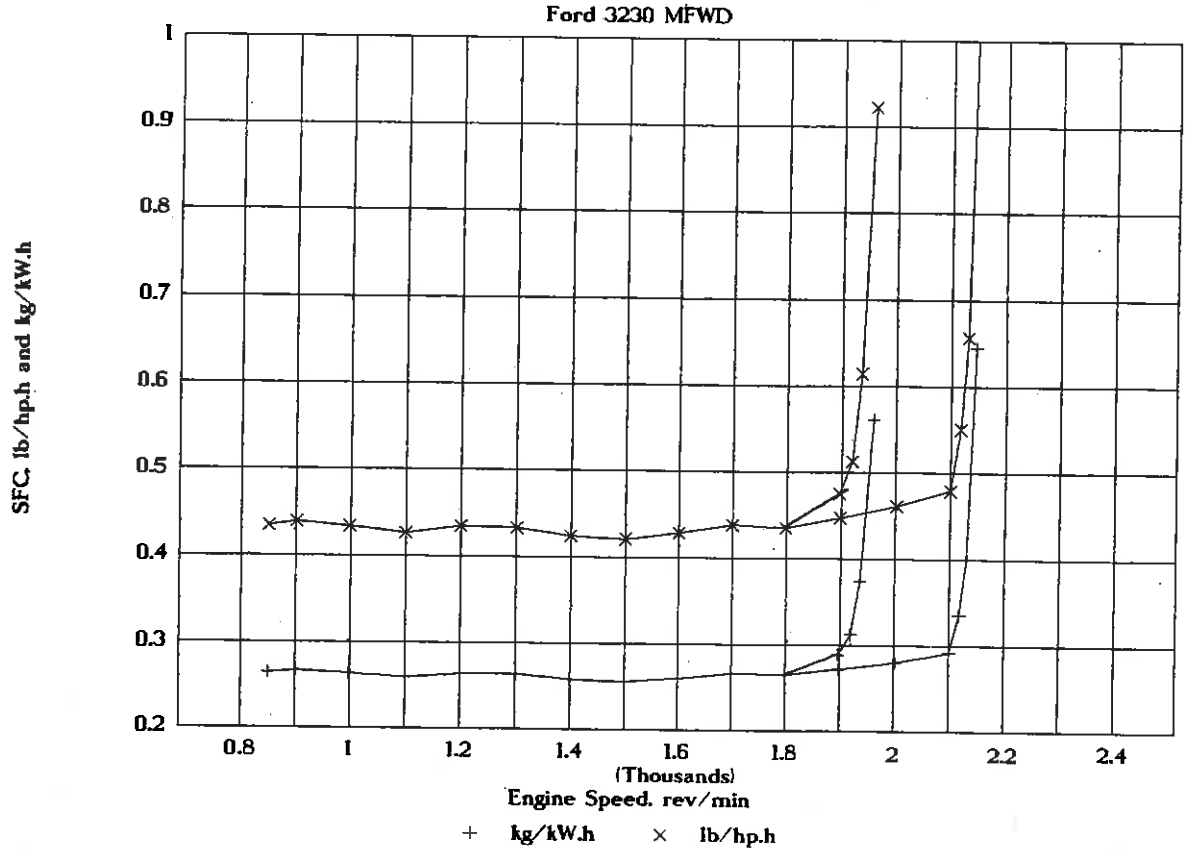
PTO Power

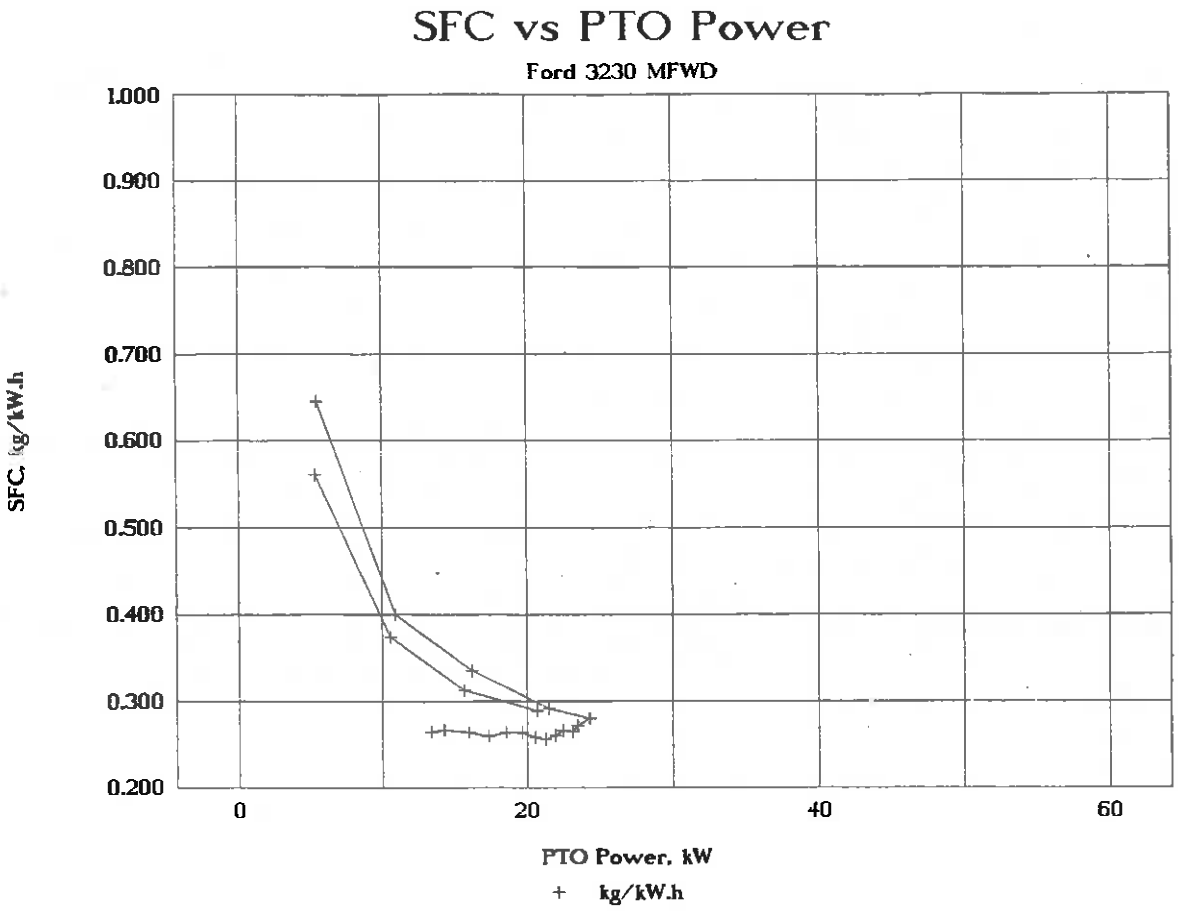


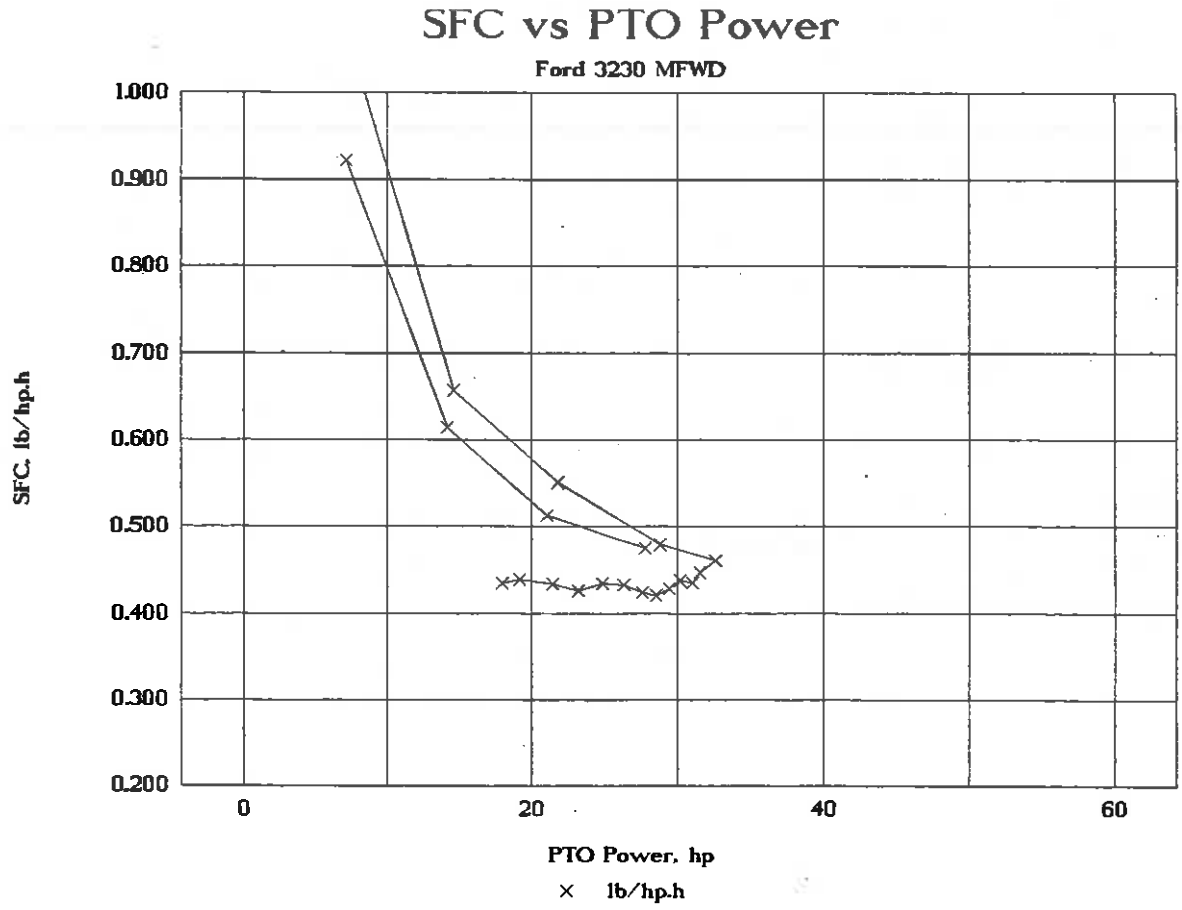
PTO Fuel Consumption



PTO Specific Fuel Consumption




SFC vs PTO Power
Ford 3230 MFWD
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
SFC, kg/kW.h
0
20
40
60
PTO Power, kW
+ kg/kW.h


SFC vs PTO Power
Ford 3230 MFWD
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
SFC, lb/hp.h
0
20
40
60
PTO Power, hp
× lb/hp.h

University of Nebraska Tractor Test Laboratory

DRAWBAR POWER AND FUEL CONSUMPTION (UNBALLASTED TRACTOR) Optional test 2 WD

Date of tests: 12–Apr–91 15–Apr–91 Fuel density: 0.838 kg/l
Type of track: Concrete Test # 1642

Gear	Power kW	Pull kN	Speed km/h	Engine Speed rev/min	Slip	SFC kg/kW.h	SFE kW.h/l	Temperature, deg C: Fuel	Coolant	Oil	Dry	Wet	Relative humidity	Barometric pressure kPa
Ia. Maximum Power (unballasted, 2wd 2000 rev/min)						Tire pressure:		97 kPa, rear			110 kPa, front			
Drawbar height: 381 mm														
2 (2L)	11.45	12.82	3.21	2120	14.90%	0.454	1.85	53	79	96	9	7	76%	97.70
3 (3L)	18.28	12.32	5.34	2001	14.57%	0.374	2.24	55	82	101	18	16	82%	97.19
4 (4L)	19.17	8.82	7.82	2003	8.11%	0.355	2.36	57	81	98	13	12	89%	97.29
5 (1H)	19.54	7.38	9.53	2000	6.46%	0.350	2.39	56	79	98	14	13	90%	97.26
6 (2H)	19.12	5.71	12.06	1999	5.20%	0.358	2.34	55	82	100	18	16	82%	97.19
II. Part Loads (unballasted, 2wd 2000 rev/min)						Tire pressure:		97 kPa, rear			110 kPa, front			
Drawbar height: 381 mm														
II.1 In selected gear at maximum power														
5 (1H)	19.54	7.38	9.53	2000	6.46%	0.350	2.39	56	79	98	14	13	90%	97.26
II.1.1 75% of pull at maximum power at rated speed														
5 (1H)	15.70	5.54	10.20	2112	5.26%	0.387	2.17	38	82	96	13	9	59%	97.66
II.1.2 50% of pull at maximum power at rated speed														
5 (1H)	10.75	3.71	10.44	2128	3.74%	0.471	1.78	39	80	97	13	9	59%	97.66
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1														
6 (2H)	15.68	5.52	10.22	1695	5.20%	0.344	2.43	38	79	94	13	9	59%	97.66
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2														
6 (2H)	10.78	3.70	10.48	1711	3.74%	0.405	2.07	38	79	94	13	9	59%	97.66

University of Nebraska Tractor Test Laboratory

Date of tests: 12–Apr–91 15–Apr–91 Fuel density: 6.993 lb/gal
Type of track: Concrete Test # 1642

Gear	Power hp	Pull lb	Speed mph	Engine Speed rpm	Slip	SFC lb/hp–hr	SFE hp–hr/gal	Temperature, deg F: Fuel	Coolant	Oil	Dry	Wet	Relative humidity	Barometric Pressure in Hg
Ia. Maximum Power (unballasted, 2wd 2000 rev/min)						Tire pressure:		14 psi, rear			16 psi, front			
Drawbar height: 15 in														
2 (2L)	15.35	2883	2.00	2120	14.90%	0.746	9.38	128	175	206	49	44	76%	28.85
3 (3L)	24.52	2770	3.32	2001	14.57%	0.614	11.39	132	180	213	64	60	82%	28.70
4 (4L)	25.71	1984	4.86	2003	8.11%	0.584	11.97	134	178	208	56	54	89%	28.73
5 (1H)	26.20	1659	5.92	2000	6.46%	0.575	12.15	133	175	209	58	56	90%	28.72
6 (2H)	25.64	1284	7.49	1999	5.20%	0.588	11.90	131	179	212	65	61	82%	28.70
II. Part Loads (unballasted, 2wd 2000 rev/min)						Tire pressure:		14 psi, rear			16 psi, front			
Drawbar height: 15 in														
II.1 In selected gear at maximum power														
5 (1H)	26.20	1659	5.92	2000	6.46%	0.575	12.15	133	175	209	58	56	90%	28.72
II.1.1 75% of pull at maximum power at rated speed														
5 (1H)	21.06	1246	6.34	2112	5.26%	0.636	11.00	101	180	204	56	48	59%	28.84
II.1.2 50% of pull at maximum power at rated speed														
5 (1H)	14.41	833	6.49	2128	3.74%	0.775	9.02	102	177	206	56	48	59%	28.84
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1														
6 (2H)	21.03	1242	6.35	1695	5.20%	0.566	12.35	101	175	202	56	48	59%	28.84
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2														
6 (2H)	14.45	832	6.51	1711	3.74%	0.666	10.49	101	175	202	56	48	59%	28.84

Repairs: None
Remarks: None

This test report provides the results of the tests conducted in accordance with the OECD Standard Test Code for the Official Testing of Agricultural Tractor Performance - C(87)53 Final - Annex II, Restricted Code.

This report has been approved by the OECD Coordinating Centre in Paris (CEMAGREF) on September 6, 1991

Ford 3230 8 x 2 with MFWD OECD # 1324

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Date: 21 October 1991

LINCOLN, NEBRASKA 68583-0832, USA

Test 1642 PTO Graph Data

Test number: 1642
Number and date of O.E.C.D. approval: 1324 - Approved 6 Sept 1991
Testing station – City – Country: Tractor Test Lab, Lincoln, NE, USA
Make: Ford New Holland
Trade Name: 3230 MFWD

Index	Power kW	Speed		Engine torque N–m	Fuel Consumption	
		Engine rev/min	PTO rev/min		Hourly l/h	Specific kg/kW–hr
1	24.3	2002	601	115.8	8.12	0.280
2	23.5	1898	570	118.2	7.63	0.272
3	23.1	1799	540	122.8	7.31	0.265
4	22.5	1699	510	126.4	7.15	0.266
5	21.9	1599	480	131.0	6.82	0.261
6	21.3	1501	450	135.3	6.50	0.256
7	20.6	1399	420	140.4	6.33	0.258
8	19.6	1301	390	144.1	6.17	0.263
9	18.5	1200	360	147.6	5.85	0.264
10	17.3	1100	330	150.4	5.36	0.259
11	16.0	998	300	152.9	5.03	0.264
12	14.3	901	270	151.4	4.55	0.267
13	13.4	850	255	150.4	4.22	0.264
Part loads, the governor control set for maximum power at rated engine speed						
14	0.1	2167	650	0.4	3.09	28.015
15	5.5	2145	644	24.4	4.22	0.645
16	10.9	2130	639	48.9	5.20	0.399
17	16.2	2117	635	73.3	6.50	0.335
18	21.5	2100	630	97.6	7.47	0.292
Part loads, the governor control set for maximum power at standard power take–off speed						
19	0.1	1983	595	0.4	2.27	22.551
20	5.3	1958	587	26.0	3.57	0.561
21	10.6	1936	581	52.1	4.71	0.374
22	15.7	1919	576	78.1	5.85	0.312
23	20.7	1897	569	104.2	7.15	0.289