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(Restricted code)
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NEBRASKA TRACTOR TESTING LABORATORY
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INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF NEBRASKA - EAST CAMPUS
LINCOLN, NEBRASKA 68583-0832, USA

REPORT ON TEST IN ACCORDANCE WITH OECD RESTRICTED CODE (CODE II)

FOR THE OFFICIAL TESTING OF AGRICULTURAL TRACTORS

FORD 5640 - 16 x 4 MFWD (4WD)
WITH MECHANICAL FRONT WHEEL DRIVE



MANUFACTURED BY: Ford New Holland Inc
500 Diller Avenue
New Holland, PA. USA

NEBRASKA TEST NO. 1656

Test dates: April-May 1992

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 18 September 1992

Ford 6640 - 16 x 4 with MFWD **OECD # 1396**

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SPECIFICATIONS OF TRACTOR.

Manufacturers name/address	Ford New Holland Inc. 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	200 hours
Location of Test	Tractor Testing Laboratory Lincoln, Nebraska,USA.

TRACTOR SPECIFICATIONS.

Make	Ford
Model	5640 - "S" series (LA514M) 16x4 MFWD (4WD)
Type	Unit construction, mechanical front wheel drive (MFWD)
Number of driving wheels	4
Serial Number	*BD05905*
1st Serial number	*BD02168*

ENGINE.

Make	Ford New Holland (Genesis™)
Model	EA 268 CID NA
Type	Diesel,direct injection, four-stroke, Naturally aspirated
Serial Number	*EA334873*
Cylinders	
Number/Disposition	4, in-line, vertical
Bore/stroke	111.8 mm x 111.8 mm (4.4 in x 4.4 in)
Capacity	4400 ml (268 cu in)
Compression Ratio	17.5 - 1
Arrangement of valves	Overhead
Cylinder liners	None
Fuel System	
Feed system	Gravity
Make/Type/Model of filters	Plastic strainer in tank; CAV paper element and water trap between tank and injection pump
Fuel tank capacity	103.4 liters (27.32 US gallons)
Make/Model/Type Inj. Pump	Lucas DPS 60L850/2/2375
Pump Serial number	23358 LJG

Production setting of pump	
Flow Rate (Rated Eng.Spd & Full Load)	12.7 - 13.6 kg/hr 28.0-30.0 lb/hr
Make/Model/Type Injectors	CAV/JB6801134 multi-hole
Injection pressure	23 MPa (3335 psi)
Timing	12 degrees before TDC
Governor	
Make/Model/Type	Lucas/mechanical
Governed engine speed range	From 750 to 2310 rev/min
Rated engine speed	2200 rev/min
High-idle speed range	2295-2375 rev/min
Air Cleaner.	
Pre-cleaner	
Make/Model/Type	None
Air intake location	Under hood above and in front of radiator
Main Cleaner	
Make/Model/Type	Locker Air Maze/dry paper main and secondary elements. Exhaust aspirated
Maintenance indicator	Air restriction warning light
Lubrication system.	
Type of feed pump	Eccentric Rotor Pump
Type of filters	Full flow spin on + metal mesh in sump.
Number	One spin on element
Oil cooler	Water to oil, lower radiator
Cooling system.	
Type of coolant	Liquid
Type of pump	Centrifugal/belt driven
Fan specification	Belt driven
Number of fan blades	4
Fan diameter	480 mm (18.9 in)
Coolant system capacity	13 l (13.7 US qt)
Type of temperature control	1 thermostat
Superpressure system	90 kPa (13 psi)
Starting system.	
Make/Model/Type of starter	Bosch/JF/Electric
Power Rating	3.1 kW (4.16 HP)
Cold starting aid	CAV thermostart
Safety device	Transmission neutral and PTO off switches

Electrical system.	
Voltage & grounding.	12 Volt DC;negative ground
Generator	
Make/Model/Type	Magneti Marelli A127L; belt driven
Power rating	55 Amp at 2130 engine rpm.
Batteries	
Number & connection	1-12 V Lead acid
Rating	107 Amp-hr at 20 hour rating 800 cold crank amps
Exhaust system.	
Make/Model/Type	Nelson Burgess; 2-chamber
Location	vertical above hood, left side
TRANSMISSION.	
Clutch. (travel)	
Make/Model/Type	AP, Single dry plate
Number of plates	1
Plate diameter	330 mm (13 inch)
Method of operation	Mechanical/pedal operated
Gear Box.	
Make/Model/Type	Ford New Holland 16x4 Dual Pwr.
Arrangement	Main: Four fwd + 1 rev; Dual range shift (mech) + dual range power shift (panel switch).
Number of gears	16 forward and 4 reverse operated by two hand levers and one panel switch
Oil cooler	Heat exchanger with air
Available options	None
Rear axle and final drives.	
Make/Model/Type	Ford New Holland/crown wheel and pinion, differential and inboard planetary reduction
Differential Lock	
Type	Mechanical/ jaw clutch
Method of engagement	Pedal operated
Method of disengagement	Self disengaging/spring return

Front Axle and final drives.

Make/Model/Type	Carraro/709-S/Limited slip diff
Differential lock	None

Gear ratios and travel speeds.
(Tire dynamic radius of 770 mm (30.3 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 2200 rev/min [km/h]	[mph]
Forward			
1L	279.25	2.29	1.42
2L	223.75	2.85	1.78
1H	217.19	2.94	1.82
2H	174.03	3.67	2.29
3L	127.48	5.01	3.11
3H	99.15	6.44	4.00
4L	93.66	6.82	4.24
5L	78.16	8.18	5.09
4H	72.85	8.77	5.45
6L	62.62	10.21	6.34
5H	60.79	10.51	6.52
6H	48.71	13.12	8.16
7L	35.68	17.91	11.13
7H	27.75	23.03	14.31
8L	26.21	24.37	15.15
8H	20.39	31.34	19.47
Reverse			
1L	194.26	3.29	2.05
1H	151.09	4.23	2.63
2L	54.37	11.75	7.30
2H	42.29	15.11	9.39

Number of front wheel revolutions
for one rear wheel revolution. 1.366

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
Standard PTO. 540 rev/min.	
Location	Rear of tractor, vertical center plane.
Diameter of shaft	35 mm (1.375 in)
Number of splines	6; conforms to ISO 500/1979.
Height above ground	663 mm (26.1 in)
Distance from median plane of tractor	0 mm
Distance behind rear axle	458 mm (18.0 in)
PTO Speed at rated engine spd	629 rev/min
Engine speed at Std. PTO spd	1902 rev/min
Engine speed/PTO speed ratio	3.522:1
Direction of rotation when viewed from shaft end	Clockwise.

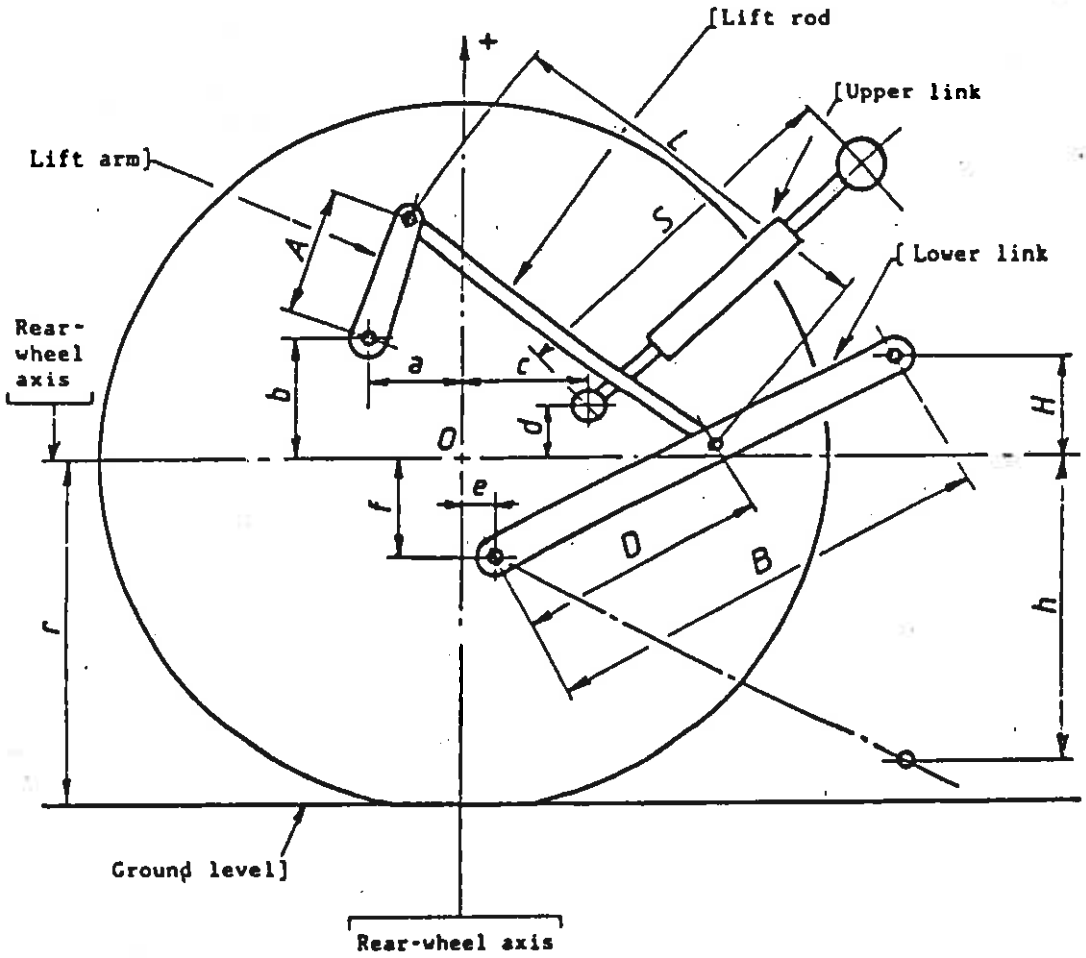
POWER LIFT.

Make	Sauer Sunstrand
Type of hydraulic system	Closed Center; Load sensing
Number/Type of cylinders	One internal/single acting
Type of linkage lock for transport	None
Relief valve setting	17.5-18.2 MPa (2550-2650 psi)
Opening pressure of cylinder safety valve	19.7 MPa (2850 psi)
Lift pump type	Gear
Power transmission to pump	Permanent PTO shaft driven; 2nd pump is gear driven by engine.
Type/Number of filters	Two full flow, replaceable
Location of oil reservoir housing	Transmission and rear axle
Number/Type/Location of tapping points.	2 pairs of ISO standard couplings at rear of tractor.
Max. oil volume available for external cylinders.	18.2 l (19.2 US qt)

THREE POINT LINKAGE.

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

THREE POINT LINKAGE



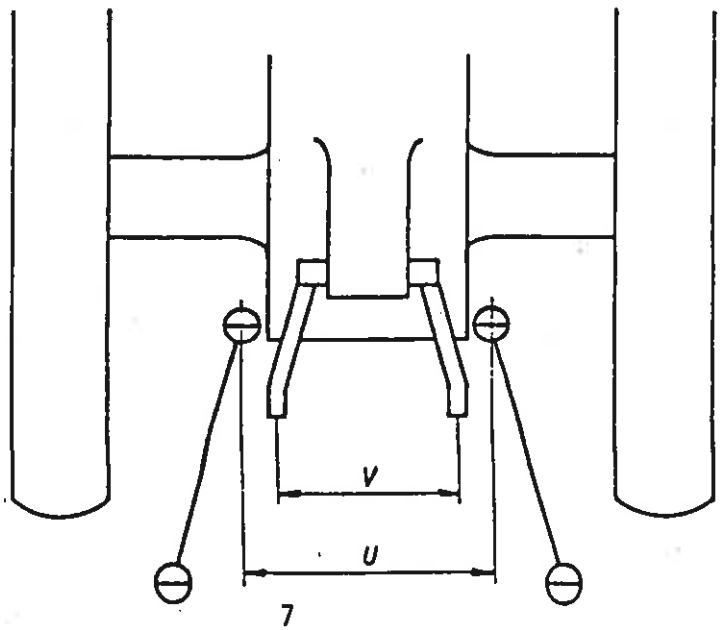


Table 1.1 -*Linkage geometry dimensions.

			Dimension or range [mm]	Dimension or range [in]	Settings used on test [mm]	Settings used on test [in]
Lift category			II			
Rear Tire - Radius Index	(r)		770	30.3		
Front Tire - Radius Index	(r')		590	23.2		
Length of lift arms	(A)		254	10.0	same	
Length of lower links	(B)		915	36.0	same	
Distance of lift arm pivot from: horizontal	(a)		102	4.0	same	
rear wheel axis: vertical	(b)		341	13.4	same	
Horizontal distance between the 2 lower link points	(U)		527	20.7	same	
Horizontal distance between the 2 lift arm end points	(V)		610	24.0	same	
Length of upper link	(S)		610	24.0		
		to	830	32.7	714	28.1
Distance of upper link pivot from: horizontal	(c)		325	12.8	same	
rear wheel axis: vertical	(d)	Hi	205	8.1		
		Lo	149	5.9	205	8.1
Distance of lower link pivot from: horizontal	(e)		102	4.0	same	
rear wheel axis: vertical	(f)		229	9.0	same	
Distance of lower link pivot points to lift rod pivot pts on lower links.	(D)		412	16.2		
			466	18.3		
			520	20.5	520	20.5
Length of lift rods	(L)		743	29.3		
		to	879	34.6	857	33.8
Height of lower hitch points relative to rear wheel axis In low position	(h)		264	10.4		
		to	594	23.4	566	22.3
In high position	(H)		4	0.2		
		to	236	9.3	50	2.0
Height above ground of lower hitch points when locked in transport position.			774	30.5		
		to	1006	39.6	819	32.2

*Assuming (r) with a tire dynamic index of 770 mm (30.3 in)
ISO 4251/1-1984

SWINGING DRAWBAR.

Type	Oscillating
Height above ground	460 mm (18.1)
Distance of hitch point from rear wheel axis,horizontal	714-865 mm (28.1-34.1 inch)
Distance of hitch point from PTO shaft end	
Vertical	228 mm (9.0 in)
Horizontal Position 1	242 mm (9.6 in)
Position 2	357 mm (14.0 in)
Position 3	406 mm (16.0 in)
Lateral adjustment; Right side	274 mm (10.8 in)
Left side	274 mm (10.8 in)
Distance of pivot point from rear wheel axis; horizontal	13 mm (0.5 in) forward.
Diameter of drawbar pin hole	27 mm (1.1 in)
Maximum vertical static permissible load	Position 1: 16.0 kN (3600 lb) Position 2: 10.4 kN (2350 lb) Position 3: 8.9 kN (2000 lb)

STEERING.

Make/Model/Type	Ford New Holland/Hydrostatic
Method of operation	Steering wheel
Pump	Fixed Displacement Gear pump
Ram(s)	One double acting cylinder for both steering arms
Working pressure	16.7-17.8 MPa (2465-2580 psi)

BRAKES.

Service brake.	
Make/Model/Type	Girling/Multiplate wet type.
Method of operation	Mechanical; operated by two pedals which can be locked together.
Parking brake.	
Type	Mechanical; linked 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	2362 mm (93 in)

Track width adjustment

	Minimum [mm]	Minimum [in]	Maximum [mm]	Maximum [in]	Adjustment method
Front	1412	55.6	2119	83.4	Reversing wheels and offset lug rims
Rear	1442	56.8	2286	90.0	Power-adjust rims

PROTECTIVE STRUCTURE.

Make/Model/Type	Ford New Holland/56-66-7740/ 2-post frame
Manufacturer's name/address	Hans Sauerman Hohenwarterstrasse 29 8899 Frienhausen NR Munich, Germany
Protective device	Two-post; Non-tiltable Rollbar
OECD approval number	CSD 1331/9

DRIVER'S SEAT.

Make/Model/Type	Grammer/DS44/1 HBA
Type of suspension	Mechanical
Range of adjustment	
Longitudinal	150 mm (5.9 in)
Vertical	100 mm (3.9 in)

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	1168	46.0	112 x 172	226	8.9
Rearlights	1702	67.0	83 x 127	838	33.0
Rearreflectors	1626	64.0	45 x 127	838	33.0
Rear work light	1867	73.5	83 x 140	724	28.5

TEST CONDITIONS.

Overall dimensions.

Length	4087 mm/160.9 inch
Width Minimum	2192 mm/86.3 inch
Height - Top of ROPS	2605 mm/102.6 inch
- Top of exhaust	2858 mm/112.5 inch
Ground clearance (unballasted)	407 mm/16.0 inch
Clearance-limiting part	Swinging Drawbar support

Tractor Mass (with ROPS, full fuel tank).

		without driver [kg]	without driver [lb]	with driver [kg]	with driver [lb]
Unballasted	Front	1450	3196	1470	3240
	Rear	2211	4875	2266	4996
	Total	3661	8071	3736	8236
Ballasted	Front	1450	3196	1470	3240
	Rear	2906	6407	2961	6528
	Total	4356	9603	4431	9768

Ballast.

	Number of weights	Mass (total) [kg]	Mass (total) [lb]	Water [kg]	Water [lb]
Front	None				
Rear	6	272	600	423	932

Tire Specifications.

	Front Wheels	Rear Wheels
Make	Goodyear	Goodyear
Dimensions	14.9-24	18.4R34
Ply rating	6 ply	6-8 ply
Type	Bias	Radial
Max.load (tire manufacturer)	1510 kg/tire (3330 lb/tire)	2604 kg/tire (5740 lb/tire)
Max. load(tractor manuf.)	same as above	
Inflation pressure(tire mfr)	140 KPa (20 psi)	125 KPa (18 psi)
Dynamic Radius Index	590 mm (23.2 in)	770 mm (30.3 in)
Chosen track width	1715 mm (67.5 in)	1646 mm (64.8 in)

Oils and Lubrication.

Capacity and change interval:

	Capacity liter	Capacity quart	Oil change hours	Filter change hours
Engine (w/o filter)	11.4	12.1	300	300
Gear Box (incl. rear axle + rear final drive + hydraulics	62.0	65.2	1200	300
Front axle housing	6.2	6.6	1200	---
Final drive, front	3.0	3.2	1200	---
Hydraulic system	common with gear box			

Oil and Lubricant specifications:

	Recommended	Used during test
Engine oil		Same
Type	Ford ESN-M2C121-B	
Viscosity	SAE 15W-40	
Classification	API CD or Mil-L-2104C	
Transmission		Same
Type	Ford ESN-M2C134D	
Viscosity	9.0 CST at 100° C	
Classification	MIL-L-2105	
Hydraulic fluid	same as transmission oil	Same
Steering oil	same as transmission oil	Same
Front axle and hubs		Same
Type	Ford ESN-M2C134-D	
Viscosity	9.0 CST at 100° C	
Classification	MIL-L-2105	
Grease	Ford M1C137-B	Same
Number of lubrication points	13	

Fuel

Type/grade	Premier/Grade 2-D, in conformity with national standard
Density (Pto test)	0.8381 g/cm³ (6.978 lb/gal) at 15°C (59°F)
(Drawbar test)	same as Pto test.
Cetane number	53.9
Viscosity	2.31 cSt at 37.8°C (100°F)

COMPULSORY TESTS.

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

Date of tests : 4 May 1992
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.						
49.41 (66.26)	2199	624	15.68 (4.14)	13.11 (28.90)	0.265 (0.436)	3.15 (16.00)
1.2 Power at rated engine speed. (1 hour)						
49.41 (66.26)	2199	624	16.58 (4.14)	13.11 (28.90)	0.265 (0.436)	3.15 (16.00)
1.3 Maximum power at standard PTO speed. (540 rev/min)						
47.10 (63.17)	1904	540	14.34 (3.79)	11.99 (26.45)	0.255 (0.419)	3.28 (16.67)

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.						
49.41 (66.26)	2199	624	15.68 (4.14)	13.11 (28.90)	0.265 (0.436)	3.15 (16.00)
ii. 85% of the torque obtained in (i)						
42.84 (57.45)	2243	636	14.00 (3.70)	11.70 (25.80)	0.273 (0.449)	3.06 (15.54)
iii. 75% of the torque defined in (ii)						
32.46 (43.53)	2265	643	11.72 (3.10)	9.80 (21.60)	0.302 (0.496)	2.77 (14.06)
iv. 50% of the torque defined in (ii)						
21.78 (29.21)	2282	647	9.28 (2.45)	7.76 (17.10)	0.356 (0.585)	2.35 (11.92)
v. 25% of the torque defined in (ii)						
10.97 (14.71)	2296	651	7.16 (1.89)	5.99 (13.20)	0.546 (0.897)	1.53 (7.77)
vi. unloaded						
0.30 (0.40)	2310	655	5.05 (1.33)	4.22 (9.30)	14.168 (23.293)	0.06 (0.30)

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						
47.10 (63.17)	1904	540	14.34 (3.79)	11.99 (26.44)	0.255 (0.419)	3.28 (16.67)
ii. 85% of the torque obtained in (i)						
40.43 (54.22)	1923	545	12.37 (3.27)	10.34 (22.80)	0.256 (0.421)	3.27 (16.59)
iii. 75% of the torque defined in (ii)						
30.75 (41.24)	1951	553	9.93 (2.62)	8.30 (18.30)	0.270 (0.444)	3.10 (15.73)
iv. 50% of the torque defined in (ii)						
20.70 (27.76)	1971	559	7.81 (2.06)	6.53 (14.40)	0.315 (0.519)	2.65 (13.45)
v. 25% of the torque defined in (ii)						
10.60 (14.21)	1990	565	5.70 (1.50)	4.76 (10.50)	0.449 (0.739)	1.86 (9.44)
vi. Unloaded						
0.24 (0.33)	2014	571	3.74 (0.99)	3.13 (6.90)	12.861 (21.144)	0.07 (0.33)

No-load maximum engine speed	2310 rev/min
Equivalent engine torque:	
at rated engine speed	215 Nm (2199 rev/min)
at maximum torque	254 Nm (1297 rev/min)
Mean atmospheric conditions:	
Temperature-dry bulb	24'C (76'F)
Relative humidity	31 %
Barometer	98.18 kPa (28.99 in Hg)

Maximum Temperatures :

Thermostat housing	88'C (190'F)
Engine oil	106'C (222'F)
Fuel at injection pump	60'C (140'F)
Engine air intake	27'C (81'F)
Trans./Hydr. Oil	86'C (187'F)

2. HYDRAULIC POWER AND LIFTING FORCE.

Date of test: 5 May 1992
Location: TTL/UNL, Lincoln, Nebr.

2.1 HYDRAULIC POWER TEST - HYDRAULIC PUMP PERFORMANCE

Sustained pressure with pump stalled	17.65 MPa (2560 psi)
Pump delivery rate at minimum pressure & rated engine speed	69.3 l/m (18.3 g/m)

	Flow Rate l/min (gal/min)	Pressure MPa (psi)	Power kW (hp)
At 90% of relief valve setting	57.9 (15.3)	15.9 (2300)	15.3 (20.5)
At maximum hydraulic power.	55.6 (14.7)	16.6 (2400)	15.3 (20.6)

Tapping point(s)	Two hydraulic outlets combined
Hydraulic fluid temperature at flow meter	66'C (151'F)

2.2 POWER LIFT TEST.
Test date : May 11, 1992

	Hitch Points	Frame
Lower hitch points above ground - down position. [mm/in]	203/8.0	137/5.4
Vertical movement without load [mm/in]	616/24.3	772/30.4
Vertical movement with load [mm/in]	577/22.7	757/29.8
Maximum corrected force through full range [kN/lbf]	22.7/5112	17.3/3879
Corresponding pressure [kPa/psi]	16599/2408	
Moment about rear axle [kN.m/ft.lb]	43.9/32376	43.8/32327
Maximum mast tilt angle [degrees]	---	8.4

Lifting height relative to the horizontal position of lower links

[mm]	-424	-333	-300	-201	-99	0
[in]	-16.7	-13.1	-11.8	-7.9	-3.9	0
Corrected lift forces.						
hitch points [kN]	--	25.7	22.7	23.7	24.7	24.7
hitch points [lb]	--	5778	5112	5337	5544	5553
at frame [kN]	22.4	19.6	--	20.0	20.1	19.8
at frame [lb]	5031	4403	--	4491	4522	4455

Lifting height relative to the horizontal position of lower links

[mm]	99	198	244	312	333
[in]	3.9	7.8	9.6	12.3	13.1
Corrected lift forces.					
hitch points [kN]	24.7	24.4	24.5	--	--
hitch points [lb]	5553	5483	5508	--	--
at frame [kN]	18.9	--	17.9	17.4	17.3
at frame [lb]	4241	--	4025	3916	3879

Date of tests: 07-May-92				Fuel density:	0.838 kg/l									
Type of track: Concrete				Test number:	1656									
Gear	**Power**	**Pull**	**Speed**	**Engine speed**	**Slip**	**SFC**		**Temperature, deg C**					**Rel hum**	**Pressure**
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet		kPa
II. Part loads (unballasted, fwa)				Tire pressure:		83 kPa, rear		97 kPa, front			Drawbar height		445 mm	
II.1 in selected gear at maximum power														
8 (5L)	44.73	19.93	8.08	2198	3.22%	0.298	2.81	56	84	98	18	11	41%	98.61
II.1.1 75% of pull at maximum power at rated speed														
8 (5L)	34.71	14.95	8.36	2256	2.45%	0.324	2.58	51	84	93	23	13	30%	98.48
II.1.2 50% of pull at maximum power at rated speed														
8 (5L)	23.58	9.98	8.50	2279	1.75%	0.377	2.22	54	83	94	23	13	30%	98.48
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1														
10 (6L)	34.83	14.96	8.38	1814	2.53%	0.292	2.87	54	84	95	23	13	30%	98.48
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2														
10 (6L)	23.54	9.98	8.49	1824	1.75%	0.323	2.59	54	83	91	23	13	30%	98.48
II.2 in selected gear nearest to 7.5 km/h														
8 (5L)	44.73	19.93	8.08	2198	3.22%	0.298	2.81	56	84	98	18	11	41%	98.61
II.2.1 75% of pull at maximum power at rated speed														
8 (5L)	34.71	14.95	8.36	2256	2.45%	0.324	2.58	51	84	93	23	13	30%	98.48
II.2.2 50% of pull at maximum power at rated speed														
8 (5L)	23.58	9.98	8.50	2279	1.75%	0.377	2.22	54	83	94	23	13	30%	98.48
II.2.3 next higher gear at reduced engine speed, same pull and travel speed as II.2.1														
10 (6L)	34.83	14.96	8.38	1814	2.53%	0.292	2.87	54	84	95	23	13	30%	98.48
II.2.4 next higher gear at reduced engine speed, same pull and travel speed as II.2.2														
10 (6L)	23.54	9.98	8.49	1824	1.75%	0.323	2.59	54	83	91	23	13	30%	98.48

Date of tests: 07-May-92				Fuel density:	6.978 lb/gal									
Type of track: Concrete				Test number:	1656									
Gear	**Power**	**Pull**	**Speed**	**Engine speed**	**Slip**	**SFC**		**Temperature, deg F**					**Rel hum**	**Pressure**
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		in Hg
II. Part loads (unballested, fwa)				Tire pressure:		12 psig, rear		14 psig, front			Drawbar height		17.5 in	
II.1 in selected gear at maximum power														
8 (5L)	59.99	4482	5.02	2198	3.22%	0.489	14.27	133	183	208	64	51	41%	29.12
II.1.1 75% of pull at maximum power at rated speed														
8 (5L)	46.55	3361	5.19	2256	2.45%	0.533	13.10	124	183	199	73	56	30%	29.08
II.1.2 50% of pull at maximum power at rated speed														
8 (5L)	31.62	2244	5.28	2279	1.75%	0.619	11.27	130	182	201	73	56	30%	29.08
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1														
10 (6L)	46.71	3363	5.21	1814	2.53%	0.480	14.54	129	183	203	73	56	30%	29.08
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2														
10 (6L)	31.56	2243	5.28	1824	1.75%	0.532	13.13	129	182	196	73	56	30%	29.08
II.2 in selected gear nearest to 4.6 mph														
8 (5L)	59.99	4482	5.02	2198	3.22%	0.489	14.27	133	183	208	64	51	41%	29.12
II.2.1 75% of pull at maximum power at rated speed														
8 (5L)	46.55	3361	5.19	2256	2.45%	0.533	13.10	124	183	199	73	56	30%	29.08
II.2.2 50% of pull at maximum power at rated speed														
8 (5L)	31.62	2244	5.28	2279	1.75%	0.619	11.27	130	182	201	73	56	30%	29.08
II.2.3 next higher gear at reduced engine speed, same pull and travel speed as II.2.1														
10 (6L)	46.71	3363	5.21	1814	2.53%	0.480	14.54	129	183	203	73	56	30%	29.08
II.2.4 next higher gear at reduced engine speed, same pull and travel speed as II.2.2														
10 (6L)	31.56	2243	5.28	1824	1.75%	0.532	13.13	129	182	196	73	56	30%	29.08

OECD Drawbar Data (SI)

Date of tests: 07-May-92 | Fuel density: 0.838 kg/l
Type of track: Concrete | Test number: 1656

Gear	Power	Pull	Speed	Engine speed	Slip	SFC		Temperature, deg C					Rel hum	Pressure
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet		kPa
I. Maximum Power (unballasted, fwa at 2200 rev/min)					Tire pressure:		83 kPa, rear		97 kPa, front		Drawbar height		445 mm	
3 (1H)	27.97	38.08	2.64	2258	14.32%	0.381	2.20	53	83	90	13	8	45%	98.65
4 (2H)	34.56	38.30	3.25	2238	14.91%	0.361	2.32	53	83	90	11	7	56%	98.65
5 (3L)	43.12	32.13	4.83	2202	5.81%	0.311	2.69	56	84	92	14	9	51%	98.65
6 (3H)	42.56	24.22	6.33	2199	3.90%	0.313	2.67	56	84	94	16	9	38%	98.61
7 (4L)	44.54	23.94	6.70	2200	3.97%	0.304	2.75	58	84	98	17	10	18%	98.61
8 (5L)	44.73	19.93	8.08	2198	3.22%	0.298	2.81	56	84	98	18	11	41%	98.61
9 (4H)	42.64	17.58	8.73	2205	2.83%	0.312	2.68	56	84	100	18	11	41%	98.58
10 (6L)	43.60	15.41	10.19	2204	2.53%	0.306	2.73	56	84	98	18	11	41%	98.58
11 (5H)	43.00	14.73	10.51	2205	2.37%	0.308	2.71	56	84	98	19	11	36%	98.58
12 (6H)	41.65	11.39	13.16	2201	1.91%	0.318	2.63	55	84	98	19	12	43%	98.58

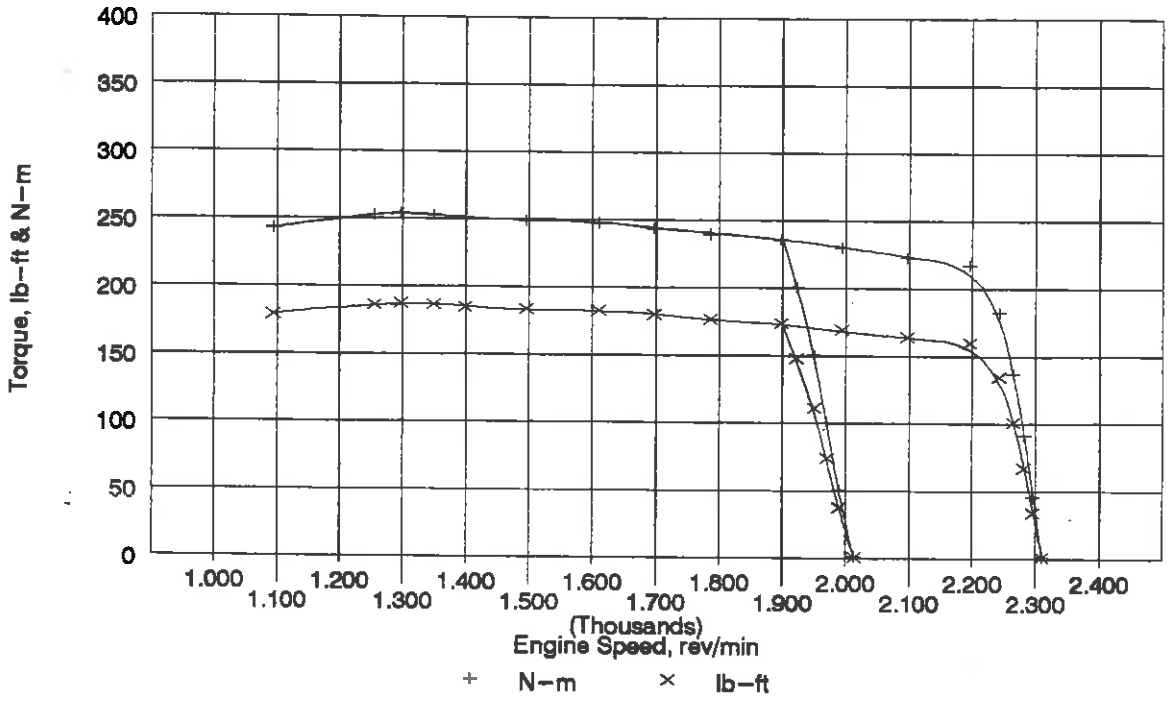
OECD Drawbar Data (US)

Date of tests: 07-May-92 | Fuel density: 6.978 lb/gal
Type of track: Concrete | Test number: 1656

Gear	Power	Pull	Speed	Engine speed	Slip	SFC		Temperature, deg F					Rel hum	Pressure
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		in Hg
I. Maximum Power (unballasted, fwa at 2200 rev/min)					Tire pressure:		12 psig, rear		14 psig, front		Drawbar height		17.5 in	
3 (1H)	37.50	8560	1.64	2258	14.32%	0.626	11.15	128	182	195	55	46	45%	29.13
4 (2H)	46.34	8611	2.02	2238	14.91%	0.593	11.76	128	182	195	52	44	56%	29.13
5 (3L)	57.83	7224	3.00	2202	5.81%	0.511	13.65	133	183	197	58	48	51%	29.13
6 (3H)	57.07	5445	3.93	2199	3.90%	0.515	13.54	132	184	201	60	49	38%	29.12
7 (4L)	59.72	5383	4.16	2200	3.97%	0.500	13.97	137	184	208	62	50	18%	29.12
8 (5L)	59.99	4482	5.02	2198	3.22%	0.489	14.27	133	183	208	64	51	41%	29.12
9 (4H)	57.18	3953	5.42	2205	2.83%	0.513	13.61	134	184	213	65	51	41%	29.11
10 (6L)	58.46	3464	6.33	2204	2.53%	0.503	13.87	133	184	208	65	52	41%	29.11
11 (5H)	57.67	3311	6.53	2205	2.37%	0.507	13.78	134	184	209	66	52	36%	29.11
12 (6H)	55.85	2562	8.18	2201	1.91%	0.523	13.36	132	183	209	67	53	43%	29.11

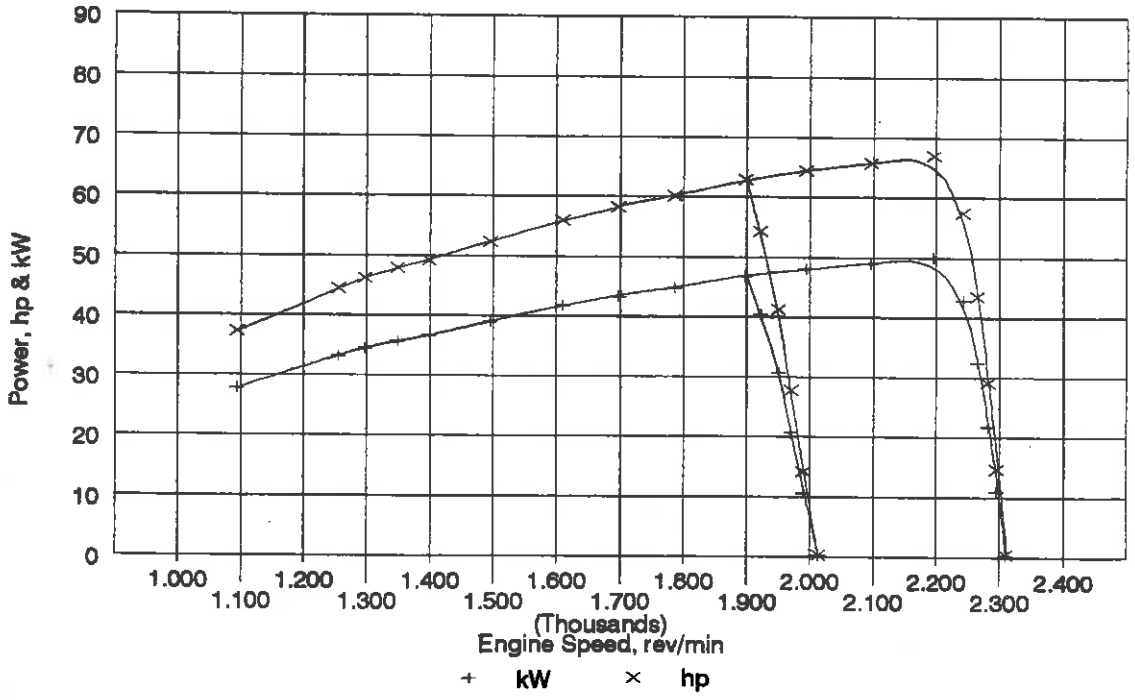
Equivalent Crankshaft Torque

Ford 5640 MFWD



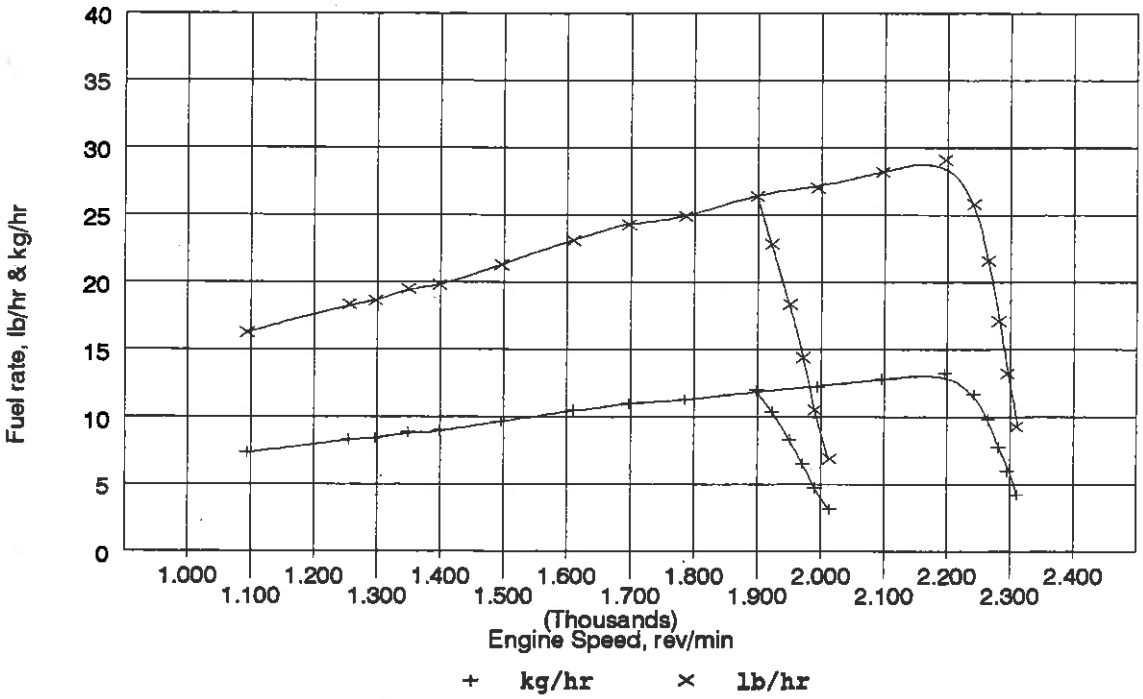
PTO Power

Ford 5640 MFWD



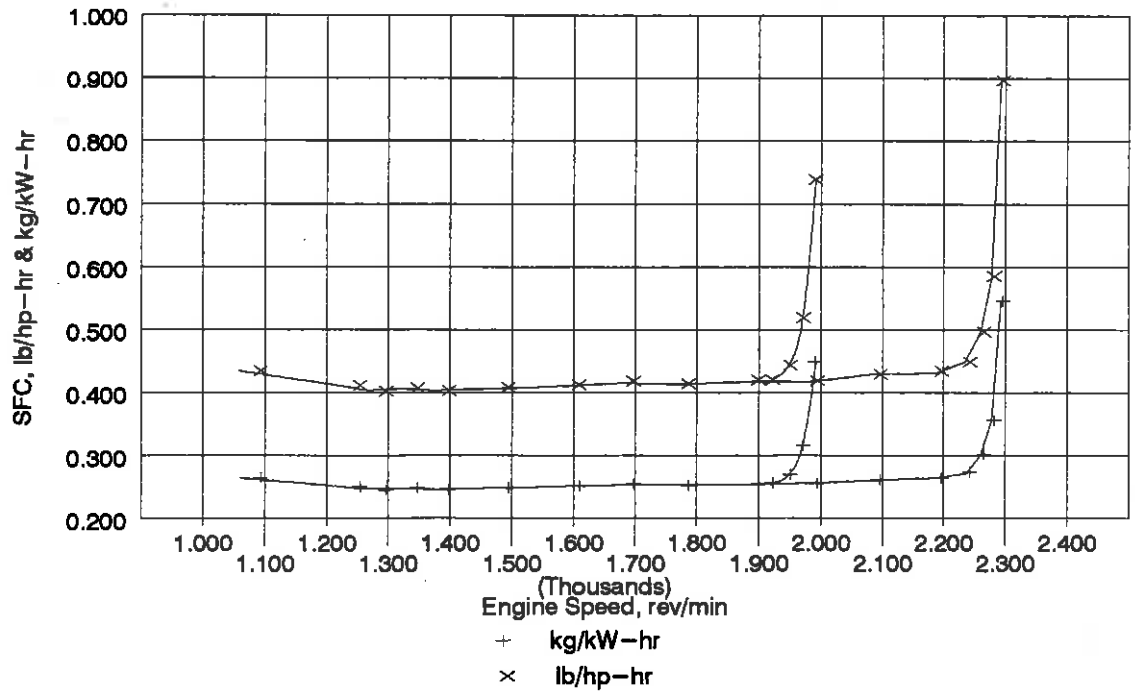
PTO Fuel Consumption

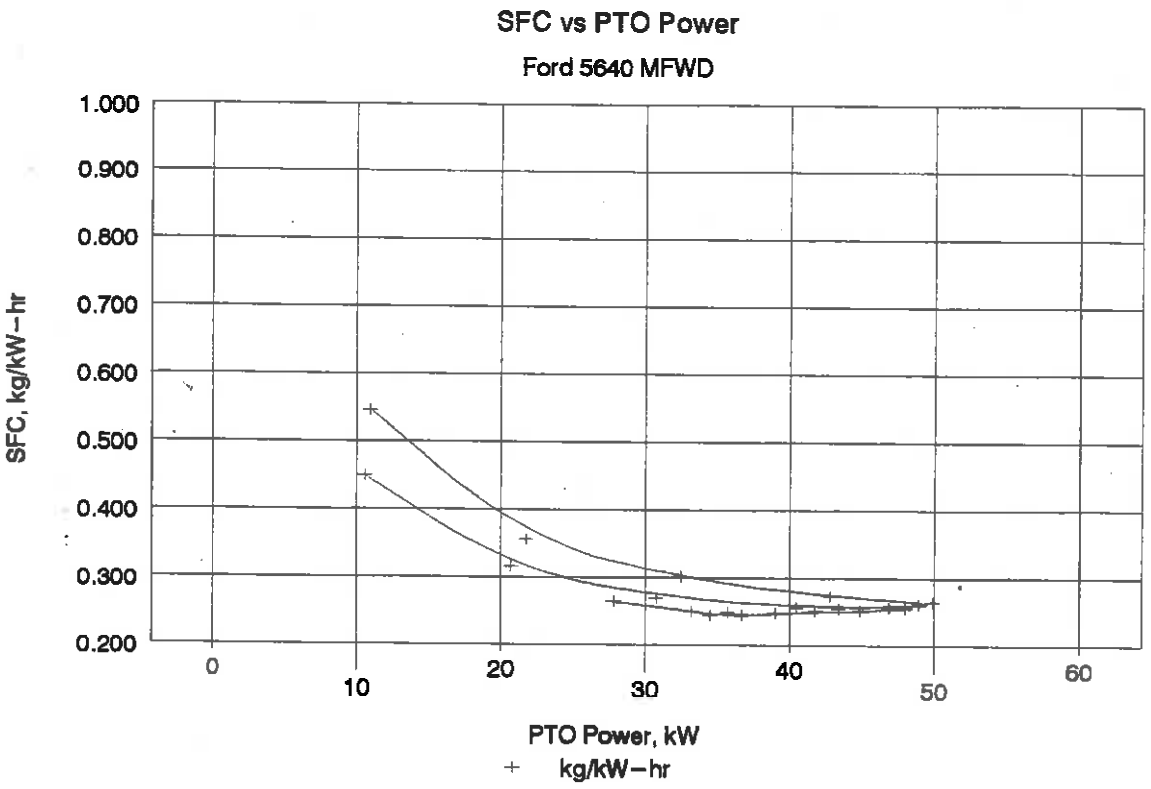
Ford 5640 MFWD

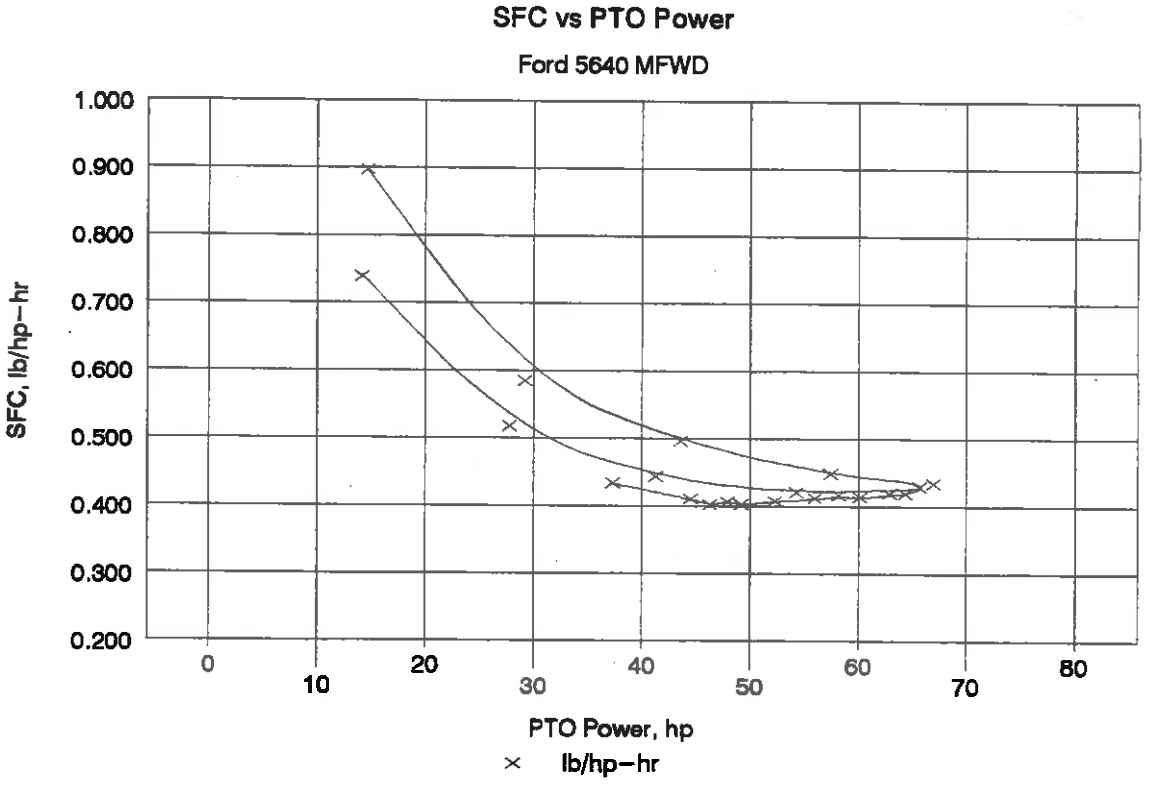


PTO Specific Fuel Consumption

Ford 5640 MFWD




SFC vs PTO Power
Ford 5640 MFWD
SFC, kg/kW–hr
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0
10
20
30
40
50
60
PTO Power, kW
+ kg/kW–hr


SFC vs PTO Power
Ford 5640 MFWD
SFC, lb/hp–hr
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0
10
20
30
40
50
60
70
80
PTO Power, hp
× lb/hp–hr

OPTIONAL TESTS - BALLASTED-FRONT DRIVE DISENGAGED

Date of tests: 12-May-92 Fuel density: 0.838 kg/l
Type of track: Concrete Test number: 1656

Gear	Power	Pull	Speed	Engine speed	Slip			Temperature, deg C					Rel hum	Pressure
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet		kPa
II. Part loads (ballasted, 2wd)					Tire pressure:		83 kPa, rear		97 kPa, front		Drawbar height		445 mm	
II.1 in selected gear at maximum power														
8 (5L)	44.28	19.83	8.04	2203	2.78%	0.300	2.78	56	84	100	18	16	82%	97.29
II.1.1 75% of pull at maximum power at rated speed														
8 (5L)	34.26	14.86	8.30	2257	2.01%	0.323	2.59	54	84	94	23	18	62%	97.53
II.1.2 50% of pull at maximum power at rated speed														
8 (5L)	23.27	9.93	8.44	2281	1.40%	0.380	2.20	55	83	94	23	18	62%	97.53
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1														
10 (6L)	34.33	14.88	8.31	1810	2.01%	0.293	2.85	55	84	97	23	18	62%	97.53
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2														
10 (6L)	23.24	9.92	8.43	1825	1.32%	0.322	2.59	54	83	92	23	18	62%	97.53
II.2 in selected gear nearest to 7.5 km/h														
8 (5L)	44.28	19.83	8.04	2203	2.78%	0.300	2.78	56	84	100	18	16	82%	97.29
II.2.1 75% of pull at maximum power at rated speed														
8 (5L)	34.26	14.86	8.30	2257	2.01%	0.323	2.59	54	84	94	23	18	62%	97.53
II.2.2 50% of pull at maximum power at rated speed														
8 (5L)	23.27	9.93	8.44	2281	1.40%	0.380	2.20	55	83	94	23	18	62%	97.53
II.2.3 next higher gear at reduced engine speed, same pull and travel speed as II.2.1														
10 (6L)	34.33	14.88	8.31	1810	2.01%	0.293	2.85	55	84	97	23	18	62%	97.53
II.2.4 next higher gear at reduced engine speed, same pull and travel speed as II.2.2														
10 (6L)	23.24	9.92	8.43	1825	1.32%	0.322	2.59	54	83	92	23	18	62%	97.53

Date of tests: 12-May-92 Fuel density: 6.978 lb/gal
Type of track: Concrete Test number: 1656

Gear	Power	Pull	Speed	Engine speed	Slip			Temperature, deg F					Rel hum	Pressure
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		in Hg
II. Part loads (ballasted, 2wd)					Tire pressure:		12 psig, rear		14 psig, front		Drawbar height		17.5 in	
II.1 in selected gear at maximum power														
8 (5L)	59.37	4459	4.99	2203	2.78%	0.494	14.13	133	183	212	65	60	82%	28.73
II.1.1 75% of pull at maximum power at rated speed														
8 (5L)	45.94	3342	5.16	2257	2.01%	0.532	13.13	130	183	201	73	64	62%	28.80
II.1.2 50% of pull at maximum power at rated speed														
8 (5L)	31.21	2232	5.24	2281	1.40%	0.625	11.16	131	182	202	73	64	62%	28.80
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1														
10 (6L)	46.03	3345	5.16	1810	2.01%	0.482	14.46	132	184	206	73	64	62%	28.80
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2														
10 (6L)	31.16	2230	5.24	1825	1.32%	0.530	13.17	130	182	198	73	64	62%	28.80
II.2 in selected gear nearest to 4.6 mph														
8 (5L)	59.37	4459	4.99	2203	2.78%	0.494	14.13	133	183	212	65	60	82%	28.73
II.2.1 75% of pull at maximum power at rated speed														
8 (5L)	45.94	3342	5.16	2257	2.01%	0.532	13.13	130	183	201	73	64	62%	28.80
II.2.2 50% of pull at maximum power at rated speed														
8 (5L)	31.21	2232	5.24	2281	1.40%	0.625	11.16	131	182	202	73	64	62%	28.80
II.2.3 next higher gear at reduced engine speed, same pull and travel speed as II.2.1														
10 (6L)	46.03	3345	5.16	1810	2.01%	0.482	14.46	132	184	206	73	64	62%	28.80
II.2.4 next higher gear at reduced engine speed, same pull and travel speed as II.2.2														
10 (6L)	31.16	2230	5.24	1825	1.32%	0.530	13.17	130	182	198	73	64	62%	28.80

OECD Drawbar Data (SI)

Date of tests: 08-May-92 Fuel density: 0.838 kg/l
Type of track: Concrete Test number: 1656

Gear	Power	Pull	Speed	Engine speed	Slip	SFC		Temperature, deg C					Rel hum	Pressure
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet		kPa
lb. Maximum Power (ballasted, 2wd at 2200 rev/min)					Tire pressure:		83 kPa, rear		97 kPa, front		Drawbar height		432 mm	
4 (2H)	32.94	36.73	3.23	2241	14.51%	0.362	2.31	57	84	97	18	12	49%	97.73
5 (3L)	42.24	31.88	4.77	2202	5.86%	0.312	2.68	57	84	100	21	14	46%	97.66
6 (3H)	42.18	24.12	6.29	2198	3.16%	0.315	2.66	55	83	97	17	14	72%	97.26
7 (4L)	43.82	23.63	6.68	2204	3.23%	0.303	2.76	56	83	99	18	15	73%	97.26
8 (5L)	44.28	19.83	8.04	2203	2.78%	0.300	2.78	56	84	100	18	16	82%	97.29
9 (4H)	42.25	17.57	8.66	2202	2.32%	0.314	2.66	57	84	100	19	16	74%	97.32
10 (6L)	43.83	15.62	10.10	2205	2.17%	0.303	2.76	57	84	101	20	16	66%	97.32
11 (5H)	42.78	14.79	10.41	2203	2.01%	0.311	2.69	57	84	101	21	17	67%	97.36
12 (6H)	41.55	11.54	12.97	2190	1.63%	0.319	2.62	58	85	101	22	17	61%	97.39

OECD Drawbar Data (US)

Date of tests: 08-May-92 Fuel density: 6.978 lb/gal
Type of track: Concrete Test number: 1656

Gear	Power	Pull	Speed	Engine speed	Slip	SFC		Temperature, deg F					Rel hum	Pressure
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		in Hg
lb. Maximum Power (ballasted, 2wd at 2200 rev/min)					Tire pressure:		12 psig, rear		14 psig, front		Drawbar height		17 in	
4 (2H)	44.17	8257	2.01	2241	14.51%	0.595	11.73	134	183	207	64	53	49%	28.86
5 (3L)	56.64	7168	2.96	2202	5.86%	0.514	13.59	135	184	212	70	57	46%	28.84
6 (3H)	56.56	5423	3.91	2198	3.16%	0.517	13.50	132	182	207	62	58	72%	28.72
7 (4L)	58.76	5312	4.15	2204	3.23%	0.498	14.00	132	182	210	64	59	73%	28.72
8 (5L)	59.37	4459	4.99	2203	2.78%	0.494	14.13	133	183	212	65	60	82%	28.73
9 (4H)	56.66	3950	5.38	2202	2.32%	0.517	13.50	135	184	213	66	61	74%	28.74
10 (6L)	58.78	3512	6.28	2205	2.17%	0.498	14.02	134	184	214	68	61	66%	28.74
11 (5H)	57.37	3326	6.47	2203	2.01%	0.511	13.65	135	184	213	70	62	67%	28.75
12 (6H)	55.72	2594	8.06	2190	1.63%	0.524	13.31	136	185	213	71	63	61%	28.76

OECD Drawbar Data (SI)

Date of tests: 07-May-92 Fuel density: 0.838 kg/l
Type of track: Concrete Test number: 1656

Gear	Power	Pull	Speed	Engine speed	Slip	SFC		Temperature, deg C					Rel hum	Pressure
	kW	kN	km/h	rev/min		kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet		kPa
Ia. Maximum Power (ballasted, fwa at 2200 rev/min)						Tire pressure:		83 kPa, rear		97 kPa, front		Drawbar height	432 mm	
3 (IH)	32.22	44.16	2.63	2249	14.15%	0.364	2.30	54	84	91	16	11	54%	97.80
4 (2H)	40.08	42.56	3.39	2205	9.44%	0.329	2.54	55	84	94	17	12	55%	97.77
5 (3L)	42.86	31.56	4.89	2205	4.33%	0.310	2.69	58	85	100	19	12	43%	97.70
6 (3H)	42.15	23.84	6.36	2201	2.98%	0.315	2.66	55	83	97	16	14	81%	97.26
7 (4L)	43.77	23.36	6.75	2204	2.98%	0.302	2.77	55	83	98	17	15	81%	97.26
8 (5L)	44.00	19.51	8.12	2201	2.45%	0.301	2.77	56	83	98	18	16	82%	97.29
9 (4H)	41.94	17.59	8.58	2168	2.37%	0.316	2.65	57	84	99	18	16	82%	97.29
10 (6L)	43.11	15.19	10.22	2211	2.06%	0.309	2.71	57	84	99	19	16	74%	97.32
11 (5H)	42.02	14.41	10.50	2206	2.06%	0.316	2.64	57	84	101	21	17	67%	97.36
12 (6H)	40.82	11.19	13.13	2200	1.60%	0.325	2.57	57	84	100	22	17	61%	97.36

OECD Drawbar Data (US)

Date of tests: 07-May-92 Fuel density: 6.978 lb/gal
Type of track: Concrete Test number: 1656

Gear	Power	Pull	Speed	Engine speed	Slip	SFC		Temperature, deg F					Rel hum	Pressure
	hp	lb	mph	rev/min		lb/hp.h	hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		in Hg
Ia. Maximum Power (ballasted, fwa at 2200 rev/min)						Tire pressure:		12 psig, rear		14 psig, front		Drawbar height	17.0 in	
3 (IH)	43.21	9927	1.63	2249	14.15%	0.598	11.67	130	183	197	61	52	54%	28.88
4 (2H)	53.74	9568	2.11	2205	9.44%	0.541	12.91	131	183	202	63	53	55%	28.87
5 (3L)	57.47	7095	3.04	2205	4.33%	0.510	13.67	136	185	212	66	54	43%	28.85
6 (3H)	56.52	5361	3.95	2201	2.98%	0.517	13.49	131	182	206	61	58	81%	28.72
7 (4L)	58.70	5252	4.19	2204	2.98%	0.497	14.06	131	182	208	63	59	81%	28.72
8 (5L)	59.00	4387	5.04	2201	2.45%	0.496	14.08	132	182	209	65	60	82%	28.73
9 (4H)	56.25	3955	5.33	2168	2.37%	0.519	13.44	134	183	211	65	61	82%	28.73
10 (6L)	57.82	3416	6.35	2211	2.06%	0.507	13.76	135	183	211	67	61	74%	28.74
11 (5H)	56.35	3239	6.53	2206	2.06%	0.520	13.41	134	184	213	69	62	67%	28.75
12 (6H)	54.74	2516	8.16	2200	1.60%	0.534	13.06	135	184	212	71	63	61%	28.75

Repairs: The left rear tire slipped on the rim during the maximum pull test (15% slip) and the inner tube had to be replaced.

Remarks: The fuel injection pump malfunctioned during the PTO tests and was replaced. All the data in this report were obtained from the tests with the replacement pump.