OECD APPROVAL # 1356/1
1356/2
(Restricted code)
Date of approval: March 16 1992

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

RESTRICTED TEST-CODE II

CASE INTERNATIONAL 9230 (4 WD) Articulated
STEIGER 9230 (4 WD) Articulated



MANUFACTURED BY: J.I. Case Company
3401 First Avenue
Fargo, North Dakota, 58102 USA

NEBRASKA TEST NO. 1649

Test date: June 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 March 16, 1992

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SPECIFICATIONS OF TRACTOR.

Manufacturers name/address	:	J.I. Case Company 3401 First Avenue North Fargo, North Dakota 58102
Location of tractor assembly	:	Fargo plant
Submitted for test by	:	The manufacturer
Selected for test by	:	The manufacturer in agreement with the test station.
Place of running in	:	J.I. Case Fargo, North Dakota
Duration of running in	:	197 hours
Location of Test	:	Tractor Testing Laboratory Lincoln, Nebraska, USA.

SPECIFICATIONS OF TRACTOR

TRACTOR.

Make/Model/Type	Case IH 9230/4WD/articulated
Number of driving wheels	4
Serial number	*JCB0027357-
1st Serial number	*JCB0006875-

ENGINE.

Make	Consolidated Diesel Company
Model	6TA-830
Type	diesel, direct injection, turbocharged and intercooled
Serial Number	44577092
Cylinders	
Number/disposition	6, in-line, vertical
Bore x stroke	114.0 mm x 135.0 mm (4.488 in x 5.315 in)
Capacity	8269 ml (505 cu in)
Compression Ratio	16.5 - 1
Arrangement of valves	Overhead
Cylinder liners	Wet, replaceable
Super charging	
Make/Model/Type	Holset/H2E/exhaust gas driven
Pressure	81-106 kPa (12-15.5 psi)
Fuel System	
Feed system	Engine driven transfer pump
Make/Type/Model of filters	Case IH/spin on/ primary J903410 secondary J903640
Fuel tank capacity	435 liters (115 US gallons)

Make/Model/Type Injection Pump	Robert Bosch/PESWM/in line multiple plunger
Pump Serial number	PES6MW100/120RS1137-1
Production setting of pump Flow Rate (Rated Eng.Spd & Full Load)	34.3 - 38.0 kg/h (75.6 - 83.8 lb/h) (fuel density - 0.838 kg/l)
Make/Model/Type of injectors	Robert Bosch,17 mm P/N J908511
Injection pressure	20.5 MPa(2975 psi)
Timing	22 degrees BTDC
Governor	
Make/Model/Type	Robert Bosch,mechanical,RSV
Governed engine speed range	From 850 to 2400 rev/min
Rated engine speed	2200 rev/min
High-idle speed range	2400 +/- 50 rev/min
Air Cleaner.	
Pre-cleaner Air intake location	Integral with air cleaner
Main Cleaner Make/Model/Type	Donaldson/FHG14-0133/ dry element
Secondary element	pleated paper
Maintenance indicator	restriction switch in air inlet tube,light on dash
Lubrication system.	
Type of feed pump	full pressure, positive displacement.
Type of filters	full flow
Number	1
Oil cooler	Heat exchanger with engine coolant
Cooling system.	
Type of coolant	Liquid
Type of pump	Centrifugal,belt driven
Fan specification	ECS P/N 411357
Number of fan blades	6
Fan diameter	610 mm (24.0 in)
Coolant system capacity	28 liter (29 qt)
Type of temperature control	2 thermostats

Starting system.	
Make/Model/Type	Nippendenso/F4.0/electro-mechanical engagement
Power Rating	4.0 kW (5.4 hp)
Cold starting aid	Ether spray in intake manifold and in-block coolant heater
Safety device	Electrical lockout on gearshift and PTO controls
Electrical system.	
Voltage	12 Volt
Generator	
Make/Model/Type	Delco Remy/Series 21SI/200
Power rating	125 Ampere at 2200 engine rpm.
Batteries	
Number & connection	2-12 V batteries in parallel
Rating	90 amp-hours per battery at 20 hour rating 625 Cold crank amps per battery
Exhaust system.	
Make/Model/Type	Nelson/23719-N/aspirated/ expansion chamber
Location	Vertical,right front side of cab outlet directed to right side

TRANSMISSION TO WHEELS

Clutch. (travel alone)	
Make/Model/Type	FTK/wet multiple plate, oil cooled
Number of plates	10
Plate diameter	229 mm (9.0 in)
Method of operation	Hydraulic pressure, controlled by foot pedal.
Gear Box.	
Make/Model/Type	FTK/EW16/Full Powershift
Arrangement	countershaft
Number of gears	12 forward, 3 reverse controlled by a single hand lever
Oil cooler	Heat exchanger with air
Available options	None

Rear axle and final drives.

Make/model/Type	Raba 593/inboard planetary, bar type
Differential Lock Type	multiple disc clutch with limited slip
Method of engagement	electrically
Method of disengagement	electrically

Front Axle and final drives.

Make/Model/Type	Raba 593/inboard planetary, bar type
Differential lock Type	multiple disc clutch with limited slip
Method of engagement	electrically
Method of disengagement	electrically

Total ratios and travelling speeds

Gear Number	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at rated engine speed of 2200 rev/min [km/h]	[mph]
Forward			
1	194.199	3.50	2.17
2	160.496	4.24	2.63
3	130.410	5.21	3.24
4	107.402	6.33	3.93
5	88.769	7.66	4.76
6	72.107	9.43	5.86
7	61.084	11.13	6.92
8	50.490	13.47	8.37
9	41.009	16.58	10.30
10	33.778	20.13	12.51
11	27.912	24.36	15.14
12	22.679	29.99	18.64
Reverse			
R1	148.512	4.58	2.85
R2	82.119	8.28	5.15
R3	46.723	14.56	9.05

Calculated with a tire dynamic radius index of 820 mm (32.3 in) (ISO 4251/1-1984)
Number of revolutions of front wheels for one revolution of rear wheels 1.000

POWER - TAKE - OFF.

Main Power-Take-Off.

Type	Independent
Method of engagement	Hydraulically actuated multi-plate clutch operated by hand lever, independent of main drive clutch.
Number of shafts	One

Power take-off proportional to engine speed

1000 rev/min.

Location	Rear of tractor, vertical center plane.
Diameter of shaft	44.4 mm (1.75 in)
Number of splines	20;conforms to ISO 500/1979.
Height above ground	764 mm (30.1 in)
Distance from median plane of tractor	0 mm
Distance behind rear axle	691 mm (27.2 in)
PTO Speed at rated engine spd	1049 rev/min
Engine speed at Std. PTO spd	2098 rev/min
Ratio of Engine rpm to PTO rpm	2.09797:1
Direction of rotation (viewed facing driving end)	Clockwise.

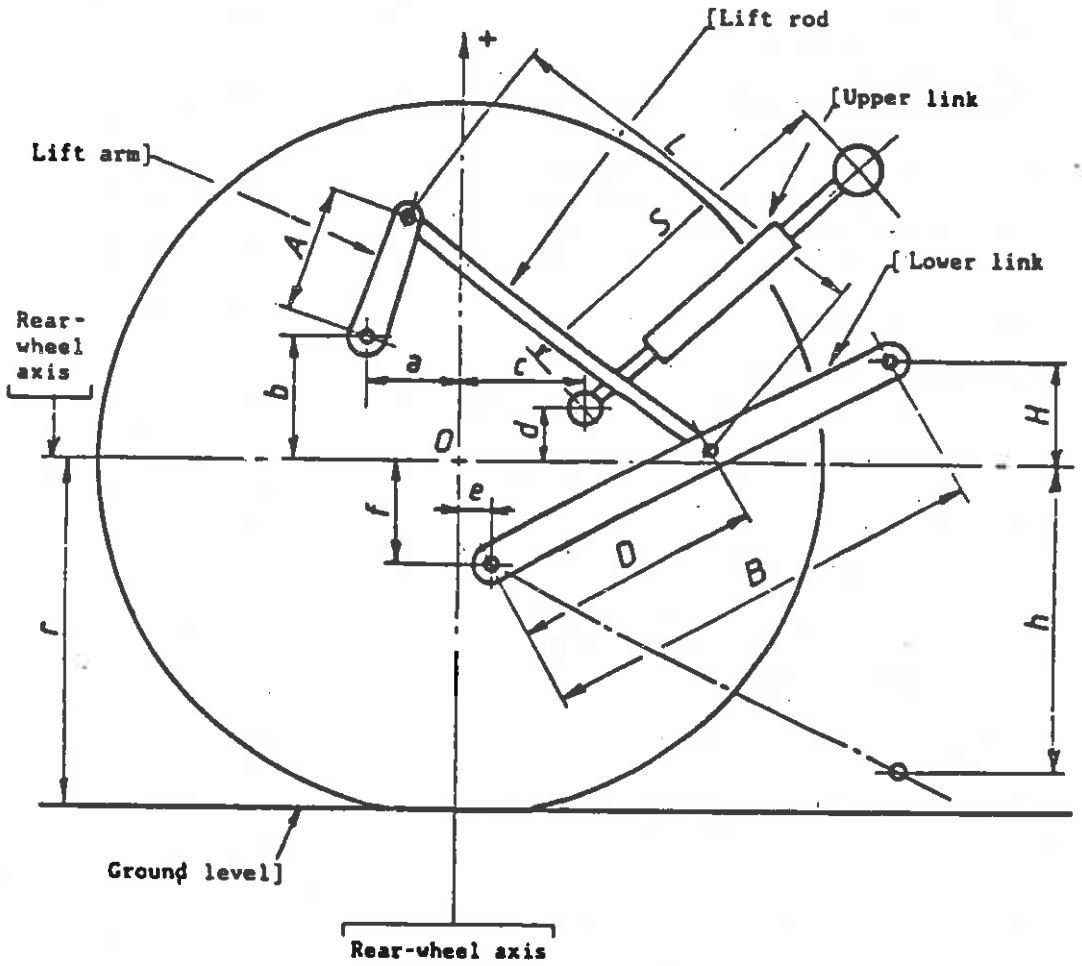
POWER LIFT.

Make/Model/Type	Cessna axial piston pump, pressure and flow compensated
Type of hydraulic system	closed center, load sensing
Number/Type of cylinders	Two external,both single acting
Type of linkage lock for transport	Hydraulic
Relief valve setting	17.237 +/-0.345 MPa (2500 +/- 50 psi)
Opening pressure of cylinder safety valve	20.684 MPa (3000 psi)
Lift pump type	axial piston, pressure and flow compensated
Power transmission to pump	direct drive
Type/Number of filters	Spin on cartridge/one
Location of oil reservoir	separate reservoir, right side,rear end of front frame
Number/Type/Location of tapping points.	4 pairs of ISO standard couplings at rear of tractor
Max. oil volume available for external cylinders.	22.7 l (24 qt)

THREE POINT LINKAGE.

- Category 3 in conformity with ISO 730/1-1977, except for horizontal distance from PTO to center of hitch points on the lower links while in the horizontal position - 616 mm
- Category adaptor - Quick coupler

THREE POINT LINKAGE



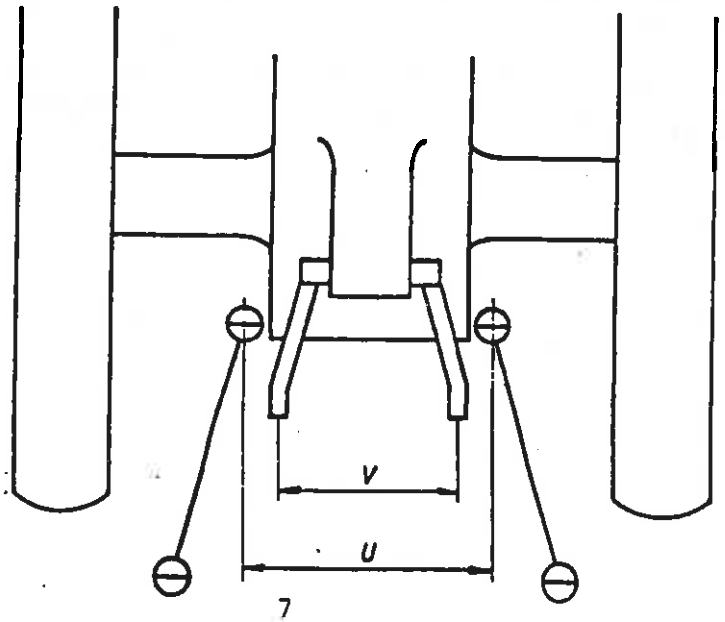


Table 1.1 - *Linkage geometry dimensions.

		Dimension or range [mm]	Dimension or range [in]	Settings used on test [mm]	Settings used on test [in]
Lift category		III			
Rear Tire - Radius Index	(r)	820	32.3		
Front Tire - Radius Index	(r')	820	32.3		
Length of lift arms	(A)	533	21.0	same	
Length of lower links	(B)	1067	42.0	same	
Distance of lift arm pivot from: horizontal	(a)	134	5.3	same	
rear wheel axis: vertical	(b)	637	25.1	same	
Horizontal distance between the 2 lower link points	(u)	627	24.7	same	
Horizontal distance between the 2 lift arm end points	(v)	719	28.3	same	
Length of upper link	(S)	722 to 848	28.4 to 33.4	740	29.1
Distance of upper link pivot from: horizontal	(c)	554 579	21.8 22.8	579	22.8
rear wheel axis: vertical	(d)	187 289	7.4 11.4	289	11.4
Distance of lower link pivot from: horizontal	(e)	259	10.2	same	
rear wheel axis: vertical	(f)	251	9.9	same	
Distance of lower link pivot points to lift rod pivot pts on lower links.	(D)	584	23.0	same	
Length of lift rods	(L)	869 to 965	34.2 to 38.0	959	37.8
Height of lower hitch points relative to rear wheel axis In low position	(h)	518 to 718	20.4 to 28.3	688	27.1
In high position	(H)	105 to 273	4.1 to 10.7	136	5.4
Height above ground of lower hitch points when locked in transport position.		925 to 1093	36.4 to 43.0	956	37.7

*Assuming (r) with a dynamic tire index of 820 mm (32.3 in) ISO 4251/1-1984

SWINGING DRAWBAR.

Type	Swings for hook-up only
Height above ground:	Maximum 544 mm (21.4 in) Minimum 417 mm (16.4 in)
Adjustments	inverting drawbar
Distance of hitch point from rear wheel axis, horizontal	1198 mm (47.2 in)
Distance of hitch point from PTO shaft end	
Vertically	253 mm (10.0 in)
Horizontally	508 mm (20.0 in)
Lateral adjustment (center of clevis)	
Right hand	none
Left hand	none
Distance of pivot point from rear wheel axle;horizontally	478 mm (18.8 in)
Diameter of drawbar pin hole	46 mm (1.8 in)
Maximum vertical permissible load	56.7 kN (12750 lb)

STEERING.

Make/Model/Type	Eaton hydrostatic steering control unit
Method of operation	hand wheel
Pump	Cessna axial piston,pressure and flow compensated
Ram(s)	Two
Working pressure	15.9 MPa (2300 psi)

BRAKES

Service brake.

Make/Model/Type	Kelsey Hayes,caliper,dry disc
Method of operation	manual/hydraulic,operated by foot pedal.
Trailer braking take-off	none

Parking brake.

Type	caliper/dry disc
Method of operation	mechanically by hand lever

WHEELS

Number.	
Front	Four; Driving and steering
Rear	Four; Driving and steering
Wheel base	3058 mm (120.4 in)

Track width adjustment

	Minimum [mm]	Minimum [in]	Maximum [mm]	Maximum [in]	Adjustment method
Front	1524	60.0	3302	130.0	adjustable clamping wedges on bar axle
Rear	1524	60.0	3302	130.0	same as front

PROTECTIVE STRUCTURE

Make/Model/Type	Case IH,4CSF-2
Manufacturer's name/address	Case IH 3401 First Avenue North Fargo, North Dakota
Protective device	Cab,Case IH,4CSF-2,4 post with charpy v-notch certified material
Tiltable	No
OECD approval number	CSS 076/13 - for Case IHC 9230 CSS 076/14 - for Steiger 9230

DRIVER'S SEAT

Make/Model/Type	Sears, P108 air seat, 9100
Type of suspension	air suspension
Type of damping	fore/aft and lateral
Range of adjustment	
Longitudinal	152 mm (6.0 in)
Vertical	76 mm (3.0 in)

LIGHTING.

	Height above ground of center [mm]	Height above ground of center [in]	Size [mm]	Distance from outside edge of lights to median plane of tractor. [mm]	Distance from outside edge of lights to median plane of tractor. [in]
Headlights	1670	65.7	102 x 165	361	14.2
Cab-lights(rear)	3048	122.0	90 x 140	968	38.1
(front)	3300	130.0	90 x 140	762	30.0
Rearlights	1949	80.6	102 x 165	940	37.0
Reflectors	N/A				

TEST CONDITIONS.

Overall dimensions.

Length	Width minimum	Width maximum	Height at top of protective structure	Height at top of exhaust silencer
6410 mm	3035 mm	3767 mm	3279 mm	3309 mm

Ground clearance (unballasted) 280 mm (11.0 in)
Clearance-limiting part bottom of drawbar

Tractor Mass (with Cab, full fuel tank)

		Without driver [kg]	Without driver [lb]	With driver [kg]	With driver [lb]
Unballasted	Front	5632	12416	5670	12500
	Rear	5303	11692	5340	11772
	Total	10935	24108	11010	24272

Tire and track width specifications.

	Front	Rear
Make	Goodyear	Goodyear
Dimensions	18.4R38	18.4R38
Ply rating	1 star (6,8 ply)	1 star (6,8 ply)
Type	Radial	Radial
Max.load (tire manufacturer)	25.35 kN (5700 lb)	25.35 kN (5700 lb)
Max.load(tractor manufacturer)	same	same
Inflation pressure (tire mfr)	124 kPa (18 psi)	124 kPa (18 psi)
Dynamic Radius Index	820 mm (32.3 in)	820 mm (32.3 in)
Chosen track width - inner	1665 mm (65.6 in)	1665 mm (65.6 in)
- outer	2900 mm(114.2 in)	2900 mm(114.2 in)

Oils and Lubrication.

Capacity and change interval:

	Capacity liter	Capacity quart	Oil change hours	Filter change hours
Engine	22	23	250	250
Gear Box	34	36	1000	1000
Front and Rear axle	34	36	1000	---
Hydraulic system (includes steering, and hydraulic lift)	68	72	1000	1000

Specifications:

	Recommended	Used during test
Engine oil		
Type	SAE 15W40	same
Viscosity	14.8 cSt at 100'C	
Classification	API CE/CD	
Transmission oil		
Type	Case IH Hytran Plus	same
Viscosity	6.2 cSt at 100'C	
Classification	NA	
Hydraulic fluid		
Type	Case IH Hytran Plus	same
Viscosity	6.2 cSt at 100'C	
Classification	NA	
Steering oil	same as hydraulic	same
Grease	NLGI No.2 Lithium	
Number of lubrication points:	28 (includes 17 for PTO and three point hitch)	

Fuel

Type	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)
(Drawbar test)	Same as Pto test
Cetane number	53.9
Viscosity	2.40 cSt at 38'C(100'F)

III.TEST RESULTS

COMPULSORY TESTS RESULTS

(1) MAIN POWER TAKE-OFF

Date of tests : 11 June 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.						
162.71 (218.20)	1900	906	44.93 (11.87)	37.65 (83.00)	0.231 (0.380)	3.62 (18.38)
1.2 Power at rated engine speed. (1 hour)						
148.12 (198.63)	2199	1048	44.44 (11.74)	37.24 (82.09)	0.251 (0.413)	3.33 (16.92)
1.3 Maximum power at standard PTO speed.(1000 rev/min)						
154.98 (207.83)	2097	1000	44.86 (11.85)	37.59 (82.88)	0.243 (0.399)	3.45 (17.54)

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

Power kW (hp)	Speeds engine rev/min	PTO rev/min	Fuel Consumption hourly l/h (gal/h)	hourly kg/h (lb/h)	specific kg/kW.h (lb/hp.h)	Specific energy kW.h/l (hp.h/gal)
(i) Torque obtained at maximum power at rated engine speed.						
148.12 (198.63)	2199	1048	44.44 (11.74)	37.24 (82.09)	0.251 (0.413)	3.33 (16.92)
(ii) 85% of the torque obtained in (i)						
129.94 (174.25)	2252	1074	40.44 (10.68)	33.88 (74.70)	0.261 (0.429)	3.21 (16.31)
(iii) 75% of the torque defined in (ii)						
98.13 (131.59)	2286	1090	33.13 (8.75)	27.76 (61.20)	0.283 (0.465)	2.96 (15.04)
(iv) 50% of the torque defined in (ii)						
66.70 (89.44)	2320	1106	26.63 (7.04)	22.32 (49.20)	0.335 (0.550)	2.50 (12.71)
(v) 25% of the torque defined in (ii)						
33.02 (44.28)	2350	1120	18.68 (4.93)	15.65 (34.50)	0.474 (0.779)	1.77 (8.98)
(vi) Unloaded						
0.28 (0.38)	2375	1132	12.18 (3.22)	10.21 (22.50)	36.493 (59.995)	0.02 (0.12)

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

Power kW (hp)	Speeds engine rev/min	PTO rev/min	Fuel Consumption hourly l/h (gal/h)	hourly kg/h (lb/h)	specific kg/kW.h (lb/hp.h)	Specific energy kW.h/l (hp.h/gal)
(i) Torque obtained at standard pto speed.						
154.98 (207.83)	2097	1000	44.86 (11.85)	37.59 (82.88)	0.243 (0.399)	3.45 (17.54)
(ii) 85% of the torque obtained in (i)						
127.75 (171.31)	2165	1032	38.81 (10.25)	32.52 (71.70)	0.255 (0.419)	3.29 (16.71)
(iii) 75% of the torque defined in (ii)						
104.91 (140.69)	2187	1043	31.99 (8.45)	26.81 (59.10)	0.256 (0.420)	3.28 (16.65)
(iv) 50% of the torque defined in (ii)						
69.51 (93.21)	2220	1058	25.82 (6.82)	21.64 (47.70)	0.311 (0.512)	2.69 (13.66)
(v) 25% of the torque defined in (ii)						
34.17 (45.83)	2249	1072	17.70 (4.68)	14.83 (32.70)	0.434 (0.714)	1.93 (9.80)
(vi) Unloaded						
0.15 (0.21)	2274	1084	11.04 (2.92)	9.25 (20.40)	60.121 (98.838)	0.01 (0.07)

No-load maximum engine speed	2375 rev/min
Equivalent engine torque:	
at rated engine speed	643 Nm(2199 rev/min)
at maximum power	818 Nm(1900 rev/min)
at maximum torque	852 Nm(1800 rev/min)
Mean atmospheric conditions:	
Temperature-dry bulb	23'C (73'F)
Relative Humidity	69 %
Barometer -	97.92 kPa(28.92 in Hg)

Maximum temperatures:		
	Thermostat housing	88'C (190'F)
	Engine oil pan	104'C (220'F)
	Fuel at pump inlet	55'C (132'F)
	Engine air intake	32'C (89'F)
	Hydraulic oil	55'C (131'F)
Turbocharger boost pressure		
	at rated engine speed	107 kPa (15.5 psi)
	at maximum power	114 kPa (16.5 psi)

2. HYDRAULIC POWER AND LIFTING FORCE

Date of test: 14 June 1991
Location: TTL/UNL, Lincoln, Nebr.

2.1 HYDRAULIC POWER TEST - Hydraulic pump performance

i. Sustained pressure with pump stalled: 17.58 MPa (2550 psi)

ii. Pump delivery rate at minimum pressure & rated engine speed: 109.8 l/m (29.0 gpm)

iii.

	Flow Rate l/min (gal/min)	Pressure MPa (psi)	Power kW (hp)
At 90% of relief valve setting.	94.6 (25.0)	16.06 (2330)	25.3 (34.0)
At maximum hydraulic power.	94.3 (24.9)	16.20 (2350)	25.5 (34.1)

Tapping point(s): Two hydraulic outlets combined

Hydraulic fluid temperature at flow meter: 65'C (149'F)

2.2 POWER LIFT TEST.

		Hitch Points	Frame
Lower hitch points above ground - down position.	[mm/in]	132/5.2	165/6.5
Vertical movement without load	[mm/in]	824/32.5	840/33.1
Vertical movement with load	[mm/in]	724/28.5	691/27.2
Maximum corrected force through full range	[kN/lbf]	57.1/12830	57.6/12942
Corresponding pressure	[kPa/psi]	15823/2295	
Moment about rear axle	[kN.m/ft.lb]	82.9/61154	118.7/87574
Maximum mast tilt angle	[degrees]	--	5.0

Lifting height relative to the horizontal position of lower links

[mm]		-436	-378	-350	-251	-149
[in]		-17.2	-14.9	-13.8	-9.9	-5.9
Corrected lifting forces.						
hitch points	[kN]	57.2	--	57.1	59.9	62.6
	[lb]	12852	--	12830	13455	14081
at frame	[kN]	--	66.4	62.6	62.0	62.3
	[lb]	--	14922	14076	13941	14004

Lifting height relative to the horizontal position of lower links

[mm]		-50	49	150	250	288	313
[in]		-2.0	1.9	5.9	9.8	11.3	12.3
Corrected lift forces.							
hitch points	[kN]	64.7	66.8	68.6	69.8	70.2	--
	[lb]	14553	15017	15426	15701	15773	--
at frame	[kN]	62.1	62.0	60.6	59.5	58.1	57.6
	[lb]	13968	13941	13631	13374	13068	12942

Date of tests:	12–Jun–91		Fuel density:	0.838 kg/l											
	13–Jun–91	Test #	1649												
Type of track:	Concrete		Engine											Relative	Barometric
Gear	Power kW	Pull kN	Speed km/h	Speed rev/min	Slip	SFC kg/kW.h	SFE kW.h/l	Fuel	Coolant	Oil	Dry	Wet		humidity	Pressure kPa
I. Maximum Power (unballasted, 4wd	1900 rev/min)					Tire pressure:		97 kPa, rear (inner)			97 kPa, front (inner)				
			Drawbar height:		343 mm			83 kPa, rear (outer)			83 kPa, front (outer)				
1	100.30	109.52	3.30	2261	10.01%	0.318	2.63	53	83	92	24	23		92%	97.36
2	122.10	111.47	3.94	2223	9.45%	0.299	2.80	52	83	93	24	23		92%	97.36
3	133.14	105.50	4.54	2046	8.09%	0.282	2.97	55	84	93	24	23		92%	97.36
4	141.09	96.59	5.26	1903	5.79%	0.266	3.15	55	84	93	24	23		92%	97.36
5	142.93	79.48	6.47	1900	3.92%	0.263	3.19	55	85	101	28	24		72%	97.63
6	144.23	64.67	8.03	1895	2.88%	0.260	3.22	54	86	100	28	24		72%	97.63
7	144.23	54.26	9.57	1902	2.31%	0.260	3.23	54	86	99	29	24		66%	97.63
8	143.80	44.54	11.62	1900	1.81%	0.262	3.20	54	86	98	30	24		61%	97.60
9	143.72	35.99	14.38	1900	1.65%	0.262	3.20	54	87	96	31	24		56%	97.60

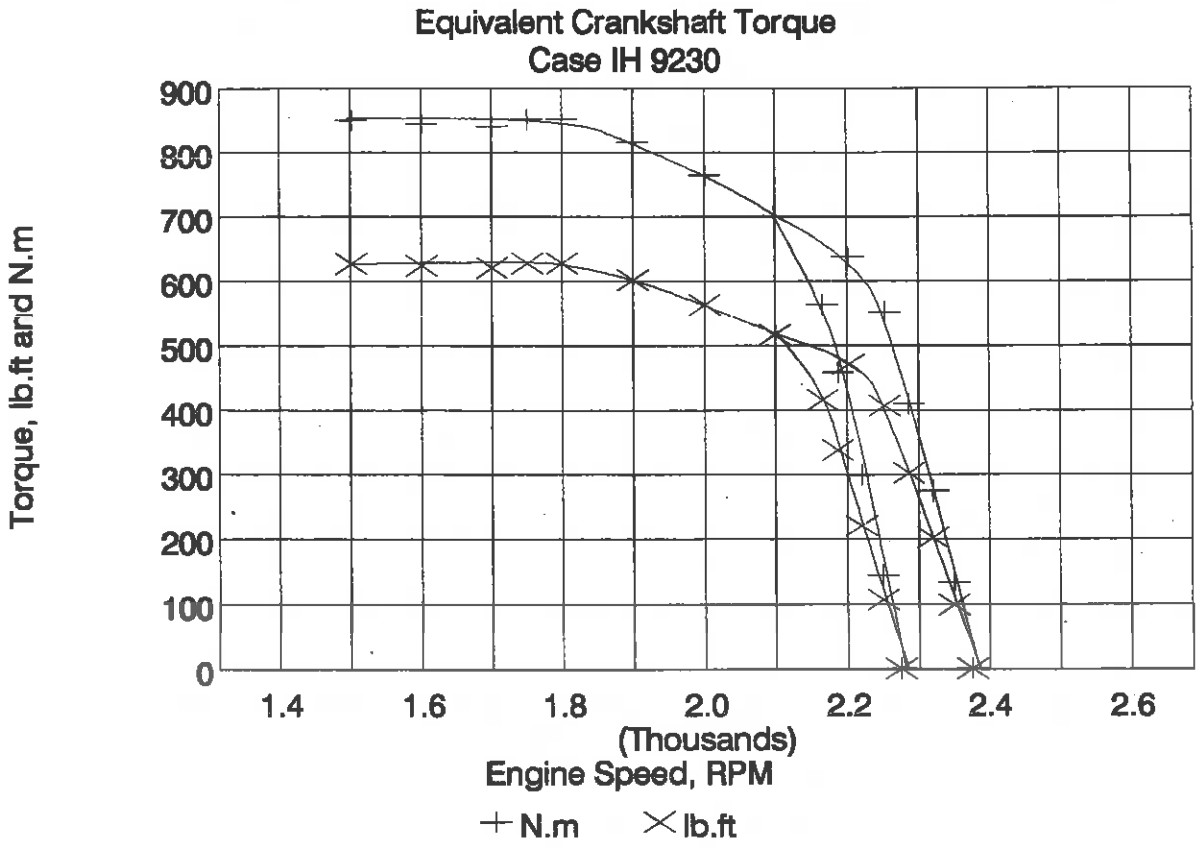
Note: Pull in 1st and 2nd gear limited due to bounce.

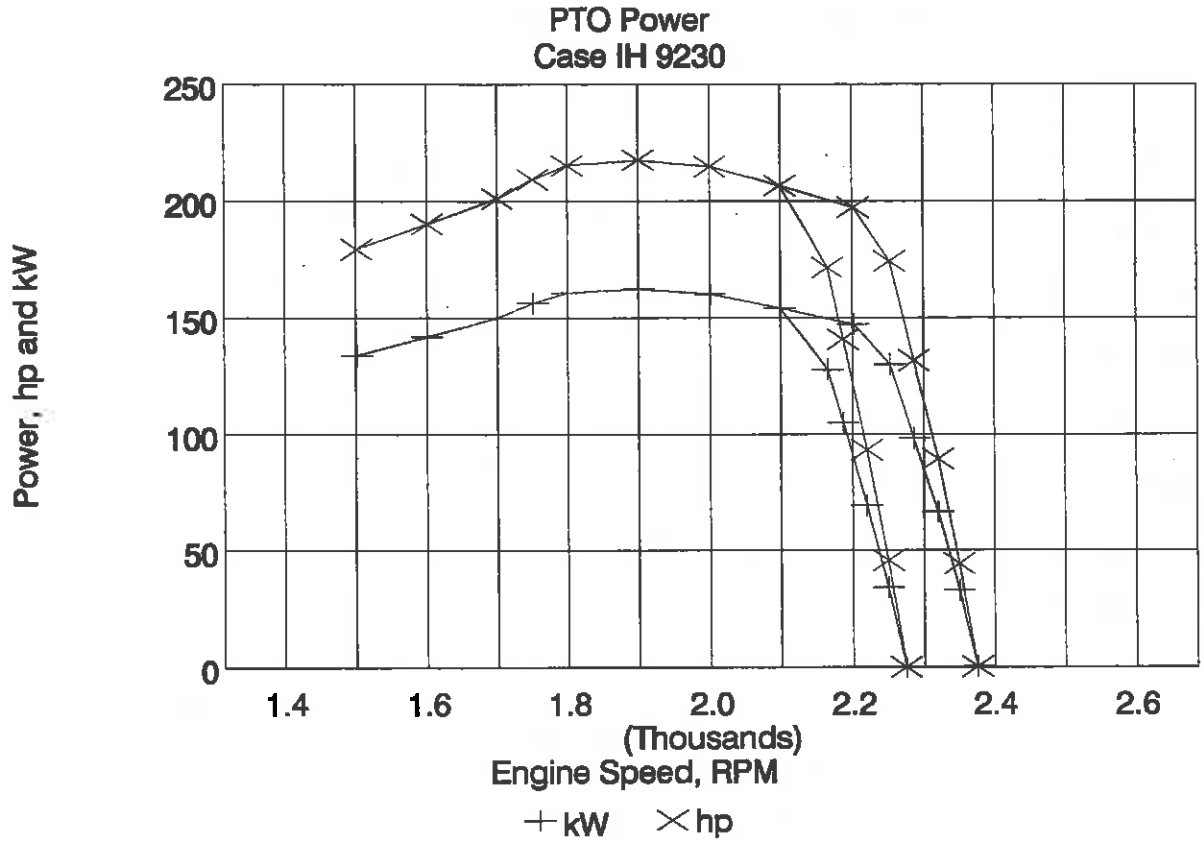
II. Part Loads (unballasted, 4wd	1900 rev/min)					Tire pressure:		97 kPa, rear (inner)			97 kPa, front (inner)				
			Drawbar height:		343 mm			83 kPa, rear (outer)			83 kPa, front (outer)				
II.1 in selected gear at maximum power															
6	144.23	64.67	8.03	1895	2.88%	0.260	3.22	54	86	100	28	24		72%	97.63
II.1.1 75% of pull at maximum power at rated speed															
6	101.60	37.54	9.74	2266	1.48%	0.304	2.76	54	85	94	33	25		52%	97.49
II.1.2 50% of pull at maximum power at rated speed															
6	69.24	25.01	9.97	2304	0.98%	0.351	2.39	53	83	91	33	25		52%	97.49
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1															
7	101.54	37.56	9.73	1918	1.48%	0.271	3.09	54	84	93	33	25		52%	97.49
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2															
7	69.13	25.01	9.95	1950	0.81%	0.302	2.77	53	83	90	33	25		52%	97.49
II.2 in selected gear nearest to 7.5 km/h															
5	142.93	79.48	6.47	1900	3.92%	0.263	3.19	55	85	101	28	24		72%	97.63
II.2.1 75% of pull at maximum power at rated speed															
5	103.28	47.16	7.88	2268	2.14%	0.300	2.79	54	84	95	31	24		56%	97.56
II.2.2 50% of pull at maximum power at rated speed															
5	70.43	31.40	8.06	2306	1.31%	0.345	2.43	55	83	90	31	24		56%	97.56
II.2.3 next higher gear at reduced engine speed, same pull and travel speed as II.2.1															
6	103.20	47.14	7.88	1842	1.98%	0.268	3.12	55	84	94	31	24		56%	97.56
II.2.4 next higher gear at reduced engine speed, same pull and travel speed as II.2.2															
6	70.32	31.40	8.06	1870	1.31%	0.293	2.86	54	83	93	31	24		56%	97.56

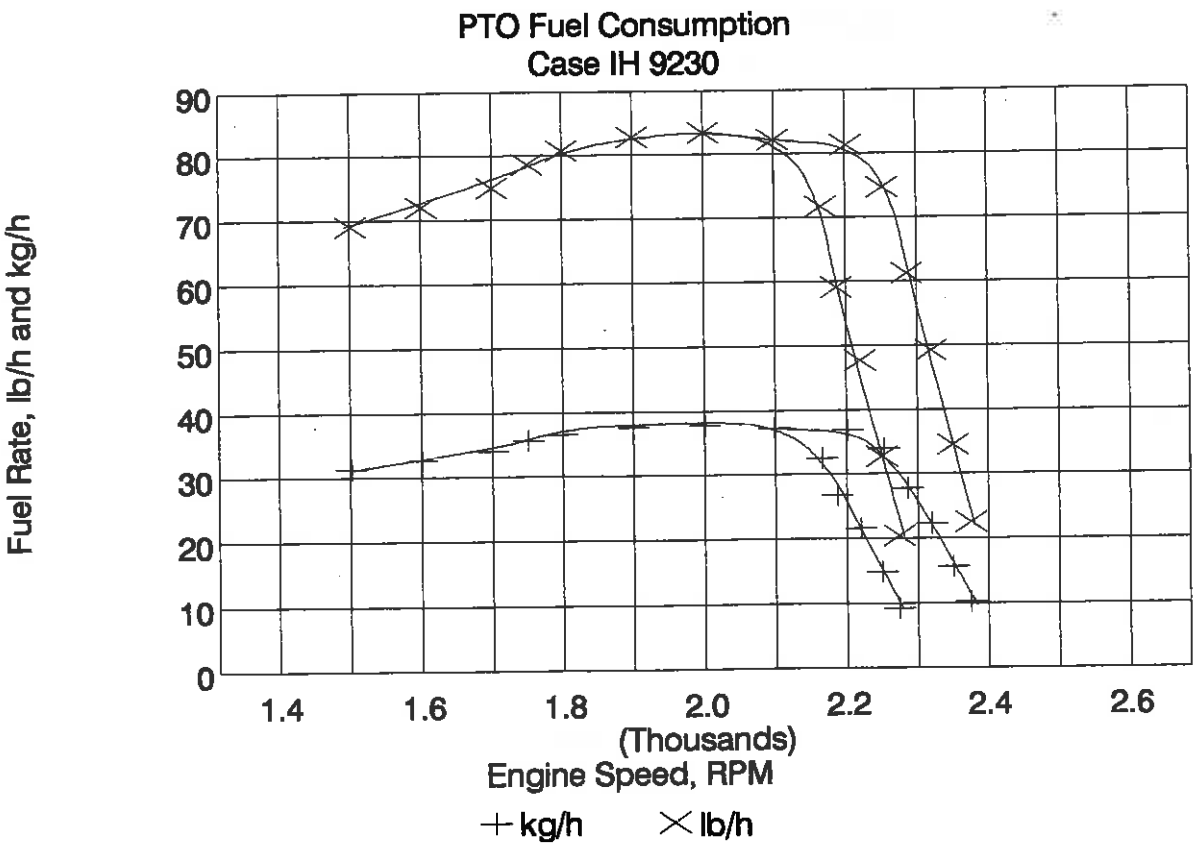
Date of tests:	12–Jun–91		Fuel density:	6.993 lb/gal											
	13–Jun–91	Test #	1649												
Type of track:	Concrete		Engine											Relative	Barometric
Gear	Power hp	Pull lb	Speed mph	Speed rpm	Slip	SFC lb/hp.h	SFE hp.h/gal	Fuel	Coolant	Oil	Dry	Wet		humidity	Pressure in Hg
I. Maximum Power (unballasted, 4wd	1900 rev/min)					Tire pressure:		14 psi, rear (inner)			14 psi, front (inner)				
			Drawbar height:		13.5 in			12 psi, rear (outer)			12 psi, front (outer)				
1	134.50	24622	2.05	2261	10.01%	0.524	13.36	128	182	198	76	73		92%	28.75
2	163.74	25061	2.45	2223	9.45%	0.492	14.21	126	182	200	76	73		92%	28.75
3	178.54	23717	2.82	2046	8.09%	0.463	15.09	132	183	199	76	73		92%	28.75
4	189.20	21714	3.27	1903	5.79%	0.437	16.01	131	184	200	76	73		92%	28.75
5	191.67	17867	4.02	1900	3.92%	0.432	16.18	131	185	214	82	75		72%	28.83
6	193.41	14539	4.99	1895	2.88%	0.428	16.35	129	186	213	83	75		72%	28.83
7	193.41	12198	5.95	1902	2.31%	0.427	16.38	130	188	210	84	75		66%	28.83
8	192.83	10013	7.22	1900	1.81%	0.431	16.22	130	187	208	86	75		61%	28.82
9	192.73	8091	8.93	1900	1.65%	0.431	16.24	130	188	204	88	76		56%	28.82

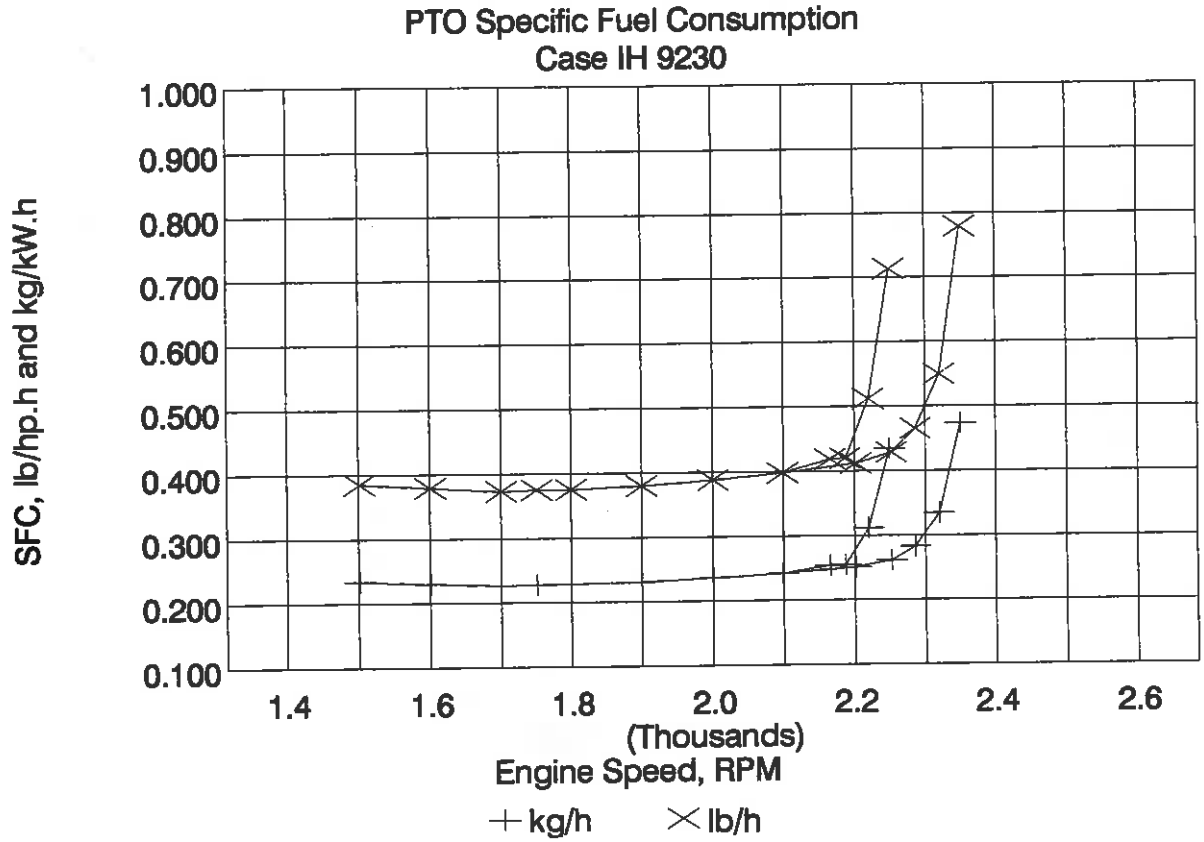
Note: Pull in 1st and 2nd gear limited due to bounce.

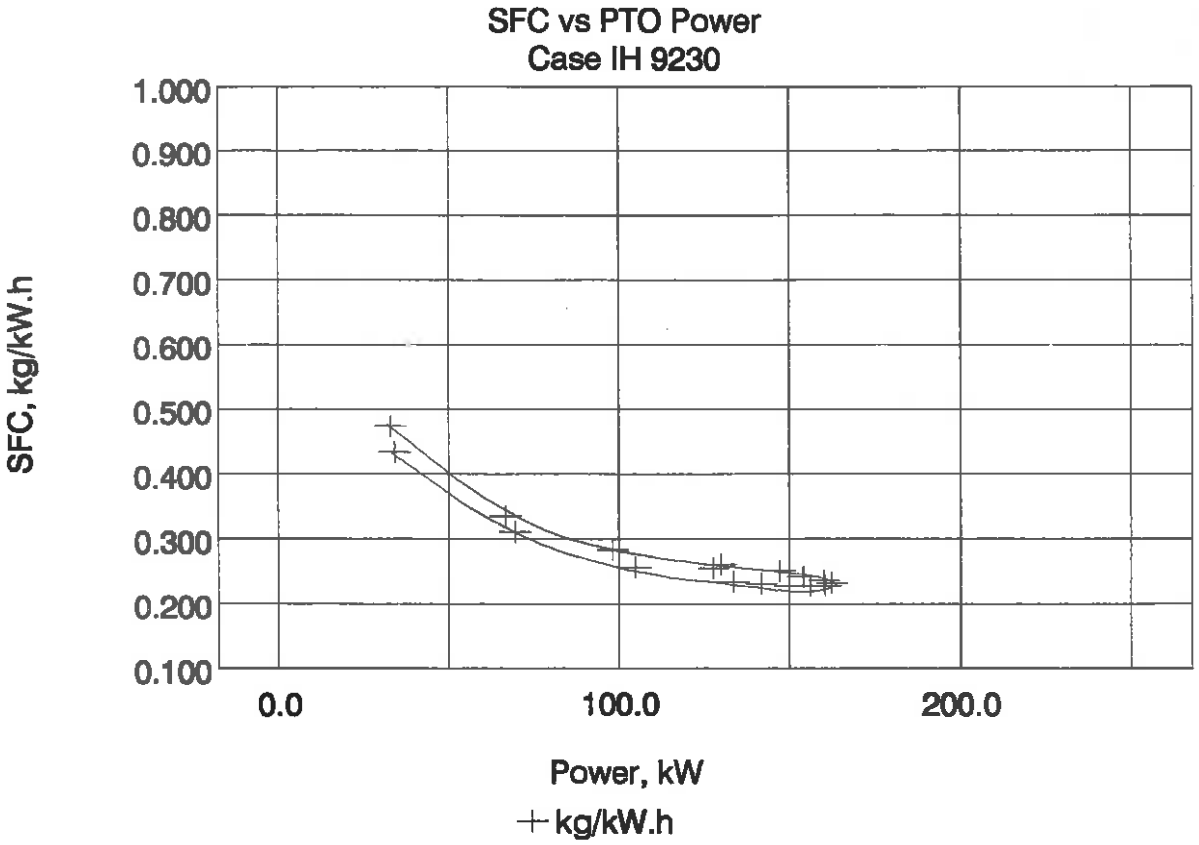
II. Part Loads (unballasted, 4wd	1900 rev/min)					Tire pressure:		14 psi, rear (inner)			14 psi, front (inner)				
			Drawbar height:		13.5 in			12 psi, rear (outer)			12 psi, front (outer)				
II.1 in selected gear at maximum power															
6	193.41	14539	4.99	1895	2.88%	0.428	16.35	129	186	213	83	75		72%	28.83
II.1.1 75% of pull at maximum power at rated speed															
6	136.25	8439	6.05	2266	1.48%	0.500	13.99	129	185	202	91	77		52%	28.79
II.1.2 50% of pull at maximum power at rated speed															
6	92.85	5623	6.19	2304	0.98%	0.577	12.11	128	182	196	91	77		52%	28.79
II.1.3 next higher gear at reduced engine speed, same pull and travel speed as II.1.1															
7	136.17	8444	6.05	1918	1.48%	0.446	15.70	129	184	199	91	77		52%	28.79
II.1.4 next higher gear at reduced engine speed, same pull and travel speed as II.1.2															
7	92.71	5622	6.18	1950	0.81%	0.497	14.08	127	181	194	91	77		52%	28.79
II.2 in selected gear nearest to 4.6 mph															
5	191.67	17867	4.02	1900	3.92%	0.432	16.18	131	185	214	82	75		72%	28.83
II.2.1 75% of pull at maximum power at rated speed															
5	138.50	10601	4.90	2268	2.14%	0.493	14.18	130	184	203	88	76		56%	28.81
II.2.2 50% of pull at maximum power at rated speed															
5	94.45	7059	5.02	2306	1.31%	0.567	12.34	131	182	195	88	76		56%	28.81
II.2.3 next higher gear at reduced engine speed, same pull and travel speed as II.2.1															
6	138.40	10599	4.90	1842	1.98%	0.441	15.86	131	183	201	88	76		56%	28.81
II.2.4 next higher gear at reduced engine speed, same pull and travel speed as II.2.2															
6	94.31	7060	5.01	1870	1.31%	0.482	14.50	129	181	199	88	76		56%	28.81

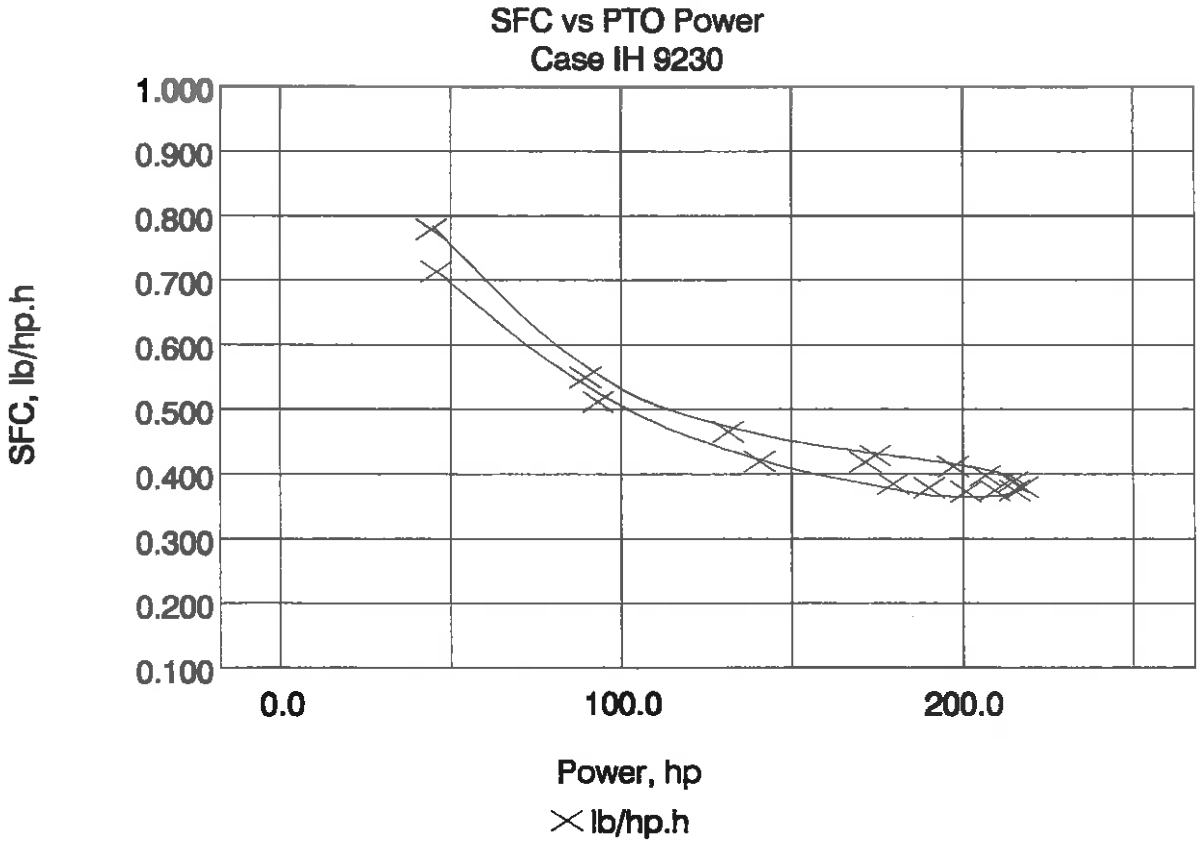

Equivalent Crankshaft Torque
Case IH 9230
Torque, lb.ft and N.m
900
800
700
600
500
400
300
200
100
0
1.4
1.6
1.8
2.0
2.2
2.4
2.6
(Thousands)
Engine Speed, RPM
N.m
lb.ft


PTO Power
Case IH 9230
Power, hp and kW
250
200
150
100
50
0
1.4
1.6
1.8
2.0
2.2
2.4
2.6
(Thousands)
Engine Speed, RPM
kW
hp


PTO Fuel Consumption
Case IH 9230
Fuel Rate, lb/h and kg/h
90
80
70
60
50
40
30
20
10
0
1.4
1.6
1.8
2.0
2.2
2.4
2.6
(Thousands)
Engine Speed, RPM
+ kg/h
× lb/h


PTO Specific Fuel Consumption
Case IH 9230
SFC, lb/hp.h and kg/kW.h
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
1.4
1.6
1.8
2.0
2.2
2.4
2.6
(Thousands)
Engine Speed, RPM
+ kg/h
× lb/h


SFC vs PTO Power
Case IH 9230
SFC, kg/kW.h
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.0
100.0
200.0
Power, kW
kg/kW.h


SFC vs PTO Power
Case IH 9230
SFC, lb/hp.h
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.0
100.0
200.0
Power, hp
lb/hp.h

Repairs: None
Remarks: None