PAMI

OECD NO. (Restricted Code) 1647/1
(Restricted Code) 1647/2
Date of Approval: March 11, 1997

REPORT OF TEST IN ACCORDANCE WITH **OECD RESTRICTED CODE (CODE II)**
FOR THE OFFICIAL TESTING OF AGRICULTURAL TRACTORS



NEW HOLLAND 8870 POWERSHIFT MFWD
NEW HOLLAND G210 POWERSHIFT MFWD
30 km/h Version (4WD)

Manufactured by: New Holland Canada Ltd.
Versatile Farm Equipment Operations
Box 7300; 1260 Clarence Ave.
Winnipeg, Manitoba; Canada; R3C 4E8

Date of Test: May/July 1996

PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

Test Station: P.O. Box 1060
Portage la Prairie, Manitoba
CANADA R1N 3C5
Telephone: (204)239-5445
Fax: (204)239-7124

Head Office: P.O. Box 1900
Humboldt, SK
CANADA S0K 2A0
Telephone: (306)682-2555
Fax: (306)682-5080

TABLE OF CONTENTS

		Page
1.	SPECIFICATIONS OF TRACTOR	1
2.	TEST CONDITIONS	11
3.	COMPULSORY TEST RESULTS	15
	3.1 Main Power Take-off Test	15
	3.2 Hydraulic Power and Lifting Force	16
	3.3 Drawbar Performance	18
4.	OPTIONAL TESTS	19
	4.1 Ballasted Drawbar Test	19
	4.2 Power Lift Test (with 20.8 R 38 tires)	20
	4.3 Power Lift Test (with 710/70 R 38 tires)	20
	4.4 Power Lift Test (ASAE S349.2)	21
	4.5 Power Lift Test (SAE J283 Jun 93)	21
	4.6 Noise Tests (Nebraska 75 % Pull)	22
5.	REPAIRS	22
6.	REMARKS	22
7.	ANNEX (CURVES)	22

This report also pertains to the New Holland G210. For marketing purposes the New Holland 8870 can also be designated as the New Holland G210 in certain countries.

Manufacturer's Name and Address:	New Holland Canada, Ltd. Versatile Farm Equipment Operations Box 7300, 1260 Clarence Winnipeg, Manitoba; Canada R3C 4E8
Location of tractor assembly plant:	Winnipeg, Manitoba; Canada
Submitted for test by:	Manufacturer
Selected for test by:	Manufacturer, with agreement of the test station
Place of running in:	New Holland North America Inc., Test Center, New Holland; PA, and Versatile Farm Equipment Test Track, Sanford, Manitoba; Canada
Duration of running in:	220 hours
Location of tests:	PTO and hydraulic power lift tests carried out at, Prairie Agricultural Machinery Institute (PAMI), Portage la Prairie, Manitoba; Canada. Drawbar performance and noise tests carried out at the manufacturers premises Versatile Farm Equipment Test Track Sanford, Manitoba; Canada and withnessed by D.J. May, Project Engineer and K.A. Carmichael, Technical Services Manager, (PAMI - Portage la Prairie).

1. SPECIFICATIONS OF TRACTOR

1.1 IDENTIFICATION

Make/Model/Type:	New Holland/8870/ Mechanical Front Wheel Drive, 30 km/h Version
Number of driving members:	2 or 4
Serial Nº:	D408517
1st Serial Nº:	Confidential

1.2 ENGINE

Make/Model/Type:	New Holland/675-TA-VA /Diesel, Turbocharged Air-to-air intercooled
Serial Nº:	VA588439

1.2.1 Cylinders

Number/disposition:	Six/ in-line, vertical
Bore/Stroke:	111.8/127 mm (4.5/5.0 in)
Capacity:	7480 cm^3 (456 in^3)
Compression ratio:	17.5:1
Arrangement of valves:	Overhead
Cylinder liners:	None

1.2.2 Turbocharging

Make/Model:	Garret/TO4E/exhaust gas driven
Pressure:	109 kPa (32.2 in HG) max at 2100 rpm

1.2.3 Fuel System

Fuel feed system:	In-line injection pump
Make/model/type of fuel filters:	Racor/87840136/Cartridge
Capacity of fuel tank:	416 Litres (110 US Gallons)
Fuel Cooler:	None
Make/model/type of injection pump:	Bosch/87800844 "p" 3000 In-line
Serial N°:	5691450056
Pump Manufacturer's production rack setting:	132 ± 4.7 mm^3/stroke at 1050 pump rev/min
Flow rate (rated engine speed and full load):	31.4 ± .94 kg/h (69.2 ± 2.1 lb/h)
Fuel density:	0.840 kg/l at 15°C
Timing:	16 degrees BTDC static
Make/model/type of injectors:	Bosch/1876871/5 Hole Differential Needle
Injection pressure:	25.51 MPa (3700 psi)

1.2.4 Governor

Make/model/type:	Bosch/ "RSV" All Speed/Mechanical
Governed range of speed:	750 to 2305 rev/min
Rated engine speed:	2100 rev/min
High idle speed range:	2280 ± 25 rev/min

1.2.5 Air cleaner

Pre-cleaner:	
Make/model/type:	Nelson/86011070/Aspirator
Location of air intake:	Through front grill
Main Cleaner:	
Make/model/type:	Nelson/9846495/Pleated paper
Maintenance indicator:	Light on cab instrument cluster
Location of air intake:	Through front grill
Secondary Element:	Nelson/9846495/Pleated paper

1.2.6 Lubrication system

Type of feed pump:	Gerotor, Full pressure,positive displacement
Type of filter:	Spin on/Paper Element
Number of filters:	One
Oil cooler:	Oil to water, plate type, engine mounted, left side

1.2.7 Cooling system

Type of coolant:	50/50 water/glycol base anti-freeze
Type of pump:	Belt driven Centrifugal Vane Pump
Specification of fan:	Belt driven, Viscous fan speed control
Number of fan blades:	Eight
Fan diameter:	711 mm (28.0 in)
Coolant capacity:	26.5 liters (7 US Gallons)
Type of temperature control:	Thermostat
System pressure:	90 kPa (13 psi)

1.2.8 Starting system

Make/model/type:	Delco Remy/37MT/300/solenoid engaged
Starter motor power rating:	4.5 kW (6.0 hp)
Cold starting aid:	Engine coolant heater and ether spray to intake manifold
Safety device:	PTO off, park brake on, transmission in neutral

1.2.9 Electrical system

Voltage:	12 Volt, negative ground
Alternator:	
Make/model/type:	Delco Remy/21 SI/belt driven
Power:	12 Volt, 130 amp at rated engine speed
Battery (number of accumulators):	2, 12 volt batteries in parallel (SAE Group 31)
	950 cold cranking amps at -18C (SAE J537 rating)
Rating:	122 Ah at 20 hour rating/battery

1.2.10 Exhaust system

Make/model/type:	Nelson/2483A/Aspirating
Location:	Horizontal muffler/under engine hood at cab end
Exhaust stack location:	Vertical, right front of cab

1.3 TRANSMISSION TO WHEELS

1.3.1 Clutch (tavel alone)

Make/Model/Type:	Funk/9300 series/Wet mulit-plate clutch/Integral with transmission/oil cooled
Number of plates:	Fourteen
Diameter of plates:	150 mm (6.0 in)
Method of operation:	Electronic/Hydraulic/Pedal actuated

1.3.2 Gear box

Make/Model/Type:	Funk/9300 Series/direct drive, full power shift
Arrangement:	Nine rotating countershafts, oil cooled
Number of gears:	Sixteen forward, nine reverse, controlled by a single lever
Oil Cooler:	Heat exchanger with air
Available options:	Creeper Gear Box

1.3.3 Rear axle and final drives

Make/Model/Type:	New Holland/Crown wheel and pinion, differential and in board reduction
Differential lock:	
Type:	Electro-hydraulic
Method of engagement:	Switch activated in cab
Method of disengagement:	Self disengaging with brake pedal operation or switch

1.3.4 Front axle and final drives:

Make/model/type: Dana 70 AG/Electro-Hydraulic engagement
Differential lock: Not Available

1.3.6 Total Ratios and travelling speeds

Gear No.	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed(*) at rated engine speed of 2100 rev/min km/h
Forward		
1	251.40	2.85
2	212.72	3.37
3	181.78	3.94
4	158.69	4.52
5	134.29	5.34
6	114.75	6.24
7	97.48	7.35
8	83.39	8.59
9	70.56	10.15
10	60.30	11.88
11	52.64	13.61
12	44.54	16.09
13	38.06	18.81
14	32.33	22.16
15	27.36	26.19
16	23.38	30.64
Reverse		
3	186.22	3.85
4	157.57	4.55
5	134.65	5.32
6	117.55	6.10
7	99.46	7.20
8	85.00	8.43
9	72.21	9.92
10	61.10	11.73
11	52.21	13.72

* Tire dynamic radius of 905 mm (ISO 4251/1 - 1992)
Number of relevoultions of front wheels for one revelution of rear wheels: 1.31

1.4 POWER TAKE-OFF

1.4.1 Main power take-off

Type:	Independent/wet/multi-plate
Method of engagement:	Electro-hydraulic/Modulated engagement/controlled from consol
Number of shafts:	One at rear of tractor in vertical median plane
Method of changing power take-off shaft ends and speeds:	None

1.4.1.1 Power take-off proportional to engine speed at 1000 rev/min

Location:	Rear of tractor in vertical median plane
Diameter of power take-off shaft end:	44.5 mm (1.75 in)
Number of splines in conformity with ISO 500/1991:	20
Height above ground:	843 mm (with 20.8 R 42 tires 905 mm dyanmic radius)
Distance from the median plane of the tractor:	On center line
Distance behind rear-wheel axis:	590 mm (23.2 in)
PTO speed at rated engine speed (2100 rev/min):	1103 rev/min
Engine speed at standard power take-off speed:	1903 rev/min
Ratio of rotation speeds (engine speed/PTO speed):	1.903
Direction of rotation (viewed from behind tractor):	Clockwise

1.4.1.2 Power take-off proportional to ground speed: None

1.4.2 Optional power take-off: None

1.5 POWER LIFT

Make/Model/Type:	New Holland/Cat 2, 3 and 3N with draft and position control with Cat III quick coupler
Type of hydraulic system:	Closed centre, load sensing
Number/Type/Size of cylinders (single- or double-acting):	Two/Single acting/102 mm (4 in), stroke 200 mm (7.88 in)
Type of linkage lock for transport:	Electro-hydraulic
Relief valve pressure setting (tolerance):	19.0 ± 0.3 MPa (2750 ± 50 psi)
Opening pressure of cylinder safety valve (if fitted):	None
Lift pump type:	Variable displacement axial piston pump
Transmission between pump and engine:	Gear drive from engine output to hydraulic pump
Type and number of filters:	Synthetic media, screw on cannister type, 2 filters
Site of oil reservoir:	Integral with transmission and rear axle
Type, number and location of tapping points:	Leverless, quick disconnect, four, located at rear of tractor
Maximum volume of oil available to external cylinders:	37.1 l(9.8 US Gallons)

1.6 THREE-POINT LINKAGE

Category: III, in conformity with catergory 3 of ISO 730/2 - 1982

Category adapter: Available as optional equipment

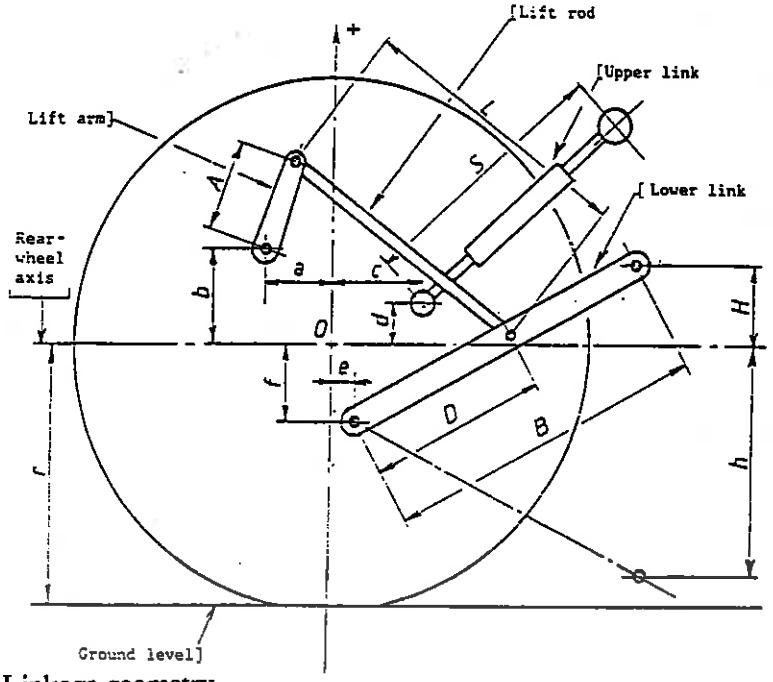


Figure 2.1 Lift test - Linkage geometry

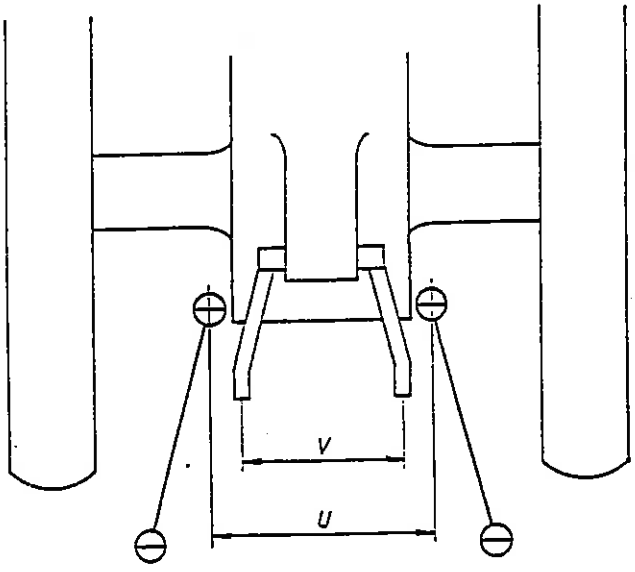


Figure 2.2 Lift test - Linkage geometry

Table 2.1 - Linkage geometry dimensions (when connected to standard frame)

		Dimension or Range	Settings used in Test			
		(mm)	Main test 3.2.2 (mm)	Small tires 4.2 (mm)	Large tires 4.3 (mm)	ASAE/SAE 4.4 & 4.5 (mm)
Rear tire - radius index	(r)	905	905	855	920	905
Front tire - radius index	(r')	695	695	695	695	695
Length of lift arms	(A)	380	380	380	380	380
Length of Lower links	(B)	915	915	915	915	915
Distance of lift arm pivot point from rear wheel axis: horizontally	(a)	-200	-200	-200	-200	-200
vertically	(b)	395	395	395	395	395
Horizontal distance between the 2 lower link points	(u)	540	540	540	540	540
Horizontal distance between the 2 lift arm end points	(v)	637	637	637	637	637
Length of upper link	(s)	608 to 815	757	780	755	733
Distance of upper link pivot point from rear wheel axis: horizontally	(c)	505	505	505	505	505
vertically	(d)	200	200	200	200	200
Distance of lower link pivot point from rear wheel axis: horizontally	(e)	325	325	325	325	325
vertically	(f)	315	315	315	315	315
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	465	465	465	465	465
Length of lift rods	(L)	759 to 890	873	845	880	890
Height of lower hitch points relative to the rear-wheel axis: - in low position	(h)	409 to 730	675	625	690	702
- in high position	(H)	50 to 281	88	117	77	63
Height above ground of lower hitch points when locked in transport position (*)		Any height within lift range - Electro-hydraulic lock				

(*) Assuming r = tire dynamic radius index of 905 mm (ISO 4251/1-1992)

1.7 SWINGING DRAWBAR

Type:	Sliding drawbar
Height above ground:	
Maximum:	545 mm (21.5 in)
Minimum:	448 mm (17.6 in)
Type of adjustment	
Vertical:	Reverse bend
Horizontal:	Manual slide
Distance of hitch point from rear wheel axis, horizontally:	1102 mm (43.4 in)
Distance of hitch point from power take-off shaft end:	
Vertical:	305 mm (12.0 in)
Horizontal:	508 mm (20.0 in)
Lateral adjustment (centre of clevis):	
Right-hand:	259 mm (10.2 in)
Left-hand:	259 mm (10.2 in)
Distance of pivot point from rear wheel axis, horizontally:	Forward 51 mm (2.0 in)
Diameter of drawbar pin hole:	41.0 mm (1.6 in)
Maximum vertical permissible load:	20.9 kN (4700 lbs)

1.8 TRAILER HITCH: None

1.9 HOLED DRAWBAR

Number of holes:	Three
Distance between holes:	102 mm (4.0 in)
Hole diameter:	41 mm (1.6 in)
Thickness/width of the drawbar:	45/76 mm (1.8/3.0 in)
Height above ground:	
Minimum:	448 mm (17.6 in)
Maximum:	545 mm (21.5 in)
Horizontal distance to power take-off shaft end (rear):	508 mm (20.0 in)

1.10 STEERING

Make/Model/Type:	New Holland/Hydrostatic/Power steering
Method of operation:	Steering wheel
Pump(s):	PFC Postion Pump, on demand
Ram(s):	Two dual acting cylinders
Maximum working pressure:	17.24 MPa (2500 psi)

1.11 BRAKES

1.11.1 Service brake:

Make/Model/Type:	New Holland disk brakes/Multiple disk between differential and final drives
Method of operation:	Hydraulic boosted, in cab pedals
Trailer Braking Take-off:	Not available

1.11.2 Parking brake

Type:	Rear axle - oil immersed 3 disc
Method of operation:	Mechanical, in cab control lever

1.12 WHEELS

Number:	
Front:	Two
Rear:	Two, Four optional (duals)
Wheelbase:	3115 mm (122.6 in)

Track width adjustment:

	Minimum	Maximum	Adjustment Method
Front	1524 mm (60 in)	2235 mm (88 in)	Reversing wheels and offset lug rims
Rear	1524 mm (60 in)	3150 mm (124 in)	Sliding tapered hubs and reversible rims

1.13 PROTECTIVE STRUCTURE

Make/Model/Type:	New Holland/Genesis 2/Safety Cab
Manufacturer's name and address:	Crenlo Rochester, Minn; USA
Protective device:	ROPS Cab, not tiltable
OECD approval number:	CSS - 0256/4-6
Date of approval:	November 29, 1993
Modification certificate if any:	MC/96/7149/0296 (under authority of Silsoe Research Institute)

1.14 SEAT

1.14.1 Driver's Seat

Make/Model/Type:	Sears Generation 2000/SA 12055-000E/Low profile
Type of suspension:	Air spring with adjustable damper
Type of damping:	Hydraulic
Range of adjustment:	
Rotation:	30 deg (25 to right, 5 to left) 6 stops
Longitudinal:	178 mm (7.0 in)
Vertical:	76 mm (3.0 in)
Optional and Passenger Seats:	

1.14.2 Optional Driver's Seat: Not available

1.14.3 Passenger Seat: Not available

1.15 LIGHTING

	Height of centre above ground mm	Size mm	Distance from out side edge to median plane of tractor mm
Headlights	1720	250 x 100	360
Sidelights	1025	150 x 80	780
Rear top	2905	150 x 80	490
Reflectors	1970	75 x 190	965
Rear fender	1925	150 x 80	600
Front cab	2905	150 x 80	300

2. TEST CONDITIONS

2.1 OVERALL DIMENSIONS

	Length mm	Minimum width mm	Maximum width mm	Height to top of protective structure mm	Height to top of exhaust silencer mm
Unballasted	5027	2845		3118	3197
Ballasted	5669		3700	3118	3197

2.2 Ground clearance: 509 mm

Clearance limiting part: Drawbar cage

2.3 TRACTOR MASS (with cab)

	Unballasted		Ballasted	
	Without Driver kg	With Driver kg	Without Driver kg	With Driver kg
Front	2866	2876	3795	3805
Rear	5770	5835	7075	7140
Total	8636	8711	10870	10945

2.4 BALLAST DETAILS

	Weights	
	Number	Total Mass (kg)
Front	6 weights (110 kg each) + bracket	723
Rear Wheels	Duals with hubs	884
Rear Weights	2 weights (200 kg each) + 6 weights (37 kg each)	622
Test Equipment		5

2.5 TIRE SPECIFICATIONS

	Front	Rear
Tires:		
-make:	Armstrong	Armstrong
-dimensions:	16.9 R 30	20.8 R 42
-ply rating:	2 Star	2 Star
-maximum load (tire manufacturer)	22.6 kN	30.8 kN
-maximum load (tractor manufacturer)	22.6 kN	30.8 kN
-inflation pressure (tire manufacturer)	165 kPa	165 kPa
-dynamic radius index:	695 mm	905 mm
-chosen track width, singles:	1855 mm	1645 mm
duals:		3160 mm

2.6 OILS AND LUBRICATION

2.6.1 Capacity and change interval

	Capacity	Oil Change h	Filter Change h
Engine	21 L (5.5 US gallons)	Every 300 Hours	Same
Transmission Final drive (rear) Rear axle Hydraulic system (*) Brakes Steering	117 L (30.9 US gallons)	Every 900 Hours (or yearly)	Same
Front axle	12.3 L (3.25 US gallons)	Every 1200 Hours	
Final drive (front)	3.2 L (0.85 US gallons)	Every 1200 Hours	

* Hydraulic system is common with transmission, final drive (rear), rear axle, brakes and steering.

2.6.2 Specifications (SAE, API, Mil.L, ISO)

	Recommended	Used during test
Engine oil		
Type	New Holland	Petro Canada
Viscosity	15W - 40	15W - 40
Classification	API CF - 4	API CF - 4
Transmission oil		
Type	New Holland	Esso Hydraul 56
Viscosity	@ 100 C - min 9 c'stokes	
Classification	ESN - M2C134 - D	ESN - M2C134 - D
Hydraulic fluid	Same as transmission	Same as transmission
Final drive oil (rear)	Same as transmission	Same as transmission
Steering oil	Same as transmission	Same as transmission
Brake Fluid	Same as transmission	Same as transmission
Front axle and hubs	Same as transmission	Same as transmission

2.6.3 Grease: Lithium Base EP - high temperature

Number of lubrication points: 29

2.7 FUEL

Type: No. 2, diesel in conformity with national standard

Density at 15°C (60°F):

PTO tests 0.8525 gm/cm^3 (7.115 lb/US Gallon)

Drawbar tests 0.8502 gm/cm^3 (7.095 lb/US Gallon)

3. COMPULSORY TEST RESULTS

3.1 MAIN POWER TAKE-OFF TEST

Date and location of tests: May 22, 1996
Prairie Agricultural Machinery Institute
Portage la Prairie, MB; CANADA

Dynamometer: AW Dynamometer Inc.
Water Brake Dynamometer

Power	Speed		Fuel Consumption			Specific Energy
	Engine	PTO	Hourly		Specific	
kW	rev/min		kg/h	l/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER - TWO-HOUR TEST						
149.6	1677	881	32.3	38.01	216	3.94
3.1.2 POWER AT RATED ENGINE SPEED						
138.6	2100	1104	32.3	38.04	233	3.64
3.1.3 STANDARD POWER TAKE-OFF SPEED (1000 ± 25 rev/min)						
149.3	1903	1000	32.9	38.71	220	3.86
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at rated engine speed						
138.6	2100	1104	32.3	38.04	233	3.64
3.1.4.2 85% of torque obtained in 3.1.4.1						
122.1	2176	1144	29.7	34.99	243	3.49
3.1.4.3 75% of torque defined in 3.1.4.2						
93.1	2213	1163	24.1	28.41	259	3.28
3.1.4.4 50% of torque defined in 3.1.4.2						
62.9	2244	1179	18.7	22.05	298	2.85
3.1.4.5 25% of torque defined in 3.1.4.2						
31.9	2276	1196	13.3	15.71	418	2.03
3.1.4.6 unloaded						
3.6	2300	1208	8.7	10.22	2422	0.35
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED (1000 rev/min) 3.1.5.1 the torque corresponding to maximum power						
149.3	1903	1000	32.9	38.71	220	3.86
3.1.5.2 85% of torque obtained in 3.1.5.1						
136.6	2050	1077	31.5	37.11	230	3.68
3.1.5.3 75% of torque defined in 3.1.5.2						
104.4	2089	1097	25.7	30.29	246	3.45
3.1.5.4 50% of torque defined in 3.1.5.2						
71.0	2131	1120	19.2	22.55	270	3.15
3.1.5.5 25% of torque defined in 3.1.5.2						
36.3	2171	1141	13.3	15.67	367	2.31
3.1.5.6 unloaded						
3.3	2221	1167	7.9	9.29	2399	0.35

No load maximum engine speed:	2300	rev/min
Torque (equivalent crankshaft) at maximum power:	851.8	N-m
- at rated engine speed	630.2	N-m
- at standard power take-off speed	749.1	N-m
Maximum torque (equivalent crankshaft):	978.1	N-m at 1370 rev/min engine speed
Mean atmospheric conditions:		
- temperature:	20°C	
- pressure:	98.34 kPa	
- relative humidity:	66%	
Maximum temperatures:		
- coolant:	90°C	
- engine oil:	115°C	
- fuel:	61°C	
- engine air intake:	24°C	

3.2 HYDRAULIC POWER AND LIFTING FORCE

Date of tests: May 28, 1996
Prairie Agricultural Machinery Institute
Portage la Prairie, Manitoba; Canada

3.2.1 Hydraulic Power Tests

Sustained pressure with relief valve open: 19.3 MPa
Pump delivery rate at minimum pressure: 127.6 L/min

	Flow Rate	Pressure	Power
	l/min	MPa	kW
Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power	98.0	17.3	28.3
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	115.0	16.7	32.0

Tapping point used for test: Dual remote hydraulic outlets
Temperature of hydraulic fluid: 65 ± 5°C
Opening and closing pressure of the unloading valve: Not applicable since this hydraulic system does not use an accumulator.

3.2.2 Power Lift Test

Linkage settings for test - See Table 2.1 and Figures 2.1 and 2.2

	at the hitch point	on the frame
Height of lower hitch points above ground in down position	230 mm	183 mm
Vertical movement without load	763 mm	934 mm
Vertical movement with load	695 mm	876 mm
Maximum corrected force exerted through full range	58.2 kN	50.5 kN
Corresponding pressure of hydraulic fluid	17.3 MPa	17.3 MPa
Moment about rear-wheel axis	72.2 kNm	93.4 kNm
Maximum tilt angle of mast from vertical		11 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points													
mm	-407	-400	-360	-300	-200	-100	0	+100	+200	+300	+335	+400	+469
Lifting forces (the values of force measured shall be corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting of the hydraulic lift system													
at the hitch points in kN	–	–	58.2	59.9	63.1	66.8	69.2	72.0	73.8	73.7	73.6	–	–
Corresponding pressure:						17.3 MPa							
at the frame in kN	52.0	52.1	–	52.9	54.4	55.8	57.0	57.6	57.3	55.3	–	53.1	50.5
Corresponding pressure:						17.3 MPa							

3.3 DRAWBAR PERFORMANCE

Date of Tests: June 24, 1996 Tire Pressure: Front: 83 kPa
Drawbar Height: 499 mm Rear: 110 kPa
Location of Tests: Versatile Farm Equipment
Operations Test Track
Sanford, MB; CANADA

Gear and Range	Power	Drawbar Pull	Ground Speed	Engine Speed	Slip of Tires	Specific Fuel Consumption	Specific Energy	Temperatures			Atmospheric Conditions		
								Fuel	Coolant	Engine Oil	Temperature	Humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.3.1 MAXIMUM POWER IN TESTED GEARS													
F1	60.1	82.60	2.62	2232	14.9	355	2.39	58	83	104	18	56	98.89
F2	70.4	82.24	3.08	2219	15.0	338	2.52	60	84	104	19	53	98.88
F3	81.5	82.17	3.57	2201	15.1	330	2.58	60	84	106	19	53	98.88
F4	92.0	81.73	4.05	2184	15.1	321	2.65	60	85	107	19	53	98.88
F5	107.3	82.51	4.68	2132	15.1	315	2.70	60	84	107	17	57	98.88
F6	115.6	81.91	5.08	1895	11.4	284	2.99	58	86	109	17	57	98.88
F7	122.1	81.85	5.37	1675	9.9	267	3.18	58	87	109	17	57	98.88
F8	129.0	70.24	6.61	1678	6.3	254	3.35	60	87	112	17	60	98.89
F9	132.3	60.00	7.94	1677	3.8	245	3.47	57	87	112	16	65	98.89
F10	130.0	49.95	9.37	1679	3.0	256	3.32	59	87	112	17	60	98.89
3.3.2 FUEL CONSUMPTION													
3.3.2.1 in selected gear, at maximum power at rated speed													
F9	124.0	44.42	10.05	2099	2.7	269	3.16	59	86	110	17	60	98.89
3.3.2.1.1 75% of pull at maximum power at rated speed													
F9	97.7	33.25	10.58	2193	2.0	288	2.95	59	86	106	18	56	98.89
3.3.2.1.2 50% of pull at maximum power at rated speed													
F9	66.6	22.12	10.84	2231	1.3	327	2.60	59	84	107	18	56	98.89
3.3.2.1.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1													
F10	97.8	33.33	10.56	1870	1.9	265	3.20	59	85	107	18	56	98.89
3.3.2.1.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2													
F10	67.1	22.26	10.85	1909	1.2	296	2.87	59	83	106	18	56	98.89
3.3.2.2 in selected gear nearest to 7.5 km/h at rated speed													
F8	120.2	51.14	8.46	2100	4.2	275	3.09	59	86	111	17	60	98.89
3.3.2.2.1 75% of pull at maximum power at rated speed													
F8	94.9	38.36	8.91	2191	3.3	287	2.96	59	83	106	20	49	98.92
3.3.2.2.2 50% of pull at maximum power at rated speed													
F8	64.9	25.57	9.14	2229	2.5	322	2.64	60	83	105	20	49	98.92
3.3.2.2.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1													
F9	94.7	38.35	8.89	1850	2.4	259	3.28	60	84	105	20	49	98.92
3.3.2.2.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2													
F9	65.0	25.53	9.16	1892	1.6	288	2.95	59	83	104	20	49	98.92

4.0 OPTIONAL TESTS

4.1 BALLASTED DRAWBAR PERFORMANCE

Date of Tests: July 4, 1996
Location of Tests: Versatile Farm Equipment Operations Test Track
Sanford, MB; CANADA

Drawbar Height: 497 mm
Tire Pressure: Front: 131 kPa
Rear: 55 kPa

Gear and Range	Power	Drawbar Pull	Ground Speed	Engine Speed	Slip of Tires	Specific Fuel Consumption	Specific Energy	Temperatures			Atmospheric Conditions		
								Fuel	Coolant	Engine Oil	Temperature	Humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.3.1 MAXIMUM POWER IN TESTED GEARS													
F1	81.0	113.47	2.57	2198	14.9	330	2.58	58	86	106	23	67	98.22
F2	93.6	112.75	2.99	2175	15.1	320	2.65	59	86	107	28	57	98.06
F3	106.8	113.70	3.38	2092	14.9	312	2.73	59	87	108	28	57	98.06
F4	110.4	113.91	3.49	1889	14.9	299	2.84	59	88	108	28	57	98.06
F5	121.9	110.29	3.98	1676	7.4	272	3.12	58	87	108	23	67	98.22
F6	127.9	95.75	4.81	1679	4.6	256	3.31	59	88	109	23	70	98.19
F7	131.7	82.59	5.74	1677	3.1	248	3.43	58	88	108	23	70	98.19
F8	132.8	70.71	6.76	1679	2.6	247	3.44	58	88	110	23	70	98.19
F9	132.3	59.46	8.01	1676	2.2	248	3.42	58	88	110	23	70	98.19
F10	131.8	50.41	9.41	1675	1.7	249	3.41	57	87	102	23	70	98.19
3.3.2 FUEL CONSUMPTION													
3.3.2.1 in selected gear, at maximum power at rated speed													
F9	122.9	43.80	10.10	2101	1.5	269	3.16	59	87	108	23	71	98.08
3.3.2.1.1 75% of pull at maximum power at rated speed													
F9	96.5	32.87	10.57	2189	1.2	293	2.90	58	86	104	28	57	98.03
3.3.2.1.2 50% of pull at maximum power at rated speed													
F9	65.7	21.94	10.78	2225	0.8	340	2.50	59	85	106	28	57	98.03
3.3.2.1.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1													
F10	96.2	32.83	10.55	1868	1.1	270	3.15	58	86	107	28	57	98.03
3.3.2.1.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2													
F10	65.8	21.95	10.79	1904	0.8	299	2.84	58	85	106	28	57	98.03
3.3.2.2 in selected gear nearest to 7.5 km/h at rated speed													
F8	123.4	52.13	8.52	2101	1.8	268	3.18	59	86	109	23	71	98.08
3.3.2.2.1 75% of pull at maximum power at rated speed													
F8	96.8	39.05	8.92	2188	1.4	293	2.90	59	86	107	28	57	98.03
3.3.2.2.2 50% of pull at maximum power at rated speed													
F8	66.0	26.09	9.11	2224	0.8	333	2.55	59	85	107	28	57	98.03
3.3.2.2.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1													
F9	97.2	39.09	8.95	1858	1.4	265	3.20	57	86	107	28	57	98.03
3.3.2.2.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2													
F9	65.8	26.00	9.11	1881	0.8	288	2.95	58	85	105	28	57	98.03

4.2 POWER LIFT TEST (with 20.8 R38 tires - Dynamic Radius Index 855 mm)

Linkage settings for test - See Table 2.1 and 2.2

	at the hitch point	on the frame
Height of lower hitch points above ground in down position	230 mm	189 mm
Vertical movement without load	742 mm	926 mm
Vertical movement with load	707 mm	865 mm
Maximum corrected force exerted through full range	59.9 kN	48.6 kN
Corresponding pressure of hydraulic fluid	17.3 MPa	17.3 MPa
Moment about rear-wheel axis	74.3 kNm	89.9 kNm
Maximum tilt angle of mast from vertical		10 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points													
mm	-351	-310	-300	-200	-100	0	+100	+200	+300	+397	+400	+500	+514
Corrected lifting forces													
at the hitch points in kN	–	59.9	60.0	63.0	66.4	69.8	72.6	75.0	76.2	74.8	–	–	–
Corresponding pressure:						17.3 MPa							
at the frame in kN	48.6	–	50.2	52.9	55.6	57.1	58.2	58.4	57.3	–	55.2	51.9	50.6
Corresponding pressure:						17.3 MPa							

4.3 POWER LIFT TEST (with 710/70 R38 tires - Dynamic Radius Index 920 mm)

Linkage settings for test - See Table 2.1 and Figures 2.1 and 2.2

	at the hitch point	on the frame
Height of lower hitch points above ground in down position	230 mm	185 mm
Vertical movement without load	767 mm	933 mm
Vertical movement with load	736 mm	868 mm
Maximum corrected force exerted through full range	59.1 kN	51.1 kN
Corresponding pressure of hydraulic fluid	17.3 MPa	17.3 MPa
Moment about rear-wheel axis	73.3 kNm	94.5 kNm
Maximum tilt angle of mast from vertical		10 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points													
mm	-420	-400	-375	-300	-200	-100	0	+100	+200	+300	+361	+400	+448
Corrected lifting forces													
at the hitch points in kN	–	–	59.1	61.5	64.9	67.5	70.5	72.5	73.8	73.8	72.4	–	–
Corresponding pressure:							17.3 MPa						
at the frame in kN	51.8	52.2	–	53.6	55.2	56.4	57.4	57.8	57.5	56.3	–	53.0	51.1
Corresponding pressure:							17.3 MPa						

4.4 POWER LIFT TEST (ASAE S349.2 with 20.8 R42 tires-Nebraska Test)

Linkage settings for test - See Table 2.1 and Figures 2.1 and 2.2

	at the hitch point	on the frame
Height of lower hitch points above ground in down position	203 mm	220 mm
Vertical movement without load	765 mm	823 mm
Vertical movement with load	714 mm	802 mm
Maximum corrected force exerted through full range	62.6 kN	61.3 kN
Corresponding pressure of hydraulic fluid	18.6 MPa	18.6 MPa
Moment about rear-wheel axis	77.6 kNm	113.4 kNm
Maximum tilt angle of mast from vertical		5 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points												
mm	-387	-370	-300	-200	-100	0	+100	+200	+300	+327	+400	+432
Corrected lifting forces												
at the hitch points in kN	62.6	–	65.9	70.0	72.5	75.4	77.8	78.8	78.1	76.8	–	–
Corresponding pressure:	18.6 MPa											
at the frame in kN	–	69.3	69.0	69.0	69.7	70.3	70.6	70.1	67.7	–	63.0	61.3
Corresponding pressure:	18.6 MPa											

4.5 POWER LIFT TEST (SAE J283 Jun 93, with 20.8 R42 tires-Nebraska Test)

Linkage settings for test - See Table 2.1 and 2.2

	at the hitch point	on the frame
Height of lower hitch points above ground in down position	203 mm	220 mm
Vertical movement without load	765 mm	823 mm
Vertical movement with load	714 mm	802 mm
Maximum corrected force exerted through full range	58.2 kN	57.1 kN
Corresponding pressure of hydraulic fluid	17.3 MPa	17.3 MPa
Moment about rear-wheel axis	72.2 kNm	105.6 kNm
Maximum tilt angle of mast from vertical		5 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points												
mm	-387	-370	-300	-200	-100	0	+100	+200	+300	+327	+400	+432
Corrected lifting forces												
at the hitch points in kN	58.2	–	61.3	65.1	67.5	70.2	72.4	73.3	72.7	71.5	–	–
Corresponding pressure:	17.3 MPa											
at the frame in kN	–	64.5	64.2	64.2	64.9	65.5	65.7	65.3	63.0	–	58.6	57.1
Corresponding pressure:	17.3 MPa											

4.6 NOISE TESTS

Date of tests:	June 24, 1996
Location of tests:	Versatile Farm Equipment Test Track Sanford, Manitoba; Canada
Sound level meter Make/Model/Type:	Bruel & Kjaer/Model T2236/Precision Integrating
Type of track:	Concrete
Noise at operator ear 75% pull at maximum power rated speed noise level:	74.5 dB(A)
Gear Number:	F10

5. REPAIRS

None

6. REMARKS

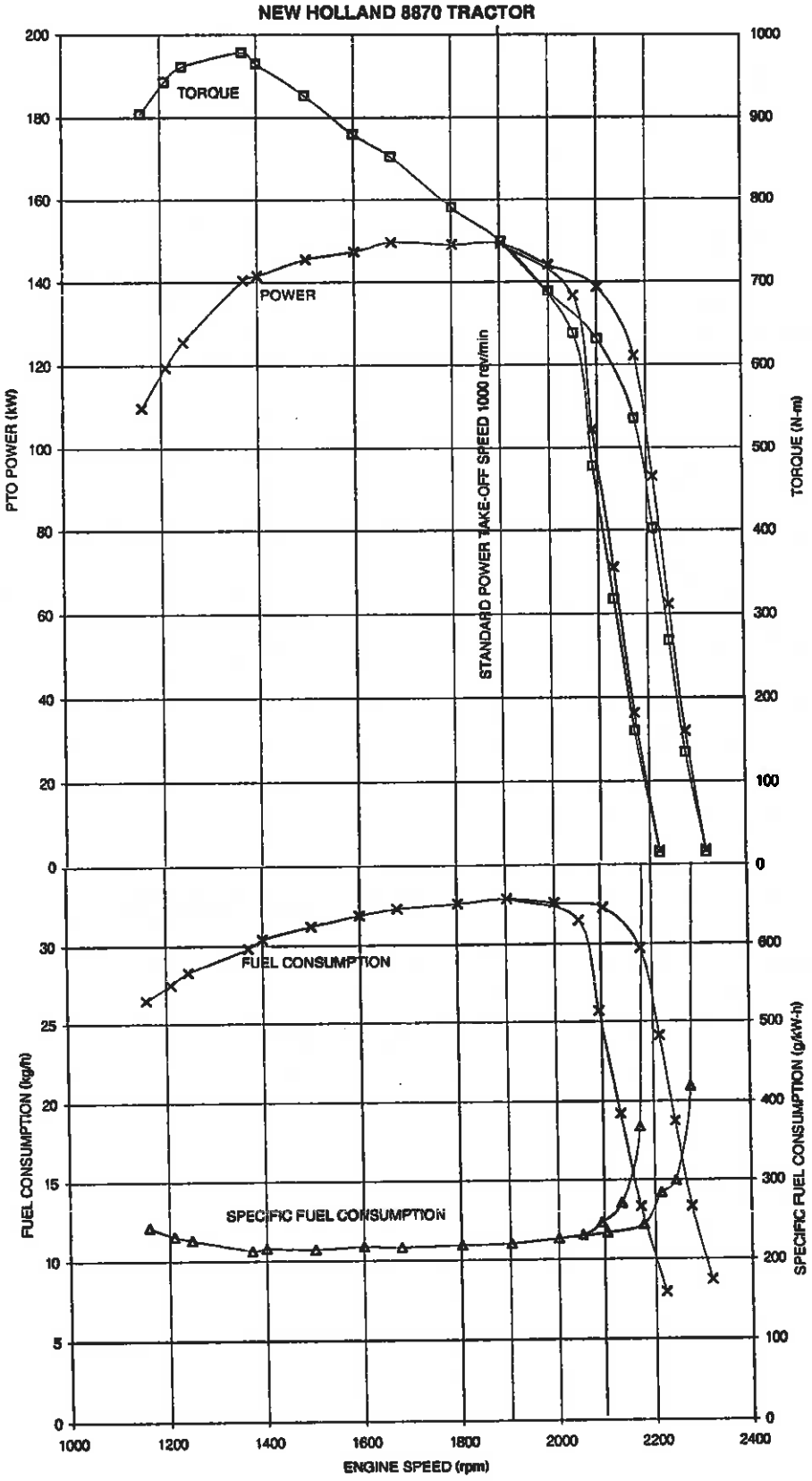
None

7. ANNEX (CURVES)

Tests carried out by: D.J. May, P.Eng., Project Engineer
K.A. Carmichael, Project Technologist

Signed: _____
Bruce Allen, P.Eng., MBA
Station Manager for the Director

Date: JAN. 23, 1997


NEW HOLLAND 8870 TRACTOR
TORQUE
POWER
STANDARD POWER TAKE-OFF SPEED 1000 rev/min
PTO POWER (kW)
TORQUE (N-m)
FUEL CONSUMPTION
SPECIFIC FUEL CONSUMPTION
FUEL CONSUMPTION (kg/h)
SPECIFIC FUEL CONSUMPTION (g/kW-h)
ENGINE SPEED (rpm)
200
180
160
140
120
100
80
60
40
20
0
1000
900
800
700
600
500
400
300
200
100
0
30
25
20
15
10
5
0
600
500
400
300
200
100
0
1000
1200
1400
1600
1800
2000
2200
2400

NEW HOLLAND 8870 TRACTOR

