PAMI

OECD NO. 1648/1 (Restricted Code)
1648/2 (Restricted Code)
Date of Approval: March 12, 1997

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



NEW HOLLAND 8770 POWERSHIFT MFWD
NEW HOLLAND G190 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: July/August 1996

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This report also pertains to the New Holland G190. For marketing purposes the New Holland 8770 can also be designated as the New Holland G190 in certain countries.

Manufacturer's Name and Address:	New Holland Canada, Ltd. Versatile Farm Equipment Operations Box 7300; 1260 Clarence Ave. 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 test site; New Holland, PA; USA
Duration of running in:	75 hours
Location of test:	PTO and hydraulic power lift tests carried out at: Prairie Agricultural Machinery Institute (PAMI) Portage la Prairie, MB; Canada Drawbar performance and noise tests carried out at the manufacturer's premises VERSATILE FARM EQUIPMENT Test Track, Sanford, Manitoba and witnessed by D.J. May, P.Eng., Project Engineer and K.A. Carmichael, Project Technologist (PAMI-Portage la Prairie, Manitoba)

1. SPECIFICATIONS OF TRACTOR

1.1 IDENTIFICATION

Make/Model/Type:	New Holland/8770/ Mechanical Front Wheel Drive, 30 km/h Version
Number of driving wheels:	2 or 4
Serial Nº:	D409192
1st Serial Nº:	Confidential

1.2 ENGINE

Make/Model/Type:	New Holland/675-TA-VH/Diesel/Turbo charged Air-to-air intercooled
Serial Nº:	VH601084

1.2.1 Cylinders

Number/disposition:	Six/In-line, vertical
Bore/Stroke:	111.8/127 mm (4.4/5.0 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/GT35/exhaust gas driven
Pressure:	149 kPa (44 in HG) maximum 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 gal)
Make/model/type of injection pump:	Bosch/87800862/"A" 2000 In-line
Serial Nº:	66227 04969
Pump Manufacturer's production rack setting:	125 ± 3.8 mm^3/stroke at 1050 pump rev/min
Flow rate (rated engine speed and full load):	32.9± 0.99 kg/h (72.5 ± 2.2 lb/h)
Fuel density:	0.840 kg/l at 15°C
Timing:	21 degrees BTDC static
Make/model/type of injectors:	Bosch/87841116/Five-hole type/Differential Needle
Injection pressure:	24.13 MPa (3500 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 intake:	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
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 litres (7 US gal)
Type of temperature control:	Thermostat
System pressure:	90 kPa (13 psi)

1.2.8 Starting system

Make/model/type:	Delco Remy/37 MT/Type 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):	Two, (SAE Group 31) 950 cold cranking amps/battery at -18°C (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 (Travel alone)

Make/Model/Type:	Funk/9300 series/Wet multi-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 counter shafts, oil cooled
Number of gears:	Sixteen forward, nine reverse, operated 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 inboard reduction
Differential lock:	
Type:	Electro-hydraulic
Method of engagement:	Switch 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/Crown wheel and pinion, differential and planetary reduction with electro-hydraulic engagement
Differential lock:	Not Available

1.3.5 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 4257/1 - 1992)
Number of revolutions of front wheels for one revolution 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 console
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
Diameter of power take-off shaft end:	44.5 mm (1.75 in)
Number of splines in conformity with ISO 500/1991:	Twenty
Height above ground:	843 mm (with 20.8 R 42 tires - 905 mm dynamic radius)
Distance from the median plane of the tractor:	On centre line
Distance behind rear-wheel axis:	589.5 mm (23.2 in)
PTO speed at rated engine speed (1000 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: Not available

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 position 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 ISO 730/1-1982
Category adapter: Available as optional equipment

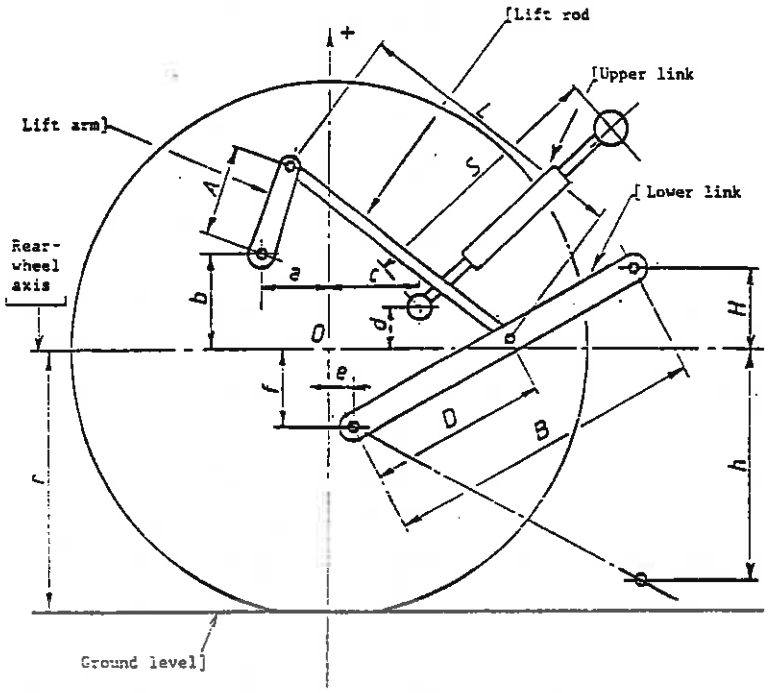


Figure 2.1 Lift test - Linkage geometry

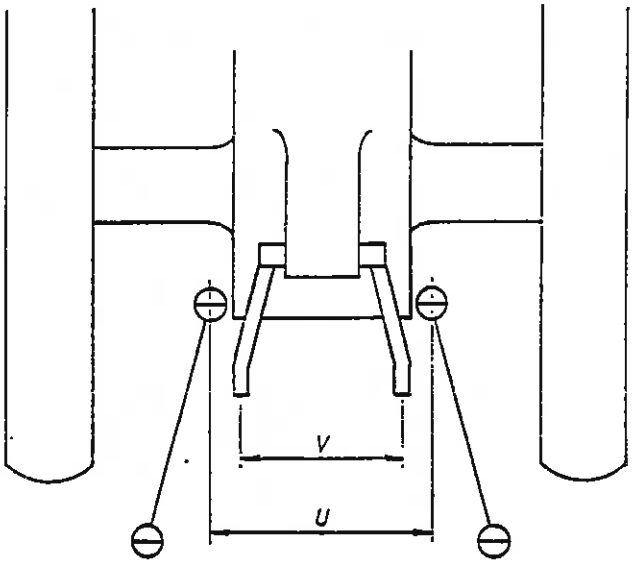


Figure 2.2 Lift test - Linkage geometry

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

		Dimension or range (mm)	Settings used in test			
			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	763	755	766	711
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	880	835	887	887
Height of lower hitch points relative to the rear-wheel axis: in low position	(h)	409 to 710	675	625	690	702
in high position	(H)	50 to 281	87	133	82	70
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 (12.0 in)
Distance of hitch point from 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 rear wheel axis, horizontally:	Forward 51.0 mm (2.0 in)
Diameter of drawbar pin hole:	41.0 mm (1.6 in)
Maximum vertical permissible load:	20.9 kN (4700 lb)

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:	
Maximum:	448 mm (17.6 in)
Minimum:	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):	Pressure/Flow control, piston 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, driving and steering
Rear:	Two, four optional (duals), driving
Wheelbase:	3115 mm (122.6 in)

	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-0256/7-9
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/SA12055-000E/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)

1.14.1 Optional Driver's Seat Not available

1.14.2 Passenger seat Not available

1.15 LIGHTING

	Height above ground of centre mm	Size mm	Distance from outside 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 mm	2845 mm		3118 mm	3197 mm
Ballasted	5426 mm		3700	3118 mm	3197 mm

2.2 Ground clearance: 509 mm

Clearance limiting part: Drawbar cage

2.3 TRACTOR MASS

Mass with cab:

	Unballasted		Ballasted	
	Without Driver kg	With Driver kg	Without Driver kg	With Driver kg
Front	2909	2919	3308	3318
Rear	5839	5904	6745	6810
Total	8748	8823	10053	10128

2.4 BALLAST DETAILS

	Weights	
	Number	Total mass (kg)
Front Weights	6 weights (40 kg each) + bracket	337
Rear Wheels	Duals with hubs	884
Rear Weights	2 weights (38 kg each)	76
Test Equipment		8

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	38.0 kN
-maximum load (tractor manufacturer)	22.6 kN	38.0 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	Filter Change
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 the test
Engine oil . type: . viscosity: . classification:	New Holland 15 W-40 API CF-4	Petro Canada 15W40 API CF-4
Transmission oils . type: . viscosity: . classification:	New Holland @ 100 C - min 9 c'stokes ESN - M2C134	Esso Hydraul 56 ESN - M2C134
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): 0.8526 g/cm^3 (7.115 lb/US gal)

3. COMPULSORY TEST RESULTS

3.1 MAIN POWER TAKE-OFF TEST

Date and location of tests: July 14, 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						
138.7	1700	893	32.1	37.71	232	3.67
3.1.2 POWER AT RATED ENGINE SPEED						
122.9	2100	1103	31.9	37.47	260	3.28
3.1.3 STANDARD POWER TAKE-OFF SPEED (1000 ± 25 rev/min)						
133.8	1903	1000	32.4	38.01	242	3.52
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at rated engine speed						
122.9	2100	1103	31.9	37.47	260	3.28
3.1.4.2 85% of torque obtained in 3.1.4.1						
108.6	2184	1147	29.5	34.59	272	3.14
3.1.4.3 75% of torque defined in 3.1.4.2						
82.6	2215	1164	24.1	28.27	292	2.92
3.1.4.4 50% of torque defined in 3.1.4.2						
56.0	2250	1182	18.5	21.66	330	2.58
3.1.4.5 25% of torque defined in 3.1.4.2						
28.3	2275	1196	13.3	15.62	471	1.82
3.1.4.6 unloaded						
2.3	2294	1205	8.4	9.82	3620	0.24
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED (1000 rev/min) 3.1.5.1 the torque corresponding to maximum power						
133.8	1903	1000	32.4	38.01	242	3.52
3.1.5.2 85% of torque obtained in 3.1.5.1						
123.2	2062	1084	31.5	36.91	255	3.34
3.1.5.3 75% of torque defined in 3.1.5.2						
94.1	2098	1103	25.0	29.36	266	3.20
3.1.5.4 50% of torque defined in 3.1.5.2						
63.8	2134	1121	19.2	22.47	300	2.84
3.1.5.5 25% of torque defined in 3.1.5.2						
32.3	2162	1136	13.2	15.53	410	2.08
3.1.5.6 unloaded						
2.8	2187	1149	7.4	8.67	2624	0.33

No load maximum engine speed:	2294 rev/min
Torque (equivalent crankshaft) at maximum power:	779.1 N-m
- at rated engine speed	558.7 N-m
- at standard power take-off speed	671.4 N-m
Maximum torque (equivalent crankshaft):	857.2 Nm at 1380 rev/min engine speed
Mean atmospheric conditions:	
Temperature:	27°C
Pressure:	97.74 kPa
Relative Humidity:	73%
Maximum temperatures:	
Coolant:	89°C
Engine oil:	110°C
Fuel:	59°C
Engine air intake:	35°C

3.2 HYDRAULIC POWER AND LIFTING FORCE

Date of tests: July 14, 1996
Prairie Agricultural Machinery Institute
Portage la Prairie, Manitoba; Canada

3.2.1 HYDRAULIC POWER TEST

Sustained pressure with relief valve open: 19.2 MPa
Pump delivery rate at minimum pressure: 126.1 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	105.8	17.3	30.5
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	114.1	16.6	31.6

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	176 mm
Vertical movement without load	762 mm	940 mm
Vertical movement with load	677 mm	804 mm
Maximum corrected force exerted through full range	58.8 kN	54.0 kN
Corresponding pressure of hydraulic fluid	17.3 MPa	17.3 MPa
Moment about rear-wheel axis	72.9 kNm	99.9 kNm
Maximum tilt angle of mast from vertical		11 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points												
mm	-414	-400	-360	-300	-200	-100	0	+100	+200	+300	+317	+390
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	–	–	58.8	61.5	66.3	70.7	73.3	75.0	75.8	75.2	74.2	–
Corresponding pressure					17.3 MPa							
at the frame in kN	60.6	60.1	–	55.6	55.2	56.9	58.2	60.0	61.3	58.2	–	54.0
Corresponding pressure:					17.3 MPa							

NH8770/NH G190

3.3 DRAWBAR PERFORMANCE

Date of Tests: July 29, 1996
Location of Tests: Versatile Farm Equipment Operations Test Track
Sanford, MB; CANADA

Drawbar Height: 500 mm
Tire Pressure: Front: 83 kPa
Rear: 110 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	59.5	81.75	2.62	2213	14.9	381	2.24	59	84	104	21	66	99.29
F2	71.1	83.32	3.07	2200	15.0	361	2.36	59	84	105	21	66	99.29
F3	83.7	84.60	3.56	2180	15.0	350	2.44	59	84	106	20	71	99.31
F4	93.0	84.10	3.98	2129	15.0	343	2.48	59	85	107	20	71	99.31
F5	100.4	84.29	4.29	1942	15.1	322	2.65	59	85	107	20	71	99.31
F6	105.0	82.89	4.56	1764	15.0	309	2.76	59	85	107	20	77	99.29
F7	117.9	73.96	5.74	1702	5.9	271	3.15	58	86	107	20	77	99.29
F8	119.6	62.87	6.85	1702	5.0	267	3.19	58	86	108	20	77	99.29
F9	122.2	53.76	8.18	1701	3.1	263	3.24	58	85	107	20	77	99.29
F10	121.2	45.26	9.64	1702	2.3	264	3.23	56	85	106	20	77	99.29
3.3.2 FUEL CONSUMPTION													
3.3.2.1 in selected gear, at maximum power at rated speed													
F9	106.1	37.54	10.17	2100	2.3	296	2.88	59	86	108	21	65	99.29
3.3.2.1.1 75% of pull at maximum power at rated speed													
F9	83.1	28.09	10.65	2187	1.8	328	2.60	59	85	108	21	65	99.29
3.3.2.1.2 50% of pull at maximum power at rated speed													
F9	56.8	18.80	10.88	2222	1.2	373	2.29	59	84	107	21	65	99.29
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	83.2	28.15	10.64	1865	1.6	284	3.00	59	85	104	24	57	99.24
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	56.6	18.79	10.84	1890	1.1	318	2.68	59	83	103	24	57	99.24
3.3.2.2 in selected gear nearest to 7.5 km/h at rated speed													
F8	104.2	43.87	8.55	2099	3.9	303	2.81	60	86	108	22	59	99.26
3.3.2.2.1 75% of pull at maximum power at rated speed													
F8	82.1	32.90	8.98	2186	3.0	326	2.62	59	85	107	22	59	99.26
3.3.2.2.2 50% of pull at maximum power at rated speed													
F8	55.8	21.95	9.15	2223	2.9	369	2.31	59	84	106	22	59	99.26
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	82.0	32.88	8.98	1848	2.0	278	3.07	59	85	104	22	59	99.26
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	56.0	21.99	9.17	1875	1.4	311	2.74	59	83	103	22	59	99.26

4.0 OPTIONAL TESTS

4.1 Ballasted Drawbar Performance

Date of Tests: August 1, 1996
Location of Tests: Versatile Farm Equipment Operations Test Track
Sanford, MB; CANADA

Drawbar Height: 495 mm
Tire Pressure: Front: 110 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	73.8	103.38	2.57	2191	15.1	369	2.31	59	86	106	26	56	98.64
F2	87.1	104.57	3.00	2162	15.1	358	2.38	59	85	107	26	56	98.64
F3	93.6	102.72	3.28	2020	15.0	342	2.49	60	86	107	25	58	98.65
F4	100.1	101.92	3.53	1900	15.0	326	2.61	58	86	107	25	58	98.65
F5	112.5	93.32	4.34	1800	6.6	285	2.99	57	87	104	25	58	98.65
F6	116.3	85.28	4.91	1698	4.4	275	3.10	59	85	107	25	60	98.59
F7	118.4	72.70	5.86	1698	3.1	272	3.13	59	86	107	25	60	98.59
F8	119.4	61.96	6.94	1700	2.9	270	3.16	58	86	107	25	60	98.59
F9	118.3	51.86	8.21	1703	2.0	270	3.15	59	86	109	26	56	98.64
F10	117.2	43.76	9.64	1701	1.5	271	3.15	58	86	107	26	56	98.64
3.3.2 FUEL CONSUMPTION													
3.3.2.1 in selected gear, at maximum power at rated speed													
F9	102.1	36.07	10.19	2098	1.3	307	2.77	58	86	109	26	56	98.64
3.3.2.1.1 75% of pull at maximum power at rated speed													
F9	80.4	27.05	10.70	2193	0.9	336	2.54	58	85	109	26	56	98.64
3.3.2.1.2 50% of pull at maximum power at rated speed													
F9	54.7	18.05	10.90	2228	0.7	388	2.20	58	85	107	25	60	98.59
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	80.1	27.02	10.67	1870	0.8	297	2.87	58	86	105	25	61	98.55
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	54.4	18.03	10.86	1896	0.5	338	2.53	59	84	105	25	61	98.55
3.3.2.2 in selected gear nearest to 7.5 km/h at rated speed													
F8	105.6	44.17	8.61	2100	2.6	298	2.86	58	86	109	25	60	98.59
3.3.2.2.1 75% of pull at maximum power at rated speed													
F8	82.9	33.11	9.01	2190	2.1	330	2.59	58	85	108	25	60	98.59
3.3.2.2.2 50% of pull at maximum power at rated speed													
F8	56.4	22.06	9.21	2226	1.7	377	2.26	58	85	107	25	60	98.59
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	82.4	33.09	8.97	1846	1.3	290	2.94	59	86	105	25	60	98.59
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	56.4	22.07	9.20	1884	0.8	325	2.63	59	84	104	25	60	98.59

4.2 POWER LIFT TEST (with 20.8 R38 tires - dynamic radius index 855 mm)

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

	on the hitch point	on the frame
Height of lower hitch points above ground in down position	230 mm	184 mm
Vertical movement without load	758 mm	949 mm
Vertical movement with load	678 mm	839 mm
Maximum corrected force exerted through full range	60.5 kN	51.3 kN
Corresponding pressure of hydraulic fluid	17.3 MPa	17.3 MPa
Moment about rear-wheel axis	75.0 kNm	94.9 kNm
Maximum tilt angle of mast from vertical		14 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points												
mm (in)	-356	-310	-300	-200	-100	0	+100	+200	+300	+368	+400	+483
Corrected ILifting forces												
at the hitch point in kN	–	60.5	60.6	63.9	67.0	70.0	72.5	74.2	75.1	74.9	–	–
Corresponding pressure:	17.3 MPa											
at the frame in kN	52.7	–	53.3	54.7	56.3	58.0	59.7	59.8	58.8	–	56.4	51.3
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

	on the hitch point	on the frame
Height of lower hitch points above ground in down position	230 mm	174 mm
Vertical movement without load	772 mm	944 mm
Vertical movement with load	705 mm	853 mm
Maximum corrected force exerted through full range	57.6 kN	50.0 kN
Corresponding pressure of hydraulic fluid	17.3 Mpa	17.3 MPa
Moment about rear-wheel axis	71.4 kNm	92.5 kNm
Maximum tilt angle of mast from vertical		10 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points													
mm (in)	-431	-400	-375	-300	-200	-100	0	+100	+200	+300	+330	+400	+422
Corrected lifting forces													
at the hitch point in kN	–	–	57.6	60.1	64.0	67.7	70.9	73.2	74.5	73.8	73.2	–	–
Corresponding pressure:	17.3 MPa												
at the frame in kN	52.4	53.0	–	55.2	56.8	58.0	58.9	58.7	58.0	56.0	–	51.5	50.0
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

	on the hitch point	on the frame
Height of lower hitch points above ground in down position	203 mm	201 mm
Vertical movement without load	772 mm	827 mm
Vertical movement with load	705 mm	723 mm
Maximum corrected force exerted through full range	61.9 kN	62.9 kN
Corresponding pressure of hydraulic fluid	18.6 MPa	18.6 MPa
Moment about rear-wheel axis	76.8 kNm	116.4 kNm
Maximum tilt angle of mast from vertical		5 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm (in)	-389	-387	-300	-200	-100	0	+100	+200	+300	+318	+335
Corrected lifting forces											
at the hitch point in kN	--	61.9	66.0	70.1	73,7	76.3	78.6	79.9	80.0	78.8	--
Corresponding pressure:				18.6 MPa							
at the frame in kN	76.3	--	71.8	70.1	70.5	71.5	71.7	70.2	65.4	--	62.9
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 Figures 2.1 and 2.2

	on the hitch point	on the frame
Height of lower hitch points above ground in down position	203 mm	201 mm
Vertical movement without load	772 mm	827 mm
Vertical movement with load	705 mm	723 mm
Maximum corrected force exerted through full range	57.6 kN	58.4 kN
Corresponding pressure of hydraulic fluid	17.3 MPa	17.3 MPa
Moment about rear-wheel axis	71.4 kNm	108.0 kNm
Maximum tilt angle of mast from vertical		5 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm (in)	-389	-387	-300	-200	-100	0	+100	+200	+300	+318	+335
Corrected lifting forces											
at the hitch point in kN	--	57.6	61.3	65.1	68.4	70.9	73.0	74.2	74.3	73.1	--
Corresponding pressure:				17.3 MPa							
at the frame in kN	70.9	--	66.7	65.1	65.4	66.4	66.6	65.2	60.8	--	58.4
Corresponding pressure:				17.3 MPa							

4.6 NOISE TESTS

Date of tests:	July 29, 1996
Location of tests:	Versatile Farm Equipment Test Track Sanford, Manitoba; Canada
Sound level meter Make/Model/Type:	Bruel & Kjaer/Model T2236/Preceison Integrating Sound Level Meter
Type of track:	Concrete
Noise at operator ear 75% pull at maximum power rated speed noise level:	75.0 dBA
Gear Number:	F10

5. REPAIRS

None

6. REMARKS

None

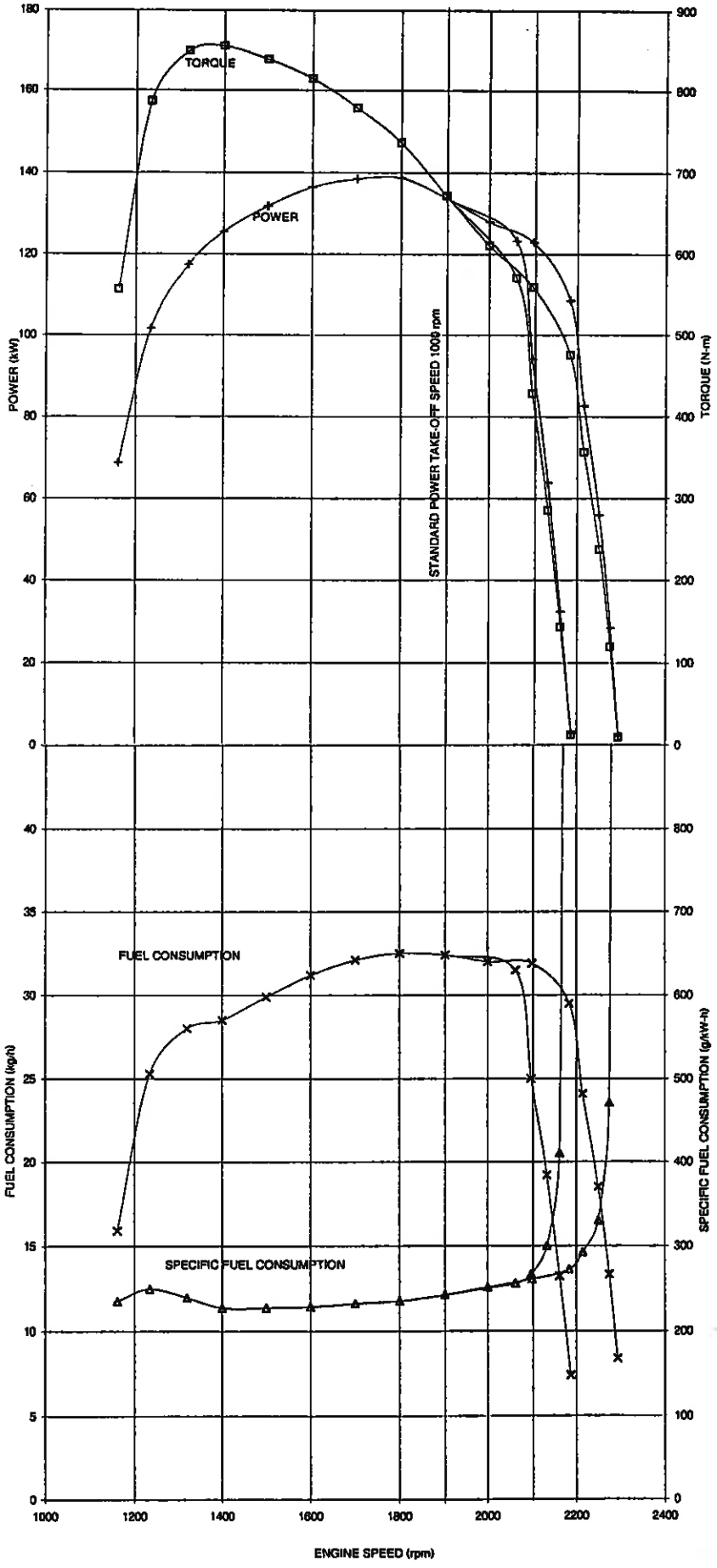
7. ANNEX (CURVES)

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 8770 TRACTOR



NEW HOLLAND 8770 TRACTOR

