SILSOE RESEARCH INSTITUTE
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Report No: OECD/7131/0196
OECD Approval No: 1721 Restricted Code
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Report on test in accordance with the OECD STANDARD CODE II (RESTRICTED CODE) for the Official Testing of Agricultural and Forestry Tractors

New Holland 8160/M100 Four-Wheel Drive Tractor with 23-speed Hi-lo Transmission (30 Km/h)



Manufactured by: New Holland UK Ltd
Basildon
Essex
United Kingdom

Submitted for test by: The manufacturer

Report No: 788

Date: September 1997

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OECD/7131/0196

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Tractor manufacturer's name and address:	New Holland UK Ltd Basildon, Essex, United Kingdom
Location of tractor assembly:	Basildon, Essex
Submitted for test by:	The manufacturer
Selected for test by:	The manufacturer
Place of running in:	Basildon, Essex
Duration of running in:	130 hours
Location of test:	Silsoe Research Institute Wrest Park, Silsoe, United Kingdom

I. SPECIFICATION OF TRACTOR

TRACTOR

Make:	New Holland
Model:	8160/M100
Type:	Four wheel drive, unit construction
Serial No:	BX00072
1st Serial No:	003794B

ENGINE

Make:	New Holland
Model:	675/TC
Type:	4 stroke direct injection diesel
Serial No:	TC468479

Cylinders

Number/disposition:	6 vertical In-line
Bore/stroke:	111.8 mm/127.0 mm
Capacity:	7480 cm^3
Compression ratio:	17.5 :1
Arrangement of valves:	Overhead
Cylinder liners:	None, monobloc construction

Supercharging

Make:	None fitted

Fuel system

Fuel feed system:	Wabco series 6000 or Purolator 'Facet' electric lift pump
Make, type and model of fuel filter:	Plastic strainer in tank and one disposable canister filter with sediment bowl and water seperator plus secondary disposable canister filter between tank and injection pump
Capacity of fuel tank:	325 litres
Make, type and model of injection pump:	Bosch, 'VE' Rotary, 0 460 426 238
Serial No:	471 62589
Manufacturer's production setting of injection pump:	
Flow rate:	61.6-65.4 mm^3 per stroke at 1100 rev/min pump speed and full load
Timing:	Delivery starts 6° before T.D.C
Make, type and model of injectors:	Bosch, multihole, 0 432 191 650 nozzle
Injection pressure:	270-278 bar

Governor

Make:	Bosch
Model:	None
Type:	Mechanical incorporated in fuel injection pump
Governed range of engine speed:	700 rev/min to 2420 rev/min
Rated engine speed:	2200 rev/min

Air cleaner

Pre-cleaner:	None
Make:	Locker Air Maze or Donaldson
Type:	3 stage dry paper element with replaceable cartridge (Exhaust Aspirated - optional)
Model:	None
Location of air intake:	Under engine hood in front and above radiator
Maintenance indicator:	Warning light on instrument panel

Lubrication system

Type of feed pump:	Forced feed from eccentric rotor pump
Type of filter:	Metal mesh strainer in sump on suction line and full flow disposable canister on pressure line to engine
Number:	1

Cooling system

Type of coolant:	Water and antifreeze (50% solution)
Type of pump:	Belt driven centrifugal impeller
Specification of fan:	Thermal controlled with viscous clutch
Number of fan blades:	5
Fan diameter:	510 mm
Coolant capacity:	25.5 litres
Type of temperature control:	Thermostat with full flow bypass
System pressure:	100 kPa

Starting system

Make:	Bosch JF
Model:	JF
Type:	Electrical, positive engagement, solenoid operated
Starter motor power rating:	3.1/3.6 kW
Cold starting aid:	CAV Thermostart - Type 357-33
Safety device:	Starting operable when all gear levers are in neutral

Electrical system

Voltage:	12 V
Generator:	Alternator
Make:	Magneti Marrelli
Model:	MME A 127
Type:	Belt driven
Power:	70/100 amps at 6000 rev/min
Batteries:	2 CEAC lead acid, mounted on front support
Rating:	70/95 AH at 20 hours rating

Exhaust system

Make:	Alcom
Model:	None
Type:	Underhood horizontal silencer with vertical stack pipe
Location:	Left-hand side of engine, under bonnet
Height of outlet above ground:	2982 mm

TRANSMISSION TO WHEELS

Main clutch

Make:	New Holland
Model:	None
Type:	Wet multiplate in gearbox, for travel only
Number of plates:	7
Diameter of plates:	160 mm
Method of operation:	Mechanical/electro-hydraulic with pedal overide

Gear box

Make:	New Holland
Model:	Dual command (Hi-lo)
Operation:	4 gears fully synchronised plus 3 ranges with synchromesh on upper 2 ranges, with an additional Hi/lo function on forward gears, operated by two levers on right-hand console. Forward and reverse actuated by a steering column mounted shuttle lever.
Number of gears:	23 forward, 12 reverse (30 km/h)
Available options:	46 x 24 with creep (30 km/h), 24 x 12 (40 km/h) 48 x 24 with creep (40 km/h)

Rear axle final drives

Make:	New Holland
Model:	None
Type:	Crown wheel and pinion with differential and inboard epicyclic reduction gear final drive
Differential lock:	
Type:	Mechanical
Method of engagement:	Electro-hydraulic actuation in response to signal from switch on right-hand control panel
Method of disengagement:	Via panel switch or in response to electrical signal from brakes on application

Front axle and final drives

Make:	New Holland
Model:	None
Type:	Crown wheel and pinion with differential and outboard epicyclic reduction gear final drives
Drive engagement:	
Type:	Multiplate clutch - located within the gearbox
Method of operation:	Electro-hydraulic actuation in response to signal from switch on the RH control panel
Differential lock:	
Type:	Mechanical
Method of engagement:	Electro-hydraulic actuation in response to signal from switch on right-hand control panel
Method of disengagement:	Via panel switch or in response to electrical signal from brakes on application

Total ratios and travelling speeds

Gear	Ratio	Group No	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at rated engine speed:* 2200 rev/min km/h
Forward				
1	L	A	478.02	1.42
1	H	A	396.84	1.72
2	L	A	331.37	2.05
2	H	A	275.10	2.47
3	L	A	230.32	2.95
3	H	A	191.21	3.56
4	L	A	160.72	4.23
4	H	A	133.42	5.10
1	L	B	166.33	4.09
1	H	B	138.09	4.93
2	L	B	115.31	5.90
2	H	B	95.73	7.10
3	L	B	80.14	8.49
3	H	B	66.53	10.22
4	L	B	55.91	12.16
4	H	B	46.43	14.65
1	L	C	68.02	10.00
1	H	C	56.47	12.04
2	L	C	47.15	14.42
2	H	C	39.15	17.37
3	L	C	32.77	20.75
3	H	C	27.21	25.00
4	L	C	22.87	29.74
1		A	489.13	1.39
2		A	339.08	2.01
3		A	235.68	2.89
4		A	164.45	4.14
1		B	170.20	4.00
2		B	117.99	5.76
3		B	82.01	8.29
4		B	57.22	11.89
1		C	69.60	9.77
2		C	48.25	14.10
3		C	33.54	20.28
4		C	23.40	29.06

A = Low range B = Medium range C = High range

(*) Calculated with a tyre dynamic radius index of 820 mm (ISO 4251/1-1992)

Number of revolutions of front wheels for one revolution of rear wheels: 1.340

POWER TAKE-OFF

Main power take-off

Type:	**Independent**
Method of engagement:	**Electro - hydraulically operated multi-plate clutch in response to a signal from switch on the right-hand control panel**
Number of shafts:	**1 interchangeable shaft, 6 or 21 spline to ISO.500/1991**
Method of changing power take-off speeds:	
Two speed	Shiftable, 540 or 1000 rev/min by lever on right-hand console

Clutch

Make:	New Holland
Model:	None
Type:	Multiplate, wet
Number of plates:	6
Diameter of plates:	140.0 mm

Two/three speed shiftable power take-off proportional to engine speed and with changeable shafts

540/750/1000 rev/min	540 rev/min	750 rev/min	1000 rev/min
Location:	Rear of tractor	Rear of tractor	Rear of tractor
Diameter of power take-off shaft:	34.9 mm	34.9 mm	34.9 mm
Number of splines:	6 or 21	6 or 21	6 or 21
Height above ground:	803 mm	803 mm	803 mm
Distance from the median plane of the tractor:	Central	Central	Central
Distance behind rear wheel axis:	602 mm	602 mm	602 mm
Pto speed at rated engine speed:	603	769	1037
Engine speed at standard power take-off speed:	1971	2145	2121
Ratio of rotation speeds:	3.65	2.86	2.12
Power restriction and maximum torque:	None	None	None
Direction of rotation (viewed from behind tractor):	Clockwise	Clockwise	Clockwise

Power take-off proportional to ground speed

Travelling distance for one revolution of power take-off shaft	.355 m	.263 m	.194 m
Number of power take-off shaft revolutions for one revolution of rear driving wheels	15.4	19.6	26.5

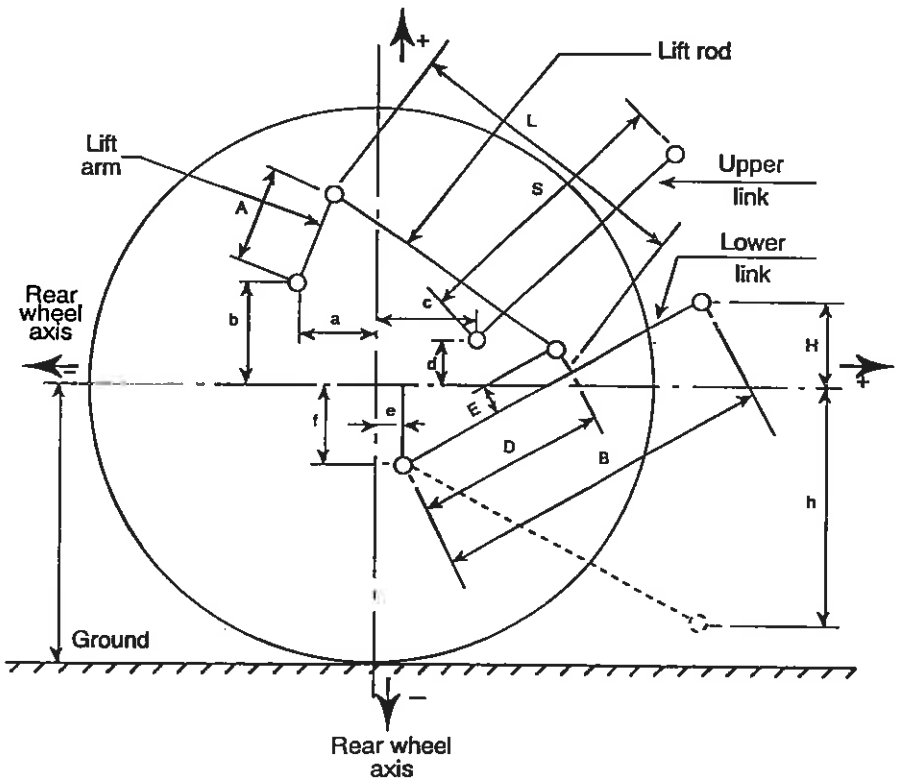
POWER LIFT - standard

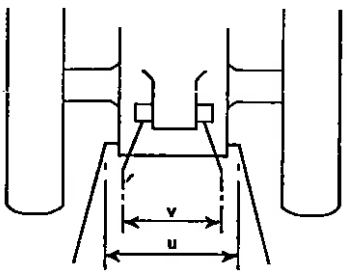
Pump - standard

Make:	New Holland
Model:	None
Type:	Electro-hydraulic with solenoid valves, open centre for lift and drop
Type and number of cylinders:	1 single acting inside transmission housing plus the option of single acting, externally mounted assistor ram (1 fitted for test)
Type of linkage lock for transport:	Hydraulic
Relief valve pressure setting:	18.7 - 193 MPa
Opening pressure of cylinder safety valve:	19.3 MPa
Lift pump type:	Gear
Transmission between pump and engine:	Gear driven from pto shaft, independent of main and pto clutches
Type and number of filters:	2 disposable canister filters
Site of oil reservoir:	Rear axle housing
Type, number and position of tapping points:	1, 2, 3 or 4 remote couplers at rear of tractor
Maximum volume of oil available to external cylinders:	18 - 20 litres

THREE-POINT LINKAGE

Category:	2 to ISO standard 730-1:1994
Category adaptor:	None
Controls:	Electronic draught/position control link. (Optional - draught or position control) Lower link sensing





LIFT TEST
Linkage geometry

Table 2.1
Dimensions of linkage when attached to the standard frame (ISO 730/3-1994 CAT 2)

			Dimensions or range	Settings used in main test	Settings used in optional tes
Length of lift arms		(A)	230	230	230
Length of lower links		(B)	974	974	974
Distance of lift arm pivot point from rear wheel centre line:	horizontally:	(a)	156	156	156
	vertically:	(b)	362.5	362.5	362.5
Horizontal distance between the two lower link points:		(u)	544	544	544
Horizontal distance between the two lift arm end points:		(v)	560	560	560
Length of upper link:		(S)	652-942	754	768
Distance of upper link pivot point from rear wheel centre line:	horizontally:	(c)	430-455	455	430
	vertically:	(d)	208-275	208	275
Distance of lower link pivot point from rear wheel centre line:	horizontally:	(e)	220	220	220
	vertically:	(f)	250	250	250
Distance of lower link points to lift rod pivot points on lower link centre line:	horizontally:	(D)	435-504	435	504
	vertically:	(E)	on centre line	on centre line	on centre lin
Length of lift rods:		(L)	635-780	740	780
ISO mast height			610	610	610
Height of lower hitch points (*) relative to the rear wheel centre line, situated 820 mm above the ground level:					
- in low position		(h)	250-744	625	599
- in high position		(H)	41-328	70	75
Height of lower hitch points when locked in transport position (*)			Any height within lift range (hydraulic transport lock)		

* Assuming r = tyre dynamic radius index of 820 mm ISO 4251/1-1992

SWINGING DRAWBAR

Type:	Clevis		
Height above ground, unballasted maximum:	545 mm		
minimum:	443 mm		
Type of adjustment:	Inverting drawbar		
Distance of hitch point from rear-wheel axis, horizontally:	845 mm	960 mm	1010 mm
Distance of hitch point from power take-off shaft ends:			
Vertically:	258 mm	360 mm	
Horizontally:	243 mm	358 mm	408 mm
Lateral adjustment from the (centre of clevis):			
Right-hand	172 mm	208 mm	220 mm
Left-hand	172 mm	208 mm	220 mm
Distance of pivot point from rear axles horizontally:	300 mm		
Width of clevis:	68 mm		
Diameter of pin hole:	33 mm		
Maximum vertical permissible load - Clevis uppermost:	910 kg	1065 kg	1630 kg
Clevis underneath:	910 kg	1065 kg	1135 kg

Trailer Hitch

Type: None fitted

Linkage Drawbar

Type: None fitted

Front Towing Hitch

Type None fitted

STEERING

Make:	New Holland
Model:	None
Type:	Hydrostatic
Method of operation:	
Pump:	New Holland
Motor:	Danfoss OSPC-160-OR
Ram:	2, a balanced single acting cylinder operating each steering arm
Filter:	Integral with hydraulic power lift system
Working pressure:	166 - 178 bar

BRAKES

Service brake

Make:	New Holland
Model:	None
Type:	Oil-immersed single plate disc
Method of operation:	Hydraulic, independent on rear wheels (On (4WD) models. When the service brakes are actuated the front wheel drive is automatically engaged providing 4-wheel braking)
Trailer braking take-off:	Hydraulic connector fitted to ISO 5676-1983

Parking brake

Make:	New Holland
Type:	Fully independent three plate disc operating on bevel pinion shaft
Method of operation:	Hand lever with ratchet

WHEELS

Number: 4

Front: 2 steering and driving

Rear: 2 driving

Wheelbase: 2723 mm

Track settings

	Minimum mm	Maximum mm	Adjustment method
Front	1551	2269	Reversing wheels and offset lug rims
Rear	1630	2232	Reversing wheels and offset lug rims

PROTECTIVE STRUCTURE

Make:	New Holland
Model:	New Holland SLTV 1
Type:	Cab safety frame
Manufacturer's name and address:	New Holland UK Ltd, Basildon
Protective device:	
Rollguard:	Safety cab
Tiltable/Not tiltable:	Non-tiltable
OECD approval number:	CSD-1398/1-12, 28 September 1994
New Holland M100	CSD1398/11
New Holland 8160	CSD1398/5

Original test and minor modification certificates under the responsibility of S.H. STATENS HUSDYRBRUGSFORSOG BYGHOLM, DENMARK

DRIVERS SEAT

Make/Model/Type:	Grammar DS85H1/90A
Type of suspension:	Low frequency, parallelogram suspension spring
Type of damping:	Double acting, hydraulic
Range of adjustment:	
Longitudinal:	± 75 mm
Vertical:	± 30 mm

Passenger seat (optional)

Make:	New Holland
Type:	Soft plastic moulding, half folding, on LH side of inner fender. EEC approved to Directive 76/763/EEC-e110725

LIGHTING

In accordance with EEC Directive 78/933/EEC

Unrestricted beam angle of headlight in plan view: 140°

	Height above ground to centre mm	Size mm	Distance from outside edge to median plane of tractor mm
Headlight	1380	150 x 90	200
Sidelights	1840	105 x 30	870
Rear lights	1827	50 x 50	847
Axle reflectors	792	100 x 35	570
Cab reflectors	1827	50 x 50	847

II **TEST CONDITIONS**

Overall dimensions

Length mm	Width		Height at top of	
	Minimum mm	Maximum mm	Protective structure mm	Exhaust pipe mm
4658	2135	2771	2824	2982

Ground clearance (unballasted tractor) 360 mm

Clearance-limiting part: Drawbar clevis in lowest position

Tractor mass (with safety cab)

	Unballasted		Ballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	2032	2037	--	--
Rear	2997	3067	--	--
Total	5029	5104	--	--

Tyres and track width specification

	Front	Rear
Tyres dimensions ply rating type	 14.9 R 28 128A8 Radial	 18.4 R 38 146A8 Radial
Maximum load (tyre manufacturer's), kg 30 km/h (40 km/h)	1925 (1800)	3210 (3000)
Maximum load (tractor manufacturer's), kg	1925 (1800)	3210 (3000)
Inflation pressure (tyre manufacturer's), Bar	1.6	1.6
Dynamic radius index	640	820
Chosen track width (manufacturer's nominal)	1757	1830

Oils and lubrication

Capacity and change interval

	Capacity litre	Oil change hours	Filter change hours
Engine	19.0	300	300
Front axle differential	9.0	1200	None
Final drive (front) - per side	1.7	1200	None
Rear axle Dual command + CCLS	73	1200	300
Gearbox } Hydraulic system } Final drives (rear) } Steering }	Integral with rear axle		
Brakes	0.5	Top-up	None

Fuels and lubricants used in tests

Fuel

Type: Diesel oil to Class D, 1.5 to 5.5 cSt
Specific gravity: 0.8390 g/cm^2 at 15°C

Oils	NH spec	Recommended	Used during test
Engine oil			
Type:	NH 324B	SAE 10W/30	As recommended
Viscosity:		11.5 cSt at 100°C	
Classification:		API CF-4	
Transmission oils			
Type:	NH 410B	SAE 10W/30	As recommended
Viscosity:		9 cSt at 100°C	
Classification:		API GL-4	
Rear final drives			
Type:	NH 410B	SAE 10W/30	As recommended
Viscosity:		9 cSt at 100°C	
Classification:		API GL-4	
Front differential and final drives			
Type:	NH 410B	SAE 10W/30	As recommended
Viscosity:		9 cSt at 100°C	
Classification:		API GL-4	
Hydraulic brakes			
Type:	NH 610A	No equivalent	As recommended
Viscosity:		6 cSt at 100°C	
Classification:		No equivalent	
Hydraulic fluid			
Type:	NH 410B	SAE 10W/30	As recommended
Viscosity:		9 cSt at 100°C	
Classification:		API GL-4	
Steering oil			
Type:	NH 410B	SAE 10W/30	As recommended
Viscosity:		9 cSt at 100°C	
Classification:		API GL-4	
Grease points			
Recommended grease:	NH 720A	Lithium based	As recommended
Number of lubrication points:	14		

III. TEST RESULTS

A. COMPULSORY TESTS

1. MAIN POWER TAKE-OFF (1000)

Date and location of tests: 13 August 1997
Silsoe Research Institute,
Wrest Park, Silsoe, Bedford

Type of dynamometer: Eddy Current, Borghi and Saveri

Power kW	Speed		Fuel consumption			Specific energy kWh/l
	Engine rev/min	P.T.O. rev/min	Hourly kg/h	Hourly l/h	Specific g/kWh	
1.1 MAXIMUM POWER - TWO HOUR TEST						
68.2	1910	901	17.22	20.53	252	3.32
1.2 POWER AT RATED ENGINE SPEED						
65.9	2200	1038	18.18	21.66	276	3.04
1.3 STANDARD POWER TAKE-OFF SPEED (1000 ± 25 rev/min)						
66.5	2120	1000	17.96	21.40	270	3.11
1.4 PART LOADS 1.4.1 The torque corresponding to maximum power at rated engine speed						
65.9	2200	1038	18.18	21.66	276	3.04
1.4.2 85% of the torque defined in 1.4.1						
58.6	2296	1083	17.28	20.60	295	2.85
1.4.3 75% of the torque defined in 1.4.2						
44.8	2338	1103	14.58	17.37	325	2.58
1.4.4 50% of the torque defined in 1.4.2						
30.0	2359	1113	11.83	14.10	394	2.13
1.4.5 25% of the torque defined in 1.4.2						
15.1	2371	1118	9.21	10.97	610	1.38
1.4.6 Unloaded						
0	2393	1129	6.73	8.02	–	–

Power kW	Speed		Fuel consumption			Specific energy kWh/l
	Engine rev/min	P.T.O. rev/min	Hourly kg/h	Hourly l/h	Specific g/kWh	
1.5	PART LOADS AT STANDARD POWER TAKE-OFF SPEEDS (1000 ± 25 rev/min)					
1.5.1	The torque corresponding to maximum power					
66.5	2120	1000	17.96	21.40	270	3.11
1.5.2	85% of the torque obtained in 1.5.1					
58.3	2192	1034	16.54	19.72	284	2.96
1.5.3	75% of the torque obtained in 1.5.2					
44.7	2238	1056	13.90	16.57	311	2.70
1.5.4	50% of the torque obtained in 1.5.2					
30.2	2271	1071	11.32	13.49	374	2.24
1.5.5	25% of the torque obtained in 1.5.2					
15.3	2291	1081	8.77	10.46	582	1.44
1.5.6	Unloaded					
0	2319	1094	6.20	7.39	--	--

No load, maximum engine speed: 2393 rev/min

Torque (equivalent crankshaft) at maximum power: 341.1 Nm

Torque (equivalent crankshaft) at rated speed: 286.0 Nm

Maximum torque (equivalent crankshaft): 403.4 Nm
(engine speed 1413 rev/min)

Mean atmospheric conditions:

- Temperature 24°C
- Pressure 1020 m bar
- Relative humidity 76%

Maximum temperatures:

- Coolant 84°C
- Engine oil 102°C
- Fuel 55°C
- Engine air intake 30°C

2. HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 12 September 1997

2.1 Hydraulic power test

Sustained pressure with relief valve open: 19.6 MPa

Pump delivery rate at minimum pressure: 99.6 l/min

	Flow rate l/min	Pressure MPa	Power kW
Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power	76.4	17.6	22.41
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	92.4	17.0	26.18

Tapping point used for test: Auxiliary service connection

Temperature of hydraulic fluid if different from 65 ± 5°C: -- °C

Opening pressure of the unloading valve: -- MPa

Closing pressure of the unloading valve: -- MPa

2.2 Power lift test - (To ISO 730-1:1990)

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	193 mm	193 mm
Vertical movement	732 mm	892 mm
Maximum corrected force exerted through full range	31.0 kN	29.0 kN
Corresponding pressure of hydraulic fluid	17.6 MPa	17.6 MPa
Moment about rear-wheel axis	37.0 kNm	52.3 kNm
Maximum tilt angle of mast from vertical	--	12 degrees

Linkage settings for test - **see Table 2.1 and Figure 2.1**

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-432	-377	-300	-200	-100	0	100	200	300	355	460
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure delivered by the hydraulic system)											
at the hitch points kN	--	31.0	37.2	42.4	45.6	48.0	49.7	50.8	52.2	53.0	--
Corresponding pressure: 17.6 MPa											
at the frame kN	29.0	31.8	34.9	38.0	39.2	39.6	39.4	38.7	37.7	37.4	37.2
Corresponding pressure: 17.6 MPa											

3. DRAWBAR POWER AND FUEL CONSUMPTION TEST (UNBALLASTED TRACTOR), 4 WHEEL DRIVE

Date and location of tests: 9 September 1997
Silsoe Research Institute
Wrest Park, Silsoe
Bedford MK45 4HS

Type of track: Concrete

Height of drawbar above ground	Tyre inflation pressure (kPa)	
	Front	Rear
395 mm	117	103

Gear and Range	Power	Drawbar Pull	Speed	Engine Speed	Slip of wheels or track	Spec fuel cons	Spec energy	Temperature			Atmospheric conditions		
								Fuel	Coolant	Eng oil	Temp	Rel Humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kwh	kWh/l	Deg.C	Deg.C	Deg.C	Deg.C	%	kPa
3.1	MAXIMUM POWER IN TESTED GEARS												
3LA*	36.1	48.5	2.68	2312	15.4	427	1.96	59	83	100	22	38	101.9
3HA*	42.2	48.0	3.16	2272	15.6	397	2.11	58	83	100	23	38	101.9
1LB	48.3	46.9	3.71	2217	11.9	364	2.31	56	84	98	19	50	101.9
4LA	49.4	46.4	3.83	2189	10.9	345	2.43	59	84	97	22	47	101.9
1HB	52.6	45.9	4.12	1993	9.6	327	2.57	54	84	100	21	47	102.0
4HA	52.7	45.1	4.20	1948	8.9	325	2.58	59	85	101	20	52	102.0
2LB	55.3	40.8	4.88	1912	6.8	311	2.69	56	84	100	20	50	102.0
2HB	54.9	33.1	5.97	1912	5.3	314	2.67	53	84	100	20	50	102.0
3LB	54.8	27.4	7.21	1915	4.4	314	2.67	52	84	98	16	63	102.0
1LC	56.0	23.7	8.51	1908	3.7	303	2.77	53	84	100	17	60	102.0
3HB	53.9	22.2	8.74	1914	3.6	318	2.64	55	84	100	17	62	102.0
1HC	54.5	19.0	10.36	1915	3.1	315	2.66	52	84	95	18	53	102.0
4LB	53.7	18.5	10.45	1914	3.1	321	2.61	51	83	98	19	53	102.0
2LC	54.5	15.8	12.41	1907	2.7	312	2.68	54	84	99	19	55	102.0
4HB	52.0	14.8	12.65	1912	2.6	328	2.56	53	84	100	19	53	102.0
2HC	51.7	12.4	15.04	1911	2.3	328	2.56	55	84	100	20	52	102.0
3.2 3.2.1	FUEL CONSUMPTION In selected gear, at maximum power at rated speed												
1LC	52.8	19.3	9.85	2197	3.2	343	2.44	49	84	99	17	61	102.0
3.2.1.1	75% of pull at maximum power at rated speed												
1LC	41.9	14.5	10.44	2311	2.4	387	2.17	51	84	100	16	62	102.0
3.2.1.2	50% of pull at maximum power at rated speed												
1LC	28.8	9.7	10.66	2345	1.8	494	1.70	53	83	100	17	61	102.0
3.2.1.3	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.1												
1HC	41.9	14.5	10.42	1918	2.7	343	2.44	53	83	95	21	40	101.9
3.2.1.4	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.2												
1HC	28.8	9.7	10.64	1944	2.0	396	2.12	55	82	95	22	40	101.9
3.2.2	In selected gear nearest to 7.5 km/h, at maximum power at rated engine speed												
2HB	51.7	26.8	6.94	2198	4.2	347	2.42	53	84	98	17	61	102.0
3.2.2.1	75% of pull at maximum power at rated speed												
2HB	41.1	20.1	7.36	2312	3.3	399	2.10	53	83	99	17	58	102.0
3.2.2.2	50% of pull at maximum power at rated speed												
2HB	28.0	13.4	7.54	2346	2.4	508	1.65	51	83	99	17	58	102.0
3.2.2.3	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.1												
3LB	41.1	20.1	7.35	1936	3.5	332	2.53	53	83	95	21	40	101.9
3.2.2.4	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.2												
3LB	27.9	13.4	7.51	1960	2.5	402	2.09	54	82	95	21	41	101.9

*Maximum power limited by wheelslip

TEST RESULTS

B. SUPPLEMENTARY TESTS

2. POWER LIFT TESTS

1. Power lift test - (To manufacturers lift rod setting)

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	220 mm	220 mm
Vertical movement	661 mm	716 mm
Maximum corrected force exerted through full range	39.4 kN	40.8 kN
Corresponding pressure of hydraulic fluid	17.6 MPa	17.6 MPa
Moment about rear-wheel axis	45.5 kNm	71.1 kNm
Maximum tilt angle of mast from vertical	--	6 degrees

- Linkage settings for test - see Table 2.1 and Figure 2.1

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-353	-350	-300	-200	-100	0	100	200	250	311	363
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure delivered by the hydraulic system)											
at the hitch points kN	--	38.1	41.3	48.1	52.1	54.4	55.8	56.5	56.9	57.1	--
Corresponding pressure: 17.6 MPa											
at the frame kN	39.4	39.4	42.1	46.4	48.3	48.7	48.1	46.5	45.6	44.6	43.9
Corresponding pressure: 17.6 MPa											

3. DRAWBAR POWER AND FUEL CONSUMPTION TEST (UNBALLASTED TRACTOR), 2 WHEEL DRIVE

Date and location of tests: 10 September 1997
Silsoe Research Institute
Wrest Park, Silsoe
Bedford MK45 4HS

Type of track: Concrete

Height of drawbar above ground	Tyre inflation pressure (kPa)	
	Front	Rear
510 mm	117	103

Gear and Range	Power	Drawbar Pull	Speed	Engine Speed	Slip of wheels or track	Spec fuel cons	Spec energy	Temperature			Atmospheric conditions		
								Fuel	Coolant	Eng oil	Temp	Rel Humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kwh	kWh/l	Deg.C	Deg.C	Deg.C	Deg.C	%	kPa
3.1	MAXIMUM POWER IN TESTED GEARS												
3HA*	31.3	35.2	3.20	2329	15.3	468	1.79	58	83	100	21	46	101.9
1LB*	35.9	35.6	3.63	2318	15.1	428	1.96	56	83	99	19	51	101.9
4LA	37.8	34.7	3.92	2311	12.1	410	2.05	59	83	99	19	52	101.9
1HB	43.4	34.0	4.58	2288	10.7	389	2.16	54	84	100	20	49	101.9
4HA	44.7	34.1	4.72	2277	10.7	386	2.17	53	84	100	20	49	102.0
2LB	49.7	33.3	5.38	2230	10.2	343	2.45	57	83	100	20	50	101.9
2HB	52.6	30.7	6.16	2053	7.3	331	2.53	55	84	98	19	49	102.0
3LB	54.6	28.1	6.99	1913	5.5	319	2.63	51	84	97	16	51	102.0
1LC	55.6	24.1	8.31	1911	4.6	309	2.72	52	84	100	15	54	102.0
3HB	53.9	22.7	8.54	1915	4.3	317	2.64	52	84	100	17	53	102.0
1HC	54.9	19.6	10.10	1912	3.7	311	2.70	50	84	99	17	52	102.0
4LB	54.6	19.3	10.19	1909	3.6	314	2.67	51	83	100	17	52	102.0
2LC	55.0	16.3	12.17	1911	3.1	312	2.69	50	84	100	17	54	102.0
4HB	53.2	15.4	12.39	1914	3.1	323	2.60	51	84	100	17	53	102.0
2HC	52.5	12.8	14.71	1909	2.6	331	2.54	52	84	100	18	53	102.0
3.2 3.2.1	FUEL CONSUMPTION In selected gear, at maximum power at rated speed												
1LC	52.4	19.5	9.66	2202	3.8	353	2.38	51	84	98	15	54	102.0
3.2.1.1	75% of pull at maximum power at rated speed												
1LC	41.5	14.6	10.23	2314	2.9	382	2.20	51	84	99	16	54	102.0
3.2.1.2	50% of pull at maximum power at rated speed												
1LC	28.5	9.8	10.44	2342	2.1	464	1.81	51	83	99	16	53	102.0
3.2.1.3	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.1												
1HC	41.4	14.6	10.23	1923	2.9	312	2.69	57	83	96	20	49	101.9
3.2.1.4	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.2												
1HC	28.5	9.8	10.42	1942	2.2	392	2.14	54	82	96	21	48	101.9
3.2.2	In selected gear nearest to 7.5 km/h, at maximum power at rated engine speed												
2HB	52.1	27.8	6.74	2201	5.5	337	2.49	52	84	91	19	51	102.0
3.2.2.1	75% of pull at maximum power at rated speed												
2HB	41.7	20.9	7.18	2310	4.0	385	2.18	56	84	99	19	49	102.0
3.2.2.2	50% of pull at maximum power at rated speed												
2HB	28.4	13.9	7.38	2344	2.7	474	1.77	57	83	100	19	50	102.0
3.2.2.3	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.1												
3LB	41.5	20.9	7.16	1932	4.2	328	2.56	54	83	98	21	44	101.9
3.2.2.4	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.2.												
3LB	28.4	13.9	7.38	1965	2.7	374	2.25	55	82	96	20	47	101.9

* Maximum power limited by wheelslip

REPAIRS AND ADJUSTMENTS DURING TESTS: None

REMARKS: None

Test carried out by: S J Devonshire

Signed: Officer in charge of tests

P C Seward

Signed: for the Director

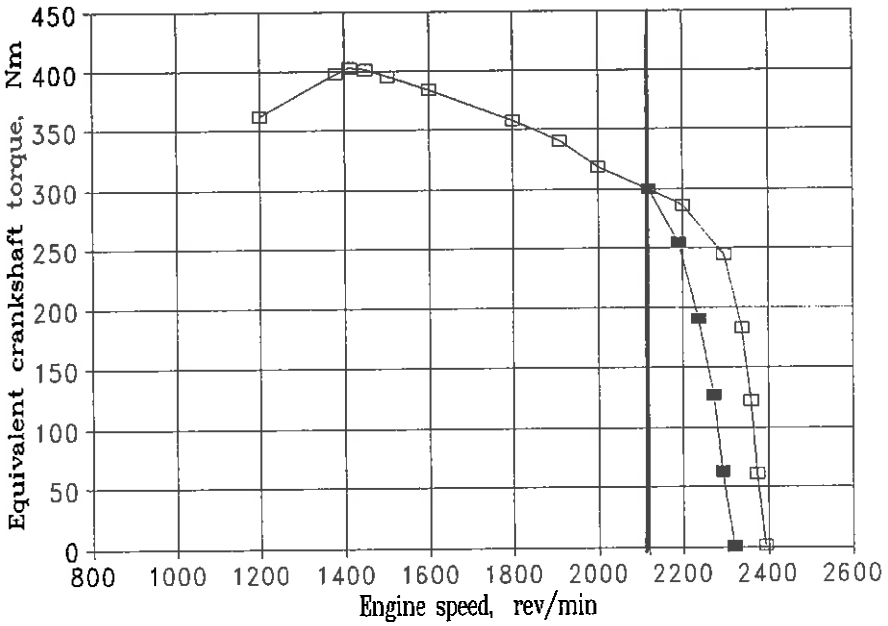
P C Seward
Head of Test Engineering Group

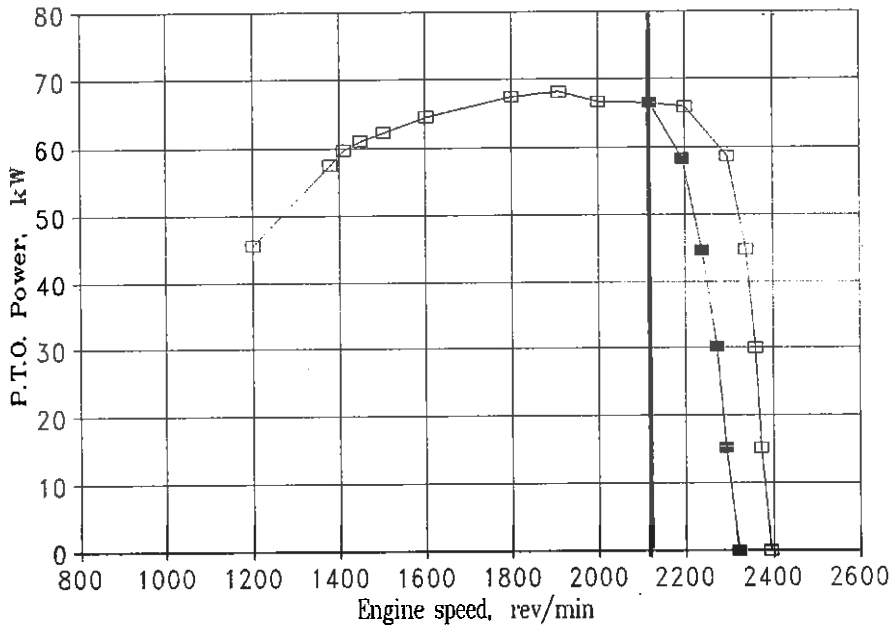
Date: 18/12/97

ANNEX 1 MAIN POWER TAKE-OFF CURVES

P.T.O. POWER TEST - NEW HOLLAND M100 FOUR-WHEEL DRIVE (1000 rev/min)

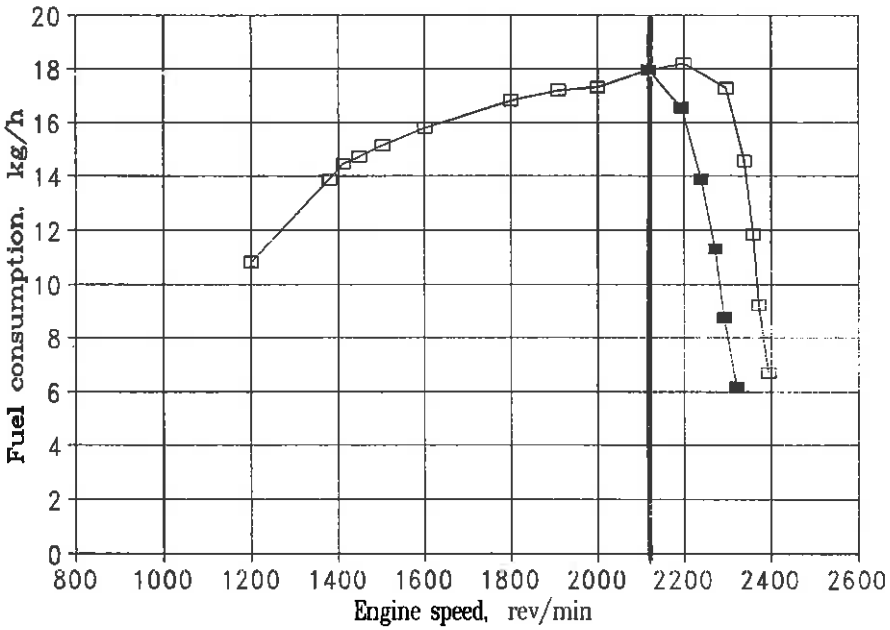
Governor set for maximum power at rated speed □
Governor set for maximum power at pto speed ■
Power take-off speed (1000 rev/min) |

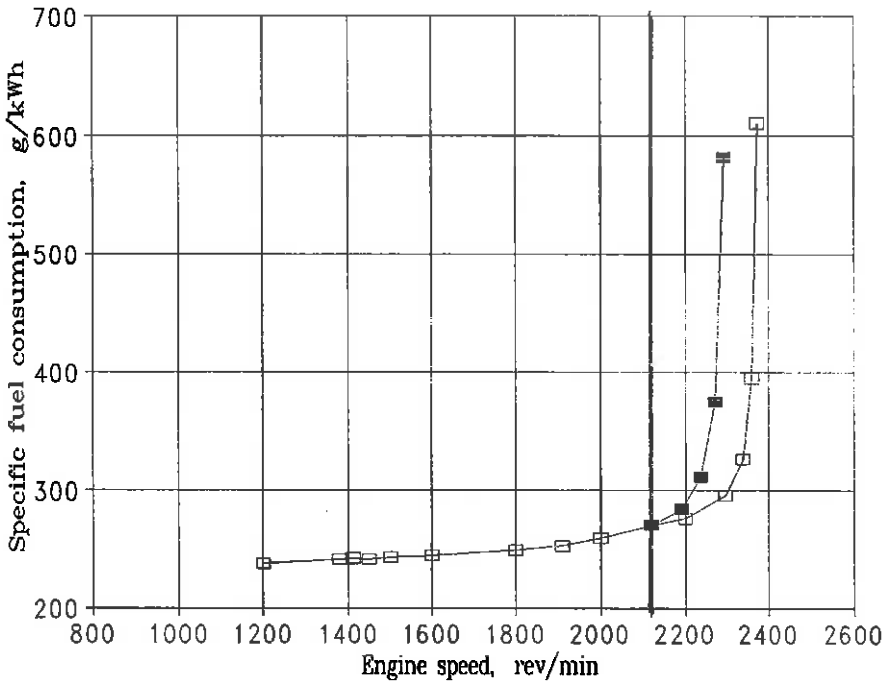




P.T.O. POWER TEST - NEW HOLLAND M100 FOUR-WHEEL DRIVE (1000 rev/min)

Governor set for maximum power at rated speed □
Governor set for maximum power at pto speed ■
Power take-off speed (1000 rev/min) |





P.T.O. POWER TEST - NEW HOLLAND M100 FOUR-WHEEL DRIVE (1000 rev/min)

Governor set for maximum power at rated speed □
Governor set for maximum power at pto speed ■

